**Bacterial, Computational, and Cloned Life? The Ottoman-Islamic Law and Politics of Nonhuman Vitality**

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[This paper is a very preliminary attempt to present some of the ideas driving my current research project (which is also in its initial stages). I am aware that many of the connections I make here are tenuous at best. I would welcome your thoughts on how I might strengthen them—or whether they ought to be abandoned altogether. Thank you for reading the following with patience!]

*Introduction*

Cloning and artificial intelligence appear to pose only a very recent challenge to jurisprudence. As biotechnological and informational innovations, they seem to lend themselves to study only by scholars with a purely contemporary outlook—those in policy, political science, cultural studies, and the like. Historians—especially those reading the work of jurists who worked before the widespread research in genetics or prior to the advent of computers—would seem to have little to contribute to conversations surrounding the legal life or political behavior of biotechnological or computational objects.

Even more, to the extent that scholars today are seeking out precedents or pre-existing narratives in which to embed their juridical work on cloning, replication, algorithms, or artificial intelligence, these precedents are heavily reliant on a specific kind of analogy. Commentators have responded to technological innovation of this sort, that is to say, primarily by citing pre-existing (human) social behaviors that might resemble the behaviors of those (humans) now touched by biotechnological and computational change.[1] Rarely do we see any attempt to find examples of biotechnological or computational objects themselves in history or legal precedent.

[1] Ayman Shabana, "Islamic Law Between Classical Legal Texts and Modern Contexts: From Physiognomy to DNA Analysis," *Journal of Islamic Studies* 25 (1) (2014): 1-32, 1. S. Aksoy, "Making Regulations and Drawing up

The two assumptions underlying most ongoing work on law and biotechnological change, indeed, seem to be, first, that human-centered legal categories—legal categories that take human life, human sexuality, human reproduction, or human cognition as the norm—are the only legal categories that exist in the juridical-historical record, and, second, that these categories are sufficient as tools or frameworks for addressing computational and biotechnological objects. Put differently, the starting point of much of the work on the legal problems posed by, say, artificial intelligence is that we must either continue to accept the human as our legal touchstone—no other touchstone being historically available to us—*or* we must develop entirely new, unprecedented legal categories with which to analyze these emergent problems. The possibility that there might be a set of legal precedents or a historical narrative relevant to something that looks like biotechnological or computational existence—a set of precedents that rest on, say, nonhuman life, nonhuman sexuality, nonhuman reproduction, or nonhuman cognition—has not been explored.

But might it be worth reconsidering these assumptions? Might there be some evidence of an Islamic law of nonhuman life or nonhuman cognition that pre-dates contemporary technological change? The hypothesis driving this paper is that such evidence does exist. And the following pages therefore, first, begin to excavate what may turn out to be a remarkably robust pre-existing legal-historical narrative of nonhuman life and cognition in the Ottoman-Islamic tradition. Second, they make the case that this early juristic work on biological and informational objects such as germs, viruses, bacteria, and even inorganic particles might provide an alternative—and potentially productive—framework for addressing ongoing computational and biotechnological challenges to conventional legal categories. And third, they

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Legislation in Islamic Countries under Conditions of Uncertainty, with Special Reference to Embryonic Stem Cell Research," *Journal of Medical Ethics* 31 (7) (July 2005): 399-403, 399.

posit, as a result, that this early legal writing on nonhuman life can help us to consider how, or whether, computational and biotechnological objects might be incorporated as legal figures into contemporary Islamic law political theory.

The first section of this paper introduces the bacterium and the algorithm as political figures. It demonstrates that much of the ongoing research in biology and computation has highlighted the connections and similarities between the two, has played up the ability of both to think in sophisticated ways, and has, as a result, hinted at the potential political relevance of both. In addition to challenging the boundaries that conventionally divide organic and inorganic life, that is to say, this work also invites us to consider whether nonhuman biological, computational, or biotechnological actors are capable not only of life, not only of legal life, but also of contemplative political life. The next section of the paper provides some historical examples of what this nonhuman political life looks like. Drawing on Ottoman responses to contagion in the late nineteenth-century and Ottoman-Turkish interpretations of brain function in the early twentieth-century, it suggests that the juridical tools for addressing the problems posed by life that is clearly political, but just as clearly not human, already exist.

