SIT HAPPENS

talking about sitting – by Christine Ackers

We do a lot of it. We generally do it very badly, as is evidenced by the growing lists of damaged parts we develop through sitting for long periods. Nor is it entirely due to our increased longevity that these lists are lengthening. Complainants of neck pain and sore knees include an increasing number of children – some as young as three years.

well-distributed loads

We have advanced in strides to protect our health from invasive attack; but when it comes to recognising the importance of good carriage and well co-ordinated movement for the healthy maintenance of the systems and structures of our bodies, we have less awareness today of the effects of use on function than in pre-industrial ages, when we were the machines we used.Even my 19th century Encyclopedia of Embroidery opens with a paragraph entitled "How To Sit To Sew". It warns of the importance of 'bringing the work up to the face, and not the face down to the work', and it goes on to enumerate some of the terrible things that can happen to the neck, back and eyes of a seamstress if good sitting habits are not adopted from the start.

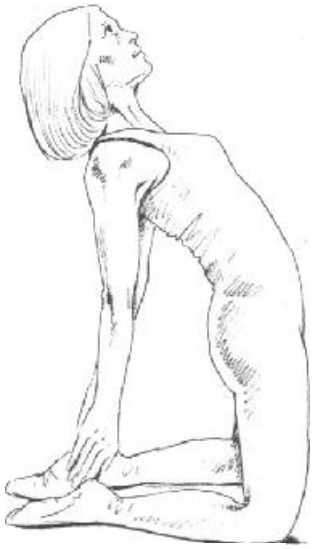
rowing harmfully

Before the 20th Century, in both our leisure and work activities we paid attention to using appropriate postures and appliances to do a job or pursue a hobby. Nowadays we see children playing sports which, with their poor co-ordination, can only harm them. We wait until our own bodies are so badly damaged that replacement of their parts becomes necessary.

Nor do medicine or its auxiliary professions come up with preventives or cures for

musculo-skeletal disorders. Although much is now recognised within the health professions about the effects of poor posture, we still have no reliable mainstream source of knowledge and practice with which to address them. Some health practitioners assume that their knowledge of human anatomy gives them a means of bringing about postural change. But this is not so. A proper understanding of use is only acquired through the development of one's own co-ordination to a high standard by means of training in the Alexander Technique. Without help from the Alexander teacher's uniquely trained hands, the essential process of lengthening and widening the body to facilitate beneficial movement is inadequately understood. The usual shallow understanding lends itself to the designing of endless posture -training systems which are added to the supermarket of confusing and contradictory gadgets and gizmos such as the 'orthotic insole,' the 'posture bra,' the 'neck pillow,' variously angled 'back supports' and 'harnesses' and the pervasive and increasingly uncomfortable 'ergonomic chair'. Currently under scrutiny is the design of the school bag. Not before time - but also a complete waste of it unless the child is simultaneously going to be taught *how to carry it.*

a poorly distributed load



body parts held in unnatural relationship

The continuing failure to repair damage caused by poor use leads the despairing health professionals with their scant knowledge of our evolutionary history to claim that "we are not designed for sitting." So what are we designed for? And if we're not 'designed for' ballet dancing, should we therefore be doing it? I suspect that neither are we 'designed' to do yoga – although it is touted as a healthful practice - especially its postures that aim to extend our parts beyond their natural limitations.

We are clearly designed to engage in some activities. It's axiomatic that to be alive we must move, to retain the fullness of our musculature, to be flesh at all. During some millenium of our several-million-year history we may serendipitously have discovered activities that we could undertake to our benefit, including some we may not have been specifically designed to perform. Sitting may be one, but which we nonetheless manage to do without harming ourselves – *provided that we do it well*.

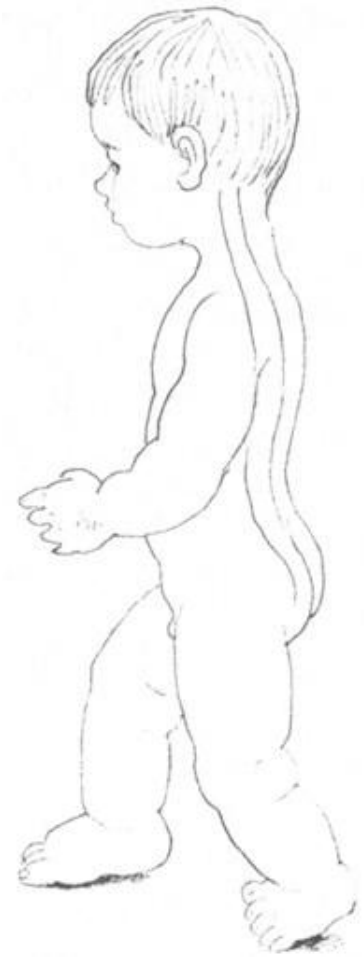
it's easy

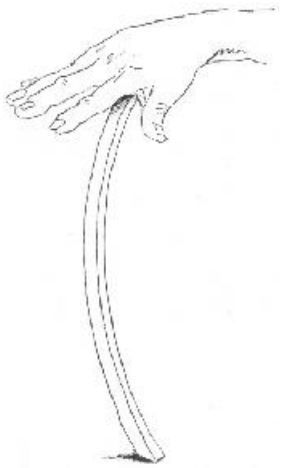
So before we move on to the question of *how* to sit well, we must first define what we think good sitting is. And in the process we can consider what sitting

might be for.

some history

There is no question of the need for sitting as a developmental stage in the human baby on her way to standing. Her spine at birth is curved concave forwards in the thoracic and pelvic regions, and is slightly curved convex forwards in the cervical region. She has no lumbar curve at all. Her cervical curve increases as she practises holding her head up during crawling and sitting. Moving and balancing her weighty head during these developmental stages also strengthens the musculature of her trunk in preparation for her bipedal future. Although the size of her head will diminish in relation to her overall size as she grows more upright, it will still be sufficiently heavy to require a second curve in her spine. This second convex forward curve forms in the lumbar region and brings her centre of gravity over her legs. It also affords more springing and flexibility for moving her precariously balanced body lightly – that is, with minimum expenditure of energy.





To understand how strength without rigidity is achieved, take a length of cane or a green twig and push down on its top end. You will feel a little resistance as it bends to left or right.

Put another curve in the opposite direction in the same length of cane and you will feel how much more powerful the resistance is when you try to push it down. Both curves are thrusting upwards against the downward force of your applied weight. The resistance of the curves as they attempt to straighten out is what puts the counteracting force into a spring.

A benign circle of events is set in train by the weight of our large heads stimulating this resistant force from our spinal curves as they thrust against it. This anti-gravitational thrust also ensures that our heads – as long as we don't fix our neck muscles - are constantly brought to the spot where their weight can be deployed in this way to our advantage.

