Physical Mediumship: Experiments with Gary Mannion, Techniques and Results

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Abstract

From January 2018 to May 2019, four series of in total about 50 experimental séances with Gary Mannion were held in Wallacia, Australia, and Bridgwater, UK. Various experiments were done, using a number of technical devices and sensors to collect data about the phenomena typically occurring in Gary's séances. This article presents the technology being used and the overall procedure of the investigations, hopefully showing new ways to further explore physical mediumship. From the considerable amount of data collected throughout the experiments, a subset is presented in detail, with focus on measurements with motion sensors and related phenomena of interest. Some of the results strongly challenge conventional explanations of fraud or trickery by the medium.

1 Introduction

After more than a century of research, physical mediumship remains to be a very controversial topic. Still today there are many circles working on the development of physical phenomena in entire privacy (as I know from personal communication), with results that apparently keep them going on ambitiously for many years. However, the main impetus on this topic probably comes from the growing popularity of séances that are open to the general public (after some pre-check of the sitters), held by "professional mediums" and showing a wide variety of phenomena such as apports, ectoplasm, direct voices, light phenomena, touches or psychokinesis. Obviously, this is a serious challenge to our worldview, as well as to the scientists daring to have a closer look at the phenomena. For every such medium there are people who are absolutely convinced of fraud, while others have no doubts to witness phenomena of a real physical medium.

And there is lots of ground in between. The potential dynamics, eventually with strong involvement of personal emotions, could recently be seen in the controversy around Kai Mügge (Braude 2014, Braude 2016, Nahm 2014, Nahm 2016).

Gary Mannion is another one of those disputed mediums, recently with a strong tilt towards 'fraud' after the release of a video secretly recorded during a séance. The whole story is quite complex and it is not within the scope of this article. Instead, the approach followed here is to steer clear from background stories, potential stakeholder interests and psychological factors, and to focus on measurement techniques and the data collected throughout about 50 experimental séances with Gary Mannion. Even for readers who are completely convinced that Gary is a fraud, the presented information should be valuable as it can be used to test hypotheses about how phenomena could potentially have been faked. In addition, it hopefully inspires new ways to investigate séance room phenomena.

1.1 Background

The idea to conduct experiments with Gary Mannion came up when I met Inge Crosson in September 2017 in Basel. She is leading the Wallacia Development Center in Australia, and has invited various mediums to Australia and organized numerous physical séances at the center. She is circle leader of Gary's home circle and has supported him for many years. Apparently, her interest in a scientific investigation of Gary's mediumship is (at least partially) related to the hope to counter the accusations he was facing in recent years. To kick-start these investigations she paid the flights (for me and my wife) to Australia and provided accommodation during our stay at Wallacia in January 2018. As the testing yielded interesting results, there was a joint decision to conduct further experiments (at everyone's own expenses). These were done at Parsonage Side Retreat, Bridgwater, Somerset, UK, with the very supportive hosts Steve, Dawn and John Bexx, in September 2018, February 2019 and May 2019.

Regarding the content and procedure of the investigations, there were no prerequisites neither from Inge nor from Gary. While typical scientific investigations in this field often focus on recording the séance phenomena on video (whether it is low-light, infrared or thermal), here a broader approach has been followed using a variety of sensors presented in the next session.

1.2 The trance personality

All experiments have been done in agreement with Gary Mannion's trance personality and main communicator 'Jimmy'. This communicator claims to have an original identity and conversations were done as if talking with a real person. In addition, he regularly mentioned a "spirit team" behind the scenes, with entities more knowledgeable than himself, while he in his own words acts mostly as "mouth piece".

The essence of such trance personas is a research question that is not going to be addressed here. Obviously, there are different possibilities regarding their true nature, such as being a dissociate partial personality of the medium, a true discarnate entity speaking through the medium or simply the play of a fraudulent medium. Here, 'Jimmy' can simply be regarded as placeholder for an Irish-accented voice coming out of Gary's mouth, that sounds somewhat different than his own voice and can only be heard when he apparently is in trance.

In the course of the investigations, Jimmy was treated like a real person and partner in the experiments; i.e. communication, mutual trust and cooperation were considered essential. There was the shared goal to jointly explore physical mediumship. This should be primarily regarded as a convenient mode of operation and will be reflected in the writing style of this article. It does not imply that Jimmy is taken for granted as the deceased human personality as whom he presents himself. While investigations on the authenticity of trance personae need to scrutinize the content of the communication, here, focus is entirely on physical phenomena, with scientific relevance independent from questions regarding the trance persona.

1.3 Publication constraints

Jimmy and his team seem to have their own agenda regarding the publication of the data. They gave precise instructions about what can be publicized and in what way, even contrary to an apparent interest of Gary who certainly liked to have results published looking in favor of him. For the experiments in Wallacia, January 2018, it lasted until March 2019 to get the approval to have some results published; in May 2019 the scope was somewhat extended. I comply with these restrictions. One might argue that these constraints come only from a trance persona whose true identity remains uncertain; but even with such doubt, I opt for mutual trust (which is, by the way, also a prerequisite to continue with these experiments). Consequently, some interesting data is not included in this article, such as everything related to the appearance of ectoplasm. Hopefully, I can follow up on this in a future article.

Nevertheless, section 2 already introduces the full set of devices and techniques used in the investigations, hopefully inspiring future investigations also with other physical mediums. Section 3 addresses the overall approach for the experiments, including information on the setting and control of the medium. Section 4 presents the resulting data within the aforementioned publication constraints. Focus is put on especially significant phenomena and séances, while also outlining the general development of the investigations. Section 5 briefly discusses the results obtained so far.

2 Testing Equipment

Investigators of physical mediumship were always eager to bring their cameras and devices into the séance room to investigate what is going on. Facing the low light or darkness of a séance, a typical request today is to use appropriate video recording devices, such as thermal video or infrared video with active infrared lighting. It is great whenever such experiments are possible, but they are not a prerequisite for science in the séance room. If a medium or his trance persona prohibit some or all types of measurements, one should not immediately interpret that as evidence for fraudulent activities which need to be covered up. There might be good reasons to keep some technical devices out of the séance room, because they affect the apparently delicate conditions required for successful accomplishment of physical phenomena.

This is evident for measurements that have a direct physical impact on the environment. If in a séance - for whatever, yet-to-be-explored reasons - darkness is required, it should be no surprise if that also regards invisible parts of the light spectrum, such that video recording with infrared lighting is ruled out. But thermal video is mostly refused just the same, even though it only records what is already there, in a passive manner (leaving aside the electromagnetic radiation emitted by any electronic device - but in our world full of electronics, no séance room will be free of electromagnetic radiation, unless being built into a Faraday cage). Even if a device does not interfere on a physical level, it might do so with regard to the information in the system. The well-known double-slit experiment in quantum physics is an example that a measurement can have a significant impact on a system by simple retrieving information about it. So far, there is no proof that such quantum effects and the collapse of the wave function can affect the phenomena in the séance room, but it certainly cannot be ruled out and it is subject to research in related areas of parapsychology (Lucadou, 1995, Atmanspacher, Römer, & Walach, 2002, Lucadou, Römer, & Walach, 2007).

2.1 Concepts and requirements

When coming to Wallacia it was not at all clear what types of experiments or measurements could be done. Thus, I prepared a variety of different sensors and spare parts, based on my experience with typical séance room conditions, phenomena and potential investigations. In the course of the experiments and the subsequent meetings in Bridgwater, adaptations of the sensors were done (e.g. parameter settings, evaluation algorithms) and also new ideas came up for using other types of sensors.

In this section, the whole portfolio of devices is presented as it evolved up to now. Some sensors have only been used marginally, others extensively. Some are straightforward and standard, others more experimental. They are all considered valuable for exploring séance room phenomena, though some of them so far have not produced significant results. Their design and configuration takes typical séance requirements into

account:

- They do not emit any light (LEDs are disabled, displays are switched off or at least covered)
- They are self-contained and running on battery power.
- There is no WiFi or Bluetooth transmission to keep EM-impact at minimum, all data is stored locally on SD cards.
- They can be easily switched on and off, even in total darkness, including the option to cut off power completely to avoid electromagnetic fields caused by devices in stand-by mode.
- Some devices are quite small so they can be easily attached to the medium's body, the cabinet or other experimental objects such as trumpets.

All data is recorded with millisecond time stamps to synchronize the data of the various devices into a common timeline. Sample rates range from 1 Hz (e.g. temperature and weight) up to 100 Hz (motion sensors). The raw data is typically stored in plain text files. I have written a software that deals with the various types of sensor data, provides utility functions for calibration, time synchronization and analysis, and also offers visualization functions that were used to generate the diagrams in this paper.

2.2 Audio

All séances were recorded with a multi-track audio recorder (Zoom H6). I also brought the equipment for audio localization (Kruse 2018), but it was not used as there were no experiments where it was considered useful. Thus, audio was recorded in stereo, sometimes with the in-built microphones and the recorder lying on the floor, sometimes with external microphones, which were positioned in front of the cabinet, occasionally also inside the cabinet and even on Gary's body.

The audio recording acts as timeline to which all other data is synchronized and related to. For the devices with an own real-time clock, such as the video camera, this is simple. The sensors' timers, however, are only running during operation. Thus, when switching on a sensor, I loudly said the sensor type and 'on', activating the sensor at the same time, thus obtaining a synchronization with an accuracy of a small fraction of a second. Similarly, specific events during the séance were derived from the sitters' comments in the audio, later establishing the practice to verbally express all significant events (light on/off, cabinet open/closed, cabinet moves, etc.).

2.3 Video and infrared (IR) video

For video recording, the Canon XA30 was used. It offers infra-red support, i.e. the filter, which is covering digital image sensors in order to reflect IR light, can be removed. In addition, the camera has an inbuilt IR lamp, which can be switched on and off. The active IR lighting was not used during the séances, but the IR sensitivity was very important. In low-light conditions the camera was always used in IR-mode, as this strongly improved image quality, benefiting from the IR radiation emitted by the low light used during the séances. As it is common for IR-video, only grayscale images are recorded, but the loss of color information is no issue when, as common in séances, only monochromatic light is used (mostly red, in Gary's séances sometimes also blue).

