

# Prosperity, Amelioration, Flourishing: From a Logic of Practical Judgment to Reconstruction

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*Abstract.* In this essay Paul Rabinow critically accounts for his work in the "Human Practices" Thrust of SynBERC, and meditates on the disciplinary forces operating on that work, from both within and without the enterprise.

*Keywords:* synthetic biology, SynBERC, Dewey, practical judgments, ethics, affect, human practices, equipment, flourishing, thumós

"The attempt to bring over from past objects the elements of a standard of valuing future consequences is a hopeless one."—John Dewey<sup>1</sup>

## INTRODUCING SYNTHETIC BIOLOGY

Various "post-genomic" projects have defined their challenge as taking up the functional redesign of biological systems. One strategy devised to meet this goal is a heterogeneous collection of enterprises loosely grouped under the compelling label of *synthetic biology*. Synthetic biology began as a visionary if minimally defined project whose goals were nothing if not audacious.<sup>2</sup> Following in the rhetorical footsteps of the manifesto-like proclamations of the preceding two decades in molecular biology, one version of the program reads as follows:

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*Law & Literature*, Vol. 21, Issue 3, pp. 301–320. ISSN 1535-685x, electronic ISSN 1541-2601. © 2009 by The Cardozo School of Law of Yeshiva University. All rights reserved. Please direct all requests for permission to photocopy or reproduce article content through the University of California Press's Rights and Permissions website, at <http://www.ucpressjournals.com/reprintinfo.asp>. DOI: 10.1525/lal.2009.21.3.301

Synthetic Biology is focused on the intentional design of artificial biological systems, rather than on the understanding of natural biology. It builds on our current understanding while simplifying some of the complex interactions characteristic of natural biology, including those working to (i) design and build biological parts, devices and integrated biological systems, (ii) develop technologies that enable such work, and (iii) place the scientific and engineering research within its current and future social context.

At the outset, the name was a basically a placeholder, or as some of its critics hold, a brand. Regardless, as its chief proponents understand synthetic biology as a process of modularization and standardization, it appears to us to be developing in and renovating a tradition nicely labeled the “Engineering Ideal in American Culture.”<sup>3</sup> Synthetic biology aims at nothing less than the (eventual) regulation of living organisms in a precise and standardized fashion according to instrumental norms. Unlike the visionaries of the previous decades’ genome sequencing projects, and their prophecies of the molecular as the “code of codes,” synthetic biologists clearly have a feeling for the organism, albeit the organisms with which its practitioners intend to populate the near future.<sup>4</sup> Synthetic biology’s pioneers work hard at conveying a feeling of palpable excitement that biological engineering will invent and implement technologies that will make better living things, although exactly what that would mean beyond efficiency and instrumental capacity-building is largely unexamined. In fact, the significance of the claim deserves attention as it opens up a series of topics calling for inquiry and deliberation.

Synthetic biology arose once genome mapping became standard, once new abilities to synthesize DNA expanded, and once it became plausible to direct the functioning of cells. Its initial projects addressed a part of the global crisis in public health—malaria. At the same time, a first ethical and professional concern that it has had to deal with arose from the risk of bioterrorism. Among its current challenges there is a cluster around the production of biofuels. In sum, synthetic biology can be understood as arising from, and as a response to, specific challenges: capacities, demands, and difficulties. Not all of these problems are radically new and not all of the solutions will be either. What they do call for is resourceful solutions and inventive ways of thinking, experimentation, and organization.

## SYNBERC

In 2006 a group of researchers and engineers from an array of scientific disciplines proposed a five-year project to render synthetic biology a full-fledged engineering discipline. Representing major research universities—UC Berkeley, MIT, Harvard, UC San Francisco—as well as Prairie View A&M in Texas, the participants proposed to coordinate their research efforts through the development of a collaborative research center: the Synthetic Biology Engineering Research Center, or SynBERC ([www.synberc.org](http://www.synberc.org)).

This center, SynBERC, was designed, proposed, and funded as an effort to invent new venues and research strategies capable of producing resourceful solutions to real-world problems where existing venues and strategies appeared to be insufficient. As the Web site puts it with the typical bravado of an early-stage undertaking:

The richness and versatility of biological systems make them ideally suited to solve some of the world's most significant challenges, such as converting cheap, renewable resources into energy-rich molecules; producing high-quality, inexpensive drugs to fight disease; detecting and destroying chemical or biological agents; and remediating polluted sites.

In addition to its far-reaching research and technology objectives, SynBERC also represents an innovative assemblage of multiple scientific subdisciplines, diverse forms of funding, complex institutional collaborations, an orientation to the near future, intensive work with governmental and nongovernmental agencies, as well as focused legal innovation and imaginative use of media. More unusual still, from the start SynBERC has built in human practices as an integral and coequal if distinctive component.