As a one-year-old, while her spine is still relatively straight, or before the

second curve has fully developed, a baby's head will pull her off balance when it falls backwards. This is an amusing period to watch. Her trunk and neck musculature is not yet strong enough to hold it up there at all angles. From now on and for another twenty odd years she will continue growing taller and broader. Then she will go on through life carrying her heavy brain around on her thin neck until she's almost a hundred.

At her sitting height one curve in her spine was sufficient for the baby to manipulate her head safely. But now she has become exceptionally tall in relation to the comparatively narrow base she has on two rather than four legs. However much taller she gets she will continue to move vertically between the ground and her uppermost reach . She will need enough strength and flexibility to perform a lot of getting up and down. Infants and small children move from stand to squat so easily.

not designed for sitting

So, once we're up there why do we bother to continue sitting? Possibly by chance, in the process of making the necessary structural changes for getting about on two legs, early humans also became better designed for sitting than for squatting. An ape's spine hasn't evolved for standing on two legs and therefore isn't so well-adapted for sitting either. Her bits are not so neatly underneath one another and their weight puts more stress on her rather straight spine. When she stands upright she is not so vertical as humans. She sits a bit, but not for long stretches.

some evolution

The classic question of evolution is whether the monkey grew a tail because she needed it to swing through the trees, or whether she grew one first and then found a use for it? Did monkeys sit so that evolution favoured the loss of their tail to facilitate it? Or did the primates find they could drop back onto their

sitting bones from a squat because they had no tail to get in the way? Perhaps that little squatting-to-sitting discovery sparked the evolution of the spinal changes necessary for eventual bipedalism. Gibbons, meanwhile settled for the arboreal life and grew longer arms. Some changes seem to be what the environment demands and others seem as though they might be fortuitous by-products of those changes.

And why would those early people not have chosen to squat or lie down when they didn't need to be dashing about? What would they have wanted to sit for? Maybe the greater stability of sitting had the edge on squatting for performing delicate hand tasks. Then again, sitting – or the half-squat - may have been a by-product of a newly-acquired lumbar curve because the now forward-tilted pelvis would be making it harder to balance in a squat. Squatting, once you have a lumbar curve, puts more strain on the spine because when the pelvis and sacrum are pushed backwards the lumbar area is forced to over-straighten. Perhaps our forebears suffered from slipped discs until someone hit on the idea of adapting the environment to their shape by creating furniture. Sitting on a log chair at a rock table would have made tool work much easier.

Early woman's iliac blades evolved into a more rounded shape to help contain her intestines and babies in her upright stance. As a consequence of this structural change to her sacro-pelvic region sitting became easier than squatting. Closer to our own time, and with her bipedal pelvis well-established, she and the clan sat with their legs in front of them to draw pictures in sand. Whether they felt the impulse to draw and positioned their upright bodies on the ground; or whether they were sitting around the campfire and in an idle moment started to enjoy each other's lines, who knows? Pictures became an important medium for spreading news and sharing thoughts. It probably wasn't long before someone was delegated the role of line drawer and who would be left sitting for longer periods than the others. Even so, that person would have spent fewer hours of her day sitting than we do now. Whatever the evolutionary purpose of sitting, if there was any, we've evidently been doing it for some time. We do not imagine a Cro-Magnon family gathered around the campfire after a hard day's hunt, *standing* to gossip or gnaw bones.

drawing by Michael Leunig

Nowadays we are almost born to sit, trained to it from when we start school. And, sadly, we do it on furniture whose design ensures that our neuro-muscular apparatus for maintaining a good shape is seriously compromised from the start.

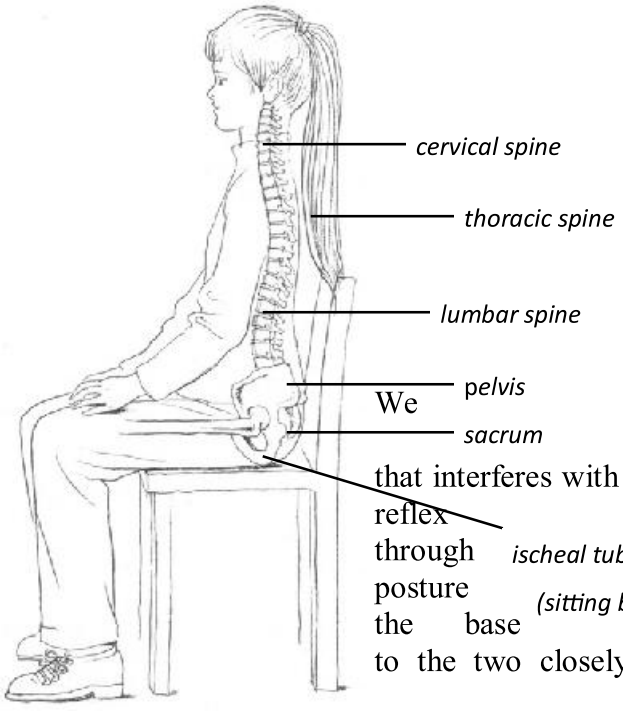
Perhaps we adopt the sitting posture so much because we have become so inept at standing that our central nervous system selects sitting as the less energy-costly option.

What is not immediately apparent is that standing badly is less stressful for our lumbar spine than is sitting wrongly. So in the long run our decision to take a break by collapsing into a

chair is not much good to us. But before we go on about bad sitting, we must clarify what we mean by good sitting .

what is good sitting

Good sitting is a balancing act of the head and the trunk, performed on the ischeal tuberosities. Because balance is a process, good posture cannot be described purely in terms of forces and angles. Balance incurs movement; and movement is what our mammalian body is designed for. It is as fundamental to our existence as is breathing, eating and thinking things over. Even while we keep perfectly still some movement will be taking place. Both moving and being still are achieved by a mix of procedures such as falling, contracting muscle, relaxing muscle, inhibiting response and balancing. They are stimulated and controlled by interactivity between several discrete functional centres within the brain. When these are all working well, we stand on our legs with a feather lightness, and we sit on our ischeals in delicate poise.



As in standing, when we sit we must not fix. We must release all the gripping and holding that interferes with our springing. We must balance and allow reflex muscle contraction to run freely through us. Sitting is the harder posture to perform well because the base we are poised on has narrowed to the two closely adjacent points of our sitting

bones. These cannot be separated - as can our legs – to widen our base and give us more play for balancing.

