

20 GLENN GOULD'S HAND

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The career of the Canadian pianist Glenn Gould (Figure 20.1) presents a unique opportunity to consider the interplay of personal and situational influences in the life of the classical soloist. His career also presents an object lesson concerning the influence and interdependence of physical and psychological factors in the artistic development of the musician. At the time of his death at the age of 50, Gould's life and musical accomplishments had been extensively documented and had already generated a significant body of published commentary and criticism. His biographers have drawn particular attention to his unorthodox medical history: from the beginning of his career until its conclusion he maintained ongoing contacts with a variety of doctors and other health practitioners. Given the persistence of a long list of physical and psychological symptoms (and the variety of treatments he sought and obtained for them), it is not surprising that a reputation for hypochondriacal thinking and behavior clings to his legacy as securely as does a reputation for interpretive genius. Against this background, a radical reinterpretation of Gould's professional and medical history may be warranted. Based upon a review of salient portions of his

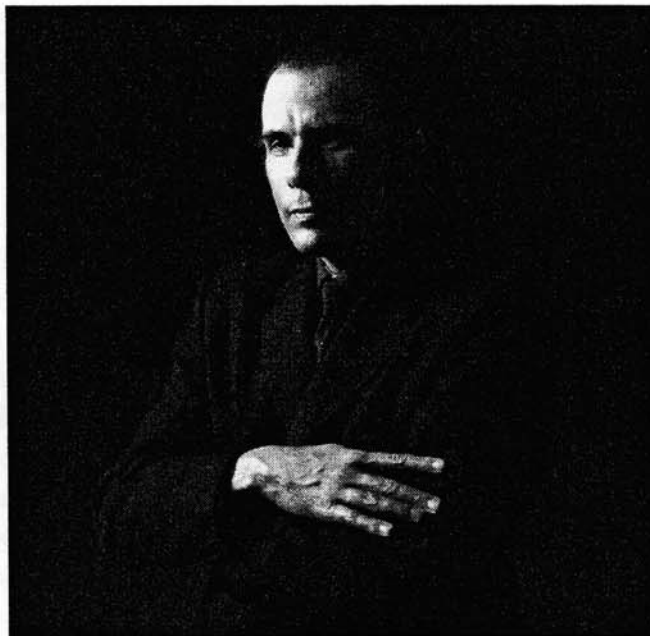


Figure 20.1 Glenn Gould.

medical history, and the print and film record, the author argues that in biomechanical terms Gould may have been almost completely unsuited for a career at the piano. Indeed, there is persuasive evidence that for virtually his entire career Gould struggled against and adroitly finessed critical limitations in upper body, forearm, and hand movement. Gould's unpublished 1977–1978 diary details the second of two major physical crises that disrupted his playing, the first of which preceded his departure from the concert stage. The second crisis, which began 5 years before his death, strongly suggests that he had developed focal limb dystonia. If this is so, his subsequent return to the recording studio would represent an unprecedented example of a musician's recovery (or partial recovery) from that disorder through retraining. It is widely accepted that Gould's re-recording of Bach's *Goldberg Variations* in 1981 provided musical history with its most celebrated reprise. With the late *Goldberg*, his other filmed performances, and the written record, Gould appears also to have left music pedagogy, performing arts medicine, and behavioral science with a rich trove of information concerning the origins, evolution, and vulnerabilities of musical skill.

A BRIEF CHRONOLOGY AND MAJOR MILESTONES OF GOULD'S CAREER

1932–1954: Background and the early years of music training and performing

Glenn Gould was born in Toronto, Canada on 25 September 1932. His mother, a voice and piano teacher, sought to foster her son's musical development with a home environment rich in the sounds of classical music, and had even begun singing and playing for him before he was born. As soon as Glenn could sit up, she began holding him on her lap at the piano, playing and singing to him. When he was 3 years old, it was discovered that he had absolute pitch. He played his first recital, a church music program, when he was 5, and at the age of 7 he qualified for entrance to the Toronto Conservatory of Music, where he began keyboard studies when he was 10.

Alberto Guerrero, a Chilean-born pianist whose speed and fluency at the keyboard were central to his reputation, was Gould's second and only other piano teacher. In 1945, 3 years after beginning work with Guerrero, Glenn gave a total of seven public performances of both organ and piano works, including a Toronto Conservatory performance of Beethoven's Piano Concerto no. 4 in G major. He presented his first commercial recital just after his fifteenth birthday. Over the next few years Glenn played more recitals and began to give radio performances; he also tried composing for the piano, tried high school, and (at age 19) broke off with Guerrero. At 20 he joined a childhood friend in forming a musical venture called *New Music Associates*, and he began intensive study of Bach's keyboard works, including the *Goldberg Variations*, a favorite of Guerrero's. His first performance of this work took place (during a hurricane!) on 16 October 1954.