The SynBERC initiative is designed around four core Thrusts: Parts, Devices, Chassis, and Human Practices. These Thrusts, in turn, are designed to meet specified goals. The goal of Thrusts 1 through 3 is to link evolved systems and designed systems, with emphasis on organizing and refining elements of biology through design rules. Thrust 4 examines synthetic biology within a frame of human practices. The name “Human Practices” was coined to differentiate the goals and strategies of this component from previous attempts

to bring "science and society" together into one frame so as to anticipate and ameliorate science's "social consequences." The task of Human Practices is to pose and repose the question of the ways in which synthetic biology is contributing or failing to contribute to the promised near future through its eventual input into medicine, security, energy, and the environment.<sup>5</sup> The purpose of such a task is to assess this form-giving through critical examination. The question of how synthetic biology will inflect these domains as it develops, not only after it achieves something, constitutes a central, if not unique, concern of Thrust 4.

The SynBERC Principal Investigators have claimed in their grant proposals, and made structurally explicit in the initial formulations of the organization of the Center, that the far-reaching promises of synthetic biology cannot be realized under existing conditions and organization of scientific research. If the PIs are correct in their assessment, and if in basic ways the promise of synthetic biology is dependent on new forms of collaboration, then the success of SynBERC will depend as much on organizational change and change of work habits as it will technical virtuosity.

Given the power differentials between the bioscientists and the human scientists, and the existing disciplinary structures of reward that shape and reinforce current practices, there is no guarantee that collaboration will be forthcoming. Indeed, there is evidence and experience to suggest that the habits and dispositions of elite scientists as well as the organization of their labs and objects will resist change, consciously and tacitly. Certainly many of these scientists have made their accommodation with the ELSI mode. They are ready to fill out safety forms, they are open to ethics discussions as long as these are periodic and nonintrusive, and they are open to regulation as long as this is downstream of their research. Some are even open to hypothetical discussions about well-meaning social concerns and consequences. In short, some are willing to *cooperate*.

The question remains open, however, whether elite scientists with all the demands on their time are ready to submit themselves to changes of a transformative sort in their habits and procedures. The question remains as to whether or not they are willing to contribute to developing *collaboration*. This question is a genuinely open one for us, and constitutes a key starting point of inquiry that we undertake in an experimental mode. By experimental mode we mean that we will monitor the progression or lack of progression of this design initiative, and analyze the results.

## PROGRAM

Our goal is to design new practices that bring the biosciences and the human sciences into a mutually collaborative and enriching relationship, a relationship designed to facilitate a *remediation* of the currently existing relations between *knowledge* and *care* in terms of mutual *flourishing*.<sup>6</sup> If successful, such practices should facilitate our current work in synthetic biology—understood as a Human Practices undertaking—through improved pedagogy and the invention of collaborative means of response.

*Pedagogy*: Pedagogy involves reflective processes by which one becomes capable of flourishing. Pedagogy is not equivalent to training, which involves reproduction of expert knowledge. Rather, it involves the development of a disposition to learn how one's practices and experiences form or deform one's existence and how the sciences, understood in the broadest terms, enrich or impoverish those dispositions.

Our inquiry is directed at the practices and experiences of the synthetic biology community. We are addressing the question: How is it that one does or does not flourish as a researcher, as a citizen, and as a human being? Flourishing here involves more than success in achieving projects; it extends to the kind of human being one is personally, vocationally, and communally. As a placeholder, we note here that *flourishing* is a translation of a classical term (*eudaemonia*) and as such a range of other possible words could be used: thriving, the good life, happiness, fulfillment, felicity, abundance, and the like. Above all, *eudaemonia* should not be confused with technical optimization, as we hold that our capacities are not already known and that we do not understand flourishing to be uncontrolled growth, progressivism, or the undirected maximization of existing capacities. Adequate pedagogy of a bioscientist in the twenty-first century entails active engagement with those adjacent to biological work: ethicists, anthropologists, political scientists, administrators, foundation and government funders, students, and so on. Contemporary scientists, whether their initial dispositions incline them in this direction or not, actually have no other option but to be engaged with multiple other practitioners. The only question is how best to engage, not whether one will engage. Pedagogy teaches that flourishing is a lifelong formative process, one that is collaborative, making space for the active contribution of all participants.

In our view, the means to inquire and explore to what extent these new relationships will be fruitful consist in the invention, design, and practice of

what we refer to as *equipment*. Equipment is a technical term referring to a practice situated between the traditional terms of method and *technology*.

