A Critical Assessment of Dewey's Attack On Dualism

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ABSTRACT: This paper examines John Dewey's critique of idealism in *The Quest for Certainty* (1929) and other works and argues that his case was overstated and pedagogically misleading. While dualism has often been regarded primarily as a metaphysical doctrine, its positive value historically has been as a heuristic device, a mode of intellectual scaffolding that reifies thought itself and makes possible instruction in logic, reflective thought, and formal argumentation. A more sympathetic reading of the history looks at classical philosophers and their modern counterparts as workers who contributed to the world rather than hid from it in a realm of idealized perfection. The consequences for education of Dewey's attack on idealism are also examined.

RESUME: Ce papier analyse le regard de John Dewey sur l'idéalisme dans *La Recherche de la Vérité (1929)* ainsi que d'autres travaux et débats mettant en lumière l'exagération de son jugement et son aspect pédagogique fallacieux. Alors que le dualisme fut souvent considéré, à l'origine, comme une doctrine métaphysique, sa réelle valeur historique fut utilisée comme un outil heuristique, un mode d'échafaudage intellectuel qui idéalisait la pensée elle-même et permettait l'enseignement de la logique, de la synthèse et de la dialectique fondée. Une lecture moins rigide de l'histoire, permet d'apprécier les philosophes classiques et modernes comme des travailleurs qui ont participé à l'élaboration du monde plutôt que des travailleurs qui se sont enfermés dans un royaume de perfection idéalisé. Les conséquences de la

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diatribe de Dewey sur l'idéalisme dans le domaine de l'éducation, sont aussi disséquées

> We are so accustomed to the separation of knowledge from doing and making that we fail to recognize how it controls our conceptions of mind, of consciousness and of reflective inquiry. (John Dewey, *The Quest for Certainty*, 1929, p. 22)

Dewey nearly got it right when he criticized abstract realms of learning as disconnected from life, and alluded to their elitist origins. The world, of course, is not divided into two separate realms, but is one realm in which behavior and thought are integral. Dewey's crusade to rejoin thought to action deserves credit for a host of practical benefits and philosophical corrections, but beneath the surface of this project there lurked some troublesome assertions and consequences. As education continues to shed its attachments to abstract formal thought in favor of a more practical orientation, a pattern of collateral damage has emerged. In this paper we will consider how an orientation like the one Dewey developed may have contributed to this melancholy trend.

In Dewey's account of classical Greek philosophy, dualism reflected the manner in which the world of work had been constituted in a society divided between those who labored with their hands and those who had the luxury of engaging in purely intellectual activity. This social division was reified as a metaphysical doctrine, according to Dewey, a world view in which thought is separate from action. In the *Republic*, Plato develops the metaphysical doctrine but also the political doctrine Dewey believes follows inevitably from it, a prescription for a rigid, hierarchical meritocracy in which abstract thought becomes one of the mechanisms of hegemonic control. Once reified as a world view, these effects loop back upon the original situation. The metaphysical doctrine situates ideas in a separate ephemeral realm that only a few can enter, and those few are seen in Plato's political scheme as the natural leadership class, hence reinforcing the original social class division. Idealism, which derives from and contributes to dualism, is a social and epistemological evil.

In addition to its social origins, Idealism arises in the Greek fascination with abstract geometry, where the lived reality of social dualism finds its apparent counterpart (and sanction) in the structure of reality itself.

Dewey's argument unfolds something like this:

(1) Idealism originates with the Greeks, especially Plato;
(2) Mathematics gave the clue to the possibility of immortal, immutable truths;
(3) Idealism is implicated in a quest for certainty outside of this world;
(4) Idealism separates mind from body, knowing from doing;
(5) Idealism thus leads to dualism;
(6) Only those who have leisure can engage in thought separate from labor;
(7) Those who engage in thought are therefore parasitic on those engaged in labor;
(8) Abstract thought fails to contribute much to those engaged in practical labor;
(9) Idealism divides the world; it sustains hierarchy;
(10) Idealism is therefore inherently undemocratic;
(11) Thought is not a separate activity, but the accumulated changes in behavior brought about by the consequences of prior actions;
(12) Philosophers established Idealism as an escape from reality, a quest for certainty;
(13) Certainty and knowledge can only derive reliably from empirical inquiry;
(14) Logical forms originate in operations of inquiry; logic is empirical;
(15) Rejoining thought and practice is necessary if we want genuine knowledge;
(16) Rejoining thought to practice is more democratic than any of the various Idealisms;
(17) Scientific inquiry embodies the integration of thought and practice;
(18) Science *is* the method of intelligence;

(19) Truth is a function of existential reality; there is no other realm in which to seek it.

Taking each of these points separately, we can sift through some of Dewey's major writings and see how they recur, evolve, and bear fruit as his philosophy matures. This is not the place for an exhaustive treatment, but a few representative passages with critical commentary will help to establish the thrust of Dewey's argument and raise appropriate questions along the way

Idealism Originates with the Greeks, Especially Plato

Dualism is the division of the world into two realms, one spiritual/ideational/intellectual, the other physical. Dewey regards dualism as the supreme evil in the world, the metaphysical and political mechanism of social class division that bars humankind from entering into genuinely democratic relationships. He attributes dualism to social class divisions that arose initially in Assyria, Egypt, and Mesopotamia, and were picked up by the Greeks (Dewey, 1938, pp. 72-73). What began as a socio-political divide was then converted to a metaphysical doctrine by Greek intellectuals:

> The definitely socio-practical division between workers and non-citizens who were servile, and the members of the leisure class who were free citizens, was converted by philosophic formulation into a division between practice and theory, experience and reason. Strictly scientific-philosophic knowledge and activity were finally conceived to be supra-social as well as supra-empirical. They connected those who pursued them to the divine and cut them off from their fellows."(Dewey, 1938, p. 73)

This bifurcation of the world, politically and epistemologically, is so deeply embedded in the western consciousness it continues time and again to generate new versions of Idealism, according to Ratner (1939, p. 17).

Dewey is clearly onto something here. The process he outlines seems reasonable, but it also seems likely that dualism occurred in some form to people from the earliest of times, given the prevalence of religious devotions in evidence as far back as 40,000 years ago. Social class division may contribute to and reinforce dualism, but its source may lie as easily in the structure of human psychology, the structure of knowledge, or in the structure

of the world itself. Dewey knew this. His emphasis on the social genesis of dualism is strategic.