1954–1955: Launching an international concert career

After performing with the Montreal Symphony in December 1954, Gould accepted his first American bookings: January recitals at the Phillips Gallery in Washington DC, and at Town Hall in New York City. Attendance at both of these programs was small—probably 35 people in New York, but both programs received rave reviews, and the New York audience included not only a cadre of America's best known pianists but the director of Columbia Records' Masterworks Division, David Oppenheim. Oppenheim immediately signed Gould to a recording contract, and in June of that year Gould made his recording debut with Bach's *Goldberg Variations*.

1955–1964: Live performance on the international stage

The response to Gould's American concert and recording debut was rapid and impressive. By the end of 1957 he had performed with 10 major orchestras (including those of New York, Pittsburgh, Berlin, and Moscow). Just as rapidly, he acquired a reputation for dazzling but wildly quirky musical interpretations, sudden performance cancellations, bizarre personal habits, and incessant musculoskeletal and psychological complaints. He openly relied upon, and advocated for others, a polypharmacy of drugs to keep his symptoms and worries in check. In a notorious 1959 incident (the more so because he was then a Steinway artist) he sued Steinway and Sons for \$300,000, complaining that he had been severely injured when their chief piano technician greeted him with an excessively forceful slap on the back.

1964–1981: Transformation of a stage career into a recording career

In 1962, Gould insisted to friends that he intended to end his stage career at the end of the next season. In fact, his last public performance was presented in Los Angeles on 10 April 1964. During this transition period he recorded and released a number of Bach works, including Book I of *The Well Tempered Clavier*. Recordings of Schoenberg, Beethoven and Mozart followed, along with his own light-hearted composition *So You Want to Write a Fugue?* Over the next decade and a half he continued to record, experimented extensively with and became an expert in electronic recording technology, lectured, published interviews and musical opinion, tried his hand at producing television, and became a pre-eminent and widely cherished (albeit decidedly hermitish) Canadian celebrity. He never sought to disguise his dislike of the stage, and indeed argued (as in a famous filmed conversation with Yehudi Menuhin) that recording technology would and *should* render stage performance obsolete. Moreover, writing in *High Fidelity* in 1966, he argued that recording technology would bring 'a new kind of listener—a listener more participant in the musical experience . . . , a potential usurper of power, an uninvited guest at the banquet of the arts, one whose presence threatens the familiar

hierarchical setting of the musical establishment' (Page 1984). This claim was more than prescient, as Gould had no way of knowing that within a mere three decades his new listener would be able to download and manipulate music from the Internet.

In April and May 1981, 26 years after he had launched his international career, Gould re-recorded and filmed the *Goldberg Variations*, a performance which some regard as the crowning achievement of his career. His final recording, the Strauss Sonata in B minor, was completed in September 1982, just before his fiftieth birthday on 25 September. He suffered a massive stroke 2 days after that birthday and died a week later.

THE PARADOX OF GOULD'S APPROACH TO THE KEYBOARD: AN INCONGRUOUS BLEND OF DEXTERITY AND DISABILITY

The roots of an unprecedented keyboard technique

The earliest descriptions of Gould's playing suggest unusually refined control of individual finger movements even as a beginning piano student (Ostwald 1997). Although his mother is characterized as an extremely strict pedagogue (which is to say, she was intolerant of missed notes), very little is known of what she contributed to the evolution of her son's celebrated keyboard technique. But much has been written about Guerrero's unusual methods. First, in order to promote maximal speed and suppleness of individual finger control, he devised and taught 'finger tapping', wherein note sequences are learned by having the fingers of the one hand slowly push or tap the fingers of the other into the keys. Another pianist (and Guerrero student) described this as 'a lowly, obsessive, and cultish exercise for acquiring absolute evenness and ease in tricky passage work' (Ostwald 1997, p. 71). Second, Guerrero encouraged Gould to sit low at the keyboard and to keep his fingers flat and his arms at keyboard level. Guerrero would sometimes stand behind Glenn, pushing down on the boy's shoulders while urging him to push up to strengthen the back muscles. This practice apparently distressed Gould's mother, who had always urged her son to sit up straight at the keyboard. Photographs of Gould when he began studying with Guerrero show him sitting in a balanced upright position, but from the time of Gould's late teens there does not appear to be a single unposed photograph of him seated or standing in anything but an exaggerated teenager's slouch, at the keyboard or away from it.

Presumably as a result of Guerrero's influence, Gould became notorious about his appearance at the keyboard, and he himself made jokes about it. In a piece written in his twenties, he said:

Like my former teacher at the Royal Conservatory, Signor Alberto Guerrero, I have developed a playing technique which involves a rather hunch-backed approach to the piano. It has its advantages and its disadvantages. On the positive side I gain finger clarity, better definition and feeling. On the negative side, it's difficult for me to get



Figure 20.2 The young adult Glenn Gould practicing at home, showing his signature attitude at the keyboard. Seated on the bench his father had prepared for him—whose seat is just 14 inches above the floor—he is extended at the pelvis and flexed throughout the thoracic spine, with elbows well below the keyboard; his wrist is held level with the plane of the forearm; left leg crossed over the right.



