The Introduction

The thesis addresses the history of Algorithmic Information Theory, also known as Kolmogorov Complexity, with the research section adding to this history with the examination of a 'Sub-Maximal Measure of Kolmogorov Complexity'. I will use the terms Algorithmic Information Theory and Kolmogorov Complexity synonymously during the course of this thesis.

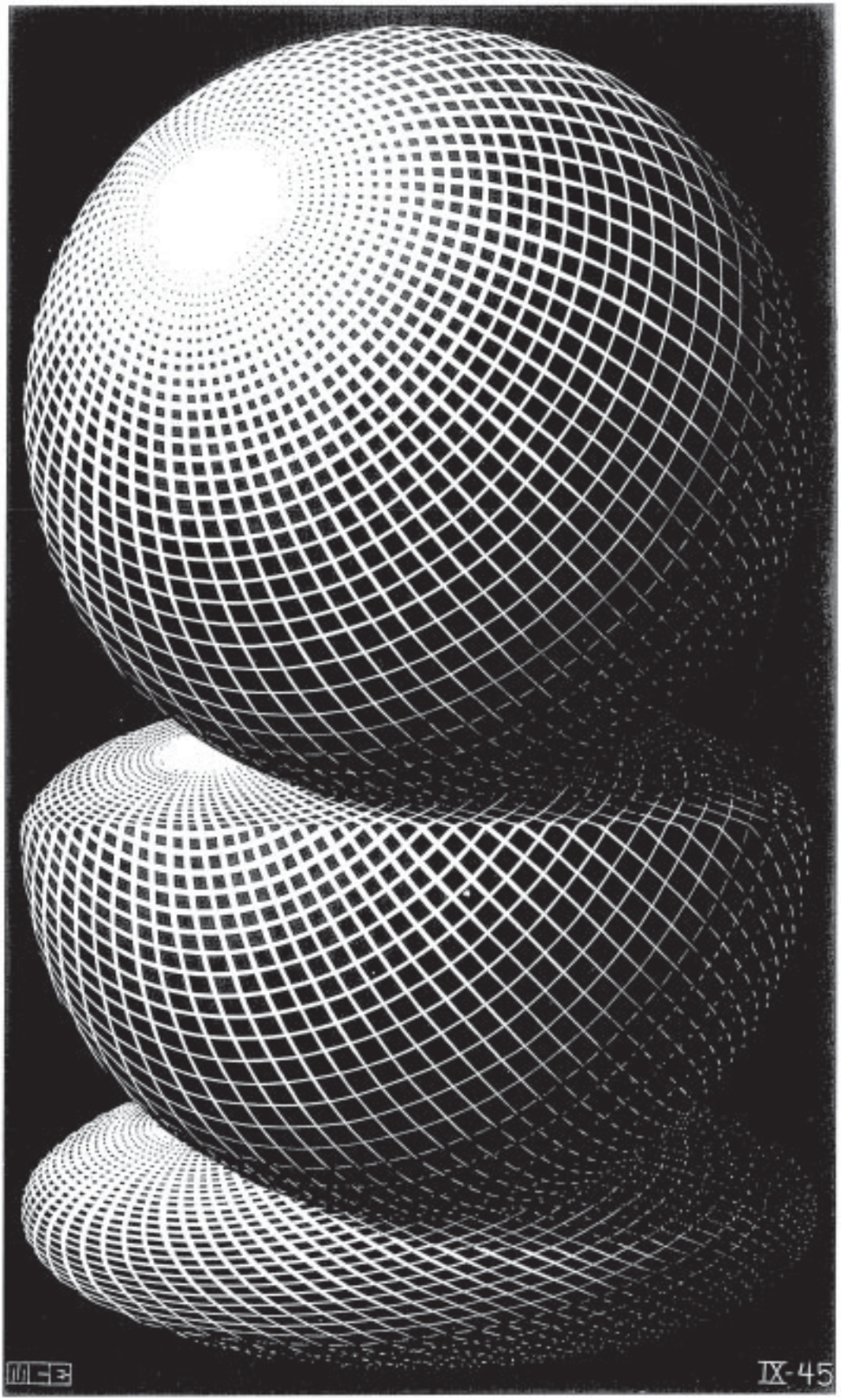
Landauer has stated that information has a physical form (Landauer, 1984: 161 and 1993). Landauer notes that the study of the ultimate limits in computing is in its early stages and it is easier to ask questions than to answer them (Landauer, 1984: 161).

The thesis is in some respects two divergent works in that the review of literature is more a historical time line told as a story and the remaining chapters the mechanics of Kolmogorov complexity. While not fiction, I am in agreement with Levin (2006) that "science without storytelling collapses into a set of equations or a ledger full of data" (Levin, 2006: 45).

The index of terminology should help in defining major ideas found in this thesis and the chapter on the history of algorithmic information theory gives a

short overview of it's founding in the mid-1960's to the present. The research aspect to this work is in the chapter on a sub-maximal measure of Kolmogorov Complexity that presents a new measure of the randomness of a binary bit string. The section on binary, ternary and quaternary-based systems of symbols is followed by a chapter on monochromatic and chromatic symbols as they relate to writing, reading, and printing entropy and information. The last chapter is on data compression for algorithmic information theory and how this compression relates to fundamental aspects of information theory.

In working on this thesis I am reminded of the comment by the Hungarian biochemist Albert Szentz-Gyorgyi (1893-1986) that scientific research involves seeing what everyone else has seen but thinking what no one else has thought (Atkins, 2005: 113).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