### The Pathway to Equipment

We began this work intending to produce a diagnosis of a new “figure” or “diagram” or “rationality” taking shape in the world. Although the contours of what seemed to be emerging were vague, we had a strong sense, arising from a great deal of discussion, analysis, seminar work, and reading, that whatever the terms “biopower” and “biopolitics” might mean—and they were being used in a growing number of ways, most of which seemed to us misleading and misguided—the term or concept or brand were clearly not adequate for understanding contemporary reality. Furthermore, as an additional support for our unease with how these terms were being used, we knew that Michel Foucault, who coined the terms, never had intended them to serve the undisciplined and heterogeneous uses to which they are currently being put. Foucault’s focus had been historical and conceptual and, at least in his later work, nontotalizing. Above all, concepts like “biopower” or “governmentality” had been conceived and put forth in a mode that was expressively capable of recursive rectification. Neither naming a unique meaning of Western or world history nor uncovering the nefarious workings of “governmentality” everywhere can meet the criteria of recursive rectification.

Once we actually began working, after multiple delays and blockages, we concluded that it was currently premature to diagnose a new “figure” or “diagram” or “rationality.” First, it became clear that what each of these terms means is far from clear. Second, we came to believe that while major changes in diverse empirical domains were unquestionably under way, it was not at all obvious that they had taken anything like a general and definitive form. Furthermore, we concluded that it was conceptually hazardous to assume that they ever would. Having reached an impasse, we decided to change strategies by shifting registers.

At first, we decided to move from characterizing a general diagram or rationality to attempting to distinguish the contours of the problematization to which that general diagram was presumably responding. Even there, however, after two semesters’ travail with multiple empirical projects laid out and discussed, it gradually came to seem likely that even the task of attempting to distinguish and characterize the parameters of an emergent problematization

in a comprehensive manner was premature. Unlike the question of what figure comes “after” biopower, however, the challenge of specifying the vectors and contours of an emergent problem-space remains, in our view, a valid one. Consequently, we decided to return to the concrete: our site of inquiry. We shifted our efforts back to the challenge of figuring out how best to comprehend, invent, and practice the work we have taken up in SynBERC.

This course correction proved to be serendipitous in opening the way to discover a means of rectification. It led us to conclude that the first work to be done was to elaborate a diagnostic of equipment. Here, the following articulation by Max Weber provided helpful orientation as to how to proceed:

It is not the “actual” interconnections of “things” but the *conceptual* interconnections of *problems* which define the scope of the various sciences. A new ‘science’ emerges where new problems are pursued by new methods and truths are thereby discovered which open up significant new points of view.<sup>7</sup>

Said another way, we shifted our attention from the attempt to characterize the “actual interconnections of things” to an attempt to distinguish “the conceptual interconnections of problems” with the hope that we would be “opening up significant new points of view.” Such points of view, we came to think, would be significant to the degree that we could transform these perspectives into actual practices. The production of actual practices, after all, is what equipment, as we understand it, is about.

### What Is Equipment?

We proceeded with an informed awareness that there is a still rather inchoate, if insistent, demand for new *equipment* to reconfigure and reconstruct the relations between and among the life sciences, the human sciences, and diverse citizenries both national and global. This conviction stems from the pragmatic situation in which we are working: the National Science Foundation funds our work. But the commonplace also resonates with a year’s work with members of the Anthropology of the Contemporary Research Collaboratory (ARC) indicating that parallel questioning, and the need for new equipment, exists in other domains such as biosecurity, biocomplexity, etc.

Equipment, though conceptual in design and formulation, is pragmatic in use. Defined abstractly, *equipment* is a set of *truth claims*, *affects*, and *ethical orientations* designed and combined into a practice.<sup>8</sup> Equipment, which has historically

taken different forms, enables practical responses to changing conditions brought about by specific problems, events, and general reconfigurations.<sup>9</sup>

Equipment is a term (word + concept + referent) that, by definition, does not retain a constant meaning. Such variation is a source of its richness and flexibility. Mapping and analyzing its distributions would be the kind of work a much more extended genealogy would have to undertake; how to undertake such an enterprise within the anthropology of the contemporary as opposed to the history of the present is, currently, largely unexplored, lacking the requisite navigational concepts and methods.

Equipment takes different forms in the contemporary. This variability stems from the fact that the contemporary is neither a unified epoch nor a culture and consequently there is no reason to expect there would be a single form within it; as well as the fact that scholarly work in the history of the present has shown that there are multiple facets to even a settled problematization and thus, it follows, multiple solutions requiring, it would be logical to assume, diverse equipment.

The challenge of constructing contemporary equipment is threefold: (a) to provide a tool-kit of concepts that enable one to conduct inquiries into the contemporary world in its actuality; (b) to conduct those inquiries in a manner such that those concepts and those inquiries function so as to make the relations (connections and disjunctions) between *logos* and *ethos* apparent, and available, to oneself and to others—that is to say, to make those relations part of the inquiry itself as well as part of a way of life; (c) to take into account the *pathos* encountered and engendered by such an undertaking, and to find a place for it within the form under construction.