Figure 20.3 Another view from the same session showing just how low he really is seated. Note the far forward head position; note also the middle and ring fingers of the left hand resting (as they always appear in photographs) side by side. Note in the right hand that he tends to break the line of the forearm and hand at the proximal interphalangeal joint.

a really *big* sound, as in some of Liszt's fortissimos . . . Sometimes I play with my shoes off or get so carried away in a performance my shirt-tail comes out or, as some friends have complained, I look as though I were playing the piano with my nose. But these aren't personal eccentricities – they're simply the occupational hazards of a highly subjective business (Gould, undated letter).

In December 1955 (the year of his American debut and of the first recording of the *Goldberg Variations*), Gould wrote a long letter to Winston Fitzgerald, the chief artists' representative at Steinway. This distinctly coltish letter was the first in what was to become a long series of such communications detailing his mostly negative

reactions to the instruments Steinway provided him with during their long and sometimes stormy association.

As you may recall, the problems posed by the manipulation of (X-205) reduced my undoubted virtuosity (???) to the point of impotence. . . . I attributed its wayward indifference to my skill to what in innocent child-like naïveté I termed 'a stiff action, aggravated by an excessive draft' (to the key-drop, that is, though I recollect there was also one in the building) but since then the passing months and 3 concerts have taken their toll and I am no longer the gay lad whose irrepressible optimism saw in every obstacle a diverting challenge to its eventual triumph. Rather do I now regard each keyboard encounter with a faint chuckle, a connoisseur's [sic] relish of the wistful irony which has brought me to this stage, and a deeper, dare I say more mature understanding of the intriguing mixture of pedals, pins, and paradox which constitute – the common piano (Gould 1955).

In this same letter Gould suggests that the action of X-205 and his own technique are incompatible, and in so doing reveals that his posture at the piano has specific biomechanical, hence musical, consequences:

While the greater depth has undoubted influence upon the tone (which, of course, I still hold in genuine esteem) in combination with the loose key action it exerts a contradictory influence upon my muscular control. . . . It requires a dispatch of considerable impetus (from the upper arm) to reach the bottom of the key in chord-playing, while such force requires, I feel, much greater resistance from the key to accommodate [sic] the pressure I must needs accord it. So—unless I change my manner of playing (which would probably be healthier, cheaper and more comfortable) and become a *typical triceps terror* I conclude that X-205 and I have attained a parting of the ways [italics mine].

Here, in as succinct a defense of his low-seated, hunchback posture as one ever finds, Gould not only proclaims his distaste for pianists' gyrations and romantic musical bombast, but explains that he had learned to avoid such excess by deliberately restricting the extension range of the elbow joint. Nearly 20 years later, in a lengthy interview with writer-fan Jonathan Cott, Gould restated (and amplified) the musical rationale for his posture, which had become a mainstay of his performance mythology:

I discovered early on that there are certain keys to the kingdom in terms of manipulating the instrument which are not those of the Prussian school, obviously. The special circumstances in terms of repertoire have to do with situations that do not demand a widening of the hands—say Bach or Mozart or pre-Bach. But you cannot, you simply cannot play Scriabin in that position, for the simple reason that the leverage required to support a widening of the hands is such that you have to be further from the keyboard. But you *can* play Bach that way, and should, because by doing so you refine the sound, you minimize the pianistic aspects of it, and you increase your control (Cott 1974).