In standing we cannot collapse so extremely as we can in sitting because our cerebellar motor function works at keeping the overall musculature more engaged, to ensure that we remain safely upright. It is aided in this by the plantar reflex, a powerfully reactive impulse that makes legs straighten when pressure is applied to the soles of the feet. The plantar reflex makes sure we don't flop to the floor in unguarded moments. It demands a certain degree of springing in the body that it is working hard to maintain upright. This muscle toning from the reflex response refreshes us when we get up from the office chair to fetch a piece of paper from another room. We benefit from the movement because it demands more extensive reflex activity throughout our body. It is the need for this that makes us hunger for exercise – and unfortunately induces us to damage ourselves with inappropriately vigorous activity, after having sat all day in harmful poor shapes.

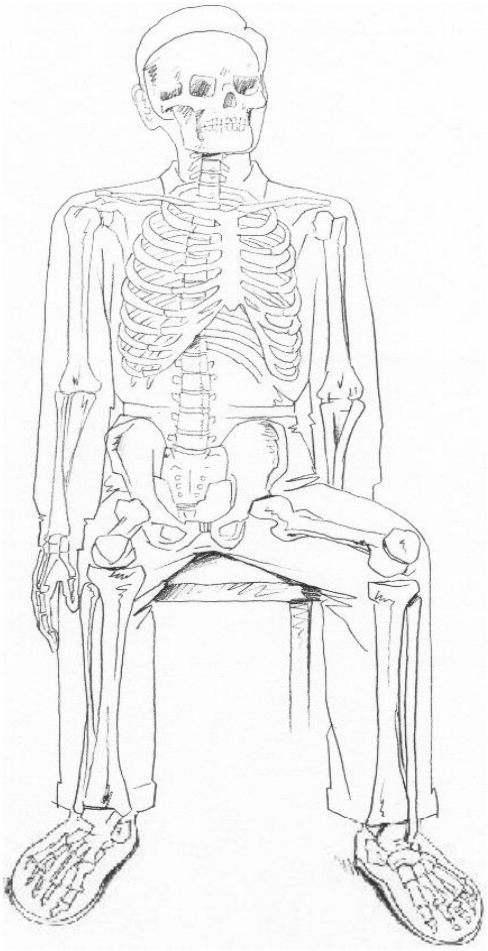
When we sit well there is sufficient reflex muscular contraction along the spine to hold it nicely erect. The aptly-named *spinae erector* muscles form part of the postural maintenance musculature which comprises muscle groups that behave reflexly, that is, we do not have direct voluntary control over them. These specialised muscles perform the more energy-conservative job of holding us upright by means of their co-ordination and work distribution programmes. The constant and *gentle* stimulation they need to stay strong is effected by their response to gravity when the body is erect. If they are not used frequently, they will rapidly lose bulk. If they have atrophied through poor posture to a non-functional wasted condition, the only way we can hold ourselves upright is by deliberately using alternative muscle groups that were not meant for the job. These wrongly employed substitutes let us know they are overworking by making us feel fatigued and 'tense'. If someone tells you to 'sit up' to improve your posture, how long can you hold the position?

rigid military posture

To help ourselves sit well we must allow movement. Movement is predicated on release. No part of us can move unless we let go of it. Try holding your arms rigid while bending them at the elbows. To do it you must interfere with the natural process by suppressing the reflex release response. It feels absurdly hard to do. It's as hard and awkward as attempting to hold ourselves stiffly in a 'good posture'with will power. Experiments have shown that reflexly activated postural musculature uses 5% - 10% of maximum voluntary contraction. It is clearly the easier option. Making the most of release and balance helps to make it so.

Sitting well is sitting upright, with the shape opened out to become as perpendicular as possible, and with the contents of the trunk and its appendages disposed around the spinal column to give the whole a good shape. A good shape is one that is easy to balance and to move without unduly loading any part. The feet must rest lightly on the floor, or, if you are on a raised platform or table your legs must be supported to a distance at least half-way

along the thighs so their weight doesn't pull the trunk off its precarious balance on the sitting bones.



The legs thus function like the base of a bookend, making balancing on the ischeal tuberosities possible. Try sitting right on the edge of a table. You will not be able to balance without leaning back and gripping down the front of yourself to counteract the drag from your legs.

Good sitting is efficient; that is, it becomes light and easy, low on expenditure of energy by using the head's weight to elicit the reflex upward thrust of the spine.

A common mistake is to think of our chunky gluteal muscles as built-in cushions that we can sink down onto. In fact when the legs are flexed for sitting, the ischeal tuberosities are protruded towards the surface we are sitting on. They need to be on a firm surface to give purchase to the trunk musculature so it can hold itself up.

Too soft a seat will defeat the reflexes. Place a hand under your buttock as you sit. You will feel a sitting bone poking onto your hand. Your buttock has made way for it by being stretched along the length of the right-angle formed by your flexed hip joint.

some comparative anatomy

The spine of a four-legged animal can be described as a single shallow arch supported by four moveable pillars. The internal organs are suspended vertically from the arch and are evenly distributed along it. It's a kind of walking bridge. We humans have straightened out our hind legs and made the spine into a column that now has two arches in it standing on only two

pillars. The weight of the internal organs is now distributed around this column. Since we turned ourselves into walking towers, our lives have become in some ways easier and in others more complex. Our shape has greater manoevreability than that of our four-legged fellows. But our balance and therefore our co-ordination is less sturdy. F M Alexander believed that self-consciousness and bipedal walking evolved together. He believed that the tricky business of maintaining the head balanced on the end of the spine at such a height on its narrow base and thin neck, was dependent on conscious control of the more refined adjustments that were now needed. Such a delicate business could no longer be left solely to the motor programming between the senses and the cerebellum. However that may be, we did evolve some aids to maintaining verticality. For instance, the soleus muscle, lying beneath the calf muscle at the back of the foreleg is especially sensitive to the swaying movements of the body towering above. It keeps the cerebellum informed of any deviation from the vertical so that it can send instructions to the musculature to bring it immediately back into balance. This rectification is in process constantly as we amble or sprint about our business. Special proprioreceptors in the neck muscles contribute additional information to the brain about the balance and position of its lolloping skull.

In common with other animals our skeletal framework provides an arrangement of struts for the muscles, whose elasticity allows movement, and for the tough connective tissue that keeps the whole thing firmly held together. Muscle is highly responsive, being suffused in a rain of electrical impulses that speed around the neuronetwork embedded throughout and about its every fibre. This electrical wash, receiving and delivering messages from the

brain, incorporates the "I" that operates our muscle-wrapped selves. Unless *I* make a decision to do something - say, to go and get a newspaper - my clambering-out-of-the-armchair programme will not engage. The *wanting* to take a step towards my goal is the first thing that must occur on the road to its fulfillment. Without the stimulus of my desire nothing will happen. But when I have decided that now is the moment to do it, my consciousness takes a back seat while the instructions are cobbled together by a series of mental functions. Programmes are sent around my body carrying instructions to expedite a task, telling some muscle groups to act, and others to not act. They are carried out largely by reflex mechanisms. Consider that each of my legs has around 50 muscles that need to be operated for it to take a step, while my brain has to ensure that the 50 muscles of my other leg don't intrude on the operation; and consider that my weight has to be transferred and the balance of the whole of the rest of me has to be adjusted while the leg the programme has decided to move off with is raised from the ground. If all this were not programmed to be carried out automatically, it would take me a lifetime to get to the post office. It has to be done reflexly. It has to be accomplished in nanoseconds. I couldn't possibly do this consciously. Muscles respond in co-ordinated groups, according to the bidding of their "I".

