Medicine, Technology, and Religion Reconsidered: The Case of Brain Death Definition in Israel

In a panoramic review of the question of brain death (BD), A.M Capron, a professor of law and medicine, referred to the history of BD as an issue that is "well settled, yet still unresolved" (Carpon 2001). Indeed, despite its day-to-day use in hospitals worldwide, the definition of BD still encounters fierce oppositions and stirs stormy debates in medical circles and outside. The medicalization of death emphasizes the duality of death as a moment and as a process (Seymour 1999; Aries 1981; Turner 1969; Hertz 1960). For centuries, however, the dissonance between death and dying went unnoticed because the medical definition of death, cessation of cardiac-respiratory activity, coincided with the lay understanding of death (Timmermans 1998). Religious traditions played an important role in sanctifying this definition. This delicate balance was upset during the second half of the 20th century with the introduction of BD. Adding neurological tests to the conventional protocols indicated not only another phase in the medicalization of death but also marked the undermining of the well-settled cohabitation of medical and lay definitions of death. In some countries, such as the United States, medicine, law, and religion quickly entered into a new alliance around the BD definition. In other countries, such as in Israel, medicine and religion (or rather the medical and religious establishments) became disjoint, leading both to tensions and to an unexpected creative interplay between the two.

In this paper we use conceptual, methodological and theoretical tools from Science and Technology Studies (STS) to understand the interplay between medicine and religion in the debate over BD in Israel. Specifically, we will delve into contemporary practices, historical records and the actors’ own voices in the Israeli debate over BD to examine the relations between medical and religious definitions of death. Case studies are known to be particularly useful not only to refine theory but also to challenge universal claims, some of which play pivotal roles in contemporary disciplines (Beaulieu et al. 2007; Wyatt and Balmer 2007). It is thus through in-depth consideration of this one “story” that we problematize a neat view of the “cultures of knowledge” involved in such highly contentious debates and introduce the ways in which religious and lay epistemology both interlace with technological authoritativeness.

The BD debate in Israel introduces highly sophisticated religious thought and authoritative medical expertise. At focus are the religious reaction to BD by a technologically-savvy group of rabbis whose religious doctrine –along with a particular form of religious reasoning- is used to *support* the truth claims made from the scientific community (BD is death) but challenge *the ways* in which they are made credible (instrumental rather than clinical). In our case, BD as “true” death is made religiously viable with the very use of technological apparatus and scientific rhetoric that stand at the heart of the scientific ethos.

For this study, we conducted interviews with key figures involved in the BD debate in Israel. We heard the perspectives of officials in the Israeli Ministry of Health, hospital mangers, rabbis, organ transplant surgeons, religious and secular ethicists. The interviews took place in 2014 in Jerusalem and Tel Aviv.We have also read the protocols of the Israeli Parliament committee that discussed from 2003 to 2008 the BD debate in preparation for its legal solution. and scan secular and orthodox press publications on the subject. We studied the intricate ways and more or less unique circumstances in which actors self-defined as belonging to the camp of orthodox religion, readily disentangle from their assigned monothetic associations with homogeneous sets of epistemologies, methodologies, and regimes of truth, challenged the medical concept of BD. We unfold the story of the struggle in Israel over the last minute of life in order to learn more about the ways science, technology and religion are intertwined in the concept of death.

**Background**

The introduction of respiratory machines in the 1950s may have saved the lives of many, but in doing so it challenged the notion of death itself. This development endowed “machines” with the power to intervene in the natural course of death and form a unique creature: a live body with a “dead” brain. In nature, such an organism would not have survived beyond mere minutes. The decay of the brain would have inevitably destroyed breathing capacities, furthering a process of de-oxygenization and again, further deterioration of all organ functioning ceased. When respiratory machines are allowed in the loop, the cycle no longer remains as vicious as nature would have it. The brain itself may deteriorate into inactive tissue, while mechanical breathing sustains the functions of many physiological properties of the body. Questions remain as to the status of such an “entity,” whether person, body, corpse or undefined living organism.

