

# AT THE CROSSROADS OF TIME, SCIENCE AND HISTORY

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**Abstract:** *Our paper is searching for historical and discursive contexts which might explain the sudden flare-up of the idea of parallel worlds in the science, history and literature of the mid-20th-century. We are having in mind Hugh Everett’s universal wave function – known later as the many-worlds interpretation of the quantum entanglement –, the forking trajectories from a single choice situation in time (Jorge Luis Borges, The Garden of Forking Paths) or in space (Andre Norton’s The Crossroads of Time), and alternative histories, such as J. C. Squire’s 1932 collection of counterfactual essays, If It Happened Otherwise. The origins of this mental representation are identified in the break-up of the continuity with classical, identity logic and the rise of polyvalent logic ushered in by the theory of the superposition of contrary states, and the traumatic effect of the sudden onset of barbarism in totalitarian regimes in a modern Europe which had evolved towards democracy in the backdrop of the luminaries’ discourses, the political agenda of the Republic of Fraternity and Reason, or the parliamentary reforms in Victorian England.*

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The crossroads of time was an idea which brought in relation two pretty distinct projects – a literary one, Andre Norton’s novel of this title, and a scientific one, which a distinguished physicist and cosmologist such as Max Tegmark, from the Massachusetts Institute of Technology,

did not hesitate to call “one of the most important discoveries of all time in science.”<sup>1</sup>. He was referring to the doctoral thesis of Hugh Everett, entitled *Wave Mechanics Without Probability*, a fragment of which was published the next year. *The Theory of the Universal Wave Function*, as the paper was later retitled, speculated on the possibility for a particle or even universe to undergo simultaneous collapse or realizations of all its proper states entangled in their wave function. All possibilities opening up at a time as a result of a choice situation – splitting, forking, or crossroads – will collapse in a universe of their own, a multiverse being born of the values previously supposed to be taken successively by a particle’s position and momentum, that is the collapsed packet of the PSI wave function, which Everett redefines as universal wave function:

Let one regard an observer as a subsystem of the composite system: observer + object-system. It is then an inescapable consequence that after the interaction has taken place there will not, generally, exist a single observer state. There will, however, be a superposition of the composite system states, each element of which contains a definite observer state and a definite relative object-system state. Furthermore, as we shall see, each of these relative object-system states will be, approximately, the eigenstates of the observation corresponding to the value obtained by the observer which is described by the same element of the superposition. Thus, each element of the resulting superposition

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<sup>1</sup> “Parallel Worlds, Parallel Lives”. Television documentary broadcast in 2007 on [BBC Scotland](#) and [BBC Four](#), in which American rock musician [Mark Oliver Everett](#) talks with physicist and cosmologist Max Tegmark, and other former colleagues of his father who reminisce Hugh Everett’s launch of his theory at a friendly meeting at Princeton University in 1954. The Nova [PBS](#) program *produced a transcript* on 21 October 2008. [https://www.pbs.org/wgbh/nova/transcripts/3513\\_manyworlds.html](https://www.pbs.org/wgbh/nova/transcripts/3513_manyworlds.html)

describes an observer who perceived a definite and generally different result, and to whom it appears that the object-system state has been transformed into the corresponding eigenstate (Everett, 1973: 10).