The camera was prepared such that no light was emitted, i.e. LEDs and displays were covered. Typically, the camera was put on a tripod such that the cabinet was captured fully, including some room for action. As an alternative setup, the camera with its 16:9 image format was rotated by 90 degrees in an upright format to better cope with the vertical orientation of the cabinet. Camera focus was switched to manual and set up before the séance, to avoid the risk that the autofocus loses track in the low-light conditions. Later, it turned out that even under most low-light conditions the autofocus performed reliably, thus also allowing to move the camera during the séance, to move it closer to the cabinet or point it at regions of interest (at least approximately, as the viewfinder could not be used in the dark).

2.4 Thermal video

For recording thermal video, the thermal camera from Therm-App (therm-app.com, resolution 384x288 pixel, 25 Hz) was available. As it is common for devices in this price range, the camera requires a connection to a mobile phone where an app provides the required user interface and image/video recording functionality. Obviously, touch screen functionality is unfavorable for séance conditions, as it emits light and cannot be used blindly. Thus, I developed a setup using a battery-powered Raspberry Pi microcomputer. Via USB it retrieves the raw data from the Therm-App camera and stores it locally, also avoiding potential compression artifacts, which the mobile app generates when storing thermal videos. Key functionality can be easily accessed in the dark with manual switches connected to the Pi.

In the experiments, thermal video had been used only rarely (e.g. with regard to ectoplasm phenomena), and it is not further regarded in this article.

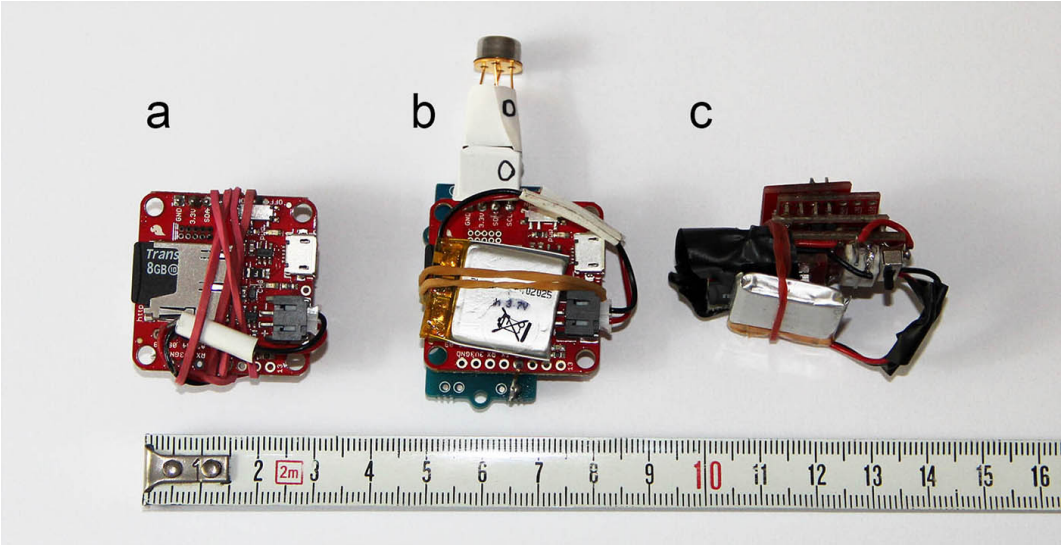

Figure 1: Sensors, configurations for motion detection (a,b) and environmental parameters (b,c)

2.5 Motion sensors

The motion sensors are the cornerstone of the experiments presented in this article, and I regard them as a very valuable means for research on physical mediumship (Figure 1, a, b). Traditionally, to restrict and control the medium's action in the dark, is to tie him up, e.g. using ropes or cable ties to bind legs and arms to the chair. For example, Warren Caylor, Mychael Shane, Bill Meadows and Gary Mannion are following this approach in their public séances. Alternatively, the medium's arms and legs are manually held and controlled by séance participants to the left and right of the medium. Kai Mügge is a proponent of that technique. Both approaches have loopholes and potential for criticism. Depending on the ties, the medium might still be able to remove his arms or legs from the ties and put them back in place for a later inspection. Participants doing the manual control might be deceived, such that the medium manages to loosen at least a single hand unnoticed, or confederates give wrong testimony.

The motion sensors presented here offer a new way to objectively and reliably control the medium throughout the whole séance. In addition they yield a detailed protocol of any motion observed with a very high sensitivity and fine-grained time resolution in the order of 10 milliseconds. The core of the devices is a 9 DOF (degree-of-freedom) motion processing unit (MPU-9250, InvenSense) comprising accelerometer, gyroscope and compass. It allows to measure forces/acceleration, angular velocities and the absolute orientation in space based on the magnetic field and the gravity vector. Such low-cost sensors are for example built into in mobile phones. To use them in our experiments, the SparkFun 9DoF Razor IMU was chosen as platform (there are

many ways to build up such system also with products from other companies such as Arduino). It contains a programmable microprocessor (using the Arduino development environment and the C programming language), which is used to handle the raw data and store it on a local Micro SD card. Powered by a LiPo battery, a small, self contained sensor is obtained which can be easily attached to the medium's arms or at other positions of interest. Additional sensors (see below) can be connected to the board and incorporated into the data acquisition (Figure 1 b).

2.6 Environmental parameters

A variety of other sensors had been assembled and programmed using the same framework, with on-board processing being done on the SparkFun 9DoF Razor IMU or, alternatively, SparkFun SAMD21 Mini Breakout (Figure 1 c). To measure environmental parameters such as air temperature, humidity or pressure, various low-cost sensors had been used (Silicon Labs Si7021, Bosch BME280, Bosch BMP388, iST HYT939), with somewhat different technical specifications. Due to the relation of barometric pressure and altitude, the pressure sensor was also intended to measure changes in vertical position. Some datasheets claimed a precision in the range of 30 cm, however, even with strong low-pass filtering the above sensors did no yield reliable results in that regard.

Furthermore, there are numerous sensors on the market for measuring air quality with respect to gas concentrations, O2 etc. Some tests have been done with the ams CCS811 sensor to measure Total Volatile Organic Compounds (TVOCs), e.g. to detect changes in the vicinity of ectoplasm. So far, the results were inconclusive. Probably, more expensive sensors are required to obtain meaningful data about the composition of the air.

2.7 Body functions

Another part of the sensor tool box were devices to measure the medium's body functions. They were also built such that they could autonomously record and store parameters throughout the entire séance:

- Electrocardiogram (ECG) sensor, with three contact electrodes (placed e.g. at the left and right arm and a leg)
- Pulse oximetry sensor capturing heart rate and O2 saturation (clipped to the finger)
- Infrared thermometer for contactless measurement of the body temperature.

None of these sensors was permitted during the séances, potentially because they require direct contact with the medium's body (the thermometer could be placed with a little distance, but I had not prepared an appropriate setup for that). In addition, the oximetry sensor uses some LED-lighting to detect blood reflectance.

2.8 Other sensors

Some other sensors were occasionally used during the séances. So far, results were of little relevance and are not included in this article. However, they may give some ideas for potential future research on physical mediumship.

- Scale: Gary's chair was placed on a wooden board, resting on four strain gauge load cells. A little device (based on SparkFun OpenScale and OpenLog components) recorded the weight with a sample rate of 2Hz. Motions of the medium were detected as short-term fluctuations and also the overall weight could be monitored throughout the séance.

- A low-cost spectral sensor (Sparkfun Triad Spectroscopy Sensor - AS7265x) was prepared to investigate the spectral reflectance of ectoplasm for comparison with other materials.

- Capacitive touch sensors: They react to the dielectric property of the touching material or body parts (a technical description is provided in Kruse 2019). First experiments have been done by placing these sensors inside the cabinet and asking Jimmy that they should be somehow touched.

- Starting with May 2019, a light sensor (ISL29125) was used to protocol the light conditions throughout the séance, helping to later easily identify phases with different lighting and to collect objective data about the brightness.

3 Procedure and experiments

Research on physical mediumship typically aims for maximum control of the medium and of the conditions under which the séance takes place, accepting the trade-off that phenomena tend to be less impressive with increasing control. When looking for scientifically indisputable evidence for the authenticity of paranormal phenomena, that seems to be a reasonable way to go. On the other hand, even for areas in parapsychology where a vast body of evidential data is available, controversy never seems to stop. Evidence will never be good enough for those scientists who a priori rule out anything which apparently challenges today's paradigms to their breaking points.

As the search for "undisputable evidence" in physical mediumship seems to be an endless and often pointless endeavor, I decided I might as well relax and take a slightly

different path. I started with the more open question of what can I experience, learn and measure in Gary's séances, without interfering too much by asking for scientific conditions and strict control. Thus, the séances were done like normal "home circles" in an informal setting. Different devices were brought into the séance room or (even better) into the cabinet, whenever it was allowed, but without too much pushing from my side. The control of the medium became stricter in the course of the experiments, while paying attention to not jeopardize a good, relaxed mood of the medium and the sitters.

3.1 Séances and participants

This approach benefited from having more than a week of experiments in Wallacia; séances were rather short (around 30 to 40 minutes) such that two or even three sittings per day were possible. This reduced the pressure to achieve results right away. experiments could develop step by step, both with regard to the observed phenomena, the controls, as well as the possibility to collect data from the measurements.

Due to the interesting results and the continuous progress, we all agreed to continue with the experiments and to have more days of testing when Inge was traveling with members of Gary's home circle to Europe. Parsonage Side Retreat, Bridgwater, UK, was selected as a perfect place for that. Up to now, there were four meetings, each with 5 to 10 days of testing: Wallacia: 2018/01/24-02/02. Bridgwater: 2018/09/13-19, 2019/02/10-18 and 2019/05/09-14. In total about fifty séances took place. Most of them were done under experimental home circle conditions, but there were also séances open to the public where some experiments were done. Séance participants were always Inge Crosson (circle leader), Eckhard Kruse and Heike Bauder. Additionally, usually two to four members of Gary's Australian home circle, who also travelled to Bridgwater, participated. Together with occasional other guests, the experimental séances had typically between four and eight sitters.

