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Devices of Difference: On the Socio-Material Forms and Effects of Technologies in Complementary and Alternative Medicine

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ABSTRACT

Despite the widespread view that complementary and alternative medicine (CAM) is a ‘natural’ and low-tech form of healthcare, by contrast with biomedicine, there are numerous devices used in the field of CAM that employ electricity as a diagnostic and therapeutic agent. These devices bring together different types and sources of knowledge, Western and Eastern theories, and expert and lay hands. They foreground complex psychosomatic, social, and environmental relations in which the patient’s body and well-being are constituted. They are used to address biomedicine’s iatrogenic effects and its indifference to specific bodily processes and entities (such as meridians or parasites). In effect they challenge, extend, and reinterpret biomedicine, thereby becoming one of the mediators between it and CAM. Although these devices are sought out by patients and used effectively by CAM practitioners, their ontological choreography and radius can become precarious in a healthcare system dominated by biomedicine. Different CAM devices then deal with the realities of biomedicine in different ways. While some modes of practising CAM devices are inclusive of biomedicine and carefully experiment with the realities it has inscribed in patients’ bodies, others reject biomedicine altogether.

Keywords

Czech Republic;
complementary and
alternative medicine (CAM);
medical technology;
ontological choreography;
ontology in practice

Introduction

Cardiac pacemakers, the Gamma knife, and myriad other technologies are the iconic objects of biomedicine today in the eyes of the public and experts around the globe. They represent modern techno-scientific progress and define the human condition (Lock and Nguyen, 2010, p. 22). However, the technologisation of medicine produces new concerns and unintended effects. For example, at a conference in December 2016 called ‘Controversies of Contemporary Medicine’ organised by the Czech Medical Chamber, top Czech biomedical

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professionals argued that the technologisation of biomedicine has had the unfortunate effects of diminishing the role of the physician and dehumanising patients and has thereby given rise to ‘other’ approaches to healthcare – namely, complementary and alternative medicine (CAM). While these professionals condemned ‘charlatanic’ CAM for its lack of scientific evidence they, at the same time, appreciated CAM’s low dependence on technological objects and procedures when compared to biomedicine. This interpretation of biomedicine, one widely shared in the Czech Republic (Křížová, 2015) and beyond (e.g. Pedersen, 2013), portrays it as a depersonalised, commoditised, and technologised practice that reduces patients to mere bodies, while CAM approaches are seen as non-technoscientific, personalised, and using natural substances that put patients at the centre of treatment.

While the use and effects of technologies in biomedicine have been extensively examined by social scientists, relatively little attention has been paid so far to technologies in CAM, though CAM is, in various forms, widely practiced today across Europe and the US (e.g. Barnes *et al.*, 2008; Harris *et al.*, 2012). In this paper we question the popular distinction claimed to exist between supposedly (over)technologised biomedicine and holistic and natural CAM by exploring the use of ‘CAM devices’ in selected versions of CAM, namely in Chinese medicine, ‘Electroacupuncture According to Voll’ (EAV), and bioresonance and frequency therapies. By ‘CAM devices’ we mean here unconventional diagnostic and therapeutic technologies in various socio-material forms that are powered by a paradigmatically modern, artificial source – electricity. As we will document on a case of ‘CAM devices’ used since the early twentieth century in what is today the Czech Republic, these devices *partake in the production of different medical and bodily realities*. For this reason we suggest they be thought of and talked about as ‘devices of difference’.

In this article, we ask the following questions: What roles do these devices of difference play in CAM? How are they put to use in everyday healthcare practices? What medical and bodily realities do they help to enact? In what ways do they mediate, or not, CAM’s positioning in relation to the biomedicine that dominates the Czech healthcare system? And, is there perhaps a lesson that today’s high-tech biomedicine can learn from how technologies are used in CAM?

To answer these questions, first we introduce a number of concepts from STS that orientate our analysis. Next, by discussing various diagnostic and therapeutic devices popularly used in the Czech lands we show how they participated in enacting various deficiencies of conventional medicine at a given time and were employed to uncover and mitigate its negative effects. These devices have also been used in speculations about various other issues of wider concern (e.g. the relationship between nature and culture, the economy) by connecting and disconnecting different types and sources of knowledge, Western and Eastern theories, methods and materials, the hands of experts and

‘others’, and human and non-human physiologies. We then look at a specific device that is currently being used in one CAM practitioner’s office in an effort to scrutinise the ontological work the device partakes in. The case indicates that, besides enacting biomedicine’s various deficiencies and negative effects, the use of such technology in some CAM approaches is no substitute for the personal doctor–patient relationship and does not simplify the complex nature of the patient’s health problems.

Instead it enhances this relationship and articulates the complex nature of a patient’s (well-)being. In the last section we discuss the various resistances and accommodations involved in acting through, around, or with the CAM devices that we encountered in the field. Regarding CAM devices’ positioning in relation to biomedicine; we argue that while some CAM devices, such as the mass-produced and do-it-yourself electro-puncture and EAV devices, are practised in a manner inclusive of biomedicine and effectively widen and open up options for practitioners and patients, others, such as ‘zappers’, used by some proponents of bioresonance and frequency therapies, reject biomedicine altogether. Thus, we discuss here not only how CAM devices are involved in the (re)production of differences between CAM and biomedicine but also within the field of CAM.

Analytical Perspectives and Methods

Medical sociologists have pointed out that technologies have significantly reshaped the way biomedicine is organised, what its goals are, and how it is practised in relation to human bodies and socialities (Casper and Morrison, 2010). At the same time, medical anthropologists have drawn analytical attention to the broader context in which medical technologies work. They have focused, for example, on how they are appropriated in non-Western settings, and on economic and political inequalities (Hadolt *et al.*, 2012; Hardon and Moyer, 2014; Beaudevin and Pordié, 2016). However, what seems to be symptomatic of such sociological and anthropological studies is the ‘society-technology dualism’ (Latour, 1987), i.e. analysing either the social impact of medical technologies or how medical technologies are culturally and socially shaped.

In STS, however, it is a well-established insight that technologies are not neutral or innocent tools (Latour, 1990; Law, 2004). This perspective seeks to avoid the society-technology dualism and redistribute agency into a collective action. In relation to medicine, STS has demonstrated in the examples of resuscitation technologies (Timmermans, 1998) and laboratory tests travelling between Europe and Africa (Mol and Law, 1994) ‘the intricate and mutually constitutive character of the human and the technological in the processes and relationships of sickness and healing’ (Prout, 1996, p. 214).

The mutually constitutive character of the human and the technological was thoroughly examined by Andrew Pickering who writes about the ‘dance of

agency', which he describes as 'a *dialectic of resistance and accommodation*, where resistance denotes the failure to achieve an intended capture of agency in practice, and accommodation an active human strategy of response to resistance' (1995, p. 22, emphasis original). As he exemplifies, while scientists are rather active in the development of a particular device, when the device is functional, they take a passive role and mostly monitor the device's performance. This period of passivity opens up space in which the agency of the device can manifest itself. Depending on the results of the device's performance there might be another reversal when human agency foregrounds and the 'dance' continues. When these dialectics of resistance and accommodation are coordinated and stabilised the dance of agency related to technologies resembles 'choreography' (1995, p. 102). Taking Pickering's perspective in our field of study, it is important to examine not only the 'mangle' of human and material agency in CAM but also various frictions and differences they produce.

