

COMMUNICATIONS  
FROM THE  
UNIVERSITY OF LONDON

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No. 76

ATLAS<sup>\*</sup> AT THE UNIVERSITY OF LONDON (SAM1)

II USER'S GUIDE

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November 1975

\* A program for the calculation of model stellar atmospheres.

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ABSTRACT

The program ABSTRACT calculates model atmospheric ...

PREFACE

A complete description of the ...

[The remainder of the page is obscured by heavy horizontal black redaction bars.]

PROGRAM 2000

10/10/00

10/10/00

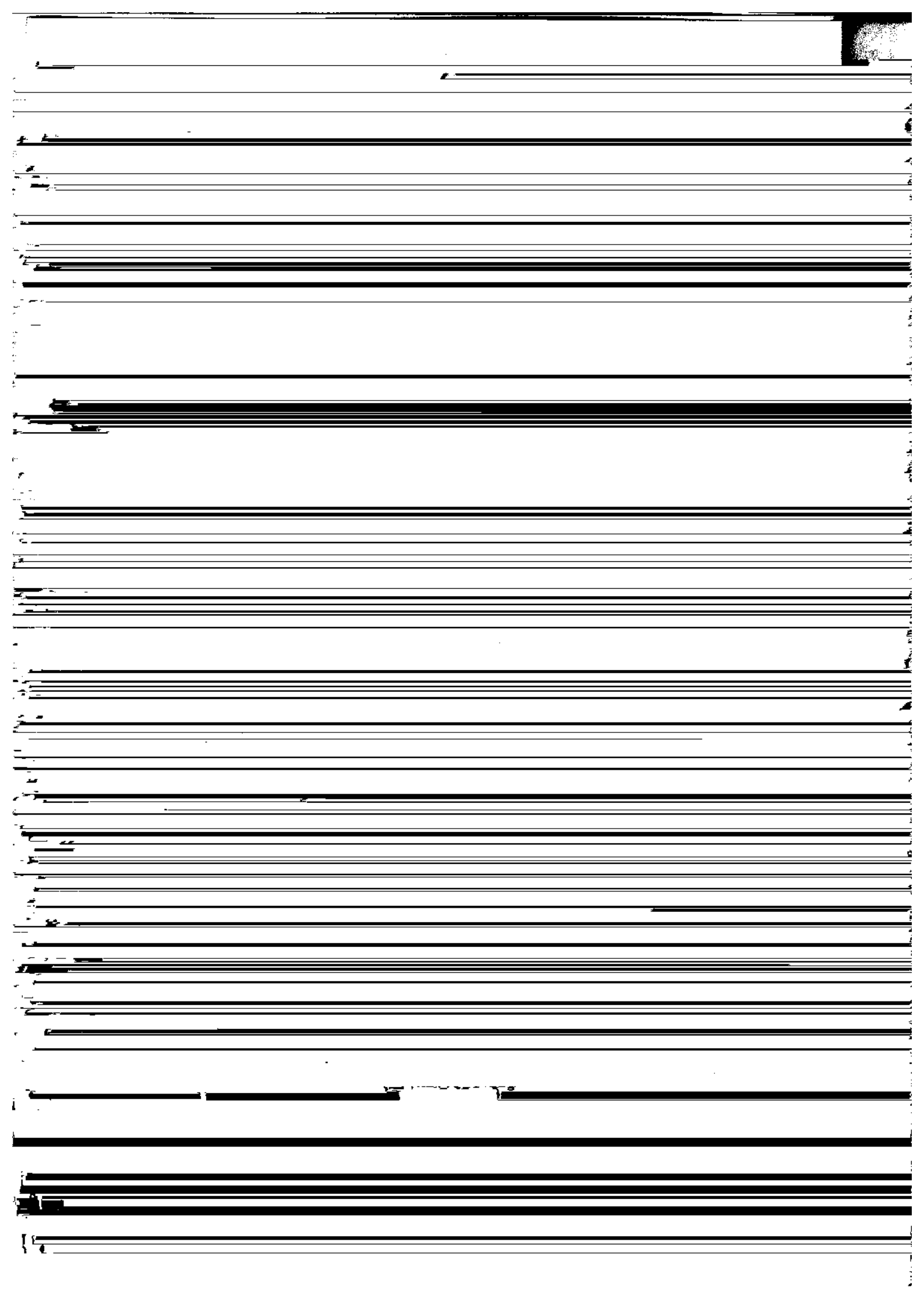
[REDACTED]

0. INTRODUCTION

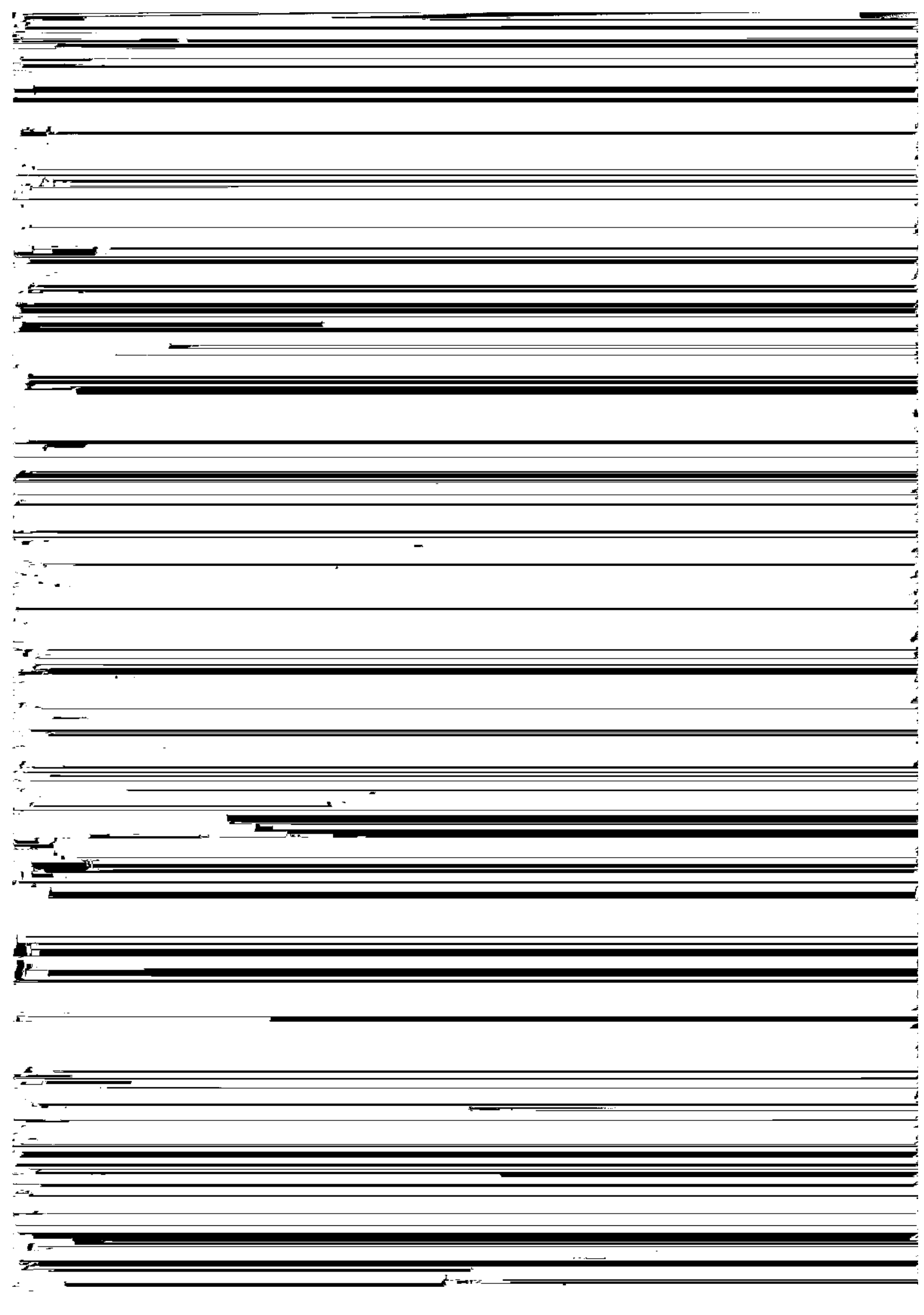
The art of model atmosphere construction has reached the stage that it is now relatively easy to calculate a so-called 'classical' model atmosphere ; i.e. a plane-parallel atmosphere in hydrostatic and radiative equilibrium (with allowance for convection using a mixing-length theory), and in L.T.E. It is also easy to calculate a non-L.T.E. atmosphere

the sample model. A complete list of all the options together with their





The rules for punching up a set of data cards are as follows :



frequency numbers of the limiting frequencies that are used in

The user does not need to bother about  $n_2$  and  $n_3$  at this stage.  
Details of how to use these options are given in section 3.2 a.

the frequency set. This control card is followed by  $n_1$  triplets  
of frequency number, frequency and integration weight on as many  
cards as are required.

1.3 Other basic (but optional) control cards.

a) A title for the model can be specified with :

TITLE    PURE HYDROGEN ATMOSPHERE WITH ELECTRON SCATTERING

The code word must start in column 1 of a data card. Columns 7 to 80 of this card are then printed as a title to the summary table.

b) The type of calculation to be performed can be identified with :

LTE    or    NLTE

The code word LTE tells SAM1 to calculate LTE.

TABLE 1

DEFAULT SETTINGS OF OPACITY SOURCES

i) H1	ON	xi) HOT	OFF
ii) H2PLUS	ON	xii) ELECTRON	ON
iii) HMINUS	ON	xiii) H2RAY	OFF
iv) HRAY	ON	xiv) H LINES	OFF
v) HE1	ON	xv) LINES	OFF
vi) HE2	ON	xvi) LINESCAT	OFF
vii) HEMINUS	OFF	xvii) X LINES	OFF
viii) H2RAY	OFF		

ix) COOL	ON	xix) XCONT	OFF
x) LUKE	OFF	xx) XSCAT	OFF

Alternatively one can use the forms:

OPACITY ON cw1 cw2 ...

OPACITY OFF cw1, cw2, ...

In this case the opacities corresponding to the code words cw1,

cw2 etc. are either switched ON or OFF.

be performed. Details of all the available options are given

[REDACTED]

A SAMPLE MODEL CALCULATION

1.1 Introduction

In this chapter the standard output of SAM1 is described with reference to a sample model calculation which the user should run.

1.2 Running the sample model

In Appendix III the user should run the program PRESET to obtain





File 1 - the starting model

Heading

depth point label.

1 P pressure in dynes  $\text{cm}^{-2}$ .  
2 XNE electron number density in  $\text{cm}^{-3}$ .  
3 ABROSS the Rosseland opacity in  $\text{cm}^{-1}$   $\text{cm}^{-2}$

Page 4 - the temperature correction table.

Column	Heading	Explanation
[REDACTED]	[REDACTED]	depth identification number

Page 2 - convection parameters.

Column	Heading	Explanation
		depth identification number
		depth variable -2

Page 7 - a summary table.  $T_{\text{eff}}$ ,  $g$ , the title of the model and the iteration number are given as a heading to the table.

