

**THE  
WALDON  
APPROACH  
TO  
EDUCATION**

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## **PART 1**

A number of members of Leeds City Council's education service for adults with learning difficulties contributed to these documents over the years, offering opinions and comments on the work in progress.

The final version of Part 1 was authored by Peter Bowker, Terry Buchan, Ann Clarke, Marilyn Crook, Mary Jo Middleton, and Paul Roberts, and, together with Part 2, which I wrote in a bid to explain the Waldon Approach to new staff, was published in 2004 in booklet form.

Terry Buchan  
October 2017

### **PREFACE**

The ideas on learning and development, and the derived educational approach, that are described in the following pages, were pioneered by the late Dr Geoffrey Waldon.

A neurologist by training, he devised a unique theory concerning the development of the human organism and the origins and growth of the understanding.

This theory was based upon his systematic observations and interpretations of the behaviours of babies and children of all ages, a project which he undertook initially for a six-year period before it became his lifelong study.

Waldon is a set of ideas centrally concerned with the phenomenon of survival: with specific reference to human beings, it addresses the matter of how physiological development and fundamental learning promote and facilitate survival.

The educational approach derived from these theories is designed to foster the growth of this adaptive capacity, which approximates to what Geoffrey Waldon termed General Understanding.

Through helping students to strengthen their General Understanding, or the basic ability to learn-how-to-learn, our aim is to assist in the development of their all round competence, autonomy, emotional equilibrium, sense of confidence etc. - in other words their capacity to be constructively and creatively active in the world.

At the heart of Waldon theory is the assertion that **meaning comes from movement**, that movement is the ultimate source of motivation, learning and development.

Everything follows from this observation.

## INTRODUCTION TO CONTENTS

Section A concerns the development of General Understanding.

Part (i) introduces a working definition of "**understanding**" as a basis from which to introduce Waldon's ideas on "**General Understanding**".

Part (ii) elaborates upon the role of "**motivation**" as the power source of our General Understanding.

Part (iii) looks at the process of **organismic development** - the simultaneous occurrence of *bodily integration* and the *structuring of a personal space*.

Part (iv) introduces a vital notion in Waldon developmental theory, that of the child's "**continuant capacity**" - the ability to switch attention from (region of space) A to (region of space) B and back again.

Part (v) provides brief summaries of the six **learning-how-to-learn tools**, which underpin all General Understanding.

Section B concerns the development of Social Understanding and Interpersonal Communication.

Part (i) looks at **Social Understanding** and how it develops with particular reference to General Understanding.

Part (ii) looks at the particulars of development in General Understanding up to 36 months and gives pointers as to the basis this provides for the development of **interpersonal communication**.

Section C concerns itself with anomalous development and the consequent difficulties in learning.

Part (i) looks at **Primary Impediments** to learning - factors relating to the human being's capacities to sample, register and build upon their experience effectively.

Part (ii) introduces **Secondary Impediments**. These are learned patterns of behaviour, which serve a short term self-protective function, but which present real obstacles to the usual processes of development, and learning.

Part (iii) looks at the nature of "**challenging behaviours**".

Part (iv) concerns the effect on **Social Understanding** when development of **General Understanding** is in some way anomalous.

Section D concerns educational intervention.

Part (i) is a summary introduction to Waldon's ideas, especially in regard to their **educational applications** with children and adults who have learning difficulties.

Part (ii) is primarily an aid to **observation** and concerns specific aspects of the development of General Understanding. It invites the observer to look closely at the manner of how things are done, at how movements are carried out - that is, at the *quality of the action itself*.

It is intended to inform any intervention designed to help someone to develop his or her General Understanding.

Part (iii) relates to the fundamental tool-using activity of **banging and scraping**.

The Appendix summarises the principles from which the Waldon educational approach is derived.

## **SECTION A**

### Recapitulation

This section deals with key points in the development of General Understanding.

Part (i) introduces a working definition of 'understanding' as a basis from which to introduce Waldon's ideas on "General Understanding".

Part (ii) elaborates upon the role of "Motivation" as the power source of our General Understanding.

Part (iii) looks at the process of organismic development - the simultaneous occurrence of bodily integration and the structuring of a personal space.

Part (iv) introduces a vital notion in Waldon developmental theory - that of the child's "continuant capacity" - the ability to shift the focus of activities from one region of space to another and back again.

Part (v) provides brief summaries of the six learning-how-to-learn tools which, along with the precursor abilities, underpin all our General Understanding.

## Understanding and GENERAL UNDERSTANDING

Essentially, "understanding" may be regarded as a behaviour-generating state: all actions are produced by, and are an expression of, the current understanding.

The condition of the understanding at any one time will therefore determine the range and type of possible behaviours that may be produced.

A change in the understanding-state (as happens when learning has occurred) will change either the range, or the type, or both, of the possible (available) behaviours.

**General Understanding** may be defined as "that physiologically-developed fundamental understanding, common to all human beings, which encapsulates and expresses the myriad possibilities of the human form and apparatus through all available patterns of activity".

All fundamental learning strengthens and enriches the developing general understanding. Such learning depends upon, draws from, and exercises all earlier learning, in a process of evolution through constant recapitulation and creation of variant forms.

The more thorough and "dense" the early learning, the greater the scope for elaboration and development of the understanding.

In the normal course of events, through the exercising of primary motivation ("a tendency to act fully on the available environment") the baby's early patterns of movement bring about significant bodily integration - resulting in the capacity to focus attention and activity through the relevant limb or limbs, with the rest of the body providing structural support - by the sixth or seventh month of post-natal life.

If, therefore, General Understanding is regarded as the foundational understanding from which all specific aptitudes and skills develop, then to the extent that a student can be helped to enhance<sup>1</sup> his or her GU we would expect him to become ("physically", "emotionally" and "cognitively"<sup>2</sup>) increasingly capable of producing adaptive<sup>3</sup> patterns of behaviour/activity.

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<sup>1</sup> That is, to strengthen and improve the **quality** of his understanding, and thereby increase it.

<sup>2</sup> We can label aspects of the understanding in this fashion, as if they were separate things, but clearly at a fundamental level they are indivisible.

<sup>3</sup> "Adaptive" in terms of biological survival; in the day-to-day social realm we would probably call them "constructive" or "appropriate".

## **MOTIVATION**

"Motivation" is the tendency to act fully on the available environment. It is the "drive to do" that powers our behaviour.

Waldon's notion of motivation is quite distinct from that of being drawn along by external incentives.

Waldon affirms that activity is intrinsically rewarding, in this sense: all actions produce receptor activity patterns (RAPs) within the nervous system, and these are accompanied by positively reinforcing, neurochemical agents ('reinforcant').

Any action or movement that occurs is made more likely to occur again in the future by virtue of this intrinsic reinforcant. The more familiar and well-defined a (pattern of) movement is, the greater the positive reinforcement associated with it.

Unconstrained, this would lead to an exponential growth in activity from birth onwards.

This explosion in activity is limited by two factors

- (i) the operation of a separate negative reinforcement system which is active in proportion to the unfamiliarity percentage of the RAPs which are produced, and which serves to inhibit behaviour (a necessary survival mechanism)
- (ii) the growth of the child - the increasing size and weight of the body, trunk and limbs, as he or she develops - which requires ever greater physical power, in order to move any part of the body.

Motivation builds akin to a head of steam, and an excess is maintained in order to power the growing body and limbs. It is effortful activity, in the first place physical activity, that stokes the system, and the "head of steam" built up by the child may be seen as proportionate to the amount of effort expended.

It follows that any factors that limit the amount of effortful activity in the individual child or adult (e.g. sensory or motor difficulties, deficiency in the internal reinforcement system, etc) will cause a lower than average motivational reservoir to be accumulated. Since there is less power, there is less activity produced, and so on.

Very many individuals with learning difficulties have lower than usual motivation with which to power their future development. The overall quantity, range, duration, frequency and amplitude of their movement is less - often very much less - than what is normally required.

Measures to continue building up motivation by specifically addressing a person's movement capacities and deficiencies will be the most important aspect of any intervention we may make.

## **ORGANISMIC DEVELOPMENT/BODILY INTEGRATION**

### *DEVELOPMENT OF INTEREST IN AND STRUCTURING OF A PERSONAL SPACE*

From birth, bodily movement (particularly limb movements) increases in amount, form and range. For about the first three months the fields of interest of each of the limbs (including the head-limb with its clusters of specialised sensory receptors) are developed and expanded, in a fairly piecemeal fashion. This occurs as reflex and spontaneous movement, and in response to handling. Movement at this time is largely that of the trunk and whole-limbs (e.g. the arms move from the shoulder in a paddle-like fashion).

By three months, with growth and increasing activity, there is some overlap of the fields of interest of the various limbs. From now on, these regions increasingly fuse, or coalesce. Regions of space relative to the axes of the body are beginning to be "known" and thus referred to by more than one exploratory limb system. Waldon terms this the *period of bodily unification*, the time when the body is recognisably becoming a true organism, a single experiential entity distinct from the outside world and consisting of co-operating parts.

Before this time experience can be imagined as consisting of an 'ocean' of receptor activity patterns (RAPs) - the sensory signals from proprioception, and from the five 'conventional' senses. The making of repeated core movements (with envelopes of variation) - always subject to external constraints such as gravity, and to internal constraints such as the physical limits to movement - is the primary source of regularity or pattern in the wealth of receptor activity, the means by which experience may begin to be organised. Alongside this process there occurs the simple registering of associations - the linking of arbitrary, contiguous occurrences (in space and/or time) of more than one sensory event.

