
Guest editorial

The original spin doctors—the meeting of perception and insanity

“Fortunately for practitioners in this department of the medical profession, a safe and effectual remedy for the unhappy disposition of maniacs here referred to, has been made known to the public through the practical work of Doctor Cox, who, though he generously gives credit of the invention to the late Doctor Darwin, was the first who had the courage to apply to practice the use of the CIRCULATING SWING, and which is now become of so much consequence in the cure of maniacs of almost every description.” (Hallaran 1810, page 59)

Modern spin doctors attempt to manipulate political information so that it will appear in a more favourable light than it might do otherwise. Spin doctors of old were much more honest but they, too, were in constant contact with the insane and their actions could induce sickness. Two hundred years ago, Joseph Mason Cox (1763–1818) published his book *Practical Observations on Insanity*. It introduced a novel technique in its treatment: spinning the body round a vertical axis in a specially designed chair which was often called Cox’s chair. Cox had studied medicine at Edinburgh University and he was one of the first medical graduates specialising in the treatment of the insane. He took over management of Fishponds Private Lunatic Asylum, near Bristol, in 1788 and devoted his life to the treatment of its patients. Fishponds was founded in the mid-eighteenth century by Cox’s father and it was one of many family-run private institutions for treating the mentally disturbed; it was then held in high regard and Cox used a variety of treatment procedures in addition to spinning (Porter 1987). He had earlier used the method of swinging, in which a chair was suspended from the ceiling and set in back-and-forth or twisting motion (see Hunter and MacAlpine 1963), but he found that rotation in a specially constructed chair produced better results:

“[Swinging] may be employed in either the oscillatory, or common, or the circulatory form. The first, or oscillatory, is too generally known to require description: the second, or circulating, is easily constructed by suspending a common Windsor chair to a hook in the ceiling, by two parallel ropes attached to the hind legs, and by two others passing round the front ones joined by a sliding knot, that may regulate the elevation of the patient when seated, who, besides being secured in a strait waistcoat, should be prevented from falling out of the chair by a broad leather strap, passed round the waist and buckled behind the spars, while another strap to each leg may fasten it to the front ones of the chair. The patient thus secured, and suspended a few inches from the ground; the motion may be communicated by an attendant turning him round according to the degree of velocity required. But a more compleat rotatory swing may be very easily contrived, of which I cannot convey a more accurate idea than in the words of Dr. Darwin, with whom I believe the idea first originated. ‘Let one end of a perpendicular shaft, armed with iron gudgeons, pass into the floor, and the other into a beam in the ceiling, with an horizontal arm, to which a small bed might be readily suspended.’ To this perpendicular shaft a chair may be fixed, and the patient secured in it as above described. A considerable improvement to this swing is a strong rod of iron, fixed to the upper extremity of the perpendicular shaft, and to that of the horizontal arm at the foot of the bed, which may be easily so contrived as to be shortened or lengthened, and thus to regulate the elevation of the bed. The necessary motion may be given by the hand of the attendant pushing or pulling the extremity of the projecting arm, with greater or less force, each time it circulates, but by a little simple additional machinery any degree velocity might be given, and the motion communicated with the utmost facility. Thus, by means of the chair or bed, the patient may be circulated in either the horizontal or perpendicular position.” (Cox 1804, pages 102–103)

Cox recommended the therapeutic effects of spinning: “This is both a moral and a medical mean in the treatment of maniacs” (1804, page 102). As he remarked, the chair was the realisation of a plan for a rotating machine proposed by Erasmus Darwin (1731–1802, figure 1, left). Darwin did not make such a human centrifuge because he thought it unsuitable for his private patients, but he recommended it to those treating patients in hospitals; his design for the ‘rotative couch’ can be seen in Wade (2002). Darwin (1801) devised the device on the basis of his theory of disease, initially expressed in *Zoonomia* (1794, 1796); he believed that any treatment that encouraged sleep was beneficial. However, sleep was not the immediate effect produced by spinning. As Cox remarked: “One of the most constant effects of swinging is a greater or less degree of vertigo, attended by pallor, nausea, and vomiting; and frequently by the evacuation of the contents of the bladder” (1804, page 106). These are the effects that would be expected from vestibular stimulation, but the function of the vestibular system was not known at that time (see Wade 2003b). Nonetheless, Cox noted that “One of its most valuable properties is its proving a mechanical anodyne. After a few circumvolutions, I have witnessed the soothing lulling effects, when the mind has become tranquillized, and the body quiescent; a degree of vertigo has often followed, and this been succeeded by the most refreshing slumbers” (1804, page 104).