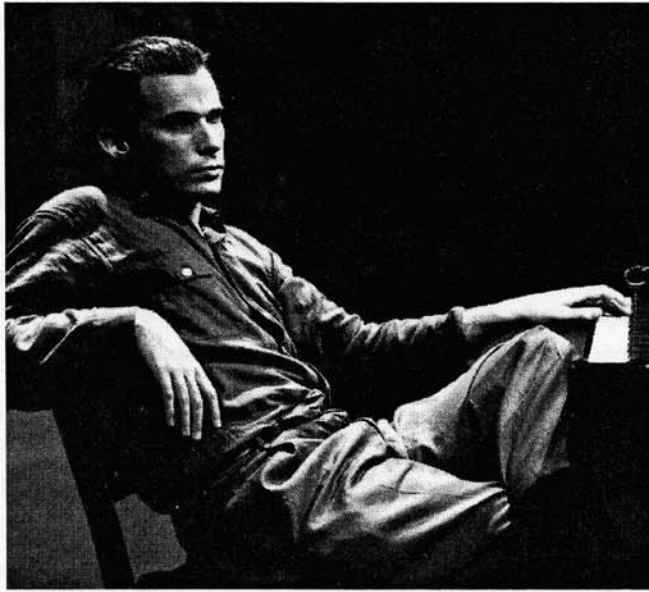


Figure 20.4 Gould taking a break. This habitual flexion posture could be a clue to one major source of his longstanding complaints of neck, upper back, arm and hand pain. The postural elimination of anatomically normal spinal curvature can slightly shorten the bony spinal column relative to the spinal cord; additional reduction of stretch-induced tension of the spinal cord and brachial plexus can be achieved by flexion of the hip and knee. Gould's flexion ('slouch') posture has been blamed on Guerrero, but it is a typical temporary compensation for rapid lengthening of the spinal column during the teenage growth spurt. Gould may simply have been misled into believing he should retain it. Note again in his right hand the proximity of his middle and ring fingers—in some photographs the fingertips are seen to overlap slightly; in the left hand, note again that he flexes the fingers at the PIP joint.

In biomechanical terms, there is a covert but profoundly important message in this explanation, which I had failed to detect on first reading. As I shall explain, its real meaning became clear only after a research year in Hannover and two subsequent re-readings of his 1977–1978 diary. Before considering the diary we must turn to Gould's musculoskeletal complaints, the dark historical counterpoint to his brilliant musical achievements.

Long-standing problems with the body

Gould's complaints about physical discomfort and about performance anxiety began long before his playing had attracted critical notice. Most of those who knew him well, and those who worked with him over extended periods, considered these complaints to be consistent with a notably hypersensitive constitution—perfectly in keeping with his unusual auditory and tactile acuity and his hyperacutely tuned aesthetic and critical sensibilities. Friedrich takes this tolerant and 'charitable' position in his biography,

suggesting that the physical and psychological complaints must have been elemental Gouldian wool and warp:

From his earliest concerts on, Gould often complained of debilitating ailments, and often canceled performances because of them. He seems to have suffered from some kind of circulatory problem that made his hands feel cold, and so he began using mittens, hot water, various pills. He felt susceptible to drafts, which led to sore throats and chills. He lived in dread of germs, viruses, infections. It is quite possible that these difficulties were largely imaginary, or a response to the stresses of playing in public . . . but a hypochondriac's pains really do hurt (Friedrich 1989, p. 28).

Following the famous 1955 Town Hall debut in New York, Glenn appeared at a postconcert party hosted by Rosie Leventritt. A mere half-hour after he arrived, however, he became ill and left. In discussing this odd and embarrassing breach of protocol (and opportunity, because, according to Harvey Olnick, Mrs Leventritt was furious at the disappearance of her guest of honor and 'hated his guts ever since'), Ostwald introduces another possible explanation:

The sudden illness was an acute bout of chronic fibrositis that had come on just before the concert. The symptoms—pain, tension, and a clumsy feeling in his arms and hands—had been familiar to him for years (Ostwald 1997, p. 114).

Glenn experienced pain each time he conducted, from keyboard or podium. He attributed the physical misery to an incompatibility between activity of the upper back and shoulder movements used for conducting and those required to play the piano (Ostwald 1977, p. 136).

Morris Herman, Gould's family practitioner in Toronto, corroborates:

He had a tremendous amount of anxiety. Much of it was focused on the upper part of his body. Often there was a lot of generalized pain and tension in his arms and shoulders (Ostwald 1997, p. 122).

1959–1960: The first playing crisis

The most extreme outbreak of these symptoms occurred in December 1959, following an incident at Steinway and Sons in New York. Gould reported to Dr Herman that the chief piano technician, William Hupfer,

trying in a coarse way to be friendly, apparently slapped him on the back. The move was a shock and a surprise (Ostwald 1997, p. 189).

Gould immediately sought help from Dr Herman, who could detect no objective evidence of injury, but who sent Gould for a consultation with orthopedic surgeon Morris Charendoff. After examining the spine, observing the hand movements and checking for nerve injury (all of which he judged to be normal), Charendoff reported back as follows:

Since that incident, he has been experiencing . . . a sense of fatigue, aching, and incoordination of the left arm and especially the left hand . . . particularly in his attempts to play the piano. He had also been aware of attacks of numbness and tingling affecting the 4th and 5th digits so that he was unable to properly coordinate these fingers in difficult technical pieces (Ostwald 1997, p. 189).

