Babies Outdoors

Play, learning & development

Contents

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Introduction

"In every culture, childhood is a special time. It is perhaps the most powerful period of our lives. Our experiences form the foundation of what we become, the core of our being – our ability to learn, our sense of ourselves in relation to the world of nature, of people, of things. It is a time for powerful experiences that forever fuel the scientist, the poet, the artist, and the imagination within us."

[Jim Greenman 1988: 30]

Daily opportunity to spend time in rich outdoor environments is of crucial importance for all children, and this is just as true for children through their first year. The phenomenally rapid development of important and complex neurological systems requires vast amounts of the right kind of movement and sensory stimulation on a daily basis. Babies are intensely driven to enquire and explore, and are greatly disadvantaged if this is restricted to a range of indoor environments, however varied. As adults entrusted with the care of very young children, we are duty-bound to provide the best possible circumstances for their well-being and healthy development. Being outdoors with an understanding and enthusiastic adult has a huge range of benefits for babies throughout this first year of life.

"A child's world is fresh and new and beautiful, full of wonder and excitement."

[Rachel Carson, 1998: 54]

The outdoors is a very special place for children in their first year, providing just the right stimulation for their rapidly developing bodies and brains. As you watch this film, here are some of the things you might identify that the outdoors offers babies:

- freedom for movement, action and working out what bodies can do;
- natural light, sunshine and fresh air, providing oxygen-rich air and helping the body to operate and grow optimally;
- visual and physical space, with the full range of close-up to views of the distance, and upwards as well as side-ways. Movement in this space enables development of all the complexities of visual perception;
- a richly varying multi-sensory environment where touch, smell, sound, taste, sight, movement and body-sense systems can develop and integrate together;
- a phenomenal range of interesting stimuli, the surprise of spontaneous events, and daily variations in the quality of the air, temperature and light as weather and seasons change;
- physical and emotional contact with the natural world: both the living world of plants, mini-beasts and other animals, and physical world of water, earth and stone;
- a myriad of different spaces (with different microclimates, sensations and viewpoints) and hundreds of things from the miniscule to the mighty to poke at and ponder;
- a place to watch people of different sizes and behaviours, to interact, to build relationships and learn about being human.

[Jan White, 2009a]

"The child is wonderfully prepared for active learning from birth. Children approach the world with all senses open, all motors running – the world is an invitation to experience. Their job is to develop and test all their equipment, make sense of the confusing world of people and things and unseen mysterious forces and relationships, like gravity, number and love."

[Jim Greenman 1988, p30]

This film has been made to support parents, providers, practitioners and inspectors in early years settings, and students, trainers and advisers in early childhood education to develop their understanding of, and commitment to, the role of the outdoors for children from birth to 12 months. Watching the sequences repeatedly will enable adults to tune more deeply into just what it is that babies want to do and know about when they are outdoors. It will also give a great deal of food for thought and discussion towards the development of appropriate provision and practice that is fulfilling for children and adults alike.

The film aims to:

- show how much babies get from being outside and why it is so important for them;
- make the special nature of being outside apparent and clear, so as to build the rational for outdoor provision in all early years settings;
- show what the outdoors offers children under one, how it meets their interests and supports well-being and development;
- illustrate how being together outdoors offers powerful contexts for attachment and companionable learning;
- help adults tune in and see more of what is really happening in babies' experiences outdoors;
- emphasise movement and exploration for this age group, showing how experience builds both brain and body;
- indicate what environments are appropriate by illustrating what babies need, what they are interested in and what they want to do;
- expand adults' thinking about what is appropriate provision - and that this is so much more than tarmac and toys;
- make adults WANT to take babies outside and be with them, to share in their pleasure, delight and discovery;
- show that babies must have outdoor experiences every day (several times in a day) and all through the year;
- make parents expect and demand outdoor opportunities every day for their child.

"Babies don't just enjoy the outdoors; they need it as they are gradually integrating their senses and building up their physical systems."

The notes have been written primarily to help viewers to observe more closely some of the significant things that are taking place for the child in the sequence. The section entitled 'things to notice and understand' aims to focus attention on issues that are important to know about. The sequences show a great deal

about child development in general, and can be used very effectively in this way. The focus of the notes, however, is to bring attention to those elements that are particularly relevant to being outdoors. Understanding more about these issues will support adults to develop both provision and their practice outdoors. There are common themes across the five children, such as 'the role of movement' and 'sensory development', because these themes are of great importance during this year. Within these themes, development can be seen as we move from Miles at 6 weeks, to Dexter at 12 months, and through watching Bobby and Dexter outdoors on different occasions over several months.

The notes for each child also have a section called 'prompts for developing practice'. The aim here is to identify what makes outdoor provision effective and satisfying for both child and adult, and to give prompts for closer observation of the film sequences followed by focused discussion. Improvements in provision and practice are more likely when understanding of these issues is developed and positive thinking about barriers, objections and stumbling blocks is carried out.

Above all, every adult living with and supporting babies wants to give them certain messages, so that they will grow up believing these things about themselves. Close examination and consideration of the film and accompanying notes should support adults to use the huge potential of the outdoors to make young children feel that:

- they are good to be with – it's great to be doing things together outdoors;
- they can feel good in their body – responding to children's drives for doing, moving and using their whole body, and helping them to take pleasure in how that makes them feel;
- they are capable and competent – offering the right level of intellectual, emotional and physical provocation and challenge, and using experiences to help children gradually learn how to look after themselves and others;
- they are trusted and responsible – setting things up so that children can play independently and support each other, and providing plenty of first-hand experiences and meaningful real tasks;
- they are curious and adventurous – offering an environment full of irresistible spaces, materials and experiences;
- they are creative and inventive – having an open, flexible approach that encourages young children's great imaginations and values the unexpected.

[Jan White, 2010a]

We hope that being able to closely observe and come to understand these five intensely enthusiastic, curious and sociable children will help you to tune into the real natures and passions of babies in their first year; and that you will want to share in their discoveries and delights in the world outdoors, every single day, throughout the year.

"Many of the things we need can wait, the child cannot wait. Right now is the time his bones are being formed, his blood is being made, and his senses are being developed. To him we cannot answer 'tomorrow'. His name is Today."

[Gabriela Mistral, Nobel prize-winning poet from Chile]

Miles

6 weeks

Things to notice and understand

The special nature of the outdoors

"The outdoors has a special way of supporting young children's well-being and supplies both the medium and the means for responding to their deep drives for exploration and their quest to make sense of their world for themselves."

[Jan White, 2009a]

In this short clip, we can see much of what makes the outdoors special for babies, even when they are just six weeks old. The quality of being in 'fresh air' is very evident, both as a place for having a good quality nap, and as a wonderfully rich sensory environment when awake and alert. Miles is breathing in oxygen-rich air that enlivens his brain and feeds the tissues of his growing body. The experience of the softly caressing spring breeze and the feeling of gently varying warmth on his face and skin, combined with the dappled light and moving shadows and leaves, together provide an environment full of sensation and interest. He also benefits from the whole-body sensations of lying in the soft grass on firm ground.

Several of the children in this film (Miles, Ko and Lucas) experience some or all of their daytime sleep outdoors, and many early years practitioners are now rethinking how they can provide the best quality of sleep for children in their settings by making use of the outdoors. Reminded by current Scandinavian practice that is driven by the belief that young children sleep best outdoors during the day – a popular view one or two generations ago in the UK – it is increasingly common for nurseries to offer choice between indoor and outdoor sleeping arrangements, finding out which conditions suit individual children. And it is frequently reported that, so long as they are comfortable and well protected, children settle better, sleep for longer, wake more gently and are more refreshed by having their naps outside in cool, fresh air. Since sleep is such a significant occupation for babies under one, the quality of this sleep is a crucial consideration for childcare settings. Neuroscience is revealing the vital role of sleep in learning, as it allows the brain to process the torrent of sensory information the young baby experiences while awake and build the neurological connections (memory) that enables them to make sense and make use of these experiences [Karmiloff-Smith, 2010].

Sensory development

"Babies experience a very different world to us, dominated by bodily sensation and the present moment. The outdoors is a wonderfully sensorial place for a baby throughout this year, with lots of sensations for the body, things to notice, watch and reach for, objects and materials to touch, feel and handle, sounds both near and far to listen to and interesting places to be in with an attentive and responsive adult. Stimulation from both the natural world and the world of humans provides multi-layered information about

what is in the world, what it does and how it all behaves, and helps the baby to find out about themselves as they develop and grow."

[Jan White, 2010b]

Very young babies exist in a state of sensorial 'here-and-now'. It is a world dominated by sensation and feeling, with no (or very little) awareness of past or future. Thus, the sensory information in their surroundings feeds how they experience life: it is very important for carers to pay close attention to this arena for babies, especially during the first few months.

Even in this brief example, it is clear that being outdoors is providing this very young baby with rich sensory stimulation that also plays a crucial role in developing several major sensory systems, such as vision, hearing, smell, temperature and touch. It is worth watching the clip several times to realise how much is happening for Miles in this place. As he wakes refreshed from a nap, he is ready and able to pay attention to a whole range of interesting inputs from his surroundings. Babies arrive in the world with many abilities and an in-built readiness to work on their own development. They are exquisitely fine-tuned to seek out and pick up on relevant and appropriate information that will do the 'right work' on their neurology and physiology, so that they develop in an optimal way. Since humans evolved in the outdoor world, our bodies have evolved to make use of the stimuli that are present in it to develop the abilities that allowed us to survive and thrive in it. As a result, the stimuli that we need for full development are best provided in *outdoor* environments – and many of the stimuli we need are relatively weakly provided in indoor environments.

Vision is a remarkably complex sensory system that is a great deal more than 'eyesight', and which requires a huge amount and range of different kinds of visual stimulation from birth onwards in order to develop and operate to its full potential. Natural light contains the full spectrum of wavelengths of both visible light and beyond. This outdoor environment can be seen to provide a 3-dimensional world of bright and dark, colour and tones, edges and contrast, near and far, motion and stillness. Babies can find the bright lights indoors and the brightness of direct sunlight difficult to cope with and will protect their eyes by closing them, so it is important to be alert to this to help in moderating such over-stimulation. Hearing is likewise complex and has several components that the brain has to build, such as discriminating one sound from its background, recognising or interpreting what that sound means, and working out which direction and how far away the sound is coming from. Miles is bathed in sounds coming from within the garden and from the world of the city beyond. In particular, he will recognise the familiar (and security giving) sounds of his brother and his Mum. Smell is very highly developed in newborns - much more so than in adults - with this part of the brain being taken over for vision as it develops to become the dominant sense in adult humans. Babies are therefore much more tuned-in to the subtleties and complexities of smells that fill the world outdoors and change throughout the year. Finally, but very importantly, we can see that Miles is very responsive to touch, responding with a smile to the pleasure of contact with his Mum. Being aware of the wonderful variety of touch and body sensations that the outdoor world offers will help adults bring the full range of this vital stimulation to the child.

Miles' brain has to do more than pay attention to and process information coming through each sensory pathway. These senses also need to wire up to each other as they develop to become smoothly interwoven (sensory integration), so that the body can work in the highly effective way it is capable of [Stock Kranowitz, 2005].

In such an integrated system, each individual sense makes great use of the others – they interact and work together to be far more effective. Having well-developed and well-integrated sensory systems is incredibly important to life functioning and learning, so it's not surprising that babies work so very hard on developing their senses and the integration of them over this year. The richness of being outdoors, especially in a nature-filled environment, for multi-sensory input cannot be achieved indoors. At the same time, perhaps because the body is designed through evolution to seek the stimuli that are available in this kind of environment, this richness seems to be more gentle and less overwhelming than when equivalent stimulus is received indoors. However, it does also explain why babies get tired so quickly after an interesting or active session outdoors (see Bobby at 3 months)! Several short periods outdoors are likely to suit young babies much more than occasional long ones.

Personal and social development

Being with others is hugely beneficial for babies. Outdoor provision that separates babies in order to meet their less-mobile needs (or keeps them indoors due to 'bad' weather) is seriously lacking in one of the most important aspects of development for this age group. Babies are intensely interested in what humans are, what they do and what it means to be human. As one of the most socially oriented animals on earth, this is not at all surprising: as humans evolved, we could only survive by living in groups and depending on each other, so that now this is deeply ingrained in our interests, learning and well-being [Roberts, 2010]. While adults are the main interest of babies, they are also intensely interested in other children, especially perhaps those who are older and more mobile. Miles feels safer by being outdoors with familiar people and finds interest and stimulation through sharing the outdoor space with other children. Outdoor environments can and should accommodate a range of ages and can often be the time that age groups can mix effectively.

Adult support and interaction

At this time of his life, Miles is very vulnerable and completely relies on adults to keep him safe. He does however have a strong inbuilt drive for survival and his own powerful strategies for making adults look after him, such as smiling (a beautiful example of which we see here) and crying. As we see here, being 'there' when the baby looks for you - being in the moment and attentive to the child as an individual - is a potent role for adults, building a sense of security for the child through sending clear messages that they matter, that you have them in mind and are looking out for their welfare at all times. Security is a primary driver for all children; and only once they are assured of consistent support from adults can they pay attention to the world and enjoy learning from the experiences it offers [Roberts, 2010].

The quality of attention and companionship that Miles experiences also goes beyond this:

> ***"Recognition is to the psyche what nourishment is to the body. It's identity food. The sentient gaze of another human being confirms our very sense of being… Recognition is the meat and potatoes of our identity. It is as indispensable to mental health as food is to physical health."***
>
> [Robert Fuller, 2004]

Prompts for developing practice

Organisation

❑ What issues would need to be addressed through both policy and practice to help bring about the vision of babies getting outdoors every day (possibly for several short periods), throughout the year?

❑ Providing the highest quality daytime sleep for babies is essential. Consider what opportunities for sleep, rest and relaxation children have in your setting and how sleeping outdoors could be investigated and tested. What conditions would be best (such as flat-bed prams or cots) and where they should be located?

Environment

❑ Miles is comfortable and stimulated by lying on the ground in the garden, where he can freely move his arms, legs and body. Watch the sequences of the other children also to inform discussion around suitable surfaces to provide in your outdoor space for the non-mobile babies through the year.

❑ The natural world is such a rich and important aspect of being outdoors and for providing sensory-rich experiences, but nature has a very limited presence in so many early years outdoor spaces (especially where there is high risk-aversion). Use your thoughts from watching all the children in this film to generate ideas for increasing 'everyday' access to nature for your babies.

Adults

❑ Effective outdoor provision requires an ethos and vision, underpinned by a strong rationale, that babies must have access to outdoor environments for plenty of time each day, every day of the year. How can you develop this understanding and belief across the staff team?

❑ Adults need a deep understanding of sensory development through this first year. Watch the sequences of all the children focusing on how being outdoors is supporting this so well. By sharing perspectives and discussion, build up a picture of the role of sensory development in the lives of children under one.

Parents

❑ As we have increasingly adopted an 'indoor culture', parents may understandably have worries or fears about their young baby going outdoors. How can you engage parents in the value of daily outdoor provision for their child? What opportunities can you find in all stages of your communication with parents and carers to convey your commitment and help them understand your approach?

❑ Sleeping outdoors has become unusual in the UK and might be considered inappropriate for babies. Use these sequences as a prompt to discuss the value of babies being able to sleep outdoors with parents and find out what their concerns really are, so that they can be addressed whilst remaining positive to developing this practice.

Bobby

3, 5 & 7 months

Things to notice and understand

The special nature of the outdoors

"Very young children have a very special way of relating to the outdoor world. It is of enormous interest to them – the easiest way to support an unsettled baby or toddler indoors is to take them to a window to look outside. They have an inborn affinity, curiosity and fascination with the natural world: sky, wind, rain and shadows; plants, trees and leaves; sticks, pebbles and rocks; water, puddles and mud; dogs, birds and beetles and people. Children use their whole body and whole self to engage with, explore, dismantle and think about the world – and this is very apparent when young children are in the real, outdoor world."

[Jan White, 2009a]

Watching the incredibly rich experiences Bobby has with her Mum in the garden, the park, the street and the local shops, it is clear that the outdoors is a very different place to the indoors for a child in their first year. Rather than attempting to 'take the indoors out', it is vital that young children's outdoor experiences capture the special nature of the outdoors, providing what the indoors cannot. Several viewings of Bobby's outdoor experiences, combined with plenty of discussion, will enable practitioners to analyse and come to appreciate the phenomenal range of differences that exists between inside and outside environments, and just how much developmental value these contain for children under one [see also White, 2011]. Babies are very tuned in to these differences and this is why they want and need to be outdoors so much, and why outdoors provision is so important for them. Paying close attention to the differences and complementary experiences available – what makes the outdoors special – will help teams to reach a shared belief in the importance of going outside for such young children: these highly valuable experiences just cannot be provided indoors. This awareness will also guide thinking about the experiences that should be made available through outdoor provision for all children in the setting.

