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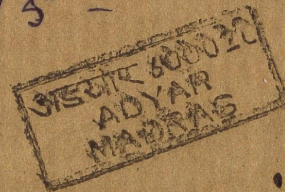
② ITC Ltd

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5<sup>th</sup> Feb 28 Sunday

~~was by~~ For the last three or four days I have been doing some experimental work on the fluorescence of organic vapours.

The last time I did systematic experimental work for a long time past I haven't done any

experimental work; in fact the last experimental I did was the one on the double magnetic double refraction of nitric oxide, ~~in~~ in the summer of

1926, i.e. ~~20 months~~ Since then, I have been exclusively ~~last~~ <sup>last</sup> confined to my desk ~~and~~ <sup>except for a short period of about a week when I set up</sup> As Prof. says it is

quite healthy for a scientific man to be out of touch with actual experimental facts for any length of time and it was specially to keep myself

busy with some experimental work that Prof. ~~asked~~ <sup>asked</sup> me to take up the subject, ~~to~~

and alcohol  
nitric oxide  
supernatant  
suspensions

no x-ray tube for investigation  
x-ray camera by Gans which  
was left uncompleted  
for several months  
I had to have  
an x-ray tube  
and camera  
to do it  
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and camera  
to do it

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2  
Though the period has been <sup>extremely</sup> fruitful ~~of~~ <sup>in</sup> my scientific output, in fact all our work on electric and magnetic double refraction, ~~diffraction~~ magnetic anisotropy of crystals, diffraction by metallic screens, and the series of ~~the~~ <sup>theoretical</sup> papers modifying the ~~the~~ <sup>Langmuir</sup> theory of ~~the~~ <sup>electric</sup> double refraction, the Lorentz-Debye theory of refraction and dielectric polarization and the Ramanathan theory of light scattering and the <sup>Phelps</sup> paper on the theory of the Maxwell effect in liquids ~~were all~~ written during this period numbering in ~~about~~ all 11 papers and 2 ~~note~~ letters to Nature, ~~were~~ written during this period of ~~about~~ <sup>less than 20</sup> ~~17~~ months. Still one must agree with Prof. Healy that it is not quite healthy for a scientific man to <sup>be</sup> out of touch with actual experiments for any length of time. It was mainly with a view to ~~remedy this state of~~ <sup>some experimental work</sup> ~~that I resigned my post~~ <sup>that I have up</sup> ~~at the suggestion of Prof. Healy~~ <sup>the general problem</sup> ~~the~~ <sup>of</sup> ~~the~~ <sup>fluorescence</sup> of organic vapours; ~~In fact~~ ~~part~~

~~is~~ because of ~~is~~ <sup>3</sup> ~~present~~ rather than  
from <sup>the present nature of</sup> any specific ~~presenting~~ problem in the  
subject awaiting experimental solution, which  
usually draws a man to a ~~new~~ new  
field. In fact ~~my first paper~~ the paper  
on the optical evidence for the anisotropy  
of the Polarization field, which I proposed  
to write jointly with Ramachandra Rao, and  
which we ~~jointly~~ <sup>partly</sup> wrote ~~at~~  
together when he was here for the Science Congress  
last month, is not yet completed; also  
my work on a theory of the Tarnan Effect  
in liquids and <sup>and</sup> on the double refraction  
of black soap films ~~is not yet~~  
~~completed either.~~ I have still to write  
out my paper on the refraction of  
liquids (in the light of our modified theory)  
which I read before the Science Congress.  
I have also ~~been reading~~ spent ~~some~~  
a week or more on trying to give a  
theory of the Tarnan Effect, and also in  
trying out whether in the photographs  
taken long ago by Professor of ~~the~~ thin  
soap bubbles placed between <sup>crossed</sup> ~~two~~ ~~nicked~~



Explain even the outstanding facts

Shores anthracene vapour - ~~it~~ exhibits

Strong fluorescence; ~~but~~ which does not seem to show any polarisation when viewed through a double image prism. Prof. has been working with me all the time.

Today Received <sup>(today)</sup> the Prof. of and Phil. mag. paper on the theory of the Maxwell Effects.

Recently Prof. has been studying into the fluorescence exhibited by ~~some of the aromatic~~ <sup>many of the aromatic</sup> liquid in the near ultraviolet ~~part~~ <sup>and the fluorescence of</sup> region present in sunlight. Some of these liquids was found to be polarised.