Choreographing the technological, bodily, social, and political matters in medical contexts was scrutinised by Cussins (1996) in her ethnographic study of assisted reproductive technology. Cussins coined the notion of 'ontological choreography' to stress that medical realities and patients' selves emerge and are redone through the coordinated yet fragile dance of heterogeneous things and procedures. Cussins' concept thus sensitises ethnographers to both the socio-technical and the processual nature of medical reality.

STS's accent on heterogeneous practices and the processes by which a reality comes about or ceases to exist, was then elaborated by Mol (2002) in her study of atherosclerosis. Instead of embarking on a mode of reasoning that aims to uncover the different perspectives patients or medical professionals have on a biologically singular disease, Mol follows the ways in which the disease is 'enacted'. This doing of medical realities (diseases, bodies, diagnostics, etc.) in practice always takes place in specific sites – for example, in the outpatient clinic's consulting room, a pathology laboratory, or a department of statistics. Mol argues 'that *ontology* is not given in the order of things, but that, instead, *ontologies* are brought into being, sustained, or allowed' (Mol, 2002, p. 6, emphasis original), often acting through, around, or with particular devices – a microscope for instance.

If a study of CAM is to stay faithful to Mol's praxiographic dictum to take 'notice of the techniques that make things visible, audible, tangible, knowable' (Mol, 2002, p. 33) with symmetrical attention to the bodily and the technological, it must pay close attention to the various *devices of difference*, such as the mass-produced and DIY electro-puncture devices that feature in some unconventional practices. This type of analytical attention allows us to attend to the ways these devices of difference partake in the *production of medical and bodily realities*, which may or may not be compatible with biomedicine.

Though most of the social science research on CAM so far has paid limited attention to devices and things, we are surely not the first ones to notice and

look at their role in CAM. Regarding non-biomedical traditions that, like CAM, recently became globalised, Scheid (2002) documented that some acupuncture techniques in Chinese medicine that practitioners and patients believe are ancient and traditional were developed only in the mid-twentieth century with the introduction of stainless steel needles, which are able to smoothly penetrate the human skin. Mukharji (2016) explored how ‘small technologies’ such as pocket watches, thermometers and microscopes became the ‘motors’ and ‘catalysts’ of the development of modern Ayurveda in the late nineteenth century. Hess (1997) has studied Raymond Rife’s electronic-frequency machine, which was designed to destroy microorganisms and sought to revolutionise theories about cancer and its treatment. Rife’s innovations were expelled from mainstream medicine in the 1930s to later reappear in CAM as a vital component in, for instance, bioresonance and frequency therapies. With these few exceptions, the social sciences have hitherto tended to reproduce the popular view of CAM as a field in which technological relations play a minor role. We believe it is time to engage both empirically and conceptually with technologies in specific versions and forms of CAM.

The present study draws on participant observation of CAM practices in private facilities and of various public, policy, and professional events concerned with CAM in the Czech Republic between 2015 and 2017 that was conducted by the two authors of this article. Here we mostly draw on ethnographic data generated in the office of a doctor we call Dr Silná, located in an upper-middle-class residential district in Prague. As we discuss below in more detail, Dr Silná, who was trained and worked professionally in the past in biomedicine, has been interested in CAM since the 1980s and opened her own private practice shortly after 1989. Recognised as one of the most experienced practitioners of the EAV method by her peers, Dr Silná has also been actively advocating for CAM in the media and in policy arenas. Another source we work with here are data generated from sixty interviews conducted with CAM practitioners, patients using various CAM therapies, representatives of CAM professional associations, public healthcare managers, and officials involved in the debates on the regulation of CAM in the Czech Republic. We also draw upon relevant archival documents and media debates. In conformity with the principles of ethnographic fieldwork, the names of the people and facilities involved in our study have been anonymised.

Historical Grounding: CAM Devices in the Czech Lands in the Twentieth Century

Unconventional devices that employ electricity for diagnostic and therapeutic purposes are nothing new in the Czech lands. In the first decades of the twentieth century, it was common in Prague’s pubs to come across ‘electricmen’, who were selling a treatment that used ‘healing sparks’ emitted by portable

electric devices in wooden cases. These devices usually consisted of an electric battery, a coil, and hand electrodes and it operated according to the principle of Wagner's vibrating hammer interrupter mechanism (Pata, 2007). Like in Western Europe, North America, and China, the emerging Czech petty bourgeoisie was enchanted by inventions such as galvanic-faradic batteries, high-frequency machines, and 'ozone' generators, and by the 'electrotherapeutics' that these devices were supposed to provide (Connor and Pope, 1999; Stark, 2014; Wexler, 2017). Czech advertisements and manuals from that time claimed that the electric currents emitted by the devices penetrate the body to treat a wide range of diseases of affluence, which they do by restoring the body's natural energy, and they also enhance health, beauty, and the performance of the embodied self. This 'popular cult of electric devices' (de la Peña, 2003), helped to objectivise electricity as a powerful healing agent and reinforced the intimate connection between the 'modern' human body and technoscience.

While some of these devices could still be found in households during the state-socialist period in Czechoslovakia (1948–1989) and nowadays are sold in auctions as technical curiosities, the electricmen who sold their healing sparks are long gone. Electricity has since become commonplace and the excitement around it has been lost. However, in the second half of the twentieth century new types of unconventional devices came into being and were used even within medicine provided by the state.

In the late 1950s a small group of Czechoslovak physicians learned about Chinese medicine within the framework of medical cooperation among communist countries. In the decades that followed, after adapting Chinese medicine to scientific discourse (mainly through the theories of Soviet neurophysiology), these physicians experimentally tested and institutionalised it as 'medical acupuncture' (for details see Stöckelová and Klepal, 2018). An important step in the incorporation of Chinese medicine into the official healthcare system occurred when a link was established between medical acupuncture and the state's research and industry. In 1978 the state granted a patent for 'Acudiast', which was a device 'for the identification, measurement, and stimulation of reflexive processes on the surface of the body' (Úřad pro vynálezy a osvědčení, 1982, p. 1). Combining four electric circuits (Figure 1) – one for indicating acupoints, one for measuring their electric impedance and two for different types of electric-stimulation treatments – the intention was to design a device that would help a trained physician to find, measure, and stimulate acupoints easily and all at the same time. Acudiast was manufactured back then by the state firm Metra Blansko, which produced various electrical instruments, most of them for use by the military in the Eastern Bloc.

In 1982 another state company, Tesla, introduced an electro-puncture device called Stimul into the domestic and later the international market. It was engineered to replace acupuncture needles with 'modern electronics' (Tesla Liberec, 1982, p. 5) and, unlike Acudiast, it was designed as a portable gadget.