Column	Heading	Explanation
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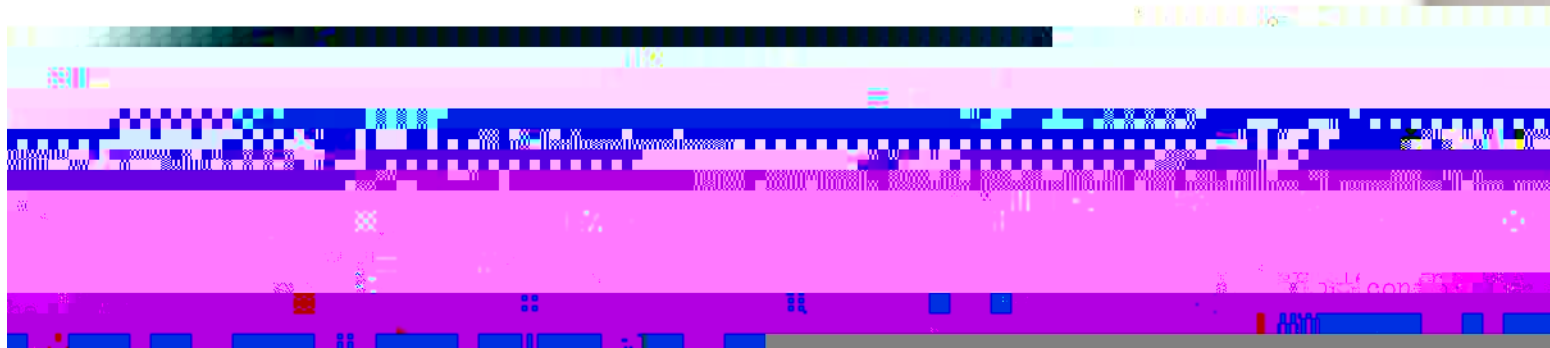
2	RHOX	mass depth variable, gm cm <sup>-2</sup>
3	TEMP	revised temperature, °K
4	PRESSURE	gas pressure, dynes cm <sup>-2</sup>

..... cm<sup>-3</sup>

Pages 8 and 9 are the output for the second iteration given by

PRINT 1 entries

[REDACTED]



calculation i.e.

TURBULENCE OFF

which sets IFTURB=0, TRBEDG=0, TRBPOW=0, TRBSND=0, TRBCON=0 (this

which sets IFTURB=1, TRBEDG=n1, TRBPOW=n2, TRBSND=n3, TRBCON=n4.

The turbulent velocity is given by :

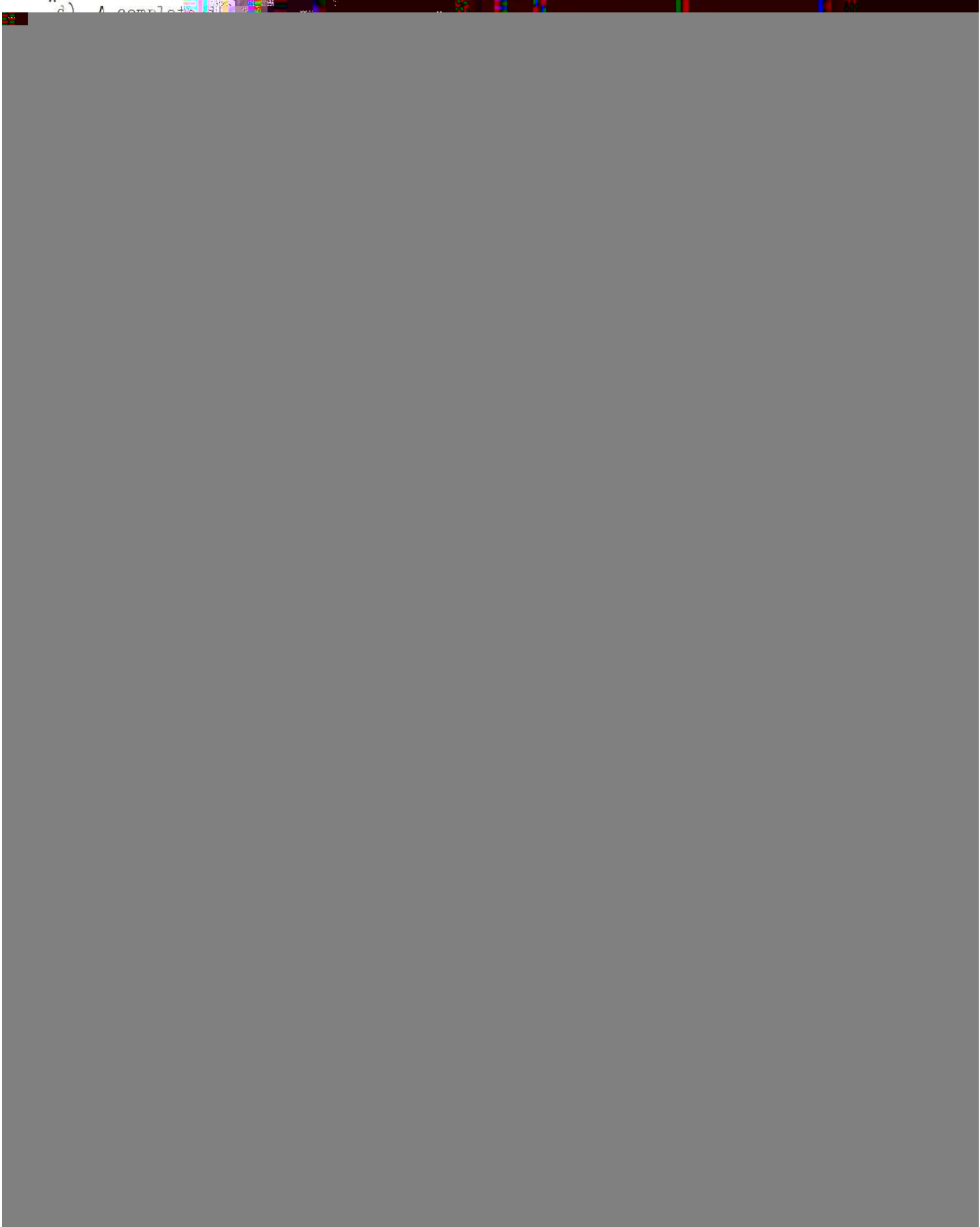
$$VTURB = TRBEDG * RHO ** TRBPOW + TRBSND * VELSND / 1.05 + TRBCON, \text{ kms sec}^{-1}$$





for  $H^-$ .

\* d) A complex





Mode of Transport	Male	Female
Public Transport	350	250
Private Car	200	200

Task 2: A company is considering launching a new product line. The success of the product depends on market conditions and the company's marketing strategy. The following table shows the expected profit (in thousands of dollars) for different combinations of market conditions and marketing strategies.

Marketing Strategy	Good Market	Poor Market
Aggressive	150	50
Conservative	100	80

Task 3: A company is evaluating the performance of its sales representatives based on their sales volume and customer satisfaction. The following table shows the number of sales and the average customer satisfaction score for each representative.

Sales Representative	Sales Volume (Units)	Average Customer Satisfaction Score
Rep A	1200	4.5
Rep B	900	4.2
Rep C	1100	4.8

Task 4: A company is analyzing the relationship between advertising expenditure and sales revenue. The following table shows the advertising expenditure (in thousands of dollars) and the corresponding sales revenue (in thousands of dollars) for different advertising campaigns.

Advertising Campaign	Advertising Expenditure (k\$)	Sales Revenue (k\$)
Campaign 1	50	100
Campaign 2	75	150
Campaign 3	100	200

Task 5: A company is studying the relationship between employee tenure and job satisfaction. The following table shows the number of employees who have been with the company for a certain number of years and their corresponding job satisfaction score.

Employee Tenure (Years)	Number of Employees	Average Job Satisfaction Score
0-5	150	3.5
6-10	200	4.0
11-15	180	4.2

Task 6: A company is evaluating the effectiveness of different training programs. The following table shows the number of employees who completed each program and their corresponding performance score.

Training Program	Number of Employees	Average Performance Score
Program A	100	85
Program B	120	88
Program C	110	86

Task 7: A company is analyzing the relationship between employee education level and job performance. The following table shows the number of employees with different education levels and their corresponding job performance score.

Education Level	Number of Employees	Average Job Performance Score
High School	200	70
Bachelor's Degree	300	75
Master's Degree	150	80

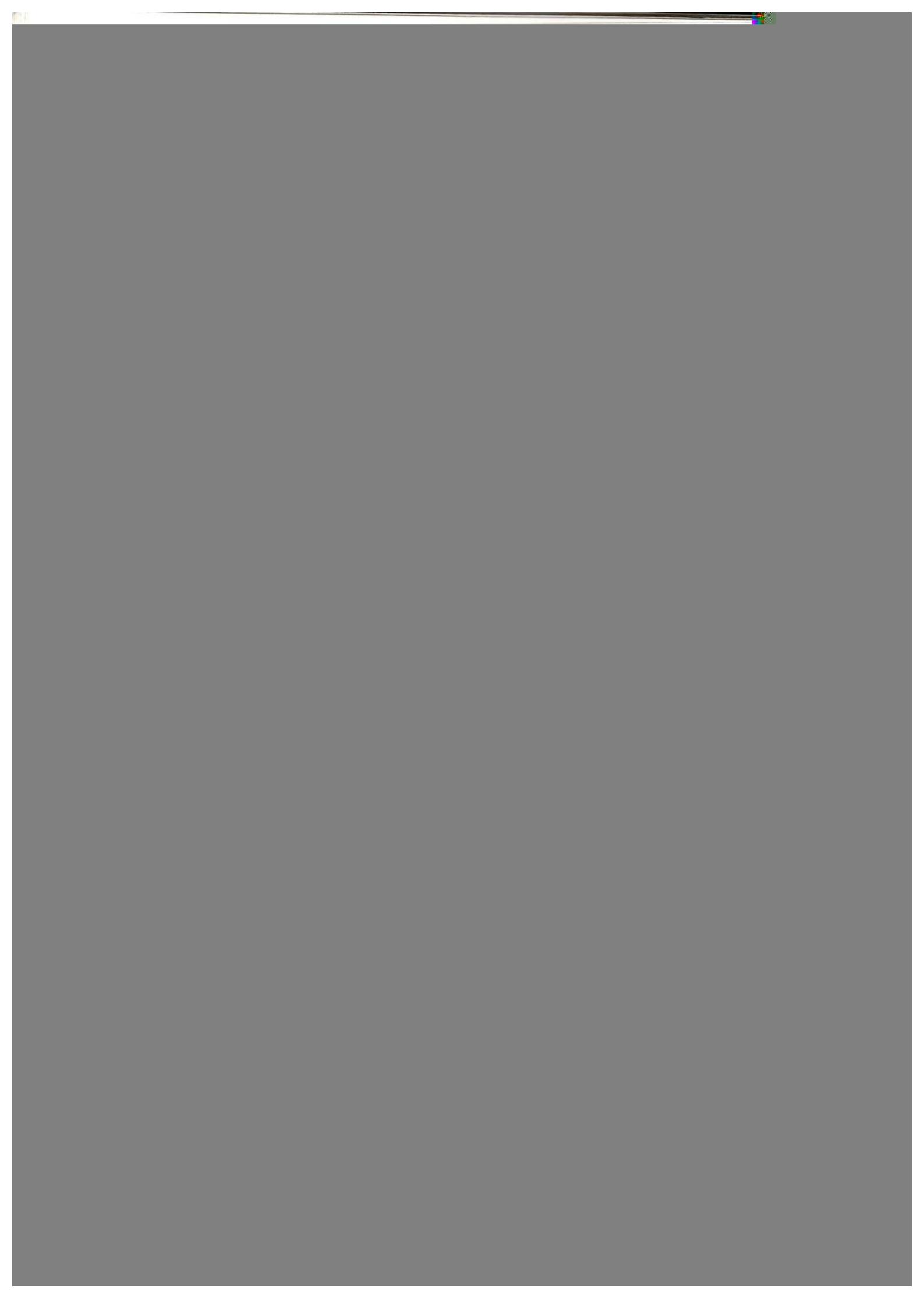
Task 8: A company is studying the relationship between employee age and job satisfaction. The following table shows the number of employees in different age groups and their corresponding job satisfaction score.

