A Brief History of Black Holes

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Neither the layman nor the specialist, in general, have any knowledge of the historical circumstances underlying the genesis of the idea of the Black Hole. Essentially, almost all and sundry simply take for granted the unsubstantiated allegations of some ostentatious minority of the relativists. Unfortunately, that minority has been rather careless with the truth and is quite averse to having its claims corrected, notwithstanding the documentary evidence on the historical record. Furthermore, not a few of that vainglorious and disingenuous coterie, particularly amongst those of some notoriety, attempt to dismiss the testimony of the literature with contempt, and even deliberate falsehoods, claiming that history is of no importance. The historical record clearly demonstrates that the Black Hole has been conjured up by combination of confusion, superstition and ineptitude, and is sustained by widespread suppression of facts, both physical and theoretical. The following essay provides a brief but accurate account of events, verifiable by reference to the original papers, by which the scandalous manipulation of both scientific and public opinion is revealed.

It has frequently been alleged by theoretical physicists (e. g. [1, 2]) that Newton's theory of gravitation either predicts or adumbrates the black hole. This claim stems from a suggestion originally made by John Michell in 1784 that if a body is sufficiently massive, "all light emitted from such a body would be made to return to it by its own power of gravity". The great French scientist, P. S. de Laplace, made a similar conjecture in the eighteenth century and undertook a mathematical analysis of the matter.

However, contrary to popular and frequent expert opinion, the Michell-Laplace dark body, as it is actually called, is not a black hole at all. The reason why is quite simple.

For a gravitating body we identify an escape velocity. This is a velocity that must be achieved by an object to enable it to leave the surface of the host body and travel out to infinity, where it comes to rest. Therefore, it will not fall back towards the host. It is said to have escaped the host. At velocities lower than the escape velocity, the object will leave the surface of the host, travel out to a finite distance where it momentarily comes to rest, then fall back to the host. Consequently, a suitably located observer will see the travelling object twice, once on its journey outward and once on its return trajectory. If the initial velocity is greater than or equal to the escape velocity, an observer located outside the host, anywhere on the trajectory of the travelling object, will see the object just once, as it passes by on its outward unidirectional journey. It escapes the host. Now, if the escape velocity is the speed of light, this means that light can leave the host and travel out to infinity and come to rest there. It escapes the host. Therefore, all observers located anywhere on the trajectory will see the light once, as it passes by on its outward journey. However, if the escape velocity is greater than the speed of light, then light will travel out to a finite distance, momentarily come to rest, and fall back to the host, in which case a suitably located observer will see the light twice, once as it passes by going out and once upon its return. Furthermore, an observer located at a sufficiently large and finite distance from the host will not see the light, because it does not reach him. To such an observer the host is dark: a Michell-Laplace dark body. But this does not mean that the light cannot leave the surface of the host. It can, as testified by the closer observer. Now, in the case of the black hole, it is claimed by the relativists that no object and no light can even leave the event horizon (the "surface") of the black hole. Therefore, an observer, no matter how close to the event horizon, will see nothing. Contrast this with the escape velocity for the Michell-Laplace dark body where, if the escape velocity is the speed of light, all observers located on the trajectory will see the light as it passes out to infinity where it comes to rest, or when the escape velocity is greater than the speed of light, so that a suitably close observer will see the light twice, once when it goes out and once when it returns. This is completely opposite to the claims for the black hole. Thus, there is no such thing as an escape velocity for a black hole, and so the Michell-Laplace dark body is not a black hole. Those who claim the Michell-Laplace dark body a black hole have not properly understood the meaning of escape velocity and have consequently been misleading as to the nature of the alleged event horizon of a black hole. It should also be noted that nowhere in the argument for the Michell-Laplace dark body is there gravitational collapse to a point-mass, as is required for the black hole.

The next stage in the genesis of the black hole came with Einstein's General Theory of Relativity. Einstein himself never derived the black hole from his theory and never admitted the theoretical possibility of such an object, always maintaining instead that the proposed physical basis for its existence was incorrect. However, he was never able to demonstrate this mathematically because he did not understand the basic geometry of his gravitational field. Other theoreticians obtained the black hole from Einstein's equations by way of arguments that Einstein always objected to. But Einstein was over-ruled by his less cautious colleagues, who also failed to understand the geometry of Einstein's gravitational field.

The solution to Einstein's field equations, from which the black hole has been extracted, is called the "Schwarzschild" solution, after the German astronomer Karl Schwarzschild, who, it is claimed by the experts, first obtained the solution and first predicted black holes, event horizons, and Schwarzschild radii, amongst other things. These credits are so commonplace that it comes as a surprise to learn that the famous "Schwarzschild" solution is not the one actually obtained by Karl Schwarzschild, even though all the supposed experts and all the textbooks say so. Furthermore, Schwarzschild did not breathe a word about black holes, because his true solution does not allow them.