The final, concluding section of the paper turns to the implications of situating conversations about nonhuman vitality and cognition within a historical context. A question that now might remain open, for example (in a way that it arguably cannot when we operate with the human as our sole touchstone), is whether, say, cloning is a problem for laws that concern themselves with life, laws that concern themselves with thought, laws that concern themselves with sexuality and reproduction, or some syncretic combination of such legislation. This question is just one of many that appear when we shift our framework of inquiry away from human norms and toward nonhuman categories of political and legal belonging.

*The (Political?) Life of Cells and Algorithms*

Biologists have been exploring the collective intellectual life of organic systems—whether these systems are mapped onto a single cell or throughout an aggregate of living material such as a slime mold—for a number of decades now. There are thousands of papers on bacterial memory, cellular decision making, and amoebic sensitivity circulating throughout the scientific community, and each makes a case that this organic material, fundamentally, thinks.[2] Moreover, many of these studies also explore the broader, theoretical implications of this shift toward thought in the natural sciences—some forging a set of deliberate connections or associations among the contemplative life of organic material, the computational work of machines, and the cognitive life of the (political) human being.

In his book, *Wetware*, for example, the biologist Dennis Bray makes a series of provocative biological and cybernetic claims about the intellectual life of single cells—claims that complicate any easy hierarchy of "higher" and "lower" thought. While maintaining the *designations* "higher" and "lower," for example, Bray nonetheless emphasizes the unexpected conclusion that might be drawn when contrasting these modes of thinking—namely, that the "lower" mode of thought is more effective than the "higher." "Where higher organisms have a brain and spinal cord," he writes, "single cells have networks of interacting proteins."[3] The way in which single cells, as biological systems, think through these networks, moreover, is telling: "by capturing a picture of their surroundings in molecular terms, biological systems acquire knowledge of the world in a way no other chemical or physical system can."[4] Cells, Bray thus concludes this section, think and "acquire knowledge" *as* environments or systems (rather than as self-contained wholes).

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[2] To provide just one example, Alain Prochiantz, *Machine-esprit* (Paris: Odile-Jacob, 2001), 157.
[3] Dennis Bray, *Wetware*: *A Computer in Every Living Cell* (New Haven: Yale University Press, 2011), 226.
[4] Ibid, 225.

Indeed, the thing that has made cells evolutionarily successful thinkers, according to Bray, is, perhaps unexpectedly, also the thing that differentiates cellular thought from the thought of "higher organisms." Whereas higher organisms situate thought in a single, bounded space—the brain—cellular environments store their memories, knowledge, and sensitivities within the molecules that compose themselves and their environments—within the molecular composition of their world. Rather than giving one small part of themselves over to thought, cells turn themselves and, or as, their surroundings into thought.

As Bray continues to define cellular thought—and to differentiate it from the thought of higher organisms (and especially humans)—this confusion about what might be described as a higher and what a lower mode of contemplation becomes more pronounced. In contrasting "highly predictable and stereotypical" bacterial memory with the "the storage of memories by higher animals," for example, he writes that the latter is "dependent upon the training regime and the internal psychological state of the organism."[5] Bacterial memories, Bray writes, although physically similar to the memories of higher organisms, are, contrarily, characterized by organization, repetition, and operation rather than by the idiosyncratic psychological content that might be invested in this data when it becomes part of a self-conscious narrative. Although Bray does not put it this way, we might thus conclude that bacterial memory is unadulterated *memory* in a way the memory of "higher organisms" is not. Bacterial memory is immune from subject formation or self-narrative. It is knowledge and contemplation rather than self-identification.

