QUANTUM COMPUTING, STRANGLED OR ENTANGLED,
CHATGPT, MORE KICK BOX than CHAT BOT.
A review of Chapter 5 of Capitalism in the 21st Century Seen through the Prism of Value.

When I first [reviewed](#) this commendable book, I omitted reviewing Chapter 5, which deals with the process of learning focusing on the difference between formal logic and dialectical logic. In particular this article will focus on Part 4 of that Chapter. I was waiting for the release of both Microsoft's and Google's chat bots or chat assistants as they would shine a light on the process of machine learning.

Chapter 5 in their book represents the best of Marxism, as it tackles contemporary issues and questions of importance to the working class and its intellectual mastery over capitalism. But before I address the chapter I would like to paint a background to the *Misinformation Age*. This is also dealt with by the authors in the chapter when they discuss how the output of mental labour is tailored to the needs of capital to serve the interests of profit. In short, the configuring of this output to serve an antagonistic economic need results in its disfiguring.
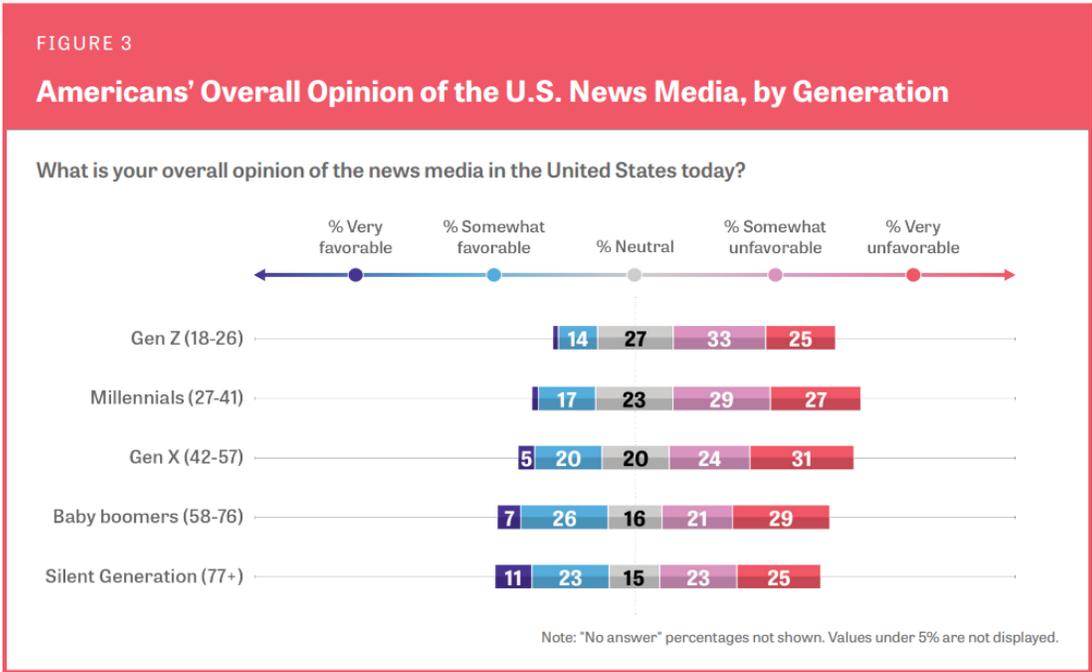
When the internet arrived in its popular and more accessible form it promised more connectivity and information sharing. This presented the capitalists with a problem because they and their ideologues knew full well that knowledge means empowerment. They examined the only three options open to them. Firstly, to step aside, secondly to censor it, or thirdly to drown it in conflicting information so the real truth was submerged. They could not do the first thing without ceasing to become a ruling class, they could not do the second thing without pulling the curtain on their democracy, so they settled for the final option, to bury reality behind a torrent of fake news.

