# MCS Heat Pump Calculator



This spreadsheet provides a methodology using the energy calculations required by the MCS Heat Pump Standard (MIS 3005-D) to assist in system design. It is not to be used for any other purpose.

The spreadsheet is designed to be used by competent persons as defined by the Standard, who have undertaken training and are part of a subject training. It is not to be used by consumers. Installers may choose to use their own calculations as long as they meet the requirements of the Standard.

The spreadsheet is protected to prevent inadvertent changes to the calculations. Please contact the Standard's Governance Body if you believe that an error exists in the calculations or if further details are required.

Version 4.1a

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| | | | |
|---|---|---|---|
| **Project Reference:** | | **MCS Designer:** | |
| **Date:** | | **Company Name:** | |
| **Customer Name:** | | **MCS No:** | |
| **Site Address:** | | **Address:** | |
| | | | |
| | | | |
| | | | |
| **Post Code:** | ***Input Required*** | **Post Code:** | |
| **Contact Nos.** | | **Contact Nos.** | |
| **Email Address:** | | **Email Address:** | |

| | | | |
|---|---|---|---|
| **Property Details** | | | |
| House Type | | Amount of Bedrooms | |
| Built (year) | | Occupants per Bedroom | |
| Electrical Supply | | Total Floor Area (m²) | |
| | | Total Volume (m³) | |
| **Design Data** | | | |
| Outside Design Temp - ODT (ºC | *-2.5* | Altitude (m) | |
| Degree Days (DD) | *2228* | Min Hot Water Cylinder (litres) | |
| Mean air temp - MAT (°C) | *10* | Hot water per occupant (l/day) | |
| MAT Location | *W Pennines (Ringway)* | Legionnaires' protection (days) | |
| **Building Requirements** | | | |
| Space Heating load (kW) | *0.00* | demand (kWh/yr) | |
| Heat loss W/m² | *0.00* | Immersion Energy (kWh) | |
| Space Heating (kWh/yr) | *0* | Total Energy Usage (kWh/yr) | |
| **Selection** | | | |
| Type of Heat Pump | | Buffer Vessel (litres) | |
| Manufacturer | | Hot Water Cylinder (litres) | |
| Model | | Type of Emitters | |
| Output @ ODT/DFT (kW) | ***Input Required*** | Design Flow Temp - DFT (°C) | |
| Output @ 0°C/HW (kW) | ***Input Required*** | CH pump power (W) | |
| Manufacturers htg SCOP | ***Input Required*** | Hot Water storage temp (°C) | |
| Manufacturers HW SCOP | ***Input Required*** | Hot Water system efficiency | |

| | | | |
|---|---|---|---|
| **Estimated Running Costs** | | | |
| Space Heating | *£0.00* | Ground Pump | |
| Hot Water from Heat Pump | *£0.00* | Electric (p/kWh) | |
| Hot Water from Immersion | *£0.00* | Gas (p/kWh) | |
| Total Running Costs | *£0.00* | LPG (p/kWh) | |
| Central Heating Pump | *£0.00* | Oil (p/kWh) | |

| |
|---|
| 1 |
| 0.00 |
| 0.00 |
| |
| 0 |
| 45 |
| 7 |
| |
| 0 |
| 0 |
| 0 |
| |
| 50 |
| 70.00% |
| |
| £0.00 |
| £0.14 |
| £0.05 |
| £0.52 |
| £0.61 |

## U VALUE CALCULATOR

**Fabric Type:**

| Layer | Element | Material | Thickness (mm) |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| | | | |
| | | | |

| EXTERNAL WALL TYPE - SOLID | |
|---|---|
| Solid Brick Wall | |
| | |
| | |
| Solid Brick Insulated Externally | 19mm F |
| | 19mm F |
| | 19mm F |
| Solid Brink Insulated Internally | Brick 1 |
| | Brick 2 |
| | Brick 3 |
| Solid Stone Wall, Unplastered | |
| | |
| | |
| Solid Stone Wall, Internally Insulated | Stone 305 |
| | Stone 457 |
| | Stone 610 |
| Solid Concrete Wall, Dense Plaster | |
| | |
| | |
| | |
| Solid Concrete Wall Insulated External, Dense Plaster | 19mm Re |
| | 19mm Re |
| | 19mm Re |
| | 19mm Re |

| EXTERNAL WALL TYPE - CAVITY | |
|---|---|
| | |
| Cavity Wall (Open cavity or mineral Wool Slab), Lightweight Plaster | Brick |
| | Brick |
| | |
| Cavity Wall, aerated block inner leaf, lightweight plaster | Brick 102mm op |
| | Brick 102mm open ca |
| | Brick 102mm, miner |
| | Brick 102mm, miner |
| | Brick 102mm open c |

| | |
|---|---|
| | Brick 102mm open c |
| Cavity Wall, high performance aerated block inner leaf, lightweight plaster or plasterboard | Brick 102mm ope |
| | Brick 102mm, mine |
| | Brick 102mm, mine |

| EXTERNAL WALL TYPE - RENDERED EXTERNALLY | |
|---|---|
| | |
| Cavity Wall (Open cavity or mineral Wool Slab), Lightweight Plaster | Rende |
| | Render 19 |
| | |
| Cavity Wall, aerated block inner leaf, lightweight plaster or plasterboard | Render 19mm, |
| | Render 19mm, brick 1 |
| | Render 19mm, standarc |
| Cavity blockwork wall, inner aerated block, lightweight plaster | Render 19mm, standar |
| Cavity wall, rendered, aerated block inner, lightweight plaster | Render 19mm, stanc |
| | Render 19mm, stanc pe |
| Solid Wall, rendered outside, plaster inside | Render 19mr |

