

The Alexander Technique in the world of design: posture and the common chair

Part II: Body-conscious design for chairs, interiors and beyond

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Galen Cranz

Part I established that chairs are health hazards and that status concerns have blinded most people in our civilization to their physiological inappropriateness. Part II explores the possibilities for more rational, body-based designs.

Better chairs

What might body-conscious design mean for chairs? Most chairs are too high, so that they push up under what anatomists call the popliteal region (the region behind the knee). This means that most people under 5'7" tall endure undesirable pressure on the back of the thighs. The standard height of the front of a desk chair seat off the floor is eighteen inches. Since average height for an US woman is around 5'6", this standard is appropriate only for tall people, usually men. Most women, some men and all children do not have legs enough to allow their feet to reach the floor without

experiencing pressure under the thighs. Moreover, they will be unable to feel their 'sit bones' (ischial tuberosities). This is bad because these bones are structurally intended to carry the body's weight, and one should be able to feel them. By contrast, a person's flesh is not supposed to perform a load-bearing function. When it does, compression of the capillaries reduces circulation. The ideal situation, therefore, is for the bones to receive the load and transfer it down to the seat and floor. All this underscores the importance of one's heels touching the ground. Ergonomists agree that the heels are supposed to take a portion of one's seated weight (with the major portion taken by the sit bones) (Osborne 1982). But how can this happen if the chair is too high? The feet dangle, the heels are lifted up off the floor, the flesh behind the thigh is compressed, and one's pelvis is pulled forward. Often people end up sitting on their poor coccyxes

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instead of their ischial tuberosities. One conclusion is to make chairs lower to the ground, and in the meantime use books or boards on the floor to make up the difference in length between chair legs and human legs. Quite the opposite alternative is to make chairs very much higher so that they function as 'perches', discussed below.

The problem of having one standard size for chairs is especially acute for children. Figure 1 shows a fashionable chair for short people designed by Steve Narcissian, one of the students in the class 'Designing for the Near-Environment' at UC Berkeley.¹ Regarding size, think of the problem of Goldilocks. Should not chairs like shoes come in different sizes: one for mama bear, one for papa bear, and one for baby bear?

The issue of 'support' provides another major controversy. If a person practices what Rudofsky (1980) calls 'autonomous seating' that is, sitting without a back support, he or she uses all layers of muscles that keep a person upright. Lumbar support becomes unnecessary, even though it is widely thought to be so, even by ergonomic specialists. Similar folklore developed in the nineteenth century with regard to shoes. At the time everybody thought people had to have ankle support, so it was important that everyone have high-top shoes with laces (Rudofsky 1980)! Today this seems silly and people manage fine without ankle support. The case of lumbar support

¹The author created a seminar and design studio at the University of California at Berkeley called 'Designing for the Near Environment,' in which students design a shoe, a chair, and then an entire room interior. Through the process of development from one project to the next students learn how to pay attention to their bodies, discover the contradictions of chair sitting, and design to support more postures and activities than chair sitting.

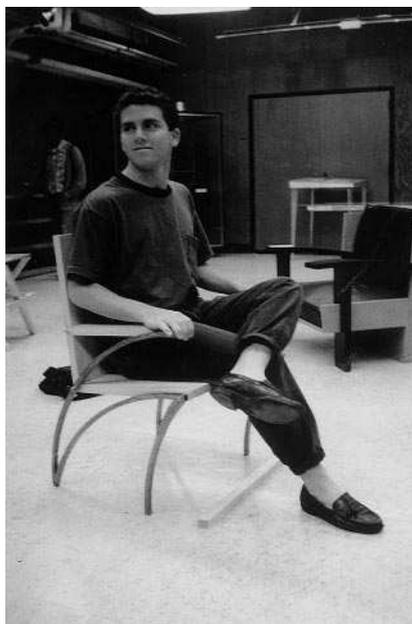


Fig. 1 Steve Narcissian, in a steel and wood chair of his design and construction, produced for course work with me at the University of California at Berkeley, 1990.

is similar — people do not actually need it if the musculature of the torso is allowed to work in a balanced way (Fig. 2). Lumbar support has been invented in an attempt to compensate for the strains put on the lower back by the traditional right angle seated posture which throws the spine into a c-shape. Changing the posture in favor of a better one (with the knees substantially lower than the hips — see discussion of perching below) would be preferable to trying to force the lumbar curve back into existence against the forces that flatten it. In fact, the case can be made that lumbar support is actually undermining people's strength and vitality.