Shortly after Einstein published the penultimate version of his theory of gravitation in November 1915, Karl Schwarzschild [3] obtained an exact solution for what is called the static vacuum field of the point-mass. At that time Schwarzschild was at the Russian Front, where he was serving in the German army, and suffering from a rare skin disease contracted there. On the 13th January 1916, he communicated his solution to Einstein, who was astonished by it. Einstein arranged for the rapid publication of Schwarzschild's paper. Schwarzschild communicated a second paper to Einstein on the 24th February 1916 in which he obtained an exact solution for a sphere of homogeneous and incompressible fluid. Unfortunately, Schwarzschild succumbed to the skin disease, and died about May 1916, at the age of 42.

Working independently, Johannes Droste [4] obtained an exact solution for the vacuum field of the point-mass. He communicated his solution to the great Dutch scientist H. A. Lorentz, who presented the solution to the Dutch Royal Academy in Amsterdam at a meeting on the 27th May 1916. Droste's paper was not published until 1917. By then Droste had learnt of Schwarzschild's solution and therefore included in his paper a footnote in acknowledgement. Droste anticipated the mathematical procedure that would later lead to the black hole, and correctly pointed out that such a procedure is not permissible, because it would lead to a non-static solution to a static problem. Contra-hype!

Next came the famous "Schwarzschild" solution, actually obtained by the great German mathematician David Hilbert [5], in December 1916, a full year after Schwarzschild obtained his solution. It bears a little resemblance to Schwarzschild's solution. Hilbert's solution has the same form as Droste's solution, but differs in the range of values allowed for the incorrectly assumed radius variable describing how far an object is located from the gravitating mass. It is this incorrect range on the incorrectly assumed radius variable by Hilbert that enabled the black hole to be obtained. The variable on the Hilbert metric, called a radius by the relativists, is in fact not a radius at all, being instead a real-valued parameter by which the true radii in the spacetime manifold of the gravitational field are rightly calculated. None of the relativists have understood this, including Einstein himself. Consequently, the relativists have never solved the problem of the gravitational field. It is amazing that such a simple error could produce such a gigantic mistake in its wake, but that is precisely what the black hole is — a mistake for enormous proportions. Of course, the black hole violates the static nature of the problem, as pointed out by Droste, but the black hole theoreticians have ignored this important detail.

The celebrated German mathematician, Hermann Weyl [6], obtained an exact solution for the static vacuum field of the point-mass in 1917, by a very elegant method. He derived the same solution that Droste had obtained.

Immediately after Hilbert's solution was published there was discussion amongst the physicists as to the possibility of gravitational collapse into the nether world of the nascent black hole. During the Easter of 1922, the matter was considered at length at a meeting at the Collège de France, with Einstein in attendance.

In 1923 Marcel Brillouin [7] obtained an exact solution by a valid transformation of Schwarzschild's original solution. He demonstrated quite rigorously, in relation to his particular solution, that the mathematical process, which later spawned the black hole, actually violates the geometry associated with the equation describing the static gravitational field for the point-mass. He also demonstrated rigorously that the procedure leads to a non-static solution to a static problem, just as Droste had pointed out in 1916, contradicting the very statement of the initial problem to be solved — what is the gravitational field associated with a spherically symmetric gravitating body, where the field is unchanging in time (static) and the spacetime outside the body is free of matter (i. e. vacuum), other than for the presence of a test particle of negligible mass?

In mathematical terms, those solutions obtained by Schwarzschild, Droste and Weyl, and Brillouin, are mutually consistent, in that they can be obtained from one another by an admissible transformation of coordinates. However, Hilbert's solution is inconsistent with their solutions because it cannot be obtained from them or be converted to one of them by an admissible transformation of coordinates. This fact alone is enough to raise considerable suspicions about the validity of Hilbert's solution. Nonetheless, the relativists have not recognised this problem either, and have carelessly adopted Hilbert's solution, which they invariably call "Schwarzschild's" solution, which of course, it is certainly not.

In the years following, a number of investigators argued, in one way or another, that the "Schwarzschild" solution, as Hilbert's solution became known and Schwarzschild's real solution neglected and forgotten, leads to the bizarre object now called the black hole. A significant subsequent development in the idea came in 1949, when a detailed but erroneous mathematical study of the question by the Irish mathematical physicist J. L. Synge [8], was read before the Royal Irish Academy on the 25th April 1949, and published on the 20th March 1950. The study by Synge was quite exhaustive but being based upon false premises its conclusions are generally false too. Nonetheless, this paper was hailed as a significant breakthrough in the understanding of the structure of the spacetime of the gravitational field.

It was in 1960 that the mathematical description of the black hole finally congealed, in the work of M. D. Kruskal [9] in the USA, and independently of G. Szekeres [10] in Australia. They allegedly found a way of mathematically extending the "Schwarzschild" solution into the region of the nascent black hole. The mathematical expression, which is supposed to permit this, is called the Kruskal-Szekeres extension. This formulation has become the cornerstone of modern relativists and is the fundamental argument upon which they rely for the theoretical justification of the black hole, which was actually christened during the 1960's by the American theoretical physicist, J. A. Wheeler, who coined the term.

