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Why (Study) the Humanities?

THE VIEW FROM SCIENCE

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9.1. Introduction

Questions about the value of the humanities and the relationship between the sciences and humanities have been very much in the news recently.[1] Just a brief review in the public press shows scientists and humanists weighing in and responding to one another. Public opinion is shifting in favor of science and technological education. There are two related challenges that have been leveled about the value of the humanities.

1. There is a threat to the perceived value of the humanities in the culture at large. This manifests itself in two ways: reduced public support for humanities research, and students being steered away from studying the humanities in university.[2] One often hears complaints of the form, "Why should we as a culture invest resources in humanities education? Why should we spend good money for our children to study French literature, or why should the state subsidize degrees in philosophy? Science and engineering degrees are effective ways of getting jobs and we (as a country) need

1. Stanley Fish, Steven Pinker, Philip Kitcher, Daniel Dennett, and Martha Nussbaum have all weighed in on the public discussion. A new report commissioned by a bipartisan quartet of lawmakers looks at the role of the humanities and social sciences in public education: http://www.humanitiescommission.org/.

2. This is the threat addressed here: http://today.duke.edu/2013/06/humanitiesreport.

more scientists and engineers, but what is a degree in cultural anthropology worth?"

2. And then there is the threat to the humanities mounted by those who claim that in a scientific worldview the human sciences will ultimately be absorbed into (or replaced by) the hard sciences, and there will be no place for the humanities as a source of knowledge.[3] Those who defend this position base it on the claim that we are bits of matter, alongside other bits of matter, governed by material laws, and so understanding ourselves is not different in principle from understanding celery or cells. The great complexity of the human has fostered the illusion that human behavior is different in kind, but that position is indefensible from the point of view of science.

On the face of it, these are two quite different challenges. In response to the second, the position that some have retreated to is to relinquish the claim that the humanities provide a source of knowledge about the human being and hold that it "makes our lives better" in other ways. In response to the first, some have argued that contrary to appearances, a humanities education will make you a better lawyer, businessman, get you a better job, or make you better at public relations (see Rand 1999). Martha Nussbaum has argued that it makes you a better citizen and so is crucial to the success of the polis.[4] A more dismissive answer is provided by Stanley Fish, who rejects corporate or economic values as the sole or ultimate arbiter of value. He demands to know why the humanities should have to justify themselves by those standards any more than corporate values have to justify themselves by the standards of the humanities. One might make more money as an engineer, but one would be culturally illiterate, historically ignorant, and uninsightful. Rhetorically, Fish is right. There is no reason that the humanities should have to justify themselves by the standards of the sciences. His response, however, makes it sound as though the humanities are a pleasurable diversion to be enjoyed by those with the privilege of leisure, and that is not the kind of defense that

3. Alex Rosenberg is the most outspoken advocate of the position, though one finds glimmers of it in the opinions of many scientists and philosophers, and it is a challenge that any self-styled naturalist has to address in their own thinking.

4. Nussbaum (2010). Fareed Zakaria, in an interestingly related recent piece in the *Atlantic*, has argued that education in the humanities, as opposed to STEM education, makes one more creative and entrepreneurial and that is what has allowed America to flourish economically despite lagging behind in STEM education.

will persuade a parent to support a child's decision to study art history rather than (say) physics. A deeper defense would say what kind of knowledge the humanities provide, how it differs from that of the sciences, and why it is indispensable in a well-lived life. It would address the relationship between the scientific vision of the human being and the humanistic one explicitly, and say whether the humanistic vision is undermined by what science is teaching us about ourselves. This way of putting it brings it close to the second problem, so I want to begin by addressing that one.

9.2. The Physics of Open Systems

Every physical system falls under the scope of general microscopic laws that govern the universe as a whole. Those laws are exact and exceptionless. At the level of human behavior those laws are also local and deterministic.[5] Consider any subsystem of the universe and an enclosing sphere of any diameter around that system.[6] We call the variables that characterize the world on the boundary and outside the sphere exogenous, and those that characterize the interior of the sphere endogenous. Locality entails that the values of variables on the surface of the sphere screen off (render irrelevant) the values of variables outside the sphere. This, together with determinism, entails that if we know the initial state of the matter inside the sphere and all of the forces that impinge on the surface of the sphere over any interval of time, we can predict the behavior of anything inside the sphere with certainty. This holds regardless of the size of the sphere and regardless of what kind of matter it encloses. Let's call this the DL principle (for deterministic-local).