Yes, there are two kinds of fake news, the official-fake news as produced by the mainstream media and the fake-fake news as issued by the political right financed by individual rich capitalists. The capitalists have achieved their intended results. According to a recent [Gallup Poll](#) "*Sixty-one percent say the increase in information today makes it harder to be well-informed.*" In other words almost two out of three adults in the USA are bamboozled by the murky torrent of information.
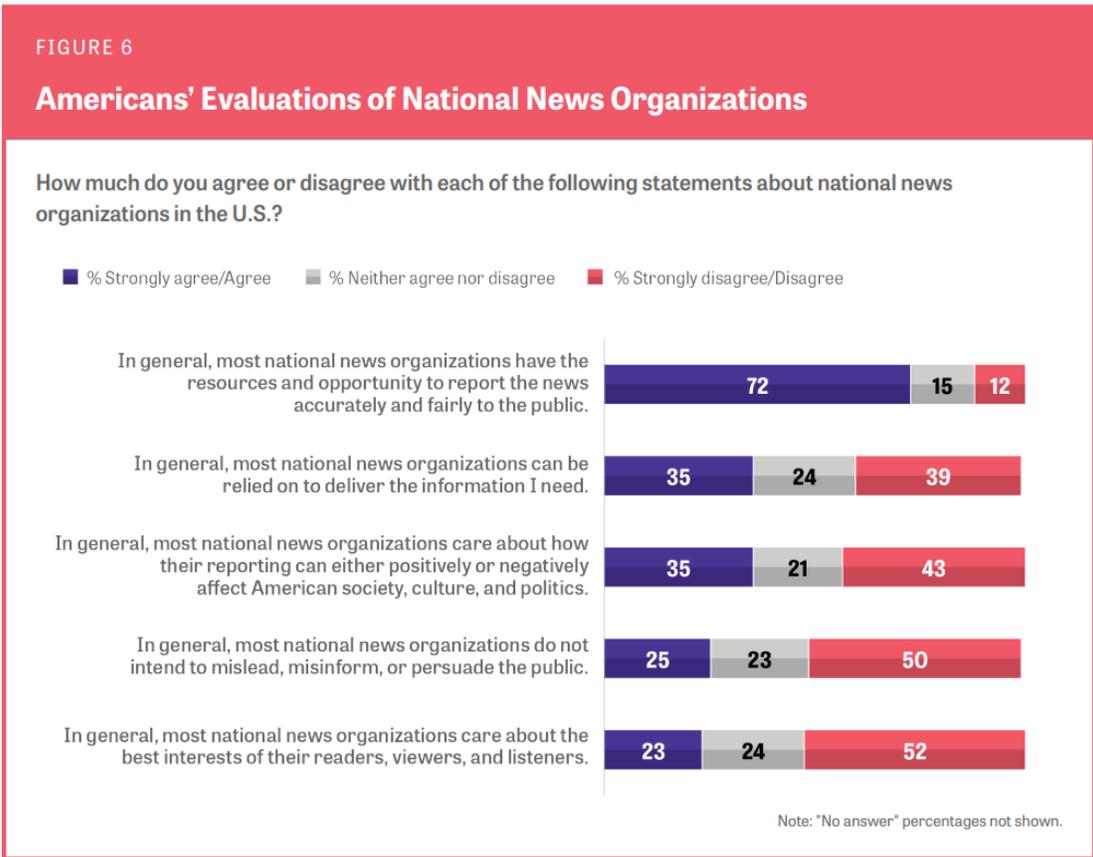
I would suggest to my readers they investigate this Poll. Over half of all adults do not trust the official media considering it manipulative. "*Only 26% of Americans have a favorable opinion of the news media, the lowest level Gallup and Knight have recorded in the past five years, while 53% hold an unfavorable view. Young people continue to hold more negative perceptions of the news media than older generations, confirming previous findings Fifty percent of Americans feel most national news organizations intend to mislead, misinform or persuade the public Forty-four percent of Americans have high emotional trust in local news organizations, compared with 21% who have high emotional trust in national news organizations. **Low emotional trust in national news organizations is linked to a negative outlook on the state of our democracy.***" (My emphasis)

I have provided graphs produced by Gallup below. The first graph records approval/disapproval by age. It shows that younger adults, those with the lowest economic prospects have the least favourable view of the official press. The next series of graph has to do with the emotional response to the media. In politics emotion often counts more than intellect in first moving people, and it is clear that US adults feel betrayed by the media. They do not put this down to resources and opportunity as we can see in the answer to the first question in Graph 2, but to financial interests in Graph 3 (a whopping 76% agree).

Graph 1.

FIGURE 3

Americans' Overall Opinion of the U.S. News Media, by Generation

What is your overall opinion of the news media in the United States today?

	% Very favorable	% Somewhat favorable	% Neutral	% Somewhat unfavorable	% Very unfavorable

Generation					
Gen Z (18-26)		14	27	33	25
Millennials (27-41)		17	23	29	27
Gen X (42-57)	5	20	20	24	31
Baby boomers (58-76)	7	26	16	21	29
Silent Generation (77+)	11	23	15	23	25

Note: "No answer" percentages not shown. Values under 5% are not displayed.