The film captures the interesting moment when Bobby, at 3 months old, moves across the threshold from indoors to outside. She quickly registers the new and contrasting sensations on her face of cool, moving air and bright wintry light. This contrast alerts Bobby's brain and focuses her attention. From the base of security she feels by being safely held by an attentive adult, this stimulation activates inborn learning systems that put her in a ready-to-learn exploratory mode, using her eyes to gather visual information and her highly sensitive tongue to investigate the qualities of the air – she is probably very aware of smells too. Young babies are very tuned to contrast as it helps their brain learn how to separate and distinguish things in the environment; and there are many visual, tactile, temperature, sound and movement contrasts to be found outdoors (see below for visual contrast), giving myriad opportunities for gradually making sense of the world around them.

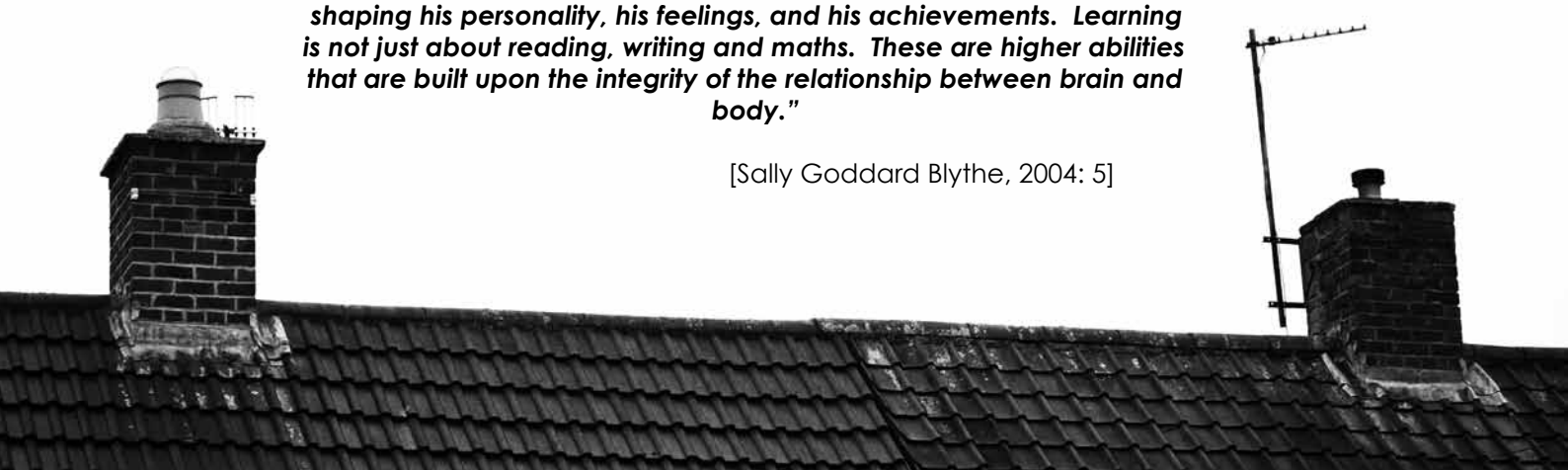
Even more than the garden, the park, streets and shops offer wonderfully interesting worlds for Bobby as she progresses through this year. Babies are driven with a strong biological need to find out about and make sense of the real physical world and the real world of humans: and the outdoors in all its richness and complexity has a huge role in this. Frequent and repeated short walks into the locality and community, with very small groups of children, are so valuable that practitioners must work out how to tap this potential – especially where children of working parents are spending long days in the childcare setting [Lindon et al., 2008]. Revisiting the same places many times is far more valuable than a few large excursions to different venues each time. The immediate locality provides the most relevant and interesting spaces for children under three, and these are the very places they most want to take their time in, to experience as fully as they can. Each time Bobby revisits something in these places, she adds to her understanding, builds new thoughts and has novel ideas. As babies' perception, comprehension and physical abilities develop and change so rapidly, new things become available in the same environment, so that the security of familiarity actually makes available an ever-changing landscape of sensation and opportunity. Alongside marked seasonal change and differences in the environment provided by our wonderfully variable weather, there will always be something intriguing and fascinating to notice and explore together. Watching both Bobby and Dexter over time makes clear this interplay between the changing environment through the year and the physically and mentally changing child, and builds a strong case for the immense value of babies getting out into rich outdoor environments every single day, no matter what the weather conditions or other perceived barriers. During this year, children are developing at such a rapid rate that they cannot wait through the winter for 'good' weather – they need the richness of this environment every day of their lives.

Bobby is fortunate to have an active local high street, a local park and wonderfully natural areas around the garden. These environments provide extremely rich and stimulating places for adults and babies to spend unhurried time in together. However, it is possible to find rich places in most locations – for children of this age such places do not need to be large or exotic, but they do need to be experienced with no adult agenda and plenty of time to go with the child. Notice, for instance, how Bobby needs time to take in the rocking horse before she begins to share the experience with her Mum: much more has been gained by slowing down from an adult timescale to 7 month-old Bobby's. Small daily forays into the local area can become a routine part of practice, providing another layer of outdoor provision (and a superb way of augmenting limited onsite outdoor spaces), when adults seek suitable and nearby spaces, become familiar with them so as to feel confident and comfortable using them, and make regular, frequent visits and journeys in them with the same very small groups of children.

The role of movement and physicality

"Movement is an integral part of life from the moment of conception until death, and a child's experience of movement will play a pivotal part in shaping his personality, his feelings, and his achievements. Learning is not just about reading, writing and maths. These are higher abilities that are built upon the integrity of the relationship between brain and body."

[Sally Goddard Blythe, 2004: 5]



It is really not possible to overstate just how important movement is for babies throughout the first year – both being moved and moving themselves. Babies absolutely love to move and are driven to develop their physical abilities from the moment they are born (and in fact long before this in the womb). Living in a sensory here-and-now, they are bathed in the internal sensations of movement generated both by moving the body (from the body awareness or *proprioceptive* sensory system) and by moving in gravity-filled space (from the motion-detecting vestibular sensory system that gives us balance and coordination). Babies are biologically programmed to continually seek stimulation for developing these senses as these two systems are both vital in their own right and as the neurological underpinning for full functioning of other senses, such as touch, hearing and vision. This is why a small baby will wake up and protest as soon as you stop soothing it by rocking, jiggling or walking! Babies need huge amounts of time and opportunity to engage in a wide range of playful physical experiences every day in order to develop the right foundations for health and happiness, both now and in their futures [White, 2008].

This drive for movement is perhaps so strong because of its fundamental influence on all other aspects of a child's life. Movement is the child's first 'language', providing the primary means of experiencing and thinking, and, although we become largely unaware of it, it remains our dominant sense throughout life [Hannaford, 1995; Goddard Blythe, 2004]. Young children learn about themselves and their environment through movement [Donaldson, 1978]. Babies take in information about the external world by physically and bodily interacting with it; they build understandings by moving through it and manipulating it; they think by moving and express their thoughts through movement; and they gain an understanding of their bodies, themselves and how their body relates to the world by experiencing the sense of movement [White, 2008].

However, opportunity for this much movement is being alarmingly reduced in the lives of babies as they spend more time strapped into car seats and buggies by adults in a hurry (now becoming referred to as 'bucket baby' or 'container baby' syndrome!), have limited opportunities for active floor play, and 'boisterous' play by and with young children is increasingly frowned upon. The recent rise in numbers of diagnoses of special needs involving sensory processing issues, such as dyslexia, dyspraxia, problems of attention, language impairment, emotional problems (and later adult problems of anxiety, agoraphobia and panic disorder) may well be connected to the reduction in movement in the daily lives of babies and toddlers [Goddard Blythe, 2004: 17; Stock Kranowitz, 2005].

There is much to notice and understand about movement in the sequences of Bobby outdoors. The movement games that we see Bobby and Ko play with an adult they feel completely safe with, clearly give these babies great pleasure and fun, and are as important to healthy development as is touch. Being moved through space – swooping, flying, hanging up-side-down, jiggling, dropping and bouncing – all give pronounced feelings of motion in space. Children of all ages, from new-born to teenagers, actively seek experiences that involve rocking, swinging, rolling, turning, spinning, twisting, tilting, tipping, falling, bouncing, sliding and moving fast, wherever they can be found. Moving in these ways provides sensations that develop vestibular organs in the inner ear that tell us where we are in space in relation to the force of gravity. Babies love these tipping and falling sensations because it's very important for life functioning that they develop this sensory system very well. The vestibular sensory system underpins the development of balance, body control and coordination, which themselves

underpin a great deal else both physically and emotionally. When our balance is out of sorts, we feel confused, uncomfortable and unable to function. Having a strong sense of motion and balance allows us to cope in the world, and is a vitally important developmental process [Goddard Blythe, 2004], that can only mature through movement of the body in space. Young children need very many such movements, every day, over several years to develop this sense fully so that they are comfortable in their body, and can move, control and position it with ease - and it clearly underpins the developing ability to walk towards the end of the first year.

Babies have to rely on adults to understand just how much they need to create the stimulation this neurological system requires and who find ways for them to access to it in as many appropriate ways as possible. Men often play body and motion games in this way much more vigorously with babies [Jamison, 2004: 108] and it is more often the female carers that need to examine their reactions and concerns in the light of this biological need. Of course, it is the security of playing such games with a closely familiar adult, who knows how to handle the baby and picks up on their subtle clues of pleasure and distress that makes these games so beneficial. Experiencing 'scary-funny' feelings [Sandseter, 2007] and surviving 'safe emergencies' [Forencich, 2006] together is a tremendous way to build emotional bonding too. Notice the anticipation and relief in Ko's body language and the way these emotions are shared by his Mum (for more on the value of body games for the sense of proprioception, see the notes for Ko). Bobby also demonstrates great enjoyment of the gentle rocking motion of the hammock alongside her key adult, so much so that she is stimulated by her feelings of well-being into some delightful vocalisations in a conversation with Mum. Hammocks and swing seats do make wonderful features for an outdoor environment and are commonly seen in early years settings in Europe, serving the nurture and movement needs of children from a few months to six years old.

"It is imperative that babies spend lots of time lying free of restraint on their backs, and especially on their tummies. A great deal of neurological and anatomical development takes place through being in these positions, also allowing babies to play with their feet and work on rolling over."

[Jan White, 2010c]

Carefully watching the beautiful sequence of Bobby at 7 months in the garden in summer reveals some of the enormous value of babies being able to lie on the ground outdoors with full freedom of movement, minimal restraint by clothing and footwear, and all the wonderful gentle and complex stimulation of fresh air, nature, space and a fully attentive and tuned-in adult. Without her shoes, Bobby can grab and handle her feet, finding out what is her, where it is, and how it feels from the outside and the inside at the same time; bringing about some deep neurological connections. As she experiences her full physicality, cycling legs and hands, she is highly stimulated and this encourages her to express her pleasure by vocalising. Alongside this, her visual system is stimulated by the depth of the visual field as she alternates her gaze and attention between close up (her hands) and far away (the sky, birds and other features in the distance). Changing focus easily like this is known as 'accommodation' and is an important aspect of well-functioning sight.

As soon as they are ready, babies need to spend increasing amounts of time on their tummies, giving them a new view on the world and bringing about a surprising range of anatomical and neurological growth. Head control is one of the most

important motor skills a child ever develops [Goddard Blythe, 2008]. The spine, hips and hands are encouraged to open up; the shoulder girdle, neck, arms, joints and hands are strengthened; distance sight, eye tracking and hand-eye coordination is stimulated; dexterity of the hands and fingers and use of the feet are promoted. These all help considerably in the change over this year from the foetal C-shape to the S-shape spine needed for upright locomotion and from the closed fist of the newborn to the fully functioning toddler hand. Stimulation to the abdominal organs helps with such things as development of bladder control and feelings of hunger or fullness. And, not least, being on the tummy with interesting things such as daisies to reach for is the first step in the all-important development of crawling (see notes for Ko). [For more on this area see Goddard Blythe, 2008 chapter 7].

Sensory development

"The deepest insight that comes out of looking attentively at babies is understanding where our ability to look attentively comes from. The most interesting thing about babies is that they are enormously interested; the most wonderful thing about them is their infinite capacity for wonder."

[Gopnik et al., 1999]

At 3 months, Bobby's attention seems to be drawn by edges – the roof line, the top of the hedge and fence – especially those outlined against the sky where there is strong contrast. Research has documented that young babies are most interested in objects that present marked differences in contrasts of light and dark [Lamb, Bornstein & Teti, 2002 in Martin & Berke, 2007]. This schematic interest in edges and boundaries helps to build perceptive ability in the brain that allows the baby to see things as separate objects against a background – it enables them to begin to interpret the vast amount of visual information being received. Whilst Bobby can make sense of close-up things she has seen many times, such as Mum's face, understanding the visual landscape takes time and much experience. Focusing first on contrast and edges allows this to be organised in a systematic way. We can see Bobby looking close and far as her brain seeks stimulus that will slowly build into the capacities to actually see in depth, understand how the world is 3-dimensional and operate successfully in it. Binocular vision (having two eyes simultaneously sending slightly different images to the brain) also enhances depth perception, but the eyes need plenty of early 3D experience for the brain to tie the two groups of information into a single image. Even though Bobby is outside for only a short time, once we appreciate how much stimulation she is getting in this rich and complex environment (all the other senses are working just as hard at the same time), we can understand that several short periods outdoors may match the attention span of a child at this age more than a few, longer ones. Bobby may well need to sleep for a while now so that her brain can process everything that has just happened [Karmiloff-Smith, 2010 - see also the notes on Miles].

Vision is extremely important to humans, and in order to construct the highly complex sensory system that it is, they need to spend plenty of time receiving a very wide range of visual stimuli, such as bright and dark, colour and tones, edges and contrast, near and far, motion and stillness [Gibson, 1986]. Taking babies outdoors increases all aspects of visual development, especially the ability to see

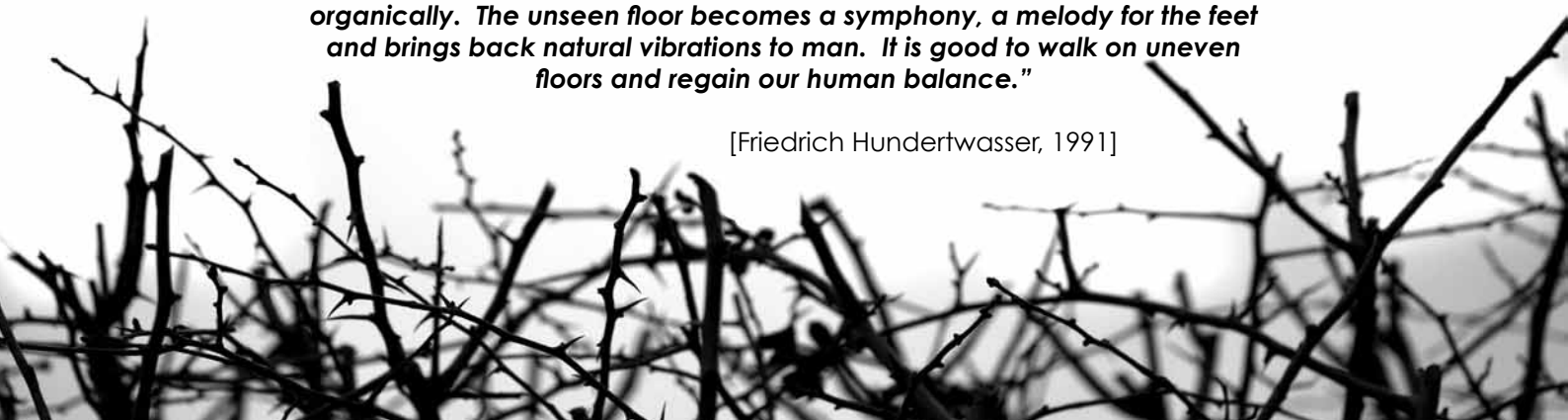
things at a distance and to perceive motion. It takes several years to achieve full adult vision, so continual visual stimulation is very important in the early years [Day, 2009], and babies need to experience real objects in natural light [Martin & Berke, 2007]. Evidence is currently building from medical research that outdoor light and a strongly 3D visual landscape affects the way the eyeball grows, reducing the development of short-sightedness [e.g. Rose et al., 2008]. As well as learning to see individual objects, their texture, shape, colour, size and so on (the task of light sensitive cells in the retina called cones that are wiring up a stream to the brain that determines 'what is it?'), an entirely different stream in the visual system concentrates on location, directing and speed, asking 'where is it, where is it going and how fast is it moving?' [Sax, 2005: 22]. This task begins with cells arranged around the outside of the retina called rods. We tend to pay attention to the objects that are in the centre of our field of view, but actually our 'peripheral vision' is equally important to us, especially for keeping us safe from unexpected harm. Our increasingly indoor, sedentary and screen-oriented lifestyles are leading to poor peripheral vision in today's children [Forencich, 2006]. Bobby's many opportunities at the park to take in a wide landscape, pay so much attention to movement of so many kinds, and link what she sees with what she simultaneously hears and feels, is exactly what she needs during this year to develop the full suite of vision capacities she needs for learning and life.