While technology may be blamed for complicating things in the first place, it is also called on to solve the resulting quandaries. Indeed, it is not the new category of BD that concerns us most, but rather the ensuing web of epistemological and ethical considerations, where technology plays a central role. Not the least of which involves the organ recovery industry that ensued. In fact, one of the reasons for which this state of sustained animation –or rather, prolonged dying - is so critical to both ethicists and medical practitioners is the opportunity it opens for the retrieval and later transplantation of well-oxygenated organs, which are not available from donors whose hearts and lungs have ceased functioning. A case in point involves the conundrum associated with the removal of a heart from a breathing patient/corpse: removing a heart from the body of a person considered alive would kill the person. However beneficial to other patients, this practice could not enter proper medical practice intact. This concern was taken up by the 1968 *ad hoc* committee on BD at Harvard Medical school. The Harvard Committee, and numerous such national and international committees since, have convincingly justified the assignment of a “death” status to the brain-dead, even when the heart and lungs still function. And while some divergence remains in the details, most countries accepted the general idea of pronouncing dead a person having lost all brain activity, or all brain-stem activity.

Of the few dissident nations, one may notice Japan which eventually approved a BD law in 1997 (Lock 2001). Israel, although typically eager to adopt biotechnological advances, took yet another decade to align itself with the rest of the world, and still, resistance remains: The epistemological, technical, and conceptual complex of BD never truly fitted into the strongly held and defended Jewish definition of death, which traditionally involves cardiopulmonary cessation. In fact, some of the most important rabbinical figures entirely rejected the notion of BD, openly referring to physicians removing organs from BD individuals as plain “murderers” (Grodin 1994; Rappaport and Rappaport 1999). Yet, one group of rabbis, closely associated with the state-affiliated Israeli Chief Rabbinate (ICR) has developed a much more nuanced approach to BD, to its underlying biological and physiological logic, and to its importance in relation to organ donation. They have, moreover, been decisively active in negotiations – at times peaceful, at others more discordant- with the medical establishment, holding strongly to several principles which would make the declaration of BD entirely Kosher. These rabbis have most notably demanded rabbinic supervision and the use of technological instruments in each and every case where determination of BD is sought.

This “Kosherhood,” we shall claim, ties up religious authority with faith in the power of technoscientific advances to determine “true death” with powerful command. Perhaps more importantly, but surprisingly implicit in the actors’ statements, it serves a unique function in making this controversial form of “death" believable to families of potential donors, who may, for reasons other than commitment to the letter of the scribes, be reticent in accepting the passing of their (still breathing) loved ones.

Defining death

History of BD

The phenomenon of patients remaining in a state of complete cerebral death while supported by respiratory machines was first referred to in 1959 as “coma dépassé” (or “beyond coma”) (Mollaret and Goulon 1959). While initially considered with the concern of the futility of caring for this growing number of patients, the predicament soon involved a more pressing ethical bind: the need to save lives of patients that were not “dead” under any definition. Indeed, with the development of organ transplants in the 60s, these “potential cadavers,” “heart-lung preparations,” “neomorts,” “living cadavers,” “reanimation patients” (Hogle 1995; Lock 2001) became feasible sources for fresh and oxygenated organs, holding the potential to save lives of thousands. The definition of these individuals as effectively “dead” created cadavers that were live-like in the most intuitive senses: they were corpses that did not change colors; they did not smell, stiffen, decay; nor did they putrefy or decompose (Kellehear 2008).

While advances in transplant medicine gave urgency to the matter and were, historically, a central motivation for redefining death, they could never serve as its ultimate justification. If the neurological criterion were to be medically, ethically, and legally acceptable, its epistemic validity had to be grounded independently of any beneficial outcome. The recommendations of the Harvard Committee represented the first systematic attempt to provide this necessary grounding by ascertaining that the cessation of brain-stem activity was a *medically* sound basis for determining death.