The whole procedure relied on intense discussions and cooperation with the trance personality Jimmy, who also indicated a strong interest to move things forward and to support the investigations. Gary himself maintained a role as passive observer. After the séances, he was interested to hear about the results, but he did not express any recommendations or preferences regarding the further procedure. When asked about his opinion on decisions how to go on, he usually replied "please ask Jimmy / the spirit team".

3.2 Setting and control

Figure 2 shows the séance rooms at Wallacia Development Center (left) and Parsonage Side Retreat, Bridgwater (right). In Wallacia, a pop-up shower tent was used as cabinet. It weighs 2.3 kg and has a zipper door at the front, which can be opened from the top

Figure 2: Séance rooms: Wallacia (left), Bridgwater (right)

and the bottom. The tent was also brought to Bridgwater and used intermittently with the cabinet provided by Parsonage Side Retreat, a heavy wooden box built from timber doors with a thick curtain at the front opening, weighing in total 70 kg. Inside the cabinet, Gary was sitting in an armchair, with his arms and legs tied to the chair.

As mentioned, initially control was rather casual, e.g. in Wallacia often scarfs were used to bind Gary to the chair. The séance room was not locked and could be accessed throughout the day. However, as the area around the cabinet remained clear, it was very unlikely that any tools for trickery would have remained unnoticed while I set up my equipment and worked by myself in the séance room before the others entered. During the public séances, a strict, standard procedure was followed, including the search of the medium, checks of the the room and all participants, and the use of cable ties.

In Bridgwater, step by step somewhat stricter controls were applied. Cable ties were always used to bind Gary's wrists and legs to the chair. In Mai 2019, the room, chair and cabinet were always systematically checked before the séance and a pat-down search was done to Gary. The protruding ends of the cable ties were cut and sealed with tape (Figure 3, results of this specific séance are presented in section 5). Occasionally, the cable ties were examined afterwards. Circumferences of the wrist cable ties were between 18 and 20 cm, it is hard to image how Gary could slip in or out of them. The cable ties around the legs measured between 27 and 34 cm, leaving room for improvement by having them always tight and closer to the ankles. The more elaborate controls apparently did not have any negative impact on the phenomena. And as stated above, the motion sensors are expected to contribute to or even outperform conventional means of control.

3.3 Séances, typical course of action

Even though no formal protocol was established, the experimental séances typically followed a similar structure. Usually, I entered the room first to set up sensors, put the camera on the tripod etc. In order to charge batteries and read out the data, no device

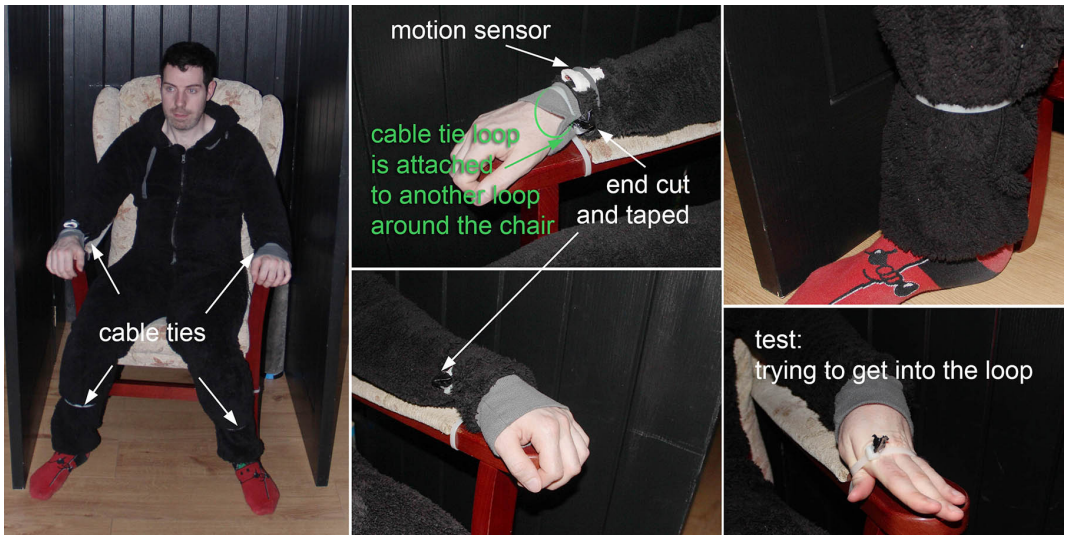

Figure 3: Cable ties (2019/05/13 morning)

remained inside the room between séances. I thus had always the opportunity to check the cabinet, the chair and the room, even though this was typically done rather casually not following a fixed checklist. Generally Heike joined me to prepare the cable ties and help with the checks.

Inge, Gary, and the other sitters arrived somewhat later. While Gary was taking his seat inside the cabinet, Inge prepared the lights, music player, potentially with the help of other sitters. Gary was tied to the chair, usually by Heike. If sensors were attached to his arms, I did this immediately before. The cabinet was closed, seamlessly transitioning to the start of the séance, with Inge switching off the light, often saying a few words like ”Dear spirits, here we are again...” and turning on some low-volume music or just continuing with ongoing chit-chat.

A few minutes later, Jimmy’s voice could be heard from the cabinet with a simple “Hello”. The sitters replied, music or chit-chat stopped and a conversation with Jimmy started. Typically, I reported the results and issues from the evaluation of the data of the previous séance. Next steps for the current séance were discussed, with Jimmy giving instructions, e.g. regarding light conditions or the use of sensors or the camera. He also frequently encouraged the sitters to ask any questions. These mostly regarded the ongoing research or more general concepts behind the phenomena and physical mediumship. Jimmy answered either directly or said he would need to check with his team and come back later with an answer. Personal questions were mostly outside the scope of these conversations. This went on for several minutes up to a quarter of an hour until Jimmy paused the conversation, often by saying ”talk among yourselves for a moment”.

Then, experiments with physical phenomena followed. These could be visible,

if the red-light was on, such as cabinet motions, or audible, as the chair or cabinet made recognizable noises. In the course of the séance, music was used only rarely and with low volume. Thus, when chit-chat stopped often it was very silent, allowing it to hear from inside the cabinet some quiet bubbling sound, allegedly related to the extrusion of ectoplasm. Sometimes, no phenomena seemed to occur but the sensors later showed interesting readings and effects. Sometimes, Jimmy later claimed to have "tried something" without further information and without any apparent results.

Another "Hello" from Jimmy indicated the next phase of conversation, potentially followed by further cycles of experiments, until the séance approached its end after about half an hour. There was a chance for last questions to Jimmy and a briefing on the set-up for the next séance, before Jimmy closed with some standard farewell "take our love and light...". After a few minutes of silence or chit-chat, Gary's voice or yawning or coughing could be heard from the cabinet, and shortly after he confirmed that the cabinet could be opened and lights switched on.

4 Results

All séances are presented here with their timeline, with minute numbers referring to the start of the audio recording. Thus, some preparation before the start of the séance is included, like the attachment of the motion sensors, which shows up as strong peaks in the motion data; thus also providing a comparison for the usually very small motions during the séance. Light conditions are indicated, the state of the cabinet (open/close), phases of conversation with Jimmy and other interesting events as cabinet motions or the use of the video camera. It is also marked when Gary's voice was heard from the cabinet or when he was visibly awake in the open cabinet to limit the remaining interval in which he potentially could be in trance.

The data presented here focuses on the experiments done with the motion sensors, as these have been given approval for publication by Jimmy. Phenomena often reoccurred similar in different séances, with the tendency to grow stronger over time. The most impressive results are presented in detail, but some information is also provided to show how the investigations started and how the phenomena developed over the course of time.

4.1 Wallacia, January 2018

The experiments at Wallacia Development Center went from 2018/01/24 to 2018/02/02. The first days were mostly driven by test measurements and conversations with Jimmy, without significant phenomena. In these days, some EEG experiments were done by Andrea Groh, who was using the "Mind mirror" neurofeedback system to measure Gary's brainwaves during his trance. The setup was quite invasive, as it wired an EEG

Figure 4: 2018/01/24, motion sensor on left wrist

cap to a laptop in the séance room. Nevertheless the first days could be used for conversations with Jimmy and some tests with the sensors.

2018/01/24: In the first séance in the evening, the scale was used, placing Gary's chair on a wooden board residing on the load cells. One motion sensor was attached to his left wrist, another one to the chair. Also the air sensor was placed inside the cabinet. The data from the scale indicated when Gary sat in the chair and any minor body motions were reflected by slight variations of the measured weight. The air sensor showed a slow, steady increase of humidity and temperature inside the closed cabinet.

Figure 4 shows the data from the motion sensor at Gary's wrist (the motion sensor at the chair remained motionless and is not depicted). The top of the diagram gives an overview of the séance timeline: After the cabinet was closed and the light switched off, music was played until 0:10:07, when Jimmy started the conversation. He asked for a short explanation of the "objects", i.e. the sensors and the EEG. At 0:12:02 he paused the conversation ("talk among yourselves for a moment"), music was played. At 0:13:58 he was back and announced "we play around with the different objects here" and that they would return the medium afterwards. At 0:14:18 music and chit-chat resumed, while no phenomena were observed till the end of the séance.

The lower portion of the diagram shows the readings of the motion sensor. The smaller upper part represents intensity of motion. The gyroscope, i.e. rotational movement, is represented as filled brown curve, the acceleration as blue line. If the sensor is entirely calm, acceleration is 1 g, rotation 0 degrees per second. Both values are calculated as length of the 3D-vectors of the x, y, z components, as the individual data typically does not give more insight and clutters the diagram. The lower section indicates the orientation of the sensor in 3D-space as the heading (blue), pitch (green) and roll (red) angles. These are calculated based on the magnetic field and gravity vectors.