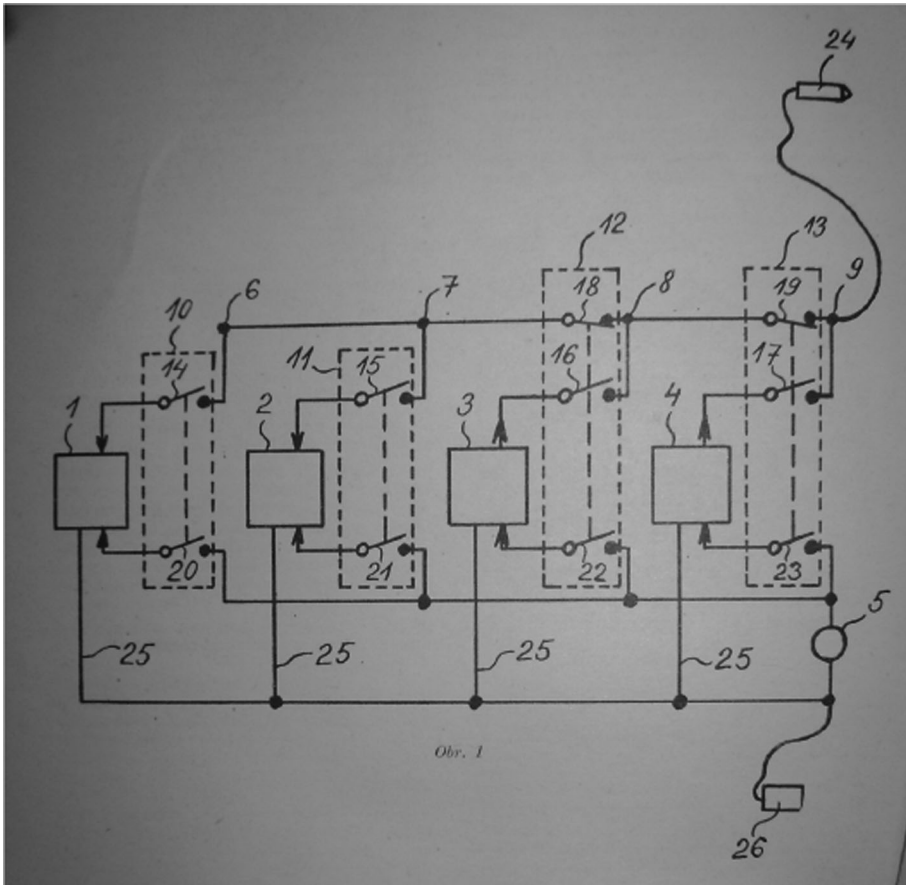


Figure 1. Acudiast's technical schema as it appeared in the patent (Úřad pro vynálezy a osvědčení, 1982).

Powered by a 9 V battery, it was to be used at home or in the workplace to help restore bodies suffering from maladies ranging from tobacco addiction to arthritis. The belief was that the rectangular waveforms at low frequencies (20 Hz) produced by Stimul's simple pulse generator had therapeutic effects. As designed, these Stimul's waveforms were supposed to solve what was seen as a serious problem in state medicine – namely, that ‘with repeated usage, the effectiveness of some medicines is reduced and they even became harmful’ (5).

These mass-produced devices not only embodied the virtues of state socialism (affordability, simplicity, money-saving, technoscience), they also helped to introduce realities like acupoints and meridians into circulation within the state's official medicine and among patients. The promotion of such technologies by the state also created room for various bricoleurs, like the small group of technical enthusiasts who emerged around Rody Wirya I Gusti Ngurah. ‘Dr Rody’ was a physicist of Indonesian origin who was working in the early 1980s in a major Czechoslovak industrial company, where he was

allowed to set up an unofficial laboratory and consulting room for electro-acupuncture. Dr Rody and his fellow tinkerers experimented with stimulating acupoints using different electric currents and frequencies. Various home-made devices emerged from their experiments and protocols. As one acupuncturist remarked in an interview with us, their technical innovations proved that acupuncture signals not only followed meridians but were also transmitted by ordinary human cells through their membranes – a discovery he claimed was well ahead of its time and that was ‘later proved correct’ by studies in the West and China. Dr Rody himself gained fame during his life and, as we were told by a lecturer in medical acupuncture at the Institute for Postgraduate Medical Education, he ended up treating G. Husák, the President of Czechoslovakia (1975–1989), Prime Minister L. Štrougal (1970–1988), and their families.

Another medical engineer recounted to us in detail how he started to tinker with his own electro-puncture devices and unofficially practised acupuncture in the Institute of Clinical and Experimental Medicine, the pride of the state’s healthcare system. There he had access to the latest international studies on acupuncture, which the institute’s library ordered for him, and was able to conduct research on the electric properties of acupoints. His work and the devices he developed during the state-socialist period (Figure 2) became the foundation for the small private firm he founded after 1989 that started to produce electro-, photo-, and magneto-acupuncture devices mainly for use in holistic veterinary medicine.

As the state-socialist period is usually characterised by its various forms of material and information scarcity, the bricolage and tinkering with electro-acupuncture are manifestations of the inventiveness that emerges in response to scarcity. But they also highlight the resourcefulness of the actors involved and the proliferation and ferment of original, unconventional ideas, methods, and materials that was occurring both on the margins and in the heart of the state’s technoscience and medicine. These bricoleurs often pointed out in the interviews with us that the time they spent researching acupuncture and tinkering with devices during state socialism was the ‘freest’ and most inspiring period in their career.

During the twentieth century, unconventional devices that used electricity for diagnostic and therapeutic purposes moved from bourgeois households and city pubs into scientific, industrial and healthcare centres of the socialist state. Due to their mass as well as DIY production, they expanded through healthcare institutions and practices, and significantly shaped the current CAM scene in the Czech Republic.

The Forms and Effects of CAM Devices

The end of state socialism in 1989 triggered the onset of far-reaching changes in the provision of healthcare in Czechoslovakia and, soon after, the Czech



Figure 2. A home-made acupoint detector designed by our informant in the 1980s.

Republic. A series of market-oriented reforms led to the system's liberalisation, decentralisation, and partial privatisation. This brought various CAM approaches and techniques to the public's attention (Křížová, 2015). As we have argued elsewhere (Klepal and Stöckelová, 2018), some CAM approaches even played an instrumental role in the privatisation of care and in shifting responsibility for health away from state institutions and onto the shoulders of individual patients. However, the growing presence of CAM therapies was met with substantial criticism from the medical establishment. They were backed by Sisyphus, the Czech sceptics' club, which was founded by a group of Czech scientists and medical doctors in the early 1990s to join the international sceptical movement and its efforts to counter 'the rise of irrationality'

in society. For example, the Czech Medical Acupuncture Society was threatened with expulsion from the Association of Czech Biomedical Professional Societies if its members continued to work with such 'pseudoscientific' devices as EAV, which became very popular soon after the regime change.

EAV devices were designed to work with a method of acupuncture developed by German physician Reinhold Voll that syncretises Chinese medicine's theory of energy flows (meridians) with Western medicine. They were marketed in the early 1990s by German manufacturers, who organised presentations, workshops, and customer service for the several thousand 'medical acupuncturists' that had obtained their qualifications in the socialist period.

EAV devices, such as 'Vistron' (discussed in the next section), are designed to measure the electric potential of particular acupoints. In EAV theory 50 mV represents the normal electric properties of a point/meridian/organ and is equal to the acupoint's electric impedance of 96k Ω in a healthy state. If the measured electric potential is in the range of 60–100 mV, this indicates a decrease in the impedance of the point/meridian/organ and it is usually a sign of inflammation. On the other hand, measurements below 50 mV signal an increase in impedance and thus deterioration of function.

The widespread use of the EAV method also led to particular local modifications of the device. One of the key innovators was Dr Kapka, a psychiatrist by training and an unconventional practitioner widely appreciated by CAM consumers and numerous followers, but also continually criticised by the Czech medical establishment. Since the socialist period he has, in his clinical practice, inventively combined various CAM methods with theories from microbiology and quantum physics. He has gradually developed his own version of the EAV device, which now plays a key role in the method he uses to detect and eliminate toxins in the human body. In a book looking back on his career Dr Kapka explained that the EAV device caught his attention because with its help Voll 'was able to diagnose immediately causes of diseases or processes in the body which allopathic medicine was trying to identify laboriously and often without success'.