When a glitch occurs in this intricate communication system, we experience cramp pains. Both the agonist and antagonist muscles have answered the call to action simultaneously. The neuronetwork in your leg, say, has got a message a little wrong, and it is attempting to both straighten and bend itself simultaneously. Remarkably this doesn't happen often; and when it does, it's promptly rectified by conscious intervention.

So while "I" sit, an interplay of neuro-electrical programmes maintains me, out of my awareness, on my sitting bones. If I am well-habituated, stocked with good-use programmes, a predominance of reflex muscular activity will minimise the effort needed to hold myself up. This good posture will not be upset by any additional individuated act such as waving Hallo to someone as I sit. The additional voluntary activity will be organised so as to enhance the reflexive performance of my sitting, thus ensuring that the energy and wear costs of adding a wave to my poise will be small. Neither sitting nor waving should tire or damage me. Come to think of it, nor should I become fatigued or harmed by pushing a mouse around a pad.

dangers lurk within

Among animal designs the human has exceptional manoevreability and dexterity. We can curl into a ball or stretch out to our full length and create an infinite range of shapes in between. Our limbs flex and extend and rotate with a versatility that affords us a greater variety of movements than any other creature on earth. Even our closest relatives, the chimpanzees, cannot do with their hands or legs or trunks what we can with ours. The flexibility of the spine at

its lumbar and cervical curves helps us to balance and manoeuvre our willowy structure. If my sacro-pelvis is given an unexpected shove forwards, my thorax springs back at once to stop me from falling over. In an instant I can swerve the whole or twist a bit of myself to avoid danger. My parts move automatically to compensate each other for the threat to my balance.

With all we've got going for us, we should be the most joyful of creatures.

But when destructive programmes develop, the organism ends up working against itself. The downside of our versatility is that we are able to continue functioning while deviating far from the ideal of our blue-print verticality. It's very hard work operating a word-processor with the body at full throttle in a slump. Paradoxically it will need to spend more energy tightening down in front to keep from falling over than it needs for clicking along on

the keys. That we manage to function at all betwixt the absurd contradictions we create is due to our marvellous adaptability coupled with an extraordinary flexibility. Somehow we manage to keep going for years using these gifts to our disadvantage – at least until a

damaged part causes enough pain or hindrance to capture our attention.

The tragedy of allowing such deterioration in comportment is that once the trunk has shortened and become misshapen, the relationship of its parts – especially that of the head to the trunk - will no longer effect the gentle stretch of the postural muscles needed to stimulate them. The body's most important muscles will wither and will be supplanted by compensatory muscle groups that should remain free until required for more strenuous jobs. In vicious circle fashion, because the alternative muscle groups are shape shorteners, their employment prevents engagement of the postural maintenance musculature, thereby

ensuring that all attempts to "correct the posture" will fail. The now vestigial postural muscles will need subtle coaxing by means of specialised re-education in good habits of use, to restore them gradually to adequate fullness.

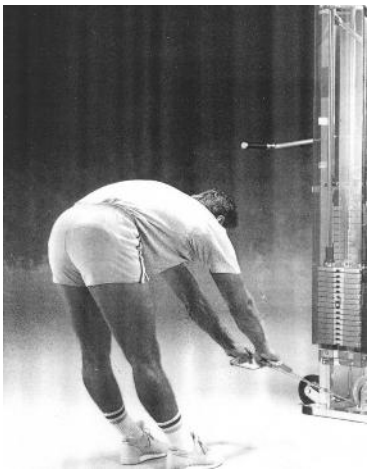
individuation and integration

Another factor that adds to our rich movement potential is the high degree of individuation we acquire as we mature. Individuation is the ability to move one part on its own while leaving the rest of the body undisturbed. When we are mature we can stand very still and blink an eye without moving any other part of ourselves. This must have been useful during our hunting eras as a means of communicating silently. It is the body's ability to remain

integrated while individuating that enables us to keep our balance while we wink or wave.

But when a baby chuckles she kicks her legs and flings her arms around at the same time. Her unindividuated way of responding is very appealing. Perhaps we are nostalgic for the feeling of deep satisfaction such total response gives. As she gets older she'll get better at individuating her response: she'll be able to smile and wave one hand at a time. Her integration skills may not be the greatest yet so she might stagger a little; and she'll hold her hand with a charming floppiness while she is not yet very good at individuating her waving hand from the gross movement of her arm.

The trap we fall into is that because we are moving only one part, we assume the unengaged parts don't need our attention, they can go hang. It's a mistake to think that while I'm winking what I'm simultaneously doing with my legs can be ignored. On the contrary this is precisely the point at which I need my individuation and integration skills to be up to scratch. If I stiffen and shorten myself while operating my eye-lid musculature I shall be harming myself – while just winking. This is why exercises to strengthen one area of the body – without taking into consideration what is happening to the other parts while we perform them – can end up doing us overall more harm than good. How many people do you know who, subsequent to performing a 'back-strengthening' exercise, have developed a sore neck, knee or shoulder? They would not have had any guidance in how to use themselves to perform the specific movement - what to best be doing with the rest of themselves to ensure that they don't harm other parts of themselves in the process. We need both individuation and integration. Our superior separation skills must not obscure the fact that we act as one. It is fallacious to think that giving a wink or a wave are really all that we are doing.



By understanding a bit about individuation we can recognise that we act as one, under a central command. What the "I" decides to do, the brain then organises its specialist departments to carry out. First I must have the desire to do it, then – if it's something I've been practising for a while, such as getting a sandwich down my gullet, the software for grasping and moving my hand to my mouth kicks in. It happens before I know it. On the other hand, when I learn something new such as driving, I must first bring consciousness to the task. Once the skill is learned, I will then not have to give my attention to the particulars of steering, braking and accelerating. The vehicular controls will have become almost an extension of myself. I shall be able to listen to a talking book while I'm driving from Sydney to Brisbane. And I can be alert to the vicissitudes of the highway at the same time. I can respond to sudden ice or a lovely view.