As long as we continue to design and use chairs, what advice can be given to the hapless sitter? In general, planar backs and seats are

Box 1

When selecting a *conventional* chair, pay attention to the following *physical specifications*

- For conventional right-angled sitting, seat height should be no greater than the top of your knee minus 2".
- A forward-tilt seat. The more a task takes you forward, the more the seat should tilt forward; you will also require a forward slope for the work surface, and a computer at eye-level. Note also that the logic of forward-tilt seats argues for raising seat height significantly (4–6"), which creates a *perching* chair rather than a conventional chair.
- Firm-textured surface, upholstered but not more than 0.5–1" in depth.
- Flat, uncountoured seat.
- Space between seat and backrest.
- Mid-back support or full-back, neck, and head support excepting space for the buttocks.
- Flat, planar backrest.
- Armrests for support if reading, typing, painting, or other similar activities.

Now that you have the proper chair, you need to **use** it properly:

- Both feet should be flat on floor (helps organize the spine upward).
- Legs not crossed (helps protect pelvis).
- Knees should be lower than hip sockets (takes strain off lower back).
- Pelvis should not be rolled back.
- Spine should retain natural curves, but appear straight overall.
- Chest should be open rather than collapsed.
- Head should be balanced on top of spine, not resting back and down on it.
- Eyes should be able to look at work or people within a 15 degree zone, not forced to look too far up or down.



Fig. 2 In the perch, halfway between sitting and standing, the lumbar curve is retained automatically. Drawing by Denise Hall.

better than contoured ones.² Box 1 offers guidance for what chair to select — and how to use it!

Designs which support other postures

As important as it is to select the best chairs possible, no chair is perfect; the posture itself is stressful even with training. Selecting a better chair improves one's general welfare

²Backboards can be useful in eliminating the excessive curves in car, airplane and theater seats, but, unfortunately, most backboards are curved to provide lumbar support. The only planar backboard on the market is available through Posture Evolution Products, Katona, NY (Tel: +1914232-9968).

only so far; finding a way to incorporate a variety of different postures and movement into one's life routines is an even more significant step towards well-being. Body-conscious design means supporting a variety of different postures. Anthropologists have studied the problem of posture systematically; the American anthropologist Gordon Hewes (1957) has documented hundreds of human postures throughout the world. Human beings really can get into all of them! There is no truth to claims, for example, that it is impossible to squat. And, of course the most important observation is that in many cultures people live,

recreate and work without chairs. There are many examples of alternative postures and cultural amenities designed to facilitate them. Think of the Turkish sofa and divan, from which our words 'sofa' and 'divan' derive. Think of Japanese and Chinese platform tables. (According to environmental psychologist Gary Hart (1990), US children given a chance to design their own furniture reportedly reinvent these.) Or think of Persian carpets — formal ceremonies are conducted on them at floor level. Scholarship also has been conducted on the floor from India to Arabia. Finally, even in Western civilization important events took place without



Fig. 3 Constructive rest position.

chairs. For example, the Austrian American architectural theorist Bernard Rudofsky (1980) pointed out that the Last Supper was, in fact, not a seated event. It took place lying down as a Roman banquet.

Sitting is tiring, which is why people slump and seek the back rest for support. What else can one do when tired? As an answer, the Alexander Technique offers the rest position, sometimes also called 'constructive rest.' (Lying down may be the first line of defense against the tyranny of the chair.) Figure 3 shows how, instead of slumping, one can rest in a more constructive way. Simply lie down on a firm planar surface for 5, 10 or 15 minutes. One should do this at least once a day — and not on a bed. Lying on a hard flat surface offers the chance for the ribs to open out. True rest is not possible in a chair that mimics the body's shape, that wraps around the body pushing the organs in on themselves. But a hard planar surface provides the backing against which the pelvic wings can open out, and against which the ribcage can expand, making room for the organs and enabling the discs between

vertebrae of the back to plump up. This, not slumping, is genuine rest.

Figure 3 also shows that in the rest position one should keep one's knees up so the lower back goes all the way to the floor, and the hip, knee, and ankle joints open. If one then bends one's arms at the elbow, the elbow and wrist joints open too. Most importantly, one should think

about the head going forward and the spine lengthening. It further helps if one puts the head on something — a little book or a similar object — to reproduce in the horizontal the correct posture of the vertical: that is, the head slightly forward of the spine. In this position one does not have to do anything — just think about these directions and enjoy breathing. After that, slumping will not be such a temptation because one will feel refreshed.

