"That which is accepted as knowledge is sometimes discarded tomorrow." Consider knowledge issues raised by this statement in two areas of knowledge.

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Plato considered knowledge to be defined as "justified, true beliefs". My interpretation of this is that 'true' knowledge can be justified through one or more ways of knowing, and therefore can be believed by society. Furthermore, it is possible for some knowledge to be discarded if significant doubt is raised – once again, with justification. However, there is a divergence in the ways that knowledge can be accepted in the first place, particularly in areas of knowledge as dissimilar as the natural sciences and ethics. Consequently, discarding knowledge in these two areas of knowledge will follow very different processes, or may not be possible at all.

As far as epistemology goes, the manner by which knowledge is accepted is a broad, yet extremely intriguing topic. Paradoxically, the first knowledge issue arises from this matter itself: how is knowledge accepted to be true? "Justified, true beliefs" only go so far. In my study of epistemology, I have found that knowledge is acquired through education and experience. In a broader sense, the sum of society's knowledge stems from how it is justified. However, it is a bit circular to claim that knowledge is accepted to be true when it follows Plato's definition - "justified and true." Instead, many scholars, including myself, believe that knowledge is generated through the interaction of critical and creative thinking. This relates to the notion of paradigm shifts, which are significant changes in a knower's perspective. Evaluating this claim further in the natural sciences and ethics will shed light on the converse – can knowledge decay and therefore be relegated to be discarded?

In the natural sciences, there is a common belief that when knowledge is accepted to be true, it oftentimes occurs at the cost of other previously held theories. The knowledge issue that surfaces from this belief is: to what extent do advancements in scientific knowledge result in abandonment of previous knowledge?

"The history of science is replete with theories that only became accepted by the scientific community after a long and protracted uphill battle" that significantly changed society's beliefs and understanding, particularly about the nature of humanity (Wolinsky). For instance, through his observations in astronomy, Copernicus created knowledge regarding the place of human civilization in the universe. Following his theory of heliocentrism, people moved away from the previous religious knowledge that the Earth is the center of the universe, around which the sun and other astronomical bodies revolved. Instead, it eventually became accepted knowledge that the Earth orbits the Sun, and thus, the idea of the solar system was born. In a different example, one that we discussed extensively in my Group 4 project, Darwin's theory of evolution brought about drastic changes in our understanding of the origin of man (and other animal species). No longer could humans consider themselves different from animals through some God-given traits and stories of creationism. Once again, a belief system based on religious knowledge was discarded, and a radical scientific theory became accepted as knowledge. In support of this, Max Planck, a prominent physicist in the 20th century, once said "[a] new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it." (Wolinsky). The implication of Planck's quote is that replacing knowledge is a very slow process. The two paradigm shifts, Copernicus's heliocentrism and Darwin's theory of evolution, are among many others that indicate a pattern of faith-based knowledge being replaced over a long period of time by knowledge accepted to be true in the natural sciences.

As knowledge in the natural sciences began to explain more and more phenomena in our universe, the idea that previous knowledge was <u>always</u> consigned

to be discarded became more rare. Modern science in particular shows a breakdown in the idea that knowledge must be refuted and then replaced by new knowledge; and in its place a counter-claim emerges: advancements and refinements in knowledge, particularly in the natural sciences, have frequently resulted in the coexistence of strongly justified knowledge, both old and new. One such instance is the paradigm shift that emerged from Thomas Young's double-slit experiment - the implications of which we examined in my HL Physics class. In essence, the experiment involves monochromatic, coherent light (from a laser) diffracting through two extremely narrow slits placed a miniscule distance apart. The result of this is a diffraction pattern caused by wave interference (Tretkoff 2). At the same time, the absorption of light by the screen suggests that light consists of a stream of particles, whereas waves in their classical sense would reflect back. When this experiment was first conducted in 1801, it empirically demonstrated how light behaves as both a wave and a particle. This wave-particle duality caused a paradigm shift in the scientific community, changing the debate from whether light is comprised of waves OR particles, and instead hypothesized that light in fact behaves as both (Tretkoff 2). In another example, the modern theory of quantum (non-Newtonian) mechanics raises questions about the motion of sub-atomic particles (Clark). However, the previous theory, Newtonian mechanics, was already strongly justified and proven during the last two centuries. Through verification by scientific rationality and justification, it has now been accepted that both Newtonian and non-Newtonian mechanics can co-exist. At the atomic scale, the theory of quantum mechanics is indispensible in explaining the interactions of electrons and other sub-atomic particles (Clark). At the same time, on a much larger, universal scale, objects follow the rules laid out by Newtonian mechanics. These theories, old and new, work together to contribute a deeper