Touch is a vital sense and the skin of babies is a very sensitive organ through which the infant absorbs a wide range of tactile information at a very deep level [Carlson, 2006]. Their need to find out about things encourages touching and investigation, and the outdoors offers unlimited, richly tactile surfaces and resources. At 3 months, Bobby sticks out her tongue as the best way to find out about the new environment she has just arrived in. At 7 months she pulls the grass she has succeeded in grasping after so much effort to her mouth to investigate it in the most sensitive and meaningful way she has. Through use of the hands during this year, the sensitivity of her fingertips will increase to the point, some time in her second year, that mouthing is not so necessary. But babies in this year do need to explore with their mouths (however, they are not 'eating' the object), and so practitioners need to find a comfortable way of allowing this whilst keeping the child safe enough, otherwise tactile investigation at this age will be sadly limited.

It is delightful to watch Bobby's reaction to feeling the long, daisy-filled grass on her bare feet. The toes and soles of the feet are very sensitive, so the information the body receives through them must be important. Enclosing babies' feet in shoes before they are needed for protection in walking takes away a really significant means of finding out about the world. Finding occasions where shoe-free exploration is acceptable or even encouraged really enriches what the outdoors has to offer (see also Liam in *Toddlers Outdoors* [Siren Films, 2010]).

"People also have a sense for the touch of our hands and feet. If modern man is forced to walk on flat floors as they were planned thoughtlessly in designer's offices, estranged from man's age old relationship of contact to earth, a decisive part of man withers and dies. This has catastrophic consequences for the soul, the equilibrium and the wellbeing of man. Man's ability to experience ceases and he becomes disabled, mentally and organically. The unseen floor becomes a symphony, a melody for the feet and brings back natural vibrations to man. It is good to walk on uneven floors and regain our human balance."

[Friedrich Hundertwasser, 1991]



What matters to babies: cognitive development; the right stuff: materials and resources

Cognitive scientists use the fact that babies look longer at things they find interesting to study how they perceive and understand the world [Gopnik et al., 1999]. They pay attention to specific things and spend longer looking at things that are novel. So, tuning in to what Bobby is drawn to and stares at tells us something about what is going on in her mind. As we noted, at 3 months her attention is repeatedly directed towards high contrast at the edges or boundaries of large objects in the landscape, helping to develop her capacity to see things as separate objects. This schematic interest, seen by closely watching for patterns in her behaviour, is leading to structures (what Piaget labelled as 'schemas') in her brain that allow her to think about the world [Arnold, 2010]. In the park at 5 months, her gaze is still drawn to high contrast in the bare tree branches, but now it is of a more complex pattern. She also has a persistent interest in watching moving things. The movement of objects against a background gives information about edges that also contributes to the mind's ability to see things separately.

She also seems to be gathering information about what things move and what don't, how things move, and things that move in the same way. The park is full of movement and different kinds of motion. There are many things (birds, leaves, humans, dogs and water) that move in a variety of ways (up and down, to and fro, high and low, fast and slow) and through a range of mechanisms (legs, wings, wheels, flowing and blowing). Bobby is full of curiosity and fascination about all these things, and now she has much more stamina for sustained attention and can enjoy longer periods of stimulation. Through very many experiences of watching movement, coupled with the information coming from internal senses when she herself is moving, she slowly constructs and continually modifies her mental theories about how the world works: how things can move and how they are likely to move. Perhaps movement is one of the reasons young children find animals so fascinating and compelling.

The outdoors is also full of things that happen. During the first year, the baby's world changes from one where things are just happening as isolated events, to one where things are increasingly connected with each other. Two important cognitive processes are growing in the baby's consciousness: an awareness of 'object permanence' (it still exists when I don't see it) and an awareness of 'cause and effect' (one thing happening can give rise to another event). Through lots and lots of experiences of the world at work, the child begins to understand the world as separate from them self. Knowing that something still exists when it is not in sight means that the child is beginning to be able to represent an object (through imagination) as a thought in their mind. This is an ability that has to be present for the use of language to grow during the second year [Fernyhough, 2008: 70]. In this regard, it is interesting that 'gone' seems to be a common word in the early repertoire of toddlers. In the park, we can see some good examples of the way in which being outdoors provides the underpinning experiences needed through this year for these mental capacities to emerge. Pigeons are there and then gone, shadows come and go, and pebbles can be handled but disappear as they drop into water.

In the garden at 7 months, Bobby has a strong experience of 'cause and effect' when she pulls the grass stem that she has worked so impressively to reach. As she pulls, she can feel the tug of resistance in her hand and arm (through the proprioceptive sense as well as touch) and see the movement in the other grass

stems resulting from her action. Building an understanding that events can be connected and of what follows what is very significant learning in this year. Infants also learn which changes in the stream of events around them are their own work. With improving knowledge of their own body movements, they know what they have done, so they can determine what they have caused. This serves to help them distinguish between the self and the external world [Fernyhough, 2008: 67]. Experience of cause and effect also underpins learning, being able to predict, imagination and building a strong self-image (see also *Toddlers Outdoors* and *Two's Outdoors* [Siren Films, 2010]). Bobby has also developed the ability to share attention between the event and her Mum, so that she can benefit from sharing her interest with another mind [Siraj-Blatchford et al., 2002]. The adult skilfully picks up on this interest and repeats the experience, helping Bobby to consolidate and extend her new connections, building memory and learning. This sequence is worth watching closely more than once as it is a wonderful example of what Rosemary Roberts calls 'companionable learning', that is also 'the central process or mechanism whereby wellbeing develops' [Roberts, 2010: 53].

Personal and social development

Bobby clearly thrives on being outdoors with her key adult and here are many examples in this film sequence that demonstrate how experience outdoors can contribute to the growth of an emotionally strong child. Her growing sense of self is strongly related to her use of her body and her developing body awareness. Her well-being comes from being so well stimulated and able to take in the world at her own pace. Spending long, unhurried periods with someone who cares about and understands her so well adds to her feelings of value and self-worth.

Bobby's Mum, Molly, has experienced the value of going outdoors together every single day as part of their routine. Bobby thrives on these experiences and Molly also gains by having time with her baby where she is fully engaged, enlivened and responsive to her, which is fulfilling for both of them and helping to deepen the relationship they have with each other. Every day is different and new, and all weather is really good weather, holding different kinds of experiences even in the same places. Although adults know that they should talk a great deal with babies, even early years practitioners can find it difficult to know what to talk about with a baby under one. The rich contexts of being outdoors together provide unlimited material for almost constant commentary from adults as they pick up on what the baby is focusing on. In all three sequences here, Molly is never short of something to talk about with Bobby because she is so attentive to where the baby is looking, what she is doing and how she seems to be feeling. Watch the film also to pick up on what conditions and circumstances make Bobby feel secure and stimulated enough to vocalise herself.

However, this is not just meaningless chatter! The baby gains emotional security from seeing and hearing her most significant person whilst coping with new environments and experiences. Attention and recognition is vital is building a strong sense of self-worth [Fuller, 2004]. On these outings, Bobby is bathed in the sounds of her language, picking up intonation and expression before she takes meaning in words. And the well-timed, relevant and meaningful nature of the adult's comments is highly significant. In a research review for the Talk to Your Baby campaign, one of the key aspects found to matter in communicating with babies was 'contingency'. This is "the extent to which a communication is produced *when the intended recipient is fully oriented towards receiving and processing it*. This means that the baby and the adult are engaged in reciprocal activity – they

are cueing in, and responding, to each other, so they are 'in tune'. This is also known as sensitivity or responsiveness. Contingency between adults and babies is important not only because it is effective linguistically in developing children's gestures, vocalisations speech and syntax, but also psychologically and cognitively in order for babies to form secure attachments" [National Literacy Trust, 2010, their italics]. This clearly also has connections with 'sustained shared thinking' identified in the REPEY study as significant in children's intellectual development [Siraj-Blatchford, 2002].

Because we are an intensely social and cooperative species, babies have a huge drive and need to find out about the human world, and once again the outdoors contributes greatly. Watching interactions between people is a serious occupation and because her pushchair faces the pusher, Bobby can really observe and take in the interchanges at the shops. She can see how people communicate and behave towards each other, and she watches her Mum's behaviour very closely to find out if this is a safe event, smiling with relief and finally kicking her legs in pleasure when Mum signals that this is a positive situation. The warm internal feelings from sharing this smile will also give her confidence in future meetings with unknown people. Babies need to reference their significant adults constantly when introduced to new situations to find out, "Am I safe?" This is a primal concern that kept us alive throughout our evolutionary history, so it is a very deep need that drives our psychology and physiology and therefore our well-being and our ability to learn. In the pusher-facing pushchair, Bobby can constantly gauge Mum's reactions and stress levels, so in new and high-stimulus environments her cortisol levels (the hormone that floods our bodies to ready us for 'fight or flight' emergencies) stay low. If prolonged and unaided, raised cortisol levels are corrosive to a baby's brain, especially in the development of self-regulation [Gerhardt, 2004: 130]. Regulation that comes from the adult is required for babies to develop the capacities to regulate their own emotional state. The pusher-facing pushchair allows the baby to enjoy the experience of being out on the street or in a busy place, and to benefit maximally from it both through being relaxed and through contingent communication with the adult.

Adult support and interaction

A non-mobile baby is forced to rely completely on the adults who care for them to bring the world to them: she cannot get there herself and is reliant on having adults who deeply understand what she needs and when she is ready for particular experiences. Adults really are the gate keepers of the outdoors for babies, and we have a big responsibility to take them beyond the comfortable and familiar indoor environment that we have spent so much time and effort preparing, into the phenomenal richness of the world that they are biologically designed to develop in. We are responsible for showing her the physical and human world, and making developmentally appropriate things happen for her, all the while being alert to discomfort, over-stimulation and signs of saturation. Whenever they are outdoors, babies need their adults to be tuned into what interests them at that moment, to know what experiences would be valuable and to respond positively to their reactions and needs. Most importantly, they need their adults to slow down to their time scale. There are several examples in the sequences of Bobby that demonstrate the value of allowing plenty of time for her to perceive, register, process, check with the secure base, process some more and finally respond. In turn we see an adult who constantly strives to notice what is important to Bobby, and to recognise what significance this has before she decides how to respond. She is very attentive, picking up on the baby's body language and

facial expression, and using all the experience she has built up through the months together. Molly's quick responses to Bobby's emotional states also helps her to build self-regulation [Gerhardt, 2004], so that she is able to make the most of the immensely rich potential for stimulation and learning of being outdoors. The key person approach seeks to recreate, as far as possible, this depth of relationship in partnership with the child's parents; drawing both upon close communication with the families and upon their own accumulated understanding through spending plenty of focused time together. Communicating frequently will draw parents into the vital role of spending time daily outdoors, all through the year, as well as making it possible to support the child most effectively.

Some research carried out in the 1970's showed that when the women in the study held a baby that was dressed as a boy they faced them outwards, actively bringing their attention to many things out in the world. However, the same baby dressed as a girl was held facing inwards and the adult concentrated on nurturing face-to-face exchange. When taking babies out into the setting's garden, it is important for adults to be conscious of how they are interacting with the child and whether they are restricting the opportunities for shared attention in the environment. Where there is a dedicated space for under-ones or under-two's, it is also crucial that adults frequently take the younger babies, perhaps in their arms, into spaces with older children too.

Molly helps 7 month-old Bobby do what she almost can, but is not quite able to do by herself. When she notices the bobbing grass stem at the side of the garden, Bobby has a great desire to grasp it and it is a big stimulus for movement. Rather than simply moving the child to the grass, or bringing it to her, the adult takes a significant decision to help but only *just* enough. Bobby does get there under her own steam and is very energetic in her attempts. Sharing her exhilaration by looking between Mum and grass when she finally gets it, we also get a lovely sense of combined achievement and fascination. This physical 'scaffolding' enables Bobby to work at the edges of her emerging abilities (Vygotsky called this the 'zone of proximal development' [Mooney, 2000]), and is much more valuable than the adult moving her to reach the grass easily.

"It doesn't help a child tackle a difficult task if they succeed constantly on an easy one. It doesn't teach them to persist in the face of obstacles if obstacles are always eliminated from the regime."

[Carol Dweck, cited in Claxton, 1999: 35]

Prompts for developing practice

Organisation

❑ Going for very small walks in the locality just beyond the home or setting are clearly of great value and importance for babies. What enables or limits these in your provision? How could organisation be changed to increase the amount that the locality and community are part of your outdoor provision? Include in your discussions the value of pusher-facing pushchairs.

❑ There is lots of value for Bobby from being outdoors in all the seasons. The most effective and satisfying outdoor play occurs when children are able to go outside whenever they need to; but many shorter sessions can be more appropriate, especially for the youngest or in difficult weather. What can be done to make

getting babies outdoors easy and therefore a reality on a frequent basis (such as by having clothing that is easily changed and considering nappy-changing outdoors when possible)?

Environment

❑ View the sequences several times to consider the endless richness of simple things like grass, pebbles and water in Bobby's outdoor spaces. Analyse what she attends to in each of her outdoor environments and what these features and materials offer her for well-being, thinking and development. Extend this discussion to consider what your outdoor areas could provide to offer a developmentally appropriate outdoor environment for babies through their first year.

❑ Back and tummy play are so important for babies both indoors and out. How could your outdoor environment be organised or enhanced to make suitable opportunities for the huge amount of this kind of play that babies should be getting each day?

Adults

❑ For babies to get the most from being outdoors, they need the close accompaniment of adults with a high commitment to the value of outdoors, who take great pleasure in being outdoors with them, and who see all weather as 'good' weather! Discuss the various ways that the adults in this film show these commitments and dispositions.

❑ Babies need to investigate with their mouths as it provides the most sensitive and meaningful information, so there is a need for high vigilance but not over-protection. Dirt and germs as a health concern is a difficult issue which has to be carefully discussed within the team and with parents. How do we enable babies to explore in a safe-as-necessary way? Is 'dirt' okay for babies and where is the boundary for safe-enough (as opposed to safe-as-possible) practice)?

Parents

❑ Effective outdoor provision requires an ethos and vision, underpinned by a strong rationale that is fully shared by parents, that babies must have access to outdoor environments for plenty of time each day, every day of the year. How can you engage parents in the value of daily outdoor provision for their child? What opportunities can you find at all stages of your communication with parents to help them understand your approach?

❑ Men are often more comfortable with physical and silly play and more inclined to play in this way to meet the rough & tumble and 'dizzy' play needs of babies, especially boys. Do your parents (including fathers) understand this need and what are their views about touch and 'rough' play?

Ko

9 months

Things to notice and understand

The special nature of the outdoors

"Children under two belong outside" [Jim Greenman, 1988: 182]

Ko's family does not have a garden, so taking him outdoors everyday is very important and the park provides a wonderfully rich environment that has lots of potential to meet his needs. It gives him the space and freedom he needs to follow his deep drives for movement. It also inspires him with all the right kinds of provocations and invitations – he finds lots that is of interest and that matches his internal motivations. The film of Ko shows clearly how the special nature of the outdoors adds to and compliments the opportunities available indoors. It should be seen as one of the two halves of the whole learning environment; and we must make the most of its potential to provide babies with experiences not possible indoors. Here, Ko is able to spend lots of time experiencing the effects of the world on his body. The opportunity to move in an unobstructed space, to physically interact with his Mum, to interact with nature and natural materials, and to watch people and how they move are just a few of the huge range of experiences that the outdoors is so good at providing. This is a powerful environment for Ko to be in; one in which all developmental domains are supported in an holistic and harmonious way.

Chance and serendipity are strengths of the outdoor environment, especially when nature is present. Interesting things happen all the time outdoors. Every day is different and brings new possibilities for Ko's Mum to find to share with him. But, because they come back daily, he also has a familiar, stable environment where he can return to previous enquiries and pleasures again and again, revisiting and repeating experiences in a way that builds up his ideas about how things are and how they behave. When the outdoor space is just an expanse of flat rubber surfacing, practitioners must set out resources every single day. This can be quite unsettling for young children – remember how it feels when you drive into a city you have never been to before, or what it is like when the supermarket has rearranged it shelves! When the richness of the environment comes mostly from the landscape, weather, natural world and people, as in places like the park, children find what they need from an environment that they can come to know well. This provides part of the safe base that allows their exploratory drive to flourish. Making the most of the opportunities that come up 'by chance' in the outdoors is one of the pleasures of working with babies; but it needs attentive, knowledgeable and alert practitioners and an open, flexible routine and planning system. Adults working with babies need to be ready and able to draw on resources, ideas, games and songs that respond to the moment or motivation.

