

**HOW TO DRAW A  
STRAIGHT LINE; A  
LECTURE ON LINKAGES**

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How to Draw a Straight Line; A Lecture on Linkages by A. B. Kempe

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Alexander Zivert

HOW TO DRAW A STRAIGHT LINE;

A

LECTURE ON LINKAGES.

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## NOTICE.

THIS Lecture was one of the series delivered to science teachers last summer in connection with the Loan Collection of Scientific Apparatus. I have taken the opportunity afforded by its publication to slightly enlarge it and to add several notes. For the illustrations I am indebted to my brother, Mr. H. R. KEMPE, without whose able and indefatigable co-operation in drawing them and in constructing the models furnished by me to the Loan Collection I could hardly have undertaken the delivery of the Lecture, and still less its publication.

7, CROWN OFFICE ROW, TEMPLE,  
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## HOW TO DRAW A STRAIGHT LINE:

### A LECTURE ON LINKAGES.

THE great geometrician Euclid, before demonstrating to us the various propositions contained in his *Elements of Geometry*, requires that we should be able to effect certain processes. These *Postulates*, as the requirements are termed, may roughly be said to demand that we should be able to describe straight lines and circles. And so great is the veneration that is paid to this master-geometrician, that there are many who would refuse the designation of "geometrical" to a demonstration which requires any other construction than can be effected by straight lines and circles. Hence many problems—such as, for example, the trisection of an angle—which can readily be effected by employing other simple means, are said to have no geometrical solution, since they cannot be solved by straight lines and circles only.

It becomes then interesting to inquire how we can effect these preliminary requirements, how we can describe these circles and these straight lines, with as much accuracy as the physical circumstances of the problems will admit of.