In our technical vocabulary, these challenges consist in designing and synthesizing a form that can maintain a constantly available level of generality. Such forms must be able to function effectively to reconstruct specific problems while being plausibly applicable to a range of analogous problems. That is, the challenge is to compose a form of equipment that will be able to function as an *equipmental platform*.

Equipmental platforms are characterized by a constantly available generality. That is to say, platforms must be designed and synthesized in such a way as to be able to function effectively to reconstruct specific problems, while being plausibly applicable to a range of analogous problems. An equipmental platform can be distinguished from equipmental activities and from specific instances of equipment. An equipmental platform discriminates appropriate

(i.e., coherent and co-operable) equipmental activities and functions as the basis for the organization of these activities. The kinds of activities it distinguishes and organizes are those activities that govern objects within a given contemporary figure. These activities taken as an integrated series are instantiated as specific instances of equipment. Put briefly, equipmental platforms function as the basis for the organization of the activities of specific equipment.

Equipmental platforms function in relation to contemporary figures in two important ways. First, platforms contribute to the determination of a problem within a broad field of problematization. Second, platforms contribute to the specification and design of possible solutions to this problem. Equipmental platforms, in short, function as a pragmatic means of transforming aspects (e.g., blockages, difficulties, disruptions of the play of true and false, etc.) of a broader problematization into concrete problems such that these problems can be taken up as a set of possible solutions.

## LOGIC OF PRACTICAL JUDGMENTS

It is here that we find some help from John Dewey. A step toward the design and development of equipment has involved extensive conceptual work. This conceptual work has led us to identify the importance of a logic of practical judgments, in which John Dewey has provided insight.

As early as 1903, in his article "The Logic of Practical Judgments," John Dewey confidently argued at length for an approach to the logic of practical judgment that does not consist in a formal set of procedures oriented to internal consistency and completeness, nor the conditions and constraints of a subjective state of mind. Rather, he argued that practical judgment is oriented to a reflective and reiterative practice of pragmatic intervention, modification, and subsequent intervention.<sup>10</sup> His battle with neo-Kantians, idealists, formalists, and above all (after the appearance of Dewey's *Logic* in 1938) with Bertrand Russell, provided the context as well as an incitation for careful fine-tuning of his core position during the course of the next half century.<sup>11</sup>

The logic of practical judgment, for Dewey, was not a question of performing a mathematical operation but rather of undertaking a directed action in a given situation. A practical judgment (and its associated propositions), he argued, is "itself a factor in the completion of the situation, carrying it forward to

its conclusion." It follows that a logical judgment does not exist in the domain of abstractions, it is not external to actions, events, and outcomes, but rather is "a determining factor in the outcome" of such processes and practices.<sup>12</sup>

Thus, to partake of the logic of practical judgments, for Dewey, is to partake of strategic and experimental action as the mode in which thinking, evaluating, judging, and learning is actually undertaken. What is at stake in the logic of practical judgments is neither the establishment of universals nor the demonstration of the categories of an analytic, transcendental or otherwise. Taken up in this pragmatic and verificationist mode, a logical judgment is simultaneously an evaluation of a desired end as well as a claim about the means available for attaining that end. It follows that since practical judgments are actions, they can be evaluated neither in the abstract nor a priori. It is only once they are put into effect that they can be evaluated. Hence, logical judgments are not external to a case but are simultaneously both the means and the ends for deciding on the worth of a propositional judgment. Dewey writes, "The determination of ends-means (constituting the terms and relations of the practical proposition) is hypothetical until the course of action indicated has been tried. The event or issue of such action is the truth or falsity of the judgment."<sup>13</sup> Later, in his 1938 *Logic*, Dewey called this mode of veridiction "warranted assertion."

Practical judgments, Dewey insists, are not subjective any more than value is; rather, they are pragmatic. Furthermore, not only are practical judgments not subjective, they do not "primarily concern themselves with the value of *objects*; but with the course of action demanded to carry an incomplete situation to its fulfillment."<sup>14</sup> Being neither primarily subjective nor objective, practical judgments are engaged and experimental modes of intervention and evaluation of such a situation. Dewey, it is clear, was no relativist. This term, as Richard Rorty was fond of reminding us, was of concern above all to objectivists. Dewey, Rorty, and—it will surprise some to hear—Michel Foucault were concerned primarily with the pragmatics of thinking, not its dialectics or analytics.

Furthermore, and consistent with the above claims, the criteria for evaluating practical judgments are not formal or a priori. They are pragmatic and goal-driven. The logic of practical judgments is a "search for conditions which will render in the future similar cases *remediable* not hopeless. The whole case for the genuineness of practical judgments stands or falls with this principle. It is open to question. But decision as to its validity must rest upon empirical evidence."<sup>15</sup> Logical judgments make sense, cohere, and have value,

only as part of inquiry, taken in the broad, engaged, and experimental sense that Dewey gives to the term.

