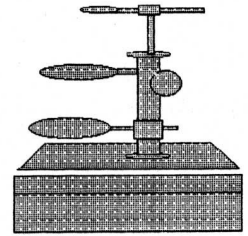


How Brown saw Brownian Movement

by *Brian J Ford*



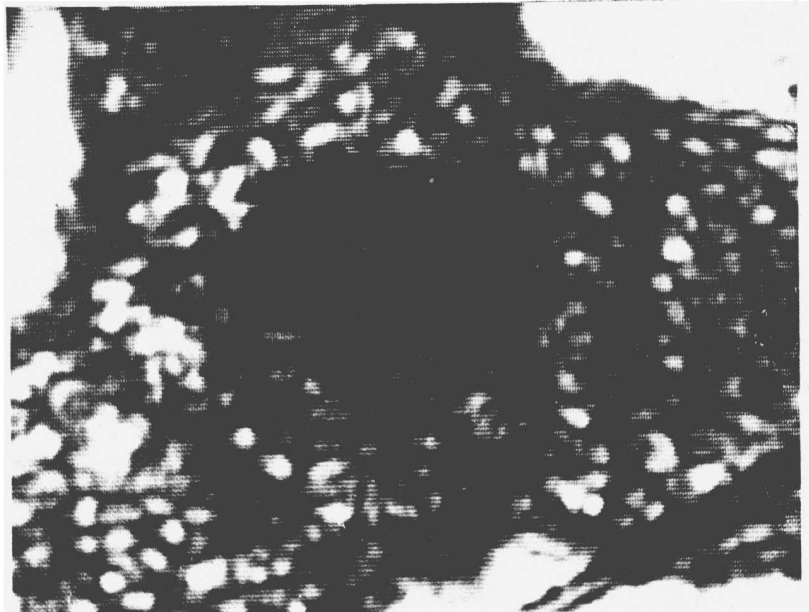
Robert Brown observed Brownian Movement in the summer of 1827.

It occurred in what he came to term "active molecules" and it may be surmised that his initial impression was that the phenomenon concerned the mechanisms of life itself.

It is easy to see why this might be, for the sight of molecular agitation within pollen grains easily conveys the impression that here we are witnessing life at work.

Brown has often been alleged to have reported seeing the phenomenon as the agitation "of pollen grains", indeed the recent accounts by Deutsch of Pasadena, California, have been founded on this common misapprehension. However, a reading of Brown's original notes shows that he was witnessing the effect "within pollen" and was not describing movement of the entire cells themselves.

This is clearly a problem, for Brown's microscope is a diminutive instrument. It is a simple (i.e. single-lensed) microscope, and has been described as "little more than a common dissecting microscope". However, these single-lensed instruments were capable of producing images of a higher quality than it is popular to concede. It has been shown elsewhere that particulate structures of sub-bacterial dimensions are easily resolved by a Leeuwenhoek lens of the seventeenth century, for instance, and Brown's own microscope can allow the microscopist to visualise particulate structures below 2 microns in diameter (well within the order of size at which Brownian Movement becomes apparent).



POLLEN GRAIN OF CLARKIA IMAGED THROUGH
BROWN'S MICROSCOPE x250

But theoretical considerations are not what here concern us. There is but one question that must be addressed, and it is this: could the original microscope be used to demonstrate Brownian Movement in the material in which Robert Brown himself claimed to observe it? The results are shown on a videomicrographic record of the observations made in July 1992 and first exhibited at Inter-Micro in Chicago during August.

Brownian Movement is an unmistakable phenomenon, familiar to all experienced microscopists. This record is clear testimony to the excellence of Brown's abilities. Not only was he a conscientious and capable microscopist, but he was sufficiently broad-minded and self-critical as to elaborate a series of demonstrations that proved, once and for all, that the phenomenon was not a concomitant of life.

His microscopical discoveries were many. He also uncovered the naked ovule of the gymnospermae and is the man who named the cell "nucleus". But his name remains most familiarly attached to Brownian Movement, and in this record we can satisfy ourselves of what Brown himself saw in the summer of 1837.

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