

known to the unknown, from that which is visible to that which is invisible, and constructs an artificial picture or model in and through which the external world can be mentally grasped and studied.

But it took a long time before this was clearly recognised by either naturalists or philosophers. The thinker who in the middle of the century probably represented the clearest views on the subject was, as I mentioned above, Lotze himself. His interest, however, did not lie in the direction of assisting the exact sciences,<sup>1</sup> but rather in defining the correct position of the biological sciences and in preparing the way for an idealistic conception of things by showing the insufficiency of all purely mechanical or materialistic reasoning. In the meantime a great variety of interests combined to effect that change in our fundamental notions which has taken place in the course of the latter half of the nineteenth century. Germany and England each made independent and original contributions; France, as we shall see, took up the subject much later, but then likewise in an original spirit.<sup>2</sup>

To begin with this country: Mill had already in his 'Logic' analysed some of the fundamental notions em-

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New criti-  
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notions.

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J. S. Mill.

<sup>1</sup> Lotze's earliest published tract, his "inaugural dissertation," had the title 'De futuræ Biologiæ principiis philosophicis.' 1838.

<sup>2</sup> It should, however, not be overlooked that Charles Renouvier already in the first edition of his 'Essais de critique générale' (1854-1864), and still more in the second edition (1875), gave a very clear analysis and criticism of the fundamental notions employed in the sciences of nature and mind, and it

is significant of the age when he wrote that his criticisms were as little estimated at their true value as were those of Lotze ten years earlier in Germany. Both Lotze and Renouvier seem to have been entirely unknown to Mill as well as to Spencer, whose writings, through their influence on followers as well as on opponents, effected a gradual clearance of first principles in this country. There is, however, no doubt that for a whole generation,