

## Brief Reports

## Shell shock: Psychogenic gait and other movement disorders—A film review

Mariana Moscovich<sup>1</sup>, Danny Estupinan<sup>1</sup>, Muhammad Qureshi<sup>1</sup> & Michael S. Okun<sup>1\*</sup>

<sup>1</sup>Department of Neurology, University of Florida, Center for Movement Disorders & Neurorestoration, McKnight Brain Institute, Gainesville, Florida, United States of America

### Abstract

**Background:** The psychological pressure on soldiers during World War I (WWI) and other military conflicts has resulted in many reported cases of psychogenic gait as well as other movement disorders. In this paper, psychogenic movement disorders captured in the WWI film footage “War Neuroses” is reanalyzed.

**Methods:** Two movement disorders specialists re-examined film images of 21 WWI patients with various and presumed psychogenic manifestations, pre- and post treatment. The film was recorded by Arthur Hurst, a general physician with an interest in neurology.

**Results:** All 21 subjects were males, and all presented with symptoms relating to war trauma or a psychological stressor (e.g., being buried, shrapnel wounds, concussion, or trench fever). The most common presenting feature was a gait disorder, either pure or mixed with another movement disorder (15), followed by retrograde amnesia (2), abnormal postures (pure dystonia) (1), facial spasm (1), head tremor (1), “hyperthyroidism-hyperadrenalism” (1). Nineteen patients received treatment, and the treatment was identified in nine cases. In most cases, treatment was short and patients improved almost immediately. Occupational therapy was the most common treatment. Other effective methods were hypnosis (1), relaxation (1), passive movements (2), and probable “persuasion and re-education” (6).

**Discussion:** The high success rate in treating psychogenic disorders in Hurst’s film would be considered impressive by modern standards, and has raised doubt in recent years as to whether parts of the film were staged and/or acted.

**Keywords:** Psychogenic movement disorders, Arthur Hurst, shell shock, psychogenic gait, World War I

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\*To whom correspondence should be addressed. E-mail: [okun@neurology.ufl.edu](mailto:okun@neurology.ufl.edu)

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### Introduction

The psychological pressures on soldiers during World War I (WWI) and in other military conflicts have resulted in many reported cases of psychogenic gait and other movement disorders.<sup>1</sup> Motion pictures of soldiers were rarely used prior to WWI. Arthur Hurst captured film footage of psychogenic gaits and other potential psychogenic movement disorders both pre- and post treatment during the WWI era. His film collection resides in the Wellcome Library in London.

In WWI, British soldiers faced the death penalty for refusing to engage in conflict.<sup>2</sup> Private Henry Farr was famously sentenced to death for refusing to join the trenches during the battle for the Western Front. Henry was one of 306 soldiers executed for “cowardice,”<sup>2</sup> and his case documents the tremendous psychological strain encountered by many during this conflict. Historical archives suggest that over

80,000 British soldiers suffered from “shell shock” as a direct result of combat exposure.<sup>3</sup> Soldiers reported not only physical symptoms but also psychological traumas. Combat stress reactions experienced by soldiers (shell shock) ranged from crippling panic attacks, anxiety, and persistent amnesia to tremor, word-blindness, nightmares, and other physical manifestations. The full array of reactions was captured by Hurst in his photo documentary.<sup>4</sup>

Rare physicians were able to address psychiatric symptoms during and after WWI.<sup>5</sup> Major Arthur Hurst, a General Physician with a particular interest in Neurology, Neuropsychiatry, and Gastroenterology, filled this vacuum. Hurst achieved notoriety for his creative approaches to treatment, which included re-education, persuasion, and suggestion.<sup>6</sup> Hurst was born Arthur Hertz on July 23 1879 in Bradford, UK.<sup>1,5</sup> His scientific career started when he