Mathematics Gave the Clue to the Possibility of Immortal, Immutable Truths

> The geometry of Euclid doubtless gave clew to logic as the instrument of translation of what was sound in opinion into the forms of rational discourse. Geometry seemed to reveal the possibility of a science which owed nothing to observation and sense beyond mere exemplification in figures or diagrams. It seemed to disclose a world of ideal (or non-sensible) forms which were connected with one another by eternal and necessary relations which reason alone could trace. This discovery was generalized by philosophy into the doctrine of a realm of fixed Being which, when grasped by thought, formed a complete system of immutable and necessary truth. (Dewey, 1929, p. 16)

We see that generalizing take place in Plato's *Republic*, both in his comments about the disciplinary effects of mathematics and in the famous Divided Line analogy. Plato makes a preemptive leap when he reifies ideas. Propositions in geometry could by then be proven, raising the possibility that they were inherently necessary truths. They were, in a sense, immortal and immutable. We cannot, today, recreate that original cultural moment of realizing the profound implications of these inevitable truths, but it is not difficult to see how Plato and before him the Pythagoreans came to believe that they had in fact discovered the ontological substructure of the universe, especially given the glimpses they had of the harmonic nature of the physical world, in music, for example. The assumption that the world is a mathematical construct remains to this day the underlying assumption of science.

If mathematical truths exist, where do they exist? In the mind? That would mean that they were dependent upon human agency for their existence. But as necessary truths they are eternal. They have to exist "out there," somehow. Plato solved this problem by positing his famous "Realm of Forms." It is at the very least an ingenious fiction. We will argue that, whether ontologically defensible or not, it is a powerful (and perhaps

crucial) heuristic in the treatment of ideas in education. Simply put, it makes ideas real for the learner.

Idealism is Implicated in a Quest for Certainty Outside of this World

> Man who lives in a world of hazards is compelled to seek for security. He has sought to attain it in two ways. One of them began with an attempt to propitiate the powers which environ him and determine his destiny. It expressed itself in supplication, sacrifice, ceremonial rite and magical cult. In time these crude methods were largely displaced [ie. internalized as prayer, contrition of heart, etc.].
>
> The other course was to invent arts and by their means turn the powers of nature to account; man constructs a fortress ... builds shelters, weaves garments, makes flame his friend ... and grows into the complicated arts of associated living. (Dewey, 1929, p 3)

As a strategy, *thinking* held out the alluring promise to provide absolute certainty, while practical labor has always been provisional and unpredictable:

> Hence men have longed to find a realm in which there is an activity which is not overt and which has no external consequences. 'Safety first' has played a large role in effecting a preference for knowing over doing and making. With those to whom the process of pure thinking is congenial and who have the leisure and the aptitude to pursue their preference, the happiness attending knowing is unalloyed; it is not entangled in the risks which overt action cannot escape. (Dewey, 1929, p 7)

This is not so much philosophy as it is mass psychoanalysis. It also ignores the very real risks that thinking does, in fact, entail when it moves into the uncharted territory of the mind, such as confusion, depression, paranoia, disillusionment, disorientation, insanity, and so on, all very real liabilities for the life of the mind. Dewey concludes,

> The quest for certainty is a quest for a peace which is assured, an object which is unqualified by risk and the shadow of fear which action casts .... Quest for complete certainty can be fulfilled in pure knowing alone. Such is the verdict of our most enduring philosophic tradition. (Dewey, 1929, p. 8)

While it began with the creation of religions, Dewey says that philosophy then took over this role, and in so doing reflected its basic substance:

> The change from religion to philosophy was so great in form that their identity as to content is easily lost from view. The form ceases to be that of the story told in imaginative and emotional style, and becomes that of rational discourse observing the canons of logic.
>
> But when [passages from Aristotle's *Metaphysics*] are placed in the context they had in Aristotle's own mind, it is clear that the comprehensiveness and universality of first philosophy are not of a strictly analytic sort. They mark a distinction with respect to grade of value and title to reverence. For he explicitly identifies his first philosophy – or metaphysics – with theology; he says it is higher than other sciences. For these deal with generation and production, while its subject-matter permits of demonstrative, that is necessary, truth; and its objects are divine and such as are meet for God to occupy himself with. (Dewey, 1929, pp. 14-15)

Dewey goes on to describe the essentially destructive task philosophy had to perform, of tearing down the old theological stories based as they were on emotional accounts calibrated to secure the loyalty of the masses to social institutions in order to swap in a philosophical equivalent:

> The negative work of philosophy was then to strip away these imaginative accretions. From the standpoint of popular belief this was its chief work, and it was a destructive one. The masses only felt that their religion was attacked. But the enduring contribution was positive. The belief that the divine encompasses the world was detached from its mythical context and made the basis of philosophy, and it became also the foundation of physical science – as is suggested by the remark that the heavenly bodies are gods. Telling the story of the universe in the form of rational discourse instead of emotionalized imagination signified the discovery of logic as a rational science. Conformity on the part of supreme reality to the requirements of logic conferred upon its constitutive objects necessary and immutable characteristics. Pure contemplation of these forms was man's highest and most divine bliss, a communion with unchangeable truth. (Dewey, 1929, pp. 14-15)

Idealism Separates Mind From Body, Knowing From Doing

> The depreciation of action, of doing and making, has been cultivated by philosophers. But while philosophers have perpetuated the derogation by formulating and justifying it, they did not originate it. They glorified their own office without doubt in placing theory so much above practice. But independently of their attitude, many things conspired to the same effect. Work has been onerous, toilsome, associated with a primeval curse. It has been done under compulsion and the pressure of necessity, while intellectual activity is associated with leisure. On account of the unpleasantness of practical activity, as much of it as possible has been put upon slaves and serfs. Thus the social dishonor in which this class was held was extended to the work they do. There is also the agelong association of knowing and thinking with immaterial and spiritual principles, and of the arts, of all practical activity in doing and making, with matter. For work is done with the body, by means of mechanical appliances and is directed upon material things. The disrepute which has attended the thought of material things in comparison with immaterial thought has been transferred to everything associated with practice. (Dewey, 1929, pp. 4-5)

There is some truth to this. Education has often reflected this split between doing and thinking, neither using cultivated intelligence to inform practical work, nor directing the course of abstract learning in a way that would retain the essential beauty and intellectual empowerment it should have.

> Thus we reach the ordinary notion of education: the notion which ignores its social necessity and its identity with all human association that affects conscious life, and which identifies it with imparting information about remote matters and the conveying of learning through verbal signs: the acquisition of literacy. (Dewey, 1916, pp. 8-9)

Literacy constitutes a mode of abstraction in which thoughts are represented by symbols, and the symbols when manipulated are then able to constitute new arrangements and combinations of thought not necessarily corresponding to conditions in the existential world. The connection is easily lost sight of, and in this passage Dewey has characterized the result, a mere moving about of the symbols without attendant advances in the capacity

for thoughtful action, and without the necessary eventual effect that it should have on human life.

Idealism Thus Leads to Dualism

The belief that ideas constitute a distinct and separate realm, a realm of pure Being, altered both individual consciousness and social institutions. Dewey believed it wrecked havoc on education by encouraging a pedagogy that was overly abstract, theoretical, and bookish.