Andre Norton, the penname of Alice Norton, imagines the coexistence of worlds as collapsed proper states, not along time but horizontally, as versions so to say of one and the same planet. It is true that a decade and a half before Jorge Louis Borges had published *The Garden of Forking Paths*, where a Chinese scholar Ts'ui Pên former governor of Yunnan Province sets out to write a labyrinthine novel of forking paths into the future. His descendent, Yu Tsun, a spy on Germany's behalf, comes to sinologist Albert alleging to be seeking aid for his translation of his ancestor's mysterious manuscript. The sinologist had decoded the meaning of Ts'ui Pên's ambiguous words, explaining to Tsun that the labyrinth meant parallel courses of action forking out of the same event, such as Tsun coming to him in a world as friend or, in another, as an enemy. We may say that, supposing Borges had quantum mechanics looming at the back of his mind, he was closer to Schrödinger's cat than to the multiverse theory. The Irish Austrian Nobel award winner illustrates his wave function version of quantum mechanics through the famous 1935 thought experiment of a cat being locked up in a box in the presence of a radioactive substance. If a uranium atom decays, and the radiation is enough to trigger a Geiger counter, the counter will set off a hammer which breaks a vial filled with hydrocyanic acid. Not until the box is open will the observer know whether an atom has decayed, or whether the radiation and the poison gas have killed the cat. Before that there is an equal probability that the cat should be dead or alive. Everett replaces the observer with splitting and removes the probability. Every time a quantum event happens, there is a splitting into parallel universes: one in which the cat is alive, and one in which the cat is dead.

By analogy, what state out of all the possible ones into which a wave function is collapsed at some moment is the one the observer comes to know through measurements - a pretty messy business, as that state is not a matter of the particle's essential and stable identity, but a provisional one due to the particle's interaction with the environment, that is, with the measuring instruments, let alone the inconvenience of the observer not being able to measure with precision both the particle's position and momentum at the same time.

In Borges' story, the forking paths only exist in consciousness: as a set of probabilities, which are unknown to the sinologist, but decohered in the spy's mind, as he has a well-defined plan about what he means to do. He kills the sinologist whose name is that of an artillery deposit of the British whose location he wants to pass over to the Germans before being imprisoned. Although often speculated as a fictional version of a scientific theory, Borges does nothing more in this story than probe into the pragmatic function of language. Tsun commits a murder only because he wants his name associated in the media with that of the sinologist. As he cannot communicate with his employers directly, he uses language to a purpose which has nothing to do with semantics. In Lacanian terms, the "Albert" signifier is sliding from under the sinologist signified under the "artillery deposit" signified<sup>2</sup>.

Norton's and Everett's speculations, however, are indeed rooted in the quantum revolution accomplished step by step by Plank, Einstein, De Broglie, Schrödinger, Niels Bohr, and Werner Heisenberg. The New Physics has changed the world we live in, but its impact upon people's minds was even greater. It meant, first of all, the end of

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<sup>2</sup> « un glissement incessant du signifié sous le signifiant » : Jacques Lacan, « *L'instance de la lettre dans l'inconscient* », in Jacques Lacan, *Écrits* (1966: 502).

identity logic for several reasons: the particles are so light that their spin can easily turn up and down; the superposition of states – such as particle and wave opened the door to polyvalent logic. Systems have no stability: their evolution can no longer be predicted, their probable states being in entanglement, interfering with one another, each realized state being the result of this interference. Correlated changes occur in systems which stand apart from each other if they were connected at some time in the past so that changes in one cause changes in the other (the Einstein-Poldolsky-Rosen experiment). It meant the death of the belief in determinism in human life, in pretraced destiny, as Deleuze and Guattari argue in *Anti-Oedipus*, as each system evolves in relation to the environment.

Everett attempted a return to realism and determinism, ruling out probability. According to Schrödinger's theory, the wave function collapses to a single state as the average result of values for position and momentum. On the contrary, Everett alleges that all of them are realised in parallel worlds.

Another source clearly alluded to in Norton's novel is the history of counterfactuals. Nial Ferguson edited a collection of essays on *Virtual History, Alternatives and Counterfactuals* in 1997 where he also surveys the tradition of this generic form in the Introduction. It is an old one. If pre-twentieth-century counterfactual histories, such as those written by Edward Gibbon, Charles Renouvier, or G.M. Trevelyan, do not mix up the real timeline and the hypothetical one, whose function is to highlight the meaning of the actual events, J.C. Squire's collection of counterfactual essays published in 1932, *If It Happened Otherwise*, abandons the confident tone, contaminated by the time's sense of uncertainty after the fall of the exact sciences into probabilistic speculation: Counterfactual history no longer seems to be of much help André Maurois goes as far as to decree: "There is no privileged past...