Based on his experiments with a DIY device and long-term communication with some EAV innovators in Germany and Austria, his device (Figure 3), unlike standard EAV devices, does not require the probe to be applied to multiple points on the hands and feet, but to just one point at the centre of the palm (acupoint 'pericardium 8'), which is the 'window' into the patient's body and health. Also, while practitioners of the EAV method use a range of CAM remedies, Dr Kapka and the hundreds of practitioners he trained (usually patients who after treatment became therapists themselves) almost exclusively test and prescribe 'informational preparations' that he started to develop after the outbreak of bovine spongiform encephalopathy in Europe, when the production of particular preparations imported from Germany was banned because of their animal components. Dr Kapka's preparations are herbal tinctures that

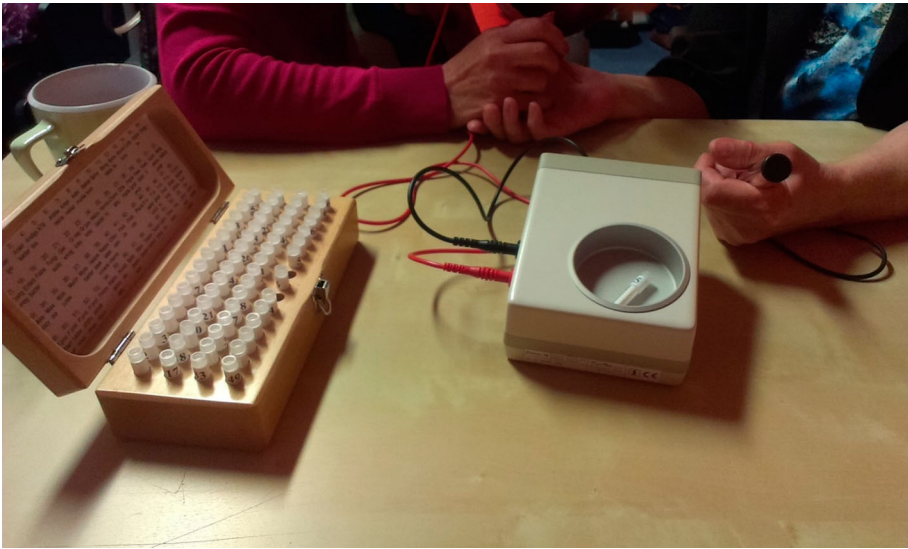


Figure 3. Aspiring instructors at an educational workshop learning how to operate Dr Kapka's device.

supposedly carry information about toxins 'in the form of a hologram' that can trigger the body's immune system and self-healing capacities into action. While this sounds rather like maverick science far beyond the currently prevailing paradigm, Dr Kapka believes that the scientific mainstream will eventually recognise these phenomena and even biomedicine will make use of them. At the same time, our discussions with Dr Kapka's and other practitioners' patients suggest that some of them seek CAM not in spite of it being beyond the current scientific consensus, but precisely because of this. They are seeking something *different*.

In addition, 'zappers' used in bioresonance and frequency therapies have recently gained popularity among CAM users. Zappers are designed to harness electromagnetic waves produced by a frequency generator in order to exterminate harmful microorganisms and parasites that otherwise cause various health problems or even life-threatening diseases. At the turn of the millennium Hulda Clark's *The Cure for All Diseases* was translated into Czech for the first time. The book revived Rife's studies on pleomorphic microorganisms as the cause of cancer and his experiments using resonant frequencies to kill these creatures (see Hess, 1997). As well as arguing that 'electricity can do many magical things' (Clark, 2009 [1995], p. 16) for a person's health, the book also offers readers instructions on how to build their own simple electronic-frequency device and on how to conduct 'zapping'. Some readers have used these instructions to build their own zappers, and one of them established a Czech firm that manufactures zappers and now sells them worldwide. For legal

reasons, however, he also rigorously includes the disclaimer that a zapper is not a medical device – so that customers take full responsibility for its use.

The zapper strongly embodies Pasteurian microbiopolitics (Paxson, 2008), in which pathogenic organisms are deemed to be the cause of numerous diseases and human bodies are conceived as territories under permanent attack from the outside (an understanding historically constitutive for biomedicine). Our interviews with people who use or sell zappers and related therapies suggest that the popularity of these devices has to do with their ability to address the insecurities that people experience in a globalised world: from the worrying vulnerability of both national borders and physical bodies and the fear of being attacked by ‘dangerous’ external threats to distrust in expertise. This includes biomedicine, which is seen as being more interested in keeping patients ill than making them healthy. For some people these devices represent an opportunity to radically take their healthcare into their own hands.

Even the brief trajectories of CAM devices in a single country highlight their great diversity. Some of the devices described in this and the previous section were used by patients at home (ozone generators and Stimul); others had to be operated by trained practitioners in consulting rooms (Akudias and the original EAV devices). Some of them, such as DIY electro-puncture devices, could be used on not only human but also animal bodies. Some were legally recognised as medical devices and even became a part of the socialist state’s healthcare, while others, such as the zapper, remain outlaws.

Like the homemade remedies circulating in postsocialist Bosnia (Jašarević, 2015), in different periods these devices tied into and made it possible to ‘speculate’ on multiple issues of wider concern: the socialist state’s economic agenda; doctors and patients confronted with the limits of biomedicine; or public mistrust of experts and certified authorities. Practicing these devices has also in various ways had the effect of connecting and disconnecting different types and sources of knowledge, Western and Eastern theories, methods and materials, experts and ‘other’ hands, and human and non-human physiologies. Despite their different material forms and effects, what all of them share is that they participate in enactments of various deficiencies of conventional (bio)medicine at a given time and they are practiced in a way that uncovers and mitigates its negative effects. In the next section, we take a closer look at a case of practising one particular EAV device drawn from our fieldwork in order to substantiate such claims.

A CAM Device in Action

At first glance Dr Silná’s office looks like an ordinary private practice. There is a waiting room and examination room. The latter contains an examination bed, a blood-pressure metre, filing cabinets with patient files, disinfectants, children’s drawings on the walls, and around the office are gifts the doctor has received

from patients. It is the office of an allergist, an immunologist, and an internist rolled into one.

On second glance, however, it is no ordinary doctor's office. It contains wall maps of the meridians in the human body; tiny gadgets designed to eliminate 'electrosmog' produced by computer screens and phones; and dozens of exotically labelled bottles of medicine, Tibetan remedies, so-called low-dose medicine (manufactured by an Italian company), Bach Flowers and homeopathic preparations. The sign on the office door tells us that Dr Silná is also an acupuncturist and a homeopath. Once you know her better, it comes as no surprise that she has been one of the most outspoken advocates of unconventional medicine in the Czech Republic in recent decades. She began in the 1980s, when, after receiving her MD, she worked at a regular hospital and discovered acupuncture as a way of reducing her patients' suffering and improving their quality of life.

After the regime change in 1989 she studied the EAV method and opened a private practice. She currently has almost 10,000 registered patients of all ages and from various parts of the country. A few thousand of them seek and pay for her services regularly.¹ She often works with whole extended families and in some cases even treats family pets. She is often informally but affectionately called the 'witch doctor' by her patients and even by a former Minister of Health, who, she told us, occasionally sends desperate patients to see her. But unlike witch doctors, she does not rely on spells. She uses the EAV device, which – as she states in the university textbook she wrote in 2012 for physicians interested in 'holistic medicine' and open to 'biomedical alternatives' – she considers a method that is 'objective, reproducible, and comparable (...) to any other electrodiagnostic method such as an EKG or an EEG'.