> Isolation of subject matter from a social context is the chief obstruction in current practice to securing a general training of mind. Literature, art, religion, when thus dissociated, are just as narrowing as the technical things which the professional upholders of general education strenuously oppose. (Dewey, 1916, p. 67)

This passage follows on the heels of a critique of the notion that intellectual discipline could be imparted by immersion in purely symbolic exercises cut off from the real world problems and situations those disciplines refer to.

There is a reverse side to this problem. While dissociated abstraction may indeed be pointless, it is equally true that education serves no purpose if it simply familiarizes us with common sense and common everyday problematics. For the sake of argument, we would like to suggest that schools are not natural settings, and that education is an artificial process, specifically aimed at immersing us in abstract, symbol based, manmade cultural systems. Its purpose is to discipline cognitive activity and harness that activity to those communally determined cultural systems. Dewey's educational recommendations were on target for the time in which he was writing because education at that time suffered from an overly bookish, poorly understood, and improperly conducted mode of pedagogy, and because schooling had in fact been bent to the social engineering protocols of a meritocratic corporate industrial order in which most citizens were viewed as prospective laborers on the nation's assembly lines. Thus, both the practical education of most students, cut off as it was from advanced intellectual culture, and the advanced cultural education of the few, were but partial experiences structured to exacerbate social class divisions. In that context,

Dewey's analysis and recommendations were ingenious. But in time they have amounted to an over-correction of sorts.

> Going to the heart of the matter, the fundamental fallacy of the theory [of formal discipline] is its dualism; that is to say, its separation of activities and capacities from subject matter. There is no such thing as an ability to see or hear or remember in general; there is only the ability to see or hear or remember *something*. (Dewey, 1916, p. 65)

By 1916 faculty psychology was already in retreat as a theory of learning, and all along it had been somewhat a straw man. There were deeper, more respectable theories available to guide liberal education, and to host the conversation over the value of mastering languages, mathematics, science, art, and so forth.

Only Those Who Have Leisure Can Engage in Thought Separate From Labor

Dewey was critical of Greek intellectuals (and later their European counterparts) who could afford to engage in sustained intellectual discourse while other human beings labored as slaves and artisans. The claim that thinking is distinct from labor is arbitrary. In point of fact, thinking is a form of labor, though one moves neurotransmitters instead of stones and timbers in the process. Of course, thinking as an activity can be wasteful and useless, just as physical labor can be. It depends upon the ends to which it is directed and the skill with which it is conducted.

Dewey wants to demonize intellectuals as exploiters of labor, but this argument is suspect as too convenient to the rest of the case he is trying to build. Furthermore, if intellectual endeavor was merely the showy privilege of the exploiting classes, we should expect to find it most prevalent among the oligarchy and tyrants, but most philosophers were of middle class status at best, and all of them contrary to Dewey's assertion were engaged in meaningful work.

It is true that sustained, deliberate, abstract reflection and the disciplinary investment it took to accumulate the mental training that makes these things possible could not have been achieved by most people whose lives were absorbed in slavery, hard labor, or the struggle for survival. In a kind of compensatory stigmatization, Dewey manages to twist this point into the claim

that purely intellectual pursuits are merely the emblem of idleness and exploitation. Naturally, if this is true, ordinary working people would have no interest in such pursuits. Ordinary people are greeted from every side with encouragement to forego purely cultural studies as not relevant to their condition in life. To some extent, Dewey encourages this view, as he argues for repackaging of education along more practical, common sense lines more systematically grounded in the existential conditions of our material environment. We are not so certain that this is a wise thing to do.

There are several disturbing dimensions to Dewey's attack on abstraction. There is a hint of anti-intellectualism implicit in the contempt for abstract thought, but consider also the implication that perhaps ordinary people, working class people, would have no personal or cultural stake or interest in participating in the kinds of cognitive exercises characterized by abstract thought and learning. One wonders if perhaps Dewey considered ordinary people incapable of making the stretch, and sought to discredit abstract learning as a means of getting an insurmountable challenge out of the picture. If so, this would hint at a bit of patrician maneuvering on his part, a pattern of paternalism that is not entirely unknown among the vanguard of social democratic thinking as they arrange the world for the benefit of the masses. It says, in effect, "We will protect ordinary people from cultural activities that are too difficult for them to master." But suppose those activities are part of the necessary preparation for full citizenship and participation in a society based on scientific culture? Then the only route to equality left is universal disenfranchisement.

Dewey seems unwilling or unable to credit philosophy with endowing humankind with a positive strategy for elevating not the status of thought but its visibility and rigor. We can well ask, How could thought have become a topic of discussion and study unless it was reified in conversation and viewed as having some sort of objective ontological status? To say, as Dewey does, that the ancients should have focused thought on actual problems instead of hiding it away in an artificial realm of ideas is to ignore the fact that, presumably, most people did not participate in that Platonic mindscape, and *did* in fact focus whatever

cognitive abilities they had on the problems they were facing in the world. Was it an effective strategy for them? In spite of this practical, Deweyan engagement in the real world by the vast majority of people, the method of intelligence for most was haphazard and ineffectual at best. That is why education confers advantages.

Those Who Engage in Thought are Therefore Parasitic on Those Engaged in Labor

This claim is seen often in Dewey's work. A good representative passage can be found in *Democracy and Education*:

> Of the segregation of educational values [discussed in an earlier chapter], that between culture and utility is probably the most fundamental. While the distinction is often thought to be intrinsic and absolute, it is really historical and social. It originated, so far as conscious formulation is concerned, in Greece, and was based upon the fact that the truly human life was lived only by a few who subsisted upon the results of the labor of others. This fact affected the psychological doctrine of the relation of intelligence and desire, theory and practice. It was embodied in a political theory of a permanent division of human beings into those capable of a life of reason and hence having their own ends, and those capable only of desire and work, and needing to have their ends provided by others. The two distinctions, psychological and political, translated into educational terms, effected a division between a liberal education, having to do with the self-sufficing life of leisure devoted to knowing for its own sake, and a useful, practical training for mechanical occupations, devoid of intellectual and aesthetic content .... The problem of education in a democratic society is to do away with the dualism and to construct a course of studies which makes thought a guide of free practice for all and which makes leisure a reward of accepting responsibility for service, rather than a state of exemption from it. (Dewey, 1916, pp 260-261)

While Dewey castigates the Greeks as the originators of dualism, promoters of social class division, and idealists, the possibility remains that the original formulation for abstract cultural studies by Plato and others was educationally sound, and that instead of dismantling it our goal should be to democratize it. Dewey helped to set the trend in education for converting all

learning to situation based, concrete, practical exercises when perhaps the goal should have been to help as many citizens as possible experience those extraordinary and enriching engagements of the mind through advanced cultural systems that were for so long the prerogative of the fortunate few.

