

When sugar is burned it is converted into water and carbon dioxide, which cannot be induced to turn back into sugar again by any amount of variation in temperature, pressure, concentration or electrical conditions. But, in a wider sense, this reaction is just as little "non-reversible" as the others—how was the sugar formed in the first place, if not from carbon dioxide and water in a plant?

The non-reversible chemical reactions are merely the last terms in a series of which the physical reactions are the simplest members, and the reversible chemical reactions the intermediate terms. And just as the physical reactions are connected with the chemical on the one hand, so they are on the other with changes which nobody calls "reactions" at all. Hot and cold iron are "the same thing," and so are, compressed and rarefied air; yet the change from one to the other involves the absorption or evolution of heat, change in density and colour, and change in chemical properties as well:—hot iron with oxygen and water gives the magnetic oxide, cold iron the sesquioxide; compressed air is more soluble in water than air at ordinary pressure.

Thus, though for practical purposes distinctions are introduced, it is important to remember that they are distinctions of degree only, not of kind; and that between the simplest physical experiments and the most complicated chemical reactions there is a complete series of connecting links.

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