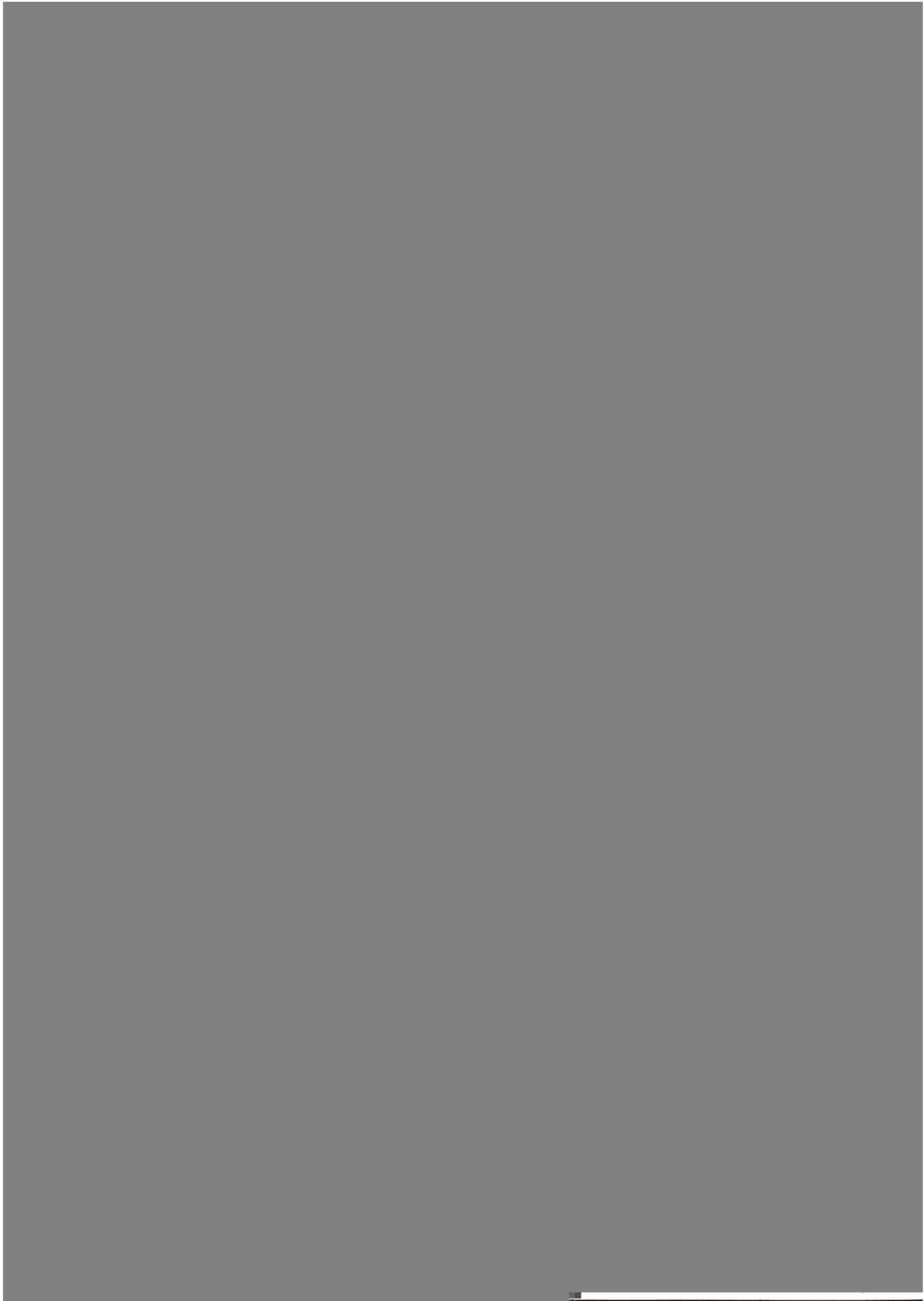
Age Group	Number of Employees	Average Job Satisfaction Score
20-30	150	4.0
31-40	200	4.2
41-50	180	4.5

Task 9: A company is evaluating the relationship between employee tenure and job performance. The following table shows the number of employees who have been with the company for a certain number of years and their corresponding job performance score.

Employee Tenure (Years)	Number of Employees	Average Job Performance Score
0-5	100	75
6-10	150	80
11-15	120	85









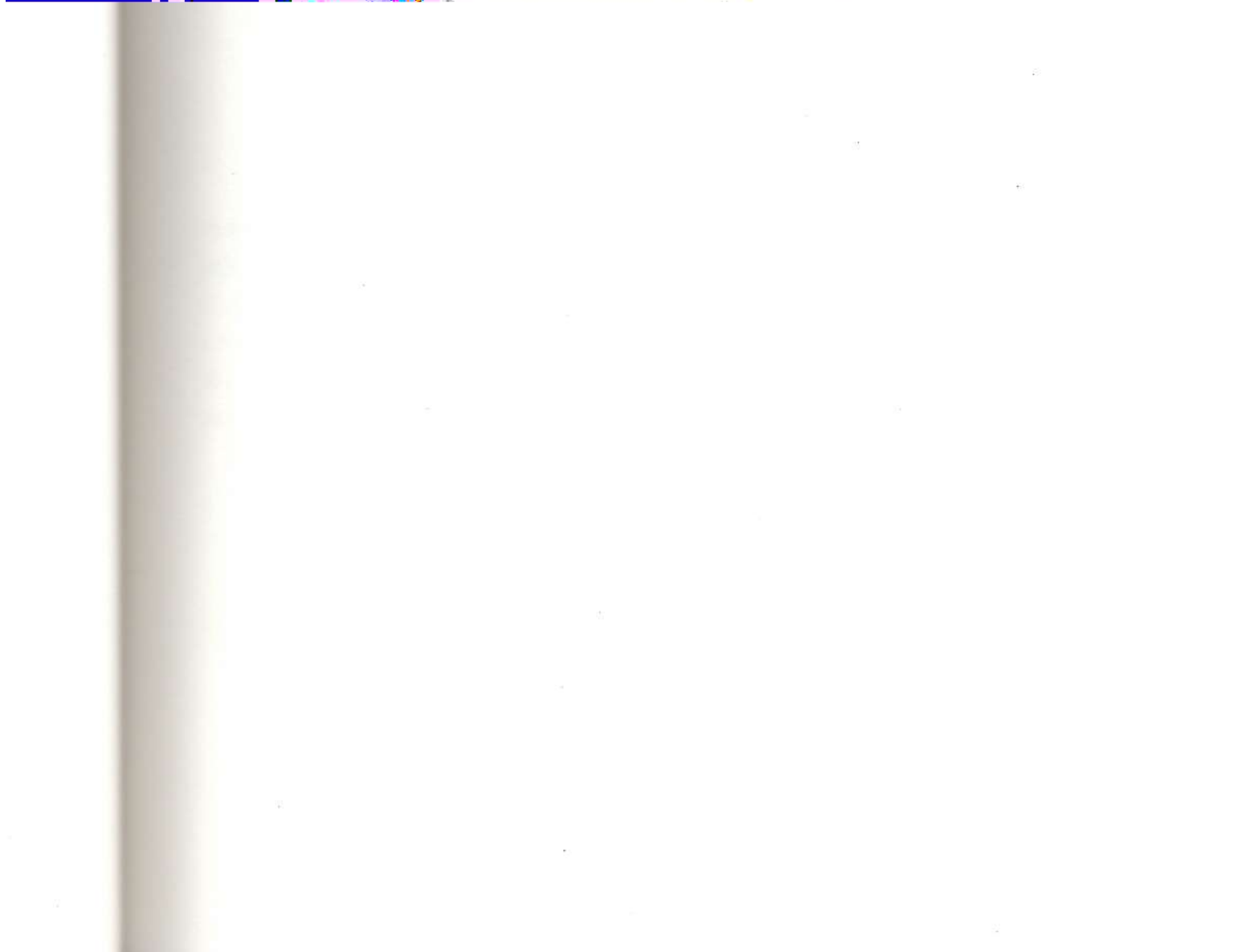
DEPTH n1 n2 n3 n4

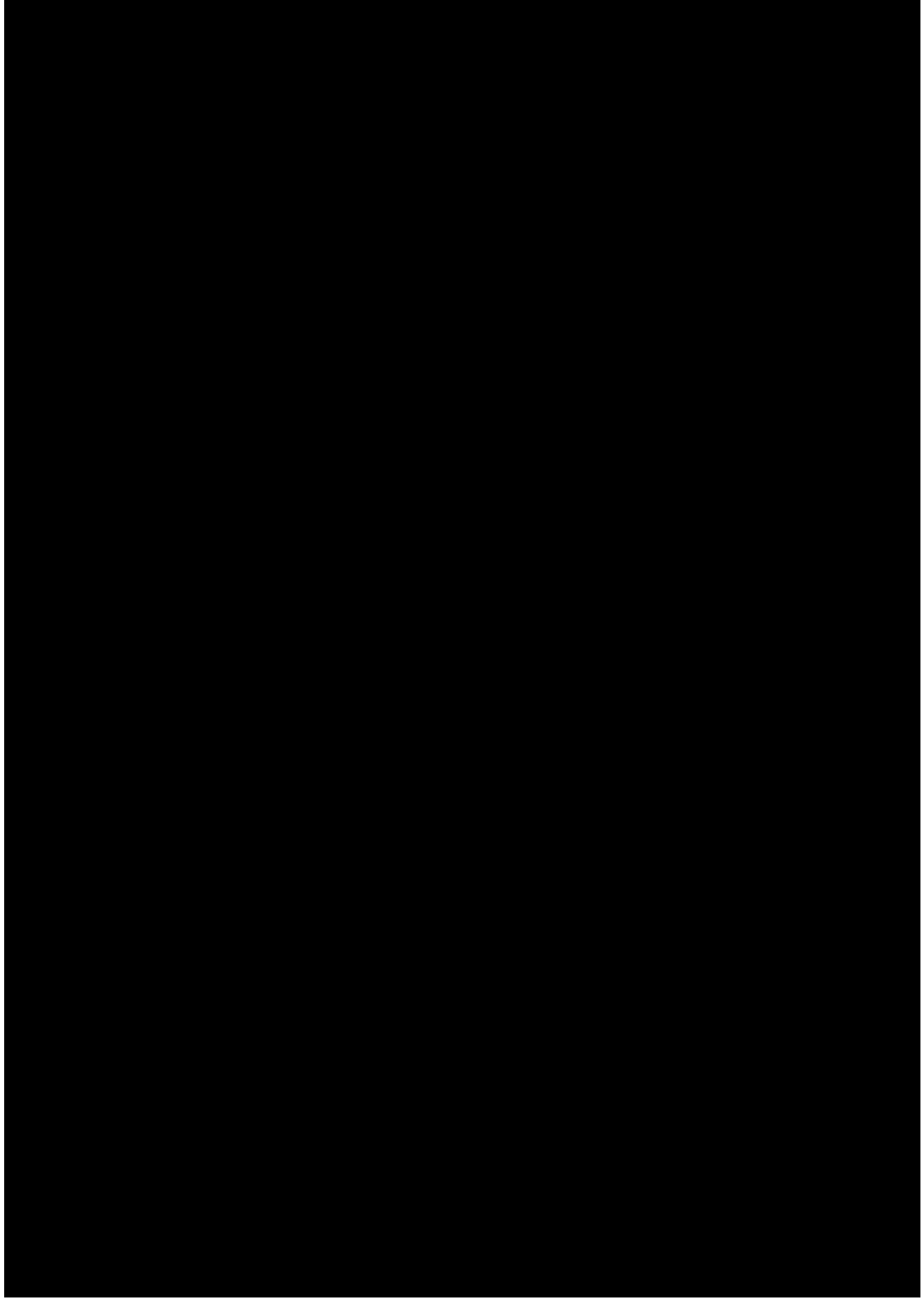
of card specifies the number of optical depths ( $n_i$ ) at

