

## III

## COSMIC EVOLUTION

But, for the scientist, these are matters of little moment. He, at least, is not obliged to take any stand concerning them. This could hardly be better illustrated than by our new facts themselves. For it seems to be clear that where science is most self-sufficient, at the very basis of physical science itself, *if anywhere*, teleology is at work. Yet it is certain that physical science needs no teleology to explain its phenomena and processes. These are mechanisms, and since the publication of Newton's "Principia" no one has seriously doubted the fact.<sup>1</sup>

To-day there is as little room for doubt that a complete description of cosmic evolution in terms of matter and energy is possible; for it is sound scientific doctrine that what exists in the finished solar system depends upon what already existed in the nebula. The forms and states and quantities of matter and energy in the nebula determine the resulting solar system. Further, since both nebulae and solar systems are common oc-

<sup>1</sup> Laplace's reply to a question of Napoleon's, "Why the name of God did not occur in his 'Mécanique celeste,'" will be recalled: "Sire, je n'ai pas besoin de cet hypothèse."