Finally, not only is the logic of practical judgments pragmatic, the standards or metrics for evaluating such a logic are as well. It "is frequently assumed," Dewey writes, "that valuation is a process of applying some fixed or determinate value to the various competing goods of a situation; that valuation implies a prior standard of value and consists in comparing various goods with the standard as the supreme value."<sup>16</sup> Dewey resists such an understanding of standards because he insists on a standard that arises within the process of determination and remediation, "not outside of it, and hence not capable of being employed ready-made, therefore, to settle the valuing process."<sup>17</sup> For if the standard were already given, then "all that remains is its mechanical application to the case in hand. Genuine moral uncertainty is then impossible, where it seems to exist, it is only a name for moral unwillingness, due to inherent viciousness, to recognize and apply the rules already made and provided, or else for a moral corruption which has enfeebled man's power of moral apprehension."<sup>18</sup> Clearly such a position advocating fixed, external, and universally applicable moral standards is not adequate to the pragmatic demands of the underdetermined situations within which thinking takes place. The pragmatist response is that "the standard is a rule for conducting inquiry to its completion; it is a counsel to make examination of the operative factors complete, a warning against suppressing recognition of any of them."<sup>19</sup>

All of this is helpful in advancing both analytic and diagnostic work. As noted, however, Dewey remained at a high level of abstraction in his philosophic work. It is entirely possible that an examination of his practical interventions in establishing schools and the like would demonstrate how these logical discussions could be put into operation. In the case of our Human Practices work and the demand to design and invent equipment, Dewey's logic has proved to be useful as an initial guide to orienting inquiry. However, we now find ourselves obliged to look elsewhere, largely to our own devices, to actually pursue the inquiry.

## HUMAN PRACTICES

We do not think that what is distinctive and intriguing about developments in synthetic biology is that they are "revolutionary" or even "cutting-edge."

These are modernist terms from a prior historical configuration that draws attention to what is “new” and “radically transformative” as the locus of significance. Our interest and attention is drawn to the combination and recombination of elements old and new into a stylized form whose defining diacritic is not its newness per se. Rather, in what has been described elsewhere as “the contemporary” as opposed to the modern, what counts as significant are the forms and possibilities that open up once the quest for the new is moderated and backgrounded (although not ignored). Hence, the basic rules of what counts as good science and engineering in synthetic biology are the traditional or standard ones. What objects are taken up and how they are combined and recombined are themselves part of a larger *Gedankenbild* that is part organizational, part conceptual, part technical—and part equipmental. How such an assemblage might be put together, made to function effectively, cope with breakdown and unexpected occurrences, and discern and address emergent problems is what both intrigues us and concerns us.

Additionally, well-established modes of engagement are structured by specific metrics. Prominent metrics have included normalization and the protection of dignity. Normalization allows for the regulation and modulation of fields of statistical regularities, such as industrial safety. The metric of dignity facilitates emergency intervention into situations of rights abuse. While recognizing the worth and utility of these metrics, Human Practices is designed to discover if it can function according to a different metric—flourishing.

We were oriented towards a reconstructive effort because various research teams at the ARC had been engaged in intensive inquiry on emergent topic areas such as biosecurity and biocomplexity for the preceding two years. For example, we had observed in the latter how a rethinking of issues had contributed to a shift from biodiversity as a central approach to a range of environmental concerns, to the emergent field of biocomplexity. While the former approach was based on understanding and preserving species as an inherent good, the latter concentrated more on the types of milieu that would enable or encourage biological complexity to flourish. Hence a certain range of prior expertise, and prior disciplinary suppositions and ethical commitments, taken as settled and desirable could well slow or even block the understanding and collection of the data that will be required for the conception of sustainability at work in bio-complexity.

A similar example can be given with biosecurity. It has become clear through our research that recombinations and reconfigurations of existing

expertise is required if a biodefense system is to be constructed that is adequate to emergent problems. Although previous Cold War experience can constitute a baseline for thinking about biosecurity today, we find ourselves in a radically different type of security situation. It follows that vastly different arrays of bioscientific understandings and technologies and new dispositions among security experts were just as vital as new dispositions and approaches among bioscientists, and, for that matter, potential aggressors.

As an integral component of the overall enterprise, Human Practices is positioned to take up problems in a way that experts-at-a-distance cannot. For example, problems in industry relations and intellectual property are certainly crucial to how synthetic biology will develop. However, Human Practices does not need to ask the question of what IP platforms exist and how can they be applied. Rather, Human Practices is in a position to pose the question of what kinds of objectives are really at stake in specific projects, how those stakes require rethinking about the interfaces among university labs, government funding, biotech interests, and the like. In this way, the problem of how to leverage existing resources, talents, and technologies in order to advance the aims of synthetic biology can appropriately be posed. Once posed, these problems can be collaboratively worked on. Such collaboration will require existing experts, to be sure. However, the expertise will need to be interfaced with emergent problems in such a way that experts will be required to think forward rather than reproduce existing insights. In sum, our work is oriented toward understanding how potentially viable design strategies emerge, how these strategies might inform synthetic biology, and what efforts are undertaken to integrate them into a comprehensive approach to the near future.