understanding of the universe. As far as the natural sciences go, wave-particle duality and Newtonian-Quantum mechanics are prime examples of advancements in scientific knowledge without forcing the refutation of previous knowledge.

It is therefore misguided to claim that knowledge is always discarded when new "justified, true beliefs" are accepted. As such, in response to the knowledge issue, the acceptance of knowledge is best described as having the possibility to coevolve, gradually building on the justifications from all ways of knowing.

In contrast to evolving knowledge in the natural sciences, ethical judgment is an area of knowledge that, at first glance, is idealistically characterized by permanence. After all, do ethics really change over time? To what extent is knowledge in ethics subject to decay and abandonment? Can it be permanent? In my discussions of these knowledge issues in TOK, I have developed my opinion on these knowledge issues. I believe that while knowledge in ethics is subject to individual beliefs and cultural context, there is a large extent of enduring ethical judgment inherent in every person. In other words, changes in one's judgments are extremely rare due to the fact that justification of one's ethics is a deeply personal matter.

In one of my personal favorite films, *V for Vendetta*, the main character himself proffers a very controversial ethical knowledge claim – that violence can be an agent of 'good'. The story goes that a "mysterious masked revolutionary" who calls himself 'V' believes it is his moral duty to liberate his countrymen and combat the totalitarian government that has taken control of a dystopian, alternate version of Britain through fascism and elimination of opposition (Ebert). In his opinion, this moral duty encompasses systematically assassinating political leaders. He justifies his belief through the real example of Guy Fawkes, a historic anarchist who aimed to bring down the real British parliament in a violent conspiracy known as the Gunpowder

Plot (Ebert). It's clear that V is decidedly convinced of his personal ethical code, no matter the opinions of others around him, and he remained steadfast in his controversial moral opinions till his last, heaving breath. Despite the limitation that *V for Vendetta* is a work of fiction, this brilliantly layered work of art contributes to my response to the knowledge issue: given a reasonably strong justification for their ethics, people are hard-pressed to discard their knowledge in ethics. In other words, once a person has decided on some enduring moral code, his knowledge in ethics is more or less permanent.

That being said, it is somewhat intellectually lazy to say that 'everyone is different, and therefore will have different knowledge in ethics'. This is an example of the ethical relativism and moral subjectivism stance and their merits only work to a certain extent. Many people believe that at its core, ethics does have some elements of objectivism – some intrinsic, universal moral truths that are true for all people (Lawhead). In my opinion, certain objective ethical truths that stem from human nature itself do exist. It can be considered universally true that slavery is abhorrently unethical, a viewpoint that originates from the idea that humans are not property to be owned. Furthermore, any intention to harm a child is unanimously considered to be immoral because of the innate human tendency to protect their young. Both of these examples are also limited in the sense that they are very extreme. However, its these extreme examples that illustrate my interpretation of the knowledge issue(s). Through these examples, I assert that, to a certain extent, ethical objectivism lends itself to permanence of knowledge in the ethics.

In this way, there is a clear distinction between the nature of knowledge in the natural sciences and in ethics. In the former, knowledge is constantly changing and being updated, sometimes resulting in previous knowledge being discarded. In the

latter, there exists a relative permanence, where knowledge is rarely discarded because it is justified on the surface by objectivism or very deeply by intrinsic personal opinions.

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