

6. Compare and contrast our approach to knowledge about the past with our approach to knowledge about the future.  
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### **Theory of Knowledge**

“Compare and contrast our approach to knowledge about the past with our approach to knowledge about the future.”

In order to compare and contrast our approach to knowledge about the past with our knowledge about the future, three areas of knowing will be considered throughout this essay; the natural sciences, history, and the human sciences. The knowledge issues identified in each of these areas of knowing, and which are crucial to fully explore each area, are respectively; whether deductive, rather than inductive reasoning, leads to a higher degree of certainty; whether history can be unbiased; and, whether human behaviour can be predicted.

The natural sciences are able to approach both the past and the future through the use of reasoning in an interplay between the general and the particular. An example of the use of deductive reasoning when approaching the past in the natural sciences, is the use of carbon dating upon fossils found in geological layers which estimates the age of the fossil within 50,000 years by analysing how much of the radioactive isotope Carbon-14 is still present. In deductive reasoning we use a concept Q, in this case that carbon dating can determine the age of fossils, and apply it to a particular P in the form “if all P is Q, then some Q is P”<sup>1</sup>. This avoids invalid generalisations such as “all fossils are 50,000 years old” and instead will refer to a particular case which can only validate the implication that “some fossils are 50,000 years old”. Therefore the key assertion of deductive reasoning is; if all premises are true and the argument is valid, then the conclusion must be true.<sup>2</sup>

The natural sciences can also approach the future with knowledge of the past. An example of this is when predicting meteorological phenomena and identifying patterns. In producing a forecast, a typical method used is the analogue method, which involves examining today’s forecast scenario and remembering a day in the past when the weather forecast looked very similar (an analogue).<sup>3</sup> In weather forecasts the method of reasoning used is therefore inductive reasoning in which a particular scenario observed in the past is used as a general model which assumes that similar weather patterns will behave in the same way. However, this type of forecast is not accurate as any variation in atmospheric pressure for example will alter the weather. The knowledge issues of whether the method of reasoning used affects the degree of certainty arises, and through the

<sup>1</sup> Eileen Dombrowski. *Theory of Knowledge Course Companion*. p.71

<sup>2</sup> Ibid. p.75

<sup>3</sup> [http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/fcst/mth/oth.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/fcst/mth/oth.rxml) 3:44pm, 10/08/2008

November 08

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examples it can be concluded that inductive reasoning, unlike deductive reasoning, is not truth-preserving in the sense that its premises give only some degree of probability, but not certainty to its conclusion.

Inductive reasoning is also used in the IB planning experiments done in my chemistry classes in which we formulate a hypothesis such as “gold can electroplate<sup>4</sup> all metals”, in order to test a theory, in this case that “all elements are composed of positive particles(protons) and negative particles(electrons) which are able to migrate with electricity in electrolysis<sup>5</sup>”. In this case the hypothesis supports the theory, as electrons from the gold migrate towards the other metal, for example zinc, next gold ions enter the electrolyte solution and move towards the negatively charged zinc, which in turn gives the excess electrons to the gold ions which become gold atoms again.

In the examples presented, natural science was shown able to approach both the past and the future, but limitations of the natural sciences should also be considered. An example of when science cannot predict is in quantum mechanics, which argues that more precisely the position of an electron is given, the less one can say what its momentum (positioning) is<sup>6</sup>. This theory, known as Heisenberg’s uncertainty principle, argues that the electron is both a particle and a wave, and that instead of being at a fixed location in an orbital, it inhabits a probability cloud<sup>7</sup>. The current knowledge we have of science, written in the form of theories, is a product of various paradigm shifts which occurred in the following way; In 1774, Dalton argued that atoms was indivisible; In 1897, Thomson discovered the electron and proposed that the atom and the electron formed a compact unit quite like a plum pudding; In 1911, Rutherford discovered that there were empty spaces in the atom, and that it was therefore composed of a nucleus with electrons orbiting around it<sup>8</sup>. According to the philosopher Kuhn, if an observation does not fit theory, then revolution will occur in the existing paradigms which will be revised to have some other paradigms added in expense of a pre-existing one<sup>9</sup>. However, according to Popper, this *falsifiability* of a theory is not necessarily unenlightening, but rather leads us to new explanations and the formulation of a theory<sup>10</sup>. Our approach to knowledge therefore changes with shifts in paradigm, which are usually accompanied with an advance in the technology available.

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<sup>4</sup> To electroplate is to cover with a thin layer of metal by electrolysis.

<sup>5</sup> Electrolysis is the separation of a substance into its chemical parts by an electric current.

<sup>6</sup> <http://plato.stanford.edu/entries/qt-uncertainty/>, 6:43pm, 22/08/2008

<sup>7</sup> Larry Gonick. *The Cartoon Guide to Chemistry*. p.28.

<sup>8</sup> Ricardo Feltre. *Química geral*. p.56 & 77 & 78.