There is an infinitude of Pasts, all equally valid” (Maurois, 1932: 52).

Chaos and uncertainty, a sense of the absurd had descended upon a world which had already experienced the horrors of mass slaughter or total war, of bloody revolutions and totalitarian political regimes. The title of the novel betrays Andre Norton’s sense of a radical break with the past in recent history and collects out of the wisdom humanity had derived from the events. The horrors of the Gulag and of the concentration camps were not new or unique in history, the problem with them was their irruption as an atavistic manifestation of power in a modern world, benefitting by the political culture and social democracy that had emerged out of the luminaries’ discourses, the ideas of the Republic of Fraternity or the parliamentary reforms in Victorian England. The earth appears in the novel as a horizontal display of mirror worlds, bombed into ruins, burned into postapocalyptic ashes, swarming with monsters and haunted across worlds by a Hitler figure thirsty for power over others irrespective of costs. The universal psychopath merges in the end with Ares, the god of war.

The atmosphere is one of thick gloom, as, apart from the universal murderer Kmoat Vo Pranj, and the universal victim, David Blake, the scene is controlled by the military. Memories of the recently concluded war steal into the plot, with Pranj’s psychopathic fixation on power, with classified files, with humanity’s sense that there is no more known rational and transparent agency in history but only secretive movements of the hiders, of shadows, of agents under cover. Somehow, the world has sunk to a level similar to the subatomic one, which cannot be directly observed. Characters are defined by their psi function, the range of psychic powers, which similarly to the  $\Psi$  [PSI] wave function, depend for manifestation on the subject’s interference with the environment: Telepathy, Telekinesis, Clairvoyance, Pervision, Levitation...

David is told that some of his qualities can be realised only in certain types of society. The wave function itself being highly organized information, we may consider them analogous.

The novel observes generic constraints, the plot being entrusted the mission of extrapolating a scientific theory and carrying to its ultimate consequences. Offering to save the life of a guest at a hotel, David Blake finds himself locked away among agents from another earth, a more advanced version, who have a sanitary role, that of seizing would-be murderers and preventing them from robbing or subjecting the citizens of other worlds/ time lines. Now that he knows about them, he cannot be left behind either for his safety or their own. He is asked whether he has heard of possible worlds theory, and the example he gets reveals the traumatic effect of the second world conflagration, people's rampant fear that Hitler might not have been ultimately defeated:

"I've read some fantasy fiction founded on that. You mean that idea that two complete worlds stem from every momentous historical decision? One in which Napoleon won the Battle of Waterloo, say, and our own in which he lost it?"

"There are points of departure even within the past few years", the man across the table was continuing.

"Conceive a world in which Hitler won the Battle of Britain and overran England in 1941. Suppose a great leader is born too early or too late." (Norton, 1956: 10).

The way Norton poses the question of alternate sequences of events lets us suspect that her models were thinkers pondering on the best of all possible worlds that could have been built by humanity instead of the one that had actually settled in rather travels in time or to fantasy lands. The contributors to John Collings Squire's collection of imaginary essays published in 1932 ranked at the top of society with statesmen, biographers, historians, influential

writers, that is, people earnestly involved in key issues of humanity's destiny. Norton's speculations are analogous to the ones in the Collings Squire book, where W.S. Churchill wonders what would have happened "If Lee had not won the Battle of Gettysburg", G. Trevelyan, "If Napoleon had won the Battle of Waterloo", while André Maurois ponders on the fate of the French Revolution: "If Louis XVI Had Had an Atom of Firmness". Norton too has the feeling of having lived through a similar crisis in world history which invited to considerations of political and moral philosophy.