Ko experiences a gentle transition to wakefulness in the presence of the secure base provided by his key adult. He looks relaxed and enlivened in this film: he clearly loves being outside. The natural world has the remarkable ability to make us feel calm and stimulated at the same time. Because we evolved in natural, outdoor places, nature modulates the human mind into an alert, ready and

interested state [Kahn & Kellert, 2002]. Nature brings lots of richness to this outdoor space, in terms of the variety of spaces available (from open areas to nooks and crannies), the surfaces to move on (such as pathways, soft grass and slopes) and materials to interact with (for example daisies and wood). The weather also brings a great deal of sensation, effect and interest, and this is a compelling reason to ensure that babies have plenty of time outdoors every day throughout the year, as required by the Early years Foundation Stage in England [DCSF, 2008: PiP card 3:3]. All this provides a 'generous' environment which is very responsive to the individual 'unique' child [White, 2011] and therefore a place that differentiates well, accommodating a wide range of personalities, abilities and interests. Here we can really see the value of thinking of outdoor provision that is appropriate for babies as a 'nursery garden' rather than a playground. A small area of rubber-covered, risk-averse surface is a very poor space by comparison for the developmental needs of any baby through their first year.

> ***"If we don't capture the potential of the outdoors, we are missing the point – and missing the huge capacity of the outdoors to help young children to thrive and grow, adding greatly to what the indoors can do."***
>
> [Jan White, 2009b]

Natural light and the higher oxygen levels outside contribute too to Ko's feelings of well-being and alertness. Sunlight stimulates production of serotonin in the brain, making us feel happy, and the blue wavelengths in it modulate the sleep-wake cycle, helping us to sleep well at night and stay alert in the daytime – and helping babies move towards regular sleep patterns. Of particular importance at the moment is the role of sunlight in helping the body to make enough vitamin D to grow strong bones, since health research shows that children in the UK commonly have suboptimal levels, with increasing prevalence of disorders linked to its deficiency. Low sunlight levels for much of the year (winter and much of spring and autumn, and our commonly cloudy skies at other times) are the reason for the evolution of fair skin in northern countries. For individuals with pigmented skin, exposure time or frequency needs to be increased 2- to 10-fold to get the same vitamin D synthesis as fair skinned individuals, and sunscreen with a SPF of 15 or over blocks more than 99% of dermal synthesis [Pearce & Cheetham, 2010]. The researchers propose that by taking the safe sun message too far, coupled with our increasingly indoor lifestyles, we are exposing children to a different kind of health risk. This suggests that while sunhats and sun protection must be carefully considered to protect the very delicate skin of babies, especially during sunny weather and in the middle of the day through summer, we should also ensure that babies actually get access to sufficient sunlight all through the year (for suitable advice on this issue, contact your local health professionals). We also need to be very attentive to babies' hydration levels and body temperature – over-dressing them can be as problematic as under-dressing, especially during the early months whilst internal temperature regulation through sweating and shivering is developing.

The role of movement and physicality

Ko loves the boisterous movement games his Mum plays with him, experiencing great pleasure and fun in being rocked, moving vigorously forward and backwards, being thrown, falling through space and being caught. He seems

to particularly enjoy the emotional aspects of predictable scary-funny moments, suspense and anticipation, and the relief of being 'saved', sharing his feelings through laughter. Taking ourselves to the edge and surviving is an important way of pushing at our boundaries and proving that the world really is a safe and survivable place, which contributes to future resilience in the face of difficulty.

We saw in the notes for Bobby how much this kind of play contributes to the development of balance, body control and coordination through stimulating development of the vestibular (or motion) sense. Much of Bobby and Ko's active play is also developing a second, fundamentally important, internal sensory system, called *proprioception*, which leads to body awareness and control. Awareness of our body, a feeling of being in it, knowing where our limbs and 'edges' are, and where it is in space are things we take for granted. We don't need to take up conscious thought (working memory) for all the thousands of ways we position and use our bodies for day-to-day functioning, because as young children we worked very hard to develop our proprioceptive sensory system. Nerve-ending sensors (proprioceptors) in the muscles, joints and tendons become connected to the brain so that we gain the complex ability to sense and control body movement and position. It is this kinaesthetic sense that helps us to know about our body from the inside and that gives us a feeling of being in our body [Sacks, 1985] and the 'feeling of life itself' [Jabadao 2005]. Children with a well-developed proprioceptive system have a strong sense of their physical body and hence a firm sense of self, and are able to feel confident in the world. Since this is what we want for all children, it is our responsibility to ensure that the children in our care have *lots* of access to the movements that develop body sense. Fortunately, because it is so important to life functioning, like vestibular development this is hard-wired in to the drives and behaviour of babies; and the outdoor environment provides plenty of invitation and provocation. Being held and cuddled, being wrapped up; arm-waving, reaching and stretching, batting, grasping and pulling; playing with the hands and pulling at the toes and feet in back play, pushing up in tummy play, rolling and wriggling; crawling, pulling upright, standing and knee-bending all give the resistance and tension work that stimulates nerve and brain development for this sensory system [White, 2008]. Most of what Ko is doing in his play in the park is contributing to this sensory development through pressure and stretching in his body, but the body play and movement games with Mum, including clambering over the perfect baby-climbing-frame of her body, are especially good at feeding the growth of body awareness. The roly-poly, puppy-like play of babies has considerable developmental significance, helping to sculpt the body, the mind and the emotions [Brown, 2009].

"It is time that we recognised that the brain does not learn by itself: the body learns too, and if we are to educate our children properly we must encourage developmental parity between body and brain. Physical education is as important as the teaching of literacy and maths in the early years."

[Sally Goddard Blythe, TES 7.1.00]

Like tummy play, crawling has been recognised as an important stage for babies as so much anatomical and neurological development is stimulated through it. "Crawling is in itself an integrating function. It provides training for hand and eye coordination at exactly the same visual distance as the child will use some years later when reading and writing. Crawling trains the balance mechanism in a new relationship with gravity. It helps to align the top and sacral sections of the spine

in preparation for standing and walking, and combines use of left and right sides and upper and lower sections of the body in coordinated movement. Crawling requires the use of all four limbs coordinated with balance and rhythm, reflecting communication between both hemispheres of the brain." [Goddard Blythe, 2008: 165-6]. "The infant also gains a huge amount of tactile stimulation both from bearing its own weight… and dragging itself along the ground. These early experiences assist in the internal 'mapping' of body awareness… This is important for good coordination later on." [Goddard Blythe, 2008: 91]. Continuing on from tummy play, crawling is significantly influential in completing the work of opening up the hands from the baby fist to the wonderful tool that can grasp, hold and manipulate objects and operate fingers individually [Wilson, 1998].

Watch Ko crawling closely to see how the two sides of his body are working together – it's the same alternation as that which adults use in walking, where the arms swing oppositely to the legs (e.g. left arm and right leg forwards with right arm and left leg back). As a cross-lateral movement, crawling activates development of the bridge of nerves connecting the two sides of the brain. This gets both sides of the body working together, including the arms, legs, eyes (binocular vision) and the ears (binaural hearing). With equal stimulation, the senses more fully access the environment and both sides of the body can move in a more integrated way for more efficient action [Hannaford, 1995]. Ko can experience powerful feelings of freedom and agency, stimulated by the space and interesting surface of the grass, supported in his adventurous explorations by the safe island of his key person.

At 9 months, Ko is also ready to work on pulling to a standing position and even to start moving sideways (cruising). Like crawling, this important stage of physical development also lasts for several weeks and raised surfaces at the appropriate height are invaluable in an outdoor space for the first year. The park bench that Ko uses to such excellent effect (see below) is a wonderful stimulus for crawling, is easily grasped for pulling up and is at the perfect height for standing or cruising. From this position, babies can delight in being in an upright position, practise the knee-flexing characteristic of this stage and are able to gain a new perspective on the world, while they slowly build up to taking their first wobbly steps.

Sensory development

Bobby spent a great deal of time gazing at fixed objects and tracking moving ones while she herself was still. While in the pushchair or her mother's arms she also experienced moving in the landscape, so experiencing visual and motion stimuli simultaneously. But Ko now has the new layer of visual experience that comes with being able to move himself around and at the same time feel *himself* through these movements. As he crawls, visual information is integrated with the vestibular (motion and balance) and proprioceptive (body awareness) information coming from his body. Crawling also helps link information from both eyes in effective binocular vision [Hannaford, 1995] and supports smooth eye tracking that will allow easy reading later in life. And it stimulates focusing at differing distances (looking down at the ground or hands, and up into long distance views), encouraging accommodation (see the notes on Bobby's back play).

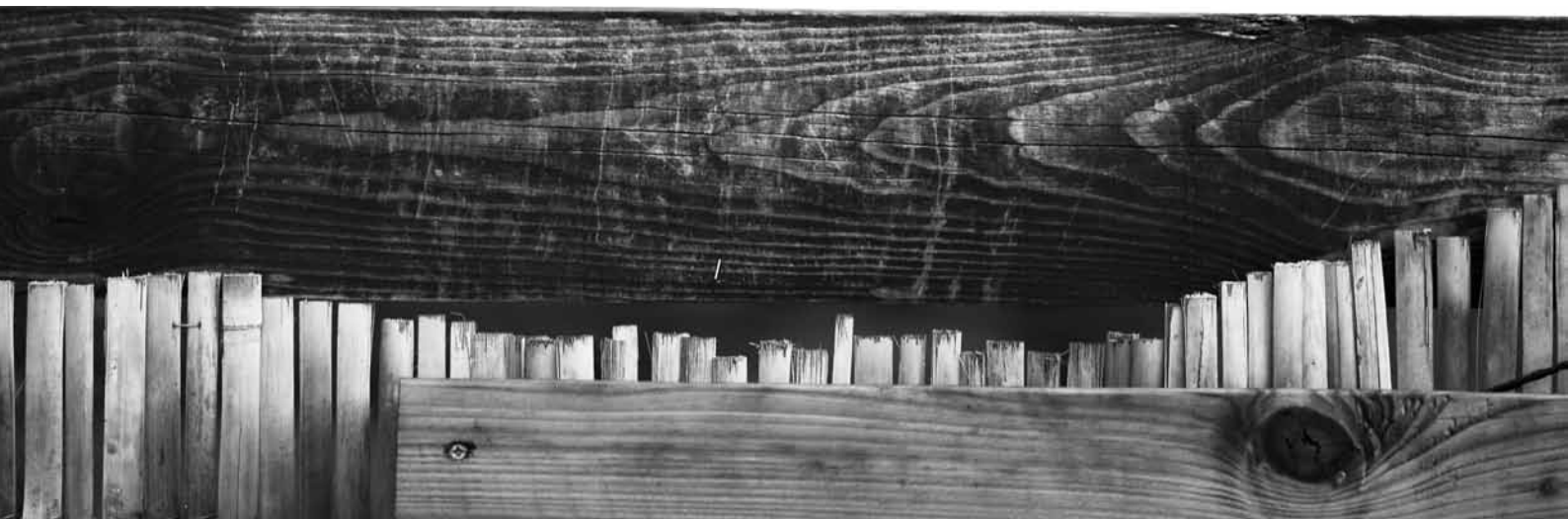
As Ko can begin to move around the environment, he is really helping the aspect of visual development that gives objects and space a sense of depth and allows us to make sense of what we see as a 3-dimensional space, so that we can move through it and relate to it with ease. This part of the visual cortex in the brain is wired up through lots of experiences of moving in an environment with objects that are both near and far. When we move, we see them slightly differently (as a result of our binocular vision) and things in the foreground appear to move against the background (a phenomenon known as parallax). The outdoors is very good at providing the complex landscape needed for these visual experiences and it is crucial that babies are able and encouraged to move around freely.

Moving around the branch of leaves might seem to be a simple activity of shared attention, but much visual work is also being done on Ko's ability to see the world of solids, how things relate to each other, the visual mapping of space and how things that change shape, colour and brightness are still the same things! Human vision is a supremely complex system that can interpret many different, interacting and subtle aspects of the world. These incredibly refined capacities need vast amounts of stimulation over many years, starting at birth, to reach the levels that we simply take for granted. Once again, when we look closely with greater knowledge of the fascinating complexities of child development, we realise just how much is happening in everything the child is doing. And our belief and trust that the baby is a driven and competent learner from birth is forced to deepen.

What matters to babies: cognitive development

The natural world provides a vast range of highly sensory and appropriate materials for babies' experiences and explorations. Ko learns more every time he goes outside, building up his knowledge and understanding of his world through the bodily interactions he has with it and the internal sensations these interactions give rise to. Because she knows him so well, his Mum can introduce him to new possibilities that match to his interests. As each of his sensory systems develops through experience they become more refined and the more his mind is able to make sense of his world. Perceptions give rise to interpretations in the mind: so skilled are we as adults that we are unaware of just how remarkably complex these skills are and how much experience is needed for them to become advanced and unconscious.

Now that he is crawling, his body is in a phase of joining these senses up (integration) so that they work together and help each other. "Crawling acts as an integrating experience in combining the use of several systems involved in motor control: balance, proprioception, vision and cooperative use of the two sides of the body (bilateral integration) which reflect active use of the two sides of the brain" [Goddard Blythe, 2008: 91]. His brain is very busy linking up the different streams of sensory input – how things look, feel, sound and otherwise impact on



him – so that it is able to build more complex pictures and interpretive abilities. Experiences that are repeated many times lay down connected nerve networks (mental maps or memory) that actually create the architecture of the brain for learning – the neurological structures that allow us to perceive, interpret, imagine and think [Damasio, 1999]. These 'maps' (analogous to Piaget's schemas) in the mind can be used again and again to make sense of new experiences, but they are constantly remoulded in the light of input from new evidence. This is why babies need to think slowly, to repeat things an enormous amount, and to follow what interests them – their brains have their own agenda! The baby's brain is working so hard on making these nerve connections with the rest of the body and within the brain itself that it's not surprising they need so much sleep – the experiences the infant has while they are awake need plenty of processing time to physiologically build these connections, and it is now understood that this happens during sleep [Karmiloff-Smith, 2010].

The right stuff: materials and resources

It is really interesting to watch Ko making use of the bench in the park. Notice just how much he is getting out of this everyday object. To adults this is simply a place to sit, relax and reflect. But for a baby of this age, it is just the right height to pull himself to standing and perfect for holding on to as he takes in the exciting new perspective of being upright. Providing the balance point that he needs, it allows a hand to be released for exploration and gesture, and a pleasant and interestingly tactile surface. It is full of interesting places, both underneath and on the seat, with a variety of shapes and surfaces to explore, especially the gaps between the solid shapes. Like many babies and toddlers he notices these holes and gaps and is drawn to investigate them (if he was a little older, he might be quite compelled to post things through these holes). The views through the gaps with things coming in and out of sight, and playing hide and seek with Mum both help to develop his growing understanding of object permanence (it is likely to be easier to grasp this idea with his most important person: surely she is still there?). Not only is the bench at the ideal height, it is a good width for Ko to begin to take steps along the bench and enter the exciting world of upright locomotion. The bench offers lots of potential for Ko that perfectly suits his level of development.

This sequence illustrates the very useful concept of 'affordance' [Heft, 1998], which has been well developed in the field of Playwork [Brown, 2003]. The child looks at a space, feature, material or object through the perspective of, 'what can I do here?' or 'what can I do with this?' In this example, the bench affords very different things to adult and child – and often children see many more possibilities than the constrained ideas that adults have developed! As the child develops and grows, so they can do different things with this same resource or feature. This apparently simple object has great affordance for Ko. Such a feature has high play value for babies, but its potential affordance will be lost if the value of what they are doing in not well understood by adults.

Seating itself is an important thing to consider in any outdoor environment designed for babies. It provides a comfortable place for an adult to sit with a baby so as to gently take in and enjoy the outdoor world together. Adults are also best placed to be attentive, engaged and available to lying, sitting, crawling and standing babies when they are comfortably sitting down. A sitting position brings the adult's face to the right height, offering the presence of the safe base that adults need to provide and being nicely available for the infant to return to for

a moment's comfort and restoration. Having several sheltered and comfortable seats that capture the morning sun or are in a wind-free corner, and are positioned with plenty to look at or near to where older children want to play, offers choice for the time of day or year and gives plenty of interest to share. A climber-covered swing-seat is the perfect place to enjoy being outdoors with a baby [White, 2010c].

Personal and social development; adult support and interaction

The close relationship Ko has with his Mum is vital for his obvious well-being and his ability to make good use of being outdoors. At this time of his life, he needs adults to keep him safe, but although popular opinion has it that children of this age have no sense of danger, it is apparent that Ko checks frequently that the person he relies on is paying attention to him and will ensure that what he is doing will not cause him harm – this is an inbuilt survival strategy that adults can make use of as the baby starts to get around by himself. Ko needs to know at all times that he is safe and by staying close to the 'safe base' his mother is providing by her *attentive* presence, his exploratory drive can come into play. If he is not sure of this attention, he will not feel relaxed enough to explore. As part of this fundamental drive for survival, he is also closely attuned to the tones in her voice and the cues in her body language. Practitioners working in settings with babies have to be aware of these subtle, often subconscious messages, and this is strongly influenced by how they feel about being outdoors in this place and how they feel about being outside with such young children. It is vital for adults working with babies to feel emotionally and physically comfortable in the outdoor environment and this is something that teams should discuss as openly as possible [White, 2010b] so that issues can be effectively acted upon, to everyone's advantage.