| EXTERNAL WALL TYPE - VARIATIONS | |
|---|---|
| | |
| Cavity wall, tile clad, (open cavity or mineral wool slab), lightweight plaster | Tiles |
| | Tiles, air space, standar |
| | Tiles, air space, stanc |
| | Tiles, air space, stanc pe |
| Solid wall, tile clad externally | Tiles, air spac |
| Cavity wall timber clad externally | Shiplap boards, airspa |
| | Shiplap boards, airspac |
| | Shiplap boards airspac |
| | Shiplap boards, airspac h |
| | |
| Brick outer timber frame wall, dp membrane, plywood sheathing, studding, vapour membrane, plasterboard | Brick 102.5mm, cavity |
| | Tiles, airspace, membr |
| | Shiplap boards, airspac |

| | |
|---|---|
| | Shiplap boards, airspac |

| Thermal Conductivity (W/mK) | Resistance R m²K/W |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| ***Total Resistance*** | **0.000** |
| ***U value of construction (W/m²K)*** | **#DIV/0!** |

| Description | U-value W/m²K |
|---|---|
| Brick 102mm, Plaster | 2.97 |
| Brick 228mm, Plaster | 2.11 |
| Brick 343mm, Plaster | 1.64 |
| Render, 75mm foam board, Brick 102mm, Plaster | 0.30 |
| Render, 75mm foam board, Brick 228mm, Plaster | 0.28 |
| Render, 75mm foam board, Brick 343mm, Plaster | 0.27 |
| 02mm, 75mm foam board, 12.5mm plasterboard | 0.30 |
| 28mm, 75mm foam board, 12.5mm plasterboard | 0.29 |
| 43mm, 75mm foam board, 12.5mm plasterboard | 0.28 |
| Stone 305mm (12") | 2.78 |
| Stone 457mm (18") | 2.23 |
| Stone 610mm (24") | 1.86 |
| 5mm, 100mm mineral wool, plasterboard on battens | 0.33 |
| 7mm, 100mm mineral wool, plasterboard on battens | 0.32 |
| 0mm, 100mm mineral wool, plasterboard on battens | 0.32 |
| Concrete 102mm, Plaster | 3.51 |
| Concrete 152mm, Plaster | 3.12 |
| Concrete 204mm, Plaster | 2.80 |
| Concrete 254mm, Plaster | 2.54 |
| ender, 75mm foam board, concrete 102mm, Plaster | 0.31 |
| ender, 75mm foam board, concrete 152mm, Plaster | 0.30 |
| ender, 75mm foam board, concrete 204mm, Plaster | 0.30 |
| ender, 75mm foam board, concrete 254mm, Plaster | 0.30 |

| Description | U-value W/m²K | |
|---|---|---|
| | **Open Cavity** | **Mineral Wool 50mm** |
| 102mm, Brick 102mm, 13mm Plaster & Skim | 1.37 | 0.56 |
| 102mm, Brick 102mm, 12mm Plaster on dabs | 1.21 | 0.53 |
| | **Inner Leaf Thickness** | |
| | **100mm** | **125mm** |
| pen cavity, standard aerated block (k=0.17), 13mm Plaster | 0.87 | 0.77 |
| avity, standard aerated block (k=0.17), 12.5mm plasterboard on dabs | 0.80 | 0.72 |
| al wool slab in cavity 50mm, standard aerated block (k=0.17), 13mm Plaster | 0.45 | 0.42 |
| al wool slab in cavity 50mm, standard aerated block (k=0.17), 12.5mm plasterboard on dabs | 0.43 | 0.41 |
| avity, high performance aerated block (k=0.11), 13mm Plaster | 0.68 | 0.59 |

| | | |
|---|---|---|
| ·avity, high performance aerated block (k=0.11), 13mm Plaster | 0.66 | 0.59 |
| n cavity, high performance aerated block (k=0.11), 12.5mm plasterboard on dabs | 0.64 | 0.56 |
| ral wool slab in cavity 50mm, high performance aerated block (k=0.11), 13mm Plaster | 0.39 | 0.36 |
| ral wool slab in cavity 50mm, high performance aerated block (k=0.11), 12.5mm plasterboard on dabs | 0.38 | 0.35 |

| Description | U-value W/m²K | |
|---|---|---|
| | Open Cavity | Mineral Wool 50mm |
| r 19mm, Brick 102mm, Brick 102mm, 13mm Plaster | 1.25 | 0.54 |
| mm, Brick 102mm, Brick 102mm, 12mm Plaster on dabs | 1.11 | 0.51 |
| | Inner Leaf Thickness | |
| | 100mm | 125mm |
| , brick 102mm, cavity, standard aerated block, 13mm plaster | 0.82 | 0.73 |
| 02.5mm, mineral wool slab in cavity 50mm, standard aerated block, 13mm plaster | 0.44 | 0.41 |
| d aerated block 100mm, cavity, standard aerated block, 13mm plaster | 0.61 | 0.56 |
| rd aerated block 100mm mineral wool slab in cavity 50mm, standard aerated block, 13mm plaster | 0.37 | 0.35 |
| dard aerated block 100mm, cavity, high performance aerated block (k=0.11), 13mm plaster | 0.51 | 0.45 |
| dard aerated block 100mm,mineral wool slab in cavity 50 mm, high rformance aerated block (k=0.11), 13mm plaster | 0.33 | 0.31 |
| m, high performance aerated block (k=0.11), 13mm plaster | 0.44 | |