Philosophical considerations have, however, all but disappeared from the sphere of policy-making and lay perceptions of the matter. This may not be as surprising, considering the importance of a proper determination of death both legally––one would need to know when wills or life insurance policies can take effect––and emotionally: families would be better knowing when to enter grieving and cease expecting miracles. Yet, this very basic definition has never been entirely settled. While “Death” has been increasingly medicalized over the last two centuries (Bauman 1992), different ideas about its nature, including some not necessarily in line with the biological view (e.g., the presence of a “soul”) continue to coexist. Death remains at once a spiritual departure and a loss of physiological function, at once a social definition and a scientific fact. In similar lines, the intricacy f BD can be represented through several levels, each involving a different degree of consensus and epistemological complexity. The most abstract question demands a philosophical undertaking that would integrate consensual elements concerning the metaphysics of death (“what *is* death?”).. The second level turns to philosophical and medical considerations to define the best criterion of death, as one or several measurable conditions. These could be irreversible loss of circulatory functions, or irreversible loss of spontaneous respiratory functions (“how does death *present* itself?”). Finally, there is the technical, or operational task of determining the best set of tests to ascertain death (“how can you *assess* death with the best accuracy?”) (Bernat et al. 1981; Khushf 2010). Thus, if death is defined as “the irreversible cessation of the integrated functioning of an organism as a whole,” the more essential ontological question of "what *is* death" would irreparably remain open (Khushf 2010). At the level of policy making, US committees as well as Israeli law chose to leave the first grade under-defined, and focus on more practical aspects of the definition of death, bracketing metaphysical considerations in view of gaining a broader basis for consensus.

Death and Judaism

There is no clear statement of what “Death” is (*i.e.* at the first level) in ancient Judaic texts. Yet, at the second level, one finds Jewish sources stipulating that a person may be presumed dead (or "soulless,” not having a *neshama*) upon the loss of breath (*neshima*). Over the years, a cardiac criterion has been grafted onto this traditional basis. These sources generally saw breath and heart-beat as interchangeable signs of life, which is only expected considering the understanding of physiology at the time. Centuries later, scientific and technological developments (most notably, Harvey’s discovery of blood circulation and successes in cardiopulmonary resuscitations) effectively showed the relative distinction between the two systems, and Judaic tradition kept with either a mix of both elements, or a straightforward cardiac criterion.

As already mentioned, there are some difficulties in accommodating BD with Jewish Halakha, not just in principle, but in relation to its own styles of reasoning as well (Hacking 1992). Essentially, Halakhic “judgments” are given based on particular cases being brought to particular rabbis. This rabbi would consult any of the sources applicable to the case at hand, and if no primary source specifically solves the matter, he may rephrase or redefine the case to bring it to proper casuistic analysis against already settled (or still unsettled) controversies and common law. This would involve processes of interpretation of and exegesis from Torah, Talmud, codes, and responsa,[[1]](#footnote-1) in this order of importance (Grodin 1994). Agreement between rabbis is not a necessity, and Jewish individuals are encouraged to follow the teaching of one particular rabbi of choice, and then regularly follow his dictate. Some rabbis are considered important *poskim* (“rulers” on matter of law) and have widespread followings. Prominent *poskim* are often part of the Israeli Chief Rabbinate in Israel (ICR), but some are decisively independent of it. One such authority was Rabbi Elyashiv, an important “ruler” that remained adamantly opposed to idea of BD until his recent passing.

Other rabbinic authorities associated with the ICR have, however, interpreted Halakha as to agree with BD. In their efforts, they drew on the idea of breathing as the *sine qua non* sign of life, rather than heartbeat. BD may thus be accepted under the premise that brain-stem functioning serves as a proxy to breathing (Barilan 2014; Grodin1994). This interpretation was further followed by another line of reasoning, according to which a BD patient, having had lost all blood flow to the brain should be considered “physiologically decapitated.” Since in Jewish law, decapitation is considered an unmistakable sign of death[[2]](#endnote-1) (even if the individual was to retain a seeming of life), BD had to be considered “true” death (Kunin 2004; Steinberg and Hersch 1995). Any motion after the “decapitation” would mean as little as “the wiggling tail of a lizard,” to which no commonsensical individual would assign the attribute of “life.”