*Interest is a function of understanding*: the more thoroughly explored a region of space is, in relation to the limbs and to the body as a whole, the more "interesting" it is. From around six months the organism is beginning to be able to focus interest through a particular limb, and to act on objects in space (to reach for, to visually fix on, etc.). For some time this is an irresistible urge if the object lies within the most familiar spatial region, a region which is quite small and well defined, in the midline and in front of the upper chest. Over the next few months, with increasing activity, there develops the ability to focus interest at wider and deeper points in space, relative to the midline and trunk.

This enlargement of the interest fields results eventually in a seamless, thoroughly-known region: a single "personal space" in which, although there is still a gradient of interest from the better-known to the less well-known, this difference is much less extreme.

Increasingly the body as a whole has been functioning in a posturally supportive manner; and there is by about nine months some active co-operation between the limbs in action, for example passing activities from one side of the body to the other, using both hands together co-operatively, etc. The head-limb will tend to be

following these actions, employing its specialised clusters of receptors to sample the environment through vision, hearing, taste and smell.

By now the directional range throughout which the organism is able to move its interest (to "scan") is expanding significantly. In contrast to the earlier piecemeal exploration of space, the time from about nine months Waldon terms the "period of comprehensive space-structuring". The richness and extent of this is a direct correlate of the operations<sup>1</sup> of, and co-operation between, the three upper limbs (including the head) with their clusters of sensory receptors, and the range, relative to the body, throughout which such activity is taking place.

This space-structuring, or co-referencing, can be viewed as the main task of the young human organism at this time, objects being convenient spatial markers serving as foci for the active attention. From now on, throughout the growing period of life, activity serves to consolidate and to extend the familiar space, by acting upon things within the whole reachable region as the latter enlarges with growth.

In the period between nine and twelve months early activity-choice (the real option of attending to here -"this" - or to there -"that") becomes possible; this capacity grows with the thoroughness of the spatial structuring and the growth of the ability to switch the means through which attention is directed.

*Inertial memory* now comes into play; it consists, in these early stages, of the capacity to continue the action-design internally, if or when an action (e.g. reach, grasp or put in) has been cut short or in some way prevented from actualisation.

The spatial structuring described above has occurred through acting in near-body space upon convenient objects. The increasingly adaptive grasp, and the acquiring of "letting-go" (initially from chance knockings-out, and from reachings-for while forgetting an already-held object) contribute to the discovery of "in-ness", and to playing with putting-in and taking-out; and also to experimentation with hand-tools - operating on the environment via held objects (for example banging, poking, scraping things with a held stick, spoon, wooden building brick, etc).

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<sup>1</sup> In terms of both quantity and quality

## **CONTINUANT CAPACITY**

By 15 to 18 months, all being well, through the exercise of primary motivation and the increasingly focused nature of the child's activities and attentions (created through its bodily integration), "continuant" capacity will begin to become established.

This may be defined as the ability to repeatedly switch the focus of one's activity-interest between separate regions of bodily space, back and forth continually.

As the "carrier" phase of all later activity, continuant capacity is crucial to the development of General Understanding since it enables the infant to gain a massive amount of experience: as he or she endlessly picks up and transfers items from A to B and back again the variation in his movements (amplitude, rhythm, direction etc), and, later, the characteristics of the items he handles, leads to a massive growth in experience. It is this experience-gain which lays the groundwork for the emergence of the learning-how-to-learn tools.

The development of these tools (Seriation, Sorting, Matching, 3D and 2D Praxis, and Coding) allows the creation of more order and pattern in experience, and the further elaboration and expansion of General Understanding.

The tools manifest individually from early in the third year and then appear in composite form in ordinary play activities with increasing frequency thereafter.

## **THE LEARNING-HOW-TO-LEARN TOOLS**

### Seriation

Seriation understanding derives directly from a developing continuant capacity: in its earliest form it consists of the simple arranging of patterns in space and time, for example the ordering of objects in sequence.

These arrangements and orderings tend to become highly elaborate over months and years of ordinary, concentrated play; as the ability to create patterns becomes abstracted from the purely physical realm, and therefore less dependent on the behaviours and relative positions of objects in material space, then the activity takes on more and more of the attributes that we come to label as "inferential thinking" or "reasoning" (a large part of which is to do with the re-creation of experiences that we term, according to circumstances, anticipation of events which we have reason to believe may occur in the apprehensible future, or memory of events that we can call to mind from the discernible past).

### Brickbuilding (3-D Praxis)

This is to do with the behaviours and properties of objects in time and space, in relation to one another and under the influence of constant, variable or intermittent forces (e.g. gravity, features of the resting surface, human agency, respectively).

This learning-how-to-learn tool is of particular relevance in arriving at an understanding of the social forces that are represented by people's behaviours (see pp 13, 14).

### Drawing (2-D Praxis) and the Use of Tools

Ordinarily, a great deal of tool usage, particularly with simple tools such as spoons and sticks, used to bang, scrape, rake, stir with etc., precedes the making of marks on surfaces that constitutes the early stage of drawing.

### Sorting

This learning-how-to-learn tool involves the allocation of patterns or objects to given sets, according to perceived similarities in the objects allocated.

Later classification involves the creation, and continual re-creation, of categories according to the changing understanding of the sorter.

## Matching

In order to find a match to a given model one needs to be able to -

use available space fully, searching through it with eye (oculo-motor) or arm-hand movements, sweeping the attending understanding repeatedly across the field of activities (scanning) and selectively homing in on and withdrawing attention from specified locations within it (focusing)

discriminate between certain properties of objects (shape, size, colour, texture, density, acoustic attributes, aroma etc.) to the extent that one can reject all available candidates except one as being too unlike the model to provide a viable match (the match does not have to be exact - it probably cannot be: we are dealing with degrees of approximation).

## Coding

Coding begins with the earliest accidental associations between perceptions and develops eventually into the organised use of symbols, arbitrarily selected by the individual.

Spoken and written language depend upon both the *fundamental* learning that gives rise to general understanding and the *associative* learning that is represented by the coding tool.

## **SECTION B**

Section B concerns the development of Social Understanding and Interpersonal Communication.

Part (i) looks at Social Understanding and how it develops with particular reference to General Understanding.

Part (ii) looks at the particulars of development in General Understanding up to 36 months and at the basis this provides for the development of interpersonal communication.

## THE DEVELOPMENT OF SOCIAL UNDERSTANDING

### WHAT IS SOCIAL UNDERSTANDING AND HOW DOES IT DEVELOP?

Whilst social understanding might be defined broadly and somewhat crudely as an understanding of the behaviours of people, the growth of this capacity encompasses two very different aspects: one is learning *what is regarded by others* as appropriate behaviour towards, or in the presence of, other people; the other is learning to understand *what one is doing oneself* (and thereby the substance of what other people are doing).

The first of these is a cultural requirement determined by the traditionally held rules of the society one lives in and which therefore can vary considerably from one geographical location to another.

The second aspect is not cultural-particular but occurs identically in all humans everywhere because it is part of the General Understanding<sup>1</sup> and therefore distinctly fundamental. This is the process whereby a child's growing capacity to do, then later to notice what he or she is doing, leads to a developing understanding of the behaviours, characteristics and properties of objects, including those of other people<sup>2</sup>.

These two elements of social development, being very different in nature are, as might be expected, learnt in very different ways. The acquisition of cultural-particular understanding, including social skills, relies heavily on social reinforcement. Learning for General Understanding (and its personal-particular derivatives) however, takes place largely under naturally occurring solitary conditions, where intrinsic reinforcement accompanies and is proportionate to the activity of the learner.

In the usual course of human development these two types of learning are inextricably linked. From the first moments after birth and throughout the vitally important early years of life the infant learns from two sources-

- a) directly from his or her own movements
- b) through simple association between his own movements and those of another person - that is, the reinforcement inevitably and unwittingly brought about by the adult carer's movements, elicited in response to those of the child.

In process (b) the infant comes to recognise behaviours in the adult that are already part of his own repertoire of behaviours, and the adult does likewise. This

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<sup>1</sup> General Understanding: that physiologically-developed understanding which is the source of every behaviour produced by an individual.

<sup>2</sup> Although people's behaviours are generally far more elaborate and complex than those of objects, their constituent parts are identical, being made up of three spatio-temporal elements:

*translocation* - movement from a to b

*reorientation* - rotation around an axis

*deformation* - change in relative disposition of parts ("shape")

is extremely important to the early bonding process and to the eventual development of interactions with other people.

But what remains largely ignored by the adult (because by its nature it is both less seductive and less obvious) is the solitary learning process described by (a) which is going on at the same time. This *necessarily* unheeded-by-others activity allows the continuing development of the understanding which lies beneath social behaviour. This is exactly the same kind of understanding which underlies the recognition of the positions, behaviours and attributes of objects - so that a child at a two years level (of General Understanding) should normally be able to respond to another person in the same way as they would to any other object.

*Note:* we are talking here about the fundamentals of pattern-creation and pattern recognition: clearly, emotional attachments to specific people are frequently stronger than attachments to objects, and the possibilities of intense two-way interactions with certain people likewise stronger.

In the usual course of things all social behaviours will be underpinned by the General Understanding.

## **LANGUAGE AND THE DEVELOPMENT OF SPEECH COMPREHENSION**

Language develops from ordinary, childhood activity – firstly from those patterns of movement that we call “play”, secondly from interaction with the adults who govern and regulate life in the particular society that the child is born into.

As is the case with perception generally, movement is fundamental to the growth of auditory perception. Spoken language depends upon movement both in a general and a specific way.

