Gullies on Mars resemble terrestrial gullies involved in the transport of abundant material down steep slopes by liquid water. However, liquid water should not be stable at the Martian surface. The articles in this volume present the two main opposing theories for Martian gully formation: climate-driven melting of surficial water-ice deposits and seasonal dry-ice sublimation. The evidence presented ranges from remote-sensing observations, to experimental simulations, to comparison with Earth analogues. The opposing hypotheses imply either that Mars has been unusually wet in the last few million years or that it has remained a cold dry desert – both with profound implications for understanding the water budget of Mars and its habitability. The debate questions the limits of remote-sensing data and how we interpret active processes on extra-terrestrial planetary surfaces, even beyond those on Mars, as summarized by the review paper at the beginning of the book.