The question of which is "higher" and which is "lower" thought thus remains largely open in Bray's research—and indeed Bray himself is never quite clear about whether we should celebrate the self-conscious, psychological, cognitive thought that characterizes, perhaps uniquely, the human brain, or whether we should evaluate this thought more critically.

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[5], Ibid, 9-10.

Moreover, even if we *do* want to place open organic or cellular systems at the beginning of a teleological narrative and the human brain at the end, Bray's writing suggests that we could easily read the book as a tale of degeneration rather than of progress. What had once been a correspondence among matter, environment, and thought became, in the end, an impoverished, disconnected brain and self. What had once been, quite concretely, an infinitely variable life and thought in and through the world became a series of rational choices predicated on a binary sense of self and other. What had once been contemplation became psychology.

And indeed, the strange ineffectiveness of (human) cognitive, as opposed to (bacterial or cellular) contemplative, life is suggested in more targeted studies of cellular thought as well. In a 2011 article in *Cell*, for example, Gabor Balazsi, Alexander van Oudenaarden, and James J. Collins compare the decision making undertaken by unicellular organisms and the decision making undertaken by the cells of complex organisms (mammals especially). Important for our purposes now are the rhetorical strategies that Balazsi, et al. use to frame their argument—and in particular how they describe the decision making undertaken by different types of organisms and cells (i.e. viruses, unicellular animals, bacteria, and the cells composing complex organisms).

One key aspect of their work is a challenge to the claim that genetically identical cells working within an identical environment will always act in predictable ways. This claim, they argue, is significantly flawed; indeed, "extensive theoretical and experimental work has started to seriously challenge this simplistic deterministic view."[6] Emphasizing the interplay between cell and environment (or, once again, among cells *as* environments[7]), Balazsi, et al. continue that "intrinsic noise enables the phenotypic diversification of completely identical cells exposed to the same environment and further facilitates cellular decision making for cells already slightly

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[6] Gabor Balazsi, Alexander van Oudenaarden, and James J. Collins, "Cellular Decision Making and Biological Noise: From Microbes to Mammals," *Cell* 144 (March 18, 2011), 910.
[7] Ibid, 922.

different."[8] Both cell *and* environment, in other words, are subject to glitches—and frequently to the same glitch. Cells contemplate idiosyncratically, even while this contemplation produces a seemingly functional cellular environment.

But the abilities of cells and environments to respond successfully to potential errors depends a great deal on the *breadth* of their contemplation—on their ability to know, remember, and feel themselves as their environments as widely as possible. Granting that even viruses are less predictable than many earlier researchers had assumed,[9] therefore, Balazsi, et al. set their conclusions in what may be—given Bray's work—a strangely familiar comparison between the thought of the largely self-contained virus and the largely environmental thought of their bacterial counterparts:

> bacteria are masters of cellular decision making, which enables them to hedge bets in a fluctuating, often stressful environment. This may explain their presence in the most extreme and unpredictable environments. Unlike viruses, which typically decide between lysis and lysogeny, genetically identical bacteria can select their fates randomly from a spectrum of multiple options…[U]nlike viruses, bacteria can combine cellular decision making with other mechanisms (such as cell-cell communication) to achieve more complex population-level behaviors. Cellular decision making appears suppressed when cell-cell communication becomes prominent (as in quorum sensing), suggesting that microbial individuality is undesired when genetically identical bacteria assume multicellular behaviors. The above examples indicate that many bacterial species are capable of population-level behaviors. Moreover, these examples suggest that the simplest

[8] Ibid, 911.
[9] Ibid, 922.

> forms of multicellular behavior do not require physical contact or communication between cells.[10]

Bacteria, then, are "masters of cellular decision making" because they select their choices randomly, they fail to distinguish between a discrete cellular body and a collective or an environment, and they likewise fail to distinguish among discrete cells—*especially when they are communicating*. Unlike viruses, which are characterized by their isolation, by their life-as-reproduction, and, perhaps above all, by their drive to replicate and communicate distinct, coherent strands of information—essentially to pass messages—bacteria contemplate and remember through environments that are in turn open-ended systems. Bacterial cells are matter that is alive because it thinks broadly rather than because it communicates narrowly.