Movement is necessary for the direct acquisition of verbal understanding because it is the vocalisations which the child hears (accompanying certain repeated activities) which are first associated with the activities, and which come more and more to symbolically represent them.

The intricate processes of development mesh in such a way that learning consolidates and proceeds on a broad front, with interpersonal communication developing alongside and feeding into the growth of the General Understanding.

## THE GROWTH OF GENERAL UNDERSTANDING, INCLUDING COMMUNICATION (-0 TO 36+ MONTHS)

### PRE-BIRTH

- foetal movements including reflexes and autorhythmic ("autorhythmic": of an inherent pulse; a biochemical physical rhythm)

### 0 TO 4 MONTHS

- increase in bodily movement: a build up of power
- exercising of the muscles producing vocalisation
- response to sounds, including the speech of others

### BY 6 MONTHS

- beginnings of bodily integration
- seeming to deliberately put hands onto things, guided by upper trunk movements
- capable of transferring attention from the hand holding the object to the other side of the body and thereby to release the grasp

### FROM 6 TO 12 MONTHS

- reaches proportionally into the whole region of available bodily space, discovering more about it by acquiring and disposing of objects, and rummaging. By structuring his or her personal space in this manner the baby learns to do things in his surroundings. He may babble to himself meanwhile, the pleasure he derives from this movement making its recurrence more likely, helping to build up a repertoire of possible sounds.

### FROM 6 TO 8 MONTHS

- used to reaching a lot. Can transfer attention from side *a* to side *b* without dropping what is held in hand *a*.

### AT 8 MONTHS

- often reaches for an object while holding onto another so that they strike against each other.

### BY 8½ MONTHS

- will deliberately use a projecting object held in the hand to touch, poke or hit other objects.

### BY 9 MONTHS

- is striking one object on another a great deal
- may produce clear voco-articulation which brings about a change in behaviour of another person
- an already well established response can now be produced with minimal support in response to the speech of others. This distinctive movement pattern ("action") will not however be directed towards any specific target, e.g. responses to *No*.

#### DURING 10 - 12 MONTHS

- is increasingly using space and engaging in such activities as pushing, pulling, banging and scraping with a hand-held object
- and so develops an enormous capacity for hand-held tool usage (eventually leading to particular usage, such as drawing and feeding self with a spoon)
- bilateral complementary use of the limbs develops, objects can be switched from hand to hand
- will release into vessels and put things onto things (e.g. a plate)
- is used to responding to relatively few (but very fundamental) speech patterns i.e. is accustomed to being modified by speech

#### DURING THE SECOND YEAR

- begins to supinate the hand and can anticipate the most appropriate grip relative to the position of the object and what it is to be used for. Acting more and more on what is around, without prompting or assistance the child will gather information whilst spontaneously pairing and separating objects, acting in sequence and using simple tools. This activity will often be accompanied by early verbal commenting (self-instructions).

#### BETWEEN 12 AND 14 MONTHS

- the putting-in and taking-out of objects becomes continuant or on-going
- might respond to an injunction without a director e.g. "Give it to me", "Here you are"  
(*director*: 'target' or 'noun')

#### FROM 15 MONTHS

- actions are directed more and more to particular locations in space (as defined and demarcated by conveniently familiar objects)
- continuant activity is well established
- capable of responding to a verbal or non-verbal injunction (definer) and a director e.g. "Give me the cup"

#### BY 18 MONTHS

- will look for things but often forget them if not rapidly discovered, i.e. ability to search is developing
- appears to recognise 'similarity' between two objects

#### BY 24 MONTHS

- will more regularly produce utterances (usually sounding like substantive nouns) which may be interpreted by others as commands
- can be affected by his own speech

## DURING THE THIRD YEAR

### AT 27 MONTHS

- actively looks for something resembling a model
- capable of responding to an outstretched hand holding an object (meaning, "Give me one of these")

### AT 30 MONTHS

- is practising early pairing and matching
- capable of being modified by the general directional and positional adverbial form as in "Put the doll in/on/under/behind the box"
- similarly to the adjectival form, e.g. "Put the spoon in the big cup"

## FROM 36 MONTHS ONWARDS

All of the previously learnt capacities are consolidated and developed as the child searches over a much wider area and gradually organises his or her understanding through the learning-how-to-learn tools of coding, brick-building, seriation, drawing, sorting and matching. So he is all the while learning to be independent and with the confidence which comes from this, will try to communicate his ideas to others in simple verbal statements.

Later, developing understanding of interdependence will lead to the desire to affect the behaviour of other people in a thoroughgoing and systematic fashion (i.e. to converse, amongst other things).

## **SECTION C**

Section C concerns itself with anomalous development and consequent difficulties in learning.

Part (i) looks at Primary Impediments to learning - factors relating to the human being's capacities to sample, register and build upon their experience effectively.

Part (ii) introduces Secondary Impediments. These are learned patterns of behaviour, which serve a short term self-protective function, but which present real obstacles to the usual processes of learning and development.

Part (iii) looks at the nature of "challenging behaviours".

Part (iv) concerns the effect on Social Understanding when development of General Understanding is in some way anomalous.

## PRIMARY IMPEDIMENTS TO LEARNING

Commenting on Primary Impediments should be seen not as a categorisation exercise but as a way of describing certain factors which may have a bearing on the present state of the General Understanding or its future development.

What follows can be used as a guide to aid observation. Rudimentary notes on terminology have been added to make some terms more accessible.

Use of an up-to-date medical dictionary such as Mosby's Medical and Nursing Dictionary, or of reference works such as The Oxford Companion to the Mind (edit. R.L. Gregory), will provide greater detail, where needed.

Where there is any uncertainty about a student's bodily condition it may be advisable to consult a physiotherapist about safe patterns of movement.

**General Understanding** comes about through a child acting upon his or her immediate environment (including in the very early stages his own body) and so, through a build-up of receptor activity patterns, creating experience. Any interference in this process will delay or hinder understanding-development. The presence of one or more Primary Impediments may - though does not necessarily - lead to the development of learning difficulties.

PRIMARY IMPEDIMENTS usually fall within one or more of the following groupings:

1 POSTURAL-MOTOR ANOMALIES

Inadequacy of the environment-sampling apparatus – the means of moving, guiding and controlling the limbs, extremities and trunk

2 DIMINISHED SENSIBILITY

Inadequacy of the sensory receptor system

3 AFFECTUAL INADEQUACY

A defect in the reinforcing mechanism which 'confirms' the learning

4 PRIMARY ENVIRONMENTAL DEPRIVATION

A virtual absence of exploitable conditions in which to learn

5 PRIMARY LEARNING INADEQUACY

A defect in the ability to learn from potential experience

Number 4 is, thankfully, rare, and 5 is extremely rare, but the other three types of impairment are found frequently in various forms and to different degrees either separately or mixed within the same person.

What is vital to note is that none of these primary impediments necessarily makes a child backward. What they clearly do is predispose a child to *learn* to be backward. Such learning is not inevitable but often occurs very early in development as short-term strategies are devised for meeting immediate needs at the expense of engagement in the full and free play which would directly improve the fundamental understanding.<sup>3</sup>

Let us look at the first three more particularly.

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<sup>3</sup> This situation is often further exacerbated by inappropriate social demands when the child is subject to anxieties because of the expectations of others about his or her development.

Learned behaviours resulting from this constitute secondary impediments (see Section C Part ii) which become a major barrier to learning-development.

But this is a further problem, distinct from those (often 'short-cut') behaviours learned directly as a result of the primary impairment.

## 1 POSTURAL-MOTOR ANOMALIES

Disturbances of the motor system can take many forms. Some are progressive, some acquired, and some, such as cerebral palsy, are the result of a non-progressive lesion in the developing brain.

Athetosis and ataxia are the two major forms of postural/motor disorder.

Athetosis is most often seen in association with cerebral palsy. It is nearly always characterised by flaccidity in the early years (though spasticity can sometimes compensate for this to produce near normal tone). Slow, involuntary, writhing movements then develop in the second or third year. Hands and feet particularly are affected but the athetoid person often has a wide range of limb movements despite the athetosis so that understanding-development need not necessarily be impaired. Where delayed motor development has an adverse effect on speech however a mistaken diagnosis of retardation can result.

Ataxia is caused by lesion in the spinal cord or cerebellum. This could be congenital, a result of birth trauma, infection, head injury or toxic substances. Ataxia affects both trunk and limbs and is characterised by poor co-ordination and postural imbalance, the individual sometimes being of unsteady gait. Disturbances of speech and eye movement can also be present. The condition can result in marked hypotonia.

Dysplasia should not in itself present a problem. Whatever the bodily shape and however partial or distended, the General Understanding should still develop fully providing all the parts of the body which can move, are moved to their full capacity and in as vigorous and varied a way as possible. Where dysplasia is additional to a motor or postural disorder, it should however add considerably to the overall strain on the person.

## 2 DIMINISHED SENSIBILITY

The sensory-nervous system is complex in the variety of form and function of its constituent parts and therefore can be influenced adversely in a number of ways. There are many different kinds of receptors - some in obvious clusters (olfactory, visual etc.); some distributed more widely e.g. near the surface of the skin; others buried deep in the muscle, joints and tendons (the proprioceptors); and still others conveying information from the internal organs, particularly those of the abdominal cavity (the interoceptors or viscerceptors).

Interference with reception is common. Receptors can be completely or partially absent, they can be present but not fully responsive to stimulation or there might be some lack of continuity in reception. (In the latter case such difficulties often give rise to learned behaviours where movements effect excessive pressure or violent impact upon the self.)