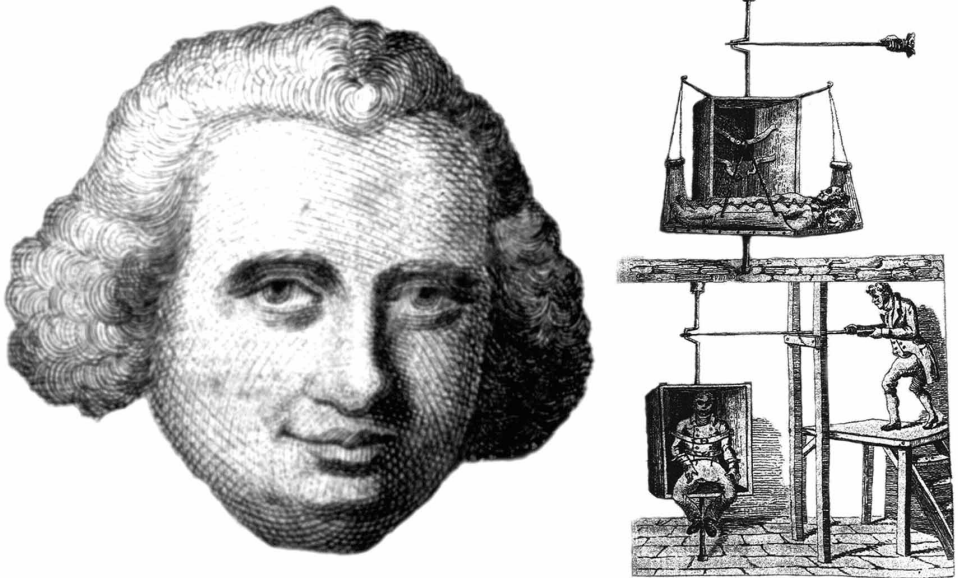


Figure 1. Left, Erasmus Darwin (1731–1802) after an engraving in *The European Magazine and London Review* 1795 27 75. Right, Hallaran’s circulating swings for the treatment of insanity—the bed and chair holding restrained patients could be driven together (after Hallaran 1818).

William Saunders Hallaran (c.1765–1825), like Darwin and Cox, had studied medicine at Edinburgh, where nervous involvement in all diseases was emphasised (see Comrie 1932). He was superintendant of the Lunatic Asylum of Cork, where he employed and adapted Cox’s chair to treat his patients. Cox was particularly indebted to Hallaran, not only for his book that considers rotation as a general treatment, but also for “having the entire management of a public institution, exclusively devoted to the reception and treatment of maniacs” using rotation. Hallaran’s device was more elaborate than that made by Cox:

“The circulating swing erected here, has been modelled from the suggestion of Dr. Cox. It is worked by a windlass, and capable of being turned an hundred times in a minute, and can with ease be regulated to the degree best suited to the intent. It is so contrived,

that four persons can if necessary, be secured in it at once, by dividing the platform attached to the perpendicular shaft into four equal compartments, which may, by removing the partitions, be occasionally adapted to the horizontal position. Powerful as this machine has proved to be, still in some cases, where its influence has been much sought for, it has had little or no effect, though actually put in motion to its full extent." (Hallaran 1810, page 67)

Hallaran (1810) reported of his spinning chair that: "since the commencement of its use, I have never been at a loss for a direct mode of establishing a supreme authority over the most turbulent and unruly" (page 60). Cox did not illustrate his chair, nor did Hallaran in the first edition of his book. However, in the second edition of his work, Hallaran (1818) depicted his rotating bed and chair (figure 1, right).