Ko is interested in his emerging ability to pull to standing, and the enthusiastic reaction from his Mum encourages him to do it again. The attitudes of his key adults to his attempts to try something new have a big influence on his actions – positive reaction will convince him to have another go; negative reaction will persuade him that it is unwise to try again. Sharing pleasure in new effort and accomplishment provides emotional scaffolding in the zone of proximal development (scaffolding tends to have both physical and emotional components – watch the sequence of Bobby also). Research into motivation and success shows that praise for *effort* is much more important that praise for achievement, giving the child the internal belief that "if I try I will succeed", rather than "I can do things because I'm clever/able/talented", giving the child a 'growth mindset' instead of a fixed one regarding their capacities. (On this note, adults saying 'well done' might be a more constructive response than 'clever girl/boy'). Grappling with difficulty and persisting is something that babies and toddlers do all the time – they are amazingly driven and resilient. "It is by supporting children through difficulty, and by encouraging them to focus their attention on the process rather than the outcome of that process, that progress is to be made. Well-intentioned collusion with their desire to escape difficulty only reinforces frailty" [Claxton, 1999].

"Knowing they can cope with difficulties is what makes children seek challenges and overcome further problems… Children learn best from slightly difficult tasks which they have to struggle through."

[Carol Dweck, cited in Claxton, 1999: 35]

Ko's Mum bathes him in the sounds, intonation and melody of his home language. Conversation is far more important than the actual words [Chilvers, 2006], but Ko is also beginning to be ready to hear the names of things [Buckley, 2003: 24]. Being outdoors is a strong environment for language generation as there is so much happening to comment on, point out, name and talk about.

Playing movement games with songs with a baby is a very powerful way of relating and supporting development. We have already seen how much these games contribute to sensory growth and emotional development. And when they involve singing, they seem to do even more. Singing together is well-known to be a strong bond-building process in itself, especially with very young children. In addition, synchronising *movement* has been found by psychologists to be an important element of rapport between two people – moving together is a powerful means of bonding [Quilliam, 1994: 65]. So playful, carefully managed singing-and-action games are truly wonderful things to do with babies, and outdoors they tend to be more energetic and exciting!

Songs also do everything the developing language-user needs. They help children hear the sounds of words; they give words meaning and help to link ideas to their word-symbols; they provide new vocabulary that the child can remember; they are full of rhyme, pattern and rhythm, and most valuable of all, they give the child pleasure and confidence in the use of language. Most importantly, songs with actions link voice with movement so that the brain is activated for learning (by the release of the neurotransmitter dopamine) and the child uses their whole body to make sense and meaning. Music-making appears to be one of the fundamental activities of mankind (no culture so far discovered lacks music [Storr, 1992: 1]) so it must have deep psychological value for all children. The outdoors should be a musical place, where babies can be musical in all sorts of ways with their voice, their body and the environment [Ouvry, 2004].

Prompts for developing practice

Organisation

- It is imperative that babies spend lots of time lying free of restraint on their backs and tummies and crawling babies need to spend lots of time moving on a range of surfaces; and the outdoors provides very developmentally valuable opportunities for both. How could you organise so that these important experiences are available outdoors on a daily basis all year? What needs to be done to ensure that the babies enjoy these times?

- If short walks into the locality and community are to be part of regular practice in a setting, the staff must know these places well, feel totally comfortable about taking babies there and able to give children enough freedom when they are there. Discuss what makes this level of comfort possible and what organisational actions would enable this.

Environment

Crawling babies need a variety of surfaces to provide different tactile experiences and on which to develop movement skills, and plenty of stimulus for crawling. Babies around Ko's age also need surfaces for pulling upright and good support while standing. Use the film of Ko, Lucas and Dexter to help review your current outdoor provision to see how well these stages are supported and to consider how this could be enhanced.

In order for the world beyond the nursery to be a routinely and frequently accessed layer of outdoor provision, suitably rich and appropriate places need to be found and they need to be easily used. Discuss the film sequences to decide what the important components of these two elements are and how this could be harnessed in your setting.

Adults

Adults need a deep understanding of the role of movement in the lives of babies. Watch the sequences of each child several times focusing on what they are doing with their body and what they seem to be getting from this. By sharing perspectives and discussion, build up a picture of the role of movement and action in the well-being, thinking and development of babies.

Adults working with this age group must have a large repertoire of movement games, action rhymes and songs, both traditional and popular, that can be drawn on spontaneously, whenever the right moment arises. How can this be supported for play outside with babies?

Parents

Current culture in the UK has over-focused our attention on the vulnerability of babies, to the extent that vital experiences are often being denied to them in case they get hurt. How can we help parents share a view of the young child as a robust and competent learner in the context of their real vulnerability? Use the film sequences in discussions with colleagues to develop your opinions and ability to explain this to parents.

Having considered the importance of babies having a wide variety of outdoor crawling experiences, discuss how you can encourage parents to value this stage, make sure their child is suitably clothed for crawling outside and not rush their child into standing and walking too quickly?

Lucas

10 months

Things to notice and understand

The special nature of the outdoors

While Bobby and Ko access huge variety through the different outdoor environments they visit each day, Lucas's nursery environment shows how much variety is generated simply through daily changes in the weather and by having a variety of spaces and places to come back to every day. Places and objects feel and behave differently each day; the amount of cloud cover affects dryness, light quality and wind levels; being high up on the wooden platform alters how the wind behaves and the temperature feels. We are blessed in the UK with four different weather systems, bringing constantly different weather and (with appropriate clothing) unexpected delights. Add to this the gradual changes through the seasons, and every day really is new and exciting.

In a rich nursery garden such as this one, there is plenty to occupy a baby's attention; but what goes on outside the fence can also be of great interest. Having some boundaries that children can look through to see the world beyond, especially if this includes a pathway for members of the community as in this setting, adds another dimension or layer to outdoor provision. However, a totally open space with only wire-mesh fencing will feel insecure, overwhelming and lacking in the nurture of an enclosed area. It is worth trying to imagine what the space looks and feels like for a child under one.

Lucas finds the slightly muddy grass hill both interesting and challenging, and a very different surface to be on than the flat, smooth, warm carpets and flooring indoors. All the surfaces in this outdoor space are natural, and having muddy ground for the babies to be on is clearly not a concern in this family centre. Through a long-held belief in the value of real-world and natural outdoor experiences in this setting, and close collaboration with parents at every point of contact since they first came to look at childcare for their child, there is a strong recognition of the value of such an environment for all ages of children [LTL, 2007]. Grass and mud may not be aesthetically pleasing to many adult eyes, but is valuable for the children's movements and explorations. Uneven ground might be seen as unsuitable in a garden for babies, but watching the way it influences and extends Lucas's balance skills it can be seen in a very different way. A messy environment with things scattered by children who want to move things around, shows that children have the freedom to follow their own enquiries in a good 'laboratory' for investigation, and indicates that children are hard at work making meaning of their world.

Although practitioners and parents have a very realistic and understandable concern about germs and hygiene when babies and toddlers are exploring in the outdoor world, this needs to be balanced with the value of exposure to the normal bacteria that live in every part of our environment. Medical opinion seems to be growing in support of the 'hygiene hypothesis', first proposed in the 1980's, which suggests that early childhood exposure to bacteria in the environment 'primes' the immune system to prevent allergies [Davies, 2009]. The young child

may need such exposure in order for their developing immune system to learn how to protect the body without over-reacting: some germs do appear to be good for us. Researchers at Bristol University and UCL have also found that a type of 'friendly' bacteria found in soil triggers serotonin production in the brain with an antidepressant effect on laboratory mice (serotonin also performs several other roles in the body), and commented, "these studies leave us wondering if we shouldn't all be spending more time playing in the dirt!" [Paddock, 2007]. Since humans evolved in the outdoor environment, it is likely that our bodies learned to live with many of the germs that co-exist with us, and that the explorations of babies assist in building a well-functioning immune system. It seems that there may be some truth in the traditional attitude that "dirt is good for you" and, along with many other health benefits, grubbing about outdoors may help to protect against allergies and other immune deficiencies.

Watching Lucas in this nursery garden, we can also see that the outdoors is able to provide a variety of spaces and places and a variety of heights, making a complex environment that has great value for all children. The raised platform is an especially useful feature for babies like Lucas. Being up high provides views of the garden which are very different to being on the ground and looking through the gaps in the railings is always popular with older babies and toddlers. The ramp offers a new physical challenge that he is very interested in and so nearly ready to take. Most importantly, the sense of enclosure at the top provides a feeling of security and nurture in an open space, meeting young children's deep psychological need to feel hidden and safe – that is, the ancient survival need for 'refuge' [Appleton, 1975]. This platform also provides the perfect place to hang things at just the right height for babies, where they move in a very satisfying way (unlike for example when hung on a fence) – notice how the practitioners have set this up so that it can be used in a very flexible way.

The role of movement and physicality

Watch closely how the slope of the grassy hill is providing stimulus and challenge for Lucas. He finds it a very different experience than the flat floor, especially when gravity catches him out. He did not expect to topple as he went to move to a sitting position while on the slope, and the adult responds sensitively by *not* intervening, giving him time to process the sensation, realise what happened to him and work out what he needs to do about it to right himself. The extra challenge of gravity on the slope also makes him adopt different movement strategies, such as the bear crawl (up on hands and feet) and reverting to tummy crawling (especially for the more difficult process of getting down the hill).

Because of the importance of crawling as a stage for particular developments, it is crucial to encourage babies to crawl as much as possible, rather than rushing on to standing and walking: there is plenty of time for this later. Lucas is a good crawler and starting to pull upright to standing. He needs surfaces that do much more than those he experiences indoors, where they are all flat, smooth, uniformly resistant and highly predictable. A rich outdoor environment for crawling babies offers stimuli to attract the child to move over distance and a variety of surfaces to provide different tactile experiences through the hands, knees and feet, and which demand different movement skills. Remember that 'contrast' is a valuable characteristic in an environment for babies. When the baby moves from one surface to another, their attention will be drawn to the contrasting sensations and the change in how they have to use their body. "Paving is hard, cool, smooth and resistant; grass is warm, soft and firm but may be wet; while sand is soft and

yielding. Gravel is sharp and loose but bark is worm, moist and graspable. Tarmac is hard and rough, while decking might be warm and ridged" [White, 2010c]. The babies also need to be wearing suitable clothing that enables crawling without hindrance: all-in-one rain suits, such as Lucas is wearing, are ideal.

A small hill is a fantastic feature to have in a garden for under two's – ensure that it has good drainage and that good topsoil is used to cover it so that the grass grows well. The hill will be very well used so is quite likely to wear out or become muddy. Rather than preventing of limiting its use in wet winter months, it is important to consider putting aside a maintenance budget so that it can be re-turfed as necessary.

Sensory development; use of the hands

"The tactile system, or sense of touch, plays a major part in determining physical, mental and emotional human behaviour. Every one of us, from infancy onwards, needs constant tactile stimulation to keep us organised and functioning."

[Carol Stock Kranowitz, 2005: 82]

Tactile experience is exceedingly important at this age. Receptors in our skin capture sensations of light touch, deep pressure, skin stretch, vibration, movement, temperature and pain. These sensations are external and come from stimuli outside our body (as compared to proprioception which is internally stimulated). Touch has been one of the predominant senses throughout our evolution and is a predominant sensation at birth, continuing to be more critical to human function throughout life than is realised. This is a huge and complex system (the skin is the most extensive organ in the body) that gives us essential information that is necessary for many kinds of everyday skills: body awareness, motor planning, visual discrimination, language, academic learning, emotional security and social skills [Stock Kranowitz, 2005: 91-101]. The development of tactile discrimination comes as we remember our interpretation of the meaning of previous touch experiences. The system tells us that something is touching us, where on the body it is touching, the pressure of the touch and what the attributes of the object are, such as size, shape, weight, density, temperature and texture. Like the other senses, although much is in place at birth, vast amounts of experience is required to wire the system up to its full functionality, it needs to become highly integrated with the other sensory systems and it needs to be in constant use to help us function well in the world. A smoothly functioning and well-regulated tactile system is crucial for normal function and an ill-functioning system is very disruptive [Stock Kranowitz, 2005: 84-90].

The world outdoors is exceptionally tactile, offering many more touch experiences and a much wider range of weather conditions, surfaces and objects than can be available indoors. As well as touching and handling objects whilst sitting, babies receive much input to this system through crawling, especially through the extra-sensitive hands and feet (bare feet are preferable for babies whenever possible). Moving means touching, and the impulse to move brings the baby into contact with many more things. Notice how much tactile input is experienced by the crawling babies in Lucas's setting and especially the tactile experience Dexter gets through crawling on the beach. (Note, babies have special padding tissue - that disappears some time after learning to walk - which makes crawling comfortable for their knees, but suitable clothing is also important).

The human hand can do things that no other animal can, allowing us to do an incredible range of things with our environment. It is wonderfully sensitive to touch, size, pressure and weight, adding immensely to the sensory input from this multi-sensory environment. In a stable sitting position (helped by the comfortable all-in-one outdoor suit he is wearing), Lucas can use his hands to interact with his environment, exploring objects and making things happen. The development of proproceptive sense in the hand for function and control is particularly important if it is to operate to the very high level it is potentially capable of, so babies engage in a great deal of holding, handling, manipulating, tapping, striking and waving of objects. If they have weight, such as a stone cobble, the degree of stimulation and demand on the muscles is increased – and this can also be seen in the film of Dexter. As he walks with a stone grasped in his hand, the feel and especially the weight of the cobble prompts him to accentuate the sensation through swinging his arm: a clearly satisfying feeling. Balancing such developmental benefit with our desire to minimise hurt and distress is always a difficult task for adults! Lucas enjoys tugging at the coloured strands, finding pleasure in the feeling of their resistance in his fingers, wrist, arm and shoulder. He also pays close attention to the feel of the spoons in his hand, what it feels like as he moves his arm up and down, and how it feels when he taps a spoon (or stone) on something solid.

Paying attention to the hands at work whilst preparing a meal or driving a car reveals how phenomenally dextrous our hands are – and how much development needs to be stimulated during the baby's first year. Humans have a unique ability to control the finger movements individually, giving us an amazing range of abilities. Our ability to grip across the hand, through an opposing thumb and being able to bring the little finger across the palm towards the thumb, is also unique enabling us to grasp objects in such as way that we can manipulate them as tools and apply them with force. Tool use is characteristic of primates, but much further advanced in humans. In the book *The Hand: how its use shapes the brain, language and human culture*, Frank Wilson suggests that the human hand has played a key role in the evolution of our intelligence and creativity [Wilson, 1998] and many professionals do make use of the hands to 'do' their thinking [Crawford, 2009].

What matters to babies: cognitive development

After their early fixation on humans, babies have a growing interest in objects. They want to know what is in the world, what these things are like, what these things do/ how do they behave, and what these things do to them. The most useful objects and materials for babies to be investigating are from the real natural world (such as stones, wood, soil and grass) and the real human world (such as pots, pans

and spoons). Watching the very close attention Bobby pays whilst manipulating the grass stem is a delightful example of the intensity of these enquiries and the wonderful richness of the natural world for this kind of exploration. Whilst still very intent on these questions, older babies towards the end of this year like Lucas and Dexter will also start to explore what they can do to these things and what they can make these things do. They need lots of time and opportunity to simply handle a wide range of objects and materials from the real world, engaging in what is known as 'object play'. Object play is clearly highly pleasurable to babies as it so often stimulates them to vocalise.

"The thirst for understanding springs from the child's deepest emotional needs… [it is] a veritable passion."

[Susan Isaacs, 1932]

The connections Bobby made as she incidentally experienced cause and effect in her daily life will accumulate over the coming months into something she is more conscious of. While he is making sounds and movement with the stone and spoons on the hanging pots, Lucas is discovering the very important concept of 'causation' (that one thing happening is dependent on something else) and also perhaps becoming aware that that he can be in control of this process. He seems to be intentionally causing things to happen - he knows he can make things happen and he knows how to - alongside more random explorations. Part of the success in his ability to think like this is that the experience is so multi-sensory. The embodied feelings from moving his arm and hitting with the stone and spoon operate alongside the motion he sees and the sounds he hears. Making things happen both inside and outside himself, linking up what it feels like in the body with what he detects from the outside world, helps him to determine what he has caused rather than what simply happens. This is very significant cognitive work, and he behaves like a scientist to build up an understanding (a theory), testing it again and again over time. Eventually, once he is sure that one thing really does cause another and what always follows what, he will become able to predict what will happen next time. It is also very significant development in self-awareness, as realising that it is *him* that made the event happen helps to distinguish himself from the external world [Fernyhough, 2008: 67]. Lucas can experience the pleasure and powerful feelings that he can make things happen.