The EAV device occupies a central place in her office. It sits on a wooden stool next to her desk and in front of her patients. The office furniture, antistatic linoleum, lamps, and gadgets to combat electrosmog have all been chosen with a view to ensuring there is as little electro-magnetic interference as possible. Dr Silná wears cotton gloves when she uses the device in order to prevent her body from influencing the measurements.

Her EAV device, a 'Vistron', is the latest model of a device that is produced by a German company certified to develop and manufacture such devices in the EU. Dr Silná appreciates the service the manufacturer provides: she does not have to worry about maintenance, calibration, or other technical issues. She just regularly cleans the probe and the hand electrode to prevent the 'transmission of negative energy from patient to patient'. Vistron is similar to other electro-puncture devices except for one key difference: the circuit it creates not only proceeds through an ohmmeter, a hand electrode, the probe, and the human body, but also a metallic tray, in which various substances (from homeopathic testers to allopathic medicines) can be placed and their positive or negative interactions with a patient's body tested.

Although there exists computer software for operating the measurement process, Dr Silná never uses it. After decades of practice, for her, the best software is her own ‘reasoning’, which she must always ‘apply to the device for it to work properly’. It is as though her body and the device form a seamless continuum. She is knowledgeable in the device’s technical parameters, Voll’s theory, and the electrical properties of the device’s circuits, but what she counts on in practice is her technical habitus: she can almost instinctively locate many acupoints, she knows how to use the probe to apply just the right amount of downward pressure on the acupoints, and she is able to recognise the measurements produced by the device just from the sound of its beeps without having to read the numbers on the display. Although her device can also be used in therapy to stimulate acupoints with an electric current produced at specific frequencies, Dr Silná rarely uses this technique because she considers the therapeutic effects of the device’s electric frequencies to be limited. For the purpose of therapy, she employs a spectrum of CAM techniques and remedies: ear or whole body acupuncture, homeopathy, dieting, Bach Flowers, low-dose medicine, Tibetan medicine, and other herbal preparations. She also uses vitamins and psychosomatic techniques. In some cases she will suggest surgery and send the patient to a biomedical specialist.

At a certain point in a patient’s visit to Dr Silná’s office, usually after a clinical interview and a discussion of the patient’s biomedical records (which patients with chronic diseases often bring with them), she uses the EAV device to take the patient’s measurements.² The patient holds an (negative) electrode in one hand and Dr Silná applies the probe to selected points along twenty meridians on the patient’s fingers and toes. The probe completes a low-voltage circuit and an electrical current is sent through this now embodied device. Patients usually fix their attention the display that shows the measurements, listen to the beeps the probe produces and discuss the results with Dr Silná. Such was the case with this female patient who came for a regular check-up:

The main complaints this patient discusses are poor digestion and anxiety. She has brought with her various medical reports, including blood tests and a thyroid gland examination, because she was told by attending physicians that her results were OK. Despite that she does not feel well. She thinks and feels that her problems are being caused by her thyroid because she has had the same problems before. Dr Silná reads the reports carefully. After reading the reports it is time to ‘find out where the problems are coming from’. She prepares a form to write down [EAV] measurements. She puts on her gloves and asks the patient to remove her rings and her watch because they could interfere with the device and she asks her to take the electrode in one hand. When the circuit has been formed she starts measuring the selected acupoints. While measuring a point on the ‘triple burner meridian’, which according to an adapted version of a theory in Chinese medicine can reveal the state of particular tissues and organs in the body, she says: ‘You were right. There is a problem with your thyroid. It measures at 70 points [millivolt] and as you already know the ideal is 50. In the reports you brought in you are perfectly fine. The thing is that the

laboratory and other biomedical examinations cannot detect a problem because they cannot see it. There is no structural change, only a change in energy, which can be observed here by the device.'

Another, older female patient is what Dr Silná refers to as almost a 'detective story', by which she means that there are many conflicting clues and dead ends that she needs to check with her device in order to determine what might be causing the patient's current problems:

The patient has been paralysed by pain coming from a hip joint. Yet the device did not measure any problems with her bones. Its measurements of the soft tissues were high (indicating inflammation). In order to find the cause of the patient's complaints Dr Silná puts various homeopathic vials and other EAV testers (Figure 4) into the device's test tray and examines their responses in the circuit. Based on these tests Dr Silná concludes that the patient's body might be infected with a virus. But the patient denies having any flu or infection. 'How about your dog? Did you vaccinate it recently?' asks the Dr Silná. 'No.' But the patient remembers that a few months earlier she got a vaccination against the flu. This information seems to solve the puzzle of what the patient's current problem is. Now Dr Silná can finally search for a cure. She tests various preparations by adding them to the circuit and combining them to figure out which ones suit the patient best. While reading the measurements she finds one homeopathic remedy that sent all the affected measurements back to 50 points and she concludes that this remedy will relieve the patient's pain by dealing with the source of her complaints – the viruses and 'toxins' that the vaccination polluted the patient's body with.



Figure 4. 'Válečky', a kit of sixty-four metal rollers that are claimed to store information about health problems (e.g. 'virus infection'), are used as testers for the EAV device in a practitioner's office.

When we discussed the cases of the patients that we encountered in the office with Dr Silná, she noted the fact that patients often come to her with the results of biomedical examinations that indicate nothing is wrong, yet they do not feel well or healthy. There are also cases of patients who come in with positive test results, but doubt their significance. For her, this points to a deadlock in current biomedicine. 'Doctors treat the laboratory not people,' she stated, meaning that biomedicine mainly recognises and treats disease as enacted in laboratory examinations and protocols, but often fails to treat the contradictory and elusive health problems that patients live with. Using the example of interleukin 10 and cholesterol, she explained to us that both of these agents can be easily measured in a laboratory to see if they are high, and they can be identified by a physician as the cause of certain health problems and managed with biomedical treatment. However, for Dr Silná, an increase in their levels is not the primary cause of pathology but rather a reaction to various interconnected processes that cut across the patient's mindful body, social milieu, and wider environment.

In her view biomedical diseases framed by laboratory findings often mistake symptoms for causes. Objectivising energetic imbalances, acupoints and organ systems with and through her device Dr Silná is convinced that she can deal with the real causes of patients' health problems and attend to what she called in her textbook the 'pluricausality' of their complaints. Emotions, stress, hormones, microorganisms, conflicts in the family or at work, 'polypragmasy' (i.e. a simultaneous application of multiple remedies – not only pharmaceuticals but also food supplements and CAM remedies), low-quality food – all these and other things need to be considered as possible etiological agencies that are at the root of patients' problems. The EAV device makes it possible for her to draw boundaries (and if necessary also to go beyond them) between biomedicine, with its focus on 'intervention' into the 'defective structures' of the body, and her CAM approach, concerned with the detection and 'regulation' of 'defects in function', that are usually invisible or inconceivable to conventional medicine, but are often caused by it.

The biomedical doctors and managers we spoke to during our fieldwork were often concerned with the problematic side effects of the current use of technologies in biomedicine, as they in effect replace the personal relationship between doctors and patients. As we observed, the EAV device in Dr Silná's office was carefully employed so that it did not become a substitute for the personalised doctor–patient relationship or simplify the complex nature of the patient's health problems. On the contrary, use of the device served to enhance the patient–doctor relationship and foregrounded the many, complex attachments to other human beings and non-humans outside the space of the office, considered as constitutive of the patient's (well-)being. The EAV device allows Dr Silná to excorporate health issues and thereby to enact the patient body as the continuation of wider existential, societal, and environmental realities.

