

## ON THE CONSERVATION OF ENERGY AND THE NATURE OF FORCE.

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*Read before the Canadian Institute, March 17th, 1877.*

The progress of scientific investigation has led to the discovery of innumerable laws by which the modes of material action are governed, and to which the various phenomena of the physical universe are referred. Having given certain observed facts and one or more of these natural laws as premises, we can, by a mere logical process, infer the resulting phenomena, the constant agreement of inferences thus drawn with observation affording accumulating evidence as to the truth of the laws.

Nevertheless, these laws are mysterious; and although we feel certain of their truth, there are many of us who cannot feel satisfied until we have discovered how and why they are as they are.

There is a space not yet bridged over between what are generally considered the necessary or essential properties of matter and its various laws of action. For instance, the ideas of form, extension in three dimensions, impenetrability and mass, seem to be properties without which we cannot conceive a material body to exist; but it is quite otherwise with gravity, or the various attractions and repulsions manifested in chemical and electrical phenomena. The fields open to science cannot be considered as fully explored until these laws have been shown to be necessary consequences; that is to say, logical deductions from the essential properties of matter, and some hypothesis as to the arrangement of matter.

The scientific world is at present divided into two great classes in regard to the nature of the action of matter on matter. One of these is content to rest with the assumption that it is possible for one body to affect the motion of another at a distance, according to the observed