Such work involves *reconstruction*. We are giving reconstruction in Human Practices a specific technical meaning, similar to that put forward by John Dewey:

Reconstruction can be nothing less than the work of developing, of forming, of producing (in the literal sense of that word) the intellectual instrumentalities which will progressively direct inquiry into the deeply and inclusively human—that is to say moral—facts of the present scene and situation.<sup>20</sup>

What is pertinent in Dewey's formulation is that science and ethics are interfaced and assembled in accordance with the demands of "progressively directed inquiry." Such inquiry is not primarily directed at real or imagined

consequences or first-order deliverables. Rather, inquiry is directed at the possibility of the invention and implementation of equipment that facilitates forms of work and life.

### **CONCLUSION: PROSPERITY, AMELIORATION, FLOURISHING**

Although Dewey's words convey a sense of conviction and plausibility, it has become apparent that, at this stage of our inquiry, we don't yet actually understand of what reconstruction consists in this case. Reflecting on and discussing this issue has raised the question of what is the metric of reconstruction? Or, approaching the topic from a different angle, what is the telos of reconstructive practice?

We have identified two candidates among the scientists with whom we are working: prosperity and amelioration. It is fair to say that all of the scientists involved are unabashedly, unashamedly, and unselfconsciously committed to prospering. To them to prosper means primarily devoting attention to advancing their careers. It also means, in many cases, striving for financial success through their involvement with start-up companies that they themselves have founded in the case of the more senior scientists or wish to found in the case of the more junior ones. It is part of the mandate of SynBERC as well as the other centers funded by the National Science Foundation that they become financially self-sufficient within ten years. Given that mandate, there is no contradiction between what the government decrees and what the scientists desire. By now within the American scientific establishment such norms are widely accepted. Bayh-Dole has long since become not only the law of the land but its norm.

A few of the more senior SynBERC scientists are aware that the security environment within which they are working must be addressed if their whole enterprise is to continue. Some understand that the stakes are significantly higher than the preservation of their own enterprise. Many, perhaps all, of the SynBERC scientists would affirm, if asked, and several are actively committed to, the goal of constructing technologies that would make major contributions to the amelioration of the environment (including climate change), of making therapeutic contributions to decreasing the toll of major diseases.

None, to our knowledge, have expressed any deep concern that prosperity and amelioration might be conflicting or contradictory goals.

Beyond this consensus, a zone of ambiguity exists. Are the metrics of prosperity and amelioration sufficient? For the scientists, such a question is largely unexamined. But even for John Dewey there is a certain ambiguity present. For surely, the desire to prosper and to improve the human condition can be understood as part of “the deeply and inclusively human.” Dewey glosses this phrase as “the moral.” But does the moral, or the ethical, or the deeply and inclusively human require something more and different than what is provided by the pursuit of prosperity and amelioration?

### Power Relations

Hence the question we confront today might be put as: what is the relation, or relationships, if any, between and among, prosperity, amelioration, and flourishing? This question brings us back to issues of power relations that have been skirted in what preceded. As with most power relations, those within SynBERC are unequal. The basic inequality between the other PIs and the Human Practices members operates without examination, bolstered by the inertia of past dispositions and the larger structures of the university that take for granted the autonomy of the biosciences as well as their primacy given their prosperity and assumed contributions to ameliorating health, the environment, etc. Said straightforwardly: Human Practices is in a dominated position.

If the inequality of the power relations—who makes decisions, how priorities are established, how decisions are implemented, who gets to make threats that can be carried out—follows more general American standards, how this situation inflects the forms that relations of cooperation and coordination take is unthematized and consequently unexplored. That topic has become a focus of our practices and our reflections. We have identified three modes currently available—representing experts, science and society, and second-order participants—and are attempting to invent an appropriate practice for Mode Three.<sup>21</sup> One further comment on power relations is in order here. In an important paper, “The Subject and Power,” offered to Bert Dreyfus and myself as an epilogue to our book on his work, Michel Foucault proposed a distinction between three types of power relations: exploitation, domination,

and subjectivation. In light of these distinctions, it is pertinent to point out that while Human Practices is subordinated within SynBERC, it is not exploited. Given our modest material needs, we have been allotted ample resources and have been left alone to do whatever work we deem to be important. Consequently, the challenge of inventing a form for a mode of subjectivation that could lead to flourishing has been granted some leeway, a measure of maneuvering room. Given these conditions, the question then becomes: how to maneuver so as to enhance flourishing? As of late 2007, we have no clear answer to that challenge.