Recalling the incident, Charendoff wrote to Ostwald in 1995, speculating that Gould might have suffered 'a minor traction injury to the various nerves entering the upper extremity and particularly the roots of the ulnar nerve.' Throughout the winter of 1959–1960 Gould sought and received a number of treatments for his left arm, including massage and chiropractic treatments. The chiropractor, Herbert Vear, told Ostwald that he had found 'a lot of tension around and above the scapula on the left side.' Irvin Stein, a Philadelphia orthopedic surgeon, immobilized the entire left arm in an upper body cast, supporting it in an abducted position 'to reduce the stretch on the brachial plexus' (Friedrich 1989, p. 91). After the cast was removed, a Baltimore neurologist evaluated Gould and decided the problem was 'hysterical—a conversion reaction' (Ostwald 1997, p. 192). The left shoulder and arm continued to plague him, though, and according to Gould's close associate, John P.L. Roberts, Gould was depressed during this period (Roberts 1999). In July 1960, when he was in New York for a recording session, he wrote to his manager that when they began recording:

my arm was in the best shape it has been since last winter. I have been wearing the collar at all times when practicing . . . but without as much physiotherapy as I had been used to, the arm tightened up again in exactly the same way and finally . . . we cancelled Thursday's session and will take up again in August . . . The symptoms are the same as before—same knot, same aches, same fatigue (Friedrich 1989, pp. 91–92).

Although Gould returned to the stage after this incident, his ambitious concert schedule was in a steep decline from that point forward. There were no concerts between 17 December 1959 and 2 March 1960, and the total number of performances fell from 52 in 1959 to 22 in 1960, 32 in 1961, 26 in 1962, eight in 1963, and two in 1964. While there are many other factors which must be considered in interpreting both his flight from the stage to the recording studio, and the complex mix and progression of his physical and psychological symptoms in which he had become mired a mere 5 years after he had achieved international celebrity, there can be no doubt that his concert career was effectively over from the time of the 1959 incident.

1977–1978: The second crisis:

We now turn to the diary Gould began in the summer of 1977.

During the 2nd TV taping (first week of June) lack of coordination was immediately apparent—Opening theme of *Casella* was unbalanced and notes appeared to stick and scale-like passages were uneven and uncontrolled. At this period problem

appeared primarily in dynamically restrained passages. An unpleasant experience, and seemingly immune to solution by ad hoc pressures. During the next two weeks problems increased. It was no longer possible to play even Bach Chorale securely—parts were unbalanced, progression from note to note insecure.

Early in this diary, Gould introduces a term which he does not define, and whose precise meaning I do not believe can be extracted from the text. The word is 'indent,' and at times it is used in a way which suggests that he means simply the joint crease on the flexor surface of the finger, and at other times suggests he is referring to a finger joint that is sharply flexed (which would have the effect of making the crease visually more prominent). He refers many times in the diary to the 'indents' and indicates that at times they are involuntary, but that controlling them has become an established part of his strategy to solve the problem. The first entry continues:

All attempts to apply thumb indents as stabilizers failed; among other symptoms was inability to articulate chords without arpeggiation and to control even those chords at any but the most minimal dynamic levels. NB: Finger indents had appeared, in the exaggerated way described, in 2nd week of June; they appeared to be an uninvited semi-solution to the dilemma and materialized (uninvited) in the studio. This suggests that they were reacting to over tense area elsewhere (possibly top of hand knuckles).

On 29 September, he reviews what has happened:

No playing during past 3–4 days. Upon approaching piano, some degree of control was evident, but following problems were in evidence as well: (1) trill control hazardous esp. in stretched hand position (D major Partita); (2) frequent 'sticking note' syndrome; (3) as result of above, dyn. unevenness much in evidence; (4) still too much 'downward address' sensation; (5) collapsed spine and shoulder correlation were used, but from time to time reversion to curved knuckle was tried; it temporarily stabilized dynamic control, though at a very restricted range; (6) wrist flexibility as indent monitor was no problem but it did not alleviate problems as described above.

Present suspicion is that current thumb indent, thumb-web controls are not functioning properly because center of gravity is too high and distance from keyboard is too great. Experiments continue.

Through the diary we learn that many new shoulder positions were attempted. The effect of facial grimacing was investigated. The curvature of the back was modified. Mental imagery was used; sensations in the wrist and across the knuckles were monitored closely. He used favorite test passages to assess his progress. There were apparent breakthroughs and revelations, but again and again he would discover that he had not solved the problem. Now it is 1978:

February 6. 3'40". Disaster. The cycle is renewed. Super indents simply do not work . . . *la* deterioration symptom. At end of session spine was allowed to fend

for itself. Above all, I do not understand why the system which worked superbly and continuously in May '67 should be but a one-day wonder now.

March 5. The superb fluency of trills (every note with its own specific, minute, adjustment) was quite lost.

March 17. There was some concern about extreme lightness being suitable for other (than Bach) repertoire and about necessity to raise fingers well off keys as response to elevation controls. Elevation produced bumpy quality in articulation.

April 8. The pendulum continues to swing. During the past 3 weeks I have tried fingers-only control; for close to a week this seemed like the long-lost security blanket; it also seemed like a return to age 15 fingers-only style. Beginning on the second or third day, however, there were wrist tightness problems, and, gradually, the separation of one note from the next deteriorated into bumpy grouping and a general lack of fluidity. There was also a general lack of volume control—the fingers permitted only a very restricted surface contact. Finger position was sharply etched. [He draws a right angle figure here.]