Abstract Thought Fails to Contribute Much to Those Engaged in Practical Labor

> The paths of communication between common sense and science are as yet largely one-way lanes. Science takes its departure from common sense, but the return road into common sense is devious and blocked by existing social conditions. (Dewey, 1938, p 77)

True, science takes its departure from common sense, but it has already departed by the time it becomes science. Cromer (1993), in his book entitled *Uncommon Sense*, and others have made this case in compelling fashion in the late 20th century. Science entails a deeper commitment to the studied use of abstraction than Dewey wanted to believe. Dewey simply did not appreciate fully the role idealization and abstraction play in science. Yet they are in effect a cultural (as opposed to a metaphysical) form of idealism.

Though he criticizes the philosophers of ancient Greece he indirectly acknowledges the positive effects of their mental labors: "If Greece, with a scant tithe of our material resources, achieved a worthy and noble intellectual and artistic career, it is because Greece operated for social ends such resources as it had" (Dewey, 1916, p. 37). Yet it was not merely the allocation of resources for cultural purposes that accomplished this. It was also the fact that artists, writers, playwrights, architects, educators, philosophers, and others shared a general social ethos of service to and engagement in the life of the community (Jaeger, 1967, vol. 1). That philosophers also took this engagement seriously places some doubt on the assertion that philosophy was merely an escape from the world.

Aside from a few concessions like this one, the disturbing tendency is for Dewey to see intellectuals as hopelessly disengaged from the real work of humankind. How is it, then, that in the few centuries in which intellectuals have been able to

pursue their adventures in abstract thought, the whole modern edifice of intellectual culture has arisen, and the conditions of labor have, in fact, grown steadily easier for much of the human race?

Idealism Divides the World; It Sustains Hierarchy

Dewey argues that dualism not only arises from exploitative social conditions, but that it also serves to strengthen those conditions by making them seem natural. It is both effect and cause of social injustice:

> This state of affairs must exist so far as society is organized on a basis of division between laboring classes and leisure classes. The intelligence of those who do things becomes hard in the unremitting struggle with things; that of those freed from the discipline of occupation becomes luxurious and effeminate. Moreover, the majority of human beings still lack economic freedom. Their pursuits are fixed by accident and necessity of circumstance; they are not the normal expression of their own powers interacting with the needs and resources of the environment. Our economic conditions still relegate many men to a servile status. As a consequence, the intelligence of those in control of the practical situation is not liberal. Instead of playing freely upon the subjugation of the world for human end, it is devoted to the manipulation of other men for ends that are non-human in so far as they are exclusive.
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> This state of affairs explains many things in our historic educational traditions. It throws light upon the clash of aims manifested in different portions of the school system; the narrowly utilitarian character of most elementary education, and the narrowly disciplinary or cultural character of most higher education. It accounts for the tendency to isolate intellectual matters till knowledge is scholastic, academic, and professionally technical, and for the widespread conviction that liberal education is opposed to the requirements of an education which shall count in the vocations of life. (Dewey, 1916, p. 136)

Dewey is right about this. The schools became implicated in converting an undemocratic ideological vision into reality. Plato's prescription for the ideal Republic was used to define and legitimize the meritocratic social structures that arose throughout the so-called Progressive Era, as much historical

research in the social foundations of education has amply demonstrated (cf., Karier's history of schooling, 1986). There is no question education has been a carefully controlled commodity, doled out selectively along social class lines. We are in agreement with this part of his analysis.

Idealism is Inherently Undemocratic

> For when these meanings in their ordered relations to one another were taken to be final in and of themselves, they were directly superimposed upon nature. The necessity of existential operations for application of meanings to natural existence was ignored. This failure reacted into the system of meanings as meanings. The result was the belief that the requirements of rational discourse constitute the measure of natural existence, the criterion of complete Being. It is true that logic emerged as the Greeks became aware of language as Logos with the attendant implication that a system of ordered meanings is involved.
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> This perception marked an enormous advance. But it suffered from two serious defects. Because of the superior status assigned to forms of rational discourse, they were isolated from the operations by means of which meanings originate, function and are tested. This isolation was equivalent to the hypostization [sic] of Reason. In the second place, the meanings that were recognized were ordered in a gradation derived from and controlled by a class-structure of Greek society. The means, procedures and kinds of organization that arose from active or 'practical' participation in natural processes were given a low rank in the hierarchy of Being and Knowing. The scheme of knowledge and of Nature became, without conscious intent, a mirror of a social order in which craftsmen, mechanics, artisans generally, held a low position in comparison with a leisure class. Citizens as citizens were also occupied with doing, a doing instigated by need or lack. While possessed of a freedom denied to the artisan class, they were also taken to fail in completely self-contained and self-sufficient activity. The latter was exemplified only in the exercise of Pure Reason untainted by need for anything outside itself and hence independent of all operations of doing and making. The historic result was to give philosophic, even supposedly ontological, sanction to the cultural conditions which prevented the utilization of the immense potentialities for attainment of knowledge that were resident in the activities of the arts – resident in them

> because they involve operations of active modification of existing conditions which contain the procedures constituting the experimental method when once they are employed for the sake of obtaining knowledge, instead of being subordinated to a scheme of uses and enjoyments controlled by given socio-cultural conditions. (Dewey, 1938, pp. 58-59)

A second part of his argument on this topic has to do with the formal institutionalisation of the separation between reason and labor, especially as it became exemplified in pubic schools under an increasingly corporate form of social organization in the late 19th and early 20th centuries.

> Under the influence of German thought in particular, education became a civic function and the civic function was identified with the realization of the ideal of the national state. The 'state' was substituted for humanity; cosmopolitanism gave way to nationalism. To form the citizen, not the 'man,' became the aim of education .... The individualistic theory receded into the background. The state [Dewey is speaking of the Prussian system] furnished not only the instrumentalities of public education but also its goal ... Since the maintenance of a particular national sovereignty required subordination of individuals to the superior interests of the state both in military defense and in struggles for international supremacy in commerce, social efficiency was understood to imply a like subordination. The educational process was taken to be one of disciplinary training rather than of personal development. (Dewey, 1916, pp. 93-39)

Platonic idealism entered a new career as Augustine and others reconciled it with early Christianity. The two cities in Augustine's cosmology reflect a dualism of the mundane and the divine. Over a thousand years later, as religion began to lose its hold on intellectuals during the Enlightenment, and under influence from Romanticism, idealism reemerged, endowed with some of the characteristics of an almighty deity. German idealism in its transition from Kant to Hegel became Absolute Mind, the all-encompassing reality, endowed with a teleological dynamic that worked out its destiny through human history. The State became its concrete manifestation, a corporate structure as compelling as any necessary truths, to which individuals were subordinate, mere cells within the corporate whole, and mind in this new

scheme lay outside individuals, in the collective mind of the volk, the oversoul, the epipsychidian, a pantheistic spirit of the world.

