



Prompt 3: How can we reconcile the relentless drive to pursue knowledge with the finite resources we have available? Discuss with reference to the natural sciences and one other area of knowledge.

Word count: 1551

Chosen Areas of Knowledge:

Natural Sciences and History

Whether it was Watson's and Crick's discovery of DNA or the idea of Genetic Engineering, our drive to pursue knowledge is never satisfied because humans always wanted to gain more knowledge, also because knowledge equals power, whether it's power in the medical field or power in solving mathematic approaches. This might conflict with the limited resources we have to pursue that knowledge. Can we even reconcile our relentless drive to pursue knowledge with our finite resources? To answer this question more focused on certain areas of Knowledge, I have chosen the natural sciences and history as areas of knowledge that will be explored concerning this essay's question.

First, we have to define the finite resources we have.

One of these resources is the tools that we use. An example of this would be the microscope. The microscope is an important tool in biology and without it, we would not be able to gain knowledge about the structure of an animal cell for example. Before microscopes were invented, we were not even able to see an animal cell with our eyes. The finite resource was the tool because we either had this tool or not. And before we invented microscopes, we did not have such tools that were able to magnify the image of an animal cell so that we would be able to see it. In order to build a tool that made it possible to magnify the image of an animal cell, scientists needed to discover the magnifying effect of lenses first. This is a discovery of physics. Only with the lenses that were discovered by physicists, scientists were able to invent the tool that today we call the microscope. This shows that tools can be ever-improving. Therefore, the finiteness of tools can be altered by other inventions and discoveries of the same or other Areas of Knowledge because with new discoveries and inventions, tools can be improved or completely new tools can be invented. Just because we do not have the tool to pursue knowledge in an Area of Knowledge right now, does not mean that we will never have this tool and pursue this knowledge. Therefore, over time and as research in all of the Areas of knowledge progresses, tools can be improved more and more and more new tools can be invented which opens new ways to pursue knowledge.

In history, most of the knowledge we have comes from sources of that time. Therefore, these sources are the finite resources we are bound to. If there is no source for a specific period in time, our knowledge is highly limited and we cannot learn about this period properly. A prominent example of this limitation is the Rosetta Stone. The Rosetta Stone is one of the most important sources we got our knowledge about hieroglyphs. The inscriptions on the stone are in two languages: Greek and Egyptian Hieroglyphs. Historians used the Rosetta Stone to decipher the

Egyptian Hieroglyphs. Egyptian texts became decipherable because of the Rosetta Stone and so we only have this vast historical knowledge about Ancient Egypt because of the Rosetta Stone. However, the Rosetta Stone is only a broken part of a bigger stone slab. This means that the rest of the Rosetta Stone is missing. We cannot know what else the rest of the Rosetta Stone could have revealed to us about Ancient Egypt. This shows that artifacts or records as a resource are finite and limit us in our pursuit of knowledge that we may not even be able to pursue this knowledge to its fullest. Therefore, it is especially important to not look at resources isolated but to take multiple resources into consideration when pursuing knowledge.

Another example of History would be the records from the time of Imperialism in the early 20<sup>th</sup> century. Historians are limited in their knowledge because they are mostly able to access documentation from the Imperialist perspective. In contrast, the documentation of the Imperialized is lacking, also because Imperializing might have destroyed documentation in order to leave as little traces as possible behind the crimes they committed during Imperialism. The documentation of the Imperializing is problematic though, because they will probably have presented themselves in a better way than they actually acted. Therefore, the bias of the documentation is also a resource that limits our pursuit of knowledge in History. The more biased a documentation of a historical event is for example, the less accurate is the representation of that historical event. Historians will have to find sources that are as least biased as possible which is difficult because almost none of the documentations of historical events are unbiased because everyone tries to portray themselves better in their documentation of the historical event. However, Historians can reconcile their relentless drive to pursue knowledge to some extent if they take multiple sources into consideration so that they can get a more objective perspective on historical events and periods.

Furthermore, funding money plays an important role in research. There is a finite number of financial resources that can be spent on research. Without enough money available, researching certain topics might become impossible. In Natural Sciences, for example, institutions will often fund research in the medical field, like cancer research, more than research in fields that are less important to them like research on ecosystem restoration. Therefore, the pursuit of knowledge of cancerous disease is less restricted to financial boundaries than the research of Ecosystem Restoration. While the funding money is the limiting resource in Ecosystem Restoration research, it supports the knowledge we get from cancer research. This shows that even though funding

money is a finite resource, how we spend it determines which pursuit of knowledge is supported and which is restricted to it. By making decisions on where the funding money should go, we shift the finiteness of this resource to a research area. Therefore, we can pursue knowledge in one certain research field by taking finite resources from another research field.

However, the finiteness of the funding money can also provide us with unexpected innovations. An example of this would be the relevance of Elon Musk's private company SpaceX that cooperates with NASA. In the early 2000s, NASA's funding money for research was cut significantly. This even led to NASA having to cancel its Space Shuttle program<sup>1</sup>. If NASA decided to keep developing their used technologies in their own Research Centers, they would have had to spend their funding money very carefully. Instead, they decided to seek more cost-effective solutions for research. One of these solutions was to work with private companies such as SpaceX. SpaceX was first hired because NASA looked for companies that could develop spacecraft that were capable of delivering cargo to the International Space Station in NASA's Commercial Orbital Transportation Services Program<sup>2</sup>. NASA profited from SpaceX because they developed the Falcon 9 and the Dragon Spacecraft in a very cost-efficient way. SpaceX on the other hand profited from this cooperation as well. SpaceX was given funding money and facilities that were provided by NASA like the Kennedy Space Center launch pads. Moreover, SpaceX was able to design reusable rocket technology with the help of NASA's provided facilities. This was very important for NASA because the reusable rocket technology meant that rockets would become much more cost-efficient. Therefore, this example of Natural Sciences shows that the finiteness of NASA's funding money was an opportunity for smaller companies like SpaceX to realize their innovative ideas. Without NASA's lack of funding money for its own Research Centers, SpaceX would not have been able to realize their innovative reusable rocket technology.

Another finite resource we have is time. Both research in Natural Sciences and History are dependent on time. In History, an example of this would be the deciphering of the Ancient Greek Script Linear B. It took Historians over 50 years to decipher the script and gain knowledge from it. This also means that a lot of Historians were not able to pursue the knowledge of the

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<sup>1</sup>Richardson: <https://www.pbs.org/wgbh/nova/columbia/richardson.html> (As of 18/12/24)

<sup>2</sup>Braukus: <https://www.nasa.gov/news-release/nasa-announces-launch-date-and-milestones-for-spacex-flight/> (As of 18/12/24)

deciphered script. They were not able to pursue the knowledge in the finite time they had. On an individual level, they were not able to reconcile their relentless drive to pursue knowledge. However, on a larger scale, humanity was able to pursue this knowledge. To the individual, time as a finite resource is much more impactful than for humanity in general. This shows that the finiteness of resources does not always impact the pursuit of knowledge in the same way. Therefore, when it comes to humanity as a whole, pursuing knowledge is much less restricted by time.

In conclusion, the finiteness of resources is not always preventing us from pursuing knowledge and we might also be able to shift the finiteness of some of our resources. Our relentless drive to pursue knowledge can be reconciled, if we do not look at resources individually. We can reconcile our relentless drive to pursue knowledge best if instead, we look at multiple resources as a whole. This is important because our gain of knowledge is dependent on multiple different resources, so we should not look at them isolated from each other.

The limits of the resources we experience do not determine the boundaries of the knowledge we can pursue but enforce it. Without these limits, innovation would not be possible.

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