April 26. A substantial list of pluses, in regard to the right hand, no debits. The left, in contrapuntal repertoire did not pose a great problem; the Toccatas, for example, were consistently fine. One wondered, however, what would happen if left hand was required to introduce thematic material.

June 16. Let us hope there will be no more entries: I do believe the solution has been found. It involves letting the hand–knuckle bridge rise as a result of the finger indent, an absorptive response to finger patterns. The rise treats the hand as a platform from which fingers reach out and explore the keys below. This makes maximum passage available to the thumb, which then proceeds to be indented but not pressured. Indeed, the secret is that because of the platform none of the fingers are unreasonably pressured, though all respond with indents.

June 23. Everything in the last entry is far from the last word. Last night, every conceivable variant was employed, none with success. For the last several days, right wrist had been unbearably sore after any 10–15 minute practice period. The discomfort seemed a response to the hand–knuckle bridge rise.

July 1. I went to apartment at 11:30 pm. The results were horrendous. G major Toccata and Fugue which had become a show piece was bumpy, unrhythmical and ditto everything else that was played.

The final entry is this:

July 12. As usual! 2 hr session provided unstable results . . . It was possible to switch, from moment to moment, to arm-drag systems; these, thru practice, ensured reasonable stability with Bach rep., but similar results were erratic and unfocussed in Krenek, etc.

After reviewing the diary with several physicians experienced in treating musicians with performance-related problems, who could agree only that Gould appeared to be struggling privately with a serious problem that was causing him great anxiety, Friedrich

came to no conclusions about the cause for this unprecedented interruption in playing (Friedrich 1989, pp. 244–252). Ostwald wondered if the hand problem might not have represented a complex reaction by Gould to the death of his mother, as if he were unconsciously seeking to re-unite with her by reviving in himself the same perfectionism with which she had taught him as a young boy. Ostwald also considers the crisis might have been a reaction to middle age, and to the notable physical decline Gould was experiencing at this point in his life (Ostwald 1997, pp. 298–303).

In 1988, when I first saw the diary, I was suspicious that Gould might be describing something more serious. By that time I had seen in my own practice a number of musicians with occupational cramp, or focal dystonia, and some of Gould's descriptions of altered control of timing and dynamics, and of unusual limb postures, were strikingly similar to the complaints of these same musicians. But there was no real basis at that time to dispute the conclusions of other interpreters, especially since most had observed his playing and knew him personally. But when I saw the diary again 2 years later I decided that my first conclusion had probably been correct. I had just returned from a year in Düsseldorf and Hannover, Germany, spent working on the problem of musician's cramp.

No one knows what causes occupational cramp, but until the early 1980s it was widely thought to be a psychological disorder. People who develop it tend to be perfectionists in their habits and have often been considered by their doctors to be hysterical. But in a landmark paper published in 1982, Sheehy and Marsden argued that occupational cramp is 'organic'—a variant of generalized dystonia, and neurologists who accept this theory have sought to clarify the details. Our own search between 1989–1990 for more clues to an explanation yielded no new specifically neurologic insights, but we quite unexpectedly found a functional quirk in the hands of nearly two-thirds of the musicians with focal dystonia. In these patients, even when the dystonia affected only one hand (which is usually the case), the fingers of *both* hands were severely restricted in both active and passive abduction movements—when the hand is held flat, the fingers do not easily move apart (Wilson et al 1993).

At first we thought we might be looking at an effect of dystonia rather than a cause: obviously, finger movements could easily be slowed under the influence of inappropriate cocontraction of agonists and antagonists. But virtually all of our musician patients insisted that they had always had to contend with a feeling of inflexibility in their hands. One pianist, a conservatory student, told us he could not understand why, as he put it, his *head* was always so far ahead of what his hands could do; indeed, it was a longstanding source of irritation to him that other students could play certain kinds of music better than he could. He had no trouble with Bach or Mozart, for example, but simply could not manage Schumann or Rachmaninov.

These musicians were both talented and highly motivated, and for all of them the problem had surfaced when they were under unusual pressure: an audition, an important tour, a recording, or when a solo program was being prepared to satisfy the requirements for a performance degree. In other words, the symptoms had developed when the stakes were high and time was short. Some also recalled their symptoms beginning

just after changing an instrument, when they were learning a new and technically difficult piece of music, or after a new teacher suggested or demanded a change in playing technique. Rarely, an apparently trivial injury seemed to act as a trigger. Taking these accounts together, we began to appreciate how often the onset of the problem coincided either with the imposition of a functional demand which the hand might not be able to meet at performance tempo, or with circumstances otherwise likely to precipitate a stress reaction.

