series (22) appearing to be $\frac{1}{4}\pi$ which is $\tan^{-1} 1$, then the series of partial sums $\sum_{n=1}^{N} \tan^{-1}\left(\frac{1}{1+n+n^2}\right)$ must somehow 'collapse' to give a term which is $\frac{1}{4}\pi$ and another which tends to 0 as $N \to \infty$. For this to happen we would need to rewrite $\tan^{-1}\left(\frac{1}{1+n+n^2}\right)$ as the difference $a_n - a_{n+1}$ between two terms in a sequence a_n, i.e. the result in (22). However Alice reaches this point, she will finish her journey with

$$\sum_{n=1}^{N} \tan^{-1}\left(\frac{1}{1+n+n^2}\right) = \sum_{n=1}^{N}\left(\tan^{-1}\frac{1}{n} - \tan^{-1}\frac{1}{1+n}\right)$$

$$= \tan^{-1}\frac{1}{1} - \tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{2} - \tan^{-1}\frac{1}{3} + \tan^{-1}\frac{1}{3} - \ldots - \tan^{-1}\frac{1}{1+N}$$

$$= \tan^{-1} 1 - \tan^{-1}\frac{1}{1+N} \to \tan^{-1} 1 = \tfrac{1}{4}\pi$$

as $N \to \infty$, as expected.

I wonder what the Queen would have made of all this.

References

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The answers to the *Nemo* page from July on paradoxes were:

1.	Oscar Wilde	A Portrait of Dorian Gray	Chapter 17
2.	Charlotte Brontë	Villette	Chapter 42
3.	Shakespeare	Hamlet	Act 3 Scene 1
4	GB Shaw	Back to Methuselah	Part IV Act 1
5.	Hermann Melville	Mardi: and a Voyage Thither	Chapter 30
6.	James Joyce	Ulysses	Scylla and Charybdis

Congratulations to Martin Lukarevski on tracking all of these down.

Quotations are on page 408.