However in view of the fact that ~~the fluorescence of~~ anthracene vapour does not show any polarisation Prof. has asked me to verify <sup>again his observations on</sup> the polarisation of ~~the fluorescence~~ in some of the liquids.

Monday 6<sup>th</sup> Feb. 28 6

When Prof went to Bangalore about  
a fortnight back in connection with  
the meeting of the Indian Institute of  
Science, I had been to the station  
and in the course of our conversation  
~~Suggested to~~ told him that Dr A.L.  
~~had met~~ <sup>(Suggested to me)</sup> I might  
Narayana ~~write to the~~ <sup>write to the</sup> ~~members~~ <sup>members</sup> ~~him~~ <sup>him</sup>  
~~for~~ <sup>for</sup> exemption from the three  
year limit for applying for the  
Doctorate. ~~at~~ and asked him if  
he might happen to meet any of the  
Council ~~members~~ <sup>of the</sup> ~~of the~~ <sup>of the</sup> ~~members~~ <sup>members</sup>  
he might happen at Madras to  
consult them on the matter.

Prof. told me today that he  
tried to ~~meet~~ <sup>called on</sup> the Vice-Chancellor  
Dr Venkataratnam but couldn't  
meet him. However he says that  
~~immediately~~ <sup>for</sup> ~~for~~ <sup>for</sup> Dr Venkat  
has written to him a very nice  
letter inviting him to deliver a  
lecture before ~~and~~ <sup>and</sup> the auspices

of the med. univ. That would give him  
an opportunity to write to Sri Venkatarathi  
and that he would refer to my case. He  
~~the~~ ~~gave~~ took from me a detailed  
account of my academic career, during  
Ding mentioned that if he were  
arranged for a regular course of lectures,  
instead of a single lecture he would  
like to take me into him.

Spent the day in correcting the  
proof and <sup>in</sup> verifying ~~in~~ various  
formulas and calculations in the paper.

Tuesday, 7<sup>th</sup> Feb.

Tried to verify the polarisation of  
the fluorescence exhibited by some of  
the aromatic liquids in the near  
~~ultra~~ ultra violet region. Incidentally  
I discovered that all <sup>pure</sup> liquids show  
a fairly intense fluorescence ~~also~~  
in the visible region, and what

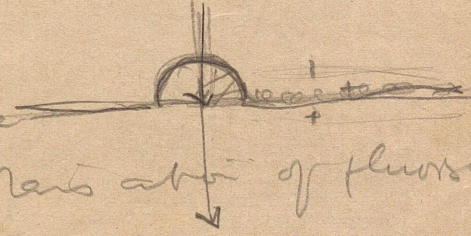
is much more interesting all of them  
 are strongly polarized; the polarization  
 being the greater for the aliphatics  
 than for the aromatics. In fact  
 the ~~fluorescence intensity~~ and ~~intensity~~ <sup>in general</sup>  
 of the fluorescent liquid seems to  
 run parallel with the polarization  
 of the scattered light, i.e. the  
 polarization of the fluorescent liquid is  
 the greater the ~~greater~~ the smaller  
 the ~~anis~~ optical anisotropy of the  
 molecule. ~~communicated to Prof~~

When I ~~had Prof~~ ~~the results~~ told

Prof about the results he would not  
 believe that all liquids ~~and~~ <sup>can</sup> ~~would~~  
 show polarized fluorescence and not  
in the visible region. When he

came into the room, I had  
 a bottle of <sup>in fact blue</sup> pentane <sup>with</sup> a violet filter in the path of  
 the incident light, and when

and when he ~~examined~~<sup>observed</sup> the track with a  
combination of green & yellow filters he remarked "you  
don't mean to suggest ~~that~~<sup>that's right</sup> all that  
is fluorescence?" ~~When he~~ However when  
he transferred the green yellow <sup>combination</sup> also  
to the path of the incident light  
he couldn't detect a trace of the  
track. He ~~said~~ was very much excited  
and repeated several times that it was  
an amazing result. ~~That~~ ~~did~~ ~~in~~  
One after another the whole series  
of liquids ~~had to be~~ ~~tested~~ ~~and~~ ~~was~~  
examined and every one of them showed  
the phenomenon without exception.  
He wondered how we missed discovering  
<sup>(all that)</sup> ~~it~~ five years ago.