depths  $z_i$  at which the model atmosphere is required, and the number of de-

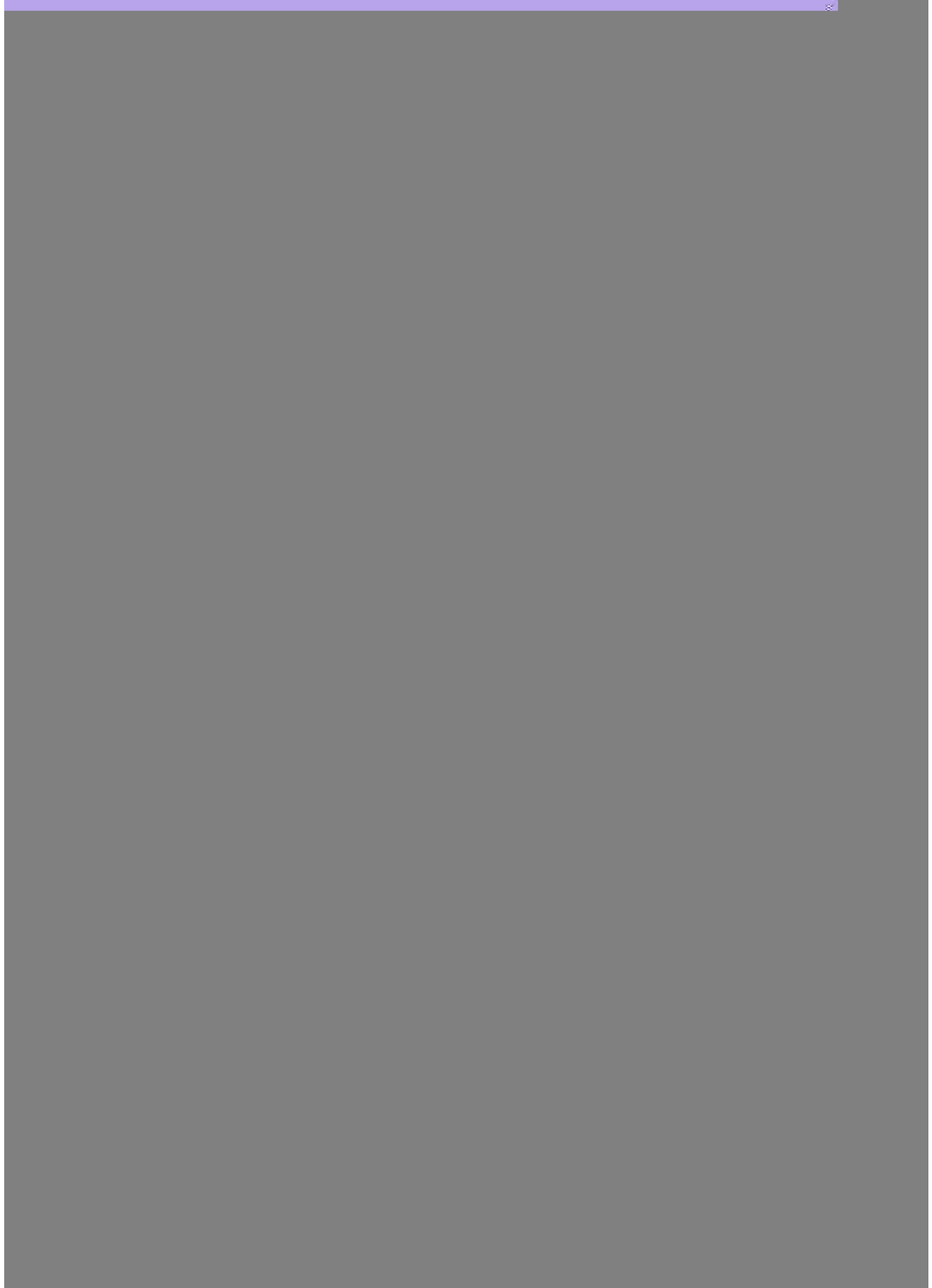
terminations. The first is used for the extended range and the

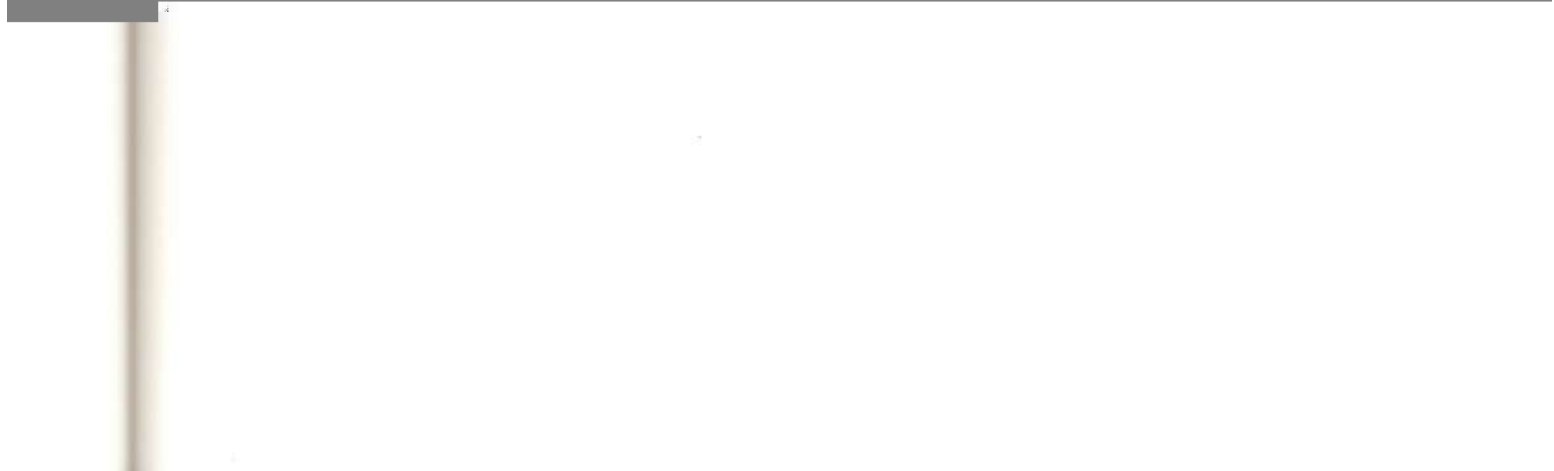
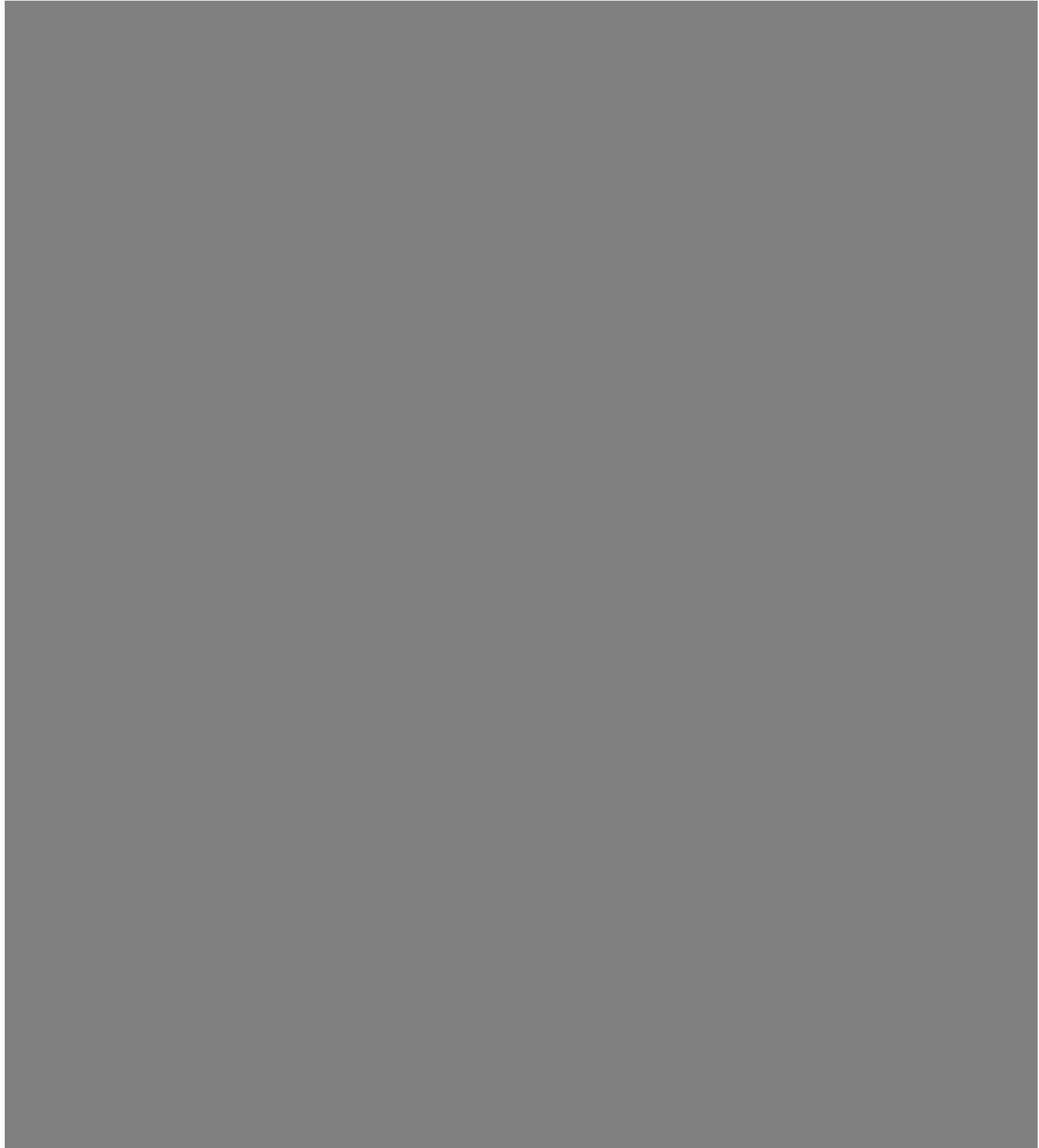
second is used for the extended range and the

