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## SOME PROBLEMS OF COSMICAL PHYSICS, SOLVED AND UNSOLVED<sup>1</sup>

By LORD RAYLEIGH, F.R.S.

OF the activities of our section, the Cape has perhaps been more identified with astronomy than with any other branch. In the middle of the eighteenth century, when exact astronomy of the southern hemisphere may be considered to have begun, there were few, if any, other places in a considerable southern latitude where an astronomer could work in safety with the necessary help of trained artisans. This tradition worthily begins with Lacaille (1750-51). Other landmarks were the foundation of the Cape Observatory (1821), the expedition of Sir John Herschel (1833-38) and the forceful and energetic career of Sir David Gill, who was the life and soul of our organization on its visit to South Africa in

<sup>1</sup> Address of the president of Section A—Mathematical and Physical Sciences, British Association for the Advancement of Science, Cape Town, South Africa, July 24, 1929.

1905. Shortly afterwards he retired, and I then had the privilege of friendship with him in London. Indeed, I have taken these few facts and dates from the copy of his "History of the Cape Observatory," which he gave me very shortly before his death. Although past his prime at the time I knew him, he was still vigorous and keenly interested in scientific developments, though if one brought anything new to his notice a severe cross-examination as to the validity of the evidence had to be faced.

It is partly on account of this association of South Africa with astronomy that I have chosen to lean as far towards this direction as I feel able, and to pass in review some subjects lying on the border-line between astronomy and physics.

After the first period of success in identifying the origin of the spectral lines of the sun and stars with

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