Cox's book was translated into German in 1811, and the technique attracted widespread interest and application in mental asylums throughout Europe. Ernst Horn (1774–1848) was a particularly enthusiastic advocate of its therapeutic value, and employed it extensively in Berlin's Charité Hospital (Windholz 1995). Müller (1998) has noted the many hospitals in which rotating machines were used, although they were not adopted without some caution. The treatment was not adopted uniformly throughout Europe; it was applied most widely in German speaking countries, and to a lesser extent in Scandinavia. Most models were based on that described by Cox, but local variations were introduced. Cox's chair continued to be used sporadically as a form of treatment in asylums for the insane for much of the nineteenth century, although the peak period of its employment was between 1810 and 1840. Some rotating chairs are still in existence in hospital museums (see Wade et al 2005).

Rotating patients in a human centrifuge seems rather crude to us, but it should be seen in the context of the competing treatments that were available (see Hunter and MacAlpine 1963). Moreover, Porter (1987) singled out Cox and Hallaran for their awareness of the particular problems faced by patients in asylums. The alternative treatments to spinning listed by Cox (1813) were vomiting, purging, bleeding, digitalis, bathing, blisters, camphor, sedatives, and stimulants. Rotation in a chair produced some of these effects, and it was certainly one way of calming the otherwise violent patient. Cox was duly circumspect about using the treatment of body rotation, but his views of its benefits corresponded to those advanced theoretically by Darwin:

"The employment of such Herculean remedies requires the greatest caution and judgment, and should never be had recourse to but in the immediate presence of the physician. The debility arising from swinging is never to be dreaded, it is generally accompanied by sleep and a sense of fatigue, while the slumbers thus procured differ as much from those induced by opiates, as the rest of the hardy sons of labour from that of the pampered intemperate debauchee." (Cox 1804, page 105)

This defines the moral as well as the medical benefit of spinning. Although rotation was considered by Cox to be a "Herculean remedy", his experience with it was seen as an improvement on the over-prescription of opium: "But the swing has another property which gives it very superior claims in these cases, that of procuring sleep, as mentioned above, and thus rendering opiates unnecessary, which very frequently not only fail in producing this desirable effect, but increase instead of diminishing the irritability, and often induce costiveness" (1813, page 170). However, in the Advertisement to the third edition, Cox presented spinning almost as a panacea:

"He [Cox] has persisted in the application of motion, in various directions and modes, by means of swings and other machinery, to certain classes of maniacs; and is convinced that no remedy is capable of effecting so much with so little hazard, and is decidedly of opinion that in almost every case it will produce perfect quiescence, allay all irritation, silence the most vociferous and loquacious, diminish that determination of blood towards the head, and that excessive heat of the surface, which so frequently obtain in some species of mania, will assist

the action of other remedies and medicines, and procure sleep after every other anodyne has failed.” (1813, page vi, original italics)

Such overblown statements were not necessary, as the basic calming produced in violent patients was reason enough for using the treatment at that time, as Lader and Allderidge (1975) indicate: “The circulating swing ... was a machine which spun the patient into a state of vertigo, vomiting and eventual unconsciousness. Since vomiting was generally regarded as a therapeutic event, and a collapsed patient was manifestly calmer than a manic one, this treatment scarcely needed the other and more subtle justifications that were given for it” (page 11). Moreover, there is now evidence that prolonged exposure to rotation can produce pleasing effects. Dodge (1923) was exposed to hundreds of rotations over many days and reported that “It can scarcely be over-emphasized how completely the character of the subjective reaction to rotation changed. Instead of being a disagreeable task the rotation experiment had a soothing, soporific character, both during and immediately after rotation” (page 21).

