

Portrait of a Unique Instrumentalist

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In September 1986 horn players from throughout the world gathered in Detmold, West Germany to attend the Eighteenth Annual International Horn Society Symposium. Lectures, master classes, and discussions among colleagues contributed to the event, but of dominant interest were the performances by the elite of the world's horn players.

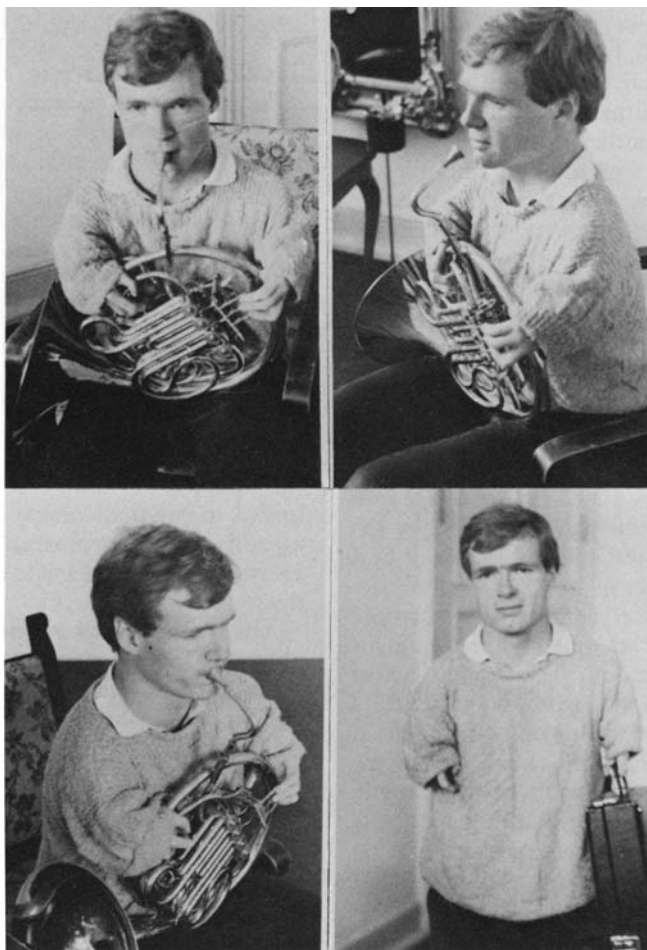
Among the performers was a young hornist from Freiburg, West Germany. Matthias Berg played the demanding Cherubini horn sonata with flawless technique. During the final concert, which included performances by such renowned players as Hermann Baumann and Ifor James, Matthias performed the Karl-Heinz Koper concerto and received a standing ovation. His youth and mastery of the horn aside, Matthias plays with a decided handicap—he has no arms.

Born with congenitally absent upper extremities, a condition known medically as phocomelia, Matthias has been able to master the art of horn playing—a skill attained by relatively few.

Matthias Berg was born in 1961 during the epidemic of limb and other developmental defects that subsequently were traced to maternal ingestion of thalidomide. In place of arms, Matthias has hand-like appendages attached to his shoulders.

Matthias' mother and father are musicians. His father, who plays a number of musical instruments including the horn, worked with him in helping him to learn to cope with the activities of daily living. In order to develop use of his hands, Matthias worked his fingers against the keys of the horn. His first exposure to the horn was therefore a therapeutic one.

How Matthias subsequently sounded the horn, became fascinated with the



horn tone, and actively attempted playing are now events he can scarcely recall. Because of his handicap, any progress in playing necessitated modification of the instrument and alteration of technique. Fortunately, the Finke Company, a German manufacturer of horns, modified a horn for Matthias' use. A special lead pipe that reaches his lips allows him to hold the instrument in his lap. In this position the keys are accessible to his left-hand-appendage.

In order to sound the instrument, the horn player must actively create each note. The basis of horn playing is development of the lips or embouchure. Only a slight change in the lips alters the tone. The range of the horn—three and a half octaves—is the great-

est of all brass instruments, so the "distance" between notes on the scale is very small. A minimal change in embouchure changes the note; thus the horn has a "built-in" problem with intonation. To address this problem, a hornist uses the right hand in the bell to shade the tone. This is not possible for Matthias. The tone must be borne entirely by the embouchure.

The horn is held in front of the performer in a position to allow maximum breath control. Holding the horn in his lap, as Matthias must, decreases the efficiency of breathing. He therefore needed to increase his vital capacity by strengthening his abdominal and chest musculature. He not only had to overcome the inherent chest weakness associated with his deformities but also

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had to overdevelop these muscles to compensate for the unnatural horn position. To accomplish this, Matthias began a rigorous program of muscle strengthening. He became actively engaged in various sports. Besides regular jogging, he has become proficient as a gymnast as well as an Olympic-class skier.

