What could a science free of prejudice and bigotry have looked like? How could the process of science be better?

Abstract:
A science free of prejudice and bigotry would be one that recognizes these realities and works actively to minimize them. It would be a scientific community where diversity of background, perspective, identity and lived experience is valued and fostered. Such a community would strive for greater inclusivity in terms of who gets to participate in scientific research (for example, by supporting historically marginalized groups), what topics are considered worth studying (for example, by investigating issues related to social justice), what methods are considered valid (for example, by acknowledging indigenous ways of knowing) and how results are communicated (for example, by using language that doesn't reinforce harmful stereotypes).

Key words:
History of science, Discrete computation, Cellular automata, SITA Simulations, computer software

Introduction:

In order for science to better reflect these values in the future we need to engage in ongoing critical self-reflection about our own practices as scientists - both individually and collectively - so that we can identify areas where improvements can be made. We also need to work towards creating structures within our institutions that support this kind of reflection and encourage us to learn from each other's experiences.

The development of science is undoubtedly shaped by historical, social, and cultural factors. Scientific progress depends on the accumulation of knowledge and insights gained through experimentation, observation and analysis, but this process is not value-free. The assumptions, beliefs, prejudices and biases that scientists bring to their work can influence the questions they ask, the hypotheses they devise, the evidence they consider as relevant or irrelevant and how they interpret it.

To improve the process of science we could also make changes like putting greater emphasis on collaboration rather than competition between researchers; increasing transparency around how research is conducted; involving more diverse perspectives at every stage of the scientific process; designing studies that explicitly address issues related to social justice; making data more open-access; moving away from metrics like publication quantity or impact factor as measures of success; providing better training for scientists in ethical reasoning; valuing replication studies as a way to build trust in scientific findings.

Overall there is much work to be done in order to create a scientific community that is truly free of prejudice and bigotry, but by taking concrete steps towards this goal we can help make science more equitable, effective and relevant to the needs of society as a whole.

How could science be different?

Science could be different in many ways, depending how it's practiced and approached. For example, science could be more collaborative, with scientists from different fields working together. Additionally, science could be more accessible, with more people having the opportunity to participate in research and contribute their knowledge and ideas. Science could also place a greater emphasis on ethical considerations, ensuring that scientific advances are made in a responsible and sustainable way.

Science could have emerged differently if the course of history and its major events had been altered. For example, if major scientific discoveries such as the theory of gravity or the laws not been made, then our understanding of the world would be vastly different. Additionally, if certain key figures in science had not existed or had pursued different fields, then the development of science may have taken a different path. Finally, if society had placed less value on science or prohibited scientific inquiry altogether, then the emergence of science as we know it today may not have occurred at all.

The relationship between mathematics and physics is complex and deeply intertwined. While it is true that mathematics has been used to describe physical phenomena since ancient times, the development of modern physics in the 17th century brought about a significant increase in mathematical sophistication. In other words, while math was not necessarily created to address questions in physics, the two fields have been mutually beneficial and have influenced each other greatly over time.

As for the question of whether or not we could have had centuries of advanced mathematics before physics came to be, it's difficult say for certain. It's possible that some form of advanced mathematics could have developed independently of physics, but given the historical connection between the two fields, it seems unlikely that they would exist in isolation from one another for very long. Ultimately, the relationship between math and physics is a fascinating and ongoing topic of study for researchers across both disciplines.

There are alternative sets of mathematics based on different axioms that could still support science to the same level of power as it is now. In fact, mathematicians have explored and developed many different mathematical systems over the years, each with their own set of axioms and rules for manipulating symbols. While some of these systems may not be widely used or accepted, they are still valid in their own right and can be used to solve problems and prove theorems just as effectively as more familiar systems like Zermelo-Fraenkel set theory. However, it's worth noting that even within a given system of mathematics, there may be different approaches or techniques that are better suited to different scientific fields or types of problems.

Scientific modelling can be done using methods other than mathematics. Analog models, such as clockwork constructions, have been used in the past for modelling physical phenomena. These models are based on the idea of creating a physical representation of a system that behaves in a similar way to the system being studied. Other examples of non-mathematical methods for scientific modelling include computer simulations and conceptual models. However, mathematical models are often preferred because they allow for precise predictions and quantitative analysis.

Discrete computation, cellular automata:
If science were fundamentally based on discrete computation, cellular automata, and similar concepts instead of differential equations, it would have a significant impact on the way we understand and model natural phenomena. There would likely be a shift towards more discrete models and simulations that rely on computational methods. This could lead to new insights and discoveries, as well as advancements in fields such as computer science and artificial intelligence. However, we must also consider the limitations of these models and their ability to accurately represent complex systems in the real world.