The right stuff: materials and resources

The natural world provides a vast range of highly sensory and appropriate materials for babies' exploration and play. Lucas learns more every time he goes outside, building up his ideas and thinking about the world. Gillian and the other adults are able to also introduce him to new possibilities every day - knowing him well, they can match these to his interests. Babies are very aware of the miniscule, drawing adults to see things again that they have long been overlooking: the intricate delicacy of an ordinary grass flower; the patterns in the wood of an old park bench; the texture of a piece of bark; the close-up behaviour of sand. Whilst vigilance to safety issues is of paramount importance, adults should act so that the babies are kept safe whilst enabling them to follow these drives. This is one of the great pleasures of working with babies, at their pace and on their agenda. It is really important that we slow down and properly attend to the things babies want to share with us: what have they really noticed; why did it capture their interest and what thinking does this tell us they are doing? Every experience that children of this age have is deep, complex and significant for the child. Appreciation of

this, and striving to understand the detail of what is happening, results in pleasure and satisfaction for both child and adult. The best learning happens when the educators consider themselves as co-researchers with the children, helping them to discover more of what interests them and continuing to learn alongside the children - both about the world and especially about how babies think and develop.

The natural materials we see these babies experiencing and investigating are excellent for supporting sensory, motor and intellectual development. But examine the expressions and emotions shown by the babies in this film as they interact with grass (Bobby), leaves (Ko), soil (Lucas), birds and sand (Dexter). Dexter's first word is inspired by his deep interest in living things. The awareness, attraction and interest children show for all things from the natural world derives from our evolutionary heritage of needing to know in detail about the world in which we were trying to survive (the 'Biophilia hypothesis' [Kahn & Kellert, 2002]). Children need nature - and nature needs children that are bonded and attached to it through continuing, positive, playful experiences throughout their childhood. The value of nature to human well-being is very well evidenced [Parsons, 2007] and as a society we are beginning to pay more attention to this vital relationship. This inborn affinity must be protected and sustained by adults from birth if it is to last through childhood - and early years practitioners have a key role and responsibility in this.

"If a child is to keep alive his inborn sense of wonder… he needs the companionship of at least one who can share it, rediscovering with him the joy, excitement and mystery of the world we live in."

[Rachel Carson, 1998]

Personal and social development

In this nursery garden, Lucas has the opportunity to mix with children of his own age/stage and also with other children. Whilst this might cause conflict indoors, the space and range of opportunity outdoors results in a calm, relaxed setting for such encounters. Babies often spend time simply 'looking on' at the behaviour of other children. They learn by watching others and getting ideas: this stimulation can be from adults, as when Gillian shows him how to make sounds on the instruments; but it more frequently comes from other children, especially those who are just ahead in their own thinking or abilities. Watch the fascinating interaction at just the right level from the toddler as Lucas stands at the bottom of the ramp. Lucas seems to be on the point of clambering up the step onto the ramp, but perhaps is not quite ready to do this. The toddler at the top with Gillian is very interested in Lucas. Notice the expression of invitation on her face and how she mimics the encouraging position of the adult. But then she also mimics Lucas's anticipatory footwork by doing a little stamping dance on the ramp: this is likely to really tune into Lucas's emotions, reaching him in a deep way that perhaps adults cannot. Slightly older children make the best tutors for younger children, and the latter are often extremely interested in the former. The interest, inspiration and scaffolding that babies get from being with children of different ages is so important that settings need to find ways for them to frequently spend good quality time together, providing that they are all in a rich environment that meets everyone's needs. Babies' needs to grow up in a community of children, finding out what it means to be human, are not met by separating them from older children. Outdoor play often seems to support mixed-age provision, perhaps because the needs of

individual children are so well met in the outdoor environment (for more on why and how this happens, see *Toddlers Outdoors* and *Two's Outdoors* [Siren Films, 2010]).

Babies very often hand the objects they are handling to adults, also expecting to be given it straight back – as adults we intuitively know that it is important to engage with this exchange. It is interesting to see that Lucas also offers his object to another child, and holds it out for quite a long time as the other tries to grasp it. Seeing such young children engaging in this behaviour suggests that it is an innate drive, but one that we should attend to and encourage. Giving gifts, especially of food, has long been an act of friendship in societies all over the world: it plays a very important role in building and keeping good relationships in an intensely social context. Other group-oriented mammals (such as primates and the dog family) do the same, and many animals incorporate the giving of food in courtship and the joint care of young. Giving and receiving is a good way to help the bond grow between two participants and is something that young children just love to do – adults can be alert to such opportunities outdoors as much as indoors.

Adult support and interaction

"Because the outdoors presents countless threats to life and limb of the hardiest baby, it may be tempting to keep them inside. Danger lurks with ingestion, falls, the effects of sun and wind on sensitive skin, and, not least, those sturdy classmates bereft of moral responsibility."

[Jim Greenman, 1991]

Very thorough risk management is really crucial if babies are to have all the fantastic and vital experiences that the outdoors can provide. However, it is also crucial to see risk assessment as the tool that enables these experiences, rather than taking them away in an effort to reduce risk to minimal levels. The new move to *benefit*-risk assessment (now adopted by the UK Government) that gives weight to the importance or value of the experience as well as judging risk and applying suitable control measures, so identifying how to make this positive experience available in a safe-enough way, helps enormously in giving babies the real-world experiences they so greatly need [Ball et al. 2008; Young, 2010]. Gillian's vigilance enables Lucas's freedom. The close attention of an adult gives each of them confidence for his explorations. The adults in this setting are also comfortable with children experiencing very minor injuries and short-term distress, as this is part of life and learning. This takes much discussion in the team, ongoing work with parents and continuing reference to and support from management so that gain and risk are most beneficially managed (see also *Two's Outdoors: notes for Skye* [Siren Films 2010]).

Once again, in this film sequence we see how the secure base that a close-by and tuned-in adult provides is vital for infant well-being and exploration. Initially, Gillian gives Lucas her full, unhurried attention as she lets him watch to see what others are doing, and decide in his own time that he is ready to be in this outdoor space. Babies benefit from gentle transitions, and the transition from indoors to outdoors can be a big one that needs emotional support every single time. The adult

role with babies outside is so much more than mere supervision and attention to safety, and we can see this in the way Gillian skilfully supports Lucas's time outdoors. Firstly, physical and attentional reassurance will be constantly required – her comment to Lucas, "I'm still here" is an example of her awareness of this need. Secondly, Gillian clearly really enjoys her time with Lucas outdoors. She gives him strong messages every time he looks at her that she enjoys being in this place with him. These messages are vital, and come from her belief and commitment to outdoor play for babies, her physical and emotional comfort and confidence in being in this place, and her deep, positive relationship with this important human being. When adults do not feel committed, confident and comfortable outdoors, this relationship of support is severely disrupted.

Thirdly, as we have seen with all the adults in this film, Gillian's most effective role with the baby is not as teacher but as 'companionable learner'. "This is about the way that a child - however young - and his or her companion learn together, in a mutual state of attention to each other. It is about 'sustained shared thinking' involving child and companion" [Roberts, 2010: 53]. In '*Wellbeing from Birth*', Rosemary Roberts unpicks this crucial concept for the construction of deep, resilient well-being into five 'companionable learning principles'. Babies benefit most from experiences where they enjoy the full attention of their companions; are assured of their continuing physical presence (when the adult is 'anchored' to the child); experience a positive sense of self through being an active 'agent'; are involved in real-life activity; and have plenty of time to go at their own pace. Support from a distance that keeps the baby secure but allows him lots of room to follow his own ideas is as equally valuable as constant verbal interaction. Very consciously going at the baby's pace, allowing him or her enough time to work through whatever it is that occupies them, and to return to these on a daily basis until they are ready to move on, nicely captured in the term 'slowliness' [Sightlines, 2008], is a really important element of appropriate practice. The outdoor world is so full of interest and opportunity for babies, and they have so much that they need to be working on for themselves that they must not be hurried, time-limited or moved on in their learning too quickly.

"Children need time to 'process' their experiences, just as we do. It is this reflective activity that generates an internal locus of control, and a sense of empowerment. It also enables children - and adults - to develop a sense of purpose."

[Rosemary Roberts, 2010: 69].

Prompts for developing practice

Organisation

❑ For outdoor play to be effective and satisfying for babies, they need to go out and come back in when they are individually ready, possibly several times in a day, going with the child rather than a set routine that may not fit their needs. What organisation would enable more flexible and spontaneous use of the outdoors? (For example, does all nappy-changing have to be done indoors?)

❑ Mixed age play can be highly beneficial for both younger and older children and the outdoors often seems to support this interaction, perhaps because the needs of individual children are so well met in the outdoor environment. Having closely watched the film from this point of view, discuss the benefits and organisational issues for your provision.

Environment

❑ Benefit-risk assessment is a valuable tool for enabling developmentally appropriate experiences, but needs thorough thought and preparation to ensure that everyone is comfortable and confident. Use the film to discuss the experiences you want to provide babies with and what layers of risk assessment and management would enable these.

❑ Ko and Lucas's explorations show the value of unobstructed space, soft grass and slopes. The small hill in Lucas's nursery garden is especially useful for advanced crawlers. How can you make these elements available in your outdoor space?

Adults

❑ Child-led learning is about offering a generous and appropriate environment so that babies can make choices. Part of this involves bringing their attention to things that connect to their interests and supporting them to build on from these, which needs in-depth understanding of each child. How could more opportunity be available in your setting for the observation that is required for this level of knowledge about individuals? Does observation need a higher 'status' as part of the adult role? Would better places for observation outdoors (such as well-placed seats) make this more successful?

❑ Noticing the subtle details of babies' play and recognising their significance ensures that responses are more appropriate and effective, and makes the job very rewarding. Children learn best when their educators are learning with them and they see themselves as continuing to learn alongside children. What has this film made you more aware of or interested in about babies' play outdoors. What aspects of child development has the film prompted you to learn more about?

Parents

❑ This setting has worked hard over many years to build confidence and understanding about babies being outside in all weathers, with access to a very natural environment that has uneven terrain. How could this confidence be built with parents in your service?

❑ Lucas clearly benefits from being outside whatever the time of year and conditions of the outdoor space as a result. Babies fall over often, risking scrapes and cuts - but this is part of their learning and development. How do we balance our fear of bumps and bruises, especially with such young children, with the developmental value of baby exploration outdoors?

Dexter

9, 11 & 12 months

Things to notice and understand

The special nature of the outdoors

"The average boy's gifts are wrapped in high activity, impulsivity and physicality - boy power - and the value of these gifts depends on the teacher, the boy and the moment. These qualities serve boys beautifully in the playground, where there is room and respect for bold strokes of action and impulse,"

[Dan Kindlon & Michael Thompson, 2000]

Being outdoors offers a wonderful sense of liberation, of freedom and of open possibility. One of the strongest aspects of the special nature of the outdoors is the amount of freedom it provides for young children. In Dexter's outdoor play, we can see several elements of this potential freedom. There is the freedom and stimulation of space to move, to use the whole body and to interact energetically with both the environment and with other people. There is also lots of freedom to make a noise and a mess! With such freedoms, there is also the stimulus, provocation and flexibility to be freely inventive. Most of all, as we see with all the children in this film, there is the freedom for babies to actively follow their own interests and inbuilt developmental processes. And because of this, with the presence and support of understanding, tuned-in adults, we see all the babies in this film being highly curious, engaged and fascinated. Babies really are driven and enthusiastic learners from birth and the more we know about how this learning takes place, the more we can provide the right experiences, trust in following the child's lead and refine the way we interact with them.

The natural world is a particularly powerful place for babies, providing unequalled experiences that closely match what children of this age most need. There is so much development during this first year that is only adequately supported in an outdoor environment. And babies are developing so fast that they cannot wait for 'good' weather to get outside. They need to spend plenty of time gaining from what the outdoors can provide that the indoors cannot, every singly day, right through the year. They must not be disadvantaged by the time of year they are born. And, of course, every type of weather is actually good weather, holding different possibilities, bringing new potential for interest and containing great developmental value. Weather is a vital component of our contact with the natural world and is part of what children from birth onwards need to experience directly and investigate to their full delight, building new connections and making memories for a lifetime. Imagine what Dexter experiences during his brief and well-dressed encounter with snow. The colour, brightness, texture, temperature and sounds of the snow itself; the cold wind on his face and the feeling inside his body as he breathes the freezing air; the sensations of trying to move on it as a surface. The human mind is attuned to novelty, programmed to look for new experiences and prefers environments that contain newness (a characteristic that Desmond Morris has named 'neophilia) [Hughes, 2008]. Babies do indeed pay

more attention to novel experiences [Gopnik et al. 1999] and the endless variety of the outdoors can meet this need within a framework of comfortable familiarity. Babies do however need an emphasis on the familiar, so adults must be cautious and highly supportive in novel experiences, and need to be alert and responsive to the tiredness that might suddenly overcome the child.

In the UK climate, rain is ubiquitous and constantly affects our lives, changing how the day feels, what the environment is like and what we can do. Rain itself is a lovely thing, and most young children, including babies, love to experience it with their whole body and whole self - staying out in the rain is full of experience and potential for having fun, experiencing rich sensations and being close with one another (such as being under a big umbrella that captures the sounds of the falling rain). As the outdoor-loving Scandinavians are so often quoted as saying, there is no such thing as bad weather, only bad clothing. Seeing rain and snow as the rich resources that they actually are - rather than hindrances to going outside - will greatly help the development of outdoor play through the year.

Dexter does lots of 'poking and pondering' [White, 2009a] that gives him close-up, intimate and 'everyday' contact with the natural world. These interactions lay down deep emotionally rich memories that form the core of the maturing person:

"The child's world is fresh and new and beautiful, full of wonder and excitement. It is our misfortune that for most of us that clear-eyed vision, that true instinct for what is beautiful and awe-inspiring, is dimmed and even lost before we reach adulthood. If I had influence… I should ask that [the] gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation for the sources of our strength."

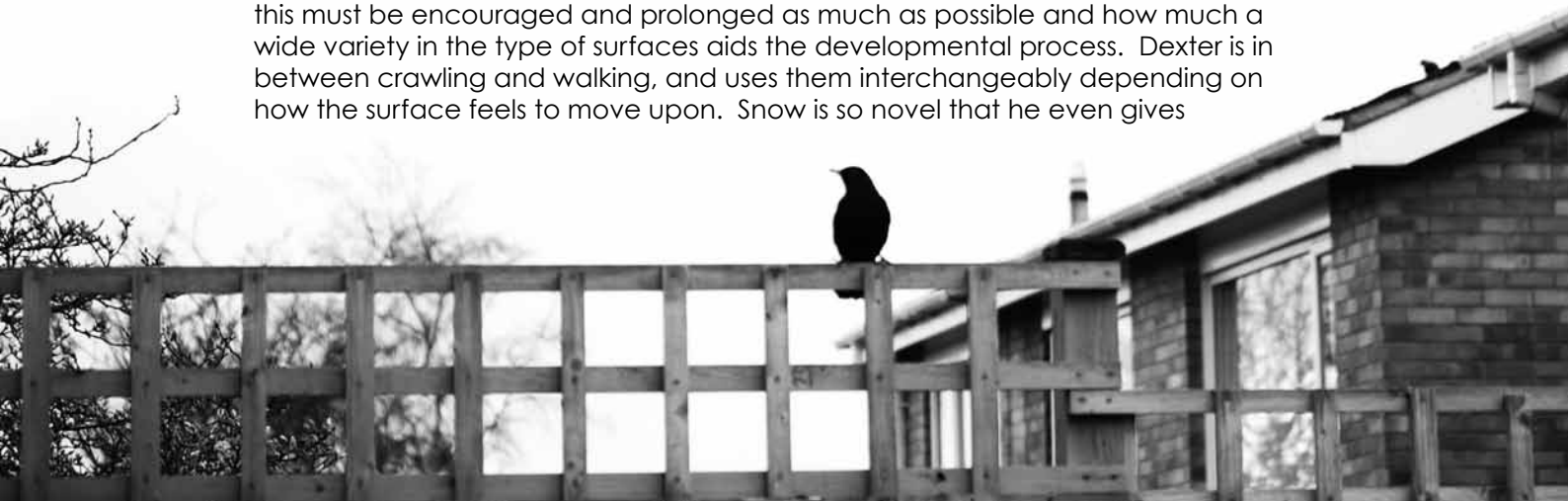
[Rachel Carson, 1998]

The role of movement and physicality

"Scientists are discovering a great deal about neurological development and are beginning to understand just how much the brain body system needs movement and rich sensory experiences to develop optimally."

Some children, and more often these are boys, have a particularly great need for activity; but all children need a great deal more than they are getting in Western societies now. There is mounting evidence of the links between vigorously active play and the sensory processing delays and difficulties associated with several, increasingly common, special needs, especially ADD, ADHD, dyspraxia and dyslexia.