### CODA

Having just presented a paper on synthetic biology in a 2006 conference at Johns Hopkins University on "Concepts of Life," I was brought to a heightened alertness when the commentator framed his remarks in terms of Seneca's fate—the Emperor Nero commanded Seneca to commit suicide, and Seneca complied. There was a moral and existential lesson that, the erudite commentator proposed, I seemed to be ignoring. At my peril. With all due politeness but with a cutting civility, Sylvain Perdigon (at the time a graduate student in anthropology at Johns Hopkins returning for a pause in his fieldwork in Palestinian refugee camps in Lebanon but equally a product, as the saying goes, of the elite French educational system) was warning about what he took to be my complicity with Power as well as what he took to be my dismissive attitude displayed toward the substance and affect of critics of biotechnology. Such a mode of subjectivation, his allegory was designed to lead the audience to imagine, could lead to tragic consequences.

Let us remember that Seneca's fate arose from his efforts to put philosophy directly into the political arena. Seneca, perhaps the richest citizen in Rome, was drawn to and repelled by his position as a close advisor to the notorious Emperor Nero. In his letters, Seneca repeatedly rehearsed the then stereotyped consolatory tropes of withdrawing from public life, in his case not simply retreating to a villa in the countryside as many other rich Roman citizens did once they fell from power, but, rather, Seneca imagined, an exodus to Greece where he could return to the study of philosophy and rhetoric at the schools of his youth. And, he hoped, to refreshment, rejuvenation, and renewal at the wellsprings of youthful virtue of the Republic in its better days.

Seneca, however, stoic that he was, resisted the temptation to withdraw and remained in Rome. Another mode of consolation was writing: in addition to his letters and moral treatises, Seneca wrote tragedies. These tragedies treat of brutal and violent affairs. Scholars continue to debate the degree to which they are fantasies and the degree to which they are a form of political realism. In one, *Octavio*, a philosopher named Seneca counsels an Emperor named Nero against bloody retribution. Eventually Nero turned against his advisor and ordered him to commit suicide. Seneca acquiesced to the Emperor's demand but implored Nero to release his wife from her duty after she failed in her attempt to precede her husband in the path of honor—a request that was granted.

The tone of our Frenchman's commentary skated between that of a caution and that of an admonition. The caution seemed appropriate while the admonition or rebuke was puzzling. One could take it to say that anthropologists ought to study those upon whom power is exercised and to concentrate upon the practices of repair and resistance that arise in response, whether in defiance or in existential inventiveness. As the department of anthropology at Johns Hopkins, following the lead of Veena Das, is the exemplar of the social suffering mode of anthropology, such advice was neither unexpected nor unappreciated. The dominant mode of subjectivation in American anthropology today is to study the dominated and exploited, or to show how those whom one studies dominate and exploit, while retaining what Foucault has referred to as "the speaker's benefit," a position of exposé or rebuke or denunciation or uplift from a position exterior to the situation. While apparently gratifying, such a mode of subjectivation, it seems to me, was unlikely to lead, if not incapable of leading, toward reconstruction or even practical judgment in Dewey's sense of the term. Hence, if the path of inquiry was seeking practical judgments, it followed that if one accepted the rebuke at face value—work with the powerful at your own moral and existential peril—then there was little I could think of to respond except that, like Seneca, and other practitioners of ancient equipment, I would keep the maxim in mind.

Although it seems not to be in the stars that the leaders of the synthetic biology center at Berkeley will ask for my suicide or that of my wife, nonetheless Monsieur Perdigon's caution was a propos and, actually, in the spirit of Seneca himself. In fact, the PIs of Human Practices have been threatened in an e-mail with replacement, in what can be legitimately taken as a petty example of authoritarian power, unless we "got along with each other." Upon reflection,

and acknowledging our desire to prosper, we are now getting along. But the threat stirred my anger especially as scientific PIs who had contributed little or nothing to the overall success of the Center have received no admonishment. After this event, my affect shifted to a cold vehemence aimed at surviving as well as achieving a more just recognition of our substantial efforts and contributions.