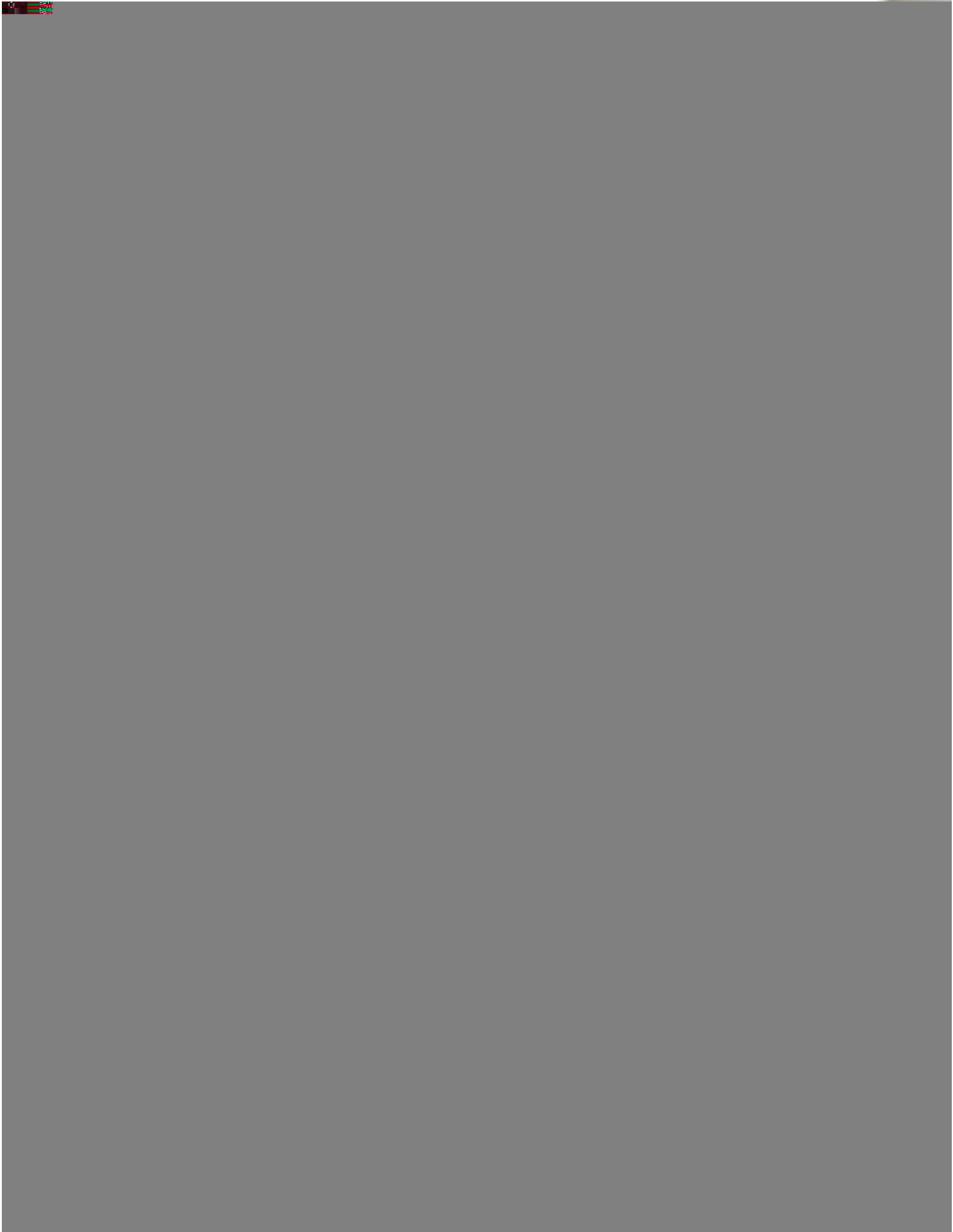




•  
BEGIN  
END











at this depth is well defined. It is a low level of water

with a high degree of variability. The variability is due to the fact that the water is not