The DL principle holds for the collection of dust particles in this little bit of space. It holds for planets. It holds for toasters, and tree frogs. And it holds also for the human being. So, here's a human being. Here are the exogenous influences impinging on a sphere enclosing it. What physics tells us is that if we have the initial state of the body and we know the forces impinging on the

5. The classical setting simply gives us a precise physical framework in which the challenge takes its sharpest and most pressing form. Until the interpretation of quantum mechanics is settled, it is impossible to say definitively whether it makes a difference to human action, though there are no ~~positive~~ physical reasons right now for thinking it will make any significant difference. At the level of brain function relevant to human action, classical physics ~~is~~ the effective theory.

6. We make it a sphere just for convenience. We can try to get it as close to the boundaries of the body as possible, though the boundaries of the body are a little vague (is the hair on your skin part of your body? What about the skin cells just flaking off . . . etc.).

surface of the sphere through some interval, we can calculate how the body will move over that interval.

That sounds like a very strong result. But it is actually quite weak for the following reason. The number of degrees of freedom in the microscopic state of the enclosed system = (6 × the number of particles that compose the system). The number of degrees of freedom in the exogenous variables $=_{\text{roughly}}$ (6 × the number of particles in the rest universe).[7] The DL principle says if we know the precise values of all of those variables, we can calculate with microscopic precision how any physical system enclosed in that sphere will behave. It does not entail that knowing anything less than that will let us calculate anything about that system. It entails, that is to say, that if we know everything we can calculate everything. It doesn't entail that knowing less than everything will let us calculate anything.

Here's what I mean. Let's consider a ~~quarter~~, and let's suppose that the only thing we really care about concerning its behavior is whether, if it is tossed right now, it will land heads. The DL principle tells us that if we know its initial microstate and the values of all exogenous variables impinging on it through the course of the toss, we can calculate with certainty how it will land. But it also tells us—and here is the crucial part—that *nothing less will do*. The reason is that the dynamical laws entail that whether a coin lands heads or tails on a given toss is so sensitive to the microscopic values of so many exogenous variables—e.g., the exact angle at which it is released, the Brownian motion of dust particles in the air, indiscernible fluctuations in speed and direction of wind—that unless we know all of this with perfect precision, or can control their effects, the outcome of the toss cannot be predicted.[8] What is happening here is that coin tosses amplify ignorance. They transfer any ignorance we have about the microscopic state of any of the particles that might make some impact on the boundary of the sphere into ignorance of the result of a given toss.[9]

7. One qualification is necessary to make this strictly correct, but it makes no practical difference here. If the universe is big enough and the sphere is small enough, and we live in a universe in which information cannot be packed densely in any region of space, there may be fewer degrees of freedom on the boundary of the sphere.

8. In the case of coin tosses, we can attach probabilities to outcomes (fifty-fifty for fair coins, different probabilities for weighted coins), because there are stable relative frequencies over the dynamically relevant exogenous variables, but that itself is not something that is generally available. If we can control the effects of exogenous variables, the outcome can be reliably predicted. It is because of the lack of knowledge and absence of control in everyday circumstances that makes coin tosses effectively unpredictable.

9. Note here that this is a different phenomenon from the sort of unpredictability that arises with chaotic systems. In the case of chaotic systems, the unpredictability has its source in the nonlinearity of the

9.3. Science Is about Generality; Humans Are All Specificity

When you see how weak the DL principle is, you might be surprised that we can have a predictive science of any open subsystem of the world. And, indeed, the vast majority of open subsystems (if by "open subsystem" we mean the matter contained in any region of space-time around which we can draw a closed boundary) do not exhibit the kind of regularity that makes it possible to formulate simple, predictive laws that express their behavior as a function of the state of the environment.[10] But some do. And we can look at the kind of dynamics that a bit of matter has to have to make a predictive science of its behavior possible.

Let's start with a toaster, and let's suppose that we are interested primarily in its gross, discernible macroscopic behavior. The toaster sits inactive when the lever is up. Depressing the lever lowers a chassis in which bread is placed and initiates a process in which electricity heats internal grills to a certain temperature for a fixed amount of time. When the process is done, the chassis returns to its normal position. There are simple laws for this behavior of toasters because a toaster has a (relatively) fixed internal structure that (moreover) makes only a small number of variables relevant to that behavior. The position of the lever and the knob to determine grill time matter, but not the presence of wind or the absence of noise. Small differences in input don't produce grossly different responses. It doesn't matter *exactly* how hard or fast you push the lever.[11] The internal wiring is hard, and designed to produce the

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equations and arises for closed systems as well as open ones. When dynamical equations are nonlinear, tiny differences in initial state can lead to radically different outcomes. That means that anything less than perfect precision in knowledge of the initial state can leave us with very great uncertainty (uncertainty spread all over phase space) about the final state. The sort of failure of unpredictability under discussion here has nothing to do with nonlinearity of dynamical equations. It has to do, rather, with the *openness* of the systems and their sensitivity to exogenous variables. It arises even if the dynamical equations are linear.