| Description | U-value W/m²K | | |
|---|---|---|---|
| | Inner Leaf Thickness | | |
| | 100mm | 125mm | |
| s, air space, standard aerated block, 13mm plaster | 0.58 | 0.53 | |
| d aerated block 100mm, mineral wool slab in cavity 50mm, standard aerated block, 13mm plaster | 0.36 | 0.34 | |
| dard aerated block 100mm, cavity, high performance aerated block (k=0.11), 13mm plaster | 0.49 | 0.44 | |
| dard aerated block 100mm, mineral wool slab in cavity 50mm, high rformance aerated block (k=0.11), 13mm plaster | 0.32 | 0.30 | |
| ce, high performance aerated block 215mm, 13mm plaster | 0.43 | | |
| ace, standard aerated block 100mm, cavity, standard aerated block, 13mm plaster | 0.53 | 0.49 | |
| e, standard aerated block 100mm, mineral wool slab in cavity 50mm, standard aerated block, 13mm plaster | 0.34 | 0.32 | |
| e, standard aerated block 100mm, cavity, high performance aerated block, 13mm plaster | 0.45 | 0.41 | |
| e, standard aerated block 100mm, mineral wool slab in cavity 50mm, igh performance aerated block, 13mm plaster | 0.31 | 0.29 | |
| | Insulation Thickness | | |
| | 60 mm | 80 mm | 100 mm |
| y, membrane, plywood 10mm, studding 100m, with infill insulation, vapour membrane, plasterboard 12.5mm | 0.43 | 0.36 | 0.32 |
| rane, plywood 10mm, studding 100mm, with infill insulation, vapour membrane, plasterboard 12.5mm | 0.47 | 0.38 | 0.34 |
| e, membrane, plywood 10mm, studding 100mm with infill insulation | 0.44 | 0.36 | 0.32 |

| | | | |
|---|---|---|---|
| e, membrane, plywood 18mm, studding 100mm with mm insulation | 0.44 | 0.36 | 0.32 |

**Degree Day data from CIBSE Guide A** (base temperature 15.5 °C) 1976-1995
**& Mean Air Temp data** (from MIS 3005 Appendix B)

| | Degree Day (K*day) | Mean Air Temp (°C) |
|---|---|---|
| *Borders (Boulmer)* | 2483 | 9.0 |
| *E Anglia (Honington)* | 2254 | 10.1 |
| *E Pennines (Finningley)* | 2307 | 10.0 |
| *E Scotland (Leuchars)* | 2577 | 8.8 |
| *Midland (Elmdon)* | 2425 | 9.8 |
| *N Ireland (Aldergrove)* | 2360 | 9.4 |
| *NE Scotland (Dyce)* | 2668 | 8.5 |
| *North-eastern (Lemming)* | 2370 | 9.4 |
| *North-western (Carlisle)* | 2388 | 9.4 |
| *NW Scotland (Stornoway)* | 2671 | 8.6 |
| *Severn Valley (Filton)* | 1835 | 10.6 |
| *South-eastern (Gatwick)* | 2255 | 10.2 |
| *Southern (Hurn)* | 2224 | 10.4 |
| *South-western (Plymouth)* | 1858 | 11.0 |
| *Thames Valley (Heathrow)* | 2033 | 11.3 |
| *W Pennines (Ringway)* | 2228 | 10.0 |
| *W Scotland (Abbotsinch)* | 2494 | 9.1 |
| *Wales (Aberporth)* | 2161 | 9.9 |

| Location | Alt (m) | External Temp ** |
|---|---|---|
| *Belfast* | 68 | -1.2 |
| *Birmingham* | 96 | -3.4 |
| *Cardiff* | 67 | -1.6 |
| *Edinburgh* | 35 | -3.4 |
| *Glasgow* | 5 | -3.9 |
| *London* | 25 | -1.8 |
| *Manchester* | 75 | -2.2 |
| *Plymouth* | 27 | -1.2 |

**Design I**

| Room | Temp (°C) | Category A |
|---|---|---|
| *Lounge* | 21 | 1.5** |
| *Living* | 21 | 1.5** |
| *Breakfast* | 21 | 1.5 |
| *Dining* | 21 | 1.5 |
| *Kitchen* | 18 | 2.0* |
| *Family* | 21 | 2.0* |
| *Hall* | 18 | 2.0 |
| *Cloaks/WC* | 18 | 2.0* |
| *Toilet* | 18 | 3.0* |
| *Utility* | 18 | 3.0* |
| *Study* | 21 | 1.5 |

**Category A:** *Air change rates for older e*
*orders may require greater*
**Category B:** *Air change rates for moder*

**Category C:** *New (or existing) buildings*

***** *Where mechanical extract*
*then it is advisable to make*
****** *Where a room contains an*
*Chimneys and Open Flues*
**Note:** All new (Post 2006), well in

| Room Volume (m³) | Rooms Throat r |
|---|---|
| *Up to 40* | |
| *Up to 40* | |
| *Up to 70* | |
| *Up to 70* | |

*Table and information taken from The D*

**Room Operative Temperature and Natural Ventilation Rates**

| Category B | Category C | Room | Temp (°C) | Category A | Category B | Category C |
|---|---|---|---|---|---|---|
| 1.0** | 0.5 | *Games* | 21 | 1.5 | 1.0 | 0.5 |
| 1.0** | 0.5 | *Bedroom* | 18 | 1.0 | 1.0 | 0.5 |
| 1.0 | 0.5 | *Bedsitting* | 21 | 1.5 | 1.0 | 0.5 |
| 1.0 | 0.5 | *Bed & Ensuite* | 21 | 2.0 | 1.5 | 1.0 |
| 1.5* | 1.5* | *Internal* | 18 | 0.0 | 0.0 | 0.0 |
| 1.5* | 1.5* | *Bed/Study* | 21 | 1.5 | 1.5 | 0.5 |
| 1.0 | 0.5 | *Landing* | 18 | 2.0 | 1.0 | 0.5 |
| 1.5* | 1.5* | *Bath* | 22 | 3.0* | 1.5* | 1.5* |
| 1.5* | 1.5* | *Shower* | 22 | 3.0* | 1.5* | 1.5* |
| 2.0* | 0.5* | *Dressing* | 18 | 1.5 | 1.0 | 0.5 |
| 1.5 | 0.5 | *Store* | 16 | 1.0 | 0.5 | 0.5 |