We saw with Ko and Lucas just how important the crawling stage is for babies, that this must be encouraged and prolonged as much as possible and how much a wide variety in the type of surfaces aids the developmental process. Dexter is in between crawling and walking, and uses them interchangeably depending on how the surface feels to move upon. Snow is so novel that he even gives



up on crawling when its slippery nature confounds him. Next time he has a go, he will have to use his body in a new way to succeed. On firm hard surfaces, Dexter finds that walking is preferable, presumably because he makes faster progress and gets a much better view of the world when upright. The uneven, less predictable and more gravity-influenced slightly sloping grass still needs help, but he's keen to stay upright. But loose sand is a very different surface to those he has previously experienced, which gives way underfoot and is really unpredictable. The demand it makes on both crawling and walking is very different to pavement or even grass, and in this new situation he reverts to the much more mastered strategy of being on all fours, which he finds works better on this fluid surface. Notice the stimulation his hands are getting as he crawls on the sand and moves onto the contrasting, smooth and slippery rubber surface (see the notes on crawling for Ko).

The stimulation of the open, firm-surfaced cemented area in the park is an excellent place for Dexter to really work on walking skills and he moves fast and turns quick corners. And with hands released by being on two feet, he can even bend to pick up the string and pull the toy along. Considerable balance and body awareness are required for such control skills - notice how he uses his arms to assist in staying upright while moving. In a study of the development of walking in 9 to 17 month-old infants, researchers noted that:

"Infant's everyday experiences with locomotion occur in truly massive doses, reminiscent of the immense amounts of daily practice that promote expert performance in world-class musicians and athletes. For example, walking infants practice keeping balance in upright stance and locomotion for more than 6 accumulated hours per day. They average between 500 and 1,500 walking steps per hour so that by the end of each day, they may have taken 9,000 walking steps and travelled the length of 29 football fields."

[Adolph et al., 2003]

This immense drive for movement cannot be comfortably met indoors - or in a pushchair - and many babies are left with pent up movement needs that leave them lack-lustre and sleepy or frustrated and depressed, and severely underfed neurological systems for healthy development and later life functioning. The richness and variety of the outdoor landscape adds a great deal more to the developmental picture: the researchers propose that the variability of infant's walking experience may lie at the heart of developmental change. Thousands of walking steps, "each step slightly different from the last because of variations in the terrain and the continuously varying biomechanical constraints on the body", facilitates mastery and flexibility in use of the body in new circumstances. An outdoor space that only has flat, rubber surfacing is developmentally inadequate for children of this age.

Children mastering balance, coordination and locomotion should have opportunities

to move in many different ways and a range of surfaces to move on that demand body control, attention, and effort. These could include uneven and less predictable surfaces, surfaces with gradients and a variety of levels, and non-resistant surfaces that 'give' underfoot [White, 2009a]. Motor control and coordination are so important for life functioning that we must find a good balance between these bodily explorations and our tolerance for bumps, scrapes and bruises.

Sensory development

"Being able to hear helps us to detect and locate sound, identify its source, detect its nuances, evoke emotion and, of course, enables us to use verbal communication with its range of psychological properties."

[Maria Robinson, 2008: 58]

The richness of the outdoors as a place for sensory exploration, development and integration, especially when several natural elements are present, is again apparent in these sequences. Like all babies, Dexter is alert to everything and notices the sounds in his environment. The abilities to hear and to modulate sensations of sound underpin our ability to really *listen* to the sounds around us and understand their meaning. Although babies are born with a well-advanced ability to receive sounds, there is a huge amount of interpretive ability still to be developed: and this first year is the window of maximum development for the complexities of hearing and listening. Hearing is used for more than listening though; the vestibular and auditory systems work together as they process sensations of movement and sound - these sensations are closely intertwined because processing for both starts through hair cells in the receptors of the ear. In tandem with the vestibular system, the auditory nervous system connects with muscles throughout the body and helps to regulate movement, equilibrium (balance) and coordination. As vestibular and auditory sensations are integrated, through purposeful interaction with the environment, the baby learns to interpret what they hear and to develop sophisticated auditory discrimination skills – the 'what' and 'where' of sounds [Stock Kranowitz, 2005: 176-7]. The outdoors is full of sounds and is a wonderful place for babies to develop all the different elements of this very important and complex sensory system. Watching Dexter attend to some of the sounds in his environment, we can see some of these components: learning how to hear sounds separately (discrimination); learning what they signify, using memory of previous experiences (recognition); locating the source of the sound (direction and distance); learning how to pick out foreground sounds against a background (auditory figure-ground); and being able to follow a moving sound, such as a car or bird (tracking). As with our eyes, having two ears (binaural hearing) working in harmony allows us to locate and move towards sounds. As Dexter hears and watches the birds or scrapes the stick on other surfaces, matching sight with sound helps to make sense of the aural sensations. Movement, hearing and vision all influence the development of each other and must become well integrated. Moving and doing matter for developing the ability to listen well and to understand what is heard. Indoors, sound bounces back from the walls and become confusing or overwhelming. Outdoors provides a comprehensible, multi-dimensional soundscape, and the range of sounds to make and learn about is both endless and fascinating.

Watching the sequence of Bobby out in the town with Mum, it is interesting to consider the richness of the soundscape around her as compared to that within a

garden. However, practitioners taking babies on walks in busy streets or other noisy places should be alert to the high decibel sounds of traffic and the overwhelming amount of big sounds and movement that bathe the infant. Babies' highly sensitive hearing can be damaged by prolonged loud sound, and in a pushchair they are at a lower level on a pavement than the ears of the adults. This must also be a consideration in thinking about appropriate outdoor spaces for very young children.

Use of the hands

Notice how much Dexter is using his hands. They have become both dextrous and highly sensitive - he has little need to put things to his mouth in order to investigate them now. It is worth watching the sequence on the beach in particular to see how the materials in this environment are stimulating and working his hands. It is a nice feedback situation in which tactile stimulation and use of the fingers build up feeling and control through both proprioception and touch senses, so that he uses his hands more and with more success.

He is also displaying a use of the fingers that is very typical towards the end of this first year - he is pointing. Note that his right finger points when he is sharing joint attention with Mum as she points out the birds above the beach, even though his arm is not extended. Pointing is one of the most basic human gestures and gesture, particularly pointing with the first finger, has been linked to the evolution and development of language: "the child always points while naming and does not name without pointing - stretching out the right hand" [McGilchrist, 2009: 111]. There might be quite a strong association between Dexter's use of pointing and the emergence of his first word 'bap': "At the neurological level, it turns out that there are similarities between the skills required for speech production and those required for hand movement, specifically movement of the right hand… language is an elaboration, extension and abstraction of sensorimotor function, originating in a proto-language formed by the utterances that were coincident with and driven by the same rhythm as the movement in question" [McGilchrist, 2009: 111]. It is interesting that Bobby babbled when she was kicking her legs, Ko vocalised while he was investigating the bench, Lucas made some verbal sounds alongside his instrument play and Dexter begins to use his voice when he is handling the things he found on the beach. "Babbling can also be heard in conjunction with the motor sequences that are sequelae of the orienting response – locomotion, grasp and manipulation" [McGilchrist, 2009: 111]. Most of the vocalisation we see in this film is associated with the baby being physically active or handling things, making a further case for active outdoor play for babies.

The right stuff: materials and resources

The outdoor environment that Dexter has access to contains just the right materials to support his thinking and development. They are part of the real world, so they are of great interest to him. They are highly sensory, providing stimulation for several senses at once and giving lots of information for making sense of them. They are open-ended, non-prescribed and abundant, so he can do what he wants with them. We provide materials like these indoors, such as sand and water, as they are very effective as learning tools, but they can be accessed in much richer ways outdoors (with much less constraint due to spillage and mess), changing subtly every day with the weather conditions and time of year and present in much greater quantities. Natural materials are the richest source of

interest and possibility for babies; they are where they belong and where they have the most to offer by interacting with all the other things in this environment. Dexter really likes the sticks he finds at the park and on the beach. Sticks have been the premier child's toy for generations, recognised by the National Toy Hall of fame:

> ***"When children pretend with sticks, they cultivate their creativity and develop their imagination. They explore as they search outdoors for just the right one. They are the original building blocks for creative play. Sticks also promote free play – the freedom to invent and discover. They encourage playing outside instead of inside. Sticks are all around us; they are natural and free. Sticks are not only possibly the oldest toy, they're possibly the best!"***
>
> [The National Toy Hall of Fame, USA]

Dexter is extending his play with objects beyond "what is in the world?" As well as finding out what he can do to a stick and what he can make it do, he is now exploring what he can do *with* a stick – that is, the relationship between two objects. He can put a stick into a container (cup and limpet shell), he can poke it into the ground, he can bury it and find it again (confirming the physical permanence of objects), and he can make sounds and a satisfying feeling in his hand by rubbing it on something else, such as stone and wood. Perhaps it is this emerging understanding of how things relate to each other that prompts him to connect the pieces of stick back together after it breaks into two.

The beach is the ultimate play environment for children of all ages, including babies, with so many elements interacting with each other - sand, water, sky, wind, shells, sticks, stones, seaweed and seagulls - and so much open-ended potential for sensory pleasure, exploration, interaction and play. This is what to aim for in the nursery garden. A simple sandpit is easy to create (be sure to cover with plastic mesh when not in use to keep animals out). The important thing is that babies can easily get right into the sand and be in it with others, including adults. A length of raised surface with sufficient depth to provide comfortable seating, within the sand area or along one side, is a very valuable enhancement (see below). With such endless stimulation, fascination and opportunity to follow his interests, it is not surprising that Dexter is showing such high levels of well-being and involvement [Lavers, 1994], despite the bitterly cold March wind. Adequate clothing for both child and adult is imperative if both parties are to make the most from such massive potential.

Watching the way Dexter and his Mum can play at the raised surface of the wooden groyne, shows what a useful feature a wide level surface at the right height is for babies who are pulling up to standing and cruising (remember Ko and the park bench) or standing stably with both hands free. This surface is perfect for him to stand at and do things, he can reach across, he can clamber onto and be on top of it in a sitting position and, best of all, he can face the adult who is sharing interest and companionable learning with him. The lap of a comfortably sitting adult is at the same height and also an excellent surface for manipulation and close interaction.

Adult support and interaction

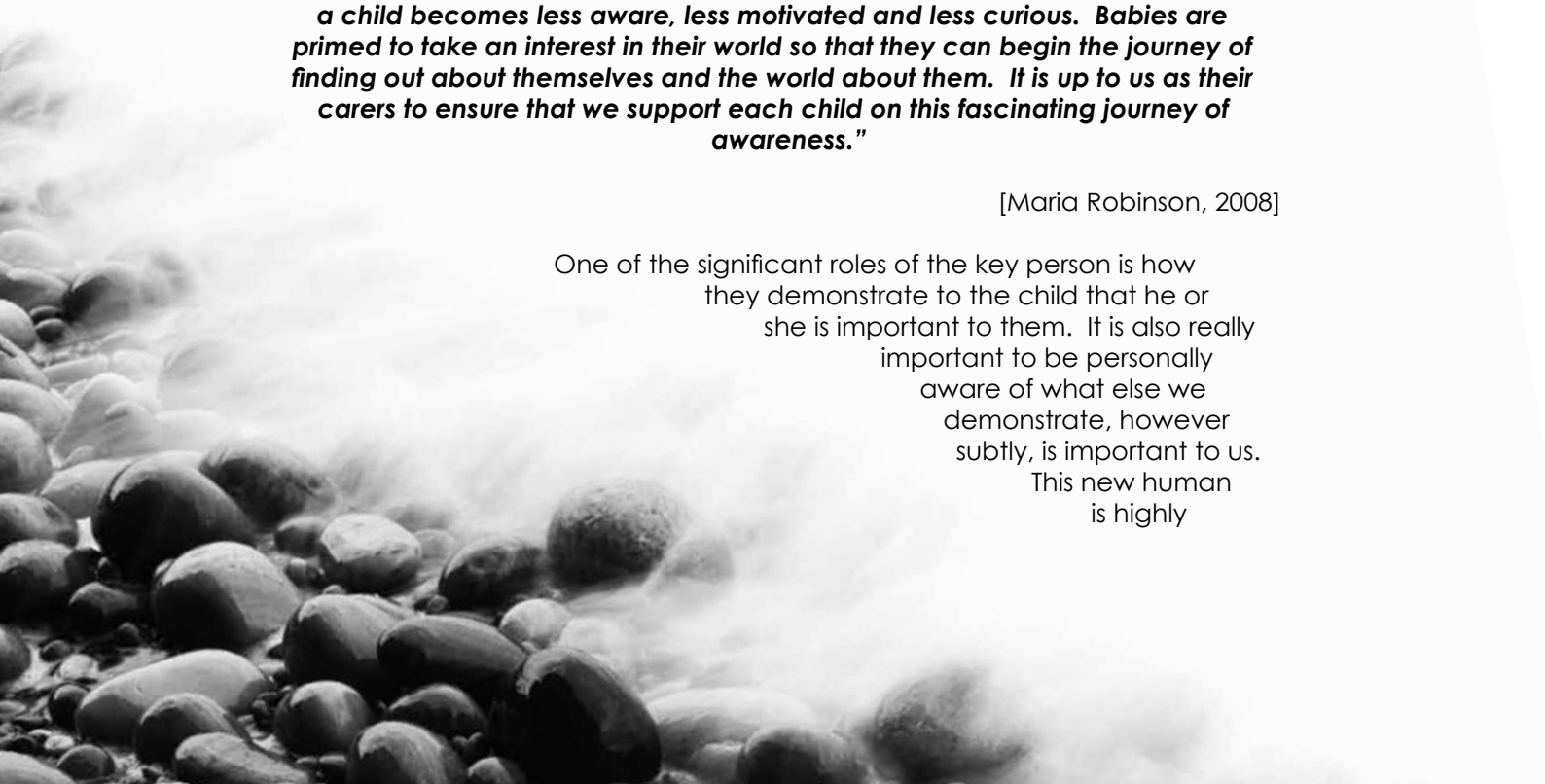
Recent research has identified over a hundred differences between the brains of human males and females, that relate to the evolutionary focus of men as hunters and women as finders and nurturers [Featherstone & Bailey, 2010]. Many of these physiological differences result in boys having a strong urge for energetic, action- and movement-oriented play, which is well accommodated in the outdoors. Men have a different way of playing with babies, and this is just one of the many reasons it is so important to increase the number of men working in the early years. One aspect of this is that they intuitively understand the need for 'rough and tumble' types of play. We have seen how much babies benefit from gently boisterous movement play but this is something that many women feel quite constrained about, being fearful of upsetting or harming the baby. Men also know that this is a good way of relating and of building feelings of affection and friendship with each other. It is important too for adults to have their own kind of fun outdoors, which might include being silly, dizzy, boisterous or energetic, and men seem to initiate this playfulness more often. Laughter is understood by research psychologists to have evolved as the way that the tight-knit 'collaborative community' strategy adopted by humans was formed and maintained - laughing together builds strong social ties [Jamison, 2004: 145]. A setting that values the outdoors and uses it for long periods every day is likely to attract more men into working with very young children, as this is a preferred environment for many men. Research in Norway has shown this to be the case, where men form 19% of the workforce in the outdoor kindergardens compared to an average of 9% across the country (compared to less than 2% in England) [paper presented at EECERA conference, Norway 2008].

The involvement of Dads with their children starts when they are babies and, for the same reasons, this is can happen more easily through spending satisfying time outdoors with each other, doing energetic things. Notice that Dexter's Dad plays football with him as a way of interacting outdoors. Sharing the new challenge presented by the snow, experiencing 'safe emergencies' together [Forencich, 2006], builds the belief and trust that Dad will keep him safe that babies need to feel about the people to whom they become securely attached.

"The attitudes and influence of parents and other adults will help define what does attract and inspire a child – or dampen interest and enthusiasm, so that a child becomes less aware, less motivated and less curious. Babies are primed to take an interest in their world so that they can begin the journey of finding out about themselves and the world about them. It is up to us as their carers to ensure that we support each child on this fascinating journey of awareness."

[Maria Robinson, 2008]

One of the significant roles of the key person is how they demonstrate to the child that he or she is important to them. It is also really important to be personally aware of what else we demonstrate, however subtly, is important to us. This new human is highly



tuned to notice what these things are, so that they learn what is important in the world. Anything that the adult shows attention to, positively or negatively, will be attended to as the best way to learn about the things that matter in their world. This is the way young children learn how to survive by keeping safe and finding the things they need. It is also how all the cultural values and content are transmitted across generations. It is, then, crucial that motivated adults transmit to children an enjoyment and pleasure in being outdoors together. If babies are to grow up retaining the internal strength that being bonded with nature generates, then it is also vital that adults show how much *they* value all aspects of the natural world; particularly by taking great pleasure in sharing the child's fascinations, but also by enthusiastically sharing their own. As adults involved in young children's lives, from the earliest days onwards we have a responsibility to support the retention of their 'inborn sense of wonder' [Carson, 1998] in a world where cultural influences are making it increasingly difficult to do so, even whilst it is increasingly urgent for the future that they do!