10. Philosophical usage often counts as a law only perfectly universal, fundamental generalizations. I am using the term loosely, to include defeasible, counterfactual supporting regularities of all kinds. So what we are looking for is a description of the gross behavior of a system (typically its movements) as a function of environmental impact. In the case of living organisms, these kinds of laws are often thought of in terms of its responses to stimuli.

11. Of course, this is all true only if we describe the toaster at a very coarse-grained level, and restrict the predicted behaviors. If we include temperature in "discernible behavior" and allow very fine discriminations, none of this would be true. The behavior would exhibit a high sensitivity to microscopic changes in its environment.

same response for the life of the toaster.[12] We don't need to know very much either about the environment, or what goes on inside a toaster to know how to expect it to behave, so long as it is operating normally.

Using this as a model, we can say that there are simple laws that allow us to express the behavior of an open system as a function of its environment wherever there exists a reduced variable subspace of the physics of the universe that makes only certain variables relevant to behaviors of interest, ~~fixing~~ the system's internal structure so that the impact of those variables is constant (over short time scales), and linear (or approximately so).[13] Toasters break down and wear out.[14] But breakdowns are infrequent, so we can ignore them at ~~some~~ cost in the exactness of the laws, and wearing out is a gradual, predictable change that can be incorporated into predictive laws.

Many systems, often of tremendous complexity, conform to this model. For example, in self-organizing systems like termite colonies or slime molds, even though these systems have an enormous number of microscopic parts and the interactions among those parts contain feedback loops that would make the physical equations for their conjoined behavior effectively unsolvable even if we knew the initial state of each of them, there is emergent behavior regular enough to permit a reduced set of variables in terms of which we can find simple, predictive laws for the configuration. These simple, predictive laws, moreover, can be discerned without a good understanding of the underlying physics.[15] There is no ~~monolithic~~ account of the dynamical underpinnings of systems that exhibit this structure. Scientifically, we've only begun to understand them. Although the open systems that exhibit this structure are the ones that tend to attract our scientific attention, it should be noted

12. What I mean by "hard" here is fixed, relative to a range of contexts. One way of making things hard, in this sense, is by making them rigid. But we can also make a connection between A and B hard relative to contexts C by having a lawlike regularity connecting A and B scaffolded by structure present in C. So, for example, the connection between the button on my garage opener and the garage is hard when the two are in spatial proximity and all of the background things that need to be in place for it to function properly are there.

13. There are three things to note: (1) the existence of such laws is relative to behaviors of interest (see fn.13), (2) in saying that the internal structure is fixed, we don't mean that it is static, but that it changes in ways that support a fixed relationship between input and output variables, and (3) simplicity has been left unanalyzed here. More can be said, but an intuitive conception of simplicity will do well enough for our purposes.

14. We do need to know how they work to fix them, or to explain their behavior when they start behaving anomalously.

15. This is not an exhaustive list.

that among all the open systems in the universe, they constitute a very small minority.

Living organisms ~~also~~ often exhibit this structure. Beginning with the macromolecules of DNA and RNA, we can trace step by step, as animal life moved from the simple ability to respond to frequently recurring environmental conditions to much more powerful mechanisms for producing behavior finely attuned to circumstance. Living systems have parts that are bound together in a relatively fixed configuration designed over ecological time to produce advantageous responses to stimuli.[16] The frog brain, for example, is a remarkably well-designed instrument for (among other things) getting frog bodies to respond in reliably predictable and adaptive ways to stimuli. The frog responds to the image of a passing fly with a flick of the tongue because that is what it has been designed to do.[17] There is a lot going on in the frog brain, but the activity is designed (in part) to produce regular macroscopic responses to a particular class of stimuli: to filter out the noise, ignore the differences between one flyspeck and another, and get the tongue where it needs to be. Because this is what the frog brain was designed to do, one frog will do the same as another, and the behavior is more or less constant over time. The same goes for mongooses, ~~and~~ mole rats, and three-toed sloths.[18]

Viewed as part of this progression, what is special about the human being is that in the human mind we see the development of a cognitive platform for the emergence of a new behavior management strategy involving deliberation and choice. Instead of passing through a set of internal filters designed to keep behavior covarying reliably with features of the local environment, the effect of the stimulus on behavior is mediated by a process that seems almost perversely geared to undermine any possibility of general laws of human behavior. Consider a mundane example of choice.