### 3 AFFECTUAL INADEQUACY

Reinforcement difficulties involving a reduction in the amount or quality of reinforcement can give rise to a condition whereby a person's behaviours appear *remote* - that is, characterised by a degree of lowered responsiveness to the behaviours of other people. This may arise as a driven need is developed for large amplitude movements (which provide greater reinforcement) at the expense of the development of smaller movements, especially those of the facial musculature ('facial expression') and of the voco-articulatory apparatus (governing the physical ability to produce speech).

In this way, disturbance to the functioning of the reinforcement system during foetal or early post-natal development may have significant and lasting effects on the baby's ability to create and learn from novel experience.

## TERMS

*Tone* of muscle - the particular state of activity of the muscle fibres.

*Spasticity* - variable raised muscle tone related to the sudden withdrawal of certain inhibitory inputs. Tone can rise involuntarily when a limb moves. Heightened tone can be unconsciously induced when breathing is rapidly varied or temporarily halted. Movement of a limb in certain ways by another person can induce spasm.

*Rigidity* - a state of uniformly raised muscle tone. Resistance to movement would be the same whatever the rate of movement of the limb, or amplitude. Can only be relaxed with drugs.

*Flaccidity* - a fairly constant 'background' state of slack tone. i.e. floppiness.

*Hypertonia* - abnormally high ('tight') tone

*Hypotonia* - abnormally low tone.

These terms are usually used to describe states which can temporarily exist within the same person where tone changes.

*Isotonic* contraction - where the limbs move as a result of contraction of the muscle fibres.

*Isometric* contraction - where muscle fibres move but the limbs don't. It is used to maintain posture for example. Much more powerful than isotonic. If well-exercised can assist in isotonic movement on other occasions.

*Paresthesia* - lack of sensitivity to touch and a high pain threshold. Can be subjectively experienced as a tingling sensation or 'pins and needles'.

*Hyperaesthesia* - extreme sensitivity to touch with a correspondingly low pain threshold.

*Dysplasia* - where the form of the body is distorted in some way.

### Terms used to describe the distribution of paralysis: -

monoplegia - one limb affected

hemiplegia - one side of the body affected

paraplegia - both legs affected

quadriplegia or tetraplegia - involvement of four limbs

diplegia - four limbs affected, legs more so than the arms

double hemiplegia - involvement of four limbs, arms more affected than legs.

## A NOTE ON MOVEMENT WEAKNESS

Whilst it is useful to be able to identify anomalies of muscle tone in an individual, *movement weakness* can be far more devastating in its effect on the learning process. Movement weakness can exist alongside hypotonicity or hypertonicity, but it is not necessarily implied by either of these conditions and it can also be visibly present when tone is normal.

Movement weakness is very much tied up with motivation - the fundamental drive to move. The effective functioning of the motor system is dependent upon a reliable infusion of power. Any lack of readiness to enliven the muscles - to bring an action into being - will necessarily undermine the whole system. Movement weakness is essentially a difficulty in understanding movement due to insufficient exercise of the system's potential. It is therefore remediable.

NB It should not be confused with *muscle* weakness which is a lack of capacity within the muscle, and which may be best described as a relative inability to oppose a physically countering force (e.g. gravity)

## SECONDARY IMPEDIMENTS TO LEARNING

In addition to the Primary Impediments described in the previous section the following Secondary Impediments may be observed.

These are the behaviours that the child learns to produce in order to cope with feelings of disadvantage caused by their condition - or, more relevantly, by other people's expectations as experienced by the child - and it is these that tend to become the chief obstacle to learning and development taking place.

These learnt patterns of behaviour, all of which have some kind of self-protective function, Waldon classifies under the headings of Handicap, Retardation and Cul-de-sac.

### **Handicap functions**

- a) Recurrent patterns of behaviour, which constitute an escape from, rejection of or avoidance of *feelings* of anxiety or insecurity - 'unpleasure'.
  - i. compensatory/competitive production of pleasure via humming, vocalising, squinting, toothgrinding, rocking, body juddering
  - ii. secondary 'reward' activities - spinning objects, inappropriate (i.e. maladaptive) verbalisation, obsessive eye contact, etc.
  
- b) Recurrent patterns of behaviour, which seek to escape from, reject or avoid *conditions* inducing 'unpleasure': -
  - i. escape - physical withdrawal, withdrawal of attention (shyness, day-dreaming etc.)
  - ii. rejection - direct rejection or 'stubborn' refusal; indirect rejection or 'displacement'
  - iii. avoidance - use of 'teddy-bear' objects and behaviours; ritualistic behaviours; obsessional organisation of surroundings

## **Retardation functions**

In general, retardation behaviours take the form of 'short cut' or effort-saving behaviours. They characteristically distort the developing understanding in the following ways:

- i. failure of continuity in activity; tendency to stagnate; reluctance to engage in activities
- ii. tendency to neglect available bodily space (e.g. neglecting use of a limb, or restricting its use to just one side of the body)

## **Cul-de-sac habits**

These tend to be marked by:

- i. failure to vary and thus develop activities; tendency to narrow and restrict basic movement patterns to stereotyped and separate, isolated activities
- ii. failure of utility - i.e. adaptive use of activities; tendency towards pleasurable self-indulgence without utilisation in everyday life

The 'skills' learned are bound or confined to the original circumstances.

## Self Protective, Especially 'Challenging', Behaviours

At the heart of the Waldon theory is the idea of two learning pathways, or types of learning: fundamental learning, a physiological process which gives rise to 'general understanding'; and associative learning, which is vitally important in the formation of 'cultural particular understanding' (i.e. coming to appreciate the rules and rituals of the society one is born into).

When a problem in fundamental learning occurs, in the first instance because of a disorder or anomaly that affects the processing of information through the central nervous system, behaviours may sometimes be produced by the learner that have an explicitly self-protective function: these are compensatory measures designed to cope with a state of perceived disadvantage, or handicap.

*The attitudes of 'significant others' are the decisive element in this regard:* well meaning attention directed towards the person with a difficulty may well have the opposite of the desired effect and cause an increase in feelings of vulnerability, with resultant anxiety that has somehow to be dealt with or assuaged by the person experiencing it. Hence the 'handicap' behaviours of rocking, head-banging, twiddling, picking, teasing, prancing, and so on.

Other behaviours, which are learned as the result of an original difficulty are the *cul-de-sac* and *retardation* habits. The first are patterns of activity which, as their name implies, have become isolated, dead-end threads which have failed to develop into the normally proliferating, branching and mutually enriching tapestry characteristic of childhood play.

The 'retardation' habits are effort-conserving measures, short-cut and/or sluggish patterns of movement which result in an impoverished *spatial understanding* (the bare bones, as it were, of general understanding).

### **Can anything be done about these handicap, cul-de-sac and retardation behaviours?**

Taking the example of "challenging" behaviours, some of which are seen as notoriously intractable, the best thing we have found to do is to

- a) treat 'understanding' as, quite simply, *a behaviour-generating state*
- b) view problematic behaviours as the result of an *inappropriate relationship between the individual and the environment*: any attempt to affect them needs to be preceded by a careful analysis of their origins, since they can only come about in the first instance through some lack of understanding, and possibly an across-the-board application of simple 'common sense' - which is not enough in itself for uncommon situations - on the part of 'significant others'.

We can then re-arrange the environment (including the expectations of carers, teachers etc.), and greatly increase the likelihood of the learner coming to acquire new, constructive patterns of behaviour that supplant some, maybe most, of the 'challenging' behaviours - which, in the best-case scenarios, may remain as vestiges only or disappear completely.

How do we go about this? There is a logical order of priority:

1 **Long term** Reduce as far as possible the chances of the learner feeling inadequate to cope with everyday contingencies by helping them to improve the quality - the all-round competence - of their general understanding.

This is done by enabling the learner to exercise their current abilities in all imaginable variations; over time these are noticed, acted on occasionally, increasingly understood, acted upon more frequently, and eventually incorporated into the repertoire of spontaneously-produced behaviours so as to be available at any time in any form, under any ordinarily occurring conditions (i.e. all except the extremes of physical or emotional collapse).

2 Helping learners to improve the quality of their general understanding means that, as part of exactly the same process, they are strengthening their tolerance of emotional strain, so that unsatisfactory or obstructive conditions, 'overfacing' and other potentially frustrating circumstances, do not distract them so much from approaching and dealing with problems in an organised and adaptive manner.

3 Eliminate, so far as is possible, conditions that tend to foster the production of defensive behaviours by arranging that the people who form the bulk of the learner's social environment understand the problem well enough to avoid making what the learner interprets as excessive demands on their understanding capabilities. This includes not responding inappropriately to the unwanted behaviours (see 4)

4 Ensure that nothing is done in response to an unwanted behaviour that would encourage or aggravate it. As far as is possible 'provocative' behaviours should be ignored, well thought out precautions being taken to minimise the vulnerability of carers or other students.

To summarise: We can help students to become less dependent on those actions that are identified as socially problematic or harmful by getting them to engage in patterns of activity that over time serve to increase their behavioural repertoire through enhancement of the behaviour-producing state (the fundamental, general understanding). New competencies gradually supplant (the need for) some, at least, of the old patterns.

### *An optimistic note*

It makes sense to assume that ideal solutions can be instituted until this is shown not to be the case. Too often assumptions about lack of staff, time-opportunity, money, expertise, etc. are entertained, decisively, even before a rational remedy is sought. This tends to have such a discouraging effect that very little in the way of remedial action may be attempted.