At the learning stage, wisdom lies in acquiring good quality programmes both for task outcome and wear of parts. Imagine a programme that involves our putting undue stress on our necks each time we depress a pedal or change the cassette.

.proprioception and learning

By means of proprioception I experience myself. My proprioceptive sense lets me know

how firm a grip I need to hold the 'phone, or how much contraction I need in my arm for picking up an egg or a brick. We are born with some motor programmes, eg. how to lock onto the nipple. From the moment of birth we know where "up" is. But much development of our proprioception is acquired the trial-and-error way. By reaching fruitlessly time and again, babies learn how close to a toy they need to be to grab hold of it. They drive their mothers mad with their tireless pre-occupation with gravity. As toddlers they discover with their bodies how to get more power and direction into throwing a ball. A few tumbles on and they will be able to assess whether a tree branch is likely to support their weight; or to estimate how much of a run they'll need to clear the creek. Watching 5 yr-olds get to work on playground furniture demonstrates the drive to learn about the world from full body contact. They manage to exploit the possibilities of a construction well beyond the imagination of its designer. Watch them coming down the shoot: head first, feet first, on back, on front, pairs in tandem, pairs head to toe, at half bent shape, sitting, lying down, running back up, one leg over the side, arms behind back, eyes shut…and so on.

Later, with their

skateboards and roller-blades they execute inventive moves on the most improbable street furniture. As they accumulate bodily experience they are building programmes for application to more complex activities – ski-jumping, sailing, playing the piano, teaching the Alexander Technique.

Tool-handling, from the relatively simple business of smashing a bone with a stone, to the extremely complex performance of micro-surgery in ever more remote control, is also dependent on proprioception. Do you remember your first go on a computer before you had a grasp of how rapidly the cursor would move across the screen in response to your wrist movement? For those of us born before most of you, learning how miniscule the movement needed to be took a few goes. An equivalently indirect finesse is needed for learning how to operate ourselves efficiently in sitting.

why we sit so badly

What we now ask of a creature designed to sprint and forage in the wild, is that she sit motionless for hours maintaining her head in fixed relation to a screen. Here we are, eons into the future, and sitting more than ever. But how many of us do so safely and in a manner that keeps us in good working order? For most of us maturing is a disaster. We muddle along through life hoping that a bit of ill-considered exercise will counteract the damage caused by long bouts of collapsed sitting. Not even our olympic athletes can sit up. As babies we did it so beautifully until the harmful influences got to work. From banana-shaped strollers to high-heeled shoes – with poor parental modelling, ruinous furniture and unsatisfactory activities, such as studying for long periods, in between – both our use and consequently our kinaesthetic appreciation are subjected to deleterious influence.

Frederick Matthias Alexander – (1869 –1955) - discovered inaccurate proprioception by observing that, when he tried to straighten himself out, he found he was not doing what he *felt* he was doing. What he saw in the mirror was not how he thought he looked. Logically he supposed that a faulty instrument would not give an accurate reading; and since his use of himself was poor, he could see that proprioceptively he wasn't working too well either. He called this faulty sensing 'debauched kinaesthesia'. We can corroborate his findings with our universal experience of an apparent lack of ability to monitor our performance. Only when a knee, neck or lower back is damaged does the question arise of what we might be doing to ourselves. Only when the swimming coach tells us our faulty strokes are not taking us to the Olympics, or our dancing teacher suggests the netball team as an alternative, do we look at movement and co-ordination as something that has anything to do with consciousness

These days in Western societies good carriage in an adult is so unfamiliar that it is often misinterpreted as rigid. This is because we cannot interpret what we don't recognise. We use memory to recognise and assess what we are looking at. In this way an actor feels her way into a role by imitating a character's posture, gesture and facial expression. She knows how someone feels when their eyes bulge and their jaw is tense because she has felt angry too. When we have lost the easy uprightness we had in early childhood, our judgement of what another is experiencing will be correspondingly limited by our current range of postural experience between collapse and the sort of painful stiffness we associate with trying to stand up straight. We won't have a fresh supply of proprioceptive experience to tell us that sitting upright actually feels pretty good! The upright posture in the other person will be read as correlating with what we would be doing to ourselves if we held ourselves upright with the only musculature we now have at our disposal. It is this same faulty perception that leads us to think that baboons are smiling at us when they bare their teeth.

Alexander spent many years pondering the question of faulty sensory appreciation, concluding that conscious control in the use of the self was the way to re-establish co-ordination and shapeliness. He retained a remarkably youthful stance up to his death at 86 years which in 1955 was a great age. He would not have imagined how the end of the 20th century would see such an increase in human longevity. We now have many more years to live with malfunction and chronic pain if good use is not inculcated from an early age. It is common now to see primary school kids with very poor posture. With 90-odd years to go, we don't want to start them off with postural programmes that are going to have deleterious effects on their future well-being.

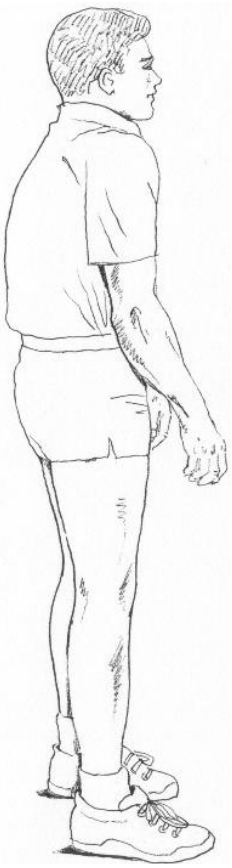
Improved co-ordination is learned

A shortened trunk is not so much a shortened spine, but rather a spine that has been pulled out of shape, particularly in its more flexible areas, by a combination of inactivity of some muscle groups and overactivity of others. The muscles packed around the spinal vertebrae that pull each one into proper arrangement with the one above and the one below, so as to achieve the spine's best overall length, slacken and atrophy from insufficient activity. So other muscle groups must take over the job of moving the animal towards its needs – in the direction of its food, or away from enemies.