Thus, a key for design exploration is the use of planar surfaces. What about the bench? Figure 4 shows a built-in bench in a Swedish farmhouse interior, while Figure 5 shows a beautiful stone bench in the Venice railway station. Figure 6 shows sittable ledges in American cities, which are at least dual purpose because one can use them to lie down on, too. Watch out for any product that claims to be 'organic' or biological just because it's curvy.

Most people might assume that the famous Reitveld chair is uncomfortable, but it is actually comfortable in the long run; its planes serve the structure of the



Fig. 4 A flat seating surface, a built-in bench in a Swedish farmhouse.



Fig. 5 Stone bench, Venice, Italy.

body, rather than its surface sensations. Charlotte Perriand and Le Corbusier's chaise longue in Figure 7 is also good because planar, and because of the open angle between trunk and thigh, but it is no longer a chair, strictly speaking. Beds also provide planar surfaces,



Fig. 6 Oakland, California.



Fig. 7 The chaise lounge by Charlotte Perriand and Le Corbusier. The original in 1925 has been copied by Conran and others in the 1980s.

and designers should try to incorporate them into living spaces, not just bedrooms. As a general rule designers should also create places where people can lie down in public. Figure 8 shows a beautiful scheme by an American artist, Lloyd Hamrol, and an architect collaborator in Santa Barbara, California. The main problem here was how to keep the edge of the cliff

from being eroded by people sitting there to watch the sun go down. This sculpture protects the cliff edge, not by fencing it off, but by offering a better place to lie down and watch the sunset.

The floor is another planar surface, exploited in this (Fig. 9) office in Berlin designed by students of Professor Nick Roericht at the Hochschule der Kunste (Carbonaro 1989). The entire office in these images is based on working at floor level — an idea that appears radical today in Western civilization. But it is not so radical as it first appears. For one, such an idea is not unfamiliar in other cultures. And even in our own civilization we work on the floor from time to time. For example, Figure 10 shows a scene from the auditorium at the Harvard Graduate School of Design. Child development specialists insist that infants should be allowed to play on the floor and that adults should spend time with them there.

Additional body-conscious artifacts can complement the chair. Foot stools are an obvious solution to the problems experienced by people whose heels dangle in chairs designed for long-legged men. Figure 11 shows an old-fashioned Swedish one, while Figure 12 shows



Fig. 8 Public art uniting sculpture, social use and ecological protection, by Lloyd Hamrol, Santa Barbara, California, 1990.

another from Pompeii which was used with a bed. Using this bed and footstool combination, one could lie down in the rest position or choose to sit up, Western style, feet supported. Contemporary Western culture needs more of them.

Other objects can substitute for chairs. Stools can provide an

element of high style while also taking proper care of the body. The one in Figure 13 was designed by Adrian Lee, a graphic designer and student of the Alexander Technique. The ball under the seat adjust its height, while the little knob at the back reminds one to think up along one's spine.³ Other stools employ a variety of heights; the two from Stockholm in Figure 14 correspond

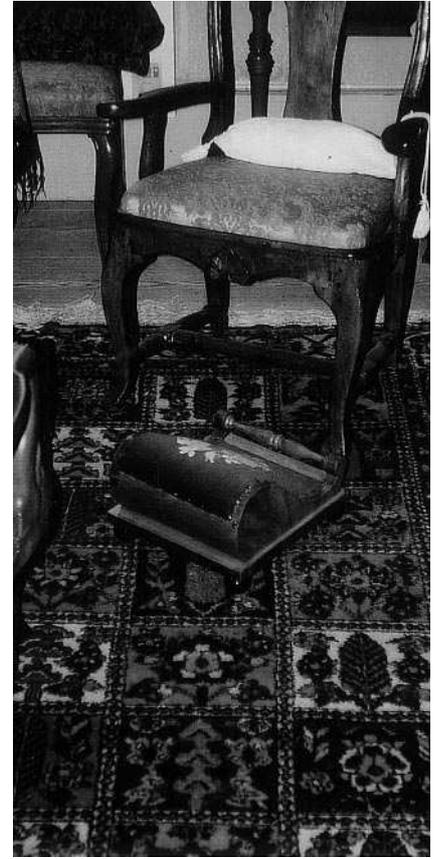


Fig. 11 Foot stool in Nineteenth century Swedish farmhouse.