To address the problem of decapitated individuals still being able to procreate (procreation being a clear sign of life), one prominent ruler -Rabbi Auerbach- agreed, in 1995, to witness a staged operation known as the “sheep experiment.” This curious enactment was orchestrated in a prominent Jerusalem hospital: a live lamb was delivered from a wholly decapitated but artificially sustained sheep. This “experiment” had nothing actually experimental about it, as it could easily have been considered via the more philosophical, and less grimy method of “thought experiment.” Yet, the need seemed to be in showing, in demonstrating, in making happen, in enacting a clinical potentiality. The very design and arrangement of such a presentation attests to the complexity in the chimeric webbing of technological, scientific, and religious authoritativeness to question the very idea of BD. In this case, technology is used to portray, in a way graspable to the lay eye, that BD is indeed Death, that is, that BD is not a mere scientific construct, bore by technological progress.

As will also be shown throughout this text, while the cultural, political, conceptual contexts seem so unique to the case at hand, local resistance bears uncanny parallels with arguments made from within non-religious philosophical concerns (e.g. Shewmon 1998, 2001). For those accepting the definition that BD is tantamount to decapitation and that decapitation necessarily implies death, coherence will demand they reject the idea that gestation and birth are ultimate signs of life. For others, who do not see decapitation as a sure sign of death or who do not consider decapitation to equate BD, there must then be some sort of integrative biological mechanism (or metaphysical presence) keeping these bodies “alive” (Miller and Truog 2010). In this case, the heart may step back into the picture, as either a sign or a proxy to this “integrating element.” Still again, any clear philosophical\theological ontology seems to evade all parties. This allows the argument to “hover” at the level of law-making, or at the specification of particular practices and instruments, rather than probe deeper––or more essentially––into the philosophical grounding of the notion of death. In a way, coherence and cohesion in practice and law have trumped reverence to a settled-upon ontology. The inner logic and tensions of these practical and semiotic webs, will concern themselves with instruments while holding to but a seeming of a metaphysical grounding.

Experiments in Accommodation

While allowing legal alignment, the elusiveness of metaphysical grounding may be at blame for the rollercoaster-quality of the Israeli political debate on BD. In 1986, following a plea from the Ministry of Health (IMoH), the ICR agreed to publicly support the life-saving enterprise of organ donation, and concurred that, in principle, Halakhawas favorable to BD. Yet, not only had twenty-one years have to pass before the ICR agreed to support organ donation, but even then, it quickly failed on its promise to openly endorse the change (Boas 2009; Boas and Lavi 2017). Based on interviews with key actors, it seems that close association with, and respect towards dissident rabbis may have played a role in the delay and the subsequent difficulties in finalizing the law and enacting effective collaboration. This complexity, however, revealed itself in a dispute that had less to do with the general spirit of the law and much more with its small letters. With the idea of BD presumably resolved *in principle*, two bitter bones of contention remained: ICR’s insistence on first, adding a mandatory “objective device” to the already existing clinical examination; and second, demanding rabbinical supervision of physicians considering BD. These demands encountered extensive resistance from the medical establishment’s side.

In relation to the instrumental testing, the resistance is perhaps best understood within its own terms, i.e. in view of accepted medical directives. The medical consensus is that BD is a *clinical* diagnosis and that instruments should be used solely in cases where clinical examination cannot be fully executed; and\or when one wishes to shorten the required waiting time for the determination of death; and\or when any of the preliminary conditions cannot be ascertained with full confidence (Lessard and Brochu 2010; Link et al. 1994). In 2002 still only 35% of the 80 countries reviewed by Wijdicks (2002) made instrumental confirmatory testing obligatory, and even then, these were devised purportedly to shorten the “waiting time” until final diagnosis. In contrast, clinical testing is mandatory in *all* guidelines (which were found in 70\80 countries). Overall, medical literature has it that tests be used at the discretion of the clinician, and not as part as any state legislative directive (Lessard and Brochu 2010; Link et al. 2004), and that, where proper guidelines are used, clinical tests should confirm diagnosis in 100% of all cases (Jørgensen and Malchow-Møller 1981). While clinical examinations may more accurately present the lack of responsiveness characteristic to the absence of significant (and relevant) brain function, some mechanical tests may show traces of neuronal activity which have little to do with the “integrative function of the brain” (Kellehear 2008; Khushf 2010). Thus, if many, including the ICR, have agreed that BD was functional rather than anatomic, it seems clinical examinations would be more suited to the task at hand (Bernat 2006; Arnold and Youngner 1993). The intriguing question thus relates to the perceived authoritativeness of the “objective tests” in the eyes of the ICR, especially considering one is accustomed to think of the ethos of objectivity as strongly embedded within deep respect to science and technology (e.g., Daston and Galison 1992, 2007; Foucault 1964; Knorr-Cetina and Amann 1990). In other words, if clinical tests are the default mode in determining BD worldwide, why do mechanical tests were added at the core of BD definition in Israel?