*existing buildings (pre 2000). Those with several chimneys and/or subject to preservation*
*infiltration allowance than shown above*
*n buildings (2000 or later) with double glazing and regulatory minimum insulation*

*constructed after 2006 and complying with all current building regulations.*

*ventilation is to be installed in a room and the extract volume exceeds the natural infiltration,*
*e due allowances for the air extracted from any connecting room or corridor.*
*open fire or chimney, due ventilation allowance must be made from table below (Rooms with*
*).*
nsulated buildings use a design temp of 21°C throughout, except bathrooms (22°C) and Store (16°C)

**s with Chimneys and Open Flues**

| estrictor fitted to flue | Air changes per hour |
|---|---|
| No | 5 |
| Yes | 3 |
| No | 4 |
| Yes | 2 |

*omestic Heating Design Guide 2015 - please refer to the guide for further information*

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

| | | | | | |
|---|---|---|---|---|---|
| **Room Dimensions** | | | | | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| **Awkward Room Dimensions** | | | | | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Height (m) | | Depth (m) | |
| Length (m) | | Height (m) | | Depth (m) | |
| Length (m) | | Height (m) | | Depth (m) | |
| **Floor** | | | | | |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| **External Wall** | | | | | |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |
| **Roof** | | | | | |
| Length (m) | 0.00 | Width (m) | 0.00 | Area (m²) | 0.00 |
| Length (m) | 0.00 | Width (m) | 0.00 | Area (m²) | 0.00 |
| Length (m) | 0.00 | Width (m) | 0.00 | Area (m²) | 0.00 |
| | | | | Area (m²) | 0.00 |
| **Windows** | | | | | |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| **Roof Glazing** | | | | | |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| **Doors** | | | | | |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| **Internal Walls** | | | | | |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| Fabric | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | |
|---|---|---|
| Volume (m³) | 0.00 | |
| Volume (m³) | 0.00 | |
| Volume (m³) | 0.00 | |
| Volume (m³) | 0.00 | *Pitched* |
| Volume (m³) | 0.00 | *Single Pitch* |
| Volume (m³) | 0.00 | *Dormer 1* |
| Volume (m³) | 0.00 | *Dormer 2* |
| Volume (m³) | 0.00 | *Dormer 3* |

| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | **Typ** |
|---|---|---|---|---|---|
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | **Expos** |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| | | | | | **Adjoin** |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Roof Glazing**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | 0.00 | Width (m) | 0.00 | Area (m²) | 0.00 |
| Length (m) | 0.00 | Width (m) | 0.00 | Area (m²) | 0.00 |
| Length (m) | 0.00 | Width (m) | 0.00 | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| Fabric | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | 0.00 | Width (m) | 0.00 | Area (m²) | 0.00 |
| Length (m) | 0.00 | Width (m) | 0.00 | Area (m²) | 0.00 |
| Length (m) | 0.00 | Width (m) | 0.00 | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| Fabric | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume (m³) | 0.00 | | | | | |
| Volume (m³) | 0.00 | | | | | |
| Volume (m³) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | | |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| Fabric | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume (m³) | 0.00 | | | | | |
| Volume (m³) | 0.00 | | | | | |
| Volume (m³) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | | |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | 2.00 | Width (m) | 2.00 | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Awkward Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Height (m) | | Depth (m) | |
| Length (m) | | Height (m) | | Depth (m) | |
| Length (m) | | Height (m) | | Depth (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |
| Length (m) | | Pitch (m) | | Area (m²) | 0.00 |
| Length (m) | | Pitch (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | 2 | Height (m) | 2 | Area (m²) | 4.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

**Party Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | 2 | Height (m) | 2 | Area (m²) | 4.00 |

| Fabric | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | |
|---|---|---|
| Volume (m³) | 0.00 | |
| Volume (m³) | 0.00 | |
| Volume (m³) | 0.00 | |
| Volume (m³) | 0.00 | *Pitched* |
| Volume (m³) | 0.00 | *Single Pitch* |
| Volume (m³) | 0.00 | *Dormer 1* |
| Volume (m³) | 0.00 | *Dormer 2* |
| Volume (m³) | 0.00 | *Dormer 3* |

| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | **Typ** |
|---|---|---|---|---|---|
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | **Expos** |
| U Value (W/m²K) | 0.00 | 0.00 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| *Pitched* | | | | | |
| *Single Pitch* | | | | | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| U Value (W/m²K) | 0.00 | 2.50 | 0.00 | 0.00 | |
| | | | | | **Adjoin** |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | |
| U Value (W/m²K) | 0.00 | 0 | 0.00 | | |
| U Value (W/m²K) | 0.00 | -10 | 0.00 | 0.00 | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |

**Heat Loss (W)** 0

**Usage (kWh)** 0

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

| | | | | | |
|---|---|---|---|---|---|
| **Room Dimensions** | | | | | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| **Floor** | | | | | |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| **External Wall** | | | | | |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |
| **Roof** | | | | | |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |
| **Windows** | | | | | |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| **Doors** | | | | | |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| **Internal Walls** | | | | | |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

# ASHP - Sound Power Level

| | |
|---|---|
| **1. Sound power level (dB)** | *62* |
| **2. Sound pressure level (dB)** | *Q4 - "Two Reflective Surfaces"* |
| **3.Distance from heat pump to assessment position (meters)** | *5* |
| **4. dB Distance Reduction** | *-19* |
| **5. Barriers Between heat pump and assessment position** | *Barrier (no view)* |
| **6.Sound pressure level @ assessment position** | *33* |
| **7. Background noise level (dB)** | *40* |
| **8. Differential between 6. & 7.** | *7* |
| **9. Decibel Correction (dB)** | *40.8* |
| **10. Final Result (dB)** | **41.0** |
| | **Pass** |