The spinning chair was designed for the treatment of the mentally disturbed but it had an unexpected scientific spin-off. The translation of Cox’s book into German resulted in its widespread adoption in hospitals for the insane. One of these rotating machines was used by Jan Evangelista Purkinje or Purkyně (1787–1869, figure 2, left) in his experiments on vertigo. He was not primarily interested in the medical applications of rotation, but in the use of the chair in investigating the subjective aspects of visual motion following body rotation. Initially, he examined the introspective aspects of post-rotary vertigo and made many experimental manipulations of it, as well as inducing vertigo by rotating the body in a specially designed device. He retained an interest in vertigo for the rest of his life and later, when he invented a magic disc or phorolyt for generating apparent motion, he produced a series of photographs of himself while spinning his body around (figure 2, right). Thus, we can still observe Purkinje spinning under the conditions he used to examine vertigo.

Prior to the introduction of the rotating chair, experiments on vertigo had been conducted by actively spinning the body about a vertical axis. When body rotation

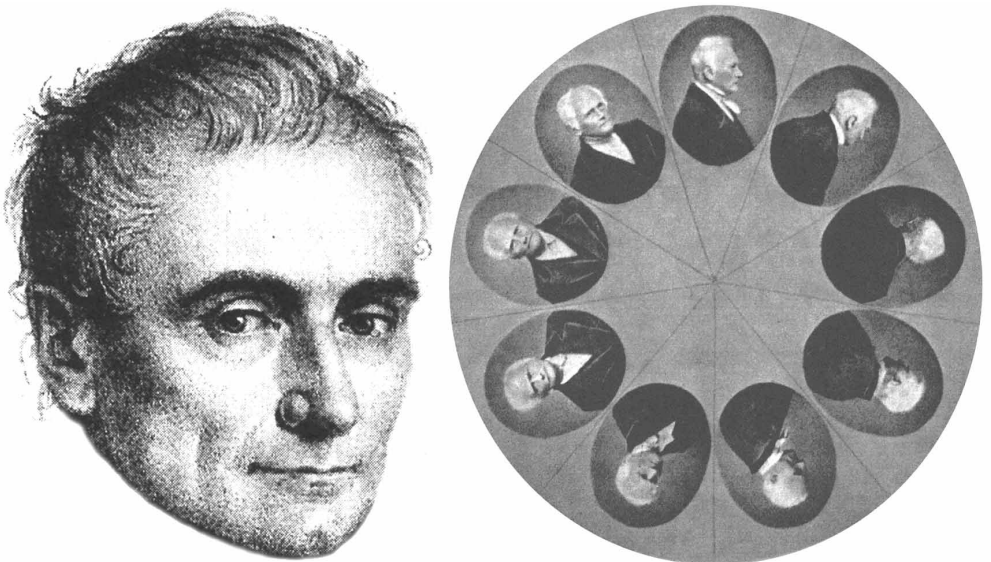


Figure 2. Left, Jan Evangelista Purkinje or Purkyně (1787–1869) after a frontispiece illustration in volume 3 of his *Opera Omnia*. Right, a sequence of pictures of Purkinje during spinning made for his magic disc or phorolyt for producing apparent motion (from Psoťníčková 1955).

stopped the visual world appeared to rotate in the opposite direction. It was this phenomenon that was studied with panache by William Charles Wells (1757–1817; 1792), and his research can be taken as heralding modern approaches to vertigo (see Wade 2003a). Like all good scientists, Wells was alert to the happy accident which he could exploit to the full: “In every part of natural philosophy, accidents often lead to discoveries, which reason alone might not easily have reached” (1792, page 34). In his case he became dizzy while conducting observations on binocular interaction between afterimages: he noted that the afterimages moved around in a manner that did not correspond with his muscular feelings of eye rotations. Thus, his experiments on visual vertigo involved generating afterimages before rotating his body, and then noting how they moved with respect to real images when rotation ceased. He appreciated that afterimages (which he called spectra) could be used as stabilized retinal images, and that they afforded a less subjective index of eye movements. This reflects the power of Wells’s approach to vision: he wished to avoid the use of subjective indices and sought more objective evidence. Using afterimages, Wells related the direction of visual vertigo to the orientation of the head during rotation and demonstrated how the eyes moved following rotation: he described fast and slow phases of nystagmus, and provided the first account of discontinuous eye movements in vertigo; he showed that nystagmus could be suppressed by attending to targets, and he described torsional nystagmus. This last was achieved by rotating the body with his head tilted backwards and then stopping the body and observing rotation of a line afterimage when the head was upright. Wells’s work was ignored or neglected, perhaps as a consequence of Erasmus Darwin’s hostile reaction to it (see Wade 2000).