## Results

attended Magdalen College, Oxford, where he won a Science Demy-SHIP and in 1901 became a student at Guy's Hospital,<sup>7</sup> where he won Gold Medals in both clinical medicine and surgery. In 1904 he was awarded his Bachelor of Medicine, BCh, from Oxford. In 1905, he won a Radcliffe traveling fellowship that shaped his future practice as a physician. He chose to go to France and Germany, where he met some of the greatest neurologists of the time, including Dejerine, Babinski, and Marie.<sup>8,9</sup> In 1907, Hurst was appointed initially as a physician of the Electrical Department, but was quickly promoted and started the first Neurology Outpatient department at Guy's Hospital. In 1915 he left to serve in WWI, initially in the Gallipoli campaign, and later in Salonika, before he returned in 1916. Hurst then persuaded the military to convert Seale Hayne Agricultural College into a special hospital for the treatment of war neuroses.<sup>8</sup> It was at this time in 1917 when he began his transformation into a leading light in the treatment of these conditions. Hurst considered himself a proponent of the questioning of medical tradition.<sup>5</sup> During this time he was able to persuade the French film industry, the Pathé Motion Picture Co., to help with production of the movie for 8 months. The film was used for training and research.<sup>8</sup> The overall purpose of the film was educational, and aimed to clarify the diagnosis of various manifestations of shell shock and to document the effects of treatment. He wrote about the "remarkable" change in many patients who were afflicted. Hurst, throughout his life, was bestowed with many appointments, awards, and accolades. He would retire as Professor of Medicine at Guy's Hospital and Oxford. He died in 1944 at the age of 65.<sup>1</sup>

The types of treatment approaches promoted by Hurst were employed to address manifestations of what became known as combat fatigue syndrome, or post-traumatic stress disorder.<sup>4</sup> The film, titled "War Neuroses", was intended to demonstrate Hurst's specific treatment techniques to physicians. Until his death he maintained the efficacy of his methods.<sup>5</sup>

## Methods

The medical literature on Arthur Hurst and on all existing WWI Hurst films was reviewed. The search uncovered a 27-min film housed in the Wellcome Library. The film is publicly available at <http://film.wellcome.ac.uk:15151/mediaplayer.html?0055-0000-4163-0000-0-0000-0000-0>.

This film was shot in the Royal Victoria Hospital, Netley, UK, in 1917, and the Seale Hayne Military Hospital in 1918. The analysis included 21 patients who manifested several neuropsychiatric signs and symptoms (Table 1).

When reviewing the film, two movement disorders specialists (M.M. and M.O.) analyzed the film independently and, based on available data, later discussed each case and reached an agreement on the likely pre-treatment diagnosis, the types of treatments administered, the time course for recovery, and the overall outcomes. The specialists describe the phenomenology and interpretation of the treatment responses in these patients (Table 2).

The entire film contains a total of 23 film clips. There were 20 film clips presenting patient cases: one clip showing a mix of previous patients, one clip showing patients during activities considering occupational therapy, and the final film clip presenting a re-enactment film called "The Battle of Seale Hayne."

The film featured 21 patients (on Film 6, two patients are presented) with various presumed psychogenic manifestations of disease. All of the patients were male. All presented with symptoms resulting from a war-related trauma (e.g., being buried, shrapnel wounds, concussion, or trench fever).

Overall, one patient presented abnormal posture (dystonia), one had facial spasm, one had head tremor, one presented with what was described as "hyperthyroidism-hyperadrenalism," and two patients presented with retrograde amnesia.

Fifteen presented with a gait disorder, and of these patients just three presented with a pure gait disturbance and 12 presented with at least one other movement disorder (seven presented with tremor, three with dystonia, one with rigidity, and one with akinesia) (Table 3).

All of the cases were documented as manifesting symptoms between 1916 and 1918. Eighteen patients received treatment. In 10, the treatment was included in the film and in the remainder it was not. Five patients received more than one treatment, as shown on film clips 4, 5, 6, 15, and 16. One received relaxation and passive movements as a treatment, one re-education and occupational therapy, one had suggestion and occupational therapy, one had suggestion and re-education, and one had persuasion and re-education.