## Ground Loop Sizing

| | | | |
|---|---|---|---|
| 1 | **Type of collector** | | |
| 2 | **Estimate of total heating energy consumption over a year for space heating and domestic hot water** | *0* | *kWh* |
| 3 | **HP heating capacity at 0ºC ground return temperature and design emitter temperature** | ***Input Required*** | *kW* |
| 4 | **FLEQ run hours** | *0* | *hrs* |
| 5 | **Estimated average ground temperature** | *10.00* | *ºC* |
| 6 | **Estimated ground thermal conductivity -** *Please select below* | | |
| | *Unconsolidated rock, Claystone, siltstone* | *2.20* | *W/mK* |
| 7 | **Maximum power to be extracted per meter** | ***Input Required*** | *W/m* |
| 8 | **SCOP** | ***Input Required*** | |
| 9 | **Maximum power extracted from the ground** | *0.00* | *W* |
| 10 | **Length of ground heat exchanger calculated using the look-up** | *0* | *m* |
| 11 | **Minimum spacing between boreholes** | *7.00* | *m* |
| 12 | **Total length of ground heat exchanger active elements** | *0* | *m* |
| 13 | **Amount of loops** | ***Input Required*** | |
| 14 | **Min length of loop** | *0.00* | *m* |
| 15 | **Length of loop** | ***Input Required*** | *m* |
| 16 | **Depth of borehole/s** | *0.00* | *m* |
| 17 | **Length of header** | ***Input Required*** | *m* |

## Pipe Sizing (Loops)

| | | | |
|---|---|---|---|
| 18 | **Power Ground HX pump** | ***Input Required*** | *W* |
| 19 | **Pipe Diameter** | *40* | *mm* |
| 20 | **Antifreeze Manufacturer** | ***Input Required*** | |
| 21 | **Antifreeze type i.e. propylene, ethylene** | ***Input Required*** | |
| 22 | **Antifreeze %** | ***Input Required*** | |
| 23 | **Protected to** | ***Input Required*** | *ºC* |
| 24 | **Viscosity @ 0 °C** | ***Input Required*** | *mm2/s* |
| 25 | **Pipe Type** | *PE-Xa* | |
| 26 | **Brine Pump flow rate** | ***Input Required*** | *l/hr* |
| 27 | **Pressure Drop** | *#DIV/0!* | *mbar* |
| 28 | **Pressure Drop due to bends** | *20.00%* | |
| 29 | **Pressure Drop due to bends** | *#DIV/0!* | *mbar* |

| | | | |
|---|---|---|---|
| 30 | **Heat Pump head** | ***Input Required*** | *mbar* |
| 31 | **Reynolds number** | ***0*** | ***Flow is laminar*** |
| 32 | **Total Pressure Drop (mbar)** | ***0.00*** | ***pressure drop ok*** |

**Pipe Sizing (Header)**

| | | | |
|---|---|---|---|
| 33 | **Pipe Diameter** | *50* | *mm* |
| 34 | **Pressure Drop** | *0.00* | |
| 35 | **Pressure Drop due to bends** | *20.00%* | |
| 36 | **Pressure Drop due to bends** | *0.00* | *mbar* |
| 37 | **Reynolds number** | ***0*** | ***Flow is laminar*** |

| Room | Room Temp (ºC) | Heat Loss for room (Watts) | Mean Rad temp (ºC) | Delta T (ºC) | Radiator Height | Radiator Size (HxW) | Radiator Panel/Convector | No. of Rads in room | Output of Rad @ delta t 50ºC (Watts) | Output of Rad at required delta t (Watts) | Heat Loss for room (Watts) | Difference (Watts) | Min Rad Size Required @ Delta t 50ºC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| - | 0 | 0.00 | -4 | -4 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | Total: | 0.00 | 0.00 | 0.00 | Radiator sizing good |

| Room | Room Temp (ºC) | Heat Loss for room (Watts) | Floor Type | MWT @ DOT (°C) | UFH active area (m²) | Unheated area by UFH (m²) | Pipe diameter (mm) |
|---|---|---|---|---|---|---|---|
| | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |
| - | | 0.00 | | | 0.00 | | |

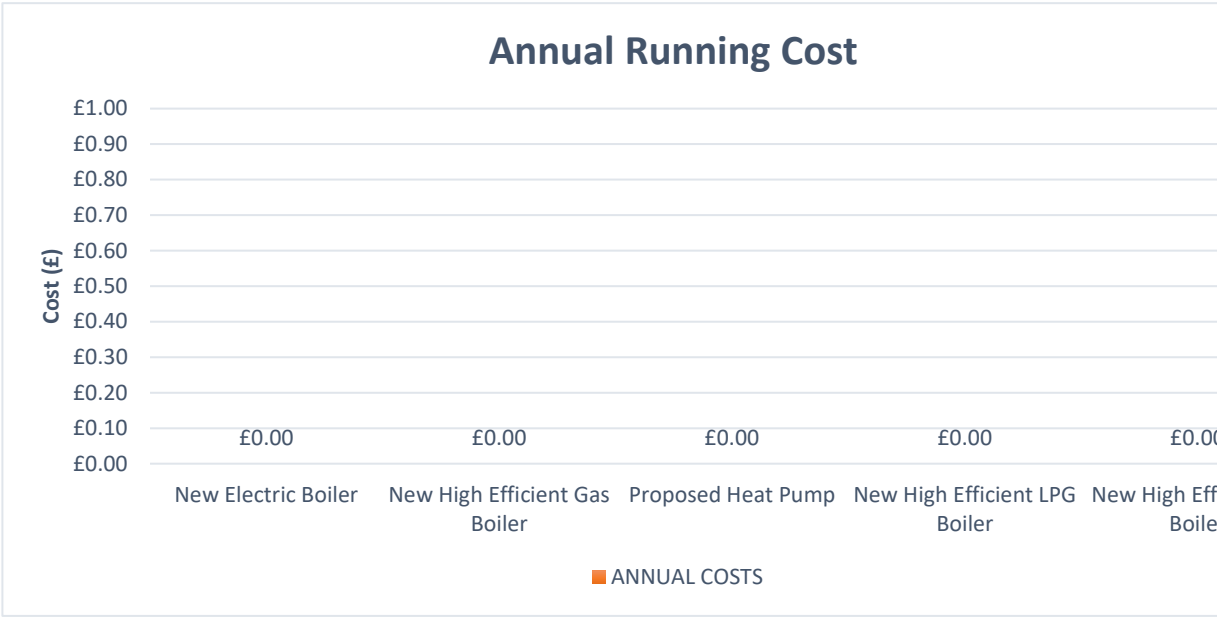
| Pipe Spacing (mm) | Floor covering (W/(m² x K)) | Amount of pipe required in room (m) | UFH output (W/m²) | Average surface temp (°C) | Total output by UFH (W) |
|---|---|---|---|---|---|
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 0.00 | 0.00 | 0.00 | 0.00 |