Darwin (1794) had examined vertigo following body rotation, produced by actively spinning about a vertical axis, but he did not see the significance of his rotative couch to such investigations. Purkinje (1820), on the other hand, produced vertigo by rotating the body voluntarily, on a roundabout, and in a rotating chair. He described rotary and post-rotary eye movements and suggested that “visual vertigo is a consequence of the conflict between unconscious involuntary muscular actions and voluntary conscious ones in the opposite direction” (1820, page 95). In one characteristically heroic experiment he was rotated for one hour and then described the visual and somatosensory aftereffects that ensued!

Purkinje’s experiments with a rotating chair fuelled the interests of others to study visual motion using similar devices. Ernst Mach (1838–1916, figure 3, left) developed his own model of a rotating device for examining the perception of motion (figure 3, right). The wooden chair could rotate around a horizontal axis; it was mounted in a

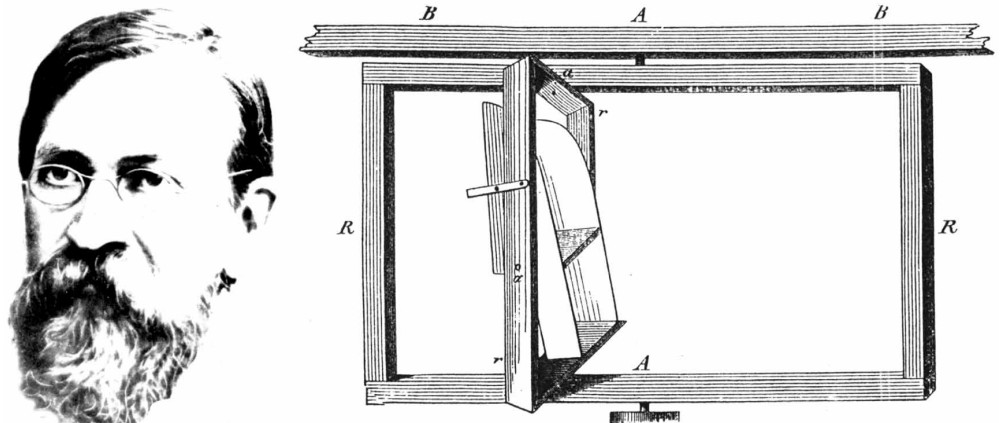


Figure 3. Left, Ernst Mach (1838–1916) after a photograph in Schmitz (1983); right, his rotating chair (from Mach 1875).

frame, rr , which could rotate around a vertical axis; this could be adjusted to different positions relative to another frame, RR , that could be rotated around a vertical axis. With this device he was able to investigate both visual orientation during tilt and the effects of rotation and he demonstrated that vertigo can be induced by visual stimulation alone. Mach made the explicit connection between Purkinje's experiments on vertigo and the function of the semicircular canals. On the basis of his spinning experiments, Mach advanced a hydrodynamic theory of vestibular function as did Joseph Breuer (1842–1925, figure 4, left) and Alexander Crum Brown (1838–1922, figure 4, right) at about the same time and independently. Both examined body rotation, but with less sophisticated machinery than Mach's: Breuer rotated the body actively, and Crum Brown used a revolving stool. Unlike many other independent discoveries these were not a source of dispute regarding priority. The three authors were scrupulous in acknowledging the research of the others (see Wade 2003b).