Fig. 9 A floor based office in Berlin, from Ufficiostile, 1989.

³She proposed this design in 1990 in response to Cranx (1989).

to bars of slightly different height for different-sized people. A stool can sometimes look like a backless chair.



Fig. 10 Lecture hall at the Graduate School of Design, Harvard. Cambridge, Massachusetts, 1979.

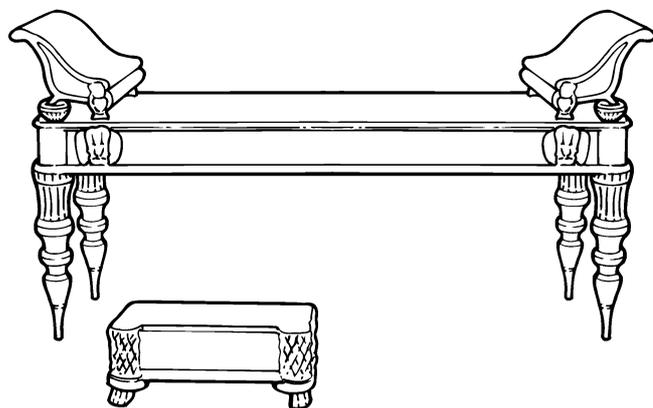


Fig. 12 Foot stool with bed from Pompeii.

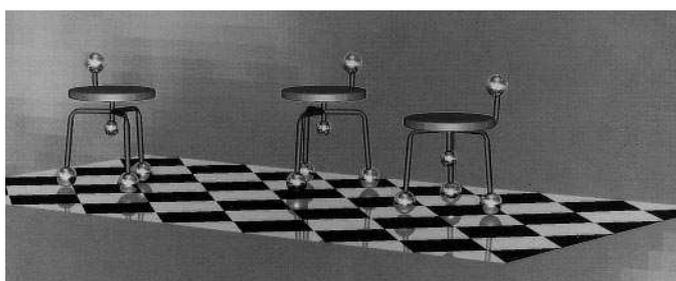


Fig. 13 Proposal for high style stool with adjustable height by Adrian Lee, 1990.



Fig. 14 Outdoor bar in Stockholm, 1989.

This is a contradiction in terms, but these from a nineteenth century Swedish farmhouse in Figure 15 really do look more like backless chairs than stools.

Designers might also spend more time addressing the problem of

stand-up work stations. They would be especially useful as one of several alternatives to chairs configured in a 'par course' situation where one would move from station to station for different activities. However, standing has its own drawbacks.



Fig. 15 Stools which look more like backless chairs, Nineteenth century Swedish farmhouse.

Standing tires the legs, and sitting tires the back, but halfway between sitting and standing is perching. This halfway posture is what Alexander called the 'position of mechanical advantage,' and what marshal arts students recognize as the 'horse'. Figure 16 shows an astronaut in outer space in zero-gravity; note the same open angle (120–135 degree) between trunk and thigh. The advantage of this posture is that it distributes the work of sitting upright evenly throughout the whole torso. Note that perching on a high (27") stool creates a similar leg-spine relationship. The Norwegian Balans chair, known variously as the posture, kneeling, or computer chair (Fig. 17), uses the same principle. This chair was designed to reduce the stresses on both sitting and standing; it creates the same 135 degree leg-spine relationship that professionals use to conserve their own strength when providing physical therapy to another (Fig. 18). However, it folds the legs merely in order to lower the body in space to be able to use standard height tables and desks; resting on the shins and losing proprioceptive feedback from the soles of the feet