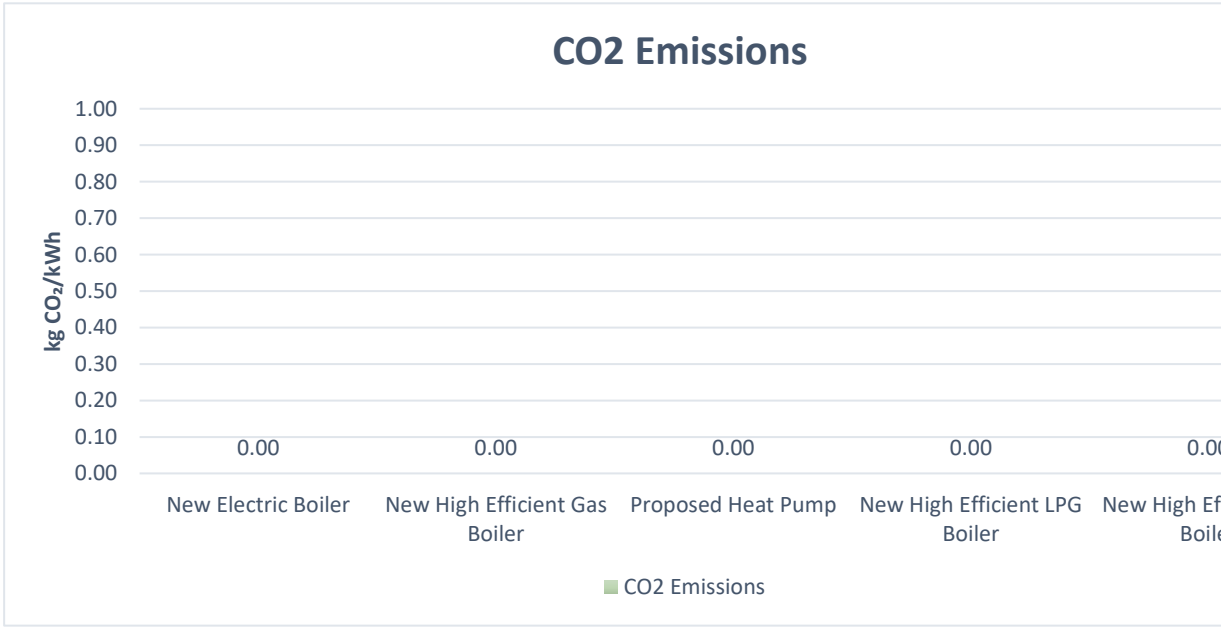
Green Flag = *Within interior zone (max. 29 °C)*
Orange Flag = *Within bathroom zone (max. 33°C)*
Red Flag = *Within peripheral zone (max. 35 °C)*
**Stop sign =** *Warning surface temp too high*

| Difference (W) |
| --- |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
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| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |
| 0.00 |

## Estimated Fuel Price Comparison Calculations

| | | | | |
|---|---|---|---|---|
| Energy Requirement (heating) | | 0 | kWhr/yr | |
| Energy Requirement (hot water) | | 0 | | |
| **OIL** | | | | |
| Price of oil per litre | | £0.61 | | |
| kWhr per litre | | 10.27 | kWhr | |
| Boiler Efficiency of existing Oil Boiler | | 88.00% | % SEDBUK | |
| Efficiency of new Oil boiler | | 88.00% | % SEDBUK | |
| | existing | 9.04 | kW hrs per litre oil | |
| | new | 9.04 | kW hrs per litre oil | |
| | existing | £0.07 | £ per kWhr | |
| | new | £0.07 | £ per kWhr | |
| **ELECTRICITY / HEAT PUMP** | | | | |
| Price of Unit of electricity | | £0.14 | | |
| SPF SH | | Input Required | | |
| COP HW @ flow temp | | Input Required | | |
| Energy Requirement (SH) | | 0.00 | kWhrs annual demand (Inc hot water) | |
| Energy Requirement (HW) | | 0.00 | | |
| Cost Htg Pump (£) | | £0.00 | | |
| Cost Ground Pump (£) | | £0.00 | | |
| Cost Immersion (£) | | £0.00 | | |
| **GAS (natural)** | | | | |
| Efficiency of proposed boiler (New) | | 90.00% | % SEDBUK | |
| Price of Gas per kWhr | | £0.05 | | |
| Energy Requirement | | 0.00 | kWhrs annual demand (Inc hot water) | |
| **GAS LPG** | | | | |
| Price of LPG per litre | | 0.52 | Bulk purchase | |
| kWhr per litre | | 6.60 | Std Conversion | |
| Boiler Efficiency | | 90.00% | Assumed if very new | |
| | | 5.94 | kW hrs per litre lpg | |
| | | 0.09 | Pence per kWhr | |
| **ELECTRIC BOILER** | | | | |
| Price of Unit of electricity | | £0.14 | | |
| Energy Requirement | | 0 | kWhrs annual demand (Inc hot water) | |
| **ANNUAL COSTS** | | | | |
| New Electric Boiler | | £0.00 | Electric | |
| New High Efficient Gas Boiler | | £0.00 | Gas | |
| Proposed Heat Pump | | £0.00 | Heat Pump | |
| New High Efficient LPG Boiler | | £0.00 | LPG Gas | |
| New High Efficient Oil Boiler | | £0.00 | Oil | |
| **CO2 EMISSIONS** | | | | |
| Electric | | 0.494 | kg CO2/kWh | 0.00 kWhrs |
| Gas | | 0.185 | kg CO2/kWh | 0.00 kWhrs |
| Heat Pump | | 0.494 | kg CO2/kWh | 0.00 kWhrs |
| LPG Gas | | 0.215 | kg CO2/kWh | 0.00 kWhrs |
| Oil | | 0.247 | kg CO2/kWh | 0.00 kWhrs |
| | | | | |
| New Electric Boiler | | 0.00 | $CO_2$ | New Electric Boiler |
| New High Efficient Gas Boiler | | 0.00 | $CO_2$ | New High Efficient Gas Boiler |
| Proposed Heat Pump | | 0.00 | $CO_2$ | Proposed Heat Pump |
| New High Efficient LPG Boiler | | 0.00 | $CO_2$ | New High Efficient LPG Boiler |
| New High Efficient Oil Boiler | | 0.00 | $CO_2$ | New High Efficient Oil Boiler |