We also began to suspect that the interaction of music and technique could unmask pre-existing biomechanical constraints—a particular structural or functional trait of the hand or arm unique to an individual—which by pure chance turned out to be unfavorable to the achievement of specific movement sequences, which is to say, playing certain combinations of notes on a particular instrument. Unaware of any anatomic basis for a technical limitation in his or her playing, the musician would intensify the practicing, the difficulties would increase, and the stage would be set for disaster. A hand whose problems had begun innocently with an occasional missed note, or a slight unevenness in rhythm or dynamics, would now go into spasms as soon as it made contact with the instrument in preparation for playing.

Musician's cramp has a particularly fiendish way of turning diligence to disadvantage, because it usually begins insidiously, with small oddities or discrepancies in performance, not unlike countless other impediments to fluency which normally respond to extra practice. In this situation, unfortunately, an increase in practice just makes matters worse, and by the time the musician realizes that something is seriously wrong, the trap has been sprung. A highly skilled hand has been innocently and ardently rehearsed into wreckage. The process can be slow, evolving over years, or very rapid—occurring literally overnight—and the degree to which the skill is affected can be minor or totally disabling. For a musician, of course, even the slightest interference with control of the hands can be musically fatal.

When, following my research year in Germany, I reread the Gould diary, I recognized that it would be very difficult to distinguish his narrative from the descriptions of the evolution and behavior of cramp in the great majority of musicians whom I had by then had the opportunity to evaluate. And when, in the light of this experience I reread the 1974 Jonathan Cott interview, I realized that in it Gould had unwittingly made himself a candidate for membership in the group of musicians biomechanically at high risk for focal dystonia. He did so when he declared that 'you simply cannot play Scriabin in that position, for the simple reason that the leverage required to support a widening of the hands is such that you have to be further from the keyboard.' What he was saying was that the preromantic piano literature favors a fingers-close-together position of the hands, whereas the romantic literature tends to require an outstretched 'posture of the hands'. Moreover, he asserts, the attainment of the latter posture requires the pianist to sit further from the keyboard. There are two possible implications of this statement, and they are really quite different.

The first possible implication would apply to any pianist sitting close to the piano with the elbows dropped and the hands flexed at the MP joints. In this hand position,



(A)



(B)



Figure 20.5 (A) Early and (B) 'middle' (pre-1977) Gould showing the stability of his preference for a low body and dropped elbow position, with hands flat and the fingers aligned with the keys. (C) and (D) This position leads to extreme ulnar deviation when the hands are kept close to the midline. In Gould's words, this is the position for Bach, not Scriabin.

(C)



(D)

finger abduction is at the minimum of its range and wide stretches are impossible. Sitting further back from the piano would favor extension of the MP joints and a marked increase in abduction range, or lateral spread, of the fingers. The second possible implication would apply only to a pianist who always experienced difficulty in 'widening' the hand, or who felt the need to straighten the entire arm in order to achieve forceful abduction of the fingers.

There are two ways one might decide which of these implications to associate with Gould's hand. By looking at him sitting close to the piano (the 'Bach' position) one would look to see whether the elbow is most often dropped or abducted, and whether the hand is flexed at the MP joints. Gould's statement to Cott thus became a mandate to examine films of his performances. That process began in 1994 and has continued to the present. The findings so far yield an unequivocal resolution of the question. There are two highly significant findings:

- When he is seated close to the piano his arms are often abducted and his wrists ulnar-deviated; wrists and fingers are generally held flat, and flexion is most often produced by a combination of flexion at both the MP and PIP joints (although flexion at the distal joint also occurs when the key is being 'brushed')—in other words, wrist and arm position do not force him into a hand position which restricts lateral movement of the fingers.
- His middle and ring finger move independently without any obvious restriction in the direction of flexion and extension, but rarely separate by more than a few degrees in abduction, no matter what the arm and wrist are doing.

Gould, in other words, was almost certainly a pianist at high risk for focal dystonia just on the basis of biomechanical factors in his hands alone.

Moreover, his longstanding postural idiosyncracies, his incessant complaints of circulatory problems in his hands, his chronic performance anxiety, and even the celebrated Steinway incident in 1959, all gain considerable importance and must be regarded as



collectively aggravating the risks posed by biomechanical factors in his hands. Beginning with his teenage years (when he stopped sitting up straight and began both his adolescent growth spurt and his work with the reputedly hunchback—apparently *pro*-hunchback, according to Gould—teacher, Guerrero) a whole constellation of postural and strategic factors came into play whose unopposed tendency was to compress and irritate the brachial plexus in the space between the scalene muscles and the clavicle, which was itself increasingly depressed toward the rib cage by the shortened muscles that secure the clavicle and corocoid process of the scapula to the anterior chest wall. (See Butler 1991 for a comprehensive treatment of brachial plexus tension, ‘double-crush’ injuries affecting the plexus, and the pathophysiology of neurovascular entrapment syndromes.)