## WHAT HAPPENS TO SOCIAL UNDERSTANDING WHEN DEVELOPMENT IS ANOMALOUS?

The presence of a primary impediment<sup>4</sup> to learning will usually result in delay, distortion and diminution of movement generated, which will necessarily slow down the course of development of the General Understanding and often reduce the amount of simply-associated learning accompanying it. But what is likely to prove more enfeebling than the original impediment itself is any subsequently-developing anxiety in the child related to what it senses is inadequacy.

The two kinds of learning described take place under different sets of conditions which are mutually antagonistic and which to some extent compete for time and opportunity. The needs of the adult for the child to 'get on' commonly result in the kind of deliberate intervention which disturbs the necessary balance between the two learning pathways.

Actively encouraging the exercise of simple association (that type of understanding which the adult most readily recognises and therefore gives importance to) results in a situation where the child's awareness (vener learning) far exceeds the underlying understanding).

As expectations from the adult increase (because of the child's appearing to understand some things which he does not - acting as if he or she understands), the child is increasingly driven to produce attention-diverting behaviours (hair tugging, picking, self-mutilation, screaming, twiddling, spinning, etc.). These inevitably exert further influence on the adult who feels obliged to respond urgently to them.

Where the tutored child starts producing social behaviours before his actual state of understanding is adequate, these likewise induce further behaviours from other people which the child cannot cope with. The consequent anxiety is likely to give rise to social defensive behaviours (chatting ceaselessly, weeping, tantrumming, refusing to co-operate, undressing, smiling/grimacing. etc.). As this type of influence is practised, over time, it becomes more directive - that is, the child becomes manipulative, selecting the response he desires and becoming ever more adept at doing so. Typically, 'teasing' type behaviours develop where the child is visibly keeping half an eye on the adult to see what influence he or she is having.

## HOW MIGHT ONE, THEREFORE, BEST FOSTER THE DEVELOPMENT OF SOCIAL UNDERSTANDING IN A PERSON WITH LEARNING DIFFICULTIES?

Social understanding, being part of the General Understanding, will develop apace as the rest of the General Understanding develops. There is no need to protect the child from social contact, and no need to push them into social opportunities. Ideally the natural balance of each day will contain a mixture of social, semi-social and effectively solitary conditions.

One powerful form of deliberate intervention is the asocial lesson which, whilst not employing social means to do so, encourages the exercise of the understanding underlying social intercourse, and simultaneously builds up a stronger tolerance to

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<sup>4</sup> e.g. a movement, sensory or affective disorder; see pp 21-26

emotional strain which will make less likely the need to resort to diversionary behaviours. It encourages an alternative 'coping' capacity based on a flexibility of response which can be utilised in any number of different situations.

In the asocial lesson the student is given lots of opportunity to practise the sorts of behaviours used in social interaction, without having to engage in the interaction itself, and is thus enabled to act in complete safety.

Then when social contact occurs outside the asocial lesson, the child will be better positioned to take advantage of the opportunity to practise freely what social understanding they have.

## **SECTION D**

Section D concerns educational intervention.

Part (i) is a summary introduction to Waldon's ideas, especially in regard to their educational applications with children and adults who have learning difficulties.

Part (ii) is primarily an aid to observation and concerns specific aspects of the development of General Understanding. It invites the observer to look closely at the *manner* of how things are done, at just how movements are carried out - that is, at the *quality of the action itself*.

It is intended to inform any intervention we make with people which is designed to help them develop their General Understanding.

Part (iii) relates to the fundamental tool-using activity of banging and scraping.

## LEARNING AND THE DEVELOPMENTAL PROCESS

A summary introduction to the ideas of Dr Geoffrey Waldon, especially in regard to their educational application with children and adults who have learning difficulties.

1 The vulnerable child learns to understand in the same way as the normally developing child.

2 The process of fundamental learning begins before birth and occurs as a result of the child's own movements in space, and, to a lesser extent, of consequent involvement with the objects encountered in that space.

3 The early developing understanding, which is common to all children regardless of the culture into which they are born, is a result of intrinsically motivated activity, the only reinforcement needed being the 'pleasure' taken in the activity itself.

4 Out of this **general understanding** grows a capacity to learn about and to adapt to particular cultural requirements. It is therefore crucially important to encourage the growth of general understanding before attempting to teach cultural-specific activities.

5 General Understanding may be seen to develop through certain recognisable stages, each of which depends upon, and contains the elements of, successful and profitable experience of activities characteristic of the earlier stages. The process is *continuously recapitulatory: nothing is ever left behind; everything is just progressively elaborated.*

Clearly, some children are at a disadvantage, they are vulnerable in that their general understanding develops more slowly than that of ordinary children.

This is sometimes because of the effects of a primary impairment (e.g. Down's syndrome, cerebral lesion, deaf-blindness, etc), but it is much more generally due to the learned secondary impediments which may be classified as

Retardation behaviours which arise as a result of greater than normal difficulty in moving the limbs, leading to reluctance to make the necessary vigorous and varied limb movements that result in useful experience gain. So children with these behaviours derive less reinforcement from the pleasure of doing than do normal children, and tend to seek unchildlike short cuts.

Handicap behaviours, resulting from undue demands being made by others (generally adults) on the child's present level of understanding. This causes a state of anxiety which the child seeks to relieve by 'handicap' behaviours such as talking incessantly, rocking, hand-flapping, withdrawing, being overly social, etc.\_

Cul-de-sac habits: dead-end patterns of activity which fail to lead to the proliferation, inter-branching and mutual enrichment which are characteristic of normally adaptive behaviours.

(All human beings produce behaviours such as these as means of coping with our own anxiety, vulnerability, feelings of disadvantage, etc. When a child is especially vulnerable he or she is more likely to produce them to a debilitating extent.)

These behaviours clearly stand in the way of useful experience gain.

6 In order, therefore to encourage the growth of general understanding in vulnerable children, and so to help to increase their capacity to deal successfully with the world, one seeks to provide for part of every day a learning environment which simulates ordinary conditions when a child is behaving in an intrinsically motivated way and learning through his own experience without external interference, explanation, praise or blame (the **Asocial Lesson**).

7 Such an environment reduces the need for the child to produce handicap behaviours and promotes the growth of 'pleasure' taken in physical activity; this then serves to diminish the incidence of retardation and cul-de-sac habits and their inhibitory effect on experience gain and subsequent learning.

8 Emphasis is laid on providing an emotionally neutral atmosphere; ensuring effortful and varied movements with the aid of appropriately designed activities; and expecting no more of the child than he is capable of at that time.

The child is thus provided with optimal conditions for the growth of **general understanding**.

9 On this firm foundation his ability to act independently, and to deal responsibly with the demands of society, will grow, the degree of 'refinement' always being crucially (though not exclusively) dependent on the degree to which the general understanding has developed.

## **THE DEVELOPMENT OF GENERAL UNDERSTANDING**

### **1a PRE-CONTINUANT BEHAVIOUR**

The capacity to pick up and dispose of an object (as an isolated action)

Increasingly objects are put into things

In the second half of the first year this can take the form of repeated putting in and taking out of a single container ('Eeyore' behaviours)

To observe:

- any spontaneous reaching to acquire
- extent of reach and variety of its direction (use of space)
- rhythmicity and fluidity of movements
- flexibility of trunk and variety of upper limb postures
- degrees to which all three upper limbs are used, separately or in complementary fashion
- adaptability of hand posture
- appropriate variations in pressure of grasp
- accuracy of targeting

Means:

Cubes and other appropriately-sized objects in a variety of shapes

Buckets, tubs, boxes, jars, variously positioned.

### **1b BANGING AND SCRAPING**

The use of a hand-held object to make either intermittent or sustained contact with a surface.

These behaviours also develop from the middle of the first year onwards, when objects are struck one against the other in pre-continuant manner

To observe: (additionally to 1a)

- any spontaneous tapping, striking, scraping
- production of rhythmic pattern
- variety of pace and direction
- vigour of engagement, persistence
- ease of movement of joints, particularly wrist, elbow, shoulder
- degree of resistance to/compliance with imposed activity

Means:

Hand sized cubes

Rods, hammers of different lengths and thickness

Large objects as targets

## 2 CONTINUANT BEHAVIOUR AND THE USE OF TOOLS

Continuant behaviour is the capacity to move things successively from one fixed location (A) to another (B) which becomes established from around 12-15 months. Tool usage develops during the second year from banging and scraping and an established continuant capacity. It is manifested as an ability to use an object as an extension of the arm, to refine/elaborate the transfer of other objects from place to place or in order to more effectively carry out specialist tasks.

To observe: (additionally to 1)

- degree of focussed attention
- degree of perseverance

Means:

Blocks, rings, pegs etc for posting, threading, as well as simple disposal  
Rods, rakes, scoops, spatulas, spoons, tongs.

## 3 THE *LEARNING-HOW-TO-LEARN* TOOLS

With the organisation of the bodily apparatus from the first year and from the massive gain of experience in the second year through continuant behaviour, certain movements begin to become established. Initially separate to some degree these begin to combine from the fourth year onwards.

Dr Waldon termed these fundamental movement patterns *learning-how-to-learn* tools.

### a) SEQUENCING AND SERIATION

The capacity for extended behaviour patterns based on the ability to order to a particular plan and employ extrapolation.

To observe:

- rhythm and fluidity of movement
- degree of continuity
- extent of scanning employed
- duration of focussing of attention
- spontaneous attempts to re-order materials or actions
- active searching for appropriate candidate to complete or extend a pattern

Means:

Wooden bricks, blocks, etc. – items for chaining, and arranging into simple and complex patterns

Lay out various tracks, pathways, etc.