Saxton, the agent from another world, launches into a debate similar to the one Alexander Pope is trying to sort out in his *Essay on Man*, steering a middle way between Hobbes's view of predatory humans and Shaftesbury's idealized image of man born with a natural inclination towards kindness: self-love and social love should be balanced against each other so that man is neither a meteorite crashing into others nor a vegetative passive will, thwarted by peers. Science fiction opens a new page in its history verging on social criticism and moral philosophy. Nobody had been able to explain to Napoleon or to Hitler that neither were expected by Europeans to be enlightened by their revolution or burned to ashes by their Blitzkrieg:

"But suppose", Saxton had set down his cup and now he leaned forward his eyes alight, "suppose such a man, born out of his time in his own world, were given the ability to move from one possibility line to another—would he not be doubly dangerous? Suppose you were born in an era in which your own society stifled your particular talents, giving you, as you thought, no proper outlet." (10).

Having come to New York to attend a college for the arts, David is enthusiastic about the perspective of seeing his potential realized in some achievement of recognized

value: "But that was not the right answer this time. "For you, Saxton rapped out. "But perhaps not for the world you moved to. That presents another side to the problem doesn't it?" (Norton, 1956: 11)

Norton's narrative structure is more complex than the one usually found in popular culture. She uses for instance the laying in the abyss trope, David, the child found in the street by a law enforcement officer and adopted by him having a foil in a kitten found abandoned by the same victimizer, Pranj, in a sack and left to freeze to death. Saxton is training the cat in telepathy, which is also David's history in their company. The novel appropriates features of mainstream fiction being among the first to layer the fictional universe not only thematically – different timelines with points of contact for those travelling across – but also formally. There are elements of metafiction, David comparing himself to Robinson Crusoe when he gets to a New York of primitive stone towers, lost in the snow of a Central Park area destroyed by racial confrontation. His identity is of a participatory kind, stamped by the seal of a literary prototype. As the action is focalized through his eyes, we may say that the author identifies with his protagonist rather than using him simply as a narrative device. On the contrary, the agents visiting his timeline as well as the criminal undergo physical or moral changes as they hop from one timeline to another. Kittson and his team confess that the end of their world and the transfer to another one had been accompanied by their change into mutants. Norton's me-copies across the universe are among the earliest examples of postmodern unstable characters, mutants who can boast no precise identity.

Hoyt, another agent, has a theory about latents, by which he means a sort of atavistic leftovers, explained to be like the systems in relation influencing each other even at a distance, after the forking into parallel worlds as in the Einstein Podolsky-Rosen paradox:

“I don’t see why we should be surprised”, Hoyt contributed for the first time. “It stands to reason that since we were the same stock in the beginning, we’re going to discover latents here and there. We’re lucky that so far we haven’t run into any true power men.” (17).

A contemporary of the bloom of existentialism, Norton allows this philosophy to send echoes into the novel’s conversations. History is defined as the outcome of events (existence precedes essence), and a life which is the same day by day – lacking a project, we might say – is declared worthless.

At the beginning, David’s captors are completely indifferent to his person, but at the end they break the rules to let David live despite the secrets he had found out about them. The parallel worlds destroyed by war are getting back to the cultivation of the land but also to feelings and sensitivity.

The novel which earned Andre Norton fame is itself standing at the crossroads of traditional scientific romances and speculative fiction, which was no longer to be distinguished from mainstream fiction, such as that written by Kurt Vonnegut (time travel in *Slaughterhouse Five*), Jeanette Winterson (localization determined on the basis of wave function in *Gut Symmetries*), Angela Carter (interferences with another universe in *The Infernal Desire Machines of Doctor Hoffman*), or Ian McEwan (relativity of time in *The Child in Time*)<sup>3</sup>.

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<sup>3</sup> See Chapter “Time and Narrative” in Jago Morrison, *Contemporary Fiction* (2003: 26-39).

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