Adding to the singularity of the rabbis’ insistence is the component of supervision. According to the 2008 “Brain-Respiratory Death Law,” religious figures would be allowed to consider the validity of BD determinations only retrospectively––i.e., as part of an annually or semi-annually convening committee. These would presumably be state official rabbis employed by the ICR. And yet, unsatisfied, some in the ICR initiated two interrelated ventures: “*Arevim*” (literally, “trustees”), a group of on-call rabbis that would be sent for if a family wishes reassurance; and “*Bilvavi*” (“in my heart”), a sector-based donor card that conditions organ donation upon the approval of *Arevim*. The ICR insisted that representatives from *Arevim* have a unique status in the process, combining specialized medical knowledge with religious authority. Placed in ICU––arguably the centermost of the biomedical world- this person would have access in “real time” to both clinical and instrumental reports and thus be able to translate the ascertained “truth” to the family, as well as ensuring any rabbinical authority that no foul play was involved. While the medical establishment did not view the presence of a rabbi as *councilor* to the family problematic, an expert *supervisor* was a different matter altogether. A “supervisor” has a form of optics, of vision, of knowledge, which allows him to “super”-vise the debatably less authoritative party. This thus unsurprisingly became one of the pain sores in the debate (Boas 2009).

Testing for Brain Death

Prior to 2008, BD was determined in accordance with general directives issued by the Israeli Ministry of Health (IMoH), the first in 1987, the second in 1996, and in both the use of instruments is recommended *only if and when* other tests cannot be fully administered, or remain inconclusive. Some changes were implemented in 2009, with the introduction of the 2008 Brain-Respiratory Death Law and then in 2011, following deliberations with rabbinical authorities. The list of tests in the 2011 version is quite extensive (including five tests for blood flow and two for electrical activity), and the level of details to be filled in the forms is staggering: extending over no less than 21 pages, in comparison to the 4 pages in 2009, and none prior to this. In 2011, another important amendment appears: While the two first actions (identifying the cause and asserting preliminary conditions, including the absence of confounding factors) remain at their positions as clause one and two, respectively, the two last clauses have been reversed: instrumental testing is placed *before* and not *after* the clinical examination including the apnea test and brainstem functions. This may reflect a growing trust in the more advanced instruments added to the list, or further pressure by the ICR. Either way, the importance of instruments in asserting of BD is growing, with both overt and more latent effects on the epistemological and technological practices involved in the process. In our case, the determination of death seems to have been largely delegated to the instruments (Latour 1994).