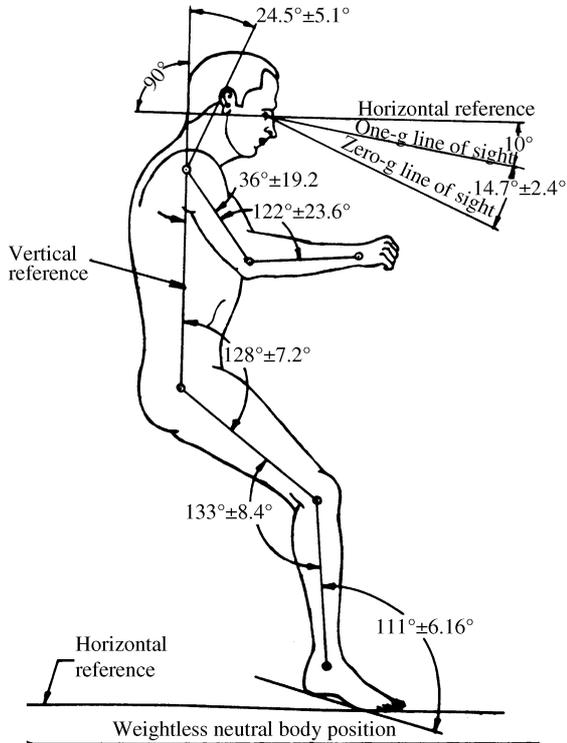


Fig. 16 The position of the body in zero gravity, sometimes called astronauts' position or neutral body posture. Drawing by NASA (National Aeronautics and Space Administration, USA).



Fig. 18 Physical therapist demonstrating the position of mechanical advantage, Stockholm, 1989.

rather than collapsing and stooping over one's work. Using the position of mechanical advantage would produce a correct upright position, but it would also require removing cupboard doors underneath sinks, and installing more pedestal sinks. Otherwise, kneecaps would bump uncomfortably into cupboard doors (Fig. 19).

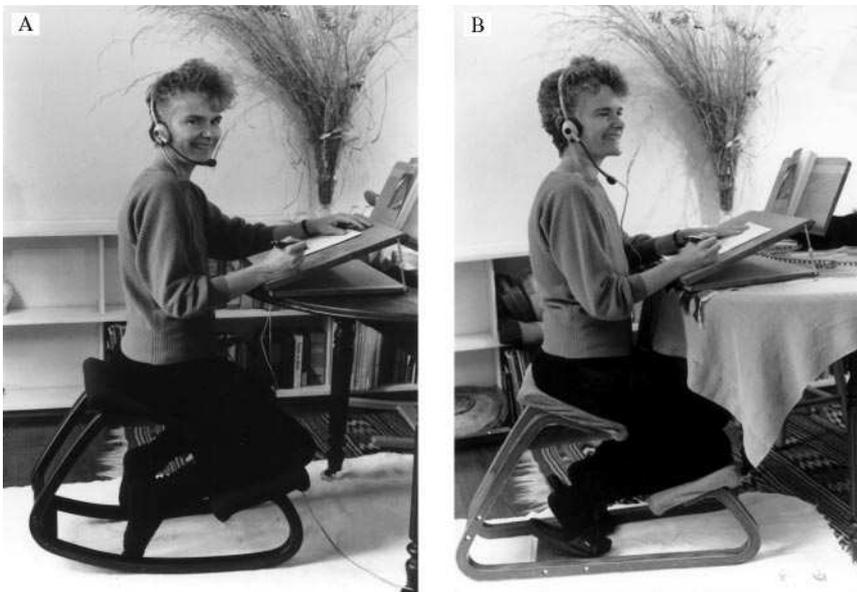


Fig. 17 (A) The original Norwegian Balans chair, Peter Opsvik designer. (B) The cheaper knock off with flat runners.

are two disadvantages of this compromise. Finally, note that a recliner uses the same 135 degree leg-to-spine relationship as the

perch, but rotated toward the horizontal plane (Fig. 7).

One should use an upright position when washing dishes,

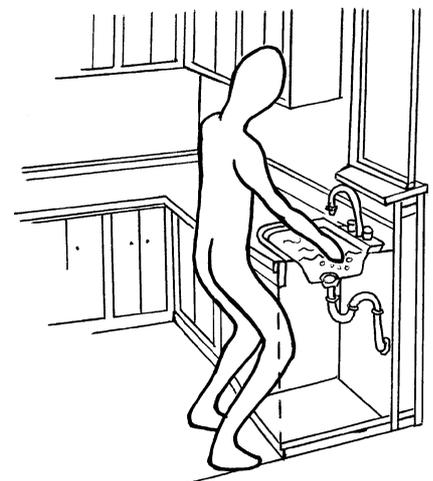


Fig. 19 To use the position of mechanical advantage while doing the dishes, cupboard doors may have to be removed.