In the afternoon took some   
measurements on the polar axis of fluorescence.

When Prof returned from  
college in the afternoon he showed





9<sup>th</sup> Feb Thursday

Set up this morning the big telescope and ~~made~~ made ~~pre~~ preliminary arrangements for observing the effect with vapours. Before the arrangements were completed Day left to ~~go~~ for his college for his lecture.

In the afternoon tried Star paper and it was surprising that the ~~modified~~ <sup>modified</sup> redative was very conspicuous. Tried a number of stars in quick succession without however the same success.

When Day came from the college at about three, I ~~had~~ announced to him the results, and there was still enough sunlight for him to ~~try~~ try for himself. He ran about the place shouting all the time, ~~said~~ <sup>said</sup> that it was a first rate discovery, that he was <sup>feeling</sup> miserable during the lecture ~~that~~ because ~~that~~ he ~~could not~~ ~~see~~ ~~the~~ ~~effect~~ had to leave the spot, and that however he was ~~confident~~ <sup>fully</sup> confident that I "wouldn't let the grass grow

with my feet. but I had discovered the  
 phenomenon in gases. He asked me to  
 "call in every body in the place to see the  
 effect" and immediately arranged ~~it~~  
 in a most dramatic manner, ~~to~~  
 into the mechanics to ~~prepare~~  
~~light~~ make arrangements for examining  
 the vapours at high temperatures ~~and~~ for  
 told Mr Sugami that it was for him  
 now to make his temp. influence on  
 the Compton Effect as great a success.

Evening, was busy preparing the  
 hot bath ~~when~~ <sup>from</sup> and I didn't  
 go out. When ~~he~~ returned after his  
 walk he told me that I ought to  
 take up tackle big problems like that  
 and asked me to take up the ~~problem~~ <sup>problem</sup>  
 of the optical evidence for the spinning  
 electron after this work was over.  
 Told Mr Ventakteswaran about the  
 discovery ~~and we had some~~ and  
 was discussed the problem, into us,  
 in the course of which he said

must

~~that nothing was done ~~by~~ beyond~~  
~~my reach, meaning the Fellowship and~~  
~~referring to the fellowship of the Roy. Soc.~~  
 that the phenomenon should be  
 called the Raman-Krishnan-effect.  
~~"we shall ask me to be a Mr~~  
 Venkateswaram or somebody will  
 call it by that name. Incidentally  
 he remarked that nothing was now  
 beyond my reach referring to the  
 fellowship of the Roy. Soc. and that  
 I might probably get the fellowship  
 before I get my Doctorate. He  
 instance in a manner most fitting  
 to me, the case of Ramanujam who  
 was only a B.A. when he got  
 his Fellowship.

10<sup>th</sup> to 15<sup>th</sup>. Studied a number of  
 vapours. Among a number of them  
 showed the effect. No definite  
 could be said regarding the polarisation

15  
of the modified scattering.

16<sup>th</sup> Feb. Thursday.

Studied today  
Pentane Vapour at high temperature  
and it showed a conspicuous polarization  
in the modified scattering.

We sent a note today to Nature on  
the subject under the title - "A new  
Type of Secondary Radiation".

17<sup>th</sup> Feb. Friday.

Prof confirmed the polarization of  
fluorescence in pentane vapour.

I am having some trouble with my  
left eye. Prof has ~~not~~ promised  
to make all observations himself  
for some time to come. ~~and to~~

~~asked me~~

19<sup>th</sup> Feb 20<sup>th</sup>

Studied a number of  
other vapours.

21<sup>st</sup> Monday.

Prof. mother's Secretary Didi  
30 to me associated

28<sup>th</sup> Feb Tuesday

Went to the cabinet  
and in the afternoon.

Day was nice and we proceeded  
to examine the influence of the  
wavelength of the incident light  
on the phenomenon. Used the usual  
blue violet filter coupled with  
a uranium glass. The range of  
wavelengths transmitted by the combi-  
neon band much narrower than  
that transmitted by the blue violet  
filter alone. ~~That~~ On examining  
the track with a spectrometer  
using spectroscopy we found to  
our great surprise the modified  
scattering was separated from the  
scattering unaltered to the mid-  
range by a dark region.

~~Immediately examined the~~

This encouraged us to see ~~the~~  
monochromatic ~~radiation~~ incident light