While the determination of BD is different in different places, all have in common the criterion of cessation of spontaneous respiration––which is actually the crucial point for Jewish law. Although some activity in the brain may persist after brain-stem death, the criterion is not anatomical (complete destruction of every living cell in the brain) but rather functional (loss of spontaneous breathing) (Reichman 2004). Thus, loss of blood circulation to the brain is a central entry point into the determination of death. Transcranial Doppler Ultrasound (TCD) utilizes ultrasound waves to reveal the extent to which (and at what speed) blood flows into the higher brain, and does not require moving the patient to the gigantic doughnut of the MRI or CT: it can be administered at the patient’s bedside. It has thus been adopted as the test of choice in Israel. Another set of tests approved in Israel include BAER and SEP which cannot serve as standalone tests and require clinical testing. These have, however, entered the list since, unlike EEG, they are capable of testing the activity of the brain stem, and are thus oriented both toward the physiological decapitation prescription and the spontaneous breathing criterion. These outputs, some in the form of images, will be handed to the rabbi for consideration and by so, will serve as boundary objects the frontiers of lay perception on the nature of death and the technical, non-intuitive biomedical reality of BD. Indeed, the "interpretative flexibility" associated with boundary objects allows them to be translated in ways that serve the needs of different groups, without necessarily reaching full or deep consensus (Bijker 1995; Star 2010; Star and Griesemer 1989). Such objects often provide a way to level-off the need for a specific expertise in order to communicate between different social groups (Bijker et al. 1987; Sismondo 2008). Images may be used to support different arguments, to make things “truer,” to discipline realities by defining its parameters of representation. Their movements between and at the boundaries of different social worlds enable them to create a conceptual space where cosmologies are reduced to the visual cue, and seem to be shared (Burri and Dumit 2008; Prasad 2005).

The Perpetual Making of Brain Death

ICR rabbis have heavily justified the creation of *Arevim* as having the aim of raising organ donation rates where public trust is missing. In this, the name suited the enterprise well: the “trustees” would then attest that all was done in compliance to the ethical obligation shared by the family and the religious institution. This reflects, once more, a broader problematique surrounding BD, namely the clash between utilitarian considerations (the provision of organs to many) and the intrinsic value of each particular life (including the potential donor’s). Prominent scholars have referred to BD as a form of “conceptual gerrymandering,” or a sort of “legal fiction” (Taylor 1997) designed to solve one or both economic and social problems of futile care of irreversibly comatose and the draught of organ for transplant (Giacomini 1997; Pernick 1999; Wijdicks and Pfeifer 2008). Even in the US, the public seems to have real concerns that the need for the procurement of organs may result in sub-optimal medical treatment. Issues of premature declaration of death and under-treatment appear as the outmost prevalent reasons for refusal to sign donor cards both in Israel and the US (Youngner and Arnold 2001; Robbins 1990). In Israel, a mixture of different agencies has arisen to smoothen over the problem, which holds on to the well-known importance of saving each particular life in Judaism (Flanelly et al. 2006; Rosner 2002).

Enacting social death

Death has important social and interactional grounds (Cassel 1974; Lock 1996). In these respects, a BD patient may still remain within a family's lifeworld, and any claims to remove this individual from the interaction may result in cries of “murder.” Mixed messages from professional caretakers only add to the uncertainty (Kaufman and Morgan 2005; Lock 2001). Often, healthcare workers may consider the patients dead or alive in fluid ways (Day 2001; Kellehear 2008; Rassin et al. 2005). Even if they do not make any statement, it is in “work practices” (Casper 1994) that meanings would be exchanged and attached to “things,” and there, one may sense the ambiguities. The “news” may be presented in a confusing manner, introducing tropes of hope, as if discussing a bad prognosis rather than a declaration of death (Kesselring et al. 2007).

At a basic intuitive phenomenological level, BD patients may appear to be soundly, peacefully asleep, not “dead.” They do not resemble corpses: they have a pinkish hue, their chest goes up and down, they may become “sick” and develop bedsores (Kellehear 2008; Sundin-Huard and Fahy 2004). There may even be some movement, known as the Lazarus reflex (Ropper 1984). Visibly, the person seems alive, and may often be lacking any exterior sign of injury or disease (Kesselring et al. 2007; Siminoff et al. 2001). Even the ECG monitor––a technological proxy *par excellence*––may at times show signs of life, the graph seldom completely flattening (Rassin et al. 2005).