Gould almost certainly developed a mild thoracic outlet syndrome in his teen years (as do many teenagers, when rapid lengthening of the spine predisposes them to slouch) and may have had the misfortune to have as a teacher a man who—if Gould’s assertion is correct—thought this was the ideal posture for playing the piano. Almost certainly, as well, he had areas of muscle tightness in the neck and upper back and around the scapula (as reported by the chiropractor who saw and treated him in early 1960). To complicate matters further, it is not unlikely that Gould’s apprehensiveness about playing, from the beginning, was as much a reaction to an uncooperative musculoskeletal system as to any purely psychological stressor. The two are not mutually exclusive, and in fact would have reinforced and aggravated one another.

Since Gould recorded the *Goldberg Variations* for a second time 3 years after the diary ends we are left in a quandary: did he ultimately solve the problem? Did it eventually subside on its own? Or did he simply discover a way to play around it? Whichever explanation is true, this is certain: Gould’s year-long retreat in 1977 and 1978 was not simply a footnote—or an embarrassing blemish—to his career. His second major physical crisis struck during the most productive period of his mature working years, and this crisis bears a striking resemblance to those which have struck other ranking artists in early- and mid-career. Gould may or may not have been a confirmed hypochondriac, but he was no fool. He was as deeply in tune with his own body as he was with the music of Bach, and when the hand problem forced him to stop work in 1977, with his career at stake and apparently convinced no doctor could help him, he turned his studio into an experimental laboratory with his own body as the object of inquiry. For the next year he used his eyes, ears, his exquisitely tuned kinesthetic sense, and his imagination, to dismantle and scrutinize virtually everything in his own posture and movements which might bear in any way on his playing.

With respect to the question of a diagnosable focal dystonia, the film record is helpful but not conclusive. Only rarely in films prior to 1977 do any abnormal movements (especially curling movements of the fourth and fifth fingers) appear. One sees consistently a hand that had exceptional agility in the vertical direction, and an extreme inclination to keep the middle and ring fingers side by side. This is a hand, in other words, for which the act of ‘widening’—to use Gould’s term—would require leverage. In Bruno Monsaiegeon’s superb film of the second recording of the *Goldberg*, the hand looks very different. There are multiple occurrences of involuntary curling of the fourth



Figure 20.7 Two adjacent frames from an out-take of Gould playing (A) Goldberg's 10th Variation at the recording session in April 1981. The time separating these images is 33 ms. Note the left fifth finger, which is curling tightly into the palm through maximal flexion at the PIP and DIP joints. One rarely sees hints of such a gesture in earlier films, which is frequent and obvious in the second Goldberg performance (B). (Images courtesy of Bruno Monsaingeon.)

(A)



(B)

and fifth fingers (typical of pianists with focal dystonia) and in many instances execution appears strained. It often appears (especially in the left hand) that downward movements of the fingers are initiated from the PIP joint rather than the MP joint, as in earlier recordings. The visual impression created by this film (even with customary retakes and the considerable editing which was done to achieve the final print) is not merely of triumph, but of uncharacteristic struggle and frustration.

CONCLUSION

Since we have lost the chance to examine Gould, the diagnosis of focal dystonia must remain a conjecture. If he did have musician's cramp he developed it in 1977, and on his own he managed to fight it to a draw. The diary provides abundant and specific documentation of the kind of altered hand control which invariably occurs in focal dystonia. And

there is no doubt Gould had a large hand whose third and fourth fingers rarely separated laterally when he was playing, even during octave stretches. It is not, I would emphasize, that they could not do this, but rather that the movement is rarely seen. This is precisely the same tendency we have learned to look for in all musicians with focal dystonia; it is observed before the dystonia develops, and it is a consequence of innate hand structure. If Gould did have a focal dystonia, he is virtually unique in having left us clear and extensive documentation of a thoughtful, meticulous and at least partially successful effort at remediation. He would also be one of very few pianists to find a successful venue in which to perform despite the limitations imposed by this disorder.

Gould's earlier and equally significant 'thoracic outlet' problem poses less of a problem diagnostically, and its implications reach far beyond Gould's universe of admirers and interpreters. He may have chosen to sit as he did for the reasons he often gave, but there were dire physical consequences and these same consequences face any instrumentalist (and indeed legions of computer terminal operators!) whose working postures encourage brachial plexus entrapment.

It will be for the Gould interpreters to decide what to make of his medical record. But this much is clear: his physical 'eccentricities' and the hand problem which surfaced in 1977 could well be the only visible clue that his arms and hands were not remotely capable of supporting in performance what his mind was capable of doing. The recording studio and a carefully selected repertoire gave him a place both to grow and to enrich the understanding of his listeners, where (despite his physical limitations) he produced a timeless and utterly distinctive synthesis of interpretive thought and musical execution.

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