Occupational therapy (marching, working on the farm, stacking bricks together, carrying tools, and making baskets) was the most common treatment; however, one soldier was treated with hypnosis, and one with relaxation, two with passive movements, and six had presumed treatment with persuasion/re-education. The treatment duration varied between 15 min and 2.5 years. Eighteen patients (86%) had partial or complete recovery, two were not shown in the film, and one had no benefit. (Table 3).

## Discussion

Arthur Hurst's WWI documentary demonstrated a significant improvement in many psychogenic gait and movement disorder symptoms. Notable to the modern clinician was that the improvement often occurred over a very short period of time, ranging from a few hours to a few months. In modern practice, most of the symptoms would be diagnosed as psychogenic movement disorders. There were, however, particular areas of concern with Hurst's documentary. For example, Hurst fails to describe the exact definitions of "persuasion and re-education". In a separate documented interview, Hurst commented that re-education encompassed bed rest, isolation from loud noises, fresh air, isolation from sunlight, and fake surgery.<sup>8</sup> When treating a patient he often removed any references to the war, recommended resting the body and mind, recommended refraining from alcohol, and he also recommended the repression of all memories of recent events.<sup>6</sup> He suggested to the patients that they would

**Table 1. Hurst's Description**

Film 1	Retrograde amnesia, hysterical paralysis, contractures, mutism, and universal anesthesia. He is completely unaware of the vigorous efforts to overcome the rigidity of his ankles.
Film 2	Amnesia, word blindness and word deafness, except to the word "bombs".
Film 3	Facial spasm.
Film 4	Lateral tremor of the head.
Film 5	Hysterical gait, swaying movement and nose-wiping tic.
Film 6 (2 cases)	Private King: hysterical gait and speech. Sandall developed additional symptoms by imitating King.
Film 7	Hysterical dancing gait. Leg movement normal while sitting.
Film 8	Hysterical shuffling gait following spinal concussion after burial.
Film 9	Hysterical pseudo-spastic gait following spinal concussion after burial.
Film 10	Hysterical wire spring gait following spinal concussion after burial.
Film 11	Hysterical slippery ice gait, with organic basis, after spinal concussion from burial.
Film 12	Hysterical ataxic gait following appendicitis in trenches.
Film 13	Hysterical gait following rheumatism and burial.
Film 14	Film showing the 6 previous patients.
Film 15	Hysterical gait following shell shock whilst suffering from trench fever.
Film 16	Complete hysterical monoplegia following salvarsan injection.
Film 17	Hysterical pseudo-pseudohypertrophic muscular paralysis.
Film 18	Hysterical gait following sciatica.
Film 19	Hysterical gait following a flesh wound in the thigh.
Film 20	Hysterical contracture of the hand persisting 35 months after receiving a wound near elbow.
Film 21	War hyperthyroidism–hyperadrenalism.
Film 22	Occupational therapy.
Film 23	The Battle of Seale Hayne.

experience complete recovery in 24 hours, even if hospitalized for years;<sup>8</sup> this type of approach would ultimately not be embraced by modern psychiatry. The last film clip "The Battle of Seale Hayne" could be considered as part of the therapeutic protocol in Dr. Hurst's practice, in which the soldiers were sent to the field and asked to experience real battlefield re-enactment. The most remarkable aspect of this re-enactment was its foreshadowing of modern desensitization therapy for post-traumatic stress disorder, which has received much press recently in its contemporary reincarnation.<sup>10</sup>

Occupational therapy (marching, working on the farm, stacking bricks together, carrying tools, and making baskets), which was highlighted in the film, was reported to be effective in all patients. In severe cases, Hurst used sodium diethyl-barbiturate in combination

with acetyl salicylic acid.<sup>6</sup> Dysfunction of the thyroid and adrenal secretion were treated with belladonna and thyroid X-rays.<sup>6</sup> He also applied faradism frequently.<sup>3,6,8,11</sup> These treatments were not reported in the film. Additionally, in most cases shown in the film, Hurst never indicated which of his techniques was applied to individual patients, and also whether he employed multiple treatments. Finally, the involvement of the French movie industry made it likely that acting and staging were involved in at least part of the film, although this has never been formally clarified.<sup>8</sup>