A mother walks into a shop to grab a coffee on her way home. She sees her young daughter, who is supposed to be at the library, talking to a boy that the mother doesn't trust. She retreats before being seen, and walks home ruminating about what to do. The incident makes her realize that her daughter is growing up, a time she has been preparing herself for psychologically,

16. I borrow the phrase "wiring and connections" from Peter Godfrey-Smith (2004).

17. Designed by natural selection or whatever hidden hand shaped the universe.

18. Responses to environmental stimuli can adapt, but adaptation in an individual frog happens slowly, and only with sustained pressure from the outside. Like the wearing out of the wiring of the toaster, it can typically be anticipated and incorporated into the laws.

but it seems too soon. She begins to think about her own life and her plans to have other children. A reconfiguration in her view of her daughter begins to occur. She wonders how much she doesn't know about her daughter, and feels instinctively that this is a delicate time in her daughter's life. By the time she is home, she has resolved to spend more time with her daughter and reaches for the phone to make dinner reservations at an old, favorite place.

The deliberative process is bringing into the causal chain between stimulus and response, here, a whole lot of stored information collected over a lifetime of personal experience. This includes beliefs not only about the world, but also about herself, her daughter, their place in the world, personal plans, memories, intentions, and commitments. If a fly's tongue snaps out unreflectively at a passing fly, the mature human adult runs his experience through a much more complex transformation that can—in the most reflective decisions—call up everything he is and has become. We are not Hamlets at every moment of our lives, but we have Hamlet moments. The result is that the choice-governed aspects of human behavior does not just depend on the immediate stimulus, but is open to influence from an in-principle unlimited number of sources, all stored in memory and encoded in the soft structure of the brain. As if that weren't bad enough, the bearing of this information on behavior is filtered through a quite complex set of higher-order principles for choice (goals, values, priorities, beliefs about who we are and who we want to be) that themselves vary from one person to the next and are constantly evolving. Where do these higher-order principles come from? They are the products of experience, in some sense, but they are forged under the hot fire of personal reflection. And reflection is one of those processes that has the hallmarks of unpredictability. It is holistic, self-feeding, and ongoing. Even if there were a deterministic equation that someone could write down that would describe it, the feedback would make the equation unsolvable within a few steps. So not only does choice make all of one's personal history potentially relevant to one's present behavior, it makes the bearing of personal history on behavior subject to second-order principles that are themselves highly variable both across the population and over the history of a single subject. And even if we held all of that fixed, very small differences in stimulus can produce huge differences in response. We are highly attuned to tones of voice, subtle cues we are scarcely conscious of (e.g., the something in the air that tips the balance between accepting and declining an invitation to speak in New Zealand). Small difference *makers* can lead to very large differences.

The effect of all of this is something that common sense knows, viz., that human behavior is highly individual and deeply unpredictable.

Responses to stimuli vary from one person to the next and over time in the history of a single person.[19] In a toaster, the structure that mediates input and output is "hard," ~~and~~ ordinarily changing slowly and in predictable ways. The structure that mediates stimulus and response in humans is "soft" and changes at lightning speed in ways that are directly relevant to its discernible behavior. The very processes that are designed to stabilize regular behaviors both across the population and over time in other animals are geared to produce variability and differentiation in the human being. All frogs flick their tongues at passing flies, birds flock, and bees dance. The *choice-governed behavior* of the individual human being, by contrast, is so highly sensitive to the specificities of personal history and belief, all encoded in the soft structure in the brain that, from an external perspective, choice effectively randomizes the effect of stimulus on response. There is no simple, general relationship between environmental stimulus and behavior. Whereas explanations of frog and fish behavior typically refer to the environmental stimulus and general laws of frog and fish behavior, explanations of human behavior typically appeal to accidents of individual history of which there are no traces in the stimulus and that can't be collected under general laws.[20] Laws seek to capture generalities, and human beings are all specificity.[21]

19. We are still physical systems, and so in principle if we knew the microphysical state of the world at some cross section of a person's back light cone and we knew the laws that govern the universe as a whole, we could predict their behavior. The same is true for any physical system. The point is that in the case of the human being (or any system whose macroscopic behavior is determined a mechanism that draws on a fund of information evolving as quickly and idiosyncratically as personal belief), nothing *less* will do.