Technologically advanced aliens:
If we were to meet technologically advanced aliens, it is difficult to know exactly how similar their physics or mathematics would be to ours. It is possible that they could have entirely different physical laws and mathematical systems than what we are currently familiar with. However, it is also possible that there could be some similarities in our understanding of the universe, particularly if these aliens evolved under similar conditions as humans. Ultimately, until we make contact with extra-terrestrial, it is difficult to know for sure how different or similar their physics and mathematics would be.

Powerful artificial or biological neural network:
It is an interesting question. It is possible that an incredibly powerful artificial or biological neural network could predict or design elements of reality without explicit scientific reasoning, at least in some cases. Nature has indeed solved many problems through trial and error, and it is possible that such a system could also do so. However, it's important to note that much of our current technology is developed through rigorous scientific inquiry and mathematical reasoning. So while it's possible that a non-scientifically reasoned system could produce useful technological advancements, it may not be as efficient or effective as one developed through scientific methods.

Evolution of different branches of science:
It is possible that different branches of science have evolved at different rates. In fact, this has already happened to some extent - for example, biology and chemistry developed separately for many centuries before they began to overlap significantly. If biology had advanced rapidly before physics, it's possible that our understanding of the physical world might have been delayed or limited in certain ways. However, it's important to note that scientific discoveries often build on one another over time, and it's likely that new insights in one field would eventually lead to advancements in others as well.

In another historical timeline, or in a fully egalitarian culture without prejudice and bigotry, how could it have been different? How would one make it different now?

In a historical timeline where prejudice and bigotry didn't exist or were actively addressed, the treatment of marginalized communities would have been vastly different. Systems and institutions that perpetuate discrimination would not have been created, and those who hold discriminatory views would have been actively challenged by society as a whole.

In the present day, we can work towards making things different by educating ourselves on issues of prejudice and bigotry and actively working to dismantle systems that perpetuate inequality. This can involve speaking out against discriminatory actions, supporting policies and initiatives that promote equity, and advocating for underrepresented communities. It's important to also listen to the voices of those who are most affected by these issues and center their experiences in our efforts towards creating a more just society.

It is true that natural philosophy has evolved into different branches of science such as physics, chemistry, biology, and others. Many scientists believe that nature at its core can be understood through mathematics, and that certain mathematical principles can be tested through experimentation. This paradigm has led to many important discoveries in science and continues to shape our understanding of the natural world today.

Galileo's assertion that the natural world is described through mathematics was a significant contribution to the development of modern science. The scientific discipline established by Galileo, Newton, and other natural philosophers during the 17th century emphasized mathematical laws that described the necessary relationships between different elements of the world. These laws were often expressed using differential equations that governed how the state of the world evolved over time. The insights gained by these scientists were frequently based on data collected from many sources around the globe and drawn from multiple societies.

We’ve also seen the communication of science develop in a particular way: largely through written books and papers, predominantly by scholars at universities, that are reviewed, edited, and published in a formal process, primarily by (especially in modern times) for-profit publication companies.

It's true that traditionally, the communication of scientific knowledge has been mainly through written books and papers authored by scholars at universities. These publications go through a rigorous peer review process before being published by academic journals or for-profit publication companies. However, in recent years there has been a shift towards open-access publishing and the use of digital platforms to disseminate scientific information more widely and rapidly. This has opened up for scientists to communicate their work in new ways such as blogs, podcasts, videos, and social media.

How could science be better?
There are many ways in which science could be improved. One approach is to increase funding for scientific research, as this can help to support more ambitious and innovative projects. Additionally, scientists work more closely with members of the public and other stakeholders to ensure that their research is relevant and useful to society. It may also be beneficial for scientists to collaborate more with each other across different fields and disciplines, as this can help to uncover new insights and perspectives that may not have been possible otherwise. Finally, it is important for scientists to prioritize open communication and data sharing in order to facilitate collaboration and avoid duplication of effort.

Scientific theories are guided by a variety of factors, including data, simulation, prediction, consistency, beauty, simplicity, and breadth. These factors are essential in helping to develop comprehensive and accurate scientific theories.

Data is an essential guide for developing scientific theories as it provides evidence that supports or refutes a hypothesis. Simulation can also be useful in testing hypotheses as it allows scientists to model complex systems and test the effects of different variables.

