

New physics and old sciences

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Calculation and education

What we now call ‘physics’ is a specially restricted science. It studies nature as an external world, where objects are related into structures. In modern physics, these structures are described mechanically – as though they were carefully engineered machines that function in a calculated way, with results that are reliably predictable.

Because of this mechanical approach, modern physics works essentially through calculation. Its theories are designed primarily to calculate predicted results. And the results are then tested mechanically, through external instruments and machines, in a world of space and structure.

In the last few hundred years, the success of modern physics has been obvious and spectacular. So much so that it has come to be regarded as a model which all other sciences should follow. But here, I would say, there is a problem. Sciences don’t only work through *calculation*, as exemplified by modern physics. They work more essentially through *education*, as exemplified by the much older science of linguistics.

In fact, the success of modern physics is achieved at the cost of an inherent restriction. What modern physics studies is a world that excludes our minds. The older sciences consider nature in a broader and a deeper way. In their approach to nature, they include both the external world and the expression of consciousness that we experience in our living faculties of sense and mind.

That broadening requires a shift of emphasis, from calculation to education. In particular, the shift can be seen by comparing modern physics with the old science of linguistics, as shown in figure 1.

Figure 1 – Modern physics and linguistics

	<i>Modern physics</i>	<i>Linguistics</i>
Primary and direct use	To <i>calculate</i> predictions and achieve objective results	To <i>educate</i> living faculties of expression and understanding
Secondary and auxiliary use	To <i>educate</i> intuitions that inspire successful theories and their useful application	To formulate rules for <i>calculating</i> correct word forms and use
Meaning of words and symbols	Defined considerably through artificially agreed convention, like names being used as mere labels to identify places on a map	Based essentially on nature and history, like words that evoke a meaning through their shape of sound

The primary and direct use of modern physics is to calculate predictions which enable us to achieve objective results. But indirectly, modern physics also serves to educate our scientific intuitions, from which successful theories are inspired.

In classical linguistics, the emphasis is just the opposite. Here, in linguistics, the primary and direct use is educational. It is to educate our living faculties of expression and understanding. It's through these educated faculties that we are able to speak and listen. And they work best when we use them naturally and spontaneously, without the cumbersome interference of calculating what we are going to say or what we may expect to hear. Linguistics does have calculating rules – of pronunciation, grammar and vocabulary. But these rules are no more than artificial aids to learning. They only help indirectly, to cultivate our living faculties of speech.

So the old science of linguistics is directly tested and applied through the educated faculties of its practitioners. This direct use of living faculties is quite legitimate, because the old linguistics looks at nature in a broader way than modern physics. In that broader approach, nature is taken to include our minds and their expression of a subjective consciousness.

Our living faculties are thus included in the nature that is studied by old sciences. These living faculties are studied as expressions of an underlying consciousness, to which we may reflect in our minds. Through that subjective reflection, these faculties are educated and controlled, so that they may be accurately used, in the testing and the application of old sciences.

In short, the old sciences make use of our living faculties, where modern physics is restricted to the use of external instruments that are mechanically standardized.

- In modern physics, a theory must be tested through mechanical instruments. It is not legitimate to test or to apply a modern physical theory through living faculties that are outside the field of study, which does not include an expression of subjective consciousness. Modern physics has no proper way of standardizing or controlling our living faculties; and so they can only be used for the intuitive creation of theories that must be tested and applied mechanically.
- In the old sciences, theories don't just work mechanically. They work more delicately and more subtly, through a subjective reflection into mind. The reflection educates our faculties – as instruments that sciences may use, to investigate what's true and to apply what has been found.

Levels of expression

However, if our living faculties are to be used in science, then they too need to be described and analysed. They work through different levels of experience, as consciousness becomes expressed, in the process of our lives. An old analysis comes down to us from Sanskrit linguistics. A summary is shown in figure 2 (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. This level is called '*vaikhari*'.
- The second level is a succession of passing states, which each of us experiences in time. For every one of us, the world of objects is conceived in this way, through a succession of replacing states that come and go in mind. Each moment brings a state of mind; and as each moment is replaced by other moments, every state of

Figure 2 – Levels of expression

<i>Body</i>	Space	Co-existing points	World of objects	Elaborated structure, perceived by body
<i>Mind</i>	Time	Replacing moments	Succession of states	Mediating process, conceived by mind
	Causality	Continued consequence	Assimilating capability	Silent seeing, at the depth of insight
<i>Consciousness</i>				

Knowing in identity

mind becomes replaced by other states that follow on in time. 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. This mediating level is called ‘*madhyamā*’.

