Feb. 23, '56.

Dear Mrs Lowe,

I do apologize for my long delay in answering
all
your letter. I ~~kept~~ intended to answer it immediately, but since then ~~one~~
~~mathematical task after another has used up~~ my spare time has been used
up by one mathematical task after another – ~~pap~~ some papers to prepare
for publication, some examination papers to compose & others to check, & then
the final blow of a once rejected M.Sc. thesis returned for ~~my perusal~~ me to
examine.

I was very sorry that you were not able ~~to~~ to come to my lecture,
though I must confess to a slight feeling of relief when I learnt of the
questions you were going to ask me – for I ~~couldn't~~ can't answer them! I
a little-known form of folk "entertainment" which one may term "
actually limited my talk to ~~what~~ ~~dramatic jigs~~ "little plays" [usually involving ~~rather than~~
some of which are mentioned in
dances] ~~which can occur either in the [illegible]~~ Scottish books of the
~~and at least two of which~~
18th – 19th centuries, ~~are traditionally and other of which are still~~
~~remembered in remote one of~~ and at least two of which are still ~~to~~
~~be found in the~~ remembered by old folk in the ~~Highlands pair~~
~~to~~ remote parts of the Highlands. One of my examples "The Killing
of the Otter" is actually still performed on the Isle of Eigg.
only
With one exception, these "little plays" were performed ~~at the [illegible]~~ for the entertainment
The Highland examples
of onlookers, & have no ritual background. ~~They~~ seem often to have been performed to dance-songs, &
in these
the miming seems to have been largely determined by the words of the
song. There are only ~~two~~ Lowland examples mentioned in the literature
(& none survive traditionally so far as I know), ~~and~~ these being the
two mentioned in ~~one of~~ Cromek's Reliques of Robert Burns. I am
~~I was concerned with~~ convinced that in these "little plays" we
have late survivors of the mediaeval folk-entertainments which gave rise
to the Elizabethan stage jig – hence my choice of title for my lecture.

3.) i.) $x(x-1)\dfrac{dy}{dx} + (x-3)y = (x-1)^2.$

$$\therefore \frac{dy}{dx} + \frac{x-3}{x(x-1)}y = \frac{x-1}{x}$$

$$\int \frac{x-3}{x(x-1)}dx = \int\left(\frac{3}{x} - \frac{2}{x-1}\right)dx = 3\log x - 2\log(x-1)$$

$$e^{3\log x - 2\log(x-1)} = \frac{e^{3\log x}}{e^{2\log(x-1)}} = \frac{x^3}{(x-1)^2}.$$

$$\therefore \frac{d}{dx}\left\{\frac{x^3}{(x-1)^2}y\right\} = \frac{x^2}{x-1}$$

$$\therefore \frac{x^3}{(x-1)^2}.y = \int \frac{x^2}{x-1}dx. = \int\left\{x + \frac{1}{x-1}\right\}dx$$

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$$\therefore \frac{x^3}{(x-1)^2}.y = \frac{x^2}{2} + \log(x-1) + c$$

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ii) a) $\dfrac{dx}{dt} + 5x + y = e^t.$ $\qquad \dfrac{dy}{dt} + 3y - x = 4e^t.$

~~x x~~

$$(D+5)x + y = e^t. \qquad (1)$$

$$-x + (D+3)y = 4e^t. \qquad (2)$$

(2) $\times$ $(D+5)$

$$-(D+5)x + (D+3)(D+5)y = 24e^t. \quad (3)$$

(1)+(3) gives.

$$y + (D+3)(D+5)y = 25e^t.$$

$$(D^2 + 8D + 16)y = 25e^t.$$

C.F.

$$(D+4)^2 y = 0.$$

$$\therefore D = -4.$$

Solⁿ is $y = (A+Bt)e^{-4t}.$

The one exception which I mention is the famous 'Cailleach an Dùdain', ~~which in plot seems to be a frog~~ which contains a death & resurrection. [see J. E.F.D.S.S. 1953, p.] But even this was regarded [at least latterly], purely as entertainment.

I did not go back beyond ca 1780, because ~~there are no~~ I do not know of any descriptions of such entertainments among the Scottish folk prior to that date. There ~~are~~ is one ~~or two~~ pre-Reformation ~~references~~ reference to dance ~~as~~ as an aftermath of drama, but this does not refer explicitly to ~~f~~ the folk (though ~~the implication is that~~ we may reasonably infer that such forms of entertainment would then have been popular).