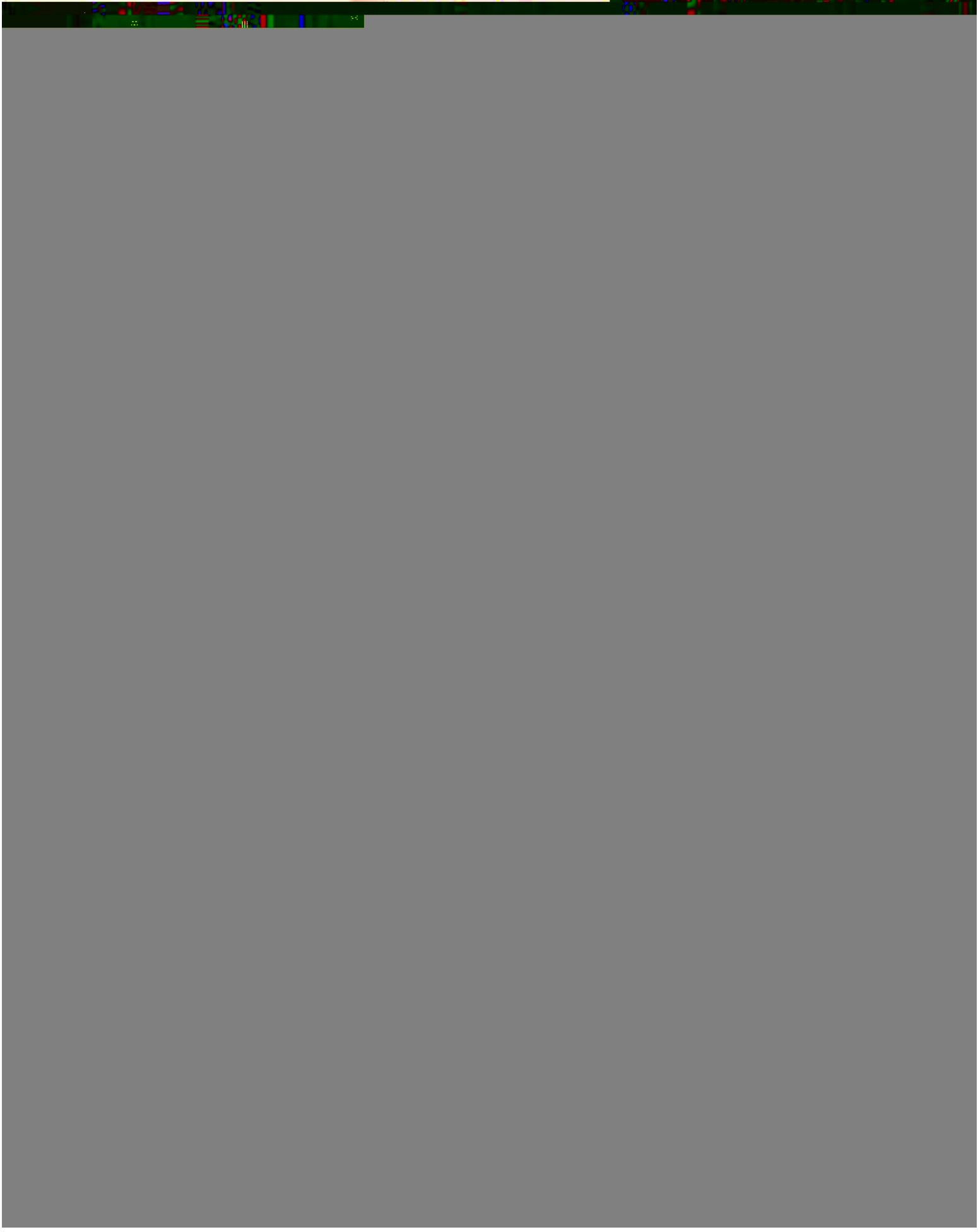












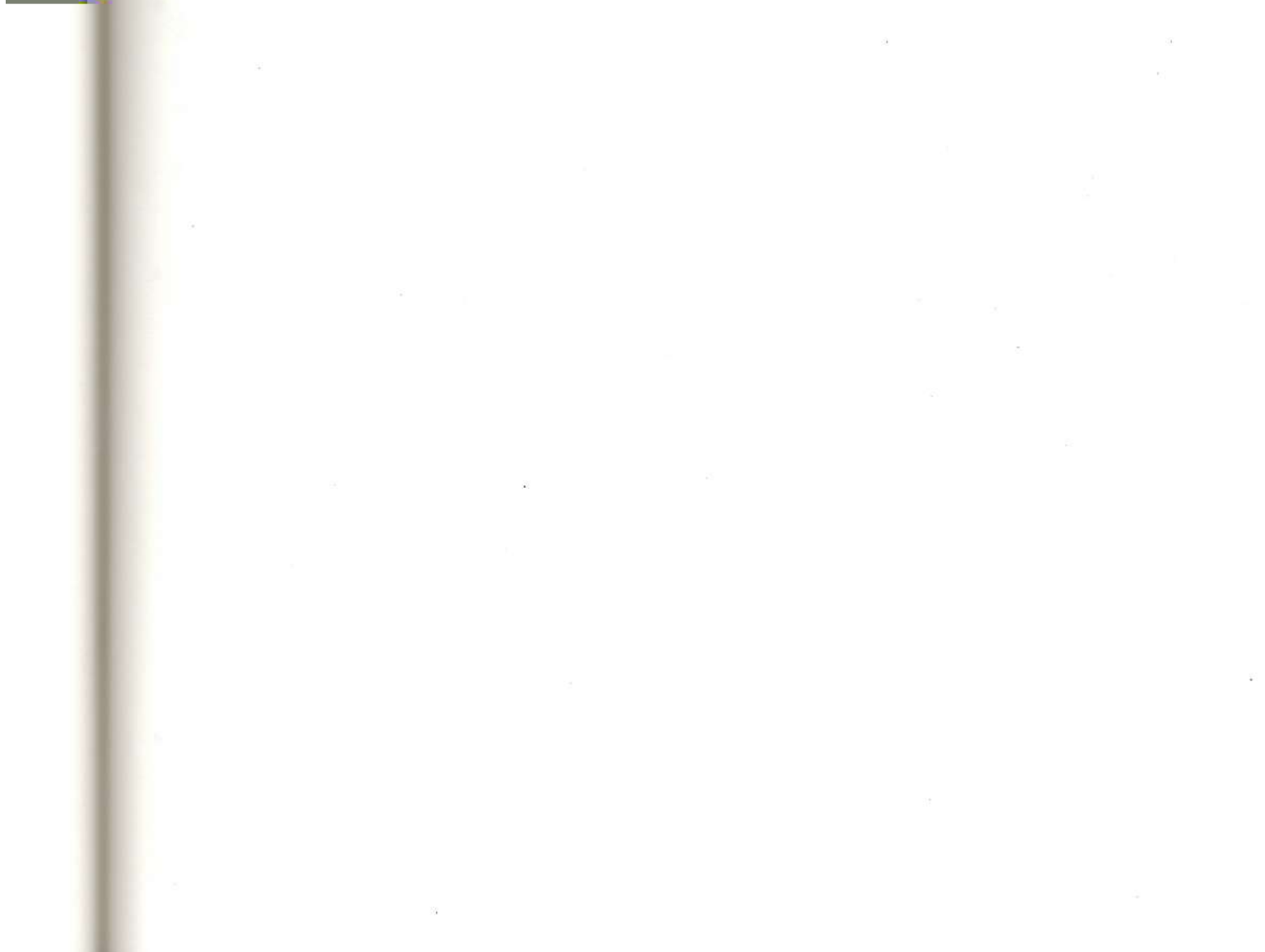
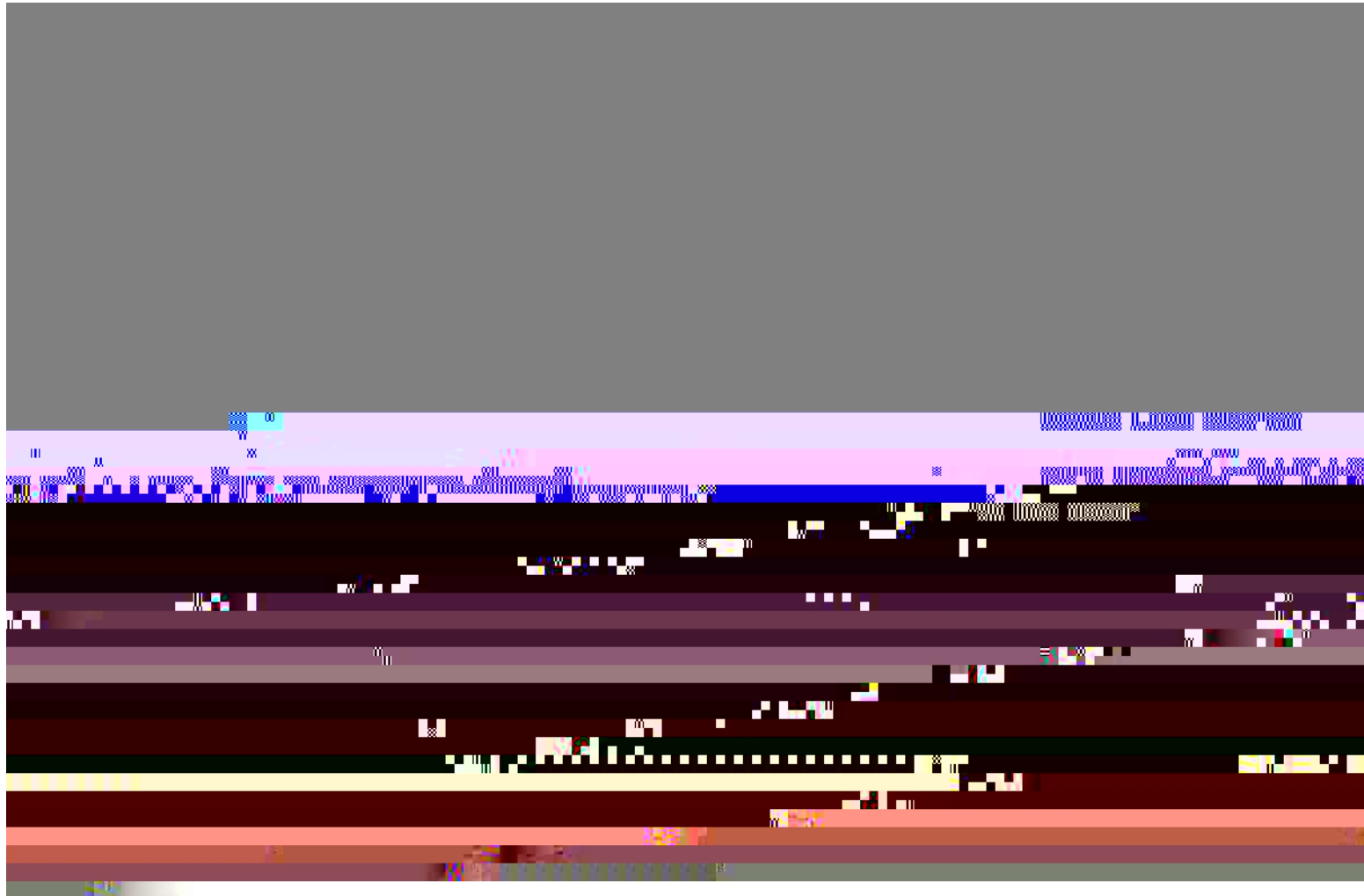