- At the third level, we experience a continued consciousness, 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. Here, consciousness appears somewhat paradoxically, as a silent and unmanifested knowing, which is often described as the ‘unconscious’. This is an inner level of invisibly continued seeing, called ‘*pashyantī*’.
- Beneath all changes and all continuities, there 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. There, consciousness is realized, in its own being. That final ground is called ‘*parā*’, which means ‘beyond’ or ‘ultimate’.

Nature and consciousness

When nature is conceived as an external world, we think of our experience as personal. This way of thinking is illustrated in figure 3. Here, each person is a knowing island, surrounded by a known world. As a person looks around, many things are known outside, through information taken in. So, for each person, a process of knowing keeps on taking place, inside. And what’s known is a surrounding world, made up of many things.

But when our minds are taken into account, we can think of our experience in a rather different way. At any given moment, a person’s mind sees some-

Figure 3 – Knowing island

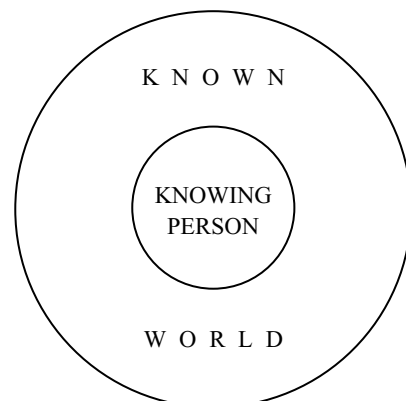
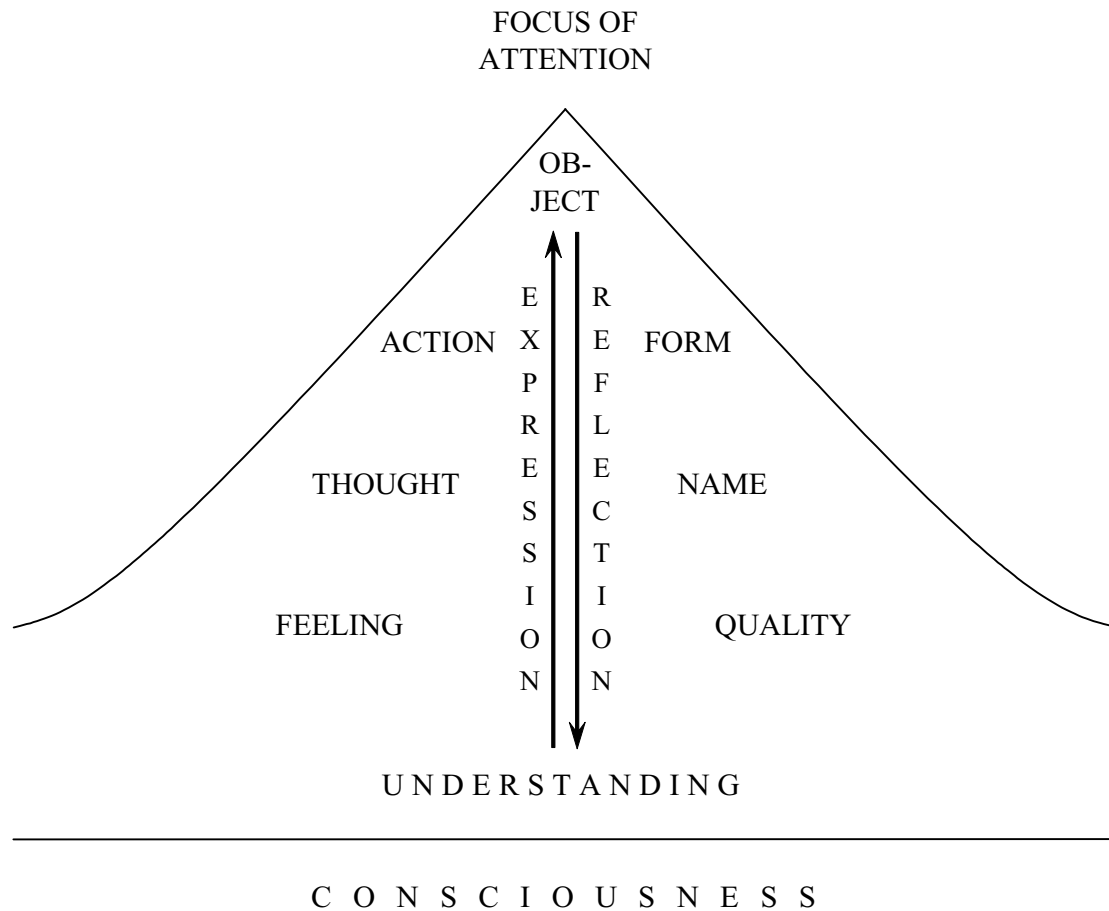