Minutes 0 and 23 show intense motions, when the sensor had been attached and removed. From 0:01:30 to 0:15:10 the sensor is very calm, but there are minimal changes in orientation, probably resulting from slight, quite smooth motions of Gary's

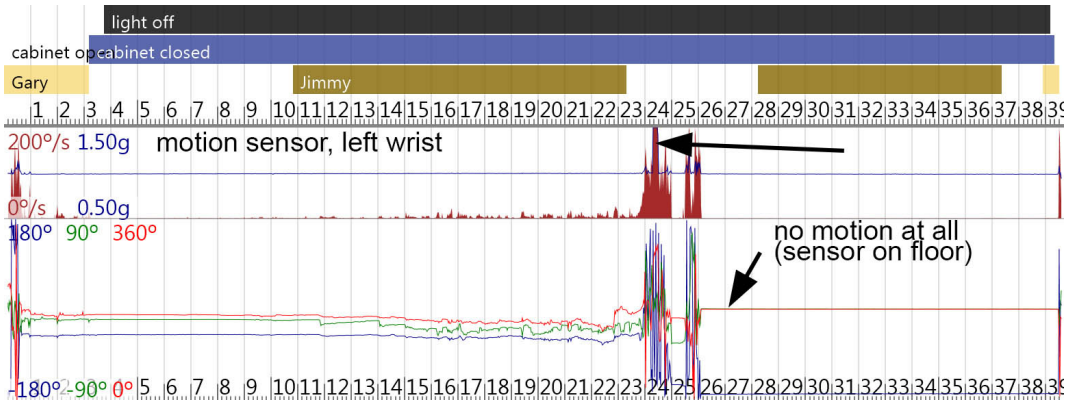

Figure 5: 2018/01/26, motion sensor removed, strong acceleration

arm. In minute 15 the sensor is strongly moved and then remains calm in a different orientation, now without any motion, which is a hint that it is no longer attached to Gary's body, but could be lying on the floor. Around 0:19:00 the sensor is moved again and potentially attached back to the arm, but in a different orientation than before. After the séance the sensor was indeed found attached to Gary's left arm, in a changed orientation.

In these early séances, Gary's arms were only tied with scarfs to the chair, so the sensor movement could be easily explained that Gary freed his right arm (knowingly or in trance) and used it to manipulate the sensor accordingly. So this experiment should be only regarded as a starting point how the sensor provides insight into what is going on in the cabinet.

In this experiment the motion sensor was attached to Gary's forearm with the circuit board directly touching his skin. Apparently this resulted in a skin irritation looking like a rectangular sunburn where the sensor had been placed. From then on the sensor was wrapped in a paper handkerchief and no more such irritations occurred.

2018/01/25: For the séance in the morning, again a motion sensor was at the left arm, the scale recorded the weight of Gary on his chair, and in addition the whole séance was recorded on thermal video. There was a conversation of about 15 minutes with Jimmy about the experiments and future setups. Jimmy asked that for the next séance the motion sensor on Gary's arm should be the only item to be used ("we need time to work with each piece"). No phenomena were observed, neither during the séance nor on the recorded thermal video. The motion sensor showed slight motions of Gary's arm while Jimmy was speaking (also visible in the next diagram).

2018/01/26: This séance continued along the same path, again with a motion sensor at the left wrist (Figure 5). During a ten-minute long conversation with Jimmy the sensor was slightly moving, then Jimmy announced an experiment and paused the conversation. For two minutes the sensor was strongly moving, such that the data

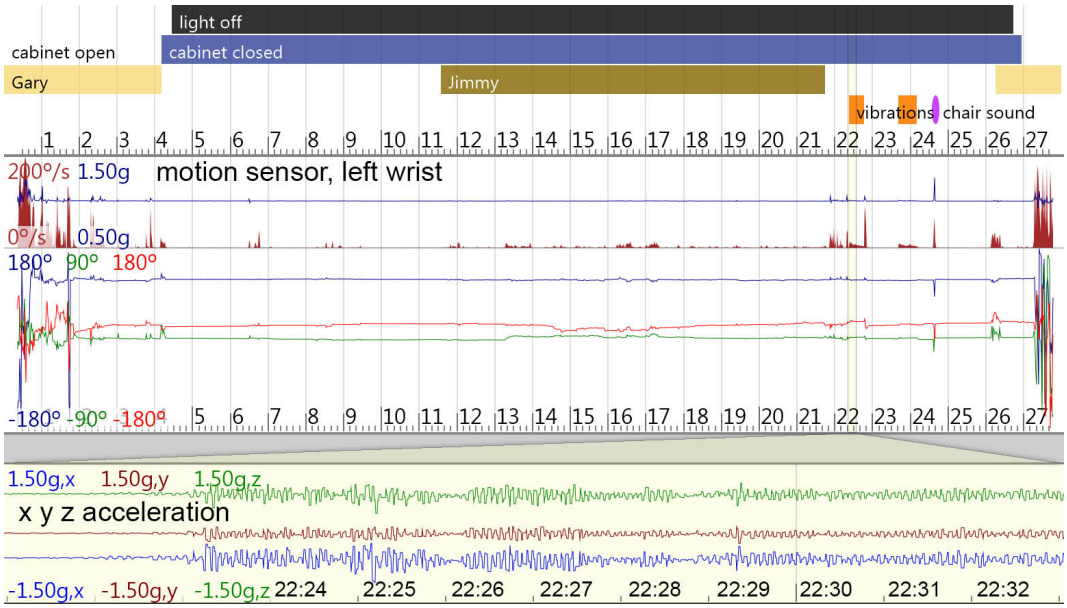

Figure 6: 2018/01/27, vibrations

was clipped to the preconfigured measurement range of 2 g for each coordinate. The measured acceleration vector has a value of 3.5 g, but the steep slope of the curve before the truncation suggests that it is considerable more. A later test showed that such a strong acceleration (in the order of 5 g) can be produced manually, holding the sensor in the hand and making very swift motions of the arm.

Afterwards, the sensor remained entirely calm until the end of the session. Jimmy resumed the conversation, explaining to have placed the sensor under the chair on the floor. After the séance, the sensor was found there, Gary's arms were tied to the chair with the scarfs as at the beginning of the séance.

2018/01/27: There was a single sensor at the left wrist, where it was also found at the end of the séance. Again, no phenomena were observed in the dark, but there were some interesting sensor readings (Figure 6). At 0:22:23 the sensor detects a vibration, which lasts about 30 seconds, pauses for a minute and continues another 30 seconds. The bottom of the figure zooms into a segment of 12 seconds when the vibration starts. Acceleration in x, y, and z direction is shown as separate curves. The sensor makes quite regular translational motions along the same direction, with a frequency of about 15 Hz. At 0:24:38 a loud cracking noise was heard, as if the chair slammed with its legs powerfully on the floor. For about a second, the sensor recorded a strong irregular motion.This phenomenon was observed in various séances (sometimes which much shorter peaks of very intensive sensor motion). According to Jimmy it is caused by the "release of remaining energy" at the end of the session.

Apparently, the sensor vibrations are caused by a trembling of Gary's arm. The

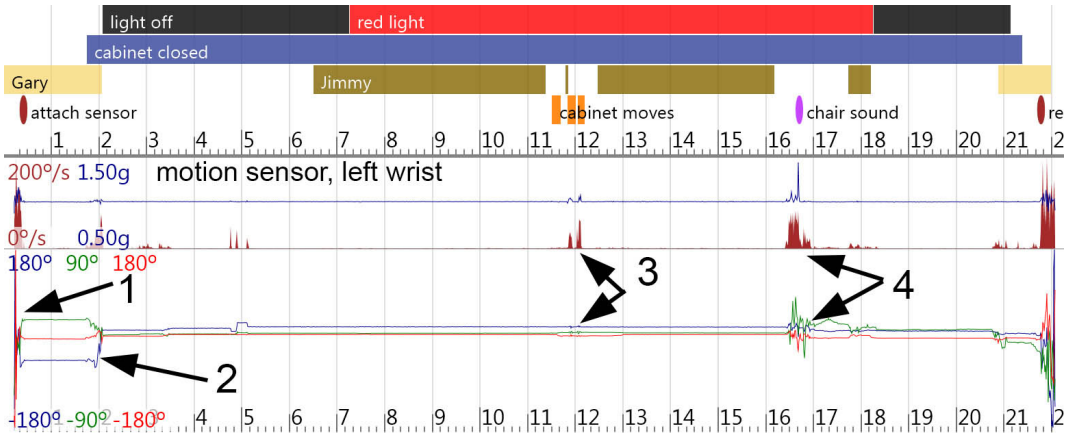

Figure 7: 2018/01/29, cabinet moves

frequency of 15 Hz is quite high in comparison to the various types of human tremor, such as in Parkinson's disease or physiological tremor of healthy people due to anxiety or fatigue. Deutschl et al. (1998) specifies various ranges up to 12 Hz, only exceeded by Orthostatic tremor (a rare disorder affecting the legs when standing) with 13-18 Hz. McAuley and Marsden (2001) report that physiological tremor can reach higher frequencies than the usual 10 Hz, such as 20 Hz at finger muscles due to the very small inertia of the moved body parts.

The public séance in the evening allowed only marginal experiments (motion sensor on a trumpet, air sensor). The séance following the next morning was limited to a conversation with Jimmy.

2018/01/29: In the morning, intense cabinet motions and rotations were observed. The setup was like in previous séances, the motion sensor at the left wrist and Gary's arms and legs tied with scarfs to the chair. Figure 7 marks the motions when the sensor was attached (1). When the cabinet was closed, there is a short, quite smooth rotation which is of special interest (2). It occurred in many séances in a similar way and was very likely caused by Gary leaning back and relaxing when the séance was about to start. From perspective of control, unfortunately, this opens the possibility that the sensor was somehow manipulated. However, the motion is short and quite slow, such that a removal or complete displacement of the sensor is very unlikely, in addition this would require to put it back in place unnoticed, where it is found at the end of séance. In the current case, the orientation remains almost exactly the same throughout the séance, so this seems very hard to achieve. Nonetheless, once this problem had been identified (unfortunately only much later, after February 2019), Gary was asked to lean back into his comfortable position before the cabinet was closed.