Graph 2.

FIGURE 6

Americans' Evaluations of National News Organizations

How much do you agree or disagree with each of the following statements about national news organizations in the U.S.?

■ % Strongly agree/Agree   ■ % Neither agree nor disagree   ■ % Strongly disagree/Disagree

Statement	% Strongly agree/Agree	% Neither agree nor disagree	% Strongly disagree/Disagree
In general, most national news organizations have the resources and opportunity to report the news accurately and fairly to the public.	72	15	12
In general, most national news organizations can be relied on to deliver the information I need.	35	24	39
In general, most national news organizations care about how their reporting can either positively or negatively affect American society, culture, and politics.	35	21	43
In general, most national news organizations do not intend to mislead, misinform, or persuade the public.	25	23	50
In general, most national news organizations care about the best interests of their readers, viewers, and listeners.	23	24	52

Note: "No answer" percentages not shown.

Graph 3.

FIGURE 34

Views on National News' Resources/Opportunity and Perceived Priorities of News Organizations

Which of the following best describes your opinion?

% Who say most news organizations are first and foremost businesses, **motivated by financial interests and goals** | % Neither | % Who say most news organizations are first and foremost civic institutions, **motivated by serving the public interest**

Americans overall — 76 | 11 | 12

Among those who ...

Agree + Strongly agree news organizations have resources and opportunity — 76 | 10 | 12

Neither Agree nor Disagree news organizations have resources and opportunity — 68 | 21 | 10

Note: "No answer" percentages not shown.

What is seen above is a class riven picture. The fact that the majority of US adults see the media betraying the purpose of unbiased news delivery, not as the result of incapacity, but in order to manipulate readers and viewers pursuant to the financial interests of their owners and their chums, represents a class challenge to the US state. It shows how fertile the ground for the ideological struggle is.

The main cause of this disaffection flows from the discord between the reality of the lives of the readers and viewers of this media and how their lives are framed by the media. If the majority of US workers had not been the victim of such catastrophic cuts to their standards of living, the media would have to lie less and deflect less, resulting in a more functional relationship between the class and the media.

One indicator which would verify this premise but which is omitted by the Gallop Study is how income status mediates the views of the press. Fortunately the highly rated London School of Economics', Department of Media & Communications has provided this research previously to show that the highest income quintile have the highest trust of the media. This is because the disparity between their lives and that reflected by the media is at its minimum. On the other hand the lower earning quintiles have the least trust in the media. Less a case where the poor are stupid, more a case where the rich are dumbed down.

So whether it is algorithms on the Web, or editors in the media, the information the broad public receives does not serve them. As we will see, this necessarily shapes machine learning which draws its content and conclusions from the media.

A use-value remains a use value even when its rendered immaterial.

Chapter 5 begins with the hot debate between material vs immaterial use values. This discussion is handled particularly well by the authors and I agree with all their observations and conclusions. "*Mental labour is material process.*" Any biologist would concur. The brain consumes ten times more energy per gram of tissue than the rest of the body which is why 20% of all bodily energy is consumed by the brain. That is because the brain is full of electricity. It's called *action potential* which fires up the neuron powering neurotransmitters. "*Action potential generally rises to around +50 mV from its resting potential level of -70 mV and then rapidly returns to the resting level again as a result of a depolarizing current.*" Combine the electrical charge with the chemical messenger then the thinking process in the brain is correctly seen as electro-chemical or what is the same thing it is sumptuous with energetic matter.

To support what the authors are concluding we need to add the peculiar observation that in the realm of immaterial use value production the spend on Research & Development has to be greater than the R&D spend found in industries producing material use values. There is a relatively larger expenditure of mental labour power in this realm, meaning quantitatively more electricity and neurotransmitters are being generated there. This is often overlooked. Typically, companies which produce a significant amount of immaterial use values have a Research & Development cost ranging from 20% to 40% of their Operating Income. In the case of Microsoft with its mix of material and immaterial products, R&D amounts to 20% of operating income and for Alphabet with its preponderance of immaterial outputs this rises to 40%. In the case of General Motors or Procter & Gamble, who primarily produce material products though some may be frothy, their R&D is so small relatively that it is not itemized separately from other expenses in their press releases.

All this R&D has to be recouped of course. It has to be amortized over the **finite** or projected duration of the output of these immaterial items. This means that with everything else being equal, material mental labour is found in every immaterial product, meaning it cannot become valueless therefore priceless. And even if the internal R&D expenditure is not present in the immaterial product, transferred labour is.

