Darwinism comprehended as a permission to be "weak"[1]

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Fitness signifies the fitting of a key with a lock. If the lock changes, the same key is no longer fitting. Thus, fitness must not stagnate either. Nor is fitness something narrowly defined like the scores of a soccer game or the speed of a sprinter at the Olympic Games. In biological "games" many more than three "champions" are receiving medals of victory. The puzzle about Darwininan evolution is not the survival of the fittest but the exuberance of survival of the *less* fit. This is also the origin of the miraculous diversity of life forms.

When Charles Darwin, back in London from the Galápagos Islands, had a closer look at the bird's bodies he brought from the islands, he discovered a surprising number of new species of finches, with very unusual adaptations. His explanation, quite correctly, was that in the isolation of the islands, i.e. in the absence of rivals from other taxa finches were able to develop the most astonishing adaptations. From the point of view of a woodpecker, the finch using a cactus spine to collect insects from the bark of trees, is a ridiculously "weak" competitor. But they don't compete because they are mutually isolated.

One phenomenon of diversity in particular deserves our attention. It is the diversity rich gene pool which conceptually was establishes in the early 1930s by Ronald Fisher, C.B.S. Haldane and Sewall Wright. The remarkable thing about it in terms of diversity is that it allows "weak" genes to accumulate if they are "recessive" i.e. usually invisible in the phenotype. The mechanism of recessivity appears almost as being *designed* to protect lots of "weak" genes from being eradicated. This plainly contradicts the vulgar perception of the Darwinian selection mechanism.

However, looking at recessivity from a long term evolutionary perspective, it appears rather ingenious. Recessivity combined with the steady occurrence of new mutations leads to the accumulation in large populations of a huge diversity of genes and their combinations. If the population is decimated by environmental stress, parasites or predators, small pockets of mutually isolated populations are likely to survive. In these very small populations inbreeding drastically increases which statistically enhances the probability for homoallel occurrence of recessive genes. This in turn means that now the once hidden genes have a high likelihood of becoming expressed. There will be a certain distinct probability for some of those genes of being useful for overcoming the new stress factors.

Primitive breeders Darwinism is inclined to depict recessivity as a lamentable mechanism preventing the swift eradication of unwanted genetic factors. But such complaints don't do justice to the mechanism. Quite often, the recessive gene carries a feature that is useful for survival. Perhaps best known are the malaria and betathalassemia resistances enjoyed by heteroallel carriers of the sickle cell anemia gene. Heteroallel carriers of the muscoviscidose gene seem to have a higher robustness against infant diarrhea. And the heteroallel disposition for diabetes appears to be adavantageous in times of hunger.

Vulgar Darwinism now appears as biologically *bad* Darwinism not accounting for the occurrence from time to time of novel stress situations for which the existing wild type may just not be well prepared while some sleeping variants carry the answer to the new challenge.

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Moreover, certain conspicuous “strong” features such as the size of the dinosaurs or the formidable teeth of pre-neolithic sabre tooth tigers don’t seem to be successful under all circumstances. Otherwise their carriers would not have become extinct. Evolution must not be ”streamlined” too much. It ought to be kept open to be successful in the long range. Also, mutations should not be avoided at any price even in a very successful species. As Ronald Fisher (1930, p35) put it, ”the rate of increase in fitness of any organism at any time is equal to its genetic variance in fitness at that time.”

”Weak” variants are protected against premature selection, and a sufficient supply of new ”weak”variants is constantly provided by the mechanism of mutation. This must be an extremely old and fundamental mechanism of evolution.