During the séance, Jimmy asked to switch on the red light, at 0:11:30 the cabinet began to move slowly and bend, at 0:11:50 it quickly rotated several full turns around the chair, while the motion sensor was somewhat shaken, but without changing its ori-

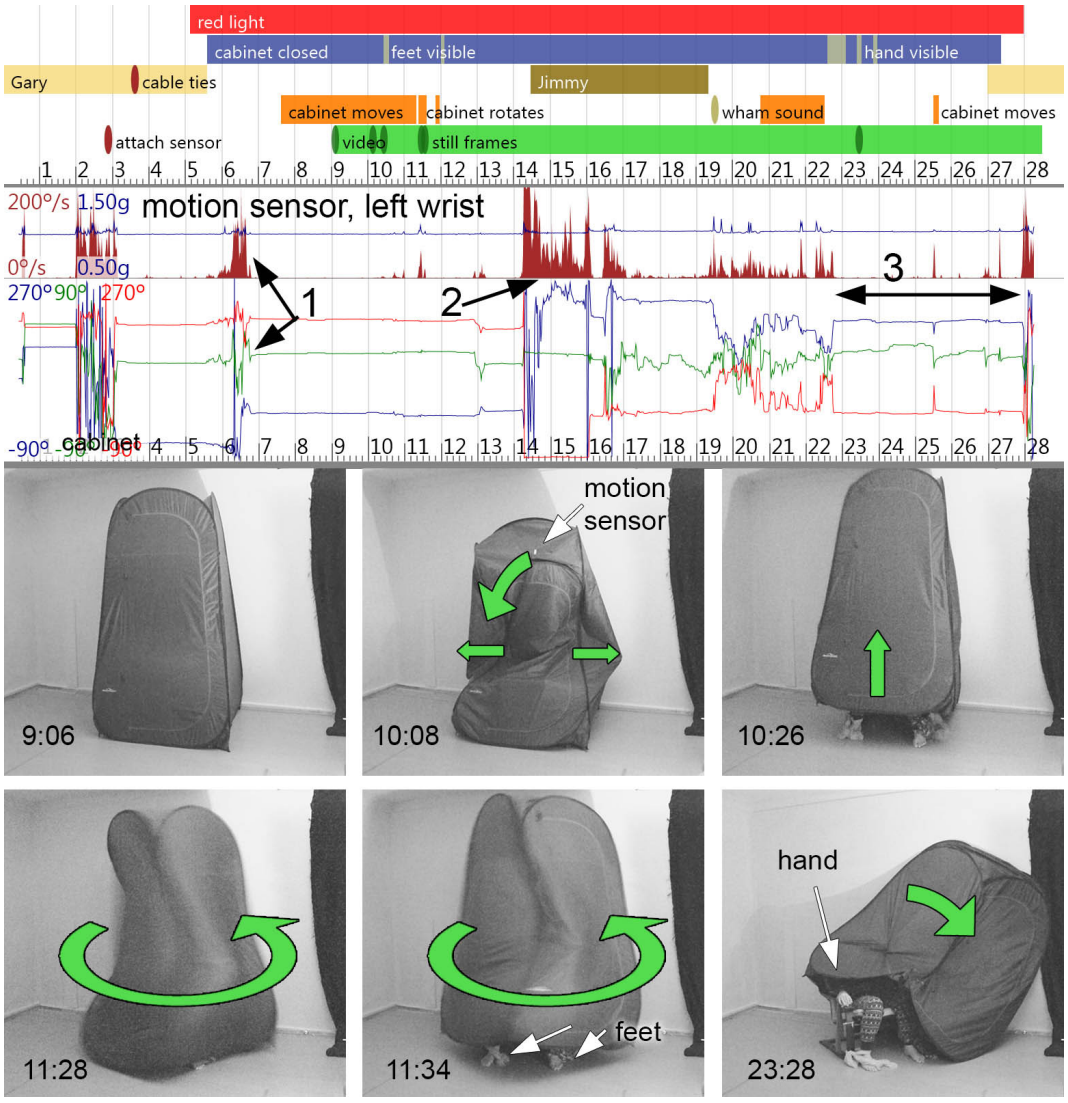

Figure 8: 2018/01/30, cabinet motions on video

entation (3). At 0:16:40 there was a loud sound from the chair as mentioned above, accompanied by strong sensor motions (4), but again with the same orientation afterwards. At the end of the session the sensor was found at Gary's wrist where it was initially placed.

2018/01/30 After witnessing the cabinet motions, I asked Jimmy that it would be great to capture them on video. The next morning I got that opportunity. For stricter control, from now on time cable ties were used to bind Gary's arms to the chair. Again, there was a motion sensor on the left wrist and on top of the cabinet. Just two minutes after the cabinet had been closed, even before the red light was switched off as usual

when starting the séances, the cabinet started to move. From Jimmy, so far, no word was heard. When asking if I could turn on the camera, the cabinet made a nodding movement. Video was recorded from 0:09:06 till the end of the séance. Figure 8 shows the data from the wrist sensor and selected video frames, with cabinet motions indicated by arrows. The data of the cabinet sensor is not displayed here, as it just reflected what was captured on video and it stopped recording data at 0:11:30, when it was thrown off the fast rotating cabinet.

At 0:11:30, the cabinet rotated very fast, in a forceful, but seemingly controlled manner, with three full 360 degree turns in six seconds. When analyzing the video frame by frame, it can be seen that from the inside something is pushing against the cabinet cloth. Often two such 'interaction points' can be seen to both sides of the cabinet and they change their position quickly causing a smooth rotation. At times, Gary's feet can be seen, motionless resting at their original position. I later tried to replicate such swift motions by myself, sitting or standing inside the cabinet and using both free hands, but with poor results. The slippery material of the tent was hard to grab, so I needed to put my hands into the corners to exert some force, and the cabinet almost stopped whenever I changed the position of my hands.

During the intensive cabinet motions, the motion sensor on the left wrist remained calm. However, unfortunately, there was a similar flaw as mentioned above that directly after closing the cabinet the sensor was moving considerably (1). Afterwards, its orientation was slightly rotated and there were still those tiny motions ruling out it was placed on the floor or an otherwise static object. In the middle of the séance, when Jimmy was speaking, the sensor moved a lot (2): From 0:14:10 to 0:16:05 the motion data was dominated by a rotational oscillation with 2 Hz, while slowly changing its orientation. The reason for this is unknown. Exactly at that time Jimmy explained that Gary's body is often moving during the phenomena and potentially mimicking the motions of some physical effects. If we wanted to avoid that effect to obtain more convincing data, the spirit team would specifically need to subdue the sensor motions.

At the end of the séance, the sensor was at the same position where it had been attached initially. While there remains uncertainty what happened throughout the séance, one might at least argue backwards to a certain point in time. From 0:23:00 on, no significant sensor motion was detected (3). So it was presumably in its final position at the wrist, while some cabinet motions were happening still at 0:25:30, when the cabinet was moved back to its original upright position. In addition, at 0:23:28 the right hand was visible at its original position, attached with the cable ties to the chair.

2018/01/30-2018/02/01: In the evening of the 30th, there was just a conversation with Jimmy, without phenomena. The next morning and in the public evening séance experiments were done which are outside the scope of this article. The next day again a mere conversation session followed, adhering to the pattern that after intensive séances the next ones were often for "relaxation" or "building up the energy" and without phenomena.