Annual Running Cost
£1.00
£0.90
£0.80
£0.70
£0.60
£0.50
£0.40
£0.30
£0.20
£0.10
£0.00
Cost (£)
£0.00
£0.00
£0.00
£0.00
£0.0(
New Electric Boiler
New High Efficient Gas Boiler
Proposed Heat Pump
New High Efficient LPG Boiler
New High Eff Boile
ANNUAL COSTS


CO2 Emissions
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
kg CO₂/kWh
0.00
0.00
0.00
0.00
0.0(
New Electric Boiler
New High Efficient Gas Boiler
Proposed Heat Pump
New High Efficient LPG Boiler
New High Ef Boil
CO2 Emissions


0
ficient Oil
er


0
fficient Oil
er

# MCS Compliance Certificate
# Heat Pump

**NOTE: All fields require a value so please use N/A or 0 where question is not applicable.**

| | | |
|---|---|---|
| **1. GENERAL INFORMATION** | | |
| 1.1 | Name of owner | |
| 1.2 | Address of installation: | |
| | Line 1 | |
| | Line 2 | |
| | Line 3 | |
| | Line 4 | |
| | Postcode | Input Required |
| 1.3 | Address of owner (if different to address of installation otherwise enter N/A): | |
| | Line 1 | |
| | Line 2 | |
| | Line 3 | |
| | Line 4 | |
| | Postcode | |
| **2. PURPOSE OF INSTALLATION** | | |
| 2.1 | Does the installation provide: | |
| | i. Space heating | |
| | ii. Domestic hot water | |
| | iii. Other (please state) | |
| 2.2 | Is the installation designed for intermittent or continuous heating? | |
| 2.3 | Are the heating services to the building bivalent/multivalent? | |
| **3. REGULATIONS AND APPROVALS** | | |
| 3.1 | i. Have all regulations been met and approvals obtained (including planning approval as required)? | |
| | ii. If an air source heat pump installed in England, does the installation comply with MCS 020 where permitted development is required? | |
| **4. HEATING CALCULATIONS** | | |
| 4.1 | i. Has a heat loss calculation been carried out for every heated room? | Yes |
| | ii. Heat loss calculator used (name and version) | MCS heat pump calculator v1.6 |
| | iii. Design external temperature (°C) | -2.50 |
| | iv. Design ground temperature (°C) (for solid floor losses only) | 10 |
| | v. Design internal temperatures (°C) | |
| | vi. Total building heat loss in kW | |
| 4.2 | If the installation has been designed for intermittent heating, what uplift factor has been applied to the building heat loss when sizing the: | |
| | i. Heat source | |
| | ii. Heat emitters | |
| 4.3 | i. Has the Domestic Hot Water (DHW) system been designed by considering the number and types of points of use and anticipated consumption within the property? | |
| | ii. Has the reheat time of the hot water storage vessel been estimated and agreed with the customer? | |
| 4.4 | Have the implications of the system design on the costs associated with providing space heating and domestic hot water to the building been explained in writing to the owner? | |
| **5. HEAT EMITTER DESIGN** | | |
| 5.1 | i. Lowest of the oversize factors or maximum pipe spacing (as appropriate) for the heat emitters that are to be used | |
| | ii. What heat emitters are installed?<br>(List all that apply using Heat Emitter Guide (HEG)) | |
| | iii. Floor covering (If underfloor heating) | |
| | iv. All Room heat losses in watts (W) (or w/$m^2$ together with floor areas) | |
| | v. Has a blending valve been installed to reduce the water temperature in the heat emitters? | |
| | vi. Temperature (°C) of the water leaving the heat pump when supplying space heating at the design external temperature? | |
| | vii. What is the Temperature Star Rating for the whole heating system? | |
| | viii. Has the customer been provided with a copy of the calculations carried out for the HEG? | |
| **6. HOT WATER SYSTEM** | | |
| 6.1 | i. Is hot water heating provided by the heat pump? | |
| | ii. Maximum flow temperature (°C) of the heat pump while providing hot water | 55.00 |
| | iii. Percentage of hot water supplied by the heat pump, excluding the immersion heater | |
| | iv. Volume of the cylinder in litres | |
| | v. Note evidence for volume of cylinder selected | 45 litres per person (rooms + 1) per day as minimum |
| | vi. Is the cylinder including the heat exchanger designed to operate with a heat pump? | |
| **7. HEAT PUMP SELECTIONS** | | |
| 7.1 | i. Manufacturer of the installed heat pump(s) | |
| | ii. Model of the installed heat pump(s) | |
| | iii. MCS product certification number for the heat pump(s) | |