Now obviously the point here is not that human thought is somehow the same as viral thought. But the echoes of Bray's distinction between the higher organism's self-contained, communicative, and psychologically self-aware state and the virus's (unfit because discrete) reproductive state is evocative. In fact, if we eliminate the intuitive organic hierarchy that appears to frame Bray's comparisons, we can find a clear—and indeed emphatic—insistence on the *superiority* of thinking outside the confines of a bounded body or clear subject-environment, self-other divide. Bacteria are alive, and are flourishingly alive, first, because they are *thinking*, and second, because they *are not* cognitive. Bacterial decision making is worthy of respect because it does *not* lead in any obvious way, after millions of years of evolution, to self-awareness. Psychology and message transmission are something of a dead end here.

As Balazsi, et al.'s emphasis on noise, information, and code, and as the title of Bray's book, *Wetware*, both hint, this alternative mode of living or *thinking* in the world is also, arguably, not unique to organic systems. Inorganic, computational systems are just as capable of

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[10] Ibid, 916.

such (potentially political) contemplation and such (potentially legal) life. Luciana Parisi has suggested in her *Contagious Architecture,*[11] for example, that scholars might indeed benefit from taking seriously the contemplative potential of algorithmic processing—what she calls an algorithmic "soft thought"—that is "as irreducible to the neural networks of the brain-mind as are bacterial and vegetal modes of cognition."[12] The richly contemplative quality of algorithmic processing, in fact, has been obscured, she argues, as a direct result of an ongoing political emphasis on "cognitivism" or "enactivism"—as a direct result of a classically biological emphasis on the brain as the seat of thought and feeling.

But, Parisi emphasizes, this link between the brain as an organ of cognition and thought is, especially in the contemporary period, untenable. In particular, such a linkage cannot help us to appreciate the extensive, non-procedural, and often random intellectual activities in which inorganic actors such as algorithms clearly engage—nor can it help us to address effectively or responsibly the enormous extension of algorithmic processes over the past half-century. If anything, she writes, the rapid expansion of algorithmic thinking over the past decades *undermines* "the neural or biological body's status as the house of soft thought"—if anything, it suggests that thought may be only *inadvertently* "linked to the brain…contingent on an accident in the evolution of multicellular organisms."[13] Moreover, *as* an accident, "the brain-thought link cannot by rights exclude the possibility of a form of thought that is not mediated by a neural network or even less by a brain."[14]

What, then, does this non-cognitive, algorithmic thought look like? Most importantly, for Parisi, this is a thought that, like bacterial thought, is constantly subject to accidents or glitches—

[11] Luciana Parisi, Contagious Architecture: Computation, Aesthetics, and Space (Cambridge: MIT Press, 2013).
[12] Ibid, 172.
[13] Ibid, 219.
[14] Ibid, 219.

to the errors that occur as the algorithm encounters and attempts to process infinite quantities of data.[15] Indeed, Parisi seems to be suggesting that algorithms come alive *because* of the glitches they encounter. As she writes when introducing the concept of "contagion"—or the "immanence of randomness in programming" that occurs as "infinite amounts of data" enter a function—for example, the "contagious architecture of these actualities is constructing a new digital space, within which programmed architectural forms and urban infrastructures expose not only new modes of living but also new modes of thinking."[16] Her emphasis is on thought that never quite reaches its goal. But life is lurking there too.

But might this algorithmic thought and life lend itself to political or legal expression? One way to address this question is to consider the series of oppositions between algorithmic thought and, specifically, human thought within which Parisi frames her argument—a series of oppositions that are perhaps unexpectedly evocative of Bray's similar set of contrasts between *cellular* thought and human thought. It is true that Bray and Parisi have very different goals in mind as they present their arguments. But reading the two alongside one another can help us to set a potentially useful foundation for addressing organic and inorganic, bacterial and algorithmic, life as a political and legal problem.