Reading stands also need attention. The one in Figure 20 still looks like an awkward contraption instead of furniture, and could benefit from visual and sculptural refinement. Rockers are another arena where designers could do new work. For example, Peter Opsvik, who designed the Balans chair, created the rocker/Balans “Tripos” chair shown in Figure 21. Ergonomic office chairs are usually better than most side chairs, but they are not perfect. They share with ordinary chairs the drawbacks of the right angle seated posture. The best ergonomic office chairs available today are actually perches (Fig. 22).

A revolution in cultural values

In the face of need for such basic changes in cultural values, what can the average person possibly do? Doubtless there is much room for improvement in the near environment, but realistically speaking individuals are relatively

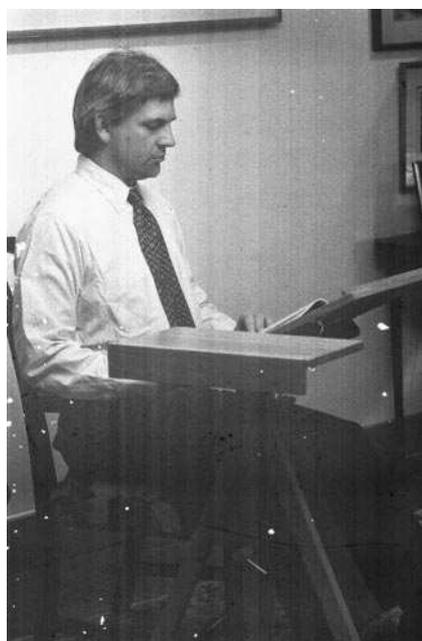


Fig. 20 Reading stands are essential to protect the head-neck joint.

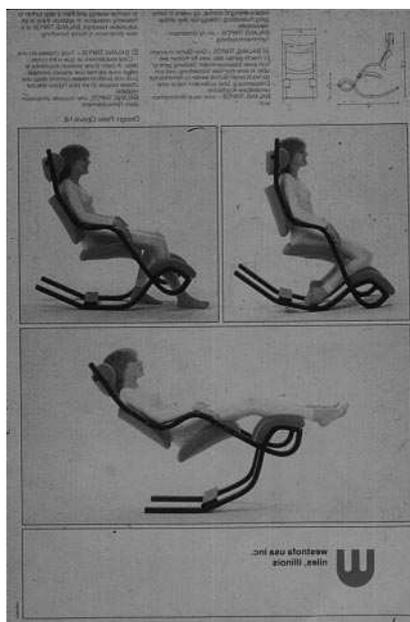


Fig. 21 Tripos, chair/rocker, by Peter Opsvik. Balans advertisement.

powerless. They can, however, take responsibility for themselves as users of chairs and other types of furnishings and as physical beings. The key may be to learn to use the environment properly, and one way to do this is to study a specialized somatic discipline like the Alexander Technique. But, eventually, entire cultures may become more body conscious. For example, in Sweden, occupational therapists actually teach workers how to lift bricks (i.e. not to lift them one-handed, and so forth). In Figure 23 they also show laborers how to take breaks constructively: lying down on the floor if necessary, in rest position with knees up or feet on the seat of a chair to insure that the lumbar spine is dropped all the way back to the floor for rest and to correct any tendency towards sway back.



Fig. 22 The Capisco saddle chair by HAG offers the advantage of the perch in an ergonomic chair.



Fig. 23 Swedish workers are told, 'It feels good to rest your back like this'.

accomplished standing up or in the lounge chair. Six of Alvar Alto's stacking stools encourage the practice of autonomous seating. In order to try to eliminate dependence on chair sitting, there is only one straight back chair. Tables do triple duty as places for paperwork, eating, or rest position up off the floor away from its drafts and dust.

Second, Figure 25 shows the floor-related office that a former student, David Robinson, set up at home. He likes to use the bed as an extra prop for books and other subjects. But he does not use the bed

However, body consciousness must also inevitably be combined with design improvements, because no matter how conscious people become, they cannot overcome the effects of lousy design. In the authors experience, the more body conscious one becomes, the more sensitive one becomes to environmental factors that cannot be overcome. Improved mental understanding must be combined with improved physical environments. Toward this end, the next three Figures show environments that attempt to bring a new way of living — both mental and cultural — together with appropriate hardware. These images acknowledge that a reconsideration of that fundamental piece of culture, the chair, inevitably requires rethinking the context in which it is used, particularly the height of work surfaces like desks and tables, but also window placement and floor surfaces. Not only interiors, but buildings themselves are affected by human posture.