Stacking and nesting items, other progressive series

## b) PAIRING AND MATCHING

The active searching for a candidate least unlike the chosen model - attention is necessarily drawn to *discrepancy*.

To observe:

Ability to scan over a large area, varying depth and direction of visual or haptic focus

Degree of thoroughness of searching and evidence of methodicalness

Degree of persistence in focussing of interest

Reference made first to the model, or to the candidates

Random or ordered approach to selection

Ability to select own models

Means:

Pairing of objects (pairs of identicals, pairs of similars)

Photo/object pairing

Drawn picture/object pairing

Pictograph/object pairing

Matching cards (pictures, symbols, shapes, directional and spatial patterns)

Pairing of drawn symbols with a drawn line.

## c) SEPARATING AND SORTING

The selection and active allocation to sets of objects or patterns according to perceived similarities (eventually giving rise to the process of classification).

To observe:

Attention to one criteria only (i.e. one set at a time extracted from mixture)

Appropriate allocation of randomly selected items (i.e. more than 1 criteria operating at a time)

Unassisted selection of an appropriate number of containers

Unassisted instigation of categories

Ability to switch criteria, reallocate

Thoroughness of scanning over wide area

Degree of active consideration of possibilities

Means:

3-D

Separating highly-differentiated elements

Sorting into group of identicals (spontaneous classification)

Sorting into several groups incorporating similar, ambiguous or discrepant elements.

## 2-D

Separating/sorting sets of identical shapes, symbols etc.

Sorting based on identical criteria with 'noise' or distortion as a factor.

Sorting according to similarity of pattern or treatment of shape.

Sorting pictures/pictographs by classification (transport, clothing, etc.)

Intersectional (two-criteria) sorting - allocation by axial clues using cards or drawn materials.

### d) PILING AND BRICK BUILDING

Brick-building is a demonstration of an understanding of spatial relationships by the positioning of objects relative to one another, taking account of direction, distance, orientation and then functional relationship.

Prior to this developmentally, the random, loose piling of objects defines a particular region of space by continual translocation and provides for the possibility of noticing changes in position, orientation, or formation which may thereby occur, as well as the recognition of variety of function according to form.

To observe:

Bodily integration, rhythmicity and fluidity of movements.

Accommodation to shape differences.

Any spontaneous attempts to structure the pile (see notes on 'Handicap and Retardation behaviours')

Degree of understanding of spatial relationships

Sequential understanding

The formation and testing of hypotheses.

Means:

Fluent piling of a variety of objects of different size, shape, weight.

Reproducing increasingly complex brick constructions (with or without a model)

Building a 3D structure from a diagram/drawing/photograph.

Assembling a functional model (e.g. 'Escor') with or without visual guide.

### e) SCRIBBLING AND DRAWING

An ability to structure two-dimensional space and demonstrate aspects of the General Understanding by making permanent marks (usually with a tool)

To observe:

Fluidity of movements and variations in scale

Variety of bodily postures adopted

Relative use of each side of the body

Appropriateness and competence of grasp

Appropriateness of, and variations in, pressure applied

Variety of form and direction of free scribble (i.e. not guided or modelled)  
Extent of area covered and location in relation to trunk  
Any spontaneous attempts at representation  
Ability to imitate a model line in sense, relative position and direction  
Ability to connect separate locations with a drawn line  
Ability to copy simple and more complex patterns and their relationships.

Means:

Thick crayons, pencils, chalk, etc.  
Very large sheets of paper and card relative to body size.

#### f) CODING

Early movements facilitate the formation of simple associations between perceptions

From this arises early coding, the ability to conventionalise an association (one thing always representing another - i.e. having a fixed meaning)

This gives rise later to coding proper - the ability to demonstrate an understanding of symbols, signs or figures.

To observe:

Methodical, organised or random treatment of materials  
Thoroughness of scanning and searching patterns  
Spontaneous physical aids (e.g. pointing with the finger of one hand or both)  
Ability to work effectively in all directions and orientations  
Degree of demonstration or prompting necessary to pick up on rules of particular games

Means:

Active pairing of picture and object - i.e. object looked for in response to picture (and picture given in response to object proffered).  
Active pairing of pictograph (later ideograph/word) and object etc.  
Strengthening of association via use of obstacles (in containers, partially out of view, totally obscured, at a distance etc).  
Finding and hiding games.  
Double coding games, extensive use of space, whilst cross-referencing.  
Incorporation of coding into other games - seriation/sorting/intersection/drawn matrices.  
Use of pictographs to aid completion of a crossword or written phrase.  
Linking sets of number patterns to a numeral - using objects to create patterns  
Simple drawn maps as instructional diagrams

## **BANGING AND SCRAPING**

### **DEFINITION**

Banging consists of shaking hand-held objects, making intermittent contact with a surface.

Scraping consists of moving a hand-held object whilst making sustained contact with a surface.

### **EDUCATIONAL VALUE**

The ability to use all hand held tools has its roots in one or both of these activities. The extension of the limb by artificial means in order to adapt that limb for a specific purpose incorporates early learning which is later refined to particular circumstances. For example, brushing shoes, raking the lawn, using a spoon, scissors, sonic screwdriver, pen, hammer, scythe, etc.

As well as these obvious developments banging and scraping plays a vital role in the growth of the individual's basic understanding. That is, it is not just about using tools but is concerned with encouraging the maximum use and integration of bodily movements.

As a result of such activity the student -

- learns to accept a wide range of changing bodily postures
- gains understanding of his or her bodily near space
- focuses attention on the limb holding the tool and can switch attention freely from the actions of one limb to the movements of another
- co-ordinates use of hand, eye and arm
- gains experience of the complementary use of the combined limbs
- produces and registers the patterns which we call rhythm
- undergoes concentrated practice of grip postures

## **THE PLACE OF BANGING AND SCRAPING IN CHILD DEVELOPMENT**

### **i) WHEN?**

At 12 weeks the child can hold an object (e.g. a rattle) for a few moments before dropping it, sometimes bringing it into contact with another surface - often her own face.

At 16-18 weeks the child will regard an object in her hand at the same time as holding it.

At 24 weeks the child can normally grasp and release, often passing a toy from one hand to another. Indeed she spends many of her waking hours engaged in this type of activity.

The child will often fail to release the object she is grasping when reaching and will tend to bring it into contact with another object. The sensation this causes will in time be noted and eventually consciously recreated.

From 24 weeks onwards we see the child banging and scraping through an increasing range of space and with a natural alternating focus of arms and eyes.

For the normally developing child the most concentrated spell of such activity will occur between when the child can sit up and when she can walk. The child's banging and scraping will become more sophisticated and discriminating but will continue in many forms throughout childhood.

A pattern can be discerned here. It begins with the child inadvertently bringing an object into contact with a surface, registering that sensation and later seeking to recreate it. In recreating the sensation she will have caused yet more sensations.

The learning grows from the doing.

## ii) WHY?

As in all child development there is a good reason for this activity occurring at this stage.

As explained above it grows out of and develops in conjunction with early 'picking up and putting in' behaviours. Just as the child's transferring of objects from place to place will produce patterns so her banging and scraping will produce visual and aural patterns. It is part of the foundation of the developing understanding.

As it also plays a vital contribution to the development of grip posture it will enhance the 'picking up and putting in' activities. There is a two-way exchange between the activities, each feeding into the other's development.

Charts listing a child's developmental stages will describe the three principal grips (palmer, pincer and tripod) and concentrate on these easily recognised landmarks. They will not seek to describe the adaptive capacities of these grip postures as they arise nor will they describe the activities which allow these grips to develop so rapidly and so efficiently.

It seems obvious that these landmarks occur as a result of concentrated learning experience. In short, they would not occur without the massive experience accruing through banging and scraping activities.

To put this into context: the learning process is usually so successful that a child of fifteen months can bring a spoon to her mouth - usually to lick food off it - and can scribble to and fro using a basic palmer grasp. Here we also see the beginnings of the child adapting her general activities to the requirements of a particular culture simply because of the materials around her.

## SOME QUESTIONS

As with all unfamiliar movement patterns the initial reaction of the student with difficulties, when encouraged to carry out banging and scraping activities, will tend to be an anxious one.

Such anxiety tends to diminish with each session. The most effective means of overcoming unfamiliarity is doing the activity. This may take the form of a series of initially very brief (1-3 minutes) sessions, which the teacher can terminate when the child is to some degree in the swing of the activity.

### 1 WHY CARRY ON WHEN THE STUDENT ISN'T HOLDING THE TOOL HERSELF OR ISN'T ATTENDING TO THE ACTIVITY?

With some students it is necessary to hold their hand over the beater for most or all of the session. Although this imposed activity is not the same as the spontaneous play of a normally developing child there are comparable benefits.

Firstly, the student cannot help but receive feedback from the sensations caused and the movement patterns imposed.

Secondly, the student's non-attending behaviour fits in with what we see in child development. That is, only through doing (initially inadvertently) will the child come to attend, focus attention and then deliberately seek to recreate the sensations.

### 2 WHY MAKE SUCH LARGE MOVEMENTS?

The amplitude and vigour of the movements are in proportion to the student's size and strength. They are the scaled up movements of a child engaged in similar activities.