Against this backdrop, Dewey offered a profoundly different vision of social organization, the relationship between the individual and the state, and the role education would play in securing the blessings of a social democracy:

> A society which makes provision for participation in its good of all its members on equal terms and which secures flexible readjustment of its institutions through interaction of the different forms of associated life is in so far democratic. Such a society must have a type of education which gives individuals a personal interest in social relationships and control, and the habits of mind which secure social changes without introducing disorder. (Dewey, 1916, 99)

Thought is not a Separate Activity, but the Accumulated Changes in Behavior Brought About by the Consequences of Prior Actions

This is the argument of Dewey's *Logic* (1938). He sees logical relationships as derived from empirical experience, and does not believe that logic should be permitted then to take flight on the wings of symbolic representation to become a separate discourse no longer connected to the existential situation, nor should logic be seen as the science of thought viewed independently of the mind's engagement with the world of objects and situations.

Philosophers Established Idealism as an Escape From Reality, a Quest for Certainty

This theme comes back again, and perhaps with greater justification, as Dewey considers the condition of intellectual discourse in his own lifetime. In an age suffering under the crushing burdens of rapid industrialization, predatory exploitation, and pressing technological and social problems, it is understandable that Dewey was troubled to see intellectuals, cloistered comfortably away in the universities of the world, still debating the number of angels that could dance on the head of a pin. The hard resumption of dualism in the writings of Descartes sets much of the tone for the modern age with its extremes of

individualism, subjectivism, and dissociation of mind from body, thought from labor.

> The student of intellectual history is aware of how the new scientific standpoint of the sixteenth and seventeenth centuries succeeded in setting up a gulf between the mental and the physical. The former was supposed to constitute a domain of existence of psychical 'stuff' marked by processes totally unlike those of the external world which confronted 'mind'. The older Greek conception that the difference was one in the type of *organization* of common materials and processes, was lost from view. Psychology and epistemology accepted complete dualism, the 'bifurcation' of nature, and the theory of thought and ideas was wrought into conformity with the dualistic assumption. (Dewey, 1938, p. 36)

Both phases of Enlightenment thought, Cartesian rationalism and the empiricism of Locke and others, were subjective in the sense that knowing was anchored in personal experience, in perception or reason rather than in the features of the physical world in the way Dewey would champion.

> It may be added that the honorific use of 'experience' when it first appeared was undoubtedly overweighted upon the side of observation, as in the case of Bacon and Locke. This overweight is readily accounted for as a historical occurrence. For the classic tradition had degenerated into a form in which it was supposed that beliefs about matters of fact could and should be reached by reasoning alone; save as they were established by authority. Opposition to this extreme view evoked an equally one-sided notion that mere sense perception could satisfactorily determine beliefs about matters of fact. It led in Bacon, as later in Mill, to a neglect of the role of mathematics in scientific inquiry, and in Locke to a pretty sharp division between knowledge of matters of fact and of relations between ideas. The latter, moreover, rested finally according to him upon sheer observation, 'internal' or 'external.' The final outcome was a doctrine that reduced 'experience' to 'sensations' as the constituents of all observation, and 'thought' to external associations among these elements, both sensations and associations being supposed to be merely mental or psychical. (Dewey 1938, p. 38)

It may be worth noting that the point Dewey is making here pertains more to the philosophers who commented on science than to the scientists themselves. The scientists tended to be realists

who found the acceptance of observations relatively unproblematic.

Certainty and Knowledge can Only Derive Reliably from Empirical Inquiry

Dewey sought to locate reality in the physical world, as science also was attempting to do. One detected the form of something by interacting with it. He recognized in science what he called the method of intelligence. His *Logic* bases logic not on eternal forms laid up in heaven, or on properties of thought inherent to the mind, or in institutional or social agreements, but in the patterns that emerge from empirical investigation, the criteria for validity being pragmatic. Getting to some absolute Truth, as Plato once offered, is no longer viewed as the goal. Better ways of knowing, as witnessed in the results that obtain from a particular pattern of inquiry, is the goal. This is akin to Popper's modest proposal (1995), that the best theories are simply those among several that have not yet been falsified. Gone are the lofty intellectual constructions of idealist philosophy; in their place, nothing more than the methods of inquiry evolved in the sobering crucible of concrete results. After the extremes of idealism and their cataclysmic political consequences in the 20th century, Dewey's recommendation seems both imminently sane and reasonable.

What constitutes the equivalent of truth in empirical science is a little easier to define than what constitutes truth in mathematics. Nor is the method of intelligence in mathematics so easy to define without resorting to simulacra of the old idealist positions. In mathematics,

> The subject-matter is completely abstract and formal because of its complete freedom from the conditions imposed upon conceptual material which is framed with reference to final existential application. Complete freedom and complete abstractness are here synonymous terms.
>
> Change in the context of inquiry effects a change in its intent and contents. Physical conceptions differ from those of common sense. For their context is not that of use-enjoyment but is that of institution of conditions of systematic extensive inference. A further new context is provided when all reference to existential applicability is eliminated. The result is not simply a higher degree of abstractness, but a new order

> of abstractions, one that is instituted and controlled only by the category of abstract relationship. The necessity of transformation of meanings in discourse in order to determine warranted existential propositions provides, nevertheless, the connecting link of mathematics with the general pattern of inquiry. (Dewey, 1938, p. 396)

What does that mean?

Transformation becomes Dewey's code word for abstraction which remains in thrall to existential conditions: "the formal relations of completely abstract subject-matters, in which transformation as abstract possibility takes the form of transform*ability* in the abstract." Dewey sites several examples in which practical experience generates forms, which are then codified into special symbolic language, and then that language sustains an abstract discourse that disconnects more or less from the original existential conditions. He wants to insist that meaning must always refer back to potential situations, situations that could arise. But, that is more plausible during the earliest phases of abstraction. Over time, abstract symbolic systems may begin to host a conversation that takes on a life (and generates a conceptual reality) of its own. In mathematics, for example, one can hold conversations about n-th dimensional tensors, or the square root of -1, or many other things which are not evidently present in the real, material world (a point he recognizes on p. 416, but dispatches via additional reference to transformations). He wants to claim that this description of potential situations and transformations allows us to avoid mere formalism, but the tactic is not altogether persuasive. We would hasten to point out that mathematical science often advances by means of pure abstraction which may or may not reflect existential possibility, but yet may yield new benefits in surprising and sometimes surprisingly indirect ways. His distemper toward abstraction hinders him from seeing that pure intellectual work in many fields is part of the dynamic of advancement.

> The opposed type of logical theory [in contrast to formalism] holds that forms are forms-of-matter. The differential trait of the variety of this type of theory expounded in this book [the Logic] is that logical forms accrue to subject-matter in virtue of subjection of the latter in inquiry to the conditions

> determined by its end – institution of a warranted conclusion. (Dewey, 1938, p. 372)

That clears things up.