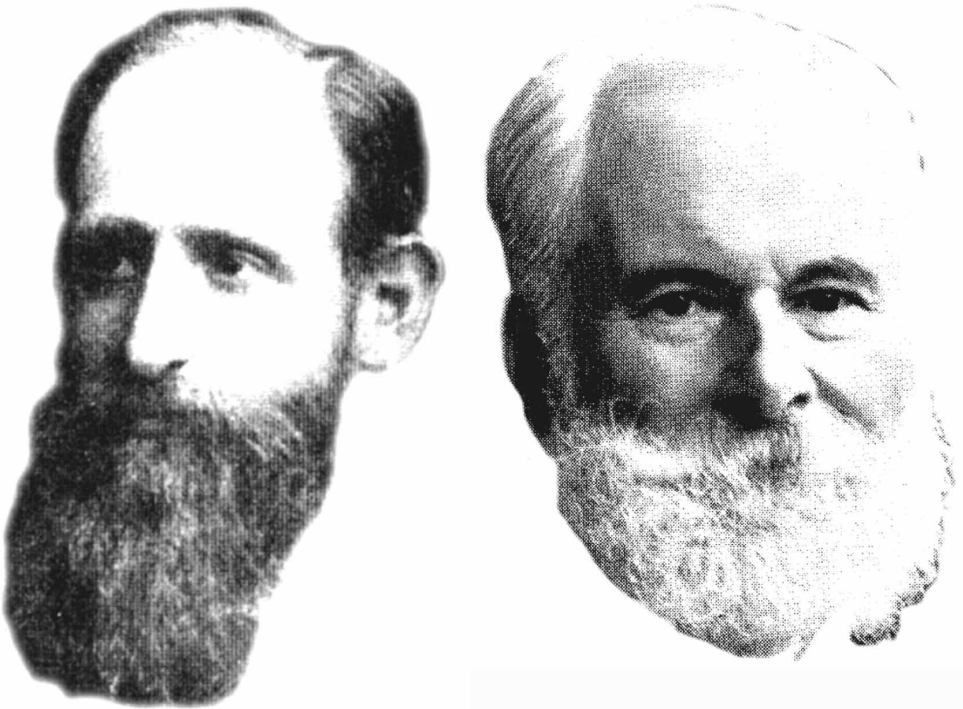


Figure 4. Left, Josef Breuer (1842–1925) after a portrait in Lesky (1965); right, Alexander Crum Brown (1838–1922) after a portrait in Comrie (1932).

One of the most readily observable consequences of rotation is nystagmus, and it is now used as a clinical index of vestibular function. Robert Bárány (1876–1936) modified the rotating chair and it is now called the Bárány chair! In addition to examining nystagmus following rotation in the chair, Bárány induced spinning sensations by irrigating the ear with warm and cold water. The procedure was known about and had been applied for many years; Friedrich Goltz (1834–1902; 1870) referred to it as common knowledge. This is now called caloric stimulation and it is a standard clinical test for vestibular function. Bárány's experiments using the chair and caloric stimulation were carried out while he was a physician in Vienna, where Breuer and Mach had been active experimenters. The award of the Nobel Prize in 1914 was announced while Bárány was a prisoner of war, although his release was expedited thereafter. On his return to Vienna, Bárány was dismayed by the reaction of his colleagues to the Nobel award; they did not consider that he had given adequate acknowledgments to the researches of those who

preceded him. Bárány moved to Uppsala and spent the rest of his academic life in Sweden. His major contribution was to integrate the experiments of Goltz, Mach, Breuer, and Crum Brown with the clinical studies of Prosper Ménière (1799–1862), and he summarised their endeavours with a musical allusion:

“*Purkinje* and *Flourens* (1825–1828) have devised an ingenious prelude, *Ménière* (1861) has introduced the first phrase, *Goltz* (1870) addressed a new theme, and the theory of *Mach*, *Breuer*, and *Crum Brown* concluded the movement, with a powerful, full-bodied accord. The second movement is like a fugue, where many voices whirl around one another, at one time with harmonic combination, and a moment later they are in conflict.” (Bárány 1913, page 399)

The human centrifuge, in the form similar to that described by Erasmus Darwin, has provided the foundation on which much vestibular research has progressed, particularly with regard to space flight (see White 1964). Problems associated with spatial disorientation during flight remain a major concern, and both the centrifuge and the Bárány chair continue to be employed in efforts to reduce sensitivity to vestibular stimulation.