### 3 WHY NOT TRAIN STUDENTS IN THE USE OF USEFUL TOOLS (SPOON, COMB, TOOTHBRUSH) BY MEANS OF TRAINING PROGRAMMES?

The problem with training programmes is that they seek to bypass much of the learning process. The skill is not learnt (it does not grow from a foundation, does not develop naturally, cannot be generalised except in a limited way) but is flimsily stuck onto the individual's patchy understanding. The most effective way of teaching the use of tools is to ensure that the skill grows from a solid understanding. The most effective way of developing understanding of tools is through banging, scraping, scribbling, scooping etc.,

### 4 DOES IT HAVE TO BE NOISY?

In order to simulate the early learning patterns a variety of targets, surfaces (hard, pliant, low, high, rough, smooth) and beaters (sticks, hammers, bricks) are used. The surface is hit with force from a number of different positions to ensure effortful

and varied movement by the student. It is inevitable, therefore, that some of the activity will be noisy.

Although the noise can act as a secondary focus of attention of the student and allows her to register aural patterns this is not essential to the activity itself.

#### 5 IS IT SUITABLE FOR ALL STUDENTS?

Many adults with learning difficulties will have ineffectual or maladaptive grips, and find it difficult to use tools, or even to pick things up, open doors, etc.

Banging and scraping activities seem eminently suitable for children and adults with such difficulties.

## APPENDIX

### FINAL WORD AND SUMMARY OF PRINCIPLES

- 1 Movement is the source of all understanding.
- 2 Understanding is most simply viewed as a behaviour-producing state.
  - All behaviours are generated by, and are an expression of, the current understanding.
  - Understanding is created as a single, indivisible whole, having different aspects which we label variously as emotional/affective; physical/bodily/physiological; intellectual/cognitive/mental; spiritual; abstract; etc.
- 3 'General Understanding' is that adaptive (behaviour-producing) capacity which forms the core of understanding. It is common to all human beings and is relatively free from environmental singularity and cultural bias.

It contrasts with Cultural Particular Understanding, which represents the capacity to produce behaviours deemed appropriate in the time and place - the society - in which one is living.

General Understanding arises from the spontaneous, self-driving activity of the organism in available body space, activity which is accompanied by *specific* reinforcement (in the sense that it is proportionate to the effort expended).

Cultural Particular Understanding coalesces as one learns the rules and conventions of one's native society. Two processes are at work here:

- the application of General Understanding to that fraction of experience which is directly concerned with the customs of a particular social realm (a 'society')
  - *associative learning* - the making of associations between one pattern (thing, event, etc) and another - which, unlike fundamental learning, is characterised by *non-specific* reinforcement, i.e. there is no necessary proportionality between the action and the reinforcement.
- 4 The chief mainspring of humanity's achievements and development is the unspecialised nature of the human body.

- 5 In human beings there are two "givens" which are essential to survival: the tendency to move - "motivation" - and the actions of the postural reflexes. All else is learnt.  
This learning occurs through the activating of the sensory receptors and the resulting activity of the nervous apparatus within the system as a whole.

- 6 The process called fundamental learning (roughly equivalent to 'learning-how-to-learn') leads to the development of General Understanding.

- 7 General Understanding is spatial in its origin and development.

The evolution of **general understanding** in the individual depends upon

- a. the capacity to move and the intrinsic drive to be active
  - b. the unspecialised form and structure of the human body
  - c. the activity of the sensory receptors, of the central nervous system, and of the physical system as a whole.
- 8 Human development depends upon the ability to capitalise upon incidental variations in pattern.

The process of fundamental learning follows a clear pathway:

- doing
- noticing what one does; later, the effects of what one does
- beginning to understand
- understanding more fully (consistently)
- incorporation of this understanding into the [core] behavioural repertoire

All forms of learning and understanding derive from or depend upon fundamental learning and general understanding.

- 9 In the normal course of development the two principal forms of understanding, General Understanding and Cultural Particular Understanding, tend increasingly to come into competition for the child's available time and attention.

- 10 Behaviours can serve both shorter term and longer term adaptive functions (the more complex the organism's interactions with its environment the more this tends to apply).

## PART 2

### RATIONALE FOR EDUCATIONAL INTERVENTION

#### SECTION A

#### What do we want for our students?

##### That they

- be active, well-motivated, and constructive in what they do
- continually introduce variations into their behaviours as much as possible, even if only in small ways, so as to build up a fuller set of movement patterns for themselves

(These movement patterns are more commonly called "activities" or "behaviours".)

- be in a setting where they do not feel the need for self-protecting behaviours
- become more self-reliant, and do as much for themselves as can be expected
- by these means, *strengthen* and *enhance* their **existing** abilities and understanding

Taking these five points together, it means that our

- *expectations* of our students should be **high**
- our demands for *effort* from them should be **high**, as you would expect
- but our demands on their *understanding* should be **low**

Why is this?

Before attempting an answer let me say a little more about each of the aims specified above, in the following section.

## SECTION B

### **What do we want for our students?**

#### That they

1 - be active, well-motivated, and constructive in what they do.

So we aim for EFFORT: we try to ensure that the student does as much as he or she can manage during the Waldon lesson.

There is plenty of scope for encouraging effort in everyday life, too, in all kinds of ways, and this is generally a good idea: strong basic motivation is necessary for anyone to achieve their potential.

This is even more important if there is some problem affecting a person's learning or development.

#### That they

2 - continually introduce variations into their behaviours as much as possible, even if only in small ways, so as to build up a fuller set of movement patterns for themselves.

These movement patterns are more commonly called "activities" or "behaviours".

So, in the lesson we present a wide range of activities which are designed to

- allow the student to exercise the whole of his or her "General Understanding" (more on this in point 3 and in section D), with special emphasis on the earlier, more fundamental elements of it
- be nothing less than *concentrated experience*, offering abundant opportunities for learning.

That they

3 - be in a setting where they do not feel the need for self-protecting behaviours.

So we seek to maintain at all times a tranquil, emotionally low-key atmosphere.

And to keep it free from inappropriate demands which would distract the learner from the task at hand.

Note

*An emotionally low-key approach, in a calm and peaceful atmosphere, is more than simple commonsense: it is designed to provide an anxiety-free haven within which students can strengthen all facets of their General Understanding - "the capacity to produce adaptive patterns of behaviour" - in other words, their ability to deal with the world and its demands from a position of some personal security and sense of well being.*

That they

4 - become more self-reliant, and do as much for themselves as can be expected.

So we provide the minimum support necessary -

- (i) to enable the student to carry out the lesson activities;
- (ii) and to be as fully engaged in doing this as he or she can be at that time.

This ties in with point 1, about effort.

There are lots of opportunities for developing greater self-reliance in ordinary activities such as

- making one's way around: getting past doors and through doorways, up and down steps, stairs, slopes and escalators, across naturally uneven earth or grassy ground, etc;
- fetching or finding clothes and shoes, putting them on, taking them off;
- helping with tasks in the house and around the garden;
- etc.

Our instincts are to be helpful towards people who have learning difficulties or disabilities.

And encouraging them to do as much for themselves as possible, in a safe environment, is probably the most helpful that we can be.

In both the medium and the long term.

That they

5 - by these means, <i>strengthen</i> and <i>enhance</i> their <u>existing</u> abilities and understanding.
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The more all these things happen the greater the increase in the student's *competence*, i.e. the smaller the difference between what he or she can do under stressful conditions and what he can do under ideal conditions.

As ***competence grows the understanding can grow***, because the student is both less anxious generally and also better able to cope with the anxiety that he does feel.

This ability to manage situations, and the confidence which goes along with it, creates a good state of preparedness for learning.

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So what is the reason for saying that our

- expectations of our students should be high;
- our demands for effort from them should be high;

but -

our demands on their understanding should be low?

In a reasonably well motivated person, General Understanding seizes every available occasion to express itself. It does not require stimulation beyond what is provided by a day-to-day environment with the normal opportunities for learning.

If the person is not well motivated he or she can be helped to become better motivated by being encouraged to do things, as suggested in points 1 and 4 above.

Note *The doing comes first, and understanding may then develop from that.*

How do you get someone to do something that he or she cannot already do?  
Pitch your expectations at the right level: find out what he can do and then support him in doing things that are similar – variations on a theme - but which require at least as much effort as what he is used to doing.  
And build it up from there.

You need never require people to understand something before they can do it.  
It is, in any case, impossible to accomplish. If you do expect them to understand something prematurely they will become anxious and try to escape from what to them is an intolerable situation.

Knowing that someone expects you to do something but not knowing what that something is or how to do it creates an appalling dilemma for the student.

So, although he cannot do what is expected of him he is still driven to do something - anything - in order to deal with the anxiety created by the demand, and it will be a very familiar, well-rehearsed pattern of behaviour that he produces, because that is all that is possible in the highly stressful conditions that he experiences.

"Challenging" behaviours arise in this way; and carefully avoiding putting students in this dilemma is what is meant by keeping the demands on someone's understanding low.

As suggested in point 5 ("competence"), enabling the student to exercise and strengthen his current understanding in learner-friendly conditions is the surest way to bring about an increase in his understanding.

Unfortunately, we are so used to regarding speech as the chief means of communication between human beings that we tend to use it inappropriately with people who have severe problems in understanding-development.

Without our intending it in any way, this use of speech all too often makes excessive demands on the client's, student's, understanding, and drives him or her to produce all sorts of self-protective behaviours - *behaviours which are not randomly generated or wilful, but which are necessary, at that time and in that situation, as short term coping strategies.*

The next section continues looking at this matter of speech.

## SECTION C

### THE UNDERSTANDING AND THE USE OF SPEECH

Understanding of speech arises from the developing General Understanding.

The ability to use speech meaningfully comes from the same source, and also from the effects that your speech has upon the people around you.

Encourage the consolidation and growth of general understanding and it follows that the abilities to use speech and to understand the speech of others will also tend to strengthen and increase.

So it is always best to keep speech plain, simple and brief, relating it only to what the student can already understand.