Enacting death in a technological setting must then include technology. Indeed, dying “naturally” in the ICU, means dying through the instruments (Seymour 1999). In cases of pending hospital death, family members tend at the screen and learn to “read” the vital signs on the monitor to a point where they may focus more on the screen than on the patients (Mol 2002). The technological apparatus translates the inner condition of their loved one, to which they have no access, to a clear picture portraying the absence of this or that biological activity (Hadders 2009). The flat line on the monitor, just like the output from the instrumental testing for BD, shifts the role of “herald” of death from the body to the technology (Glaser and Strauss 1968; Sudnow 1967). In this technology-in-practice (Timmermans and Berg 2003), the instruments and the human actors work within a complex network (Latour 2005; Mol and Law 2004), where *Arevim* would play a key role in reducing ambivalence on the part of family members, thus removing an important obstacle in deciding to allow organ retrieval (Rassin et al. 2005). This role is in perfect line with its position on the determination of death, and with its own need to work out ambiguities and uncertainties on the ontology, epistemology, and Halakhic status of BD.

Doability and human mediation

The introduction of medical technology affects the ways in which scientific and lay concepts get constructed, deconstructed and reconstructed. This is obvious where the technology actually creates new phenomena, such as with the mechanical ventilator and BD patients, but it also occurs when a phenomenon already conceived to “exist” is tackled with specific tools. In Israel, forty years after the Harvard Committee, the instruments are given a new role: of making the determination of BD “doable.” They stabilize and routinize the newly-founded “fact” that BD can be ascertained beyond reasonable––even perhaps unreasonable––doubt, reflecting its Kosherhood. In the Israeli protocol of determining BD, transcranial Doppler and angiography, are used––inter alia––as the technology of choice in confirming the clinical tests. The choice of visualizing instruments as granting "an objective" endorsement of the clinical test is of special interest from the general perspective of technological objectivity in medicine as well as from the perspective of granting legitimacy to the definition of BD in Israel. In other words, it is the “doability,” i.e. the ability to create a believable object reinforces and justifies a religious acceptance of BD.

This “doability,” however, is achieved through much human mediation. First, making the images “readable” demands considerable manipulation, and second, actually reading the images correctly often requires a high level of expertise and specialization, including both formal education and experience. Decisions made on the contrast, the colors, the sensitivity, the interface with the reader, are all pre-programmed in a way that may seem––often deliberately––transparent (Burri and Dumit 2008). What may seem to the non-initiated as a mere reflection of reality is in fact mediated by complex technological fabrication and mathematization through which rough data is organized, operationalized and transformed. Mediation may hide or reveal certain aspects of the phenomenon simply based on an abstract, opaque formula which mimics unmediated sensual faculties (Cartwright 1995; Foucault 1964). Of these faculties, vision is unquestionably the most noteworthy. Instruments easily produce images of “entities” that are naturally beyond human experience. "False colors" may be created, contrast may be added, and Gestalt filling of gaps of data is common. Images “clean out” the fuzziness of reality––in this they are hyper-real, and may seem more like Nature than Nature itself (Burri and Dumit 2008; Dumit 2004; Joyce 2006; Ihde 2009). Thus, although images are far from neutral revelations of reality, the modern tendency to regard sight as evidence, with “seeing” being almost inseparable from “knowing” seems almost insurmountable (Draper 2002; Lynch and Woolgar 1990) and would be shared, at least superficially, by the ICR.

The source of confusion is perhaps best put in Goffmanian terms (Goffman 1959), that is, in the backstage engineering of the frontstage. In the backstage, the choices in the forms of representations take into account the frontstage enactment in the ways the user interfaces are designed. While *Arevim* seek to become part of the backstage, their attitude towards the instruments is one that disregards the elaborate scriptwriting that may have turned them into artifacts that have the power to suspend disbeliefs. Another possibility may have some of these actors adopt a willing suspension of disbelief in the instruments: the more medically-savvy rabbis would then be aware of the hermeneutic mediation involved, yet see the frontstage as the place where “truth” is not only displayed but created as well. The abstract philosophical manner in which this evidence became evidence would then be much less relevant than the fact that it is, simply, an accepted form of evidence in the eyes of a public they wish to serve and an authority they seek to persuade and reassure. This constitutes a crucial component in the perceived authoritativeness of instruments and the reasons why *Arevim* will cling on to their importance. Having said that, one can also assumes that adding more layers of instruments and tests for confirming BD as well as the involvement of representative of the religious camp in the "backstage" of BD definition––is aimed to prevent false positives in determining BD and killing a person––that according the orthodox understanding of the Jewish law––is still alive