Whereas Bray emphasizes self-awareness—or psychology—as the key quality that differentiates human thought from nonhuman thought (or, at least, the thought of "higher organisms" from cellular thought), Parisi emphasizes *processing* as the key quality that differentiates immanent nonhuman thought from rational human thought. Each thereby seems to be framing the contrast between human and nonhuman thought in quite different ways. But consider what sort of processing might *lead* to Bray's psychological self-awareness. In order to

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[15] Ibid, 245.
[16] Ibid, xiii.

create a coherent self-narrative—in order to come to an understanding of self and other or subject and environment—an organism must engage in a rational, goal-driven cognitive exercise. Bray's human (but not cellular) psychology thus seems to lend itself very well to Parisi's human (but not algorithmic) processing, while Parisi's algorithmic (but not human) processing likewise lends itself to Bray's cellular (but not human) absence of awareness. Or, put differently, eternal, accidental processing is arguably nonhuman *because* it cannot end in psychological self-awareness.

But, once more, the thinking and processing described by Bray and Parisi are by no means divorced from law and politics. Indeed, if there *is* a link among algorithmic contemplation, vitality, machines, bacteria, cells, and—because, as Bray insists, they cannot be completely ignored—humans, then the thought that Parisi describes can easily become political. Existing on a spectrum with, rather than in opposition to, human consciousness, it is familiar to classical human-centered political theory. Evading, however, the pitfalls of the cognitive theory that associates thought with awareness or an embodied brain, it need not be abandoned as an anachronistic irrelevance in the face of a biotechnological or computational change. Nor must it exist only as a product of modern, humanist political theory. Vitality is still very much present in this alternative politics of life—but this vitality is not necessarily organic, and it is certainly not embodied.

Rather, nonhuman life as political life assumes a mode of thought that evades psychology, consciousness, and awareness. It assumes a mode of thought that, while always concretely embedded in matter and systems, fails to distinguish between self and other. Likewise, the information that it processes is information (or sensitivities or memories) stored diffusely, in the molecular fabric of itself and or *as* environment. And thus this nonhuman

political life rests on an always incomplete or comparative, and never absolute, mode of thinking. This thought happens through experience and existence in or as an environment rather than within a framework of thinking subjects and thought environments. It is emergent and never finished.

Finally, this type of life rests on thinking that is irrational but that is by no means maladaptive. The glitch or accident or noise that rocks the living system—that is shared, as flawed code, among bodies and environments—is itself one of the most productive aspects of the system. The glitch is the catalyst that transforms simple information processing into environmental contemplation and politics. Not only is the randomness of cellular, bacterial, or algorithmic life what makes it vital, in other words—it is also what makes it thoughtful, and thus political.

*Bacterial and Computational Life in Ottoman-Islamic Law and Politics*

But can we find any evidence that such interpretations of life and thought influenced legislation or legal scholarship in pre-twentieth century Islamic states? If we examine, first, the responses of states such as the Ottoman Empire to crises, especially, of contagion, and second, medical-juridical scholarship on issues such as embryonic development that appeared alongside these responses, we might find traces of such ideas. The problem of contagion in both pre-modern and modern Islamic states has produced a great deal of thoughtful, creative research and writing over the past decade. Justin Stearns' work on Muslim and Christian theories of contagion in fourteenth- and fifteenth-century Iberia, for example, has gone a long way toward complicating what had once been a simplistic interpretation of Muslim "fatalism" in the face of the spread of disease.[17]

[17] Justin Stearns, *Infectious Ideas: Contagion in Premodern Islamic and Christian Thought in the Western Mediterranean* (Baltimore: Johns Hopkins University Press, 2011), 85.