With unprecedented effort, Matthias' abilities grew. From simply playing the horn, he found he was gradually becoming an expert horn player. He won the German national competition for young musicians in 1981. In May of 1986 he won a special prize for the playing of a classical work in the International Competition in Geneva.

Incidence and Etiology of Congenital Limb Deficiencies

Congenital limb deficiencies are twice as common as acquired amputations. More than one limb is affected in 30% of cases of congenital limb deficiency, while all four limbs are affected in 10% of cases. Limb malformations may be caused by genetic or environmental factors or by a combination of both. Most limb defects develop during the embryonic phase at approximately three to eight weeks' gestation. Teratogenic factors during this period inhibit the rate of orderly differentiation of the fetal body's most rapidly changing part. Some defects may be associated with genetic syndromes. However, the majority of limb deficiencies are sporadic with no risk of recurrence.

Classification of Congenital Limb Anomalies

A number of terms is used to describe the types and degrees of congenital limb anomalies. Amelia refers to the total absence of a limb. However, the most common deficiency is a partial limb involvement designated by the terms hemimelia or partial hemimelia. In phocomelia a flipperlike limb is attached more or less directly to the trunk.

Medical Management of Children with Congenital Limb Anomalies

Children with lower limb reduction deficiencies are often benefitted by orthopedic interventions including surgical conversion of the affected leg to obtain an acceptable stump for prosthetic fitting. For upper extremity limb

reduction deficiencies, amputation is not desirable. Surgery is utilized in this situation to make possible the adaptation of special prosthetic devices such as a myoelectric device. The goal here is to approximate normal upper limb function. However, in a child with bilateral phocomelia, surgical interventions have not been possible, and independence can be achieved only with adaptive devices instead of prostheses.

Thalidomide Epidemic

In contrast to sporadic limb deficiencies, which may or may not be linked to a specific teratogenic agent, clustering of cases alerts physicians to an environmental factor such as drug exposure. Such was the scenario in 1961 and 1962 when MacBride, Weicher, and Lenz separately directed attention to the link between the increased incidence of reduction deformities of the limbs and maternal ingestion of thalidomide. The drug was withdrawn from the world market in early 1962, and the incidence of limb deformities returned to pre-thalidomide levels. On a worldwide basis, approximately 10,000 neonates had thalidomide embryopathy.

Thalidomide (DL- α -phthalimido-glutarimide, Contergen, Distaval, Kevadon) was synthesized in 1956 in laboratories of Chimie Grunenthal Gm Btl, Stolberg, West Germany. It was first listed in the German registry of approved drugs in 1957 and was prescribed for its sedative effect.

Thalidomide-related Anomalies

Although thalidomide may affect the development of almost any organ, the most obvious finding is reduction deformities of the limbs ranging from hypoplasia of one or more digits to total absence of all limbs. Phocomelia appears to be a fairly common type of deformity associated with thalidomide. The association of phocomelia, hearing loss, nasal hemangioma, duodenal stenosis, and other defects sometimes is described as thalidomide syndrome.

Instrumental Playing by Those with Thalidomide-related Anomalies

It would seem that children with upper limb congenital deficiencies such as bilateral phocomelia would have sufficient problems with the activities of daily living. Such deficiencies would seem to preclude the playing of a musical instrument. Any musical instrument for which manual dexterity is a

prerequisite certainly could not be approached. If, however, a different kind of skill were required such as an embouchure—as in playing brass instruments—an attempt could be made.

A number of musically-oriented children with upper extremity deficiencies have gravitated to the brass family of instruments, especially the horn. Matthias knew of only one individual who attempted to play another brass instrument: he had experimented with the trombone using his leg for moving the slide but this never proved satisfactory. Of the persons Matthias knew who attempted to play the horn, none was able to master the instrument—a most difficult instrument on which to become proficient even among those without a handicap.

Matthias' keen intelligence and musical ability as well as his outstanding embouchure made horn playing possible. However, only his great dedication and fortitude to overcome almost impossible obstacles allowed him to master the art of horn playing.

Matthias is optimistic about his future. He is presently a college senior with a double major—music and law. He confides that he is looking forward to pursuing his musical career, perhaps someday playing in a symphony orchestra. However, he is keeping his options open and also plans to continue in the field of jurisprudence.

Matthias Berg, a unique person, certainly is an inspiration to musicians, horn players in particular, as well as to all persons with physical disabilities.

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