The March issue of *Resonance* and this one both highlight many of Einstein’s profound contributions to physics. But there is no doubt that it was the theory of gravitation which firmly established him as the scientist of the century in the popular mind. This theory has come to be known as the general theory of relativity – GTR. The special theory of relativity had already shaken the old ideas of space and time. Now the new idea that space and time could be curved acquired wide notoriety. The apparently abstruse mathematics behind GTR, out of reach of most physicists, let alone laymen, certainly contributed to the general sense of awe. According to one story, the English astronomer Eddington was asked whether it was true that only three people understood Einstein’s theory of gravitation. He is supposed to have hesitated because he was trying to trace who could be the third!

But the legend of a tiny number understanding GTR is something of a distortion. In reality, many people followed up Einstein’s ideas. The effort and focus required to create a new theory is so great that the originator can miss important consequences, which are left for others to discern. For example, the exact mathematical description of the gravitational field around a spherical mass was given by the German astronomer, Schwarzschild. It is remarkable that he was able to do this while virtually on his deathbed during World War I in 1916, only months after Einstein had published his equations. Even more remarkably, the full physical meaning of Schwarzschild’s mathematics – that it could also describe black holes – was not fully understood till work by Finkelstein as late as 1951. A truly great theory is greater than its creator. It continuously reveals new riches when reexamined by the best minds.

There are other stories which have become part of the GTR lore. One of them relates to Eddington himself. He was brought up as a Quaker. This meant that his beliefs forbade him from
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Over eighty years have passed since Einstein formulated the general theory of relativity, but its reputation for depth and conceptual beauty remains unmatched. Let us hear testimony from two physicists of the highest critical standards. Lev Landau in Russia, with his student, Evgeny Lifshitz, wrote an epic seven volume Mahabharata of theoretical physics between 1937 and 1962 (three were added later). (The parallel is apt: Lifshitz, like Ganesha, was the disciple whose speed and intelligence kept his master Landau perpetually on his toes.) These authors did not believe in wasted words and unnecessary praise, but this is what they say about GTR – “The theory of gravitational fields, constructed on the basis of the theory of relativity, ... represents probably the most beautiful of all existing physical theories. It is remarkable that it was developed by Einstein in a purely deductive manner and only later was substantiated by astronomical observations”. There are hardly any other aesthetic statements in the volumes. The case for Einstein being the physicists’ physicist rests. Of course, Einstein wasn’t just a genius – he was also a human being. Maja Einstein’s biographical sketch in this issue (and the Reflections by John Stachel in the August-98 issue) tell us about the man behind the physicist.

Because GTR describes phenomena on very large length scales, it became the province of astronomers. And because the equations were so difficult, it attracted applied mathematicians for many decades. Each new solution of these equations was a milestone in the nineteen thirties and forties. Two Indian names, Bannerjee and Vaidya, appear in this roll of honour.
Today, the emphasis has shifted to grander visions of physics which incorporate GTR (our January issue) along with the other fundamental forces.

Even Einstein cannot eclipse all the other things we carry in this issue. Take the age old question – if evolution by natural selection is survival of the fittest, how come we seem to see examples of co-operation, even altruism, in the living world? We will not give away the secret, but only say it teaches us that naive pictures of evolution – nature red in tooth and claw – need to be checked by careful observation and reasoning. Of course, when one comes to one part of the living world viz. human societies - these issues acquire both great interest and great complexity. A conservative astrophysicist might well say that one should understand the earth or sun before trying to understand the universe. A similar view on the application of biology to human societies would point out how incomplete our understanding is even with regard to birds or insects. Such views will not prevent braver souls from doing cosmology or sociobiology. The latter term was originally used to cover all societies in the living world, but seems to have been usurped by the application to ourselves. Human sociobiology is so tempting that all of us are bound to be exposed to wilder manifestations in the years to come. Articles like the one we carry on conflict and co-operation will help you keep a level head.

Medicine is not merely one of the life sciences. Its job is not just to study life but to literally give it. Its concern for humans is deep, responsible, urgent. It has no room for some of the luxuries of speculation that sociobiologists can afford. Our piece on photodynamic therapy gives a good example of how all is grist to the doctors’ mill. Progress in lasers and better understanding of how they act on molecules are harnessed to fight cancer. In fact, history shows that doctors did not wait for full understanding. If they did, we might not even be taking aspirin. But our times are different from those of the pioneers. A lot of the detailed knowledge which seemed out of reach – about genes and biological molecules in general – is pouring in. Harnessing this flood is very much an open area.