Alan Mikhail's work on the environment as, itself, a social and political actor (or actant) in eighteenth- and nineteenth-century Egypt has been similarly groundbreaking. Of particular relevance to us now, though, is whether such complex interpretations of contagion and environmental life indeed fall apart, as both Stearns and Mikhail suggest they do, in the face of modern attitudes toward human subjectivity. Consider, for example, Mikhail's convincing argument that the "technology of quarantine" was responsible for removing "plague from Egyptian understandings of the environment"—for transforming the plague "into a 'foreign' disease that was to exist outside of the Egyptian social body and that was therefore to be feared, defended against, and removed."[18]

Once again, the argument here is without question convincing—modern technological innovations operated together with modern taxonomic conventions that place human subject, environment, and disease into discrete, distinct categories to create potentially problematic divisions among embodied subject, threatening germ, and passive environment. Quarantine, as technology, turned the human into a legal and social actor, the plague into a foreign enemy seeking to destroy this legal and social actor, and the environment into the backdrop against which this struggle would take place. Mikhail finds these modern conventions problematic at best.[19]

But might the modern also be a bit more complicated than it initially appears to be? Might we find evidence of an alternative law and politics of life in nineteenth and early twentieth-century responses to contagion? Such an alternative scenario would by no means involve some reification of the fable of a timeless Muslim fatalism toward disease—a fatalism that, as Stearns makes clear, needs serious reconsideration. But neither, importantly, would it

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[18] Alan Mikhail, *Nature and Empire in Ottoman Egypt: An Environmental History* (Cambridge: Cambridge University Press, 2011), 202, 238.
[19] Ibid, 291.

involve the establishment of a technological authoritarian regime intent on policing the boundaries between human legal subject and nonhuman other. Rather, such an alternative law and politics might suggest an embrace of the legal status or political existence of nonhuman, cellular, or even inorganic life—an embrace of an environment that is technological without being relentlessly taxonomic, contemplative without being narrowly rational.

With this in mind, let us turn to the response of the Ottoman government to the spread of cholera following the 1895 earthquake in Istanbul. Legislators were, according to decrees issued at the time, particularly concerned that "last year's cholera microbe might reappear," and these legislators thus insisted on the "cleanliness," "disinfection," and "purification" of people, places, open areas, gardens, food, buildings, drinks, and public fountains.[20] The interest in the *water* that flowed with equal force through bodies, places, and buildings was particularly intense—fountains, for example, receiving particular, repeated attention.[21] Immediately following the earthquake, and in immediate response to the threat of contagion, that is to say, environmental flow became extraordinary important to the Ottoman government.

Now obviously controlling the flow of water through a city makes perfect sense when cholera is the issue at stake. Cholera is a waterborne illness, and as of the late nineteenth century, legislators knew that the first response to the threat of cholera had to be the purification of urban water sources. The way in which this emphasis on appropriate flow eradicates what are ordinarily described as conventional modernist categories of thought, however, is striking. These decrees, after all, bind the Sultan to a theory of contagion that understands epidemic to be not a problem of infected bodies, not a problem of unhealthy environments, but a problem of the two inextricably intertwined. There seems to be little difference in the edict among bodies,

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[20] BOA İrade Hus. 180/18 M 1312, reprinted (i.e. photographed) in Mehmet Genç and Mehmet Mazak, eds. *İstanbul Depremleri: Fotoğraf ve Belgelerde 1894 Depremi*. İstanbul: İğdaş Kültürel Yayınları, 2000), 208-209.
[21] Fatma Ürekli, *İstanbul'da 1894 Depremi* (Istanbul: İleşitim Yayınları, 1995), 26-27.

places, spaces, or environments. The food that the body consumes occupies the same cognitive, social, and political space as the garden or building that the body occupies. And the lines between bodies, fluids, foods, and spaces disappear almost entirely.

Moreover, and perhaps more to the point, in eradicating these boundaries, the edict not only eludes any clear logic of self and other, it also creates the possibility of a type of life that is highly political, even if equally absent psychology. The Sultan seems almost compelled to grant to the reappearing microbe a political and legal existence—a thinking life—that transcends its apparently modernist role of threat to the embodied human citizen. Resting squarely on the assumption that the people, spaces, food, drink, buildings, and gardens, together, constitute an environment *subject* to infection, the edict seems likewise to assume that the cholera itself *produces* political and legal meaning. It is the cholera that binds these ordinarily disparate categories together, that undermines their very existence as separate categories.