An important concern has been raised about the clip of Sergeant Bissett, which was allegedly filmed in September 1917 through to November 1917, when Sergeant Bissett experienced significant improvement in his condition. In this clip, the background, the

**Table 2. Revised Description**

Film 1	Possible psychogenic myoclonus along with generalized weakness, rigidity, and the film also attempts to demonstrate hemibody anesthesia. The examiner is attempting to perform forced dorsiflexion movements of the feet but he finds it difficult. Later, the patient presents a complete recovery and he is shown ascending and descending stairs, running, and moving his arms in complex motions.
Film 2	The patient does not attempt to speak, and is observed to be unresponsive to language. When the examiner uses the word “bomb”, the patient hides under the bed. There is no movement disorder in this case.
Film 3	The patient presented hyperkinetic movements of his bilateral eyelids (up position), left ear (up position) and the frontalis muscle (up position). The eyelid and ear movements were arrhythmic.
Film 4	The patient presents very high frequency and inconsistent no-no head tremor, and a masked facies with lips parted.
Film 5	The patient presents with astasia abasia and a very wide based gait pattern. During walking he was weaving back and forth with a slight preference to the right. He had increased right sided arm movements, bizarre postures, and atypical wiping of his nose.
Film 6 (2 cases)	The two men presented with astasia abasia with a normal based, but drifting, gait. They were orating, talking and were observed walking together. King presented with an excessive amount of hand movements, rocking forward and back, and continuous speaking. Sandall (the other man) presented with atypical myoclonic-like tremor in his upper extremities. When walking his right arm appeared to swing more than his left. He had notable gait shuffling and seemed to be attempting to imitate King.
Film 7	This patient is observed skipping and jumping with an astasia gait pattern. He was also using a cane. While sitting he could move his legs normally. After treatment he does not use the cane to walk.
Film 8	The patient presented with an atypical magnetic type of gait with drifting to the left. He had an abnormal very fast tremor in the legs, and a balance disturbance. The tremor in the legs appeared possibly as upper motor neuron clonus.
Film 9	The patient presented with a drifting and a shuffling gait pattern, and also with imbalance. He had a high frequency bilateral lower limb tremor in both legs, and an overall decrease in right arm movement.
Film 10	The patient was observed as shaking, drifting, and shuffling with an abnormal astasia abasia gait pattern. There was a notable decrease in arm movement on the right side. He presents with balance impairment.
Film 11	The patient presented with very slow overall movements (akinesia), and a wide based shuffling gait pattern. The gait was cautious, and there was an overall decrease in arm movements.
Film 12	There was a shuffling gait and an internal rotation of his right foot. The trunk was rotated to the right, and there was a decrease in arm swing. There was an abnormal posture of the left arm that may have been a contracture.
Film 13	The patient was assisted by two canes and he ambulated with a wide based gait. He had a stooped posture, and slow arrhythmic head nodding. After treatment the patient was observed walking without a cane and with good arm swing, and with the absence of the atypical yes-yes tremor.
Film 14	The group of patients, previously seen with gait disturbance, walk a straight line with relatively normal gait patterns, normal arm swing, and no hyperkinetic movements. This series of clips support the hypothesis of psychogenic movement disorders.
Film 15	The patient presented with a wide based gait with an astasia pattern and he had shaking during walking. His gait was supported by two canes. He had an abnormal arm swing, and was shown to have balance impairment. He was then shown to be walking with a completely normal gait pattern. He held a single cane and had no shaking, and his balance appeared normal. This was likely a psychogenic pattern of movement disorders.