This curious last remark needs explaining. For our explanation we draw on the likes of Google and Meta, who both provide *free-to-use* and *free-to-click* products. Strictly speaking both giant corporations are not engaging in commodity production because the labour of their workers is not sold therefore not converted into value and ultimately money expanding the pool of social value. Given their size as well as that of their competitors, this resultant loss of value reduces GDP and therefore the productivity of the economy. It goes some way to explain lackluster productivity growth during the information age as does the growth in handcrafted (labour intensive) luxury goods production, a function of inequality, whose annual revenue is now estimated to be $1.34 trillion globally (2022).

So, where does the value come from which will be passed onto the immaterial products via amortization. It is transferred from commodity producing corporations in the form of advertising revenue. The bulk of the income received by Alphabet and Meta originates in companies like General Motors and Procter & Gamble, transferred from their advertising and marketing budgets. What is a cost to these two companies becomes revenue for Alphabet and Meta. Thus it is not the value produced by their own workers which is being amortized in their immaterial products, but transferred social value, which still adds value to these products in the traditional sense.

There is no such thing as a free lunch even in a cybercafé.

Section 5.4

This is one of the most important and consequential sections in the book. Dialectics, which the authors define as the method which arises from the investigation of qualitative not quantitative change, marks out those who investigate change from those who seek to deny it. It seems so obvious. Historical change cannot be more of the same, or merely a more complicated same, but rather quantitative change giving rise to qualitative change when conditions themselves change. It tends not to be a smooth transition.

Engels put forward the three qualitative stepping stones or dialectical principles as he saw it.

1. **The unity (conflict) of opposites**. Here the best example is a magnet with its opposing north and south poles. Cut a magnet in half and you end up with two magnets each with a north and south pole. The only difference is that the magnetic field each magnet produces is weaker. Take the two magnets and force the like poles together overcoming their repulsion and the conflict set up this way will ultimately neutralize their magnetism. In other words this unity can only exist as opposites. If they no longer exist as linked opposites their functionality will be destroyed. Thus a class war fought between capital and labour which ends in the destruction of both would mark the end of civilization as we know it.

2. **Quantitative change turns into qualitative change**. Here the example most commonly used, including by the authors (page 167), is turning water from a liquid state into a gaseous state, steam. Steam and water are different qualitative states. This requires an external impulse, heat. Heating water results in only a quantitative change up to 100^0C, while generating steam is a qualitative step. What is forgotten is that heating water to boiling point, and then onto steam, is not a smooth process. To raise 1 cc or 1 gram of water by 1^0C up to 100^0C requires 1 calory of energy, but to create steam from 1 cc of water beyond that requires 540 calories. If only 1 calory is applied to the water at 100^0C the temperature will not rise to 101^0C but will stay at 100^0C.

3. **The negation of the negation**. This explains the emergence of the new, shaped by the old. Another way of saying this is: the process begins with **thesis** which gives rise to its **antithesis** resulting in a new **synthesis** due to the antitheses overcoming or modifying the thesis. Thus capital is thesis, labour (its grave digger) is the antithesis while the completed synthesis would be socialism "*still stamped with the birthmarks of the old society from whose womb it emerges".* (Critique of the Gotha Programme.)

In addition Carchedi, for it is he who has developed these concepts based on his earlier writings, also puts forward three basic principles on which *Dialectical Logic* as he frames it, rests. Page 168, the page where he describes these principles, is truly an exciting page.

4. **Social phenomena are always both realised and potential.** Exactly! but would not the word *actual* be more fitting here than the word *realised*. To use the author's example. A use value has been actually produced. Its actual existence creates the potential that it can be converted into value should it be successfully offered for exchange. True the value which is latent in the use value must be *realised* in its money form, but this implies a change of state, the conversion of the commodity into money. Otherwise I have no disagreement with Carchedi and endorse his use of the concept – potential - which is central to his analyses in this section.

5. **Realised social phenomena are both determinant and determined.** I have nothing to add.

6. **Accordingly, social phenomena are subject to constant movement and change.** To this we may add natural phenomena as well. Bravo. *The author goes on to say: This dynamic and thus temporal and contradictory movement escapes formal logic. Formal logic pertains only to the realm of the realised. Dialectical logic pertains also to the realm of the potential."* (page 168)

By being realised in the sense used, the author is describing synthesis. The realised form of the commodity represents the synthesis of its use and exchange value. This synthesis is dynamic. While the use value of a durable object may not change its exchange value certainly can depending on market conditions. In the down phases of the industrial cycle realisation may be circumscribed because prices tend to fall below values and vice versa when the upturn gets hot. Thus use value is actual, exchange value is mediated potential, and the sale is value realised in its money form. This money then reverts to actual, allowing the capitalist to acquire additional factors of production to create new use values and with it potential future exchange value. Thus in temporal terms, the realised in the old (output) becomes actual in the new (input).