The movement set in train by Darwin and Cox has taken some unexpected turns and some of the consequences of the original spin doctors are truly spine-chilling. As early as 1810, Hallaran observed that the rotating chair could provide amusement as well as treatment: “The idiots belonging to the establishment have used it sometimes when permitted, as a mode of amusement, without any inconvenience or effect whatever, and others during the intervals, with equal satisfaction; who, on the recurrence of the paroxysm, have not been able to resist its most gentle rotation for five minutes in continuance” (pages 67–68). The legacy of these spinning machines can be found in funfairs and theme parks throughout the world and sensations of spinning are now sought rather than prescribed. Many fairground attractions involve abnormal patterns of motion, both vestibular and visual. Some devices produce complex paths of body motion, so that the vestibular system is exposed to patterns of accelerations and decelerations that would never occur with self-motion. Swings and roundabouts have provided sources of pleasure for children for centuries. Now the humble roundabout has been transformed in a variety of ways to produce complex devices the names alone of which instil terror; indeed one such theme park ride is called the spin doctor!

The reports of the use of Cox’s chair and its variants rarely make reference to the visual stimulation that accompanies the rotation or swinging. This could have added to the feelings of disorientation experienced by the patients. Indeed, as Darwin (1794) and Mach (1875) showed, such disorientation can be produced by visual means alone. A contrivance that is closely related to the swings that preceded Cox’s chair induces conflict between the visual and vestibular systems. It is variously called ‘the haunted swing’ or ‘the witch’s swing’ and it consists of a platform on which an individual sits or stands and then experiences considerable self-motion when the surroundings alone rotate, although little physical movement of the body occurs (see Wade and Hughes 2002).

We associate disorders of perception with mental disturbances but we do not often think of stimulation of the senses as a treatment for insanity. Spinning chairs were used by doctors after Cox introduced one in 1804. Initially modest and later extravagant claims were made by doctors for the therapeutic benefits of spinning. It was widely adopted in Europe in the first decades of the nineteenth century, but lost favour thereafter. Its benefits have proved to be scientific rather than medical because it was used by students of the senses to investigate vertigo and led to an understanding of vestibular function. A century later it re-emerged as the Bárány chair for the clinical assessment of labyrinthine function. Another legacy of spinning chairs is to be found in funfairs throughout the world. Two hundred years after the invention of Cox’s chair as a form

of treatment for mental patients it can be thought of as a precursor of the numerous complex devices which can be found in theme parks around the world. Rather than impose the procedure on those who are not in a position to refuse, rotation is now sought after and paid for by those who seek vestibular stimulation beyond the normal range!