20. Philip Kitcher's strategy is to break down the difference between science and humanities, to make the difference, as he puts it, one of degree rather than kind. That would make the humanities cousins of the sciences aiming for the same kind of understanding, employing the same kinds of methods, but with a less impressive history of success (though he tries to argue that this too is overstated). I think that he is right in much of what he says, and that the differences that I emphasize might be differences of degree rather than kind.

21. The line between humans and animal cognition is more complex than the contrast between frog tongue-flicking and human choice suggests. On one end of the spectrum, we see simple organisms exhibiting very regular responses to the environment. On the other, we see humans exhibiting highly irregular responses to the environment on the other. As we move from one end of this spectrum to the other, we see increasing complexity both in the character of the stimulus and in the subtlety of the response. Experts disagree on whether there is a hard line to be drawn anywhere along this spectrum. It remains true that choice has the effect of bringing into the chain between stimulus and response information encoded in memory, and so the more information is encoded in memory, and the more that information varies across the population and over time, and the more behavior is governed by choice, the less regular responses to the environment will be.

This is not to say that there aren't very useful algorithms for predicting how people will act. We rely on these algorithms every day of our lives. Their success depends on the fact that although we weren't designed simply to respond in predictable ways to impact from the environment, we *were* designed to be deliberators. If we want to understand systems whose behavior is governed by choice—i.e., to know what makes them tick, to guess how they will respond, to influence their behavior, and to interact with them effectively—we have to get good at *psychological* interpretation. We have to become skilled at understanding what other people believe and desire and feel. We need to understand one another, not in the way that we understand toasters and electrons, but as *persons*, i.e., as subject of experience and emotion, as believers and agents. Anybody that can operate in the social world has rudimentary skill at psychological interpretation, but really learning to see things through other people's eyes, to understand what they are thinking and feeling, what they hope and fear and value, having a rich sense of the complex inner world of another human being in all of its emotional and psychological complexity, ~~that~~ is a kind of understanding that can be fostered and developed by an education in the humanities. Someone who has grown up reading novels will learn to understand the ~~complex~~ hidden ~~internal world~~ that goes on inside another human being. Someone who has studied history will have an appreciation for the complex currents of culture that govern the unfolding of civilizations. Each of the fields traditionally classified a~~s~~ humanities makes a distinctive contribution to this kind of understanding.

Reasons and explanations aren't *just* about prediction. They will also make a contribution to a richer kind of understanding, a kind of understanding that is not just a matter of being able to *predict* how other persons will behave, but being able to see things through their eyes, being fair and generous and empathetic. It enriches our understanding of the world by helping us understand people in the terms in which they understand themselves. That is something that we need to be able to do if we are relate to them not as material systems, but as subjects of experience and sources of agency. For we are social animals: partners, friends, coworkers, mothers, and teachers. The better we are at understanding one another in the way that we each understand ourselves, the better we will be in these capacities. These types of human understanding are not something that one can get from knowledge of physical law. Explanations that invoke reasons teach us how to interact with people *as rational agents* and seekers of value, to affect their behavior by persuasion rather than by trying to control them causally. They teach us to address the rational standpoint and

offer reasons for them to act as we want them to act, so that our effect on their behavior is mediated by their own deliberative processes.[22] They guide in seeing things through other people's eyes and being able to construct a narrative that is fair to all viewpoints. ~~Understanding~~ in human affairs requires that kind of understanding. Science is not, and never will be, a substitute for that kind of understanding.

9.4. Science Is about Description; the Humanities Are (Partly) about Guidance

Of course that is only half of the story. What was said above was looking at the processes that mediate stimulus and response in a human being from a third-person standpoint. When we turn from a third-person to a first-person perspective, something else emerges that makes the indispensability of the humanities ~~that much~~ more manifest. Again, it has to do with choice, but this time it concerns the special status that choices have *for the person making them*. To other people's lives, we are observers. We watch them make choices, try to gauge what they are thinking, guess how they feel, what they care about, and why they act the way they do. But we are not mere observers of our own lives. We *live* our own lives and we *make up* our own minds about what to think, and how to act. We bear a special relationship to our own thoughts and experiences that makes it impossible to take a purely detached attitude toward them. There is no way of abdicating our active participation in the making of our choices. From the mundane to the momentous (i.e., whether deciding which socks to wear or whom to marry), the universe will not make those choices on our behalf.[23] The inescapability of choice is our situation in nature. And to be a chooser is to have a special kind of creative role in the production of our lives.