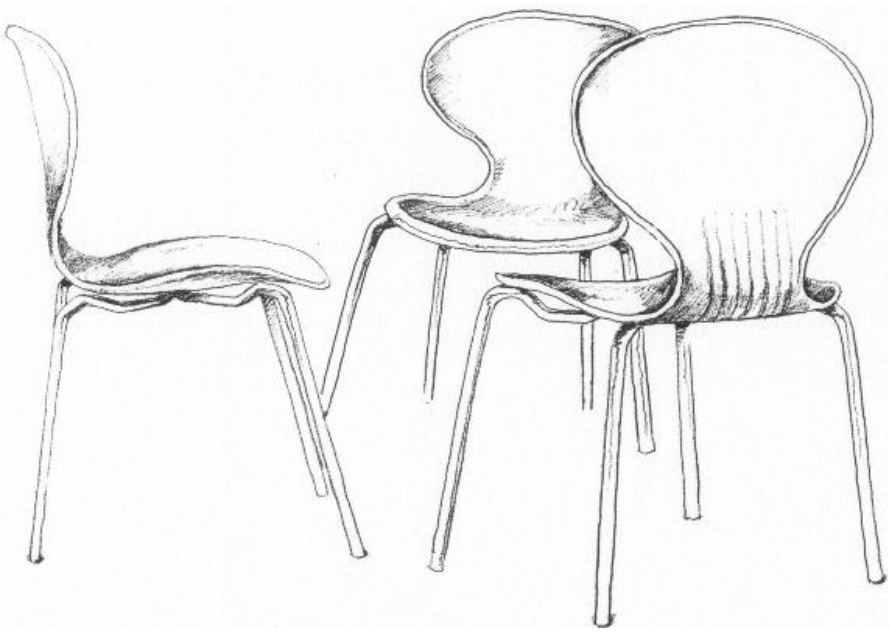
No matter how awkwardly he sits at his screen, a modern child's dominant need will keep him glued to his computer game until hunger intrudes into his awareness.Once his spine has begun to assume the shape he habitually uses for playing his games, his muscles will oblige by maintaining their length and bulk in accordance with the shape his body repeatedly assumes. Muscle has an habitual length. At whatever length it is normally used, it adds or sheds fibres in accordance with the everyday demands made of it. This is why it wastes to nothing when not used, and why it's possible to build more of it through training. But its elastic potential is also determined by use. The habit length of muscle determines the shape of the body within its genetic limitations.

doing sit-ups.....

If I do 100 sit-ups a day, I am practising drawing my upper body downwards with my hip flexors and, to a lesser extent, my abdominal muscles. Naturally this results in a very pulled down shape – and into the bargain considerable stress to my sacro-iliac joints. The shape thus arrived at will be one in which my vertebral alignment is also queered which will incur damage to the intervertebral discs and facet joints of my spine. This shape will also determine continued use of the wrong muscle groups – they will be the only ones available before long - so that the vicious circle continues until I interrupt it with intelligent strategy. Exercises to alter my shape – or my posture - will stimulate further use and development of these wrong muscles. What is needed is for this over-activated flexor musculature to diminish, so that the postural musculature can regenerate. I can only get this to happen by changing my use, changing the way I start to do things. I must abandon poor motor programmes and plan better ones. I must think.



.....results in a pulled-down shape



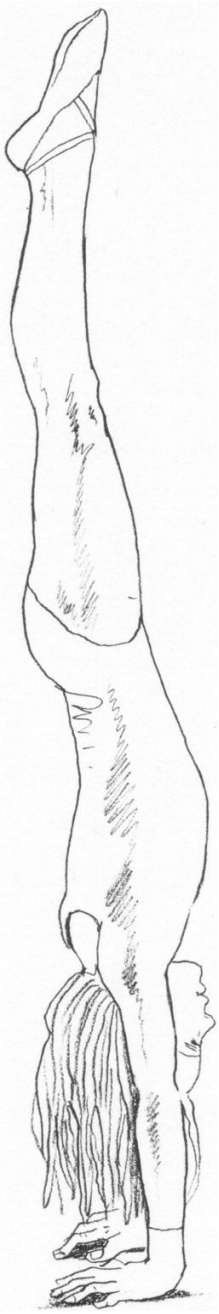
Alexander's method of re-education in the use of the self involves directing ones awareness to certain areas of the body and sending messages to inhibit the engagement of the wrong muscle groups. Simply, he called it his technique of "non-doing". Interestingly, recent scientific findings confirm his, in telling us that the postural muscles cannot be accessed directly. The physiotherapy patient can only get his multifidus muscles enlarging by directing his thinking to their region. Restoration of natural shape is achieved gradually by the cultivation of improved habits of use, never by the pushing, pulling and stretching involved in exercise programs, yoga positions, or orthotic appliances; and definitely not by being contorted into weird postures by the ergonomic contrivances that still bear the name of their ancestor – "the chair"!

F M Alexander said we must learn to non-do – to quieten the interference from the wrong parts of ourselves in order to stock up on better motor programmes.

how to sit well

Sitting is a process. It is not definitive and it therefore cannot be described in the same terms as fixed structures. In the sitting process there might exist an hypothetical relationing of parts that would result in the body's ultimate openness. Certainly just this ideal is what we must be asking for when we run our awareness through the neuro-network of our voluntary musculature in order to ensure that we don't tighten and interfere with its lengthening. But if we were to achieve such perfection we must be ready to relinquish it at once, or we shall have defeated our object. We would be trapped by fixation, which is contrary to being in process.

Processes are by definition ongoing. We want the process of sitting to be one where there is an asking for the shape to open, a releasing and balancing rather than a deliberate holding of ourselves in 'good posture' with instructions of the Head-Up, Shoulders-Back, Tummy-In variety. Generally it is now understood that the kind of instructions that get us gripping down into ourselves don't result in the opened out shape we want. It is increasingly recognised by health practitioners who address spinal damage that more release is needed. However, we have to understand specifically what we need to release, how to release it and where we want it to go to when we let go of it. Alexander further specified that we must not do things directly when it comes to re-organising the relationship of our body parts to one another, but we must *allow* the parts to move; that is, we must create the conditions conducive to their moving themselves. He was specific about the directions the parts must be coaxed to move towards, if the shape was to open out to its best. Jumping chaotically around or being bounced higgledy-piggledy in movement for movement's sake would not have impressed him. It absolutely cannot make sense to sit on a bouncing ball when the reason we sat down in the first place was to make it easier to steady ourselves for handwork. So we don't sit and stitch buffalo hides together any more; still, I wouldn't want my dentist to be wobbling around on a ball.



what to sit on

It is true to say that there are parameters within which it is more important how a person is using herself than what she is sitting on to do it. If she is using herself well she will do so with no detriment to her poise on a variety of furnitures. But outside those parameters the struggle to maintain balance becomes too much of a strain. For practical purposes our furniture must be designed in accordance with the body's need for support. We can walk on our hands, but our arms and shoulder joints are not designed to carry our weight. We are straining the structures if we do so for more than a couple of minutes at a time.

To understand what support is needed to sit well, we need to recognise that

behaviourly the head balances on the thorax which balances on the sacro-pelvis. Either the thorax or sacro-pelvis can be shifted into a new position but, in doing so, the other parts will have to correspondingly move to redress their inter-relationship to maintain as far as possible the verticality of the structure. If this correction were not to occur, the whole muscular wrapping that encloses them would have to contract unduly to stop the trunk from falling. It is possible to lean both the sacro-pelvis and thorax to the same side; but it is more probable that as the thorax moves to the left, the sacro-pelvis will tip to the right because the brain always seeks the cheaper option, the one that costs less effort. We couldn't sustain a lean of the whole for long.