Nicholas J Wade

University of Dundee, Dundee DD1 4HN; e-mail: n.j.wade@dundee.ac.uk

References

- Bárány R, 1913 "Der Schwindel und seine Beziehungen zum Bogengangapparat des inneren Ohres. Bogengangapparat und Kleinhirn. (Historische Darstellung. Eigene Untersuchungen.)" *Naturwissenschaften* **1** 396–401
- Comrie J D, 1932 *History of Scottish Medicine* 2nd edition (London: The Wellcome Historical Medical Museum)
- Cox J M, 1804 *Practical Observations on Insanity* (London: Baldwin and Murray)
- Cox J M, 1811 *Praktische Bemerkungen über Geisterszerrüttung* (Halle: Renger)
- Cox J M, 1813 *Practical Observations on Insanity* 3rd edition (London: Baldwin and Underwood)
- Darwin E, 1794 *Zoonomia; or, the Laws of Organic Life* volume 1 (London: Johnson)
- Darwin E, 1796 *Zoonomia; or, the Laws of Organic Life* volume 2 (London: Johnson)
- Darwin E, 1801 *Zoonomia; or, the Laws of Organic Life* volume 4, 3rd edition (London: Johnson)
- Dodge R, 1923 "Habituation to rotation" *Journal of Experimental Psychology* **6** 1–35
- Goltz F, 1870 "Ueber die physiologische Bedeutung der Bogengänge des Ohrenlabyrinths" *Archiv für die gesamte Physiologie* **3** 172–192
- Hallaran W S, 1810 *An Enquiry into the Causes Producing the Extraordinary Addition to the Number of Insane, Together with Extended Observations on the Cure of Insanity: with Hints as to the Better Management of Public Asylums* (Cork: Edwards & Savage)
- Hallaran W S, 1818 *An Enquiry into the Causes Producing the Extraordinary Addition to the Number of Insane, Together with Extended Observations on the Cure of Insanity: with Hints as to the Better Management of Public Asylums* 2nd edition (Cork: Edwards & Savage)
- Hunter R, MacAlpine I, 1963 *Three Hundred Years of Psychiatry 1535–1860. A History Presented in Selected English Texts* (London: Oxford University Press)
- Lader M, Alderidge P, 1975 *The SK & F History of British Psychiatry 1700 to the Present* (Welwyn Garden City, Herts: Smith Kline & French Laboratories)
- Lesky E, 1965 *Die Wiener medizinische Schule im 19. Jahrhundert* (Graz: Hermann Böhlau)
- Mach E, 1875 *Grundlinien der Lehre von den Bewegungsempfindungen* (Leipzig: Engelmann)
- Ménière P, 1861 "Mémoire sur des lésions de l'oreille interne donnant lieu à des symptômes de congestion cérébrale apoplectiforme" *Gazette médicale de Paris* **16** 597–601
- Müller C 1998 "Die Drehmaschinen in der Geschichte der Psychiatrie" *Gesnerus* **55** 17–32
- Porter R, 1987 *Mind-For'd Manacles* (London: Athlone Press)
- Psoťníčková J, 1955 *Jan Evangelista Purkyně* (Prague: Orbis)
- Purkinje J, 1820 "Beyträge zur näheren Kenntniss des Schwindels aus heautognostischen Daten" *Medicinische Jahrbücher des kaiserlich-königlichen österreichischen Staates* **6** 79–125
- Schmitz E-H, 1983 *Handbuch der Geschichte der Optik* volume 3 (Bonn: Weyerborgh)
- Wade N J, 2000 "William Charles Wells (1757–1817) and vestibular research before Purkinje and Flourens" *Journal of Vestibular Research* **10** 127–137
- Wade N J, 2002 "Erasmus Darwin (1731–1802)" *Perception* **31** 643–650
- Wade N J, 2003a *Destined for Distinguished Oblivion: The Scientific Vision of William Charles Wells (1757–1817)* (New York: Kluwer/Plenum)
- Wade N J, 2003b "The search for a sixth sense: The cases for vestibular, muscle, and temperature senses" *Journal of the History of the Neurosciences* **12** 175–202
- Wade N J, Hughes P, 2002 "Perceptual pilgrimages" *Perception* **31** 1159–1164
- Wade N J, Norrsell U, Presly A, 2005 "Cox's chair: 'a moral and a medical mean in the treatment of maniacs'" *History of Psychiatry* **16** 73–88
- Wells W C, 1792 *An Essay upon Single Vision with Two Eyes: Together with Experiments and Observations on Several Other Subjects in Optics* (London: Cadell) [Reprinted in Wade 2003a]
- White W J, 1964 *A History of the Centrifuge in Aerospace Medicine* (Santa Monica, CA: Douglas Aircraft Company)
- Windholz G, 1995 "Psychiatric treatment and the condition of the mentally disturbed at Berlin's Charité in the early years of the nineteenth century" *History of Psychiatry* **6** 157–176

ISSN 0301-0066 (print)

ISSN 1468-4233 (electronic)

PERCEPTION

VOLUME 34 2005

www.perceptionweb.com

Conditions of use. This article may be downloaded from the Perception website for personal research by members of subscribing organisations. Authors are entitled to distribute their own article (in printed form or by e-mail) to up to 50 people. This PDF may not be placed on any website (or other online distribution system) without permission of the publisher.