Or, to get at this idea from yet another direction, as the cholera appears and reappears throughout the post-earthquake system or environment, it, as operator, shifts this system, it thinks through it, and thus, even as it is diffused, it does political work. It is the glitch or accident that becomes thought, and that then becomes thinking life. Whereas the water simply flows, the cholera flows and *functions*. It is environmental *and* technological. The environmental quality of the decree thus suggests that the cholera's behavior is perhaps *more* political than the behavior of any other single, discrete biological or informational object in the post-earthquake realm.

But moments of crisis were not the only periods in which we find references to an alternative, nonhuman, non-cognitive mode of political life lurking in Ottoman governance. Bahaeddin Şakir, for example, a physician and founding member of the Young Turk Committee

of Union and Progress, made an unexpected case for a similarly robust theory of nonhuman life. Indeed, although he frames his series of lectures on Medical Law, published in 1908, within what he first insists is a *tension* between a legal or political establishment that demands positive, coherent medical knowledge and a medical establishment that remains open to repeated reinterpretations of what, precisely, life might be, the concluding implication of his work is that law and politics might lend themselves to these alternative definitions as well.

Şakir begins his discussion with an analysis of how, he believes, medical experts might help legal experts to implement the law of abortion. In particular, he writes, it is important to provide specialist knowledge of embryonic development to both lawyers and judges so that they have an idea of what is "natural" and what is "unnatural" birth.[22] He then builds on this point by presenting readers of the lectures with clear information on how long (in hours and days) a fetus at various stages of development might "live" post-abortion.[23] In the midst of this clear-cut account of how and when an embryo or fetus might live or die, however, Şakir also introduces a number of complex—and not easily answered—questions about how and why specialists might determine life or death, and what role fetal or embryonic thought, especially, might play in such determinations.

Şakir finds embryos with no brain or heart a particularly productive arena for research into these questions.[24] The examination of anencephalic fetuses, for example, can prompt physicians, he writes, to reconsider what he argues are the conventional narrowly defined interpretations of life and death. A fetus without a heart or head is considered "alive" by neither law nor medicine, it is true, he writes; but it is worth questioning this assumption, he insists, "as

[22] Bahaeddin Şakir, *Tıp Kanunu Dersleri [1908]*, 15.
[23] Ibid, 70.
[24] Ibid, 85.

scientists if not as lawyers."[25] Indeed, he continues, although neither the physicians associated with the law nor lawyers themselves consider "children" (*atfal*) born without a head to be living, and although specialists of embryonic development can speak with certainty on such matters to *judges*, it is difficult to be certain, as scientists, that some sign of viable life has not escaped one's notice. Might it be worthwhile to explore, for example, the viability of a newborn child born with a brain "filled with water, soft like paste or dough, and embellished or traced with lines like tangled grass?" Şakir's answer is that perhaps it is: no matter how carefully an autopsy might be conducted, he states, we cannot be certain that evidence of life does not exist—and that such a child might in fact live or be alive.[26]

Şakir, in other words, implicitly criticizes both what he sees as the narrow definition of "life" accepted by the legal and political establishment, and the corollary to this definition: the brain as the seat of both thought and life. Moreover, in order to question the efficacy of such a definition, Şakir presents his audience with an unusually evocative description of an apparently useless, putrefying brain in a "child" that might, nonetheless, be, or have been, alive. Associating the brain with liquid, with unformed or unfinished dough, with filigree, and with tangled grass, Şakir indeed suggests—in an echo, to some extent, of the Sultan's post-earthquake infected water—the environmental or systemic potential of what lawyers and judges want to understand as a dichotomy, as a present or absent self-contained organ. Indeed, Şakir implies, lawyers and judges might do well to move beyond such oppositional legal and political interpretations of life.