However, most of the leaning we do will not be sideways but frontwards, collapsing the chest down towards the sacro-pelvis. We drop down in front. In compensation, the sacro-pelvis must tilt backwards, or we would topple. And of course, because the spine and the pelvis are attached at the sacro-iliac joint, the flexible lumbar spine is drawn back with it. The cervical spine – the spine's other flexible part – will have been dragged forward by the thoracic slump. And, in order to stay on top of it all, the head will correspondingly reposition itself backwards of the forward curving neck, depriving the structure of the beneficial effects of the weight when it's right on top. Instead, because it is now off balance, the head must now be desperately hung on to by hyper-contraction of small muscles in the neck. No marks for guessing that this collapse down the front results in 'neck problems'.

This is our most common slumping sitting posture, and we use it on any furniture. But

b)

when the chair seat is canted upwards from the ischeals towards the knees – the standard plastic moulded chair is a perfect example - this slump becomes the most frequently selected option of three unsatisfactory postural possibilities. The first possibility a) is that you hold yourself at the angle the seat cant is pitching you (but this is unlikely as it will be too hard to sustain any longer than you could stand on your hands); the second possibility b) is that you slump down as described above; and the third possibility c) is that you pull your flexible lumbar spine forwards, tilting the sacro-pelvis far enough forwards to counteract the tilt of the seat. This third option gives the appearance of 'good posture' because it is more upright; but it puts strain on the sacro-iliac joints, and on the joint between the fifth lumbar vertebra and the sacrum (L5/S1 in medical parlance), and in the region of the atlas where the head joins the spine. When the head sits too far forward of the spine – which is the case here – it has the same effect as when it falls too far back of the spine, in the case where the cervical curvature is increased. In both these adaptations to sitting on a slope, springing is lost in the trunk because the weight of the head is not falling through the spinal curves.

c)

a)

No matter how you dress up the canted chair seat - in little skirts, or by scooping deeper holes in the back to 'accommodate the buttocks' or similar fantasies, or by adding padding or tasteful upholstery - they remain the most profoundly damaging piece of furniture in our repertoire. If the ischeals are not on a horizontal surface, the slightest tilt of the pelvis – upwards, downwards, backwards or forwards - caused by a canted seat, will effect a proportionately much larger deviation from the vertical at the head end. The brain has to compensate for this lean by trying out all sorts of interesting and deleterious shapes.

When the seat is canted *downwards* from the ischeals towards the knees, a new set of

problems arises for the sitter. To give due merit, the development of this alternative chair design is thanks to thoughtful health practitioners and Alexander Technique teachers who have recognised the harmful effects of canting the seat upwards. But faults are not simply corrected by substituting their opposite. Living things are as complex as things get on this earth, so that, as Alexander discovered, subtle and indirect method is needed to redress their illness and malfunction.

correcting the leaning tower of Pisa

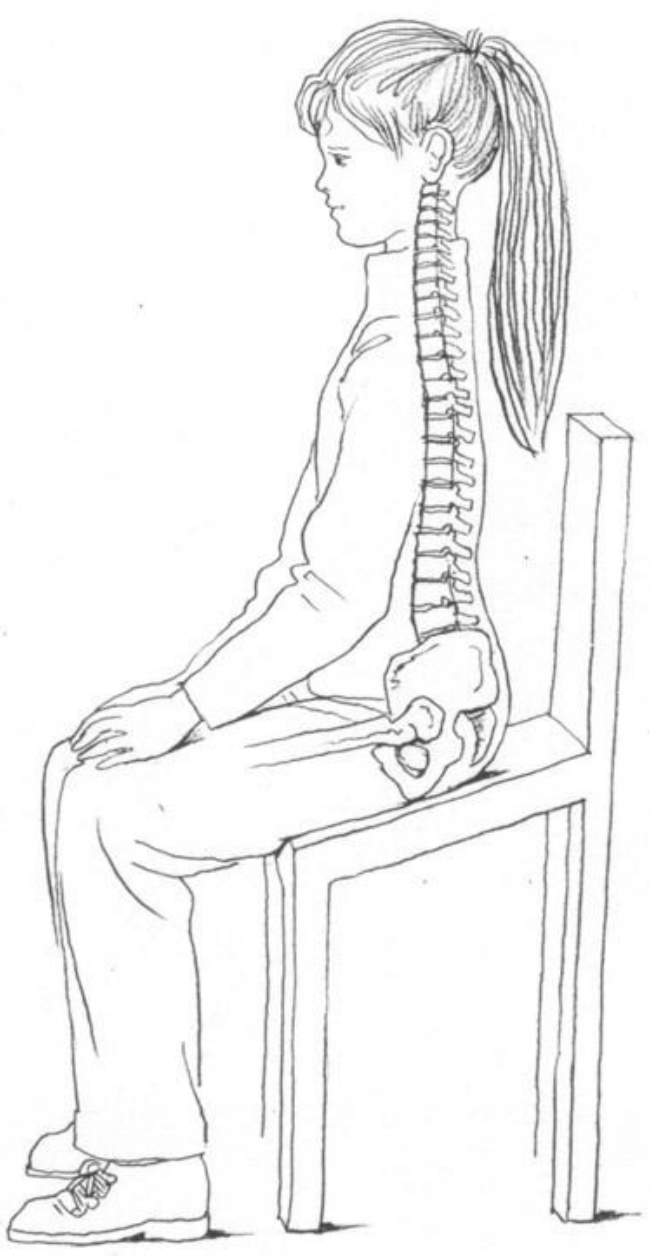
In the 1970s the application of simple logic to the question of spinal damage gave rise to the 'earth shoe'. The argument ran that since wearing high-heels caused damage to the sacro-iliac joints by pushing the sacro-pelvis forward into a sway-back shape, then wearing a shoe whose heel was lower than its toe must 'correct' the harm. This is about the same as saying that if too hot is bad, too cold must be good! This shoe further complicated the wearer's postural confusion by driving the sacro-pelvis too far backwards, bringing straightening forces to bear on the lumbar curve. To stop himself from falling over, the wearer had to tighten down in front, which drew his thoracic spine into a hump and pulled his head off balance so that his small neck muscles had to work overtime to support it. The shoe was a pain in the neck! Women didn't take to it at all. I remember thinking at the time that surely feet would have evolved a while before shoes were dreamed of? If it were useful to protect the foot from raw ground, there probably wasn't any extra benefit to be had from tilting it this way or that. The complex architecture of the human foot with its multiplicity of arches and joints, its free ankle joint and its specially sensitive skin covering, is designed to deal with a variety of surface textures and with every imaginable combination of tilts. But variation from a more-or-less horizontal surface occurs naturally only during movement, and therefore only momentarily while the weight is suspended. Even so, it is much harder work moving up or downhill.The body can adjust to having its bottom end on a slope, but it is more difficult to maintain for long. Close attention is needed to ensure that the better choice is made in adjusting the balance of the body as a whole. It is within our human capacity to walk on the very tips of our toes, but our ballet dancers need a thorough understanding of an efficient norm they can return their bodies to after the show. We must be careful not to use simplistic correctional logic where the elements of an equation are manifold and complex.