As a means to developing a more satisfactory mode of subjectivation within this situation of domination but not exploitation, I pose the question of what affect is appropriate in such a situation? Surely anger, or more accurately the Greek *thumós* is a plausible candidate. Why so? And here we leave Seneca aside (despite his treatise on anger) and turn instead to Aristotle who treats *thumós* in his treatises on rhetoric and ethics. *Thumós* is the capacity of the soul to manifest anger and zeal. *Thumós* is closely connected to the value one sets on oneself as well as the manner in which others respond to that self-esteem. These conditions lead directly to considerations of justice, politics, and ethics. For example, in the *Rhetoric*, Aristotle says:

Anger may be defined as an impulse accompanied by distress, to a conspicuous revenge for a conspicuous slight directed without justification towards what concerns one-self or towards what concerns one's friends.<sup>22</sup>

In Book IV of the *Nicomachean Ethics* he writes:

The man who is angry at the right things and with the right people, and further, as he ought, when he ought, and as long as he ought, is praised. This will be a good-tempered man.<sup>23</sup>

As with the other virtues the mean is flanked by two equally negative extremes, one an excess, the other a deficit. The excess term is "irascibility," but there is no term for the deficit:

Such a man is thought not to feel things nor to be pained by them, and, since he does not get angry, he is thought unlikely to defend himself; and to endure being insulted and put up with insults to one's friends is slavish.<sup>24</sup>

The French Hegel scholar Alexandre Kojève equates *thumós* with the Hegelian concept of "the desire for recognition." *Thumós* is the drive to assign value and the consequent legitimate desire for recognition. This striving

for value is an activity that entails another consciousness to share or reject the valuation put forth in practice or asserted in discourse. The arousal of anger when such recognition is ignored or denied is perfectly appropriate. This intimate relationship between self-evaluation and anger is captured nicely in the English word *indignation*.

Other authors have attempted to make *thumós* a marker of the ethical limits to the current excess of the desirable and/or the calculative in consumer capitalism. These criticisms of contemporary capitalism are on the mark and do not need rehearsing here. The surge of indignation, however, and even its channeling into a sustained affect is, of course, only a beginning. The forging of affect is a component in the construction of contemporary equipment. That being said, the task of imagining and inventing the ethical and veridictional components to contemporary equipment and giving them form remains a challenge. A challenge that must be taken up, it seems to me, if we are to move toward a larger comprehension of the marginalized telos of flourishing and a practice of reconstruction.

1. John Dewey, "The Logic of Practical Judgment," in *Essays in Experimental Logic* (1916) (Mineola, N.Y.: Dover Publications, 2004), 241.
2. The "we" in this paper refers above all to my collaboration with Gaymon Bennett.
3. The phrase is from Phillip Pauly, *Controlling Life: Jacques Loeb and the Engineering Ideal in Biology* (Oxford: Oxford University Press, 1987).
4. Daniel Kevles & Leroy Hood, *The Code of Codes: Scientific and Social Issues in the Human Genome Project* (Cambridge: Harvard University Press, 1993); Evelyn Fox-Keller, *A Feeling for the Organism: The Life and Work of Barbara McClintock* (New York: Times Books, 1984).
5. For more details, see [www.synberc.org](http://www.synberc.org). This article only treats the efforts of the fundamental modules of Thrust 4.
6. Each of these italicized terms will be taken up analytically in other papers.
7. Max Weber, "Objectivity in the Social Sciences," in *The Methodology of the Social Sciences*, trans. & ed. Edward A. Shils & Henry A. Finch (New York: The Free Press, 1949), 68.
8. For "practice," see Alasdair MacIntyre, *After Virtue: A Study in Moral Theory* (Notre Dame, Ind.: Notre Dame University Press, 1981).
9. Paul Rabinow & Gaymon Bennett, "From Bio-Ethics to Human Practices or Assembling Contemporary Equipment," unpublished manuscript (2007).
10. John Dewey, "Logic of Judgments of Practice," in *Essays in Experimental Logic*, *supra* note 1 at 120.
11. Tom Burke, *Dewey's New Logic: A Reply to Russell* (Chicago: University of Chicago Press, 1994).
12. Dewey, *supra* note 10 at 216.
13. Dewey, *supra* note 10 at 221. On this point, see Burke, *supra* note 11 at ch. 6.1, "Warranted Assertibility and Truth."
14. Dewey, *supra* note 10 at 231.

15. *Id.* at 218.
16. *Id.* at 236.
17. *Id.* at 238.
18. *Id.* at 239.
19. *Id.* at 242.
20. John Dewey, *Reconstruction in Philosophy* (Boston: Beacon Press, 1948), xxvii.
21. Paul Rabinow & Gaymon Bennett, "The Work of Equipment: Three Modes," unpublished manuscript (2007).
22. Aristotle *Rhetoric* 2.2.
23. Aristotle *Ethics* 4, 5.
24. *Id.*

constitutional law and adjudicatory practices in U.S. courts, and on interdisciplinary work in law and the linguistic humanities. Her chapter on "Language" is forthcoming in the Cambridge University Press *Introduction to Law and the Humanities*, and her essay, "Reviving the Subject of Law," was recently published by Cambridge in *On Philosophy in American Law* (Francis J. Mootz III ed.). She is currently working on a monograph on adjudicatory practices in U.S. courts, tentatively titled *How America Got the Bad Common Law*.

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