If "dualism" is Dewey's great cuss word, the equivalent in mathematical circles throughout the 20th century has been "platonism." Mathematicians are stuck trying to explain what mathematics is about if it is not about real objects and relationships. What is at stake here are the reasons that justify expenditure of time and resources on abstract and theoretical mathematics in the absence of clear connections to real situations (often played out as priority battles over funding and questions of intellectual freedom), as well as the problem of deciding upon and justifying what shall be included within the mathematics curriculum in public schools and colleges. The virtual elimination of Euclid from the British curriculum is the triumph of modern maths over Platonism, and one is left to wonder on what grounds if any we should mourn its passing.

Logical Forms Originate in Operations of Inquiry; Logic is Empirical

Logic as the quintessential expression of rationality is examined to determine where it resides in the scheme of things. It is a test case for matters of ontology, epistemology, metaphysics, the psychological contribution of mind and of culture to knowing, and so on.

> The theory, in summary form, is that all logical forms (with their characteristic properties) arise within the operation of inquiry and are concerned with control of inquiry so that it may yield warranted assertions. This conception implies much more than that logical forms are disclosed or come to light when we reflect upon processes of inquiry that are in use. Of course it means that; but it also means that the forms *originate* in operations of inquiry. To employ a convenient expression, it means that while inquiry into inquiry is the *causa cognoscendi* of logical forms, primary inquiry is itself *causa essendi* of the forms which inquiry into inquiry discloses. (Dewey, 1938, pp. 3-4)

Dewey's central task in the *Logic* is to argue that logic derives from inquiry; that the methodology of systematic inquiry is the

source of logic. And, he points out that, as scientific methodology has evolved since the time of Aristotle, so too has logic changed.

To assume this is to preclude several earlier beliefs about the nature of logic. For example, it precludes:

- "the determination and selection of logical first principles by an a priori intuitional act;"
- "resting logic upon metaphysical and epistemological assumptions and presuppositions;"
- "the idea that its 'foundations are psychological."

The position Dewey is taking implies

> That logic is empirical in that its subject matter consists of inquiries that are publicly accessible and open to observation, it is not empirical in the sense in which Mill, for example, developed the ideas of Locke and Hume. It is experiential in the same way in which the subject-matter and conclusions of any natural science are empirical: experiential in the way any natural science is experiential, that is, as distinct from the merely speculative and from the a priori and intuitional. (Dewey, 1938, p. 39)

> Those who, like John Stuart Mill, have systematically criticized the traditional theory [of logic] and ... attempted to build a logic in accord with modern scientific practices, have disastrously compromised their case by basing their logical constructions ultimately upon psychological theories that reduced 'experience' to mental states and external associations between them, instead of upon actual conduct of scientific inquiry. (Dewey, 1938, p. 81)

According to Dewey, the old logic, that of Aristotle, arose under conditions of inquiry different from modern science, and thus there arises a need for a new logic, one that embodies the nature of modern methods of inquiry.

"The attempt to retain Aristotelian logical forms after their existential foundations have been repudiated is the main source of existing confusion in logical theory. It is the ultimate reason why logical forms are treated as *merely* formal" (Dewey, 1938, p 94).

Greek science was qualitative, a study of the inclusion of things within qualitative categories, hence the nature of Aristotle's logic, especially syllogism. Modern science, on the other hand, is quantitative. Mathematics in the modern age is the

science of measurement, which to the Greeks was associated with the accidents of matter rather than with the eternal forms of Being. The elevation of mathematics by modern science calls for a wholly new logic.

Rejoining Thought and Practice is Necessary if We Want Genuine Knowledge

This is central to Dewey's agenda, both in the *Logic* and throughout much of his other writings. It is certainly a reasonable notion once we assume that we live in a world defined by and confined to material objects. It becomes less certain if we also allow for independence of the intellect from the constraints of material being. Exactly Dewey's point, we suppose, but one that we do not necessarily concede.

We will meet Dewey halfway, though. We are not dualists, defending Aristotelian forms, but we do defend reification of ideas as objects of thought and contemplation, and cannot deny altogether an attraction to the notion that logic is somehow implicit in the world.

Plato's notion of an ideal Form for the many objects of this world, the notion of a master template, may actually have come home to roost in some surprisingly practical ways. The idea of a master template (a purely ideational form) somehow determining the form of its physical manifestations may not be so far removed from reality as Dewey thought. After all, an engineer creates a single blueprint for the manufacture of an unlimited run of items which will be virtually identical. In mass production, a platonic form of sorts does exercise stewardship over the construction of many objects. To some degree it is a semantic quibble rather than an ontological issue whether or not the form exists outside of specific manifestations of that form. Where does the design exist? It is implicit in each of the manufactured objects, as it is in the blueprint created by the engineer. It is present in the engineer's head. It is present in the experience of all those who end up using the product. It exists in memory, and in written records. Perhaps, with a little less of a fundamentalist's intolerance toward non-literal and non-reductionist speech we can credit Plato with a useful notion after all, far ahead of his time.

Rejoining Thought to Practice is More Democratic Than any of the Various Idealisms

In the face of a massive economic organization of capital that appears utterly to dominate social institutions, Dewey fears that individuals will seek refuge in a private 'inward landscape' in the mind (1971, p. 197). He sees in this a regression, a return to the essence of dualism.

> Consequences within philosophy are of no great import. But philosophical dualism is but a formulated recognition of an impasse in life; an impotence in interaction, inability to make effective transition, limitation of power to regulate and thereby to understand. Capricious pragmatism based on exaltation of personal desire; consolatory estheticism based on capacity for wringing contemplative enjoyment from even the tragedies of the outward spectacle; refugee idealism based on rendering thought omnipotent in the degree in which it is ineffective in concrete affairs. (Dewey, 1929, p. 198)

Perhaps the most distressing iteration of idealism was the one that emerged from German philosophy after Hegel. At its worst, the assumption of an established, intrinsic, and necessary order in the universe and in human life and society leads to the kinds of abuses that characterized German social thinking in the 19th and into the 20th century where social institutions and national territories were thought to have inherent rights over and above the interests, needs, or desires of individuals. Dewey's criticism of this kind of glorification of the state is a case in point (1929, pp 200-205). Against these grand, hegemonic schemes Dewey says,

> The best guarantee of collective efficiency and power is liberation and use of the diversity of individual capacities in initiative, planning, foresight, vigor and endurance .... Full education comes only when there is a responsible share on the part of each person, in proportion to capacity, in shaping the aims and policies of the social groups to which he belongs. This fact fixes the significance of democracy. (1929, p. 209)

Of course, meritocracy also fixes the significance of democracy on a similar argument, but with especial emphasis on the key phrase, "in proportion to capacity," which is assumed to be differential and strictly limited in the majority of people. If abstract, liberal education provides an advantage that permits social elites to subordinate their fellows, then Dewey prefers we

get rid of it and ground all educational processes in the kinds of real-world problematics that define and constrain the lives of ordinary people. The suggestion is imminently sensible, particularly if it means that our capacity for intelligence will be applied to solving our problems instead of escaping from them. But in the end what Dewey prescribed is strikingly similar to what has happened under various constructivist schemes of education. Children of privilege of course do not enter these practical modes of schooling, but rather continue to master the idealized forms of culture Dewey says do not exist, and continue to harvest the advantages that Dewey writes off to social class privilege and escapism, rather than to any genuine empowerment of abilities above and beyond what common sense and existential situations alone can yield. This is really the turning point that we will want to argue upon shortly.