somewhere between

When the downwards canted chair seat is first

experienced by a person who habitually slumps she will enjoy it, as the pitching forward of her sacro-pelvis will relieve the immediate strain on her lumbar spine, and it will give the *spinae erector* muscles a fillip as her body lifts into a more upright shape. The movement would appear to produce the desirable Alexander Technique postural outcome – that is, with the back coming well back, and the head going forward. But it is soon seen that over-correction of the balance has occurred - the back has come too far back , sending the head too far forward in counteraction.

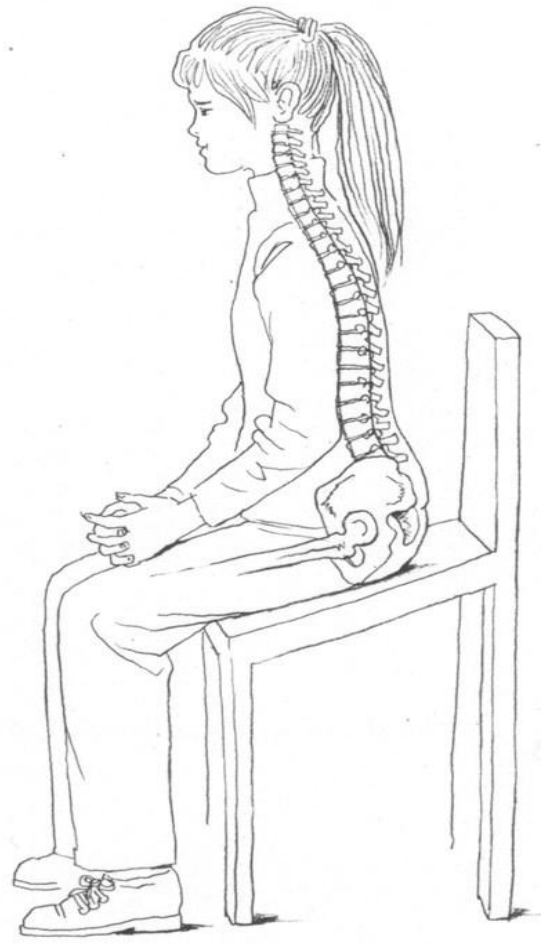
The over-compensation is revealed in the bulging backwards of the lumbar spine close to the thoracic area. Simultaneously, over-straightening of the natural forwards concave curvature in the thoracic and cervical regions has occurred. Before long the sitter's sensory apparatus will tell her she needs more upholstery, as the sacro-pelvis, straining to bring the body closer to vertical, will be tipping back onto a part of the ischeals not designed to carry weight. Her legs will be under pressure from their own weight as they fall away from the trunk, inadequately supported under the thighs. She will move her feet a long way forward to relieve the pressure. She might even feel pleased that her feet are now 'flat on the ground' as, in spite of high heels and earth shoes the belief remains that planted feet are best. (They are – but of course not by simply moving the feet further forward.) Without doubt she is more upright than when she slumped but, with regard to mechanical efficiency, she is no better off. The spine must not be too far forward; but nor must it be too far back. To encourage reflex muscular support of the trunk, it needs to be somewhere between.



compensatory spinal distortion resulting from sitting on a downwards-canted surface

compensatory spinal distortion resulting from sitting on a downwards-canted surface

When the sacro-pelvis is tipped forwards on a canted downwards seat, the body finds itself at an angle that it cannot maintain. It compensates by either leaning the thorax and head back from the lumbar spine, or by leaning the sacro-pelvis itself back as far as possible into the vertical. The first response is what occurs on the 'kneeling chair'. In the canted kneeling position the legs are prevented from pulling the whole thing over by in effect 'standing' the body on its knees. This is not comfortable for long because naturally knees were not designed to be 'stood' on. Nor is it good for the lumbar curve to be intensified by the sacro-pelvic tilt. When the sacro-pelvis is at sitting height, more commonly it seeks to rectify its position by leaning back against the drag from the unsupported legs.



too hard to maintain

If the body were to maintain the relationship of its parts in accordance with this move, it would have to be leaning back as though walking downhill. That is not the sort of hard work the sorting centres in the brain will opt for when energy needs to be conserved for handwork. Instead, it brings the upper body forward. Because the lumbar spine became rather over-straightened when the sacro-pelvis leant back, correspondingly the other spinal curves – the thoracic curve and the cervical curve – will also have been lessened; and which in turn will have positioned the head too far forward. This over-straightened condition can result from engaging in a range of movement systems, not only from the downwards-canted chair seat. The weight of the body is not able to drop naturally through the points of the ischeals at their new angle, so there is more muscular activity around the mid-trunk as it struggles with the imbalance. It is not restful. Nor does it give the benefit of exercising the postural muscles, as the over-stretch effected in the straightening of the spinal curves dulls their responsiveness. To the Alexander Technique teacher's hands, a trunk held too straight lacks a lively feel.

You can discover the straining effect of a downwards canted seat on the body's balancing mechanisms by leaning forwards on it. Then sit on a horizontal seat and lean forward. You will find there is less pressure on your legs too. Having the thighs supported makes leaning towards the keys or the kitchen table less of a strain.

When sitting has become painful, well-sprung support must be re-grown. It cannot be fixed by adopting a posture or by using an appliance such as an ergonomic chair, of whatever combinations of canted parts. When things have come to such a pass, rather more than a folkloric belief in exercise is needed to put them back together again. The whole self must re-learn good use if robust postural musculature is to be restored.

Whether we spend our working lives pole-vaulting or word-processing, the movement from stand to sit and from sit to stand puts the greatest constant demand on the neuro-muscular mechanisms of our structure. This is why Alexander Technique teachers use this everyday movement as a standard procedure for the practice of Alexander's principles. But the business of how this is achieved must be the subject of another paper. Meanwhile, since general knowledge has it that I am 70% water, I may as well pool in a firm container as slosh around in an elastic skin like a goldfish carried home from the Easter show in a plastic bag!

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