It is worth noticing how little of our own lives, for many of us, is dictated by the practicalities of survival. People need to eat and sleep to survive. In the state of nature, that meant that our daily lives were organized around the necessities of obtaining food, caring for our young, and maintaining shelter in terms largely dictated by our situation. One made a shelter with available

22. The contrast is with manipulation or coercion. Manipulation tries to control the output of the decision process by controlling the input. Coercion tries to bypass the decision process entirely by using physical force to move the body to move directly.

23. We can *choose* to be passive, but choosing to be passive is a way of choosing.

materials, and ate what one could get one's hands on. The structure and content of daily life were not, to a very great extent, a matter of choice. Things are vastly different nowadays. The landscape of opportunities that the world presents is radically expanded. There are countless ways to make a living, and countless ways of maintaining house and home. You get to choose how to make a living, where to live, and whether to have children. And that is to say nothing of what to eat, what to wear, what music to listen to, what newspaper to read, and what to watch on TV. The choices we make are ultimately choices about who we are and who we want to be. Our identities as persons and agents is constituted by them. They give shape and definition to our lives in the way that the hammering of the sculptor gives shape and definition to the unformed stone, transforming an indefinite multitude of potential shapes into a single actuality.

It is in equipping us with tools to address the very personal questions—"What should I do? How should I live?"—that I see the humanities as making an indispensable contribution. A humanities education can, among other things, open up the imagination to the rich array of possibilities of what to be. The bookish child of a farmer who reads *Jude the Obscure* for the first time can see a world open up that he hadn't known. Books—by showing us examples of successful and failed lives—help us decide which of them are worth wanting. What I learned from Plato, Aeschylus, Dante, Goethe, Tolstoy, Joyce, Elliot, and Mann played a very personal role in making me who I am. Once you see all of that—i.e., once you see your role in creating history, rather than being a passive observer—you see that the humanities are not a recherché pursuit undertaken in leisure from which people with highbrow tastes draw enjoyment. They help us decide what to make of our lives. They are *the tools of our becoming*.

It is sometimes said that if our scientific knowledge were good enough, at least in a deterministic world, we would be able to predict what we will do and we could just sit back and let it happen. One expression of the threat is embodied in the scientific challenge to free will.[24] The thought seems to be that a completed scientific understanding of the world will push forward the boundaries of prediction, leaving no room for choice. But that there is something wrong with this line of thought should be clear from the observation that without your activity, there would be nothing to predict. Our choices don't get made *unless we make them* (see Ismael 2016). Learning physics is not

24. This is explicit in Rosenberg (2011), for example.

going to relieve you (in practice or in theory) of the burden of making choices. And it is not going to relieve you (in practice or in theory) of the burden of running your life, or making yourself into what you will be. Understanding our*selves* will always be an art as much as a science because it involves a form of creation.

9.5. Deciding What to Think and How to Feel

When R. W. Hepburn remarked that "One may look upon the "material" of one's life . . . rather as an artist regards his canvas and paint or a sculptor his stone" (Hepburn and Murdoch 1956, 14–58), he meant to be both calling attention to the creative role that we play in making our lives what they are, and observing that within the bounds of the given facts of our lives, there is a great deal of discretionary leeway in how we *understand* our lives. We each have to sift through the raw materials of our own experience and cull from them an understanding of what has happened to us and who we are. And this observation extends beyond our narrow understanding of our own lives to our understanding of the people around us and the world quite generally. We are always deciding what to think and how to feel about things. This is not a passive matter of simply opening our eyes, but a complex interpretive task that requires imagination and discernment. It requires imagination because it requires to us to be able to see the interpretive possibilities. The exercise of the interpretive imagination is something at which art, history, literature, and autobiography all excel. The right portrait can make the seedy seem romantic, the innocent seem menacing, and the sublime seem ridiculous. It can exalt the debased and deflate the exalted. Tom Waits's descriptions of waitresses in cheap diners, Knut Hamsun's scathing portraits of intellectuals, Toulouse Lautrec's romantic visions of Paris brothels, and Degas's gorgeous portraits of the ballet have a revelatory character, making us see their objects differently. Interpretation isn't a matter of getting a complete or detached view of things. It doesn't strive for the kind of forensic accuracy that is prized in scientific representation. It is a matter of selecting and suppressing, foregrounding and enhancing.[25] It is designed to bring out one particular pattern, suggest an evaluation, and often to encourage us to feel a certain way. New ways of seeing can