The medium and the message

The uses of instruments in both medical practice and the production of “truth” in scientific studies have been well examined (Gross 2009; Joyce 2006; Prasad 2005). They are produced within a context of available techniques, professional knowledge, and even cultural and aesthetics preferences of the reader. Machines and instruments draw their authoritativeness precisely from the process of “blackboxing” which hides both the internal processes dividing the input and output and the involvement of human actants in these processes. Thus, the images are assigned a central epistemological virtue: objectivity (Cambrosio et al. 1993; Daston and Galison 1992). Another, no less consequential purpose served by the instruments will have less to do with the rhetorical power of the medium and more with the fittingness of the message it is portrayed to carry. Images are often used to support metaphors and stories about the world which best suit particular cognitive and cultural inclinations (Martin 1987). A Doppler study, for instance, does not automatically provide any “readable” material. The output, however, may be made to look like a familiar wave of activity; or in cases deemed appropriate, images of nouns (status) can be transformed to images of verbs (process) and *vice versa*.

The issue of process versus status is critical in the position one takes on BD. Indeed, at every stage of life––and, arguably, death, right until full decomposition both live and dead cells coexist within the organism. This makes the attempt to define biological life and death as mutually exclusive logically problematic and highly artificial (Botkin and Post 1992; Emanuel 1995; Halevy and Brody 1993). Still, if, according to another system of thought, such as emanates here from the Halakha (or for that matter, state law), life and death must be viewed as binary categories, some artifacts may provide a neater either/or answer. If any doubt remains, tests should be repeated. Epistemologies of risk, where certainty is replaced with statistical near-certainties, seem to have no place where kosher BD is concerned (Gross and Shuval 2008). This is critical in medicine where perhaps more than any other field in which science is implemented, certainty is most elusive. Yet again, a bridge between lay and the medical epistemologies of death has been constructed by less than likely actors and participants in the debate: representatives of orthodox religion, and in their hands, the power of technology. This modernist attitude is, perhaps, less expected from a body entrenched in tradition, and, as one may think, less imbibed with an awe of technology. Yet, the latter plays out by rabbis––and family members by extension- seeking certainty, evidence, and authority––where ambiguity reigns.

Conclusions

If death has a history, then the history of BD is the history of dispute, controversy and contentions. With the introduction of BD, forty years ago, the concept of death has undergone a rapid process of entropy: the mere fact of death has been charged with multiple meanings to the point where the controversial epistemology of death became a public concern. In this paper, we highlighted the different ways in which different social actors negotiated, enacted, and disputed the validity of BD. The adoption of BD as a bona fide form of death demands a reconsideration of the ontological, the epistemological and the ethical, all entangled in one mesh. In our case, religious tradition and modern technology––each with its own aesthetic, discursive qualities and assigned authority––played critical roles in the complex history of BD in Israel. The fabrication of a Kosher definition of death entailed a sophisticated use of science and technology by all parties. Rabbis affiliated with the ICR, have used technology in order to find a meeting point between the halachic (aerobic) definition of death and the neurological definition while the dissident camp of ultra-orthodox rabbis used technology in order to reject this compromise. Even today, ten years after the respiratory-brain death law, brain death is still unacceptable within large public circles.

 Although this paper discussed the making of BD in Israel, our discussion can be generalized to a growing number of instances where technological advances introduces hybrids that are in odds with lay conceptions of life and death life. Brain dead foetuses, frozen embryos, egg freezing, and gene editing are contemporary challenges that may raise similar concerns. A comprehensive understanding of the mechanism in work of these contested realities is one of the pressing tasks of bioethics today.

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1. A body of knowledge based on answers given by esteemed rabbis to particular problems. [↑](#footnote-ref-1)
2. [↑](#endnote-ref-1)