New experience ("learning") must stem from what a learner does; it cannot be transmitted by means of someone else speaking to the unpractised learner.

#### **What are the implications of this?**

A few general principles can be derived: they appear stark, as is the way with principles.

Their application is always a matter for the judgement and good sense of each one of us.

- If the student has any kind of difficulty in learning use as little speech as possible.
  
- If in doubt, say nothing, and find some other way to communicate your needs to the student.
  
- If you decide to use speech keep it simple and spare.
  
- Do not ask a student to do something unless you are certain that he or she can already do it without any problem, and can fully understand speech of whatever complexity you are using.

## SECTION D

### THE PHYSICAL, THE EMOTIONAL, THE COGNITIVE ... THE SPATIAL

Our overall aim is to facilitate the development of the student's **General Understanding**.

"Understanding" may suggest a purely cognitive state or process: this is quite misleading under any definition of the term, and is certainly so when we are dealing with the notion of General Understanding.

In Waldon,

- understanding is a behaviour-producing state;
- "general understanding" is the state that represents our capacity to produce adaptive patterns of behaviour, and so helps to ensure our survival and development.

According to this way of looking at things, General Understanding is brought into being through a physiological process which has various aspects to it - physical, emotional, cognitive, etc.

For the sake of convenience we often refer to someone's "physical difficulties", "cognitive abilities", "affective disorder", "spiritual wellbeing", and so on: this can be a meaningful exercise up to a point.

But if we forget that we are employing a metaphor when we do this exercise and start to believe that there really exist distinct, separable **elements** of a person's being that are mental, physical, emotional, etc, then we have lost sight of the essential oneness of experience which our physiology dictates.

On one occasion when I was present, Dr Waldon was asked by a parent whether he considered the problem with his son's behaviour to be mainly emotional or intellectual in origin.

Dr Waldon replied "spatial". This was the only reply that made sense to him, he explained, and went on to say why.

(The reference here is to "spatial understanding" - the ability to make full use of available bodily space - which is the foundation of General Understanding.)

The fact of the matter does appear to be this: we develop as unified beings, and later on we are taught to carve up our experiences into different subject areas or disciplines.

What *is* important is to not lose sight of the fact that learning and understanding are no more "cognitive" than they are emotional or physical.

Given our cultural training this might feel, in some sense, alien.

A straightforward way to deal with this is to simply bear in mind that **learning is a thoroughly emotional process, and a very physical one too.**

## SECTION E

### SUMMARY

We need to be clear in our own minds about the boundaries we set within which we expect our students to operate; and make it as clear as possible to the students what our expectations of them are.

We might summarise the situation as follows:

Through helping our students to strengthen their General Understanding, or fundamental ability to learn-how-to-learn, we aim to assist in the development of their all round

- competence
- autonomy
- emotional equilibrium
- and sense of confidence

In other words, their capacity to be constructively and creatively active in the world.

This is an ambitious programme, because, for the reasons suggested above, these things tend to happen all together, or not at all.

A challenge for educators, by any standards.

## APPENDIX

### LEARNING THROUGH DOING: *EFFORTFUL ACTIVITY*

As Dr Geoffrey Waldon pointed out in his studies of human development and learning, there are certain things that have to be accounted for.

The following 'conversation' attempts to address one or two of these issues.

\* \* \*

Q. How do we learn anything?

A. Through what we do.

Q. What does it mean to say that learning comes from doing?

A. When we do anything (i.e. move any part of our body) signals are sent from the sensory receptors to the central nervous system (CNS).

*Understanding* is created through the organising of these signals into recognisable patterns of behaviour.

Q. How?

A. As the stored patterns of receptor activity come to be increasingly familiar they become correspondingly easier to reproduce. This means they can serve as recipes or blueprints for ever-more-common behaviours. Introduce the idea of variations on a theme – which happen all the time, whether we want them to or not – and you can see that the more you do, the more you can learn how to do things.

Q. So where does effort come into the picture?

A. To do anything requires some effort, but the more effort you put into an activity, generally speaking, the more information you are sending to the CNS - so the scope for learning is that much greater.

Children playing, for example, put an enormous amount of effort into what they are doing, but this is often not seen as effort because an adult might think of the children as having fun, or enjoying themselves, or whatever.

To a grown-up, "effort" might suggest stress, strain – the opposite of enjoyment, in fact. But this is just one way of using the word. I prefer to see it as a neutral term for describing the intensity of our involvement in a particular task – or play activity, if we are a child.

Q. So the key to learning is effort?

A. It is certainly crucially important, yes, and along with *motivation* – which I define quite simply as "the tendency to produce movement", or "the tendency to be active, or to act on one's environment" – I would say that together they could be regarded as the cornerstone of learning.

Or, more properly, of the *ability to learn-how-to-learn*.

Q. What is the distinction you are making here, between "learning" and "learning-how-to-learn"?

A. Well, the earlier the developmental state that one is looking at, the more we would be seeing the process that I call "learning-how-to-learn" going on. Babies, and young children, for example, spend almost all their active waking hours learning about how they can move, how they can operate on the world, what are the effects of gravity on things – what happens if I pull this, or push that, or bang on this thing over here with a spoon, or stick, or whatever.

(It doesn't happen in this conscious sort of way, of course, the baby just does these things, and then later on notices them, and the effects of them and so on, and all of this is long before we've got any reason to suppose that there's any deliberate planning going on.)

Then, as the child gets older, he or she tends to learn things in the way that we normally talk about it as adults – he learns about computers, or studies maths or geography, and all those things. But this learning can only come about because all of the necessary, earlier *learning-how-to-learn* has already happened, or at least most of it has.

Q. You're talking about children a lot. How does this relate to adults who have learning difficulties or disabilities?

A. In the same way: if there's a problem with the early learning-development then there's always some *learning-how-to-learn* that needs to be caught up on.

In practice it's quite straightforward to arrange for a person with a difficulty to exercise and strengthen this early understanding – *general* understanding, I tend to call it, because it really is the basis of all understanding, so it's general or common to all human beings, and, more importantly, an expression of the essentially unspecialised, or general, nature of the human being's form, apparatus, and possible repertoire of movement patterns – and I do this by using what I call the Asocial Lesson.

Q. Which is . . . ?

A. The simplest way I can describe it is if you imagine a child playing on his or her own. There are adults around, probably one or more parents, but they're not taking any notice of the child at that time, just getting on with their own things.

This is an incredibly rich learning environment, because all the child's attention is on what he or she is doing at that time, and there's probably near-total involvement in whatever the play activities happen to be.

Think of all the patterns of movement the child is producing, all that pure, uncluttered information being conveyed to the CNS (through nerve impulses caused by the sensory receptors in the muscles, joints and tendons being activated, that is).

That is the situation I try to simulate in the asocial lesson: a highly motivated learner engaging in a great variety of activities – basically, movement patterns – that carry a wealth of relevant, high quality information to the parts of his system that can process it and make use of it.

It's what I call fundamental learning. In actual fact, it provides the neural substrate for conscious awareness, for understanding – for everything, really.

That is why I consider it so important

Q. You talk about the “highly motivated learner”, but what if the person does not want to learn – or does not seem to want to do very much at all?

A. You've got to step in and help them out! Get them to be active in whatever way you can, and gradually they'll acquire the habit of doing things, and then want to carry on doing, and so will end up doing more and more.

But notice that **the doing comes first**. You asked about someone who doesn't want to learn, or who doesn't want to do very much.

Well, in normal development, the baby has to do things – and this means *a lot of things a lot of the time* - before he or she gets to the point of being *able to want to do* anything at all.

Like just about everything else, *wanting* has to be learnt, and since you can only learn by doing, the **doing must come first**.

Q. But what about the child's natural curiosity, or inquisitiveness ... ?

A. I'm afraid there are a lot of mistaken assumptions about this. Any careful observer of a developing child will notice that a normally active child *becomes* what we call an inquisitive child; a less active child, possibly one with some problem in the early learning-development, becomes noticeably less inquisitive.

So this “curiosity” is another learnt behaviour. If you're not used to being consistently active, and attentive to what you're doing, you simply do not have the basis for speculating about something that you have not yet done – which is what curiosity is, in essence.

And, if you think about it in evolutionary terms, that does make sense, because what would happen to a species in which the young were driven by a strong

*innate* sense of curiosity but they also had quite a few years of learning to go through before they were capable of independent survival?

How many of them would survive?

Certainly far fewer than is the case with human beings, I suspect.

The key to survival and development is a balance of forces:

- freedom to act balanced by constraining forces – the force of gravity, the limiting actions of the joints, etc;
- positive reinforcement counterbalanced by negative reinforcement;
- boldness and rashness constrained by fearfulness and caution, etc.

Q. But you do agree that inquisitiveness is a very human characteristic?

A. I don't feel that it's in any way peculiar to human beings, if that's what you mean. I would think that all species develop something that might be called curiosity about their external environment, even though this might be in a very primitive form.

What distinguishes humans is that we have an extensive repertoire of behaviours that we can use, so we tend to look very busy, and sometimes very inquisitive, to the casual observer. I think a lot of this is froth, myself: in my experience very few adults are curious about what I'd call serious matters, or matters of any great significance.

Q. Such as?

A. First and foremost, the creation of experience; the origins of understanding; the formation of the human organism.

Then, the secondary issues: how as a species we have evolved in the way we have, with our particular aptitudes, appetites, use of technology, language and other advanced tools – to say nothing of our drive to self-destruct - etc.

Q. Thank you. Shall we leave it there for now?

A. I think this is a good place to stop.