25. Science is also very interested capturing patterns, but it tends to be interested in patterns that reveal regularity. It is interested in laws, and in induction, so it tries to isolate the shared and generalizable elements in nature.

transform how we experience the world, making us see familiar objects in a novel way and discover value where we hadn't seen it before.[26]

It demands discernment, because entertaining interpretive possibilities is only part of the task. We also have to decide what to think. When we have a fight with a spouse or feel affronted by an interaction with a colleague, we need to sort through what actually happened in our minds and arrive at some interpretation. In doing that, we are not trying to settle the simple narration of events (what he said, what I said, and in what order); we are trying to understand what happened in an evaluatively rich sense. We are trying to understand whether we have been wronged or are in the wrong, whether we should be hurt or apologetic, or whether we should be insulted or indifferent. On one interpretation of the fight with the spouse, I came home after a very difficult day, he attacked me for no reason, I responded defensively, and instead of staying and sorting it out, he left the house, leaving me alone hurting and bewildered. On another interpretation, I walked in the door that night already wounded and needy. When he made a careless remark, I lashed out violently, and he left the house only to keep from angering me further. Getting this right matters in obvious ways, and it is not a simple task. It demands a disciplined and willful effort to see things from other people's point of view, an unwillingness to acquiesce in self-serving interpretations, and the resolve to be fair and honest in our assessment. We portray others in a manner that is flattering to ourselves, and often misdiagnose the sources of our emotions. Iris Murdoch has done more, perhaps, than anyone to describe the moral rigors of what I've called "getting it right." Her most famous example concerns a mother-in-law who undergoes a transformation in her view of her daughter-in-law, and it is worth quoting in full.

> A mother, whom I shall call M, feels hostility to her daughter-in-law, whom I shall call D. M finds D quite a good-hearted girl, but while not exactly common yet certainly unpolished and lacking in dignity and refinement. D is inclined to be pert and familiar, insufficiently ceremonious, brusque, sometimes positively rude, always tiresomely juvenile. M does not like D's accent or the way D dresses. M feels that her son

26. It is tempting to say that interpretation is about evaluation rather than fact, but this is to suppose a separation between fact and evaluation that is not psychologically faithful. The most basic descriptive terms that we use to represent a situation—'seedy' vs. 'romantic', 'innocent' vs. 'menacing', 'sublime' vs. 'ridiculous'—don't have a clearly identifiable, shared factual core.

> has married beneath him. Let us assume for purposes of the example that the mother, who is a very "correct" person, behaves beautifully to the girl throughout, not allowing her real opinion to appear in any way. . . . [T]ime passes, and it could be that M settles down with a hardened sense of grievance and a fixed picture of D, imprisoned . . . by the cliché: my poor son has married a silly vulgar girl. However, the M of the example is an intelligent and well-intentioned person, capable of self-criticism, capable of giving careful and just attention to an object which confronts her. M tells herself: "I am old-fashioned and conventional. I may be prejudiced and narrow-minded. I may be snobbish. I am certainly jealous. Let me look again." Here I assume that M observes D or at least reflects deliberately about D, until gradually her vision of D alters . . . . D is discovered to be not vulgar but refreshingly simple, not undignified but spontaneous, not noisy but gay, not tiresomely juvenile but delightfully youthful, and so on. (Murdoch 1970, 16–17)

We are made to understand from Murdoch's discussion that the altered interpretation of D comes closer to getting it right, and that getting it right is an epistemic matter, though not one that is simply a matter of looking. I think that we all understand what she is pointing to here. We have to interpret people and events all the time, and suffer the interpretations of others. Sometimes (as M's case) getting things right is a matter of being kinder and gentler in our vision of others, but sometimes it is a matter of seeing them under the cold, harsh light of sober assessment. It is not easy to recognize that your lover is an overconfident bore, or that your child is a cruel bully.

Getting things right doesn't come easily. It brings with it a kind of truth and rigor that are quite different from the sort that one finds in the sciences. Murdoch said that it consists of "a refined and honest perception of what is really the case, a patient and just discernment and exploration of what confronts one, which is the result not simply of opening one's eyes but of a certain and perfectly familiar kind of moral discipline" (Murdoch 1999, 330). Humanistic disciplines—literature, history, and art, most obviously, but also philosophy, anthropology, and languages—engage the interpretive muscles. In so doing, they help us see more deeply into ourselves and others, and cultivate the kind of understanding that helps us get it right in our own lives. There is no monolithic account of what the humanities are and what they do. These are just a couple of examples of the myriad complex ways in which the humanities help us make sense of ourselves and the world in which we live.