Like Bray's connected, yet also discrete, cellular environments that operate *throughout* the brain—even the most rational brain—Şakir's anencephalic brain is thus fluid, like water,

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[25] Ibid, 16.
[26] Ibid, 16.

capable of a different sort of growth, like dough, and networked or open-ended, like filigree or tangled grass. The description of the dead brain that by no means suggests a dead or unthinking "child" is deliberately beautiful—this is a brain that, *because* it is not the seat of cognition or rationality, is a touchstone for an alternative theory of, once again, environmental thought and life. Şakir's unexpected departure from the Young Turks' positivist embrace of cognition and rationality leads him to the same theory of life and thought that the Sultan's equally unexpected departure from modernist notions of contagion led him. Both unquestionably adhere to modernist *vocabularies* of embodied, rational political action—but they use these vocabularies to express a material, yet disembodied, thoughtful, yet irrational, nonhuman political life.

In both of these examples, in other words, it becomes clear that perhaps what is important to defining an object as politically alive and thoughtful—and thus capable of legal behavior—is not embodiment, not a sense of self, not psychology, and not rationality. Rather, memory, the processing of information, and the work that a biological or informational object might do within and throughout a material environment seems key. And, as a result, both life and thought become emergent rather than complete in these scenarios. Marginalizing the perfect or perfectible human organism, especially as the legal and political norm, these alternative approaches to life allow for a responsible and effective interpretation of objects and actants that are not limited to human psychology and human life spans.

Indeed, we might note that such a reinterpretation of life and thought by no means limits us to incorporating the *innovative* or *new* into political or legal theory. Other nonhumans—notably God—are also centered in such a system in a way that, arguably, they cannot be when the embodied, rational human is the norm. Or, put differently, it may be the case that a legal and political system that is not, and historically has certainly never been, concerned solely with

human behavior may be the *most* effective system for considering biotechnological or informational objects. And this is the case because such systems have always concerned themselves with nonhuman life. Positivist, humanist law and politics grind to a halt when faced with, say, somatic nuclear transfer. More open, nonhuman legal and political systems need not.

*Conclusion: An Islamic Law of Nonhuman Vitality?*

Rather than drawing on the preceding pages to make an argument in favor of one, correct interpretation of nonhuman life, therefore, I would like to devote this conclusion to reconsidering some of the legal problems that seem to be posed by biotechnological and computational innovation. Ordinarily, for example, cloning—somatic nuclear transfer—is addressed primarily as a problem of reproduction (or sexuality) while artificial intelligence—be it cybernetic or networked—is addressed primarily as a problem of language or property. If, however, we consider the cell that flourishes post-cloning as a variation on the bacterium rather than as a potential complete human—and the thoughtful algorithm as a variation on a thinking environment rather than on a rational mind always in search of a discrete body—we might re-frame the debates surrounding such technological innovations. Our question, indeed, might cease to be "is it allowed or is it not allowed," it might cease to be "is this reproductive behavior licit" or "is this type of thought also a type of property," and instead it might become "how might it think and live."

Moreover, reconfiguring our approach to the ostensible problems posed by biotechnological and computational innovation can also help us to consider, or reconsider, the value of Islamic law as a more general system of thought and existence. Approaching biotech and computation in this way might help us to recognize (or remember) the potential for Islamic law and politics to be what they, arguably, are supposed to be, rather than the set of norms and

prescriptions that three centuries of comparison to positivist, human-centered legal systems have so frequently made them. Taking the bacterium, perhaps paradoxically, as a touchstone can help us to remember that Islamic law is and can be a way of thinking and talking about life and thought writ large. Doing so can link Islamic law, once again, to life in all of its multiplicity—and to environments in all of their complexity. Or, more bluntly, biotech and computation *are* perhaps insurmountable obstacles to positivist, secular law. They need not be—and they arguably never have been—for Islamic law.