<sup>9</sup> <http://plato.stanford.edu/entries/thomas-kuhn/>, 6:01pm, 22/08/2008

<sup>10</sup> <http://plato.stanford.edu/entries/popper/>, 6:22pm, 22/08/2008

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In the area of knowing history, it is important to note that in approaching the past, variables cannot be controlled and the situation cannot be reproduced in a different scenario. Historians are therefore only able to consider various interpretations contained in both primary and secondary sources in order to make causal links between the past and present<sup>11</sup>. The knowledge issue of whether history can be unbiased therefore arises due to these differing versions in sources. When considering the American feminist movement of the 1900s, two versions can be seen;

*“If men had been treated by the House of Commons as women have been treated, there would have been bloody reprisals all over the country”* as opposed to women’s *“triumphs of moral and spiritual force”* - Millicent Fawcett in 1908 in support of the suffragettes. <sup>12</sup>

*“Now that it is pretty well assured that women will vote... Let the babies vote! For that matter let the cows vote.”* - From the Gentleman’s Journal, May 1913, against women’s right to vote. <sup>13</sup>

The historian’s work will therefore depend on the argument and evidence he accepts, and these will in turn influence his work on history, which will become an argument for a particular interpretation, and consequently biased. Although history itself deals only with the past and does not approach the future within itself, it can be used through inductive reasoning as a “guide” in order to shape present course of action in the human sciences, especially in geopolitics. An example of this is in comparing the current situation of the Russo-Georgian War with the situation between Germany and Czechoslovakia in 1938. Hitler alleged in September 1938 that massacres of German civilians were taking place within Czechoslovakia and that therefore the Czechs had to hand over the industrial area of the Sudetenland, an area mainly inhabited by German speakers<sup>14</sup>. The Sudetenland is analogous to South Ossetia given that the Russian government claims that Georgia is practising ethnic cleansing and that the area is also an industrial area mainly inhabited by a population under heavy influence of a stronger bordering nation. The allied forces approached the Czechs and told them to either accept Hitler’s terms, or they fought alone. The same circumstance is being repeated in Georgia, who despite having sent 2000 troops to aid the USA and Britain in Iraq, has been denied help against Russia<sup>15</sup>. With hindsight, we know that the Sudetenland was handed over to Hitler, and that he later continued his territorial expansion to engulf the whole of Czechoslovakia. Although Sergei Lavrov, Minister of Foreign Affairs of the Russian Federation has

<sup>11</sup> Eileen Dombrowski. *Theory of Knowledge Course Companion*. p.190

<sup>12</sup> Ben Walsh. *Modern World History*. p.60

<sup>13</sup> Ibid. p.60

<sup>14</sup> Ted Townley. *Hitler and the Road to War*. p.21 & 22.

<sup>15</sup> <http://www.dailymail.co.uk/news/worldnews/article-1042816/Mass-exodus-More-50-000-flee-Russia-ignores-Georgias-calls-ceasefire.html#> , 20:08,12/08/2008

November 08

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guaranteed that “Russia has no intention of annexing or occupying any part of Georgia”<sup>16</sup>, there is still a knowledge issue to consider; can human behaviour be predicted? The knowledge we have of the past does not necessarily mean that it will prevent the past from repeating itself, or from taking a different course.

The same approach to the future is used when preparing for an Model United Nations (MUN). The first thing we do is research on the history of the country we are representing so as to position ourselves coherently with what would be best in the perspective of the country we are representing, which in my case was Israel. The topic being discussed was the establishment of a NWFZ<sup>17</sup> in the Middle East. Israel, being leader of nuclear technology in the area, believed it could not rely upon other states to aid it against an attack by the Arab countries, particularly following desertion by many states during the Holocaust<sup>18</sup>. I therefore had to position myself against any resolution allowing for a NWFZ. Although the position of delegates in relation to their countries should not differ from that in real politics, resolutions usually vary from that actually passed by the UN because each delegate will use his/her own creativity differently in solving the problem. With this example, it can be said that human behaviour cannot be predicted even when given the same situation.

In conclusion, within the natural sciences, deductive reasoning is used to approach knowledge of the past, as shown in the carbon-dating example. Similarly, inductive reasoning is used to approach knowledge of the future, but provides a less accurate level of certainty in its predictions. History, even in primary sources such as the ones presented on feminism, is made up of viewpoints and interpretations, and is consequently generally biased. Although it can only approach the past, knowledge provided by history is useful when approaching the future within the human sciences (as shown in comparing the current Russo-Georgian War with Czechoslovakia in 1938). However, as seen through MUN, the human sciences also has its limitations, as it cannot fully predict the course of events given that human behaviour is unpredictable.

**Word Count: 1599**

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<sup>16</sup> [http://www.ft.com/cms/s/0/7863e71a-689e-11dd-a4e5-0000779fd18c.html?nclick\\_check=1](http://www.ft.com/cms/s/0/7863e71a-689e-11dd-a4e5-0000779fd18c.html?nclick_check=1),  
14:20, 12/08/08

<sup>17</sup> Acronym for Nuclear Weapon-Free Zone

<sup>18</sup> Frank Barnaby. *The Nuclear Arsenal in the Middle East*. p.97-106

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