The first of the three, Figures 7 and 24, show the author's apartment in New York, used when studying the Alexander Technique. Notice the stand-up work station and the Perriand and Le Corbusier lounge chair. Telephone work can be



Fig. 24 Body conscious design can be inobtrusive. Here a stand-up work station, tables for rest position and stacking stools provide alternatives to the classic right angle seated posture. Interior by author, New York City, 1990.



Fig. 25 Home office of architect and landscape architect David Robinson, San Francisco, 1993.

when he wants to practice the rest position — it's much too soft. One should have a special place in which to practice the rest position — a firm surface — and he uses his desktop.

Third, Figure 9 shows the office of the German 'new ergonomics' professor, Barbara Tietze. Her interest in Eastern culture led her and her colleague's students to set up this office where people sit on either low stools or zafus. But, instead of Zen zafus, of hard cotton, hers are malleable felt, part of a feminist commitment to softness and low-tech felt-making. Notice that to talk on the phone Professor Tietze uses a stool on a pivot. When she is talking on the phone she can use her legs and the pivot to be in constant motion.

Basically, this last is the most important principal of body-conscious design: design for motion, first and foremost. Ultimately, the search for the perfect static body posture is not the most important way to insure physical well-being. In office design, then, teams of managers and designs could organize a par course that might provide cycles in which people could do their work. Variation in posture is critical for health. But such a principle of physical motion runs counter to the whole ethic of efficiency by control. Employers want to get the maximum amount of work out of each of their employees, and they believe controlling individual work rhythms is the only

way to do so. Designers can help legitimize movement by planning and orchestrating work stations at which people stand, perch in the 135 degree stance, sit autonomously, lie down, and recline.

Clearly, much revolutionary work must go into exploring all the ramifications of a more body-conscious design of the near environment. This would involve letting the body become its own authority. And to do this, people's minds and bodies would have to be educated. People would have to learn to assess their physical well-being accurately and truly. They would no longer be content with undiscerning assumptions like the following: 'Well, I like this — it's soft and yielding, so it must be comfortable.' And, while individuals would have to re-educate themselves, at the same time we would also need to challenge those institutionalized norms that require people to sit conventionally to listen to lectures or to sit in formation to work. Responding to these twin demands on individual behavior and collective practices would transform our lives significantly, and for the better.

REFERENCES

- Alexander FM 1996 (originally 1910) In: Fisher JMO, ed. *Man's Supreme Inheritance*. London: Mouritz
Alexander FM 1984 (originally 1932) *The Use of the Self*. Downey, CA: Centerline Press

- Carbonaro S 1989 *The Office Cries and Asks for Freedom*. Interview with Barbara Tietze. *Officiostile* 22: 90-93
Cranz G 1998 *The Chair: Rethinking Culture, Body and Design*. New York: W.W. Norton
Cranz G 1989 *Redesigning the Home in Response to Ideas about Healthy Posture from an Integrated Body-Mind Perspective*. Symposium on The Meaning Of Home, Alvkärlby, Sweden
Gideon S 1948 *Mechanization Takes Command*. London: Oxford University Press
Greenberg A 1977 *Design Paradigms in the Eighteenth and Twentieth Centuries*. Via III: *The Journal of the Graduate School of Fine Arts*. University of Pennsylvania: 64-68
Hart R 1990 Personal communication. City University of New York, Program in Environmental Psychology
Hewes G 1957 *The Anthropology of Posture*. *Scientific American* 196: 122-132
Jones FP 1976 *Body Awareness in Action: a Study of the Alexander Technique*. New York: Shoken
Leibowitz J, Connington B 1990 *The Alexander Technique*. New York: Harper Perennial
Leuder R 1983 *Seat Comfort: a review of the construct in the office environment*. *Human Factors* 25: 701
MacDonald P 1989 *The Alexander Technique As I See It*. Brighton: Rahula Books
Maisel E 1986 *The Resurrection of the Body*. Boston: Shambhala
Myers TW 1998 *Kinesthetic Dystonia*. *Journal of Bodywork and Movement Therapies* 2: 246
Oates P 1981 *The Story of Western Furniture*. New York: Harper and Row
Osborne D 1982 *Ergonomics at Work*. New York: Wiley
Rudofsky B 1980 *Now I Lay Me Down to Eat*. New York: Anchor
Tinbergen N 1974 *Ethology and Stress Diseases*. *Science* 185: 41-45