24. *Correction to my paper entitled "Blocks in the Earth's Crust and Their Movements, Part I".*

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In discussing the order of magnitude of the correction term due to topographical slope that should be added to the calculated gradients of the vertical displacements, $\delta h/s$, in the paper entitled "Blocks in the Earth's Crust and their Movements (Part I)", the following approximate relation upon which the discussions are based was introduced:

$$\tan\phi \fallingdotseq \frac{\delta h}{s}.$$

Although it does not materially affect the conclusion deduced in the paper referred to, it has since occurred to me that, in the discussion on the order of magnitude of the correction term due to topographical slope, the same might have been treated more rigorously than has been done.

From Fig. 1 in the paper, we have

$$\tan\phi=\tan(\varphi'-\varphi)$$
$$=\frac{\tan\varphi'-\tan\varphi}{1+\tan\varphi'\tan\varphi},$$

where
$$\tan\varphi'=\frac{B'C'}{AC'}=\frac{h+\delta h}{s-\delta s},$$
$$\tan\varphi=\frac{h}{s},$$
$$AC=s,$$

and
$$AC'=AC-CC'=s-\delta s.$$

We then have

$$\mathrm{trn}\varphi'-\tan\varphi=\frac{h+\delta h}{s-\delta s}-\frac{h}{s}=\frac{s\delta h+h\delta s}{s(s-\delta s)},$$

and
$$1+\tan\varphi'\tan\varphi=\frac{s(s-\delta s)+h(h+\delta h)}{s(s-\delta s)}.$$

1) M. MIYABE, *Bull. Earthq. Res. Inst.*, 9 (1931), 256.

$$\therefore \quad \tan\phi=\frac{s\delta h+h\delta s}{ss+hh-s\delta s+h\delta h}$$

$$=\frac{\delta s}{s}\left\{1+\left(\frac{h}{s}\right)^2-\frac{\delta s}{s}+\left(\frac{h}{s}\right)\frac{\delta h}{s}\right\}^{-1}$$

$$+\frac{\delta sh}{ss}\left\{1+\left(\frac{h}{s}\right)^2-\frac{\delta s}{s}+\left(\frac{h}{s}\right)\frac{\delta h}{s}\right\}^{-1}$$

$$=\frac{\delta h}{s}\left\{1+\tan^2\varphi-\frac{\delta s}{s}+\frac{\delta h}{s}\cdot\tan\varphi\right\}^{-1}$$

$$+\frac{\delta s}{s}\tan\varphi\left\{1+\tan^2\varphi-\frac{\delta s}{s}+\frac{\delta h}{s}\cdot\tan\varphi\right\}^{-1}.$$

The principal terms of correction due to topographical slope are therefore $-\left(\frac{\delta h}{s}\right)\tan^2\varphi$, $-\left(\frac{\delta h}{s}\right)^2\tan\varphi$, and $\frac{\delta s}{s}\tan\varphi$. Since the magnitude of $\frac{\delta s}{s}$ is of the same order as, or less than, that of $\frac{\delta h}{s}$, that is, $10^{-4}\sim10^{-5}$, and seeing that in most actual cases $\tan\varphi$ is generally less than unity, that is, $\varphi\ll\frac{\pi}{4}$, the correction terms due to topographical slope may well be neglected, so that by putting

$$\tan\phi=\frac{\delta h}{s},$$

we shall not far from the truth.

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24. "地塊とその運動"第1報の訂正

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"地塊とその運動" 第1報中，傾斜のある場所での垂直變動の gradient に對するその傾斜の影響を論ずる場合に，初めから

$$\tan\phi\fallingdotseq\frac{\delta h}{s}$$

と置いてしまつたが，これは次の様に論じた方が正しく，前の考へ方には誤りがあるやうであるからこゝに訂正しておく．

卽ち，原論文の第1圖から

$$\tan\phi=\tan(\varphi'-\varphi)$$

$$=\frac{\tan\varphi'-\tan\varphi}{1+\tan\varphi'\tan\varphi}.$$

そこで $$\tan\varphi'=\frac{h+\delta h}{s-\delta s},\qquad \tan\varphi=\frac{h}{s}$$

であるから，これを入れて結局

$$\tan\phi=\frac{\delta h}{s}\left\{1+\tan^2\varphi-\frac{\delta s}{s}+\frac{\delta h}{s}\tan\varphi\right\}^{-1}$$
$$+\frac{\delta s}{s}\tan\varphi\left\{1+\tan^2\varphi-\frac{\delta s}{s}+\frac{\delta h}{s}\tan\varphi\right\}^{-1}$$

となり，實際の場合の様に φ が非常に小なる場合には $\tan\phi=\frac{\delta h}{s}$ と置いて差支ないことは前の結果と變りがない．