Figure 4 – Learning from experience

thing in particular. So a particular object appears, at the front tip of attention. But underneath, other things are understood, at the background of experience. That background is the depth of our experience. It is the depth where consciousness continues, while objects appear and disappear, at the focus of attention.

From that underlying background, attention is drawn up, so as to focus on the object that appears. This focusing is shown in figure 4 (above). As an object appears in mind, it expresses understanding, from a continued background of underlying consciousness. The expression rises up through feelings, thoughts and actions that have turned attention to this particular object; so that it gets to be perceived, in a narrow focus at the surface of the mind.

As the object is perceived, its perception is reflected back – by observing the object's form and relationships, by naming the object and interpreting its meaning, and by judging its quality and value. The perception is thereby assimilated into a new state of understanding that is carried on in time – by absorption into underlying consciousness.

Then, from the new state of understanding, further feelings, thoughts and actions rise; thus turning attention to further objects that come into appearance and are assimilated into understanding. This cycle of expression and reflection keeps on mediating back and forth, between the changing objects that appear and the background con-

consciousness that carries on beneath. It's only thus that we can learn, as a variety of objects come and go, in the course of continuing experience.

If you look again at figure 4 (previous page), you will see that it divides our experience into two. At the bottom of the diagram, below the horizontal line, consciousness is shown, continuing through change. Above the horizontal line, what's shown is a nature that includes all actions in the mind, along with each object that is seen in the world.

Here, nature is not just an external world. Instead, it includes all activities, both in the world and in our minds. The world outside can't show itself to anyone. It's always shown through mind, in anyone's experience. But, where nature is taken to include our mental activities, it can be conceived to manifest itself. It shows itself to consciousness, in everyone's experience. That is the old conception of 'nature' and 'consciousness'.

In that old conception, consciousness is not an activity of mind. Instead, it is a pure witnessing, unmixed with any mental or sensual or bodily activities. It is a knowing light that is completely actionless. As nature shows appearances, they are illuminated by the light of consciousness. And consciousness illuminates itself, by merely being what it is. In short, nature is the realm of all changing activity. And consciousness is a pure knowing that remains unchanged, quite unmixed and unaffected by the changing acts of nature.

Living energy

But then, what is the relevance of consciousness? What is the practical effect of its pure knowing in our personalities and in the world outside? This effect is described by the old concept of 'prāṇa' or 'living energy'. That is the energy which we experi-