Scientific Inquiry Embodies the Integration of Thought and Practice

> The problems to which empirical method gives rise afford, in a word, opportunities for more investigations yielding fruit in new and enriched experiences. But the problems to which non-empirical method gives rise in philosophy are blocks to inquiry, blind alleys; they are puzzles rather than problems, solved only by calling the original material of primary experience, 'phenomenal,' mere appearance, mere impressions, or by some other disparaging name. (Dewey, 1929, p. 9)

This statement nicely defines the advantages that empirical method affords, but fails to show what complementary advantages the whole excursion into phenomenology has eventually managed to yield. Human consciousness does not arise solely as a result of our existential conditions and our interaction with the material environment. Some of what we experience is given by the human mind itself (Kant's point) as well as the conditioning effects of our cultural systems and social experiences. Dewey recognizes this (1916, p. 59), but grudgingly.

Therefore Science is the Method of Intelligence

> The net conclusion is that acting with an aim is all one with acting intelligently .... To do these things means to have a mind – for mind is precisely intentional purposeful activity controlled by perception of facts and their relationship to one another .... Mind is capacity to refer present conditions to future results, and future consequences to present conditions. (Dewey, 1916, p. 103)

That is certainly part of what it means to have a mind, but this definition strains to extend its grasp to the whole range of experience beyond that of a grossly empirical and behavioristic engagement with the existential environment. There are private, subjective experiences, artistic and aesthetic, and spiritual experiences, intellectual experiences, perhaps even occult and transcendental experiences, but every experience for Dewey is recast in the image of empirical inquiry or it does not exist.

Truth is a Function of Existential Reality; There is no Other Realm in Which to Seek It

"The word 'Pragmatism' does not, I think, occur in the text," Dewey says at the beginning of the *Logic*.

> Perhaps the word lends itself to misconception. At all events, so much misunderstanding and relatively futile controversy have gathered around the word that it seemed advisable to avoid its use. But in the proper interpretation of 'pragmatic,' namely the function of consequences as necessary tests of the validity of propositions, provided these consequences are operationally instituted and are such as to resolve the specific problem evoking the operations, the text that follows is thoroughly pragmatic. (Dewey, 1938, pp. iii-iv)

Would Dewey grant that God exists, based upon the observation that knowledge of His existence improves the quality of life for those who believe? Probably not. The reading of "consequences as necessary tests of validity of propositions" tends to be highly selective for Dewey. Everything refers back to material consequences, which is appropriate given the close affinity his philosophical work had with the method and epistemology of science. But it becomes difficult under such a system to see what kinds of advantages might accrue from the study of any domain of learning unless it is made over into the image of science. In the

20th century battle between the two cultures (Snow, 1964), of science and technology on the one hand, and the humanities on the other, science has for all intents and purposes won. That which exists, exists in some quantity, and can therefore be measured, was Thorndike's supposed summary of the position. If it cannot be measured, it does not exist. To be measured, it must be observable. To be observable, it must be comprised of matter and motion. We live now in an environment in which even education, long associated with spiritual culture, has become a commodity style production line, subject to the same quality control measures that regulate industry. Anything vaguely abstract is now suspect, hard to define operationally, and difficult to assess. One tends less and less to bother with culture, ideas, let alone wisdom. Other issues are more pressing. School-to-work is the orienting principle. The whole tradition of a cultural education for its own sake is suspect. In this climate, mathematics has been reduced to practical 'shopping maths' for many if not most students, and the argument even arises that we might as well discontinue mathematics instruction after the eighth grade, by which time all practical necessity has been fulfilled. Dewey did not cause these changes, and would probably not approve of the form they have taken, but he contributed if inadvertently to a climate of opinion that has rendered any semblance of idealism, platonic or otherwise, non gratis and has actually paved the way for a relatively mindless form of education. Mind, reconfigured as behaviors, even intelligent behaviors, is very different from the mind envisioned by the Greeks.

Hopefully, we have given a reasonable account of the general outlines of Dewey's attack on dualism. We would now like to take into further consideration some of Dewey's assumptions, his reasoning, and his conclusions.

Analysis

Dewey's characterization of Greek philosophy as a refuge from existential reality has some merit, for whether philosophical, aesthetic, or theological, reflection and abstract thought are associated with quietude and with sanctuary from turmoil. Dewey inverts the matter though, claiming that the philosopher thinks

in order to get away from chaos; the philosopher gets away from chaos in order to think. A quiet sanctuary is rather a condition of serious reflection than its purpose or goal.

In point of fact, each of the major philosophers and mathematicians was engaged in the life of their community, and did strive to utilize their learning for the benefit of others. It is disingenuous to claim otherwise. Thales was engaged in trade, and when he retired from business he became a teacher. Pythagoras operated a school, and was involved in politics in Croton (unsuccessfully, but that is another story). Isocrates was deeply engaged in civic life and was also a teacher. Plato too became involved in politics in his ill fated move to Syracuse. Aristotle was involved in politics in his close association with Phillip and Alexander. Socrates, like Benjamin Franklin, contributed to the political life of his society primarily from outside the official sanction of elected office, though he did serve in both the military and as a representative in government. He also knew labor, as he was a stone cutter by trade. In the Crito, Plato shows him confirming his basic allegiance to the civic life of his society. He does not "escape," even when facing death.

Some of those who had a minor role in the development of philosophy, such as Solon, Pericles, and Demosthenes, were primarily politicians. To say that any of these individuals sought refuge from the life others were leading is simply wrong. Dewey misrepresented the very nature of Greek civic life and the Greek world view when he suggested that the contemplative life was designed as a refuge from reality. Some intellectuals were even slaves, and courtesans, but most were able to engage in thought, as Dewey notes, because they had the advantage of sufficient resources to do so.

Dewey's contempt for dualism can be read as a contempt for intellectuals (though he himself was one). His effort to collapse the distinction between thinking and doing into a single act of intelligent doing is laudable, but there may be sound reasons both in the history of intellectual culture and in the developmental processes of the individual to consider these as related but distinct functions. If all knowledge is but immediate and practical, then the construction of conceptual structures and cultural systems faces certain limitations in the range of

expression and of possibility, in the same way that a refusal to take time out to build tools will mean that forevermore the job will have to be done with the implements at hand. Digging a tunnel under the English channel would not have been possible had the builders not first commissioned the construction of those two massive boring machines, a preliminary step in the work that took several years to complete before any of the digging could begin. So it is with the erecting of an intellectual and cultural infrastructure for the human mind, for human societies. It is, in effect, a separate task, however integral and conjoined one expects it to be with the real life work-a-day tasks one intends to perform.