One of the complaints or frustrations that people who gravitate to science or math sometimes make about the humanities is the squishiness of the subject matter. They complain that everything is qualitative, impressionistic, and a matter of discretion or judgment. They say that there is no proof, no certainty, and no truth. It is correct that there is no proof and no certainty, but that does not mean that there is no truth. The kind of truth ~~they~~ strive for is softer than the kind of truth we have in math or in the sciences. One has to get comfortable with ambiguity and squishiness and the lack of full resolution—i.e., with interpretation rather than calculation—to operate in that environment. But it resembles in that respect the messy world of human affairs. Not everybody needs to be a writer, artist, or historian to make some knowledge of literature, art, and history valuable. Reading Dostoyevsky, Thomas Mann, Milton, Joyce, Herodotus, Omar Khayyam, Plato, and Charlemagne teaches ~~us all kinds of~~ things that will enhance our perception and enrich our experience of the world. It will deepen our understanding of ourselves and other people, ~~teach~~ us how to live, how to love, and how to feel. That is enough to make it a valued part of ~~the academy~~.

The upshot of all of this is that sciences and humanities don't compete or conflict. They are entirely complementary, answering to different needs. The humanities provide a type of ~~understanding~~ that is both essential to human living and not readily attainable from science. The everyday notion of understanding makes room for both. Of course, that leaves open the vexed question about what universities are for. That is a question that we need to address as a culture. We do need to prepare a workforce and produce researchers who will help us cure cancer and save the earth. But education does not have to be *just* about that. It can also be about helping us make better choices, getting us to care about the right things, and opening up the imagination to new ways of thinking and being. The academy should be a place where all of these things can happen. If we ask ourselves what we would like to pass on to our children, I think that many of us would say that, alongside hoping that they learn a trade or a job that will support them, we hope that they learn how to be imaginative and resourceful and fair, that they become the kind of human beings that know how to love and that approach other people with subtlety, perceptiveness, and understanding. These are valuable qualities within the workplace and without.

9.6. Conclusion

It has taken time for science to mature so that we can see the importance of the humanities as emerging from within the scientific conception of the human

being. If there was a time when the sciences and the humanities seemed to offer competing visions of the human being, that time is past. It is now possible to say on scientific grounds what is wrong with the idea that the sciences will ever replace (or displace) the humanities. The structure of human knowledge is complex, but it forms a single fabric, in which the humanities have their place alongside the sciences, and which every part makes a contribution to understanding of ourselves and our place in the universe.

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References

Godfrey-Smith, Peter. 2004. "On Folk Psychology and Mental Representation." In *Representation in Mind: New Approaches to Mental Representation.* Ed. Hugh Clapin, Phillip Staines, and Peter Slezak. Amsterdam: Elsevier. 147–62.

Hepburn, Ronald W., and Iris Murdoch. 1956. "Vision and Choice in Morality." *Proceedings of the Aristotelian Society, Supplementary Volumes* 30: 14–58.

Ismael, Jenann. 2016. *How Physics Makes Us Free*. New York: Oxford University Press.

Kitcher, Philip. 2012. "The Trouble with Scientism." *New Republic*, 24 May. http://www.newrepublic.com/article/books-and-arts/magazine/103086/scientism-humanities-knowledge-theory-everything-arts-science.

Murdoch, Iris. 1970. *The Sovereignty of Good*. New York: Routledge.

———. 1999. *Existentialists and Mystics: Writings on Philosophy and Literature*. New York: Penguin.

Nussbaum, Martha. 2010. *Not for Profit: Why Democracy Needs the Humanities*. Princeton, NJ: Princeton University Press.

Rand, Ayn. 1999. *Why Businessmen Need Philosophy*. New York: Ayn Rand Institute.

Rosenberg, Alex. 2011. *Atheist's Guide to Reality*. New York: Norton.

Zakaria, Fareed. 2015. "Why America's Obsession with STEM Education Is Dangerous." *Washington Post*, 26 March. https://www.washingtonpost.com/opinions/why-stem-wont-make-us-successful/2015/03/26/5f4604f2-d2a5-11e4-ab77-9646eea6a4c7_story.html.