Prompts for developing practice

Organisation

❑ As we can see with Lucas and Dexter, one of the very first steps in making good use of the outdoors is to have suitable clothing to keep both children and adults comfortable and safe in the different weather conditions we have through the year. Good clothing protects without getting in the way of what babies want to do. It makes a big difference to use all-in-one suits with zips down the legs to make nappy changing easier! How can the setting ensure that appropriate clothing is always available and easy to use?

❑ For babies to benefit from the full potential of the outdoors, settings need to have a shared commitment to going out with babies all through the year. For this to be a reality, the adults must all feel both emotionally and physically comfortable in the outdoor space and know how much babies profit from these experiences. How can this level of commitment to outdoor play for babies and belief in its value be built in your setting?

Environment

❑ While watching the film of Dexter, focus on the materials he uses and consider what makes them good resources for play outdoors. Discuss what makes these materials so effective (e.g. they are open-ended and lend themselves to sensory and physical interaction) and use this to reflect on the materials in your outdoor provision.

❑ Sand and water are two of the most vital elements of outdoor provision for all ages. Notice what makes the beach effective for Dexter: the quality and abundance of the sand; the materials mixed into the sand; that children are able to mix water with sand. A sand area can be very simply made by digging into grass; a hose is the best way to supply water for babies' play. What issues arise in your setting regarding sand and water play – and how can these be resolved to enable satisfying play?

Adults

❑ Use several viewings of the film to analyse and discuss adult interaction styles in the sequences, from the talkative approaches of Bobby and Ko's Mums, to the quietly present and available style of Dexter's parents. Notice that often the adult is following and copying rather than leading or directing and how the child benefits from simply having a 'companion' in their learning. Notice too the art of 'slowliness' - that is, patience and understanding of just how important it is to a) go at the child's pace, b) allow for lots of repetition and return, and c) not to push the child forward to meet 'next steps' and milestones.

❑ Practitioners often have a weaker understanding of cognitive growth than they have of other developmental domains. Deepening knowledge of the intellectual development that is taking place over this year leads to much greater awareness of what babies are really doing outdoors and better understanding of the thinking that is happening through this 'doing', and this in turn makes working outside with babies truly fascinating. How could this developmental area be highlighted and strengthened within the practice in your setting?

Parents

❑ As part of our role in building children's natural connection to nature, we should be helping parents and carers to value spending time outdoors with their babies, especially in natural environments. As well as lots of communication about what their baby does and gets from being outdoors in your setting, what information and support could you provide for families about accessing suitable local places?

❑ It is important to pay very close attention to a baby's interests outdoors so that adults can interpret their behaviour, capture their motivations and build on their interests. For example, Dexter's interest in moving animals and the link with his new utterance 'bap' when he sees them is a significant thing to be shared with all the other adults who care for him. How do you allow plenty of opportunity for close daily communication from *home to setting* about babies' outdoor experiences?

Film commentary

Babies are active participants in their own learning. They build on the abilities they're born with. The input available from the outdoors is immense. It's varied and different from inside and the first hand experiences they get outside helps develop their brains, as they build on their movements and what their senses take in.

The film will follow 5 babies, increasing in age. They'll show what key experiences they really need and how they benefit from what the outdoors offers. We'll see how the outdoors stimulates their rapidly growing brains as they develop through their first year.

Miles

Miles wakes up gently under the tree in the natural light and oxygen rich air. He learns through his movements and his senses. He can hear the voices of his family around him and the wind rustling the leaves. He feels the breeze on his face, the temperature and the smells.

Visually he scans the tree and the sky above. Things this far away will be a bit blurred but he can see the movement and different tones. It's easiest to focus clearly on mum because she's closer. Her face is what interests him most at this age. He loves hearing her voice and at six weeks is just learning to smile.

Here outside all of Miles senses are stimulated and time spent in this rich environment will help him begin to integrate his senses and start to make sense of the world.

Bobby 3 months

This is Bobby. Here all her senses are alert. Babies can sometimes be difficult to work out and Mum constantly watches what she thinks Bobby's doing and is interested in. Her relationship with mum makes it possible for Bobby's powerful learning systems to be activated.

Hearing's her most developed sense. She likes the sound and watching the movement of the branches. Up close she can see the detail. She's also interested in contrasts and the edges of things and outside there are lots of edges set against the sky. The edges of things are important because they usually indicate where objects begin and end. Looking at edges helps her to separate the things in her visual field.

Feeling the wind and the sun on her skin are stimulating experiences for Bobby - and every day will be different.

The constant commentary is vital exposure to words and her language, and outside there's lots to comment on. She makes sure she notices Bobby's movements and facial expressions and does what she can to let her see and hear what she seems to be interested in. Mum can tell when she's had enough.

Bobby 5 months

Out for a walk in the park the rear facing pushchair means mum and Bobby can interact as they walk along. Spring's emerging and new smells fill the the air. Babies look longer at things they find interesting and during the first year of life visual stimulation is vital. Out on a walk there always seem to be things that interest Bobby and attract her attention. She's attracted to complex patterns as well as to the edges of things so the pattern of the tree's branches against the sky is fascinating to Bobby. And each tree is different.

She concentrates solely on the tree and then when mum attracts her attention she concentrates on mum. She can't divide her visual attention between the two yet.

Bobby loves playing movement games. Not only are they good fun, being moved upside down helps develop her sense of motion and position. Movement as a whole is inextricably linked with the development of the brain and babies love active, rough and tumble play.

She's also attracted to watching movement. The movement of people and objects helps to separate them from the landscape as individual things. Bobby's started babbling, often when she's stimulated.

There are so many things that she needs to learn about. Some things just suddenly move off the ground! Some things appear and then disappear. Some things move, sparkle and gurgle.

And because her physical development's advancing she's now starting to reach out to grasp things. With the use of her hands she's going to start finding out more about objects, - experiencing their textures, their size, their weight. She doesn't know yet that things are permanent. When the stone disappears in the water, for example, Bobby doesn't know that it still exists.

Bobby 7 months

In the garden

Bobby's relaxing in the garden. The hammock's both soothing and stimulating. Like being thrown in the air, swinging is an important experience as it stimulates the neurological development of motion, position and balance. Her vision is also linking up with this neurological development.

Bobby and mum talk about the cat. At 7 months Bobby's now becoming able to divide her visual attention between mum and the thing they're both looking at. This is called joint attention.

With the use of her hands she's finding out where her body begins and ends. She can see the colours and very subtle differences in the shades of grey in the sky. Her happy babbling is incorporating more sounds. She looks carefully at her hands and then to the sky, quickly focusing from one to the other. Her movements are becoming more controlled as she coordinates her hand and leg movements.

Time on the tummy strengthens the muscles needed to reach out and crawl.

A lot of neurological and anatomical development happens in this position. It opens up the spine allowing more freedom of movement in the joints and the hands and fingers become more available for grasping and feeling.

She feels different textures and surfaces with her bare feet. It's spongy and tickly. Scientists are discovering a great deal about neurological development and are beginning to understand just how much the brain body system needs movement and direct sensory rich experience to develop optimally.
She's learning to sit and her desire to grasp things encourages mum to move her closer to things of interest.

Her hands are becoming increasingly useful as she feels the texture of the grass and she can use them to make things happen, finding out something about cause and effect. Exploring objects involves all the senses - as well as vision and touch, things are often put into the mouth as the mouth is a very sensitive part of her body so it's a good way to find out about the nature of them. Outside, not everything wants to be sucked and mum gently stops her.

Bobby's increasing interest in objects means she's gradually finding out about their properties and what they're like.

Bobby In Town

Going to the shops gives Bobby the chance to watch mum as she interacts with others. She's involved with mum's conversation checking with her reactions to see what's happening. She mirrors mum's expressions. Imitating facial expression is a way of experiencing the emotion that goes with it.

The hustle and bustle of the high street offers quite different stimulation to the garden. People are doing things, vehicles are moving with noise. She's taking it all in.

Mum homes in on what's of interest to Bobby. She likes the horse. She can look at it and to mum dividing her attention. They both share their attention between the horse and each other - joint attention. It's now much more of a proper conversation.

In these few months we've seen Bobby changing at an amazing pace. Her brain has been developing rapidly. Mum's been a constant aid in this as she's tuned into her needs and interests making the most of the immensely rich stimulation that the outdoors offers to Bobby.

Ko

This is Ko. His mum's home language is Japanese and she also speaks English. They don't have a garden but mum takes him out everyday and today they go to the park. It's a nice day and he sleeps soundly outside. Mum makes sure he doesn't get too much sun.

Waking up gently there's lots to see. He sits quietly, taking in his surroundings. It's time to act and he feels the grass, and looks from his hand and the close up details then to the distance. His vision and focusing is now nearly as clear as an adults

and because of the varied visual experience he's had he has a rich 3D view of the world.

Mum turns his activity into a physical game. Babies have an innate interest in rhythm and musicality and Ko loves this song and is familiar with it. Mum builds up the suspense and Ko knows what will happen next. He laughs before it happens really enjoying the suspense.

These kinds of physical movements have far reaching effects on the brain and his body sense systems. As he's thrown in the air his vestibular sense – the sense of motion and position – is stimulated. When he's caught it helps develop his proprioceptive sense – his sense of body awareness.

This is explored further as he stretches out, feeling the position and pressure of his limbs on the grass, experiencing how his muscles feel when they're active, helping him create a real sense of his own body.

Ko has recently learned to crawl. He's very pleased. It's a big development for him. His proprioceptive and vestibular senses are both stimulated as well as his ability to focus quickly from his hands to the distance. It's while he's crawling that these three senses come together for the first time and start to become more integrated.

Crawling gives him more freedom and means he can get to some of the things he's interested in by himself. Picking the daises and the grass exercises his fine motor skills and hand eye coordination. Hands are of vital importance for finding out about more the world, for discovering what things are like and what they can do. They are becoming increasingly sensitive and handling the things he finds gives him a lot of information about them.

He keeps close to mum crawling around her, she's his safe base from which he can explore and he gets the confidence to move further away – he soon returns to mum. He uses mum very much like a climbing frame for his physical activities as he and pulls himself to standing. Mum's reaction to his new found physical abilities give him confidence and they're both happy and excited together. Mum acts as a scaffold both physically and emotionally. Ko uses her facial expressions and tone of voice as cues to whether a new situation is good or not and his confidence to explore outdoors and try new things is related to how she reacts in these situations. Her positive expression towards trying something new in an unfamiliar environment will encourage him have a go and equally a negative expression will discourage him.

The bench seat's the perfect height for him to pull himself up to standing. He likes looking through holes. He's now getting the hang of the idea that when things can't be seen it doesn't mean they no longer exist. He's beginning to understand that people and things are permanent. Hiding games reinforce this idea for Ko as mum's hand appears and disappears through the bench. He feels the different textures of Mum's hand and the bench. He uses the bench to start cruising very cautiously along it. The bench offers lots of potential for Ko that just suits his level of development.

Ko's interest in the leaves encourage him to reach. When the leaf falls he knows now that it's still there even when it's out of his sight and mum's trying to distract him. His experiences have taught him that it will probably have fallen to the ground. That's what things often do.

He's constantly adding to and changing what he knows as his experiences bring in more evidence about the world and how it works. There's so much to learn. Mum moves him all around the branch so he can see all around it.

During his time in the park Ko's vision has been stimulated by the complexity of his surroundings. His physical abilities have been supported and challenged as he moves himself towards the things he's interested in. He's linking up how they feel, look and behave and taking in what other people do.

Lucas

Lucas is 11 months old and goes to this nursery a few times a week. The babies here spend time outside every day.

Lucas can crawl and loves stretching his body and working out what it can do. He feels the grass and watches another baby crawling up a ramp. They are getting used to the feel of different surfaces, the grass is soft and cool, the decking warmer and ridged. Ground with different slopes are a challenge and he carefully negotiates this slope. Gillian, his key person, always watches what he's doing as he's beginning to move away from her more. Her presence reassures him and gives him the confidence to explore.

He likes to examine the things he finds so Gillian stays close by to keep him safe but gives him freedom to explore. He's beginning to offer things to other people. It's a sociable thing to do. He doesn't aways let go of them yet, it's more of a way of initiating an interaction with another person. And outside there are lots of people of different ages.

Babies are often attracted to small, intimate places outside to sit and be in. This one has the added bonus of things that blow in the wind. It's also a good place to stand and watch and from here he can see the garden from a different perspective.

Lucas also likes this area underneath, on the ground. He's uses the spoon as a tool. Soil and mud are irresistible to young children. He finds a stone and offers it to Gillian. He's experimenting and finds the stone can be used to hit things with. As well as leading to interactions, offering often leads to something interesting happening. Babies learn by doing things but they also learn by watching what others do.

Babies learn best when they're relaxed and his close relationship with Gillian gives him a secure feeling letting him experiment happily. He uses the spoon to dig the mud and to make different noises. He's driven to find out what he can make happen in the world by intentionally experiencing cause and effect. This area has lots of potential for Lucas, making things move, making different noises, using tools, finding out about materials.

During his time outside Lucas has been busy. He's been watching other children, negotiating slopes and surfaces while he crawls and has been fascinated by the effects of the wind. While he's been experimenting he's always had his key person close at hand to extend his experiences and follow his interests. After his busy morning he falls asleep outside in the fresh air.

Dexter 9 months

This is Dexter. He's out in the garden with dad. Dads tend to play more actively with babies, and generally people play more actively with boy babies. Often boys, but also some girls, need more frequent, active stimulation for their neurological development than others. The space and freedom of movement outdoors makes it the perfect place for more active play, allowing the brain to develop optimally.

Babies need access to the outdoors every day because they're developing so quickly. They can't wait for a good day, - they need to go out for short periods in all weathers.
Dexter rubs the snow… and dad copies him. Together they hear the crunchy noise it makes. He watches what dad does with the snow… and copies him. He feels the temperature and texture of it with his hands building up a memory of what different substances feel like. Tactile experiences are so important at this age.

Crawling on this surface is so different from normal - it's very cold and gives way under foot. It's his first experience of snow, so he's a bit cautious.

Spending time outside exploring and being active releases feel good chemicals into the brain helping to strengthen the bond between Dexter and his dad.

Dexter 11 months

Dexter's out at the park with his mum. It's another cold day but they're wrapped up warmly. As well as playing with the sticks he's listening carefully to the birds singing.

Dexter's very recently learnt to walk and because he's so securely attached to his mum he's also confident to leave her for short times. This open space is ideal for practicing his walking… for pulling things behind him… and changing direction.

Walking on the uneven grassy surface is more difficult and he gets some help.

He's beginning to use his first words to stand for things. He calls the dog a 'bap'. He's also very interested in the birds. He can now follow his mum's pointing, following the direction of her hand as well as her gaze and looks towards what she's pointing at. He says 'bap' again. He seems to be calling all animals and birds 'baps'. His mum has noticed this and often adds his word, 'bap'.

Dexter 12 months

It's a cold day and mum and Dexter wrap up warm. He's at the coast for the first time. There's so much to take in.

Birds that sit still, birds that fly and dogs all seem to have something in common to Dexter. He's categorizing things. They're all 'baps'.

Mum collects some shells and further up the beach they find a good place to stop. It's the perfect height for Dexter to stand at and do things. And as always

outside there's so much to look at and take in. He likes sticks, you can do so many different things with them. He rubs it and listens to the sound and the vibration on the sand. He experiments further and tries out different surfaces. He likes the feel of the dry sand and mum extends his experience of it. Hiding things in the sand helps Dexter's understanding of object permanence as things disappear and reappear again. The stick is such an interesting implement to Dexter. It can be poked with and banged with and put into other things. It disappears into the sand. Then reappears!

Mum's enthusiastic about the little things Dexter finds and is interested in. He clambers and manages to climb up. The stick's still his favourite. He accidentally breaks it and tries to fit it together again! Sounds come from all sorts of places outside and Dexter's twisting round to locate where this sound's coming from.

It's time to go. There's still work for Dexter to do on his way though! He's learning that he needs to use his body differently to negotiate moving through the sand. The rubbery surface is smooth and slippy. He's still a wobbly walker and at the minute he needs the hard firm road to walk on steadily. With practice he'll soon be able to tackle slopes and surfaces that give underfoot.

Dexter thrives outdoors. He uses his first word to categorise the animals he sees and hears as he's out and about. The natural materials and things he finds are perfectly suited to his level of development. His newly acquired ability to walk is practised with enthusiasm on the varied surfaces he encounters.

Conclusion

Babies don't just enjoy the outdoors, they need it as they're gradually integrating their senses and building up their physical systems.

Their particular developmental needs are catered for perfectly in the rich outdoor environment. All of their senses are stimulated by the complexities of the natural world. There's lots to watch and listen to, both near and far and their desire for the new and novel is satisfied by the varied and unexpected events that happen. Their need to find out about things encourages touching , reaching and investigating as they're inspired by the unlimited resources.
And spurred on by the fresh air their physical movements gradually move on as they develop the ability to sit, crawl, stand and begin to walk.

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