**Table 2.** Continued

Film 16	The patient presented with difficulty when arising from a chair. He required assistance in standing. He had an astasia abasia gait pattern, and a high frequency and a high amplitude tremor predominantly in his right leg. He was holding onto the examiner and also had trunk tremor. When he was lying down in bed, he had a persistent right sided high frequency and high-amplitude arrhythmic and atypical tremor. Following treatment the tremor resolved when he was lying down and the examiner performed passive movements. He was also able to lift his right leg without any tremor and he was shown walking. In the last film clip he was shown arising from bed and walking in the hall of the hospital with an almost normal gait, perhaps with some stiffness. This pattern was most consistent with a psychogenic disorder, but based on the images we could not exclude the possibility of an underlying neurological disorder.
Film 17	The patient appears to have a generalized dystonia and has hyperkinetic movements present in the legs, trunk and arms. He appears stiff, especially in his lower limbs. He is seen falling to the floor, and is also shown to have difficulty arising. After 1 hour of treatment he appears as upright and possibly stiff. Following a week of treatment he appears completely normal. He is shown standing, walking and moving. He no longer appears stiff. This pattern is consistent with a psychogenic disorder.
Film 18	The patient had an astasia abasia gait pattern and appeared rigid, with a decreased arm swing, and retroflexion of the back. When bending at the hips he flexed one knee but not both. He had balance impairment and used a cane. Following treatment he was able to walk, and to run up and down stairs. He is able to bend the trunk normally with symmetric knee flexion. He is also shown hopping normally.
Film 19	The patient presented with an astasia abasia gait pattern, and he walked with a stiff right leg. He had an atypical straight kicking movement on walking. He had an abnormal posture, and an increase in his arm swing on the left. He descended stairs and walked normally after treatment. This pattern was consistent with a psychogenic movement disorder.
Film 20	The patient had a contracture of the left hand and was holding his hand, imitating the position of holding a gun. The posture was completely reducible by the examiner. Following treatment the phenomenology changed to dystonia-myoclonus. The movement did not appear to resolve. Though this appeared psychogenic with a changing phenomenology, an underlying neurological disorder could not be excluded.
Film 21	The patient presented with a masked face, lips parted and bulging eyes. There was no frontalis muscle contraction. The examination and treatment were not shown. This is possibly not a psychogenic disorder.
Film 22	A group of patients was seen exercising, working on the farm, walking, weaving baskets, picking fruits, plowing, seeding a field, herding cattle, washing a pig and carrying objects on a farm.
Film 23	This is a clip showing an example re-enactment of the soldiers during war. They are shown marching, in the trenches, being gassed, fighting, and being rescued.

column of smoke from the chimney, and the position of the nurses, all suggested that the clip was filmed in one day, and that the patient may have been re-enacting or acting out a previous disorder.<sup>8</sup> The re-enacting of psychogenic disorders was not uncommon in the period, and this was seen previously with Charcot's "Lessons at the Salpêtrière" in which some have suggested that many of the episodes featuring hysterical patients were actually staged.<sup>12,13</sup>

Hurst was familiar with hysteria. He employed techniques such as checking for consistency of movements when seated, and when standing, and he also utilized maneuvers described by Blocq, Babinski, and Charcot in Film 7 (the chair test) and Film 16 (testing the legs in bed).<sup>14</sup>

Several of the patients in this film met many of the criteria proposed by Gupta and Lang.<sup>15</sup> These criteria for the diagnosis of psychogenic

movement disorders include abrupt onset, presence of psychological stressors (present in all patients), movement inconsistent with great variability of the symptoms (shown in Film 1, 4, 5, 6, 16, and 17), distractibility (Film 4), mixed and bizarre movements (shown in Film 3, 5, 6, 7, 8, 9, 10, 11, 12, 17, and 18), and suggestibility (probably in all cases but not shown on the film). Additionally, the very rapid recoveries (if not re-enactments), and the observation that the patients never "fell," would further suggest psychogenic illness.