The Ontological Choreography and Radius of CAM Devices

Most of the interactions we observed in Dr Silná's office went smoothly. The use of the EAV device and its testing results were hardly ever questioned by the doctor or her patients. For her patients, the EAV device, in the hands of Dr Silná, demonstrated its efficacy and superiority to biomedical and other CAM diagnostics, and as a result they were able to experience an improvement in their health or even 'clinical miracles' (Zhan, 2001).

Yet, that the work went smoothly cannot be ascribed just to the device itself. Rather, it is an effect of the dance of agency choreographed by Dr Silná. As we often observed and heard during our fieldwork, CAM devices and the realities they aim to enact oftentimes run up against practical complications and frictions, both inside and outside CAM practitioners' offices. In this section we discuss in more detail some examples of the dynamics of resistance and accommodation in which these CAM devices are involved. While frictions could be explained simply as a necessary effect of the ineffectiveness and fallibility of CAM, we take them seriously as instances of the struggle between incoherent realities. As Mol (2002) showed for biomedical technologies and practices, incoherence and multiplicity are not always a problem for medicine in action. Incoherent realities can be coordinated and distributed between sites within a clinic. However, their coexistence must be carefully tested and fine-tuned, as we witnessed during our fieldwork, and at times realities can prove irreconcilable.

Most of the friction we witnessed was the result of practical problems in the form of various incompatibilities between CAM devices and the mindful body of the patient or the practitioner. Dr Silná rarely has any difficulties, as she has developed her skills and sensibility over many years of daily practice since the early 1990s. But the highly popular devices developed by Dr Kapka to be used by his 'instructors' are a different matter. Despite having been simplified (to use only one acupoint, in the centre of the palm), even with special training it is still difficult to locate the point with the probe. An instructor of Dr Kapka's method explained during a workshop that the device is very useful because it 'can reveal a health problem at its onset when it is undetectable to current biomedicine', but much time and practice is required in order to learn how to operate it correctly. A practitioner must develop 'a great deal of inner peace' and concentration; she needs to regularly detoxify herself and develop a deep understanding of the method, because 'the device will not tell you what to do, you must already know it'. When the instructor observes how Dr Kapka works with the device she realises that the testing 'probe is just a natural extension of Dr Kapka's hand and body', which comes from him having examined the palms of tens of thousands of patients.

And the CAM practitioner is not the only one who has to be in the right condition. No matter how skilled the Dr Kapka's instructors are, it happens, for example, that patients' palms resist. Sometimes there is no 'conductivity' in

the body, no matter how much the practitioner moisturises the patient's palm. A patient's palm may be so hardened by manual labour that the device is unable to take any measurement. Testing (especially in children) can sometimes take too long and the acupoint becomes 'exhausted'. And sometimes a client's body is so full of medication that the measurements are meaningless.

Clients must also be prepared mentally. As Dr Silná noted, not all patients, even those who come to seek her treatment, are ready to accept the EAV device with all its affordances. There are patients with whom she would 'not go so far' as to use the device to try to measure the quality of their family relations or the food brands they consume. What Dr Silná wanted us to understand was that the EAV method and device have 'huge potential and a wide field of applications, but they do not work for everyone in every moment and not everyone is ready to accept them'. For her, the appropriate use of the EAV device has to be judged in each individual case by the practitioner, who takes into account how ready and willing patients are to set out with her onto unconventional ontological terrain.

In most cases experienced practitioners using various EAV devices like Dr Silná did not reject the realities of biomedicine. Based on their work with the device they were doubtful of some biomedical realities, they questioned their significance, highlighted their embeddedness in the political economy of the pharmaceutical industry, and exposed their iatrogenic effects. When these practitioners intervened in a biomedical treatment, in most cases it was to add a remedy to accompany the biomedical treatment, calibrating (usually decreasing) the dosage of pharmaceuticals and recommending the use of alternative brands of certain pharmaceuticals that the EAV device identified as more suitable for a particular patient. They were not in principle opposed to their patients using biomedicine. On the contrary, they valued their own biomedical education and experience and in some cases encouraged patients to make use of biomedicine, referring them to biomedical specialists for treatment if necessary.

On the side of biomedicine, attitudes towards the EAV method vary. Some doctors will occasionally refer their patients to a CAM office like Dr Silná's. However, the official medical bodies have adopted a more negative stance towards the EAV method and its 'pseudoscientific' devices, as we noted above in reference to the Czech Medical Acupuncture Society. The most publicly visible and systematic denunciation of the EAV method comes from Sisyphus, the sceptics' club. They repeatedly publish negative assessments of CAM and they have awarded their annual anti-prize, the 'Erratic Boulder', to a number of CAM practitioners. With regard to the EAV method, Sisyphus concludes that it 'is a synthesis of three alternative pseudoscientific methods [acupuncture, psychotronics, and homeopathy] with no proven effectiveness' (Heřt, 2010, p. 107). While CAM practitioners who use the EAV method do not welcome the attention from Sisyphus and they feared, for example, that sceptics would

try to disrupt their congress of unconventional medicine in 2016 (they did not), the criticism appears to have had little impact on their work.

A rather different case, however, are some of the groups connected with zappers and related technologies designed to kill parasites, the alleged existence of which in the Czech Republic is rejected or supposedly ignored by conventional medicine. The manufacturers, dealers, and users of these devices seem more distrustful of or hostile to biomedicine. It is telling that the main dealer in zappers in the Czech Republic claimed in a research interview that he is 'proud' to have been awarded the Erratic Boulder by Sisypheus. In effect, fetishising zappers as the 'cure for all diseases' may lead some patients to abandon conventional medicine's treatments in favour of the self-administered use of anti-parasitic remedies originally developed for veterinary medicine or other substances such as Master Mineral Solution. These substances are not available to buy freely and consumers must obtain them online from uncertified sources.

Faced with what they viewed as the spread of 'parasite madness' amongst the Czech public, academic parasitologists recently joined in the debate. In 2015, they released a statement saying that zappers and Dr Kapka's device are not certified medical equipment and both the use of these devices and the consumption of various chemical antiparasitic substances can be risky and lead patients to put off seeking biomedical treatment when they really need it (Faculty of Science of Charles University, 2015). In the popular-science magazine *Vesmír*, parasitologists published the results of their laboratory tests on the use of a zipper-like frequency generator to kill selected parasites, and they concluded that this method is ineffective (Kuchta, 2015).

A popular consumer video-magazine *A dost!* (Enough!) also took aim at anti-parasitic diagnostics and the therapies that use zappers. The show pitted the views of certified experts in biomedicine and parasitology, who agreed on the ineffectiveness and potential harmfulness of the treatments, against the views of zipper practitioners, who were deemed scientifically ignorant and motivated by profit, and were accused of frightening the population with the fake problem of parasites.

While no actual CAM patients were interviewed on the show, they have not remained silent. In an online debate beneath the video and in an online questionnaire fielded by Czech academic parasitologists among users of anti-parasitic treatments (Kolářová and Kolář, 2016) many people were eager to share personal stories about themselves or their family members being cured (or not) by these alternative therapies. While there is no story or viewpoint that could be described as 'typical', what seems to be widely shared is a deep suspicion of current biomedicine and related biopolitical practices (e.g. one woman claimed that people should be aware that 'WCs on the market are intentionally designed in a way to prevent people from inspecting their stools') and a lack of concern for the physical or biochemical principles of *how* these treatments work. What matters is the practical (in)efficiency of the treatments as attested to by the

individual cases of real people, and not their (in)effectiveness as explained by general scientific theories.