Prediction is another important factor as it allows scientists to make testable hypotheses that can be used to evaluate the accuracy of their theories. Consistency is also important as it ensures that new data and observations fit within the framework of existing scientific theories.

Beauty and simplicity can also play a role in guiding scientific theories. Theories that are elegant and simple may be more likely to be accepted by the scientific community than those that are overly complex or convoluted. Breadth is also important as it ensures that a theory applies across a wide range of conditions.

However, distractions such as bias or personal beliefs should be avoided when developing scientific theories. It's essential to remain objective when evaluating evidence and not let personal biases influence conclusions. Overall, developing robust scientific theories requires careful consideration of multiple factors, including those mentioned above.

There is always room for improvement in any practice, including science. One area that some researchers have suggested could be improved is in the reproducibility of scientific studies. In recent years, there have been concerns about the reliability of some scientific findings because they cannot be replicated by other scientists. Some have argued that more emphasis should be placed on ensuring that studies can be successfully reproduced before they are published. Additionally, there has been discussion about making scientific research more open and transparent so that others can easily access and evaluate the data and methods used in a study. These are just a few examples of areas where improvements could potentially lead to a more effective practice of science.

There are ongoing efforts to make science more effective and equitable by changing institutions and ways of learning, as well as journals and other means of communication. One example is the open access movement, which seeks to make scientific research freely available to everyone online. This helps to remove barriers that prevent people from accessing knowledge due to financial or institutional constraints. Additionally, there are initiatives focused on diversifying the pool of scientists and researchers, as well as promoting equity in research funding and collaboration opportunities. These efforts aim to create a more inclusive scientific community that leverages diverse perspectives and experiences to drive innovation and progress.

If sciences were different and better—Role of Universities:
It is difficult to predict exactly how science will evolve in the future, but there are a few possibilities that could lead to improvements in the field.

One possibility is that technology may advance to the point where it becomes easier and cheaper to conduct experiments, making scientific research more accessible to people from all backgrounds. This could result in a more diverse pool of scientists with fresh perspectives on longstanding problems.

In such a future, the process of scientific publication may also change. Perhaps new forms of media will emerge that allow for more interactive and engaging presentations of research findings, or peer review processes might become more efficient and effective through the use of artificial intelligence.

As for universities or their replacements, they may become even more collaborative and interdisciplinary. Rather than being siloed into specific departments or fields, researchers from different backgrounds might work together on projects that require expertise from multiple areas. Alternatively, new models of education may emerge that allow individuals to learn at their own pace and without needing to attend traditional institutions.

Overall, the future of science is likely to be shaped by technological advancements and changing societal values. While we cannot predict exactly what will happen, we can hope that these changes will lead to a more productive and inclusive scientific community.

Considering combined gravitation of all bodies:
Science should be exploring further into 3-body and higher up solutions and other universe models that explore further into other levels such as galaxy, solar system, Earth, electron, energy, and even nanoscopic particle levels without changing its basic equation sets and methodology. Solving questions like:

- How does the Galaxy balance its rotations of stars?
- Why did the Pioneer satellite have an irregular movement?
- Why there are so many blue shifted Galaxies in the universe?
- What is the structure of Galaxy center which will be stable and can support full Galaxy?
- How insolvable contaminations in water or in any other liquids diffuse?
- What happens to all the energy emitted by sun and other stars and Galaxies?
- How a local system of Galaxies balances each other?
- How electrons or positrons are generated in the universe?
- Exploring galaxy rotation curves
- Can these be explained…the Origin, Propagation and Uniformity of CMB??
- How hydrogen atoms and other atoms are created?
- How three states of water (H2O) are formed what is the basis?
- How astronomical Jets are formed?
- How the mathematical equations of the model are proved?
- What about SINGULARITIES in the software and in the Model?
- What is an N-body problem?

are to be done. The author’s other papers can be consulted for all these results and so many other results too.

It is important to expand our thinking and exploration beyond the traditional 2-body problem and cosmology-based Universe model in Physics. There is so much more to discover and explore when it comes to the mysteries of the universe. By pushing beyond these limitations, we can develop new insights and solutions that could have far-reaching impacts.

Conclusion:

In the section above "*Discrete computation, cellular automata:*" the usage of Computers should be more. As our sciences are differential equation-based mathematics and many differential equations doesn't have full and unique solutions; we sincerely feel usage of computer-based algorithms should be encouraged.

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Acknowledgements

I thank Maa VAK for continuous guidance for the last 45 years from the inception till now and into future.

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