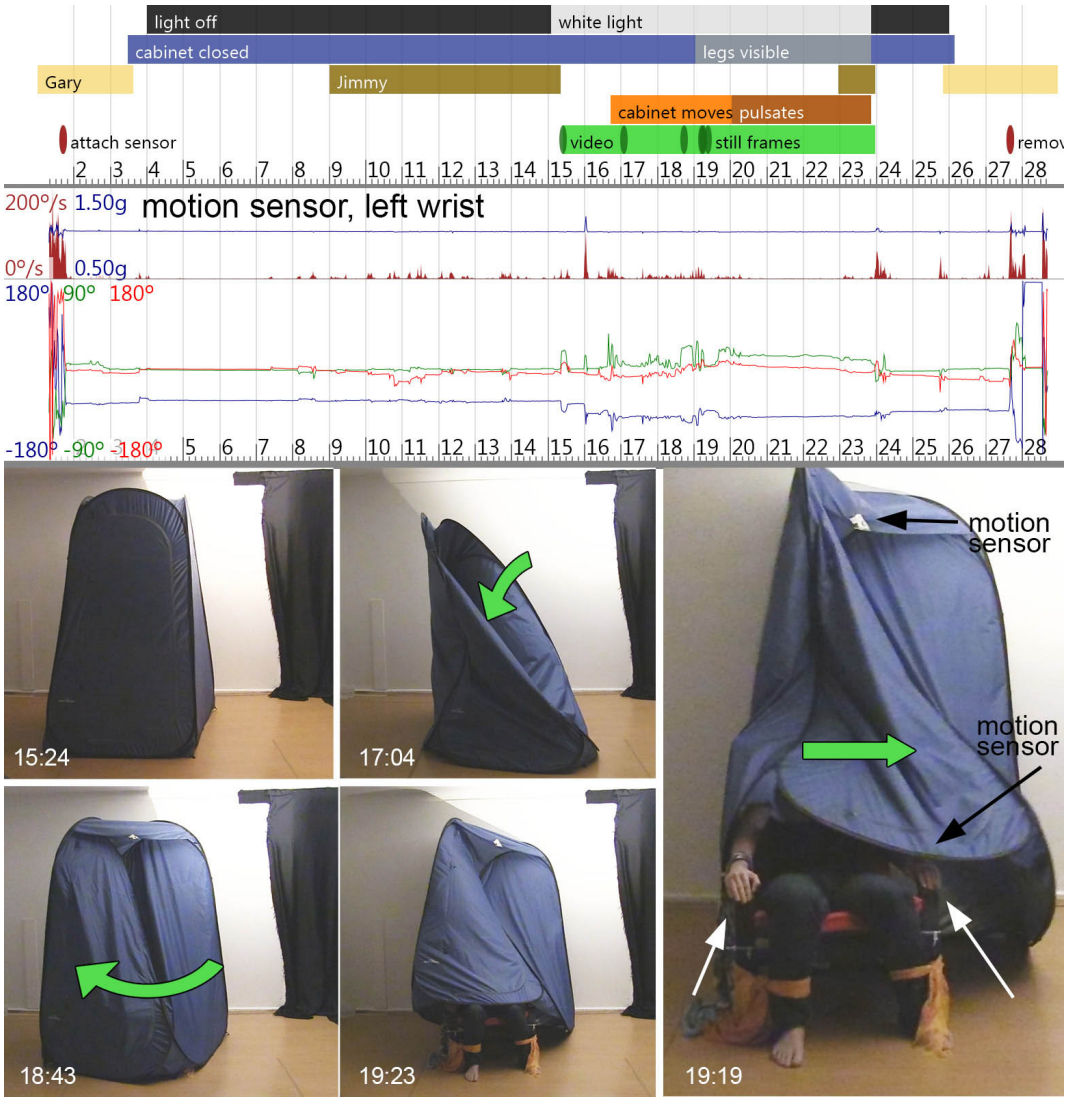

Figure 9: 2018/02/02, cabinet moves and reveals hands

2018/02/02: The last day in Wallacia another culmination point was reached. While the evening séance focused on ectoplasm phenomena not regarded here, the morning is of special interest (Figure 9): After attaching the sensor at Gary's left wrist, it remained calm throughout the whole séance until being removed. There were some minor shaking motions, but the orientation remained quite stable. At 0:14:00, to the surprise of the sitters, Jimmy suggested to switch on the white light and also permitted video recording. Various motions of the cabinet could be captured. As the cabinet was hitting Gary's arms this likely accounts for at least some of the sensor motions. The cabinet sensor (data not depicted) confirmed that in the first dark part of the séance, no

cabinet motions occurred, and it matched the motions which are visible in the video. At 0:24:10, lights were off, the cabinet was moved back into its initial upright position.

The most amazing part was found when analyzing the video. While the lower portion of the cabinet was moving forcefully in various directions, it revealed the feet, the legs and finally (0:19:19, see detail) both hands, properly in place where they had been tied at the beginning of the séance. From 0:19:29 on, the cabinet remained in its tilted position, with the cloth softly and slowly pulsating, while the unmoved finger tips of both hands could still be seen until the video recording was stopped at 0:23.59.

4.2 Bridgwater, September 2018

The experiments at Bridgwater from September 13-19, 2018, were mostly intermediate steps for later, more significant results. The meeting at this new location started with two sessions with discussions with Jimmy, but without any tests or devices, followed by a public séance.

2018/09/15: The wooden cabinet moved in the dark (clearly discernible by the sliding sound) and in red light, while the motion sensor on the left arm showed only minimal motions. No video recording was allowed.

2018/09/16: For the first time in the investigations, both of Gary's wrists could be controlled simultaneously with a motion sensor each. Thus, after quite some time Jimmy's initial announcement to add devices one at a time reached a new step. Some cabinet motions were observed in red light, while the motion sensors remained quite calm.

Apart from that, those and the remaining séances focused on other phenomena which are not regarded here, mostly related to ectoplasm, including some recordings with thermal video.

4.3 Bridgwater, February 2019

The next meeting at Bridgwater was February 10-18, 2019, with two public and 15 experimental séances. As before, initially some time was spent on conversations with Jimmy on how to proceed and what sensors to use, and it took several séances to further develop strength of phenomena and testing relevance. The experiments dealt with various types of phenomena and measurement ideas, such as the production of ectoplasm, the recording of audio close to the cabinet or even inside of it and some tests with the capacitive touch sensors. The séances relevant for this article are summarized here.

2019/02/11: In the morning séance, motion sensors were on both wrists, and in addition the light sensor, air sensor and capacitive touch sensor were placed inside the cabinet. While the light was off, various sounds could be heard from the cabinet, indicating that the chair and the cabinet were sliding over the floor. When the light was

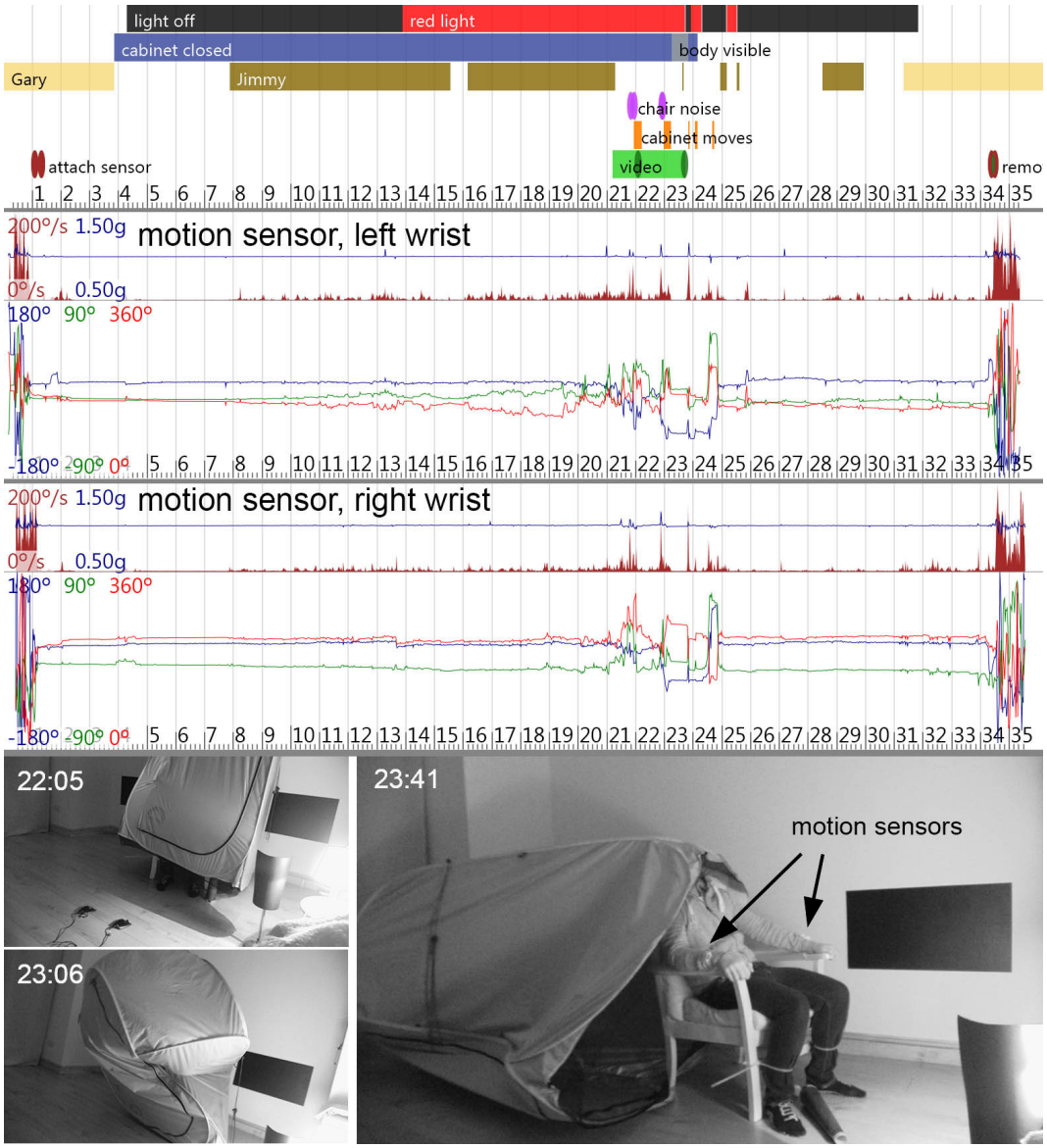

Figure 10: 2019/02/15, cabinet almost removed

switched on at the end of the séance, this was confirmed by a displaced position of the cabinet. The rotation of Gary with his chair showed up in the orientation data of the motion sensors, which otherwise were quite calm.

2019/02/11-14: The séances on the evening of the 11th and the following days (including one public séance) did not offer anything new with regard to the experiments presented here. Some phenomena reoccurred, like the fast rotation of the tent cabinet.

2019/02/15: In the morning séance, the cabinet motions developed one step further, this time revealing almost Gary's entire body (Figure 10), while the (hand-held) video camera was recording. The motion sensors on both wrists were calm throughout the start of the séance, but showed, as noticed before, some minor activity while Jimmy was speaking. During the cabinet motions they quite synchronously moved and changed their orientation, at least partially due to the movement of the chair. When at 0:23:41 the cabinet titled backwards, the chair could be seen at a position turned by 90 degrees from its original position. The sensors were in place at the wrists.

2019/02/15-17: The following evening séance was entirely blank and the next morning there was only communication with Jimmy without phenomena. The remaining séances, including a public healing séance and three more experimental séances, did not contribute to the results presented here.

4.4 Bridgwater, May 2019

The final testing days regarded here took place in Bridgwater, May 10-14, 2019. Some focus was on stricter and more systematic controls. As part of the standard protocol the room was searched and a pat-down search of medium was done. The tightness of the cable ties was carefully checked and after cutting the ends, tape was put on the closures to prevent manipulation. Before closing the cabinet, Gary was reminded to take his final, comfortable position to avoid any unwanted motion sensor readings at the start. To additionally monitor the proceeding of the séance, the light sensor was used, recording the light conditions in the room.

2019/05/10: As before, the initial session was without any devices and used to discuss with Jimmy the planned experiments and how to proceed. In the evening a public séance took place, without any measurements. The séance the next morning was still done without motion sensors, some video recording was allowed in red light, but without capturing any phenomena.

2019/05/11: In the evening, various cabinet motions were observed and recorded on video, with one motion sensor at Gary's right wrist. Finally the cabinet revealed almost the entire body, such that the left arm (the one without sensor) and even the head could be seen (Figure 11). Unfortunately, there was a problem with the motion sensor such that the acceleration and gyro channels were cluttered with random spikes making the diagram unreadable. Thus, the raw data from the compass is shown. It indicates that the sensor was shaken occasionally but quickly returned to its original orientation.