Neither of the CAM devices we observed in action could be explained in the terms of contemporary certified science and conventional medicine. As we showed, their persuasiveness is instead built on personal experience and ‘experiential knowledge’ (Borkman, 1976; Jašarević, 2015) shared among relatives and friends. In effect, this creates a niche in which the CAM devices and treatments can be practised without permanent questioning from distrusting outsiders. In the practitioners’ offices which work as ‘functional zones of compatibility’ (Cussins, 1996, p. 600), all the devices are dealt with strong confidence. Yet, there is an important difference in how the dance of agency they participate in is choreographed and how they and the realities they seek to enact relate to biomedicine.

The EAV device in the hands of Dr Silná maps onto biomedical bodies, diagnoses and substances. Dr Silná together with her device takes them seriously: she measures them and examines them; she also questions them, complements them, tinkers with them; and sometimes she directs patients to biomedical tests and treatments. Coexistence, not conflict or conquest, is sought. Dr Kapka’s device in the hands of the practitioners he has trained, who in most cases are not biomedical professionals, deals with the realities of conventional medicine in a more restrained manner. While Dr Kapka inscribed his device with certain entities and processes alien to biomedicine, his practitioners are systematically taught in their educational materials and workshops to limit themselves to mitigating the side effects of conventional treatments, and not to use Dr Kapka’s remedies to substitute such treatments.

With some groups associated with the use of zappers, most of whom are practitioners and users with no biomedical education, the situation was significantly different. Although they may be reclaiming Pasteurian microbiopolitics, zappers, with their focus on identifying parasitic entities, are used to debunk and replace biomedical realities and may lead patients to abandon conventional care. Zapper practitioners also often target patients who already feel abandoned by biomedicine. Instead of testing the limits of biomedical ontology, zappers are practised in such a way that they offer patients the certainty of a world in which parasites are the explanation for almost every health problem, all of which can be cured by the zapper’s resonating frequencies. Rather than increasing the complexity of understanding and widening the field of possible actions, the fetishised zappers and related technologies are closing them down.

Utilising the ethnographic focus on socio-technical practices and their ontological choreography, advocated by Mol (2002) and others, enabled us not only to problematise a clear-cut boundary between biomedicine and CAM but to register significant differences in the field of CAM. Our study shows that the degree of technologisation and the degree of complexity of treatment are two distinct issues – in CAM and biomedicine for that matter. As we argue in the

Conclusion, this indeed might be one of the important lessons current biomedicine may learn from CAM.

Conclusion

In this article we examined the socio-material forms and effects of electric devices in CAM, which is commonly viewed and studied by social sciences as a human relations-based zone, with low-tech components at best. We offered insights into how these devices of differences are designed and tinkered with and how they help to enact human bodies with electric properties and energetic paths in order to combat threats from pollutants, parasites, and sometimes even biomedicine.

Our examination of CAM devices was informed by STS perspectives that seek to avoid the society-technology dualism. We approached CAM devices mainly through the lens of Pickering's dance of agency and Cussins' ontological choreography. These notions helped us to follow the mangle of human and material practices and various coordinating efforts in these heterogeneous arrangements, ranging from the development of particular CAM devices, through their actual use in diagnostic and therapeutic procedures, to expert and public debates on CAM currently taking place in the Czech Republic. Together with Mol's praxiographic dictum of detailed empirical attention to enactments of (medical) realities, these notions helped us to foreground various resistances and accommodations related to CAM devices in which ontological differences between biomedicine and CAM as well as within CAM get materialised.

Although our study is limited to the particular devices of difference developed and used in a specific historical and regional setting, we believe it makes a three-fold original contribution to the wider debates on the relations between CAM and biomedicine and the use of technology in medical practice.

Firstly, while social science research often describes how CAM is subsumed within the biomedical logic of Western healthcare (e.g. Derkatch, 2008; Owens, 2015), we show that the work of CAM devices actually challenges, extends, and reinterprets conventional medicine, thereby becoming one of the mediators between biomedicine and CAM. We highlighted the ways in which CAM devices do so not simply due to their specific material-technical characteristics but also as a result of choreographing the technological, bodily, social, politico-economic, and environmental matters in a particular period of time.

Secondly, against the popular argument that technology today tends to 'dehumanise' medicine we show the use of technology in healthcare need not be at the expense of the rich practitioner-patient interaction and result in reductionism. On the contrary, in the hands of Dr Silná, whose CAM practice we followed in detail, the EAV device enacts the complex psychosomatic, social and environmental relations through which the patient's body and well-being is constituted. The inspiration that current biomedicine could draw from CAM and its efforts

to strengthen the practitioner-patient relationship lies not in the purported rejection of technology and desire to 'return to nature', but rather in its embrace of *alternative forms and uses* of technology.

Thirdly, we provide insight into the work and status of the devices of difference in a healthcare system dominated by biomedicine. CAM devices were mostly employed in self-confident and effective ways in the consultation rooms and in the cases of the patients we observed. They helped to change patients' bodies and significantly influenced patients' daily medical and self-care practices. At other times and places, the work and status of the devices of difference may also become precarious and have to be carefully experimented with when they are confronted with the biomedical realities embedded in public healthcare institutions and the patients' bodies and experience.

However, in the dances of agency involving CAM devices we observed that the realities of biomedicine were dealt with in different ways. Practicing some devices, in particular the zappers, strives to exclude biomedicine from patient care. Biomedical realities are rejected and their own enactments posited as the only true facts. Other devices, namely EAV and Dr Kapka's devices, tend to be practised in a more inclusive way and instead tweak or tinker with biomedicine. In the hands of experienced practitioners, they keep multiplicity in play. Importantly, this is not achieved through any general integration of biomedicine and CAM, but is carefully negotiated in the case of each individual patient.

This brings us to the question of what constitutes good care (Mol, 2002, pp. 166–184) in the terrain of medical multiplicity beyond biomedicine. In our study, we looked at CAM devices and realities without measuring them against the yardstick of established 'evidence-based' knowledge. We witnessed and heard narrated many stories of better and good lives attained with the help of CAM, stories often dismissed by current biomedicine. We believe that, in principle, opening up biomedicine to questioning and interference from 'other' branches of medicine and CAM deserves support. However, CAM should also be open to critical inquiries and carefully negotiate rather than reject ontological multiplicity.

Notes

1. In the Czech Republic CAM is not covered by public health insurance. Direct payments from patients may vary significantly. In comparison to other CAM practitioners, prices for Dr Silná's treatment are relatively low. The initial examination at her office costs around 40 EUR and regular check-ups (usually every three months) cost around 15 EUR. The remedies she prescribes can cost patients an additional 20–50 EUR.
2. For an example of how the procedure works, see the video produced by the German manufacturer <https://www.youtube.com/watch?v=FDDvRtWpzSg>.

