Character of Ground.	Great Britain.	India.	Switzerland.
	Foot.	Foot.	Foot.
Nearly level, very favorable circumstances of weather.	**.0230**	**.0142**	.0125
Slightly undulating, gradients not exceeding 1 in 100.	.0238	.0168	.0148
Gradients between 1 in 100 and 1 in 20.	.0379	**.0208**	.0183
Gradients between 1 in 20 and 1 in 10.	**.0566**	**.0350**	.0308
Gradients steeper than 1 in 20.			.0416

Note.—The quantities in bold face type are estimated from analogy afforded by Swiss levelling, as no direct data could be furnished.

In illustration of the high degree of accuracy attained over long lines, the following is taken from the report of the levelling operations in India for 1866, by Colonel Walker :—

Section.	Length in Miles.	Maximum Divergence of two Observers.	Terminal Divergence.
		Foot.	Foot.
Calcutta to Tilliagarhi.	242	0.20	0.15
Tilliagarhi to Patka Gerouli.	346	0.40	0.38
Agra to Patka Gerouli.	342	0.15	0.05

Some excellent results over duplicated lines have in recent years been obtained with the Wye levels used in the engineering branch U. S. A. The methods adopted were practically those of precision levelling. As an example of these I extract the following :—

Section.	Length in Miles.	Max. Divergence of two observers in feet.	Terminal Divergence in Feet.
Sioux City to Fort Randal	179	.082	.060
Fort Randall to Pierre, Dak.	190	.156	.154

The best levelling has however undoubtedly been done in Switzerland. The field rules there adopted are as follows :—

1. The levelling to be executed by equal rights whenever possible ; the difference between the length of back and fore sights never to exceed ten metres.
2. The length of sight is as a rule to be limited as under :—
   (*a*) Upon railroads with gradients 1 in 100, to 100 metres.
   (*b*) " " " steep gradients 50, to 100 metres.
   (*c*) " highroads in the plains 36,to 60 metres.
   (*d*) " mountain roads 10, to 25 metres.
3. The spirit level to be always shaded from the sun.
4. The three instrumental errors, viz.: Collimation of optical axis, inequality of pivots, and bubble error to be determined at least once each day.
5. The field work to be carried on continuously except on wet or windy days. Three kilometres at least should be the length of line levelled per day along railways and two along highways.
6. Bench marks to be made at every kilometre, and to be clearly described in the field book.

In preparing this paper I have endeavoured to touch upon all classes of engineering levelling, naturally however the subject being one which bears more particularly on geodesic work, I have given greater attention to that department. In deprecation of a possible criticism to the effect that the major portion of the methods herein detailed are of no consequence to "practical" Engineers, I would beg to remind any so disposed that possibly their particular line of work has not embraced the whole sphere of labours of the profession. I would also wish to express the hope that the members of the Canadian Society of Civil Engineers may at some day not far distant be called to do geodesic levelling within the boundaries of their own country.