Reading Dewey, one would expect him to dismiss as frivolous the time mathematicians and scientists spend on purely intellectual and theoretical pursuits, for these pursuits smack of the kind of escapism Dewey sees lingering within Platonic idealism, but in fact he does ramble into an occasional reflection on the potential usefulness of such activity, as he does toward the end of the *Logic*. If his point is a cautionary tale, that intellectual pursuits *may* lead to disengagement from the world, and that their pleasures can be seductive, then his concern is worth noting, but if his point is that immersion in the abstract is inherently elitist, escapist, and unproductive, then we cannot agree.

Much of Dewey's anxiety over dualism boils down to the manner in which this powerful cultural strategy was claimed by and associated with the leisure class. Plato argues that humans, like nature itself, were naturally divided according to the parts of the soul – appetite, spirit, and reason, and only the better sort could be expected to think. But this is no more compelling than the ancient claim that purple can only be worn by kings, and believing therefore that the color is inherently undemocratic. Remove the initial assumption and the conclusion also disappears.

To the extent that Idealism became a refuge from this world, we should probably look not to the Greeks but to neo-Platonists, and some early Christians like Augustine, who indeed made over the Realm of Forms into an ethereal paradise that many followers thereafter took refuge in. It was during the Middle Ages, not during classical civilization, that disengagement from the world

became a way of life (Jaeger, 1971, pp. 77-86). The education Plato recommends in *The Republic* does not end with the learner sitting alone on a mountaintop gazing at the sun. Rather, its finishing phase is social, the engagement in dialectic, which points clearly to the role of social intercourse in the search for truth and meaning. The purpose of that education was not self fulfillment or escape, but service to others in the form of philosophically tempered leadership. That an external benchmark for the nature of knowledge was insisted upon (the platonic forms) meant there was a target, and some hedge against a pure social construction of knowledge, or other individualistic kinds of subjectivism.

Suggesting that the world does have a determinate structure, which can be got at, has quite the opposite effect from what Dewey charges; the real danger would have come had Plato located the standard of validity not in the world out there but in the workings and content of the human mind, which is the precarious turn idealism took from Descartes and Kant onward.

In the United Kingdom, the defense of abstract, theoretical learning has begun to collapse. (It is already pretty well dismembered in the United States not by design, but by default). The mathematical portion of the National Curriculum in the United Kingdom is being guided increasingly by a belief that students have no need to study mathematical topics which they will not use in their careers, which means that most learners have no need for exposure to anything beyond intermediate arithmetic. In no way are we suggesting that Dewey is responsible for this course of events, but his was one of the best known statements defending the integration of learning with practical concerns, a move that eventually squeezes out the defense of learning for learning's sake (an unfortunate phrase, since it fails to reveal the long range developmental benefits that a cultural education tends to bestow).

It is difficult to find passages in Dewey's writings that would suggest any possibility that ordinary working people could find pleasure, empowerment, or benefit in the life of the mind as traditionally understood by those who have been privileged enough to enjoy advanced cultural studies. Instead, for Dewey, the life of the mind has to be reconfigured to reflect a material

basis, and thought must always be seen in the service of practical concerns. Evidence dating all the way back to the middle of the last ice age reveals that there is in humankind an inherent attraction to art, to theology, to poetry and philosophy, suggesting that perhaps even the humblest among us can be attracted to the refined systems of culture that will help us gain access to those ethereal realms, whether they exist purely in the mind, only in the fabric of the socio-cultural matrix, or even as a part of the world itself, as Plato believed.

Dewey's account of the nature of logic in empirical inquiry is reasonable, but his account of the nature of scientific knowledge is flawed. Toward the end of the 20th century, after 50 years of science education grounded in an increasingly sophisticated empirical approach, science educators and philosophers of science began to reckon more seriously with the role idealizations play in science. Matthews gives several solid accounts of this dawning realization and its consequences for science education (1994, pp. 137-178; 2000, pp. 251-265). Scientific knowledge itself, the constructed ways in which understanding and meaning are manifested in thought and in communication, depends upon products of human imagination that idealize the phenomena – mathematical formulae, abstractions, idealizations, theoretical objects, theories, heuristic devices, thought experiments, and so forth. The theoretical objects of scientific understanding are not the objects themselves, nor even descriptions of the objects per se, as various empiricist pedagogies would have it, but idealizations thereof. For example, Matthews points out that the pendulum described in classical mechanics had features that can only be approximated in reality, never realized, such as a frictionless fulcrum, weightless string, no air resistance, its mass concentrated at a single point, its motion in a single plane with no lateral deviation, and so on (2000, p. 262). To idealize is to make some things clear in exchange for certain trade offs. Doing so is an aid to thought, though it entails certain liabilities. No gas actually behaves as predicted by the Ideal Gas Law. But there is no way to generalize or to conceptualize very clearly about the behavior of gases under various conditions of temperature, pressure, and volume without resorting to this kind of idealization. So it is, in fact, with the theoretical treatment of any

domain. The discourse takes place not so much with the subject matter itself, but with hypotheses, idealizations, models of that subject matter. Abstraction, and in some sense, idealization are critical to the activity. While this does not constitute idealism, it does promote a kind of de facto dualism, no matter how cleverly we redress the situation with words or bury the distinctions in elaborate talk about transformations.

Ontologically, Plato's realm of forms was but marginally less real than Galileo's hypothetical, idealized pendulum or the wave-particle entities physicists refer to as photons, or the theoretical forms encountered in art or music theory. Pragmatically, these idealizations serve distinct purposes, and it is on that basis that they gain some tentative degree of legitimacy.

Idealizations characterized much of classical Greek culture. The aesthetic standard of beauty, derived from mathematical experience, was an idealization. The moral principles Aesop embedded in his parables were idealizations. The concept of Justice that Solon proposed as a basis for the rule of law was an idealization. We have not tried to argue that Dewey was wrong so much as we have tried to argue that Dewey's is an unnecessarily restrictive view, and one that has helped to cut out an epistemological orientation that had significant heuristic value for education. In its absence, considerations of beauty, intellectual elegance, imagination, the pleasures derived from cultural pursuits, the mysteries of our spiritual side, and even our capacity to engage mathematics, logic, science, language, art and other cultural domains beyond the level of a crude behavioral and materialist level seems greatly diminished. That these pursuits in intellectual culture were once the exclusive province of a privileged class hardly justifies a strategy that now bars any from entering that realm in which thought is, from time to time, and for the sheer pleasure it may afford us, cut free from our ordinary cares.

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