not satisfy the previous conditions. The positive root of the quadratic factor is

$$x = 1.9266.$$

From this

$$q \equiv d = 1.64676$$

and therefore

$$\theta = 31^\circ\ 16'.$$

Hence *the concave arch of the curve* (22) *furnishes a minimum for the integral J beyond the point where the tangent makes an angle of* 31° 16′ *with the positive x-axis.*

A statement similar to those in the two preceding sections regarding the most general solution and the determination of the constants holds for this problem.

It should be noted that in neither of the three cases considered is the angle θ corresponding to $q = d$ as large as that of the newtonian problem where $\theta = 45°$. So whether or not the newtonian law fails for small values of the angle α, it is certain that these laws hold *only* for smaller values of the angle than in the newtonian problem.

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SHORTER NOTICES.

Les Systèmes d'Équations aux Dérivées partielles. By CHARLES RIQUIER. Paris, Gauthier-Villars, 1910. xxvii + 590 pp.

DURING the past twenty years Professor Riquier has published a large number of memoirs on the theory of systems of partial differential equations. The main results of his investigations are now made more accessible to mathematicians by incorporating them in a systematic treatise where they are presented from a uniform point of view. The theory of the most general system, containing any number of equations involving any number of functions of any number of independent variables with their partial derivatives of arbitrary order—is naturally extremely difficult, and the author is to be congratulated for the clearness of his treatment. The symbolism and terminology are carefully chosen, the main