The rest of the proof of the theorem is almost immediate. In consequence of the continuity of $\sigma(t)$ there corresponds to every value of σ between 0 and $\lambda = \sigma(1)$ at least one value of t, and so at least one point of the curve. There can not be more than one point for a single value of σ, because the values of σ corresponding to any two distinct points differ by at least $\psi(\delta)$, if δ is the length of the chord joining the points. If we set $x = F(\sigma)$, $y = \Phi(\sigma)$, these are single-valued functions of σ, and are identically equal to $f(t)$ and $\varphi(t)$ respectively, by their very definition. They are continuous, because

$$\Delta\sigma \geqq \psi(\sqrt{\Delta x^2 + \Delta y^2}), \qquad \Delta x \leqq \sqrt{\Delta x^2 + \Delta y^2} \leqq \omega(\Delta\sigma) + \Delta\sigma,$$

and similarly for Δy. Finally they are not constant together in any interval, by the same argument as in the case of a rectifiable curve.

The extension of the work to curves in three or more dimensions requires only the writing down of a correspondingly larger number of symbols.

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JOHN WALLIS AS A CRYPTOGRAPHER.

BY PROFESSOR DAVID EUGENE SMITH.

IT is not probable that many bibliophiles in the domain of mathematics, seeing upon their shelves the sumptuous tall copies of the Opera Mathematica* of John Wallis, and consulting their noteworthy historical chapters, the first serious effort in the history of mathematics in England, ever consider that the author was one of the world's greatest decipherers of cryptic writing. To be sure his biographies give us the information that he was interested in cryptography, but the extent of this interest, the sixty years devoted to the subject, the services rendered to the State, the rewards and disappointments that came to him as a result—of all this the biographies tell us practically nothing. It is partly because of this fact,

* Oxoniæ, MDCXCV.