2019/05/12: The next day, there was a morning séance and a public healing séance in the evening, both without results to be presented here. Also the final séance on the morning of May 14th is of no interest here, so this section finishes with three very interesting séances on May 13th.

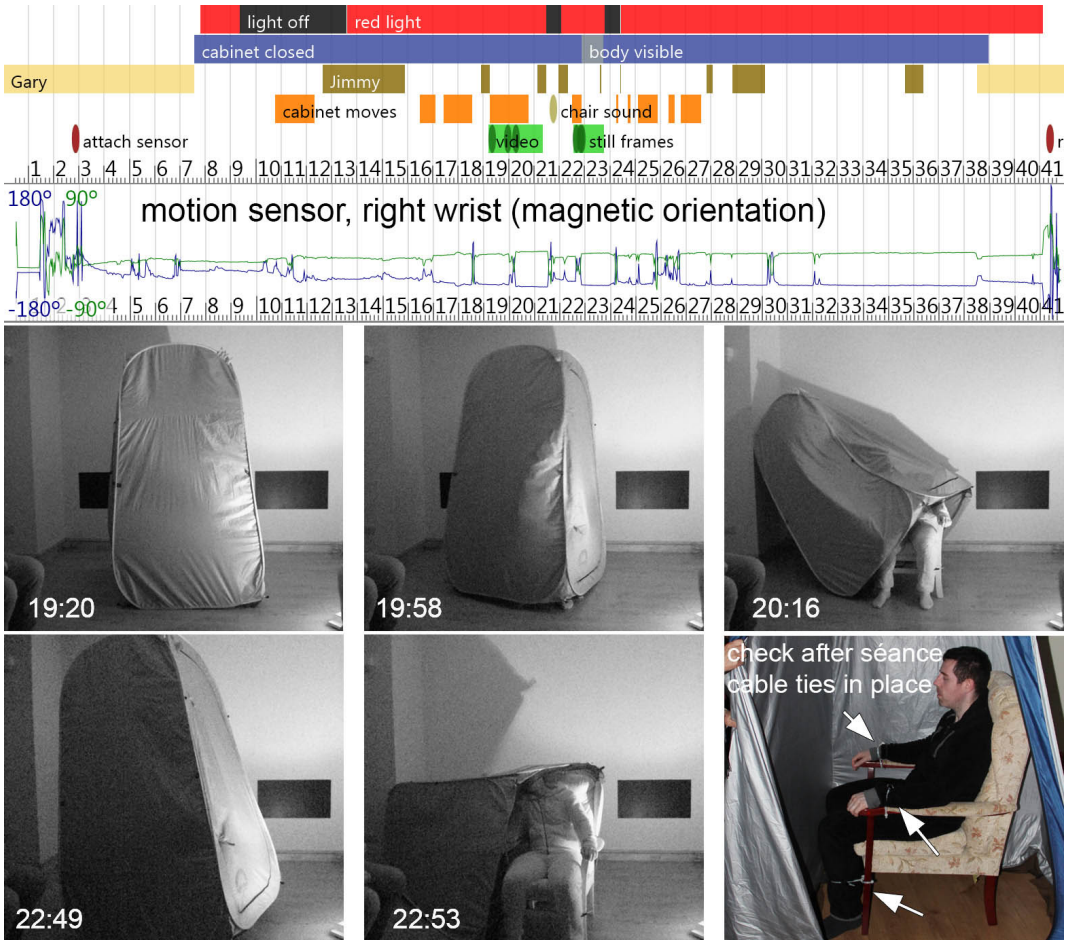

Figure 11: 2019/05/11, cabinet motions

2019/05/13 morning: Like on the day before, the wooden cabinet was used. It moved already in previous séances, often with surprising smoothness and speed. During the séance, Jimmy gave permission to put a sensor on top of it to capture its motion, also video recording was allowed. Figure 12 shows the data and two video frames from before and after a very smooth cabinet motion lasting four seconds (note, that the black cloth of the curtain appears white because it strongly reflects the IR portion of the red light). Start, end and intermediate positions are illustrated in the top view, which has been generated by mapping 3D-models of the room and the cabinet with the video footage. As mentioned, the cabinet weighs 70 kg, and in addition the armchair (12 kg) needed to move. The right wrist motion sensor showed some activity, but mostly remained in its original orientation. The precise setup of cable ties in this séance was shown in section 3.

I tried to move the cabinet in a similar way, without being tied, either sitting or

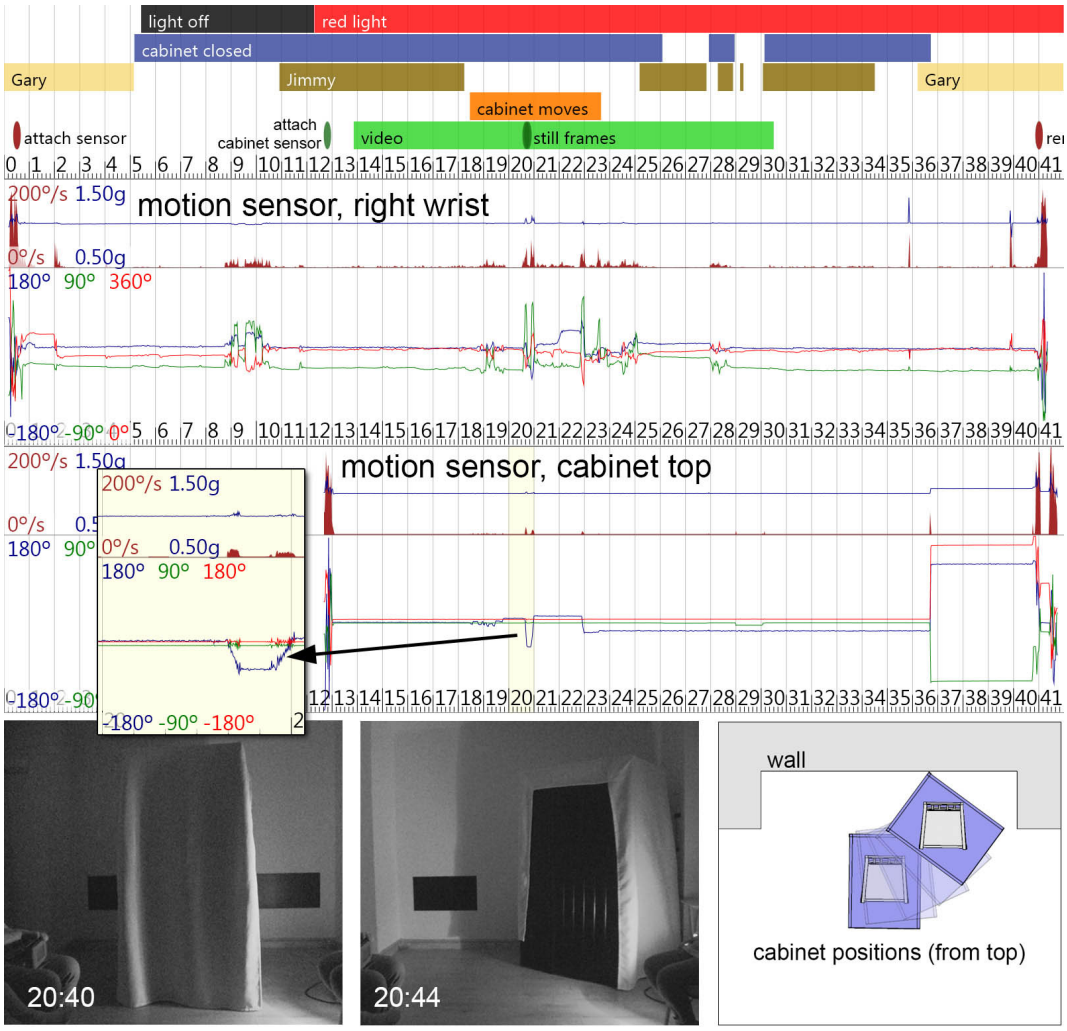

Figure 12: 2019/05/13 morning, wooden cabinet moved

standing inside and using both hands to forcefully push the sides of the cabinet. I achieved only smaller, jerky, stepwise motions, further hampered by the need for occasional repositioning of the chair.

2019/05/13 afternoon: For this séance, the tent cabinet was chosen, with a motion sensor on top, and again a sensor at Gary's right wrist (Figure 13). The wooden cabinet remained in a different part of the room a few meters away, separated from the séance area by a heavy curtain. At 0:19:23 Jimmy's voice came from behind that curtain. When the red light was switched on at 0:19:37, the tent cabinet lay flat on the floor, Gary and his chair were gone, apparently he had moved into the wooden cabinet behind the curtain. In following dark phase, sounds indicating motions of the wooden cabinet were heard, at 0:24:00 with red light again, it had partially moved into the séance