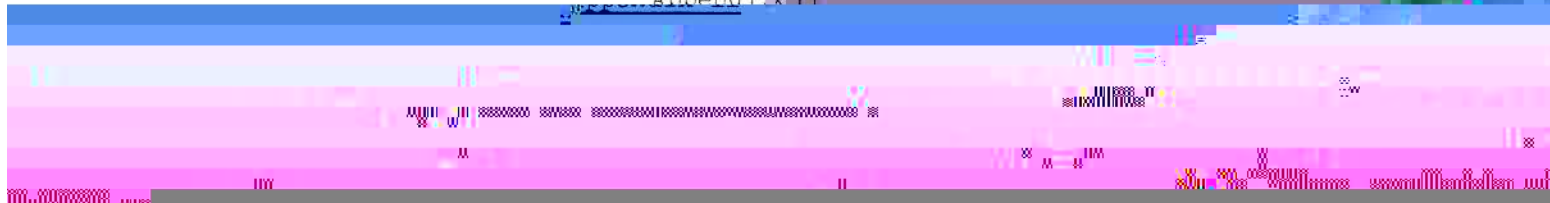






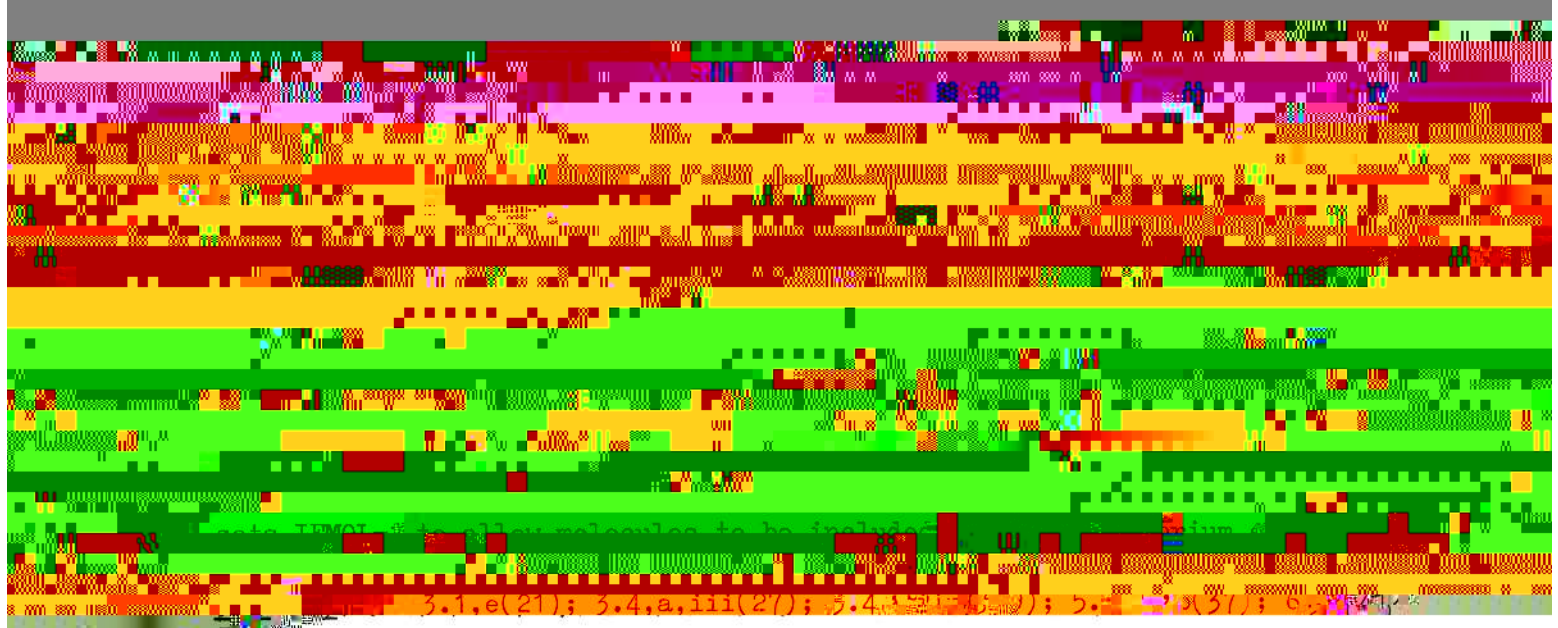


Appendix TT











NLTE

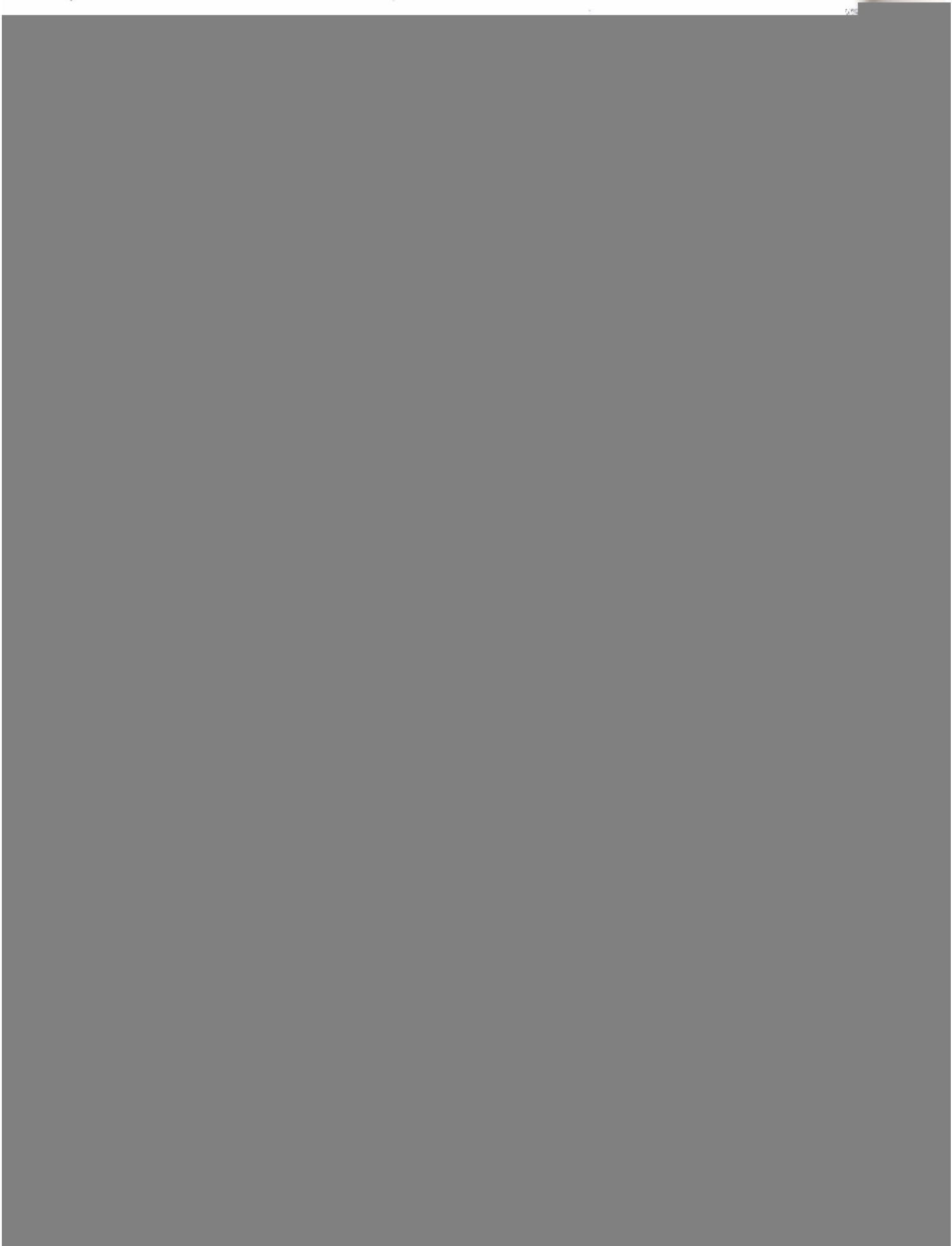
specific non-LTE calculation is to be











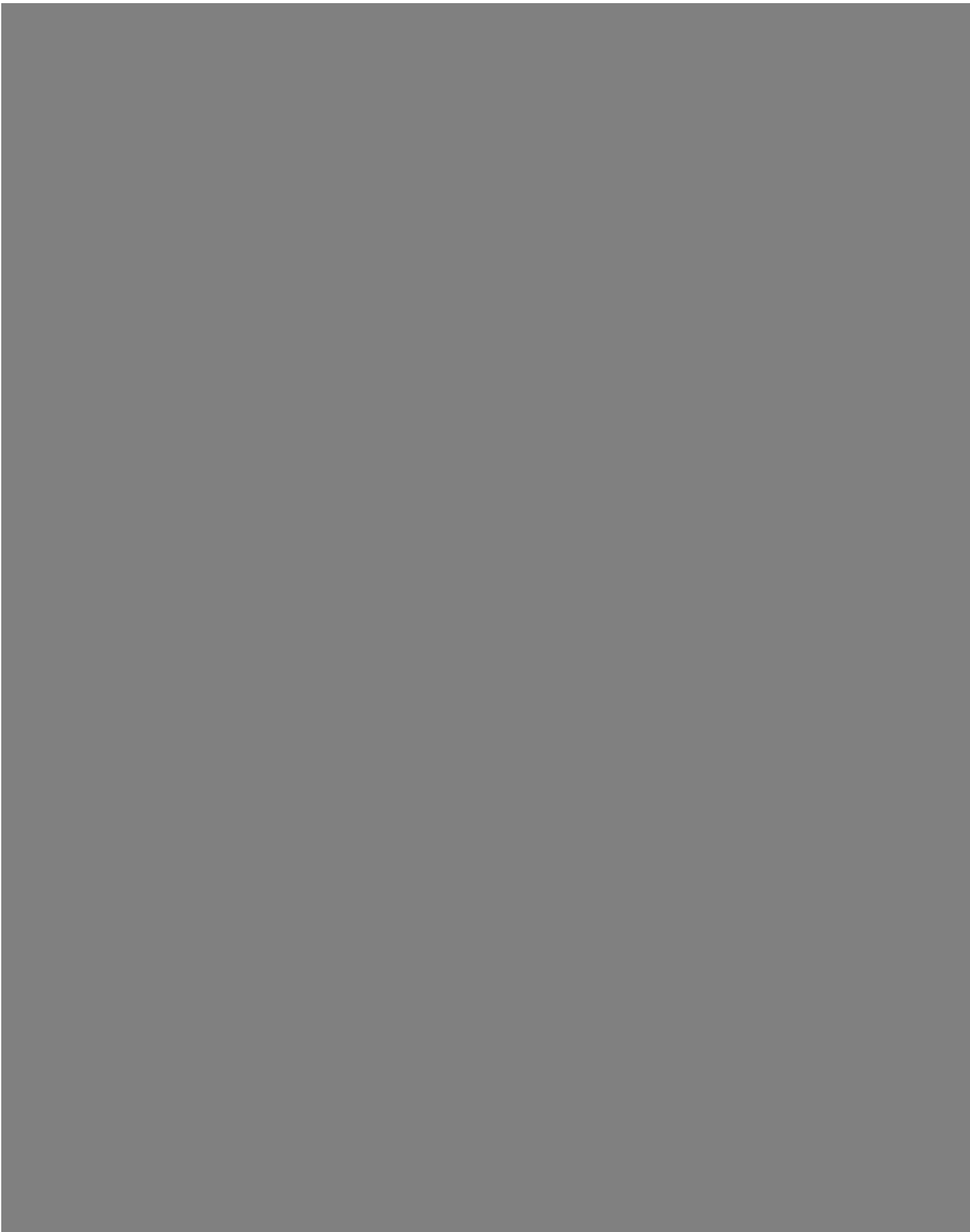
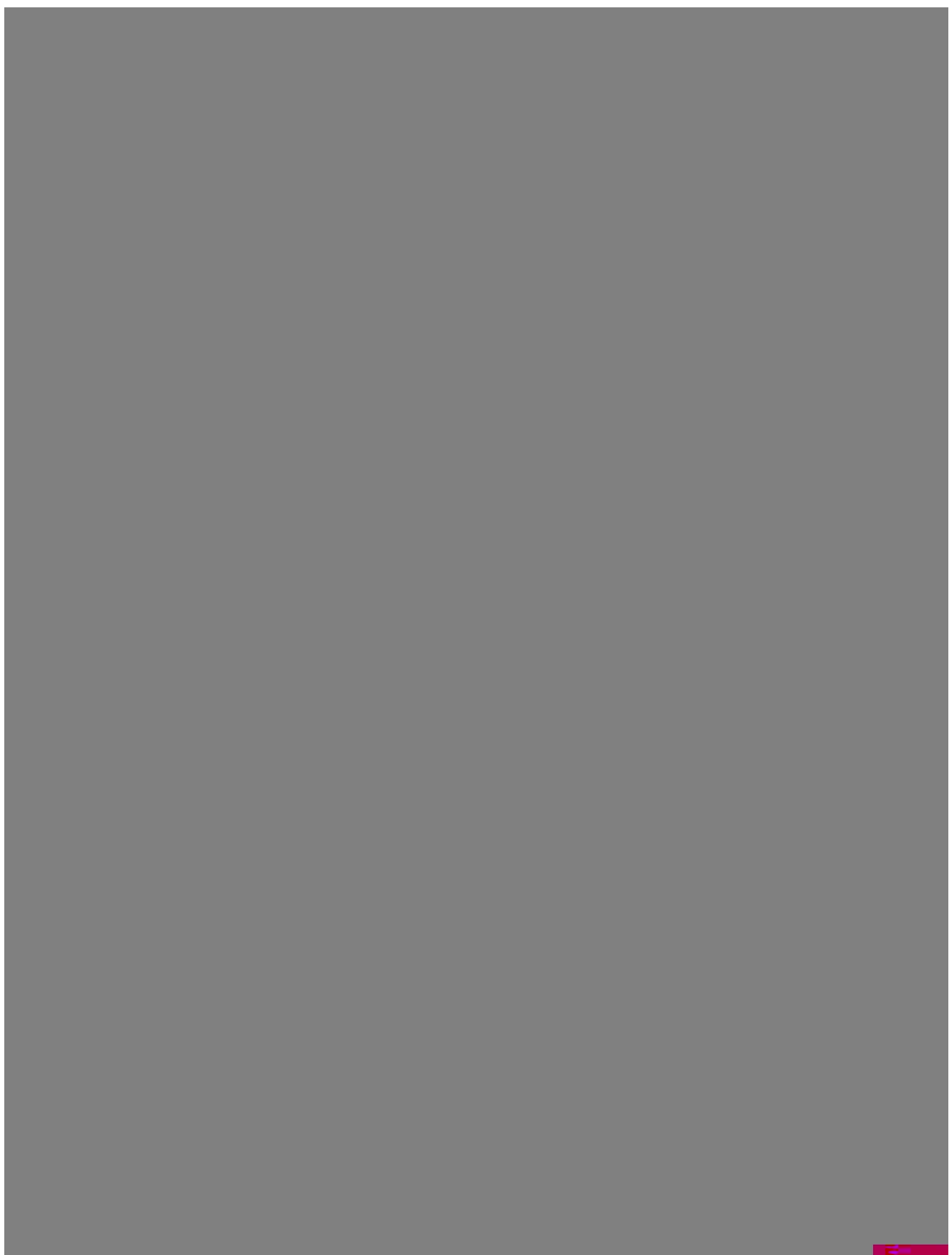