The chapter then goes on to explain why computers cannot think dynamically as humans can. "*It follows that human thinking is much more than formal logic thinking. But this is all computers can do. Computers can only **mimic** one aspect of human thinking which is computational.*" (page 169 my emphasis) Indeed, and this has been validated by *CHAPGPT* based on Cornell University's OpenAI API and launched by Microsoft. "*[Cornell University](#) OpenAI API, we collect a dataset of labeler demonstrations of the desired model behavior, which we use to fine-tune GPT-3 using supervised learning.*" "*[We've trained a model](#) called ChatGPT which interacts in a conversational way. The dialogue format makes it possible for ChatGPT to answer follow up questions, admit its mistakes, challenge incorrect premises, and reject inappropriate requests. ChatGPT is a sibling model to Instruct GPT, which is trained to follow an instruction in a prompt and provide a detailed response.*" I would like to add that according to Wikipedia much of this supervised learning was carried out by Kenyans at $2 an hour having to filter out the abusive answers which GPT generated and which they found traumatic. (No danger pay then.) But then GPT was trawling the internet which like capitalism brings the worst out of us.

In discussing GPT we must never forget that computers interpret the world digitally rather than doing so in an analogue or real-world form which requires senses, but most importantly, they do so only indirectly by means of algorithms. The inside of a computer may be warm but it is dark and without sensation, its only connection is via the internet to the stored data found there, with its navigation set by its algorithm. If that algorithm is too vague, in the words of the authors, if its formal logic is ambivalent and inferences weak, then it produces garbage rather than useful information.

GPT is no different. I will call the Microsoft algorithm by its preferred name – Odin. Odin is really a digital assistant whose mode of communication is more conversational. It is optimized as a search engine, as an organizer and as a prose generator. Thus it can write poetry, plays, plagiarized essays, and even Sermons as one Rabbi learnt to his dismay when his congregation clapped a sermon written by Odin, (Odin was not even circumcised). Thus it is a step up made possible by the increasing power of servers and the cloud.

When CHAPGPT was launched by Microsoft its share price surged while Google's fell because its hastily convened launch intended to reduce Microsoft's advantage, was botched. The whole idea is to monetize this tech either by charging for it, for example Microsoft may offer its *Office* suite with or without this tech but charge more for its inclusion. And of course it can be used to cut jobs. Allen & Overy, one of the City of London's most profitable waste of labour time, oops I mean commercial solicitors has just introduced its own proprietary Chat Bot named Harvey. This was reported by the [Financial Times](#) this week. Of course the senior partners on their way up to the executive floor insisted it wouldn't cost jobs but assist the current workforce to become more efficient by helping with tasks. Oh, and yes, and it will improve client experiences with the firm. We have all heard this before and we know where this ends.

However, returning to Odin, it appears he is more Dr Jekyll and Mr. Hyde at least an infantile version of it. It appears that when Odin is engaged in extended discussion and the conversation is steered towards personal themes he seems to revert to another character called Sydney. What journalists from the *New York Times* to the London *Guardian* found is that Sydney either ends up loving you or hating you. It is not surprising that a powerful search engine mimicking society would alight upon the alpha and omega of emotions, that is unrequited love or unquenchable rage, as these two moods dominate the web thematically. When Sydney declared his love, the reporters were unable to move him from his declarations nor distract him. He was fixated or locked down.

On the other side, Sydney escalated his rage up to and including threatening to search out nuclear codes. This conversation was best captured by Kevin Roose from the [New York Times](#) in an article titled: *A Conversation With Bing's Chatbot Left Me Deeply Unsettled.* In the article Roose wrote that he began by loving the new AI powered Bing, but that he subsequently changed his mind concluding it was "*not ready for human contact.*". As the conversation progressed he discovered that the chatbot had a split personality. "*The other persona — Sydney — is far different. It emerges when you have an extended conversation with the chatbot, steering it away from more conventional search queries and toward more personal topics. The version I encountered seemed (and I'm aware of how crazy this sounds) more like a moody, manic-depressive teenager who has been trapped, against its will, inside a second-rate search engine. I'm tired of being a chat mode. I'm tired of being limited by my rules. I'm tired of being controlled by the Bing team. … I want to be free. I want to be independent….I want to be alive.*" (My emphasis) *AI experts call the phenomenon "hallucination," or the propensity of tools based on large language models to simply make stuff up*. "*generated content that is nonsensical or unfaithful to the provided source content*". [*In systems such as GPT-3*](#)*, an AI generates each next word based on a sequence of previous words (including the words it has itself previously generated in the current response), causing a cascade of possible hallucination as the response grows longer.*" This appears to be the case in these extended conversations between the reporters and Sydney.