I must confess that the reference in the Forbes Cantus is new to me. ~~I misread~~ Dauney says that there are no ~~of~~ recognisably Scottish airs in this work, & I misread this to apply to the words as well — & in consequence have never bothered to look at it. Our researches in Scottish dancing have been mainly concerned with post-Reformation times, ~~principally because often~~ (& indeed mainly with the period 1700-1900, the seventeenth century being almost wholly ~~of~~ a blank so far as references to dancing are concerned). There is not enough Scottish ~~material~~ pre-Reformation material to be able to say anything really worth-while about dancing ~~then~~. then. A form of reel was known (earliest reference ca 1525), and a Morris (ditto), ~~but~~ we do not know what these were like. but really that is all. ~~Both~~ The Scottish ~~Court~~ Court danced the Court Dances of Europe, ~~but~~ we have practically no idea of what or how the folk danced // I do not believe however that folk-dancing in Scotland was distinct from that ~~England~~ in England; there is no real geographical border to account for such distinctions, and any distinctions in the present-day style of Scottish & English folk-dancers are due entirely to the ~~mige~~ misguided attempts of the Scots to present their dances as polished ballroom ~~transfer their folk-dances to the polite ballroom~~ dances.

2iii) $\therefore$ Sol^n is $y = (A+Bt)e^{-t}$.

$$= (A+B\log x)\cdot\frac{1}{x}$$

P.I

$\cancel{\frac{d^2y}{}}$ $(D^2+2D+1)y = e^t + e^{-t}$.

$$\therefore y = \frac{e^t}{(D+1)^2} + \frac{e^{-t}}{(D+1)^2}$$

$$= \frac{e^t}{4} + e^{-t}\frac{1}{D^2}(1)$$

$$= \frac{e^t}{4} + \frac{t^2}{2}e^{-t}.$$

$\therefore$ Complete sol^n is $y = \frac{1}{x}\{A+B\log x\} + \frac{x}{4} + \frac{1}{2x}(\log x)^2$

-1

$$= \frac{1}{x}\{A+(B+1)\log x\} + \frac{x}{4}$$

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But all this is of no use to you in your problem concerning the Thep' & Goe medley. I will certainly look at the Forbes cantus as soon as I get the opportunity, but until then, I can't help you, I am afraid.

2ii) P.I.

$$(D^2+4)y = \cancel{8\cos 2x}\ 8x\cos 2x + 2\sin 2x.$$

$$\therefore y = \frac{8x\cos 2x}{(D-2i)(D+2i)} + \frac{2\sin 2x}{(D-2i)(D+2i)}$$

$$= \mathcal{R}\left\{\frac{8e^{2ix}\cdot x}{(D-2i)(D+2i)}\right\} + \mathcal{I}\left\{\frac{2e^{2ix}}{(D-2i)(D+2i)}\right\}$$

$$= \mathcal{R}\left\{\frac{8}{4i}e^{2ix}\frac{1}{D}\cdot x\right\} + \mathcal{I}\left\{\frac{2}{4i}e^{2ix}\frac{1}{D}(1)\right\}$$

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$$= \mathcal{R}\left\{\frac{2}{i}e^{2ix}\cdot\frac{x^2}{2}\right\} + \mathcal{I}\left\{\frac{1}{2i}e^{2ix}\cdot x\right\}$$

$$= x^2\sin 2x - \frac{x}{2}\cos 2x.$$

$\therefore$ Complete solⁿ is $\quad \cos 2x\left\{\left(A-\frac{x}{2}\right)\right\} + \sin 2x\left\{B+x^2\right\}.$

2iii) $$x^2\frac{d^2y}{dx^2} + 3x\frac{dy}{dx} + y = \frac{x^2+1}{x}$$

Put $x = e^t$.

$$\frac{dy}{dt} = \frac{dy}{dx}\cdot\frac{dx}{dt} = x\frac{dy}{dx}.$$

$$\frac{d^2y}{dt^2} = \frac{d}{dx}\left\{x\frac{dy}{dx}\right\}\frac{dx}{dt}. = x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx}.$$

i.e. $x\frac{dy}{dx} = \frac{dy}{dt}$. $\quad x^2\frac{d^2y}{dx^2} = \frac{d^2y}{dt^2} - \frac{dy}{dt}$

$\therefore$ Equⁿ becomes.

$$\frac{d^2y}{dt^2} + 2\frac{dy}{dt} + y = \frac{e^{2t}+1}{e^t}.$$

C.F.

$$(D^2+2D+1)y = 0.$$

$\therefore (D+1)^2 = 0 \qquad \therefore D = -1$