TABLE 5

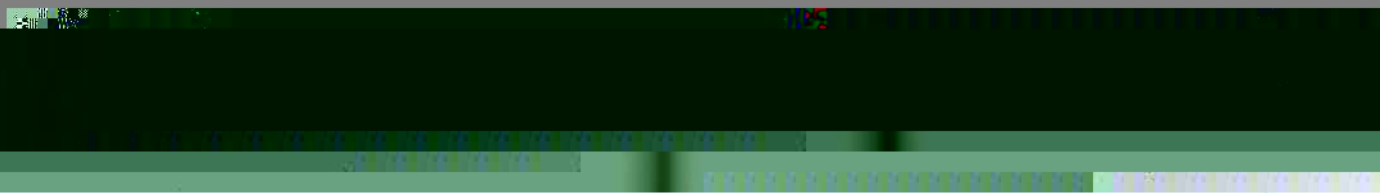
Opacita

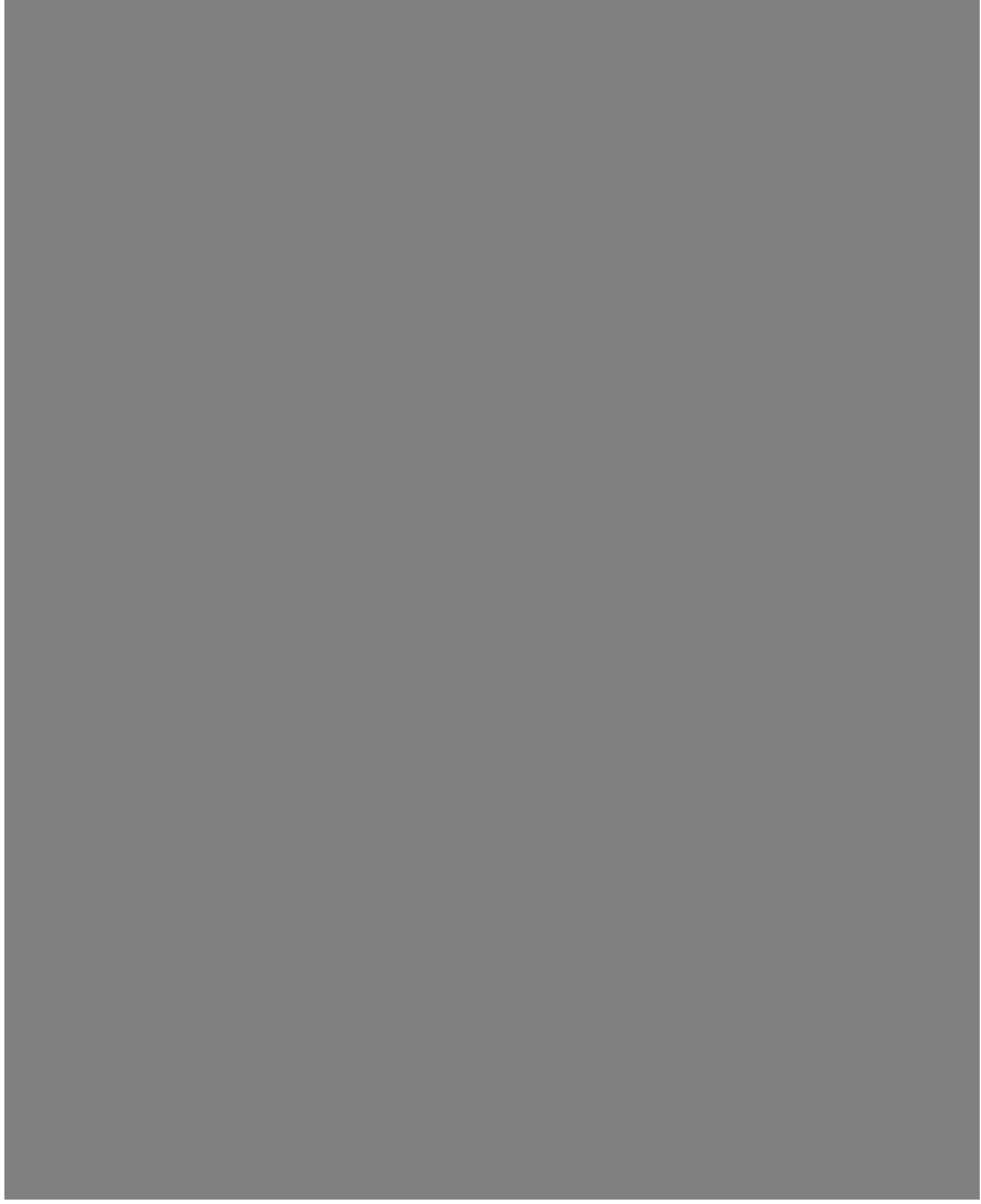
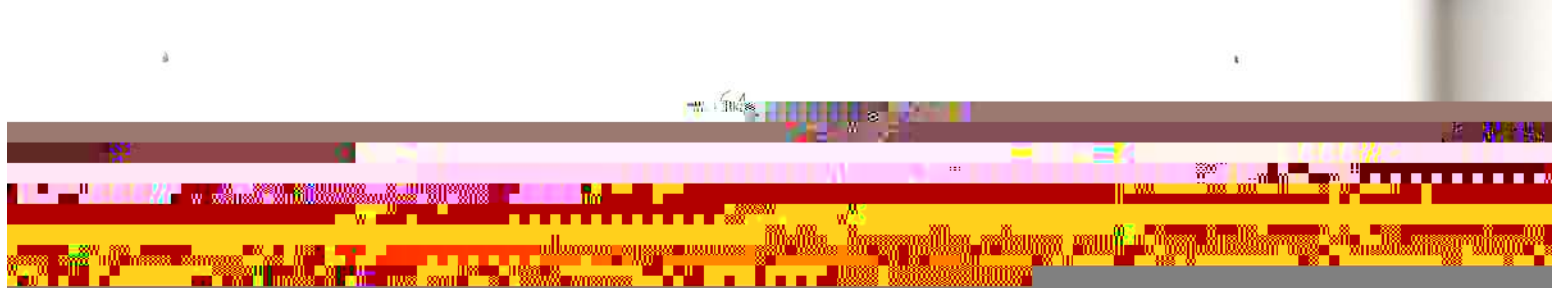






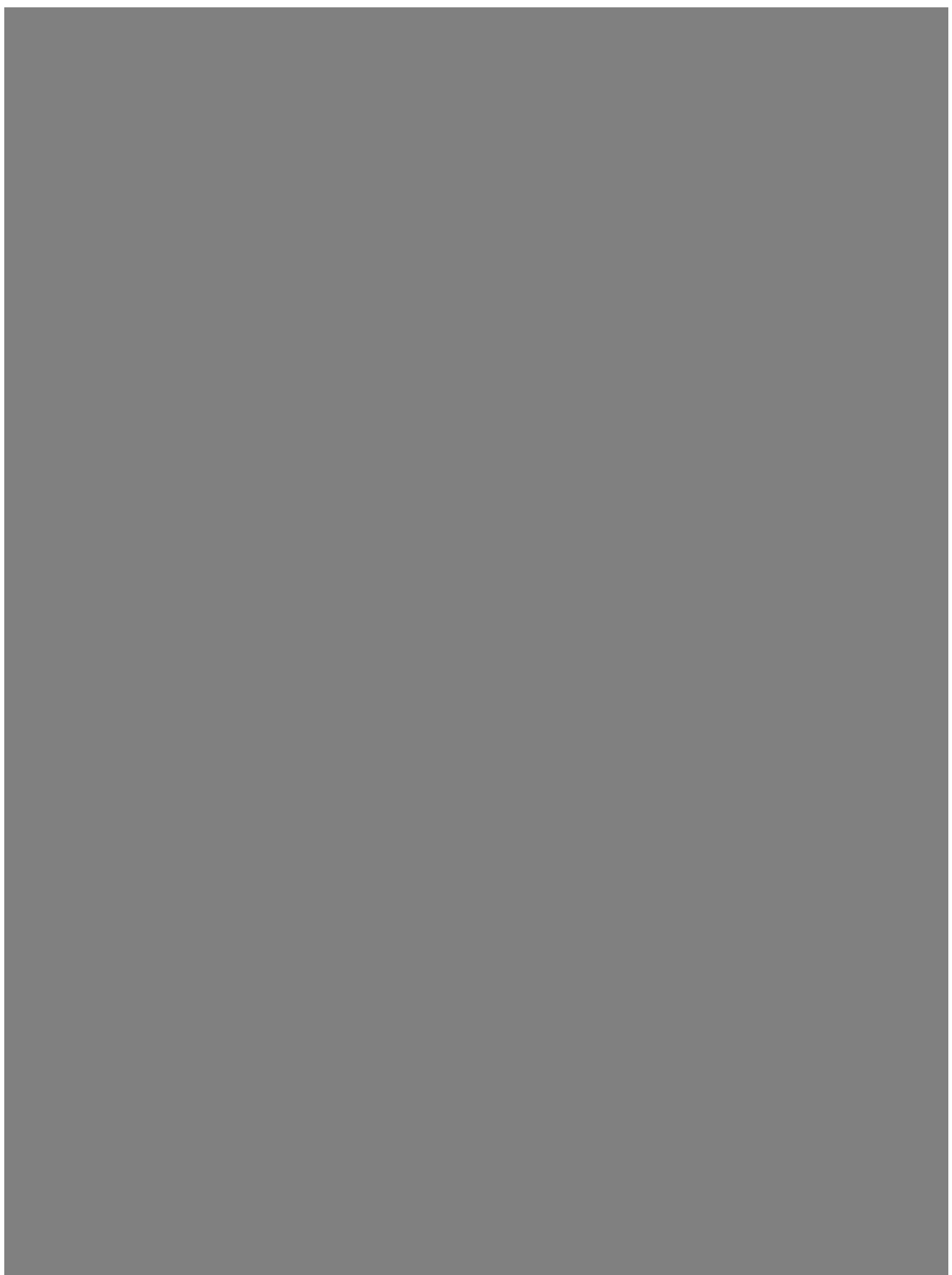








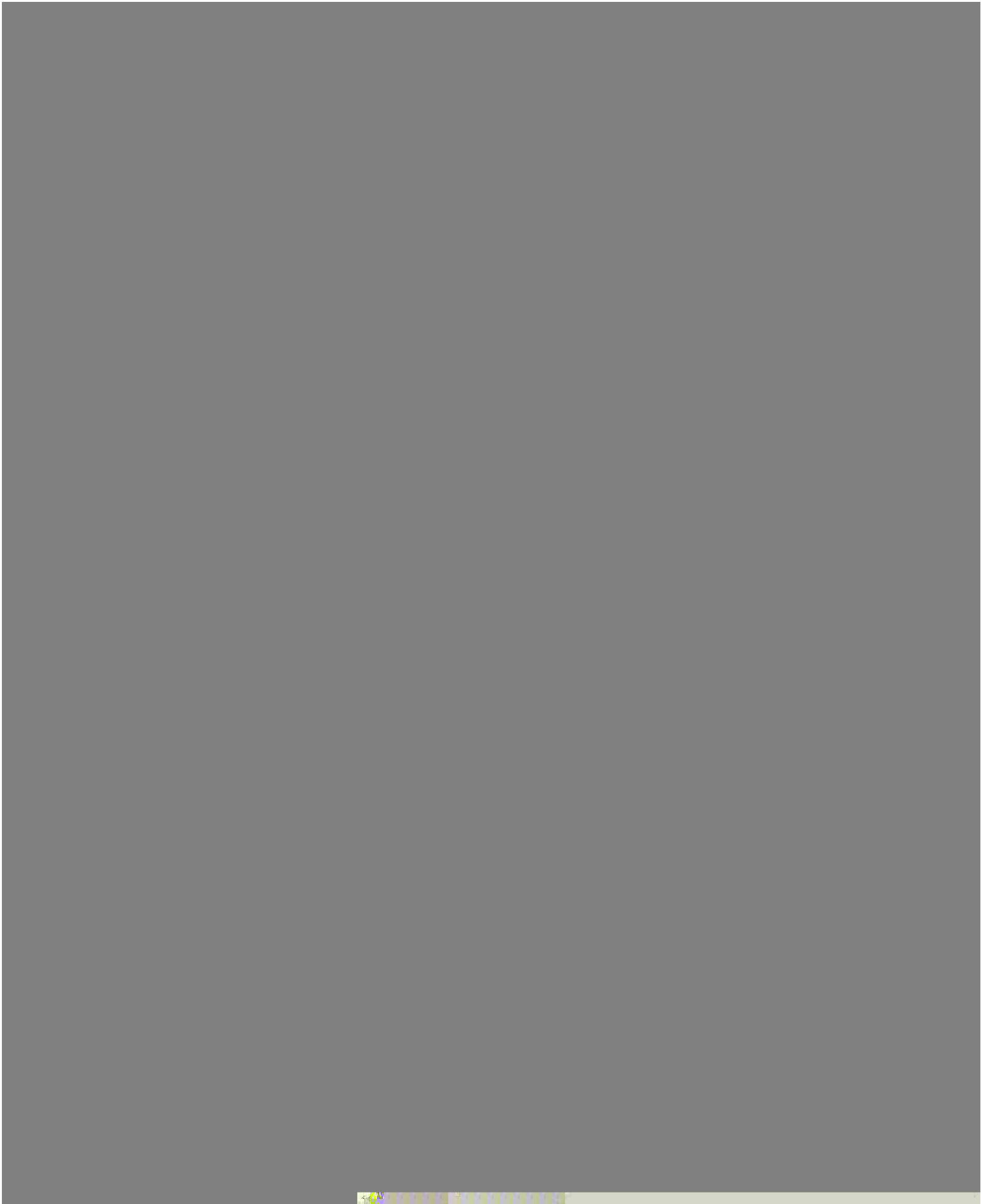






files. If the user does not wish to save the restart data then cards  
v), 





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