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References

- Barnes, P. M., Bloom, B. and Nahin, R. L. (2008) Complementary and alternative medicine use among adults and children: United States, 2007, *National Health Statistics Reports*, 12, pp. 1–24.
- Beaudevin, C. and Pordié, L. (2016) Diversion and globalization in biomedical technologies, *Medical Anthropology*, 35(1), pp. 1–4.
- Borkman, T. (1976) Experiential knowledge: A new concept for the analysis of self-help groups, *Social Service Review*, 50(3), pp. 445–456.
- Casper, M. J. and Morrison, D. R. (2010) Medical sociology and technology: Critical engagements, *Journal of Health and Social Behavior*, 51(S), pp. S120–S132.
- Clark, H. R. (2009 [1995]) *The Cure for All Diseases*, Rev ed. (Chula Vista, CA: New Century Press).
- Connor, J. T. H. and Pope, F. (1999) A shocking business: The technology and practice of electrotherapeutics in Canada, 1840s to 1940s, *Material History Review*, 49, pp. 60–70.
- Cussins, C. (1996) Ontological choreography: Agency through objectification in infertility clinics, *Social Studies of Science*, 26(3), pp. 575–610.
- De La Peña, C. T. (2003) *The Body Electric: How Strange Machines Built the Modern American* (New York: New York University Press).

- Derkatch, C. (2008) Method as argument: Boundary work in evidence-based medicine, *Social Epistemology: A Journal of Knowledge, Culture and Policy*, 22(4), pp. 371–388.
- Faculty of Science of the Charles University (2015) *Stanovisko katedry parazitologie PřF UK k diagnostickým a terapeutickým metodám používaným v alternativní medicíně u parazitárních infekcí* [Statement of the Department of parasitology, Charles university, to the diagnostics and therapeutic methods used in alternative medicine in case of parasitic infections]. Available at <https://www.natur.cuni.cz/biologie/parazitologie/aktuality/stanovisko-katedry-parazitologie-prf-uk-k-diagnostickym-a-terapeutickym-metodam-pouzivany-m-v-alternativni-medicine-u-parazitarnich-infekci> (accessed 2 January 2018).
- Hadolt, B., Hörbst, V. and Müller-Rockstroh, B. (2012) Biomedical techniques in context: On the appropriation of biomedical procedures and artifacts, *Medical Anthropology*, 31(3), pp. 179–195.
- Hardon, A. and Moyer, E. (2014) Medical technologies: Flows, frictions and new socialities, *Anthropology & Medicine*, 21(2), pp. 107–112.
- Harris, P. E., Cooper, K. L., Relton, C. and Thomas, K. J. (2012) Prevalence of complementary and alternative medicine (CAM) use by the general population: A systematic review and update, *International Journal of Clinical Practice*, 66(10), pp. 924–939.
- Heřt, J. (2010) *Alternativní medicína a léčitelství: Kritický pohled* [Alternative Medicine and Healing: A Critical View] (Chomutov: Klika). Available at http://www.sysifos.cz/files/Alternativni_medicina_Hert.pdf (accessed 2 January 2018).
- Hess, D. J. (1997) *Can Bacteria Cause Cancer? Alternative Medicine Confronts Big Science* (New York: New York University Press).
- Jašarević, L. (2015) The thing in a jar: Mushrooms and ontological speculations in post-Yugoslavia, *Cultural Anthropology*, 30(1), pp. 36–64.
- Klepal, J. and Stöckelová, T. (2018) Exploring biomedicalization through complementary and alternative medicine in a postsocialist context, *Medical Anthropology*, 37(5), pp. 412–425.
- Kolářová, I. and Kolář, M. (2016) Paraziti a alternativní / celostní medicína [Parasites and the alternative / holistic medicine], *Zprávy České parazitologické společnosti*, 2. Available at http://www.parazitologie.cz/zpravy/doc/Priloha4_dotaznik.pdf (accessed 2 January 2018).
- Křížová, E. (2015) *Alternativní medicína v České republice* [Alternative Medicine in the Czech Republic] (Praha: Karolinum).
- Kuchta, R. (2015) Pravda o parazitech a jejich vymítačích [The truth about parasites and their exorcists], *Vesmír*, September 24. Available at <https://vesmir.cz/cz/on-line-clanky/2015/09/pravda-parazitich-jejich-vymitacich.html> (accessed 2 January 2018).
- Latour, B. (1987) *Science in Action. How to Follow Scientists and Engineers Through Society* (Milton Keynes: Open University Press).
- Latour, B. (1990) Technology is society made durable, *The Sociological Review*, 38(1_suppl), pp. 103–131.
- Law, J. (2004) *After Method: Mess in Social Science Research* (London: Routledge).
- Lock, M. and Nguyen, V.-K. (2010) *An Anthropology of Biomedicine* (Chichester: Wiley-Blackwell).
- Mol, A. (2002) *The Body Multiple: Ontology in Medical Practice* (Durham: Duke University Press).
- Mol, A. and Law, J. (1994) Regions, networks and fluids: Anaemia and social topology, *Social Studies of Science*, 24(4), pp. 641–671.
- Mukharji, P. B. (2016) *Doctoring Traditions: Ayurveda, Small Technologies, and Braided Sciences* (Chicago: Chicago University Press).
- Owens, K. (2015) Boundary objects in complementary and alternative medicine: Acupuncture vs. Christian Science, *Social Science & Medicine*, 128, pp. 18–24.
- Pata, V. (2007) *Jiskra, která léčila* [A spark that cured] (Třebíč: Muzeum Vysočiny).

- Paxson, H. (2008) Post-Pasteurian cultures: The microbiopolitics of raw-milk cheese in the United States, *Cultural Anthropology*, 23(1), pp. 15–47.
- Pedersen, I. K. (2013) ‘It can do no harm’: Body maintenance and modification in alternative medicine acknowledged as a non-risk health regimen, *Social Science & Medicine*, 90, pp. 56–62.
- Pickering, A. (1995) *The Mangle of Practice: Time, Agency and Science* (Chicago and London: The University of Chicago Press).
- Prout, A. (1996) Actor-network theory, technology and medical sociology: An illustrative analysis of the metered dose inhaler, *Sociology of Health & Illness*, 18(2), pp. 198–219.
- Scheid, V. (2002) *Chinese Medicine in Contemporary China: Plurality and Synthesis* (Durham: Duke University Press).
- Stark, J. F. (2014) ‘Recharge my exhausted batteries’: Overbeck’s rejuvenator, patenting, and public medical consumers, 1924–37, *Medical History*, 58(4), pp. 498–518.
- Stöckelová, T. and J. Klepal. 2018. Evidence-based alternative, ‘slanted eyes’ and electric circuits: Doing Chinese medicine in the post/socialist Czech Republic, in: C. Brosnan, P. Vuolanto and J.-A. Brodin Danell (Eds) *Complementary and Alternative Medicine: Knowledge Production and Social Transformation*, pp. 33–58 (Cham: Palgrave Macmillan).
- Tesla Liberec (1982) *Stimul 3, přenosné kapesní zařízení pro aplikaci elektroakupunktury: Návod na použití* [User Manual for a Portable Pocket Device for the Application of Electroacupuncture Stimul 3] (Liberec: Tesla).
- Timmermans, S. (1998) Resuscitation technology in the emergency department: Towards a dignified death, *Sociology of Health & Illness*, 20(2), pp. 144–167.
- Úřad pro vynálezy a osvědčení v Praze (1982) *Autorské osvědčení 196653* [Patent Authorship Certification No. 196653] (Prague: The National Office for Inventions and Standardization).
- Wexler, A. (2017) The medical battery in the United States (1870–1920): Electrotherapy at home and in the clinic, *Journal of the History of Medicine and Allied Sciences*, 72(2), pp. 166–192.
- Zhan, M. (2001) Does it take a miracle? Negotiating knowledges, identities, and communities of traditional Chinese medicine, *Cultural Anthropology*, 16(4), pp. 453–480.