Since about 1970 there has been an explosion in the number of people publishing technical research papers, textbooks and popular science books and articles on various aspects of General Relativity. A large proportion of this includes elements of the theory of black holes. Quite a few are dedicated exclusively to the black hole. Not only is there now a simple black hole with a singularity, but also naked singularities, black holes without hair, supermassive black holes at the centres of galaxies, black hole quasars, black hole binary systems, colliding black holes, black hole x-ray sources, charged black holes, rotating black holes, charged and rotating black holes, primordial black holes, mini black holes, evaporating black holes, wormholes, and other variants, and even white holes! Black holes are now "seen" everywhere by the astronomers, even though no one has ever found an event horizon anywhere. Consequently, public opinion has been persuaded that the black hole is a fact of Nature and that anyone who questions the contention must be a crackpot. It has become a rather lucrative business, this black hole. Quite a few have made fame and fortune peddling the shady story.

Yet it must not be forgotten that all the arguments for the black hole are theoretical, based solely upon the erroneous Hilbert solution and the meaningless Kruskal-Szekeres extension on it. One is therefore lead to wonder what it is that astronomers actually "see" when they claim that they have found yet another black hole here or there.

Besides the purely mathematical errors that mitigate the black hole, there are also considerable physical arguments against it, in addition to the fact that no event horizon has ever been detected.

What does a material point mean? What meaning can there possibly be in the notion of a material object without any spatial extension? The term material point (or point-mass) is an oxymoron. Yet the black hole singularity is supposed to have mass and no extension. Moreover, there is not a single shred of experimental evidence to even remotely suggest that Nature makes material points. Even the electron has spatial extent, according to experiment, and to quantum theory. A "point" is an abstraction, not a physical object. In other words, a point is a purely mathematical object. Points and physical objects are mutually exclusive by definition. No one has ever observed a point, and no one ever will because it is unobservable, not being physical. Therefore, Nature does not make material points. Consequently, the theoretical singularity of the black hole cannot be a point-mass.

It takes an infinite amount of observer time for an object, or light, to reach the event horizon, irrespective of how far that observer is located from the horizon. Similarly, light leaving the surface of a body undergoing gravitational collapse, at the instant that it passes its event horizon, takes an infinite amount of observer time to reach an observer, however far that observer is from the event horizon. Therefore, the black hole is undetectable to the observer since he must wait an infinite amount of time to confirm the existence of an event horizon. Such an object has no physical meaning for the observer. Furthermore, according to the very same theoreticians, the Universe started with a Big Bang, and that theory gives an alleged age of 14 billion years for the Universe. This is hardly enough time for the black hole to form from the perspective of an external observer. Consequently, if black holes exist they must have been created at the instant of the Bang. They must be primordial black holes. But that is inconsistent with the Bang itself, because matter at that "time", according to the Big Bang theoreticians, could not form lumps. Even so, they cannot be detected by an external observer owing to the infinite time needed for confirmation of the event horizon. This now raises serious suspicions as to the validity of the Big Bang, which is just another outlandish theory, essentially based upon Friedmann's expanding Universe solution, not an established physical reality as the astronomers would have us believe, despite the now commonplace alleged observations they adduce to support it.

At first sight it appears that the idea of a binary system consisting of two black holes, or a hole and a star, and the claim that black holes can collide, are physical issues. However, this is not quite right, notwithstanding that the theoreticians take them as well-defined physical problems. Here are the reasons why these ideas are faulty. First, the black hole is allegedly predicted by General Relativity. What the theoreticians routinely fail to state clearly is that the black hole comes from a solution to Einstein's field equations when treating of the problem of the motion of a test particle of negligible mass in the vicinity of a single gravitating body. The gravitational field of the test particle is considered too small to affect the overall field and is therefore neglected. Therefore, Hilbert's solution is a solution for one gravitating body interacting with a test particle. It is not a solution for the interaction of two or more comparable masses. Indeed, there is no known solution to Einstein's field equations for more than one gravitating body. In fact, it is not even known if Einstein's field equations actually admit of solutions for multi-body configurations. Therefore, there can be no meaningful theoretical discussion of black hole binaries or colliding black holes, unless it can be shown that Einstein's field equations contain, hidden within them, solutions for such configurations of matter. Without at least an existence theorem for multi-body configurations, all talk of black hole binaries and black hole collisions is twaddle (see also [11]). The theoreticians have never provided an existence theorem.

It has been recently proved that the black hole and the expanding Universe are not predicted by General Relativity at all [12, 13], in any circumstances. Since the Michell-Laplace dark body is not a black hole either, there is no theoretical basis for it whatsoever.

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