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"It is only knowledge produced with difficulty that we **truly value**." To what extent do you agree with this statement?

The prompt implies that the knowledge we truly value is limited to knowledge that is produced with difficulty. In doing so, three distinctions must be made. The first is that the prompt has a one-way nature; it does not suggest that knowledge produced with difficulty is, or should be, truly valued, but instead suggests that *only* knowledge produced with difficulty *can* be truly valued. The second is regarding the word produced – this could be understood as the process of obtaining new knowledge. It must be distinguished from acquired knowledge, namely, learning shared knowledge that is already known. Third, "difficulty" is generally subjective, so I will specify it as that which is difficult within the context of the knower. Fourth, the phrase "truly valued" is quite ambiguous, and I will define it as something that is virtually universally valued within its respective community. In this essay, the areas of knowledge of the natural sciences and the arts will be examined, selected for the dissimilar nature of knowledge that each possesses. Under these conditions, I agree with the prompt to a considerable extent, but also believe that this agreement fluctuates throughout the various areas of knowledge.

There seems to be a general consensus within the natural sciences that virtually all pieces of valued scientific knowledge have also been produced with great difficulty. Almost all Nobel Prizes for Physics go to tenured professors or research scientists who prod for decades in a single subject, conducting convoluted experiments that most would

not ever be able to understand. Einstein's theory of relativity and his studies on the photoelectric effect became the pinnacle and basis of many subjects in the natural sciences, and were certainly produced – after more than 7 years of contemplation (Norton) – with difficulty. For example, with regards to my own IB world, I often have to conduct labs within my physics class that require us to replicate the production of knowledge through experiments. In these labs, however, it is nearly impossible for us to actually produce new knowledge that could be truly valued in the community, because we are given limited time, and do not have nearly enough acquired knowledge to produce new knowledge. Thus, it could be argued that we only value knowledge produced with difficulty, because it is impossible for most people within the natural sciences to produce useful knowledge without difficulty. The interdisciplinary nature of knowledge in the natural sciences also plays a role in limiting the value of its knowledge to the difficulty of its production. In the natural sciences, knowledge is largely shared and quite interdisciplinary – one discovery produced in chemistry may continued to be used in physics, and so forth – and therefore, the validity of produced knowledge in the natural sciences relies on support from shared knowledge from the past; if knowledge produced does not align with the countless other pieces of knowledge from the past, it **most likely** will be incorrect. In my own physics class, we often have to crosscheck our final answers with shared scientific knowledge to check for the validity of our derived knowledge. Sometimes, the answer we get does not correspond to the shared knowledge within the scientific community, and thus we often have to check our method for mistakes. In this sense, it could be argued that valued knowledge produced in the natural sciences, because it is not only inherently difficult to produce but also because its validity relies on shared

knowledge, is limited to the difficulty of its production.

Knowledge within the natural sciences, however, does not always have to be produced with difficulty in order to be valued – though valued knowledge produced without difficulty within the natural science appears to mostly hold a serendipitous nature. For example, the discovery of the X-Ray by Wilhelm Röngten, which later became the subject of a Nobel prize in chemistry, was entirely an accident, and could therefore be regarded as a valued scientific discovery that was not necessarily difficult. As a counter-argument, one may also argue that the process of discovering the X-Ray – namely, the complex set-up of the various vacuum tube experiments – was quite scientifically difficult. However, I have already defined "difficulty" as something which is difficult in the discoverer's context; certainly, the set-up of the vacuum tubes was complex, but within Wilhelm Röntgen's context, would not have been difficult. Though rare, not all valued knowledge within the natural sciences was produced with difficulty.

The Arts seem to follow a different trend from the natural sciences. There appears to be a divide between valued knowledge produced without much difficulty, and with difficulty. Many truly valued works of literature, for example, have been produced with great difficulty, deep thinking, and time. As George Orwell famously stated, "writing a book is a horrible, exhausting struggle, like a long bout with some painful illness" (Orwell). Some books, like George Orwell asserted, took multiple decades to write, requiring countless downpours of imagination – and much internal struggle – to fill the framework of the novel. On the other hand, some novels that are truly valued within

society were considerably less difficult to write. Take the renowned children's novel, "The Very Hungry Caterpillar"; compared to Homer's "The Iliad", it does not seem very difficult to produce. Both are "truly valued", but were produced with quite obviously different levels of difficulty.

The visual arts follow the same variance as literature. There seems to be examples of valued knowledge within the visual arts that were not difficult to produce, and examples of valued knowledge where the creator faced various struggles. For example, artist David Alfaro Siqueiros discovered in the 1930's the technique of "accidental painting", by pouring different colors of paint onto a wooden panel and simply allowing them to merge with each other (Jacobsmeyer). Though produced without much difficulty, this technique was – and is – truly valued within the art community as a beautiful amalgamation between physics and art. On the other hand, there exist artistic techniques such as those that exist within impressionism, which took several years of collaboration, rejection, and innovation to produce. Certainly, impressionist techniques are now truly valued, but so is artist Siqueiros' accidental painting technique, and there is a obvious disparity between the level of difficulty of their production.

Examples of each circumstance are endless within the area of the Arts. James Cameron's *Avatar* took 15 years to produce (Block); Andy Warhol's eight-hour and five-minute continuous footage of the empire state building took one day to produce; the former won three Oscars, and the latter was selected by the Library of the Congress to be preserved within the National Film Registry (MoMA). In the arts, the value of knowledge

does not seem to be limited by the difficulty of its production to the same extent as the natural sciences – perhaps this is because producing art is producing personal knowledge, and producing knowledge in the natural sciences is producing shared knowledge. Additionally, shared knowledge holds a yes-or-no type of character, where the knowledge has to be verified and align with other, previously known pieces of knowledge. Personal knowledge, on the other hand, is subjective, and requires no verification in order to become accredited. Personal knowledge does not seem to be hindered by the difficulty of its production, while shared knowledge does. Therefore, knowledge in the arts does not have to be produced with difficulty in order to be valued.

In conclusion, knowledge produced without much difficulty *can* be valued. The ubiquity, however, of valued knowledge produced with little difficulty seems to vary greatly from within different areas of knowledge. The area of knowledge of the natural sciences is restricted to shared knowledge – knowledge in the sciences is rarely personal – and so is much more difficult to be truly valued when produced without difficulty. The variance between areas of knowledge makes it difficult to come to a definite conclusion. Thus, because of the divided nature of valued knowledge in the arts but the quite definite nature of valued knowledge in the natural sciences, the value of knowledge is limited to the difficulty of its production to a considerable extent, though inconsistent throughout the various areas of knowledge.

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