Among psychogenic problems,<sup>16</sup> dystonia and tremor have been the most frequently reported.<sup>15,17,18</sup> In Arthur Hurst's film these symptoms were common and in some cases overlapping; 19% presenting with dystonia, 38% presenting with tremor. The most common diagnosis was unspecified gait disorder, which presented in

**Table 3. Diagnosis, Treatment and Results**

	<b>Diagnosis</b>	<b>Treatment</b>	<b>Result</b>
Film 1	Amnesia/myoclonus/rigidity	Occupational therapy (teaching/making basket)	Sudden recovery of memory. Complete recovery 2.5 years after onset.
Film 2	Amnesia/word deafness	n/a	n/a
Film 3	Facial spasm	Hypnosis	Movements resumed at hypnosis cessation.
Film 4	Tremor	Relaxation/passive movements	Complete recovery.
Film 5	Gait disturbance	Re-education/occupational therapy	The hyperkinetic movements completely resolved; however, he still presented with increased arm swing and a wide based gait.
Film 6 (2 cases)	Gait disturbance/tremor/myoclonus	Suggestion/occupational therapy	Sandall recovered 2 hours later. King never recovered.
Film 7	Gait disturbance	Re-education	Improvement in the same day.
Film 8	Gait disturbance/tremor	n/a	Some improvement after 6 weeks.
Film 9	Gait disturbance/tremor	n/a	Improvement after 3 months.
Film 10	Gait disturbance/tremor	n/a	Improvement after 9 months.
Film 11	Gait disturbance/akinesia	n/a	Improvement after 3 months.
Film 12	Gait disturbance /dystonia	n/a	Improvement after 2 months.
Film 13	Gait disturbance /tremor	n/a	Improvement after 3 months.
Film 14	Group of previous patients	n/a	n/a
Film 15	Gait disturbance/tremor	Persuasion/ re-education	Cured in the same day.
Film 16	Gait disturbance/tremor	Suggestion/ re-education	Cured in the same day.
Film 17	Gait disturbance/dystonia	n/a	Cured in the same day.
Film 18	Gait disturbance/dystonia	n/a	Cured in the same day.
Film 19	Gait disturbance/rigidity	n/a	Cured in the same day.
Film 20	Dystonia/myoclonus	Passive movements	Cured in the same day.
Film 21	War hyperthyroidism- hyperadrenalism	n/a	n/a
Film 22	Occupational therapy	n/a	n/a
Film 23	The Battle of Seale Hayne	n/a	n/a

Abbreviations: n/a, not available.

71% of patients. There is a possibility that organic disease co-existed with psychogenic illness in this film, at least in some of the documented patients. It is known that psychogenic movements can complicate and also be embedded into pre-existing organic movement disorder in approximately 10–25% of cases.<sup>18,19</sup> We cannot exclude this possibility without more information.

None of the available WWI papers<sup>20,21</sup> describe movement disorders such as in Hurst's film. Jones<sup>8</sup> previously reported how the film was actually made, describing one patient Meek, and also revealing some of the pictures used in the original movie. He revealed that the first patient in the movie was exposed to electric shock therapy for restoration of his speech.<sup>8</sup>

Hurst himself published an article in the *British Medical Journal*<sup>6</sup> suggesting that amnesia, hysteria, hyperadrenalism, hyperthyroidism, and exaggerated reflexes could all result from an emotional storm. He also suggested that the inability to move or speak after a situation involving terror could cause mutism and hysterical paraplegia. Hurst emphasized that for successful treatment, a medical officer should be convinced that the symptoms were not organic, and that organic symptoms could sometimes be superimposed.<sup>6</sup>

WWI was undoubtedly psychologically devastating for soldiers fighting on the front lines. The significant rise in incidences of shell shock was met initially by those in the medical field, as well as the lay public, with confusion and a lack of understanding, as demonstrated by the tragic case of Private Henry Farr. Arthur Hurst's documentary, even with its significant limitations and possible re-enacting, attempted to document the psychogenic component underlying the physical manifestations of shell shock. It is very interesting that there were significant improvements in patients after re-education, hypnosis, suggestion, and other modalities. A more thorough appreciation of the history of those disorders which occur as a result of war may aid us in approaching the treatment of veterans returning from war, and also help us in adopting more reasonable approaches to other psychogenic illnesses. Early identification and rapid interdisciplinary treatment of these disorders are recommended.

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