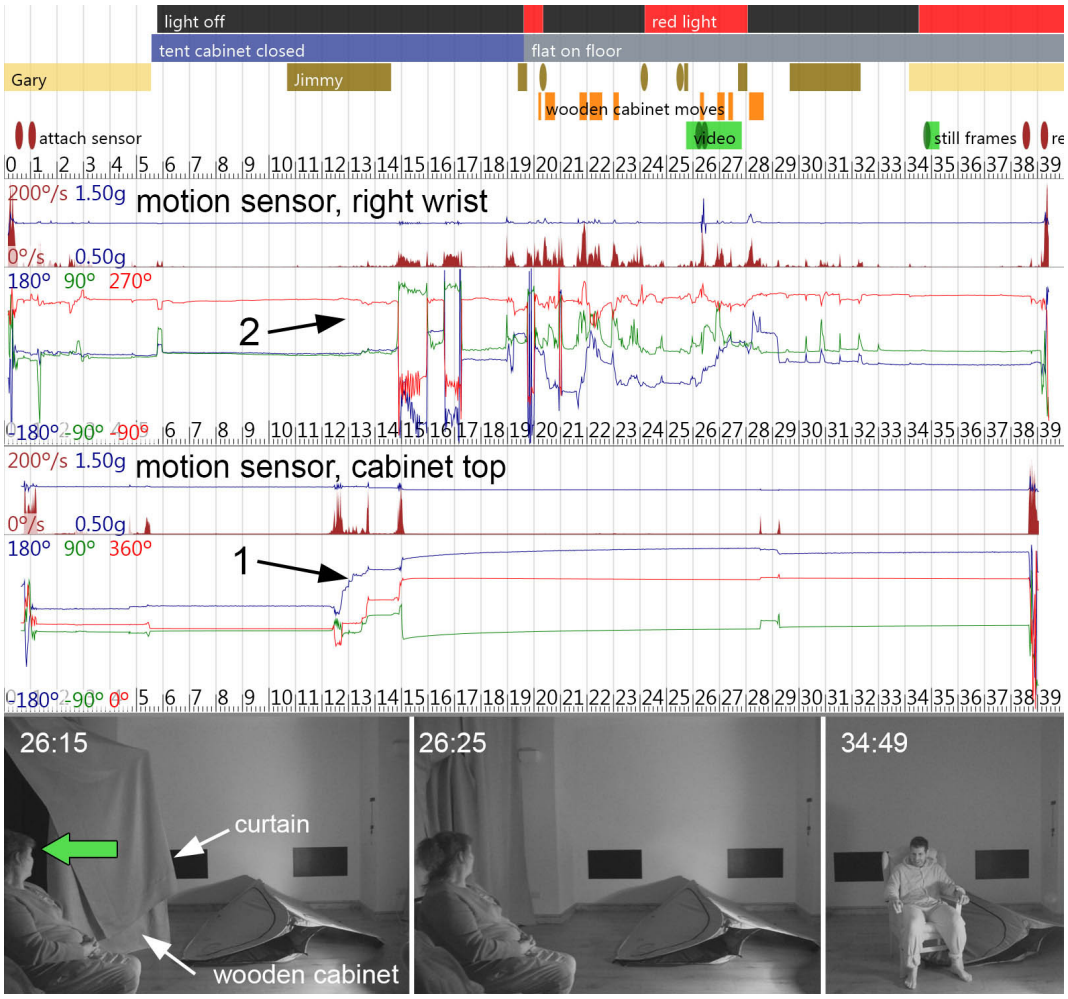

Figure 13: 2019/05/13 afternoon, Gary moves in and out of cabinets

area. Video recording was allowed, capturing how the wooden cabinet was moved back outside the séance area (indicated by the green arrow). At the end of the séance, the wooden cabinet was still outside, while Gary was freely sitting in the middle of the room, with all his cable ties in place.

While the tent was being removed (1), the wrist sensor remained very calm (2). Later, during the wooden cabinet motions the wrist sensor showed some activity, leaving the question unanswered whether Gary was somehow actively involved in moving the cabinet or just passively moved with his chair.

2019/05/13 evening: For the evening, Jimmy requested to have both cabinets inside the room, with motions sensors on both of Gary's wrists. As only one more sensor was available, it was spontaneously decided to put it onto the wooden cabinet, however, this time only the tent cabinet was involved.

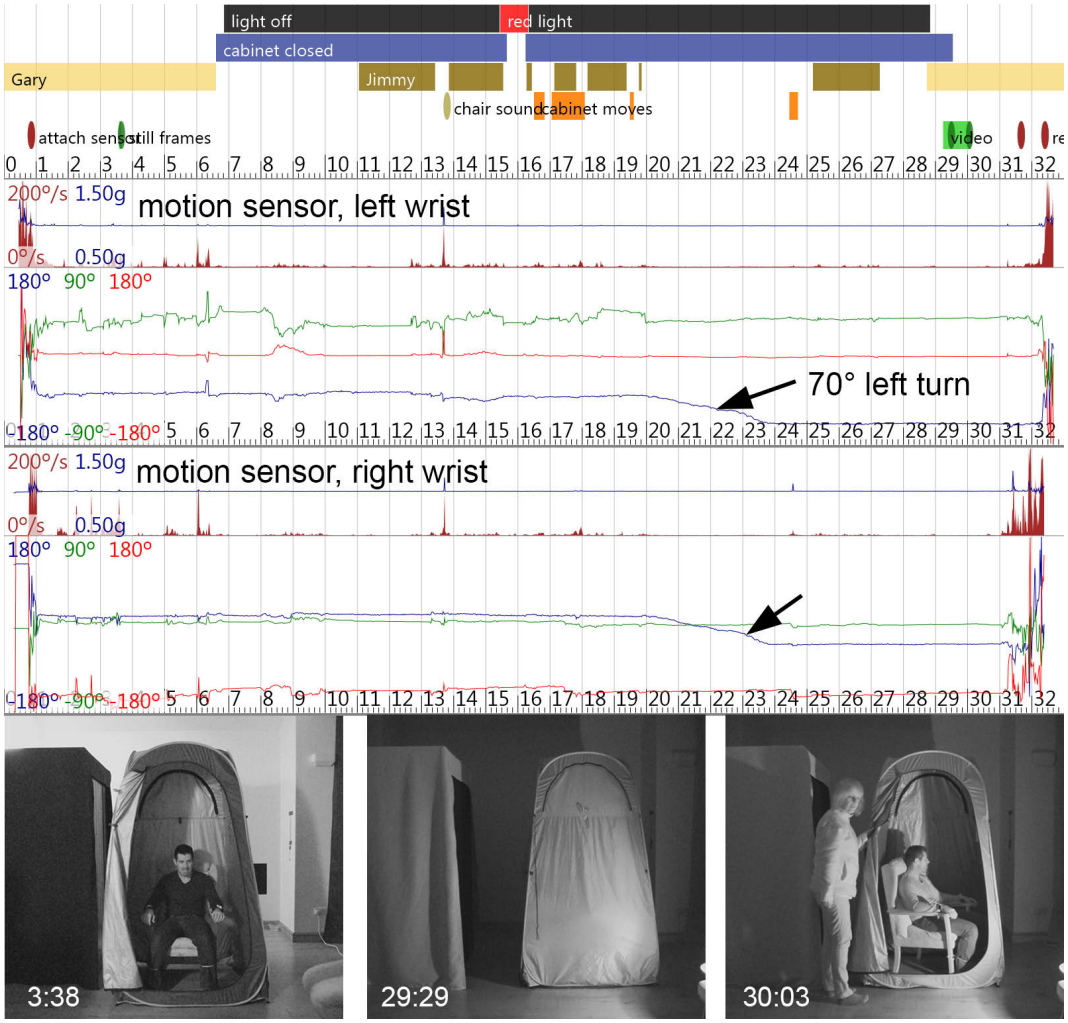

Figure 14: 2019/05/13 evening, slow rotation of chair

In a short red light phase around 0:16:00, the cabinet was opened and Gary's cable ties and the sensors were checked. The cabinet was closed, light switched off, and twenty seconds later the sound of the tent moving could be heard, while the motion sensors remained calm. At 0:19:46 Jimmy announced trying some experiments with the motion sensors. From 0:20:10 to 0:23:40, both motion sensors recorded a slow, smooth rotation by around 70 degrees to the left. As the diagram shows, the heading angle changed while the acceleration data remained entirely flat. No video recording was allowed during the séance, the pictures are from the start and end of the séance. At the end, the cabinet was turned by 180 degree (center image), Gary's position (right image, the tent door had been moved back to the front) corresponds with the 70 degree left turn detected by the motion sensors.

5 Discussion

Throughout the séances a lot of data was collected, part of which has been presented here in some detail. Focus was on the motion sensors; some phenomena, such as ectoplasm, had to be entirely omitted for now. The presented sensor tool set hopefully also outlines a new, beneficial way to approach séance room phenomena and gain new insights. Often some interesting details were discovered only later, with a deeper look at the data, such as the high frequency tremor. In this article, mostly overview timelines were presented, with the individual raw data channels aggregated to more intuitive representations. Zooming into the data may reveal additional information, as indicated in some of the diagrams. The same is true for the video recordings, which were often very interesting when analyzed frame by frame. But to avoid excessive length of this article, there was always the tough decision what still images to select.

My focus was on presenting techniques, conditions and collected data, rather than excessively engaging in discussions about potential trickery and loopholes. Nevertheless the selected results focused on the most impressive phenomena which in my opinion are hard to explain in terms of fraud or trickery. I also wanted to show the often complicated path to deal with settings and measurements that often left some wishes for more unequivocal results, such as sensor motions that could not be fully explained.

There were several séances with intensive cabinet motions, partially even revealing Gary's hands and feet, often supported by calm motion sensor readings. Some of the phenomena, namely the fast and regular whirling of the tent cabinet and the smooth motion of the very heavy wooden cabinet, I could not even nearly reproduce when moving freely inside the cabinet and using my whole body. In addition, since September 2018, tight cable ties have been always used to bind Gary to the chair, the exact conditions at all limbs have been photographed before and after the séances, providing additional material for further scrutiny.

I am happy to receive any comments also from readers who tend to interpret the presented results as expression of some trickery, if they see loopholes or suggest how such séances could be faked to produce similar data and observations. Maybe any such issues can be addressed in future experiments - or maybe they become obsolete, when further significant results can be presented. To me it seems very much that as time proceeds and mediums like Gary develop, the evidence for the authenticity of physical mediumship phenomena gets stronger and more convincing.

It is planned to continue with the experiments (another week of testing took already place in September 2019) and there are other interesting phenomena, namely related to the apparition of (alleged) ectoplasm, which are quite impressive. Hopefully, I will be able to publish them in the future, further enhancing the picture of this type of research on physical mediumship.

6 Acknowledgments

Many thanks to Gary Mannion for allowing these experiments and tirelessly sitting in so many séances, to Inge Crosson for inspiring and actively supporting this research and her invitation to Wallacia, to the members of Gary's home circle for their strong commitment, to Steve, Dawn and John Bexx for supporting us and being a lovely host at Parsonage Side Retreat, Bridgwater, and to my wife Heike Bauder for her continuous help in this research.

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