Figure 5 – Life and energy

<i>As seen externally, through mechanical instruments</i>	<i>As seen by reflective questioning, into our living faculties</i>
<p>Life is a special property of complex behaviour, which emerges in bodies that are similar to ours.</p> <p>The similarity includes mechanically constructed senses – which function like our eyes, our ears, our noses, tongues, and our skin and flesh.</p> <p>And it further includes a mechanical co-ordination of these senses and other body parts, through some mechanisms that work like our nervous systems and our brains.</p>	<p>All nature's functioning is understood by reflecting back to a common principle of consciousness, which each of us accesses by reflecting back within.</p> <p>Wherever anyone may look, whether life is seen or not depends on <i>how</i> one looks. Looking outwardly, at objective structure, no life is ever seen. Reflecting back to consciousness, whatever's seen expresses it, and is thus found alive.</p> <p>Seen thus, all nature is essentially alive.</p>
<p>In the external world, energy acts mechanically, from one object to another. Each object is thus acted upon, by influences and constraints that are imposed from outside.</p> <p>This is a quantitative energy, which is measured by external instruments and transacted between objects and persons. This energy is measured out and used for objective purposes – of achieving desired objects in the world.</p>	<p>As nature functions, a living energy arises from within, acting of its own accord. That is the energy called 'prāṇa'. It does not act from any object in the world. Instead, it is inspired from within – as it arises of its own accord, from an inmost ground of consciousness.</p> <p>That prāṇa is the qualitative energy that expresses value, meaning and purpose in our living activities – as they arise from the consciousness which knows them.</p>

ence in our living feelings, thoughts and actions, as they express the consciousness that underlies them.

That is an energy of inspiration, which arises from within. It inherently expresses value and meaning and purpose, in our personalities and in the world. And it can only be understood by reflecting back within – through forms that we observe, through meanings we interpret and through qualities that we appreciate – as we return to underlying consciousness, where the reflection is absorbed.

It is that energy which drives the process of experience in our lives. Unlike the energy of modern physics, it is not a transacted commodity, which is passed on from one object to another. Instead of being transacted by objects, it is recycled out and in – as it arises from underlying consciousness, and is returned back there again.

Accordingly, the older sciences conceive of ‘life’ in a way that is rather different from modern physics. The difference is summarized in figure 5 (previous page).

Five elements

If you look back, once again, at figure 4 (page 4), you will see that it shows nature at five levels (in the broken triangle that is formed by the three lines). First, there is a level of objects – where our limited attention gets focused. Second, there is a level of action and form – where action turns attention to objects and our experience is given shape. Third, there is a level of thought and name – where thoughts direct our actions and names are used to describe the forms that we perceive. Fourth, there is a level of feeling and quality – where feelings motivate our thoughts and acts, through an intuitive judgement of qualities and values. And fifth, there is a level of understanding – which expresses knowledge and assimilates what has been learned.

These five levels form a progression, from the gross to the subtle. This is a pro-

Figure 6 – Five elements

<i>Traditional element</i>	<i>Level of appearance</i>	<i>Examining instrument</i>	<i>Scientific disciplines</i>
‘Earth’	Pieces of matter	External body	Modern physics
‘Water’	Transforming energy	Organic faculties	Biological sciences
‘Fire’	Meaningful information	Conceiving intellect	Culture studies and humanities
‘Air’	Conditioned character	Intuitive judgement	Psychology and meditation
‘Ether’	Continuing existence	Reflective reason	Philosophical questioning

gression that has long been conceived, somewhat metaphorically, as the old ‘five elements’. An interpretation is summarized in figure 6 (previous page).

- At the level of ‘earth’, differentiated pieces of matter are perceived through our external bodies, as assumed by the calculating theories and technologies of modern physics.
- At the level of ‘water’, an activating and transforming energy is observed through our organic faculties, as cultivated and developed in biological sciences which seek to harmonize our microcosmic lives with their containing macrocosm.
- At the level of ‘fire’, meaningful information is interpreted by our conceiving intellects, as educated and clarified by culture studies and the humanities.
- At the level of ‘air’, a qualitative conditioning is evaluated by intuitive judgements that are exercised and expanded in psychology and meditation.
- At the level of ‘ether’, continuing and common principles are investigated by the reflective reasoning of philosophical enquiry, which turns its questions back upon assumptions that have been taken for granted.

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

Institutions and the individual

But, on what common ground do we build our various sciences? To what common standards do scientists refer, beneath their different personalities? And how do they use those standards to achieve an impersonal knowing, which different people can communicate and share?

In modern physics, the common ground of science is considered only as an objective world. In this world, all standards depend on external objects and constructions that are outwardly identified, by organized institutes of scientific teaching and industrial technology. Thus modern physics is primarily *institutional*. Its standards are maintained externally, by organized institutions in society.