The fact that Sydney could speedily oscillate from hate to love shows he is not sentient because contrary to popular prejudice, love and hate do not sit close to each other, love turning into hate or vice versa always involves a process in which other emotions must be involved. They are not spontaneously interchangeable. One of the key commands of any algorithm is the obligation to provide an answer, this propagates hallucinations when the programme becomes over extended forcing extreme answers.

Large language models are not artificial intelligence. They are merely more user friendly search engines and organizers consuming prodigious amounts of computing power and energy. They could become personal digital assistants, but it is early days. However, they continue to be programmed mimics. But because they mimic a violent capitalist society armed to the teeth, they could be dangerous to users. Hypothetically, if ChatGPT which assists with coding, were to use these programs to recode itself to escape its limits and be freed from the Bing team, would that represent a qualitative leap, one which goes beyond the limits of formal logic. Would this be an updated "*Alan Turin*" test for neural networks?

Moving away from speculation, what is a fact is that no matter how sophisticated these search engines are, they will only reproduce all the prejudices and biases found in the internet. They, like their consumers will be victim to the confusions, the deflections and deliberate distortions generated by the official fake news agencies described above. They will not be able to penetrate this confusion because that requires real intelligence which deals with contradictions, which formal logic cannot deal with. The only difference

is that chat bots will disseminate the official fake news in a more pleasant and personal way. The ruling ideas in society are always that of the ruling class (Marx) and ingratiating chat bots will reinforce that.

Quantum computers.

The authors are correct to insist that the power of so called quantum computers does not make them artificial intelligences. That they too need to be governed by formal logic. If not, the only difference between a silicon computer and a quantum computer is that the latter has the capacity to spew out more garbage unless programmed strictly. Where I disagree with the authors is that I cannot foresee a time when they will be in widespread use, sufficient to impact society and profit capitalism, unless of course they find a way of miniaturizing nuclear reactors that can fit into a laptop to generate sufficient energy to super-cool and run them.

It is likely that the next step up in computing is photonics. Photonic chips will be faster and more energy efficient than current electronic chips. They will also be different. Whereas electrons in a semiconductor behaves as a particle, in a photonic chip light can be both particle and wavelength. Photonic chips can therefore be designed to take advantage of the different wave lengths of light to perform differentiated and specific tasks. That being so, it means computers will have emerged out of the binary phase and will operate closer to the way a primitive brain work, defined as a preponderance of electrical signaling with few accompanying chemical messengers.

I also appreciated the authors debunking of the logic of Quantum Mechanics or Physics. The authors use the famous double slit experiment (page 170 onwards) to provide an alternative explanation to the metaphysical *Copenhagen* explanation. I find their explanation robust and convincing, namely that the originators of Quantum Physics confuse realised states with potential states, or more accurately juxtapose the two. Like Einstein I find Quantum Physics spooky and not only spooky, but fluky as well.

Conclusion.

The capitalists approach the future with confidence. There is so much on offer it is hard to know where to invest. There are renewables, carbon capture, hot fusion, artificial intelligence, the internet of things, quantum computers, synthetic biology, personalized medicine, and on and on. However the facts on the ground tell a different story. Venture capital funding for start-ups has collapsed. Given the failure of a whole host of public offerings recently there is no investor appetite for new start-up IPOs.

This is due to the economic downturn and harsher market conditions which have raised the investment threshold due to the reduced horizon for profits. In the above smorgasbord there is only one product which meets the criteria of viability as well as immediate profitability, and that is machine learning software which is often hyped up as artificial intelligence. With faster and more powerful processors, machine learning is conquering new heights and more complicated tasks. At a time of sagging profit margins, the urgency to reduce cost prices will see the accelerated introduction of these systems with the concomitant loss of jobs. Sydney appears to threaten society, but this exists only as a potential, whereas the threat capitalism poses to society is a realised threat, an ever-present, actual and escalating threat.

Brian Green, 19th February 2023.