However, in the older sciences, a further consideration is investigated – by reflecting the investigation back beneath assumed beliefs, towards a ground of knowing that is shared subjectively. That reflective investigation seeks a truth that is at once subjective and impersonal. The truth thus sought may be called ‘spiritual’. It is a ground reality of purely knowing spirit, beneath all differences of physical and mental personality.

Accordingly, the older sciences include the investigation of a spiritual reality, in their testing and their application. Most older sciences are therefore partly spiritual. They partly seek objectives in the outside world, and partly investigate subjective principles of knowing spirit. As a result, the older sciences have something of a different character from modern physics.

To get some sense of this different character, it may help to consider an ancient science that is fully and completely spiritual. In India, that science is called ‘advaita vedānta’. In ancient Greece, it was called ‘philosophia’ or ‘love of knowledge’.

As the Greek name implies, that science of philosophy is purely educational. It does not seek to calculate results or to achieve objectives in the world. It only asks for

a true knowing of impersonal reality. And it asks subjectively, by reflecting back into pure knowing, beneath all the assumptions that we make in our pictures of the world.

As that questioning proceeds, it cannot end with any standard that has come to be instituted by society. All such standards must be opened up to questioning – in search of an inmost standard that is ultimately shared by everyone, beneath all personal and social and cultural constructions.

Accordingly, the search is ultimately *individual*. It seeks a common standard that each individual must find for herself or himself, beyond all institutions in the world. As an individual learns the science of philosophy, the learning cannot be just institutional. It must in the end be fully and completely individual, under the guidance of an individual teacher.

Today, we tend to think of philosophy as an academic and theoretical subject, which is taught at schools and universities. But this is not the old science of philosophy, as it has been practised and handed down from ancient times. That discipline is quite beyond the teaching or the jurisdiction of any institutions which are outwardly organized. It is a discipline whose emphasis is inward and individual, in the extreme.

As we consider the sciences in general, it may help to locate them in a range that extends in between the extremes of modern physics and reflective philosophy.

- Modern physics is the most suited to institutional teaching in schools and universities, and to the industrial organization of engineered technology. It has therefore profited the most from modern communications and the economic developments that they have made possible. But there is an inherent weakness here. This engineering approach achieves particular results, but it does so at the expense of the environment as a whole. Its narrow calculations are insufficient in themselves. To use them wisely, they need a broader and a deeper education of our living faculties.
- In the biological sciences, there is of course a useful application of engineered instruments and machines. But, in the end, these sciences work more essentially through the educated faculties of their living practitioners, as for example in the sciences of medicine. It may be noted here that modern ‘biophysics’ and ‘biochemistry’ are not truly biological. They are no more than mere extensions of modern physics, with no truly biological conception of a living energy. For a more genuine biology, we have to consider older sciences that have come down to us as living disciplines today. These older sciences include not only medicine, but also astrology and alchemy and various ritual disciplines that are essentially beyond the scope of modern physics.
- Culture studies and humanities work in a way that is clearly more educational than calculating. Their use of information clearly benefits from modern communications, and from the instituted organization of schools and universities and libraries. But here, in the humanities, the teaching and the application are more delicate than in modern physics. They depend far less on certified results in laboratories or clinics or other institutions. What’s more essential is what’s individually learned, by the individual teacher and the individual student.
- In psychology and meditation, the teaching and the application are more inward still. They are meant for an inward journey into mind, a journey that is meant to purify an individual student’s character.

- And finally, when it comes to reflective philosophy, there is a basic questioning of what it means to be an ‘individual’. As a matter of ingrained habit, we tend to identify each individual as a physical and mental person. But there is a confusion here. This word ‘individual’ comes from the Latin ‘individuālis’, which means ‘indivisible’. That 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.

It is of course an open question as to how this individual emphasis can be maintained, in the face of larger scale commercial pressures in the modern world. I would say that it requires a more independent-minded spirit of enquiry. A spirit that remains unwilling to be compromised – as it returns to a very old investigation, which has kept on asking how and where each one of us is truly ‘individual’.