| | | |
|---|---|---|
| | iv. Heat output from the heat pump(s) in kW (excluding heat from any supplementary heaters) at the design external and design flow temperatures | Input Required |
| | v. Does the heat pump provide a full or partial heating service? | |
| | vi. If partial, what is the percentage of annual space heating requirements met by the heat pump (excluding supplementary heaters)? | |
| | vii. Does the heat pump provide full or partial hot water heating? | |
| | viii. If partial, what is the percentage of annual hot water requirements met by the heat pump (excluding supplementary heaters)? | |
| **8. DESIGN OF GROUND HEAT EXCHANGER** | | |
| 8.1 | i. Has the customer been provided with a completed copy of Table 3 from MIS 3005? | |
| | ii. Annual energy (kWh/yr) assumed for the ground heat exchanger design | |
| | iii. Confirm that: | |
| | a. the flow of thermal transfer fluid is turbulent in the ground heat exchanger active elements | |
| | b. the closed-loop ground collector system pumping power at the lowest operating temperature is less than 3% of the heat pump heating capacity | |
| | c. the method used is location specific taking account of UK average ground temperatures | |
| | d. the temperature of the thermal transfer fluid entering the heat pump been designed to be not less than 0°C at all times for 20 years | |
| | iv. Type of ground heat exchanger | |
| **9. SYSTEM PERFORMANCE CALCULATIONS AND ANNUAL ENERGY FIGURES** | | |
| 9.1 | i. Annual space heating demand (kWh/yr) | |
| | ii. Annual water heating demand (kWh/yr) | |
| | iii. Percentage of space heating and water heating demand provided by the heat pump (excluding auxiliary and immersion heaters) | |
| | iv. Annual electricity consumption of the heat pump (excluding auxiliary and immersion heaters) (kWh/yr) | #VALUE! |
| | v. Annual electricity consumption of auxiliary and immersion heaters (kWh/yr) | |
| | vi. Annual energy consumption of other heat sources (kWh/yr) | |
| | vii. Product Seasonal Performance (SCOP/SPER/SPF) of the heat pump | Input Required |
| 9.2 | i. Is the installation intended for the domestic RHI? | |
| | ii. If EPC available, maximum qualifying renewable heat (kWh/yr) from the Energy Performance Certificate (EPC) | |
| **10. INSTALLATION** | | |
| 10.1 | i. Does the installation conform to the design? | |
| | ii. Have all manufacturers' instructions been followed including installation location and condensate drainage (as appropriate)? | |
| | iii. Where the requirements of MIS 3005 exceed those of the manufacturer, have the requirements of MIS 3005 been met? | |
| 10.2 | If intended as a domestic RHI installation: | |
| | i. Does the installation conform to the MCS Domestic RHI Metering Guidance? | |
| | ii. What is the outcome of Procedure A in the MCS Domestic RHI Metering Guidance? | |
| | iii. Is the installation meter ready? | |
| | iv. If not meter ready, please state why. | |
| 10.3 | For ground source heat pumps: | |
| | i. Has the system been flushed, purged, filled and pressure tested according to MIS 3005? | |
| | ii. What make and type of antifreeze has been added to make up the thermal transfer fluid? | |
| | iii. Is the antifreeze mixed to at least -10 °C and has it been tested twice with a refractometer? | |
| | iv. Has the recommended biocide been added in the quantity specified? | |
| **11. COMMISSIONING AND HANDOVER** | | |
| 11.1 | i. Explain how the controls have been set to ensure that the system operating temperature is no higher than $T_{FSH}$ at the design external temperature | |
| | ii. Record the control settings | |
| 11.2 | i. Has the heat pump and other components of the system been commissioned according to the manufacturers' instructions and system design parameters? | |
| | ii. Has a label been attached to the system in accordance with MIS 3005? | |
| 11.3 | i. Have you given the customer a handover pack? | |
| | ii. State the issue number of MIS 3005 used | |
| | iii. Have you informed the customer that they will receive an MCS installation certificate that they should keep with their handover pack? | |
| **12. CONFIRMATION** | | |
| 12.1 | I confirm that I am authorised to complete this certificate on behalf of the MCS installation company named above and I confirm that:<br>(i) the heating installation at the premises whose address is shown above has been designed and installed in accordance with MIS 3005;<br>(ii) the design included a heat loss calculation for every room of the building that is heated by the installation;<br>(iii) the installation conforms to the design;<br>(iv) controls to ensure $T_{FSH}$ have been installed and set correctly. | |
| 12.2 | Full name: | |
| 12.3 | Job title: | |
| 12.4 | Date: | |

| 1. GENERAL INFORMATION | | RELEVANT SECTION MIS 3005 | GUIDANCE |
|---|---|---|---|
| 1.1 | Name of the owner | | Enter the name of the owner. |
| 1.2 | Address of the installation | | Enter the address where the heating system is installed. |
| 1.3 | Address of the owner | | Enter the address of the owner. If the owner address is the same as the installation address enter N/A in all fields. |
| **2. PURPOSE OF INSTALLATION** | | | |
| 2.1 | Does the installation provide: | | Confirm the purpose(s) of the installation. Select yes or no for 2.1i and 2.1ii. If there are any other purposes (question 2.1iii) then please list as appropriate or write N/A if not applicable. |
| | i. Space heating | | |
| | ii. Domestic hot water | | |
| | iii. Other (please state) | | |
| 2.2 | Is the installation designed for intermittent or continuous heating? | | Select 'intermittent' or 'continuous' as appropriate.<br><br>Intermittent heating means that the heating system has the ability to provide all the space heating requirement on the design day within a period of no more than 16 hours, without use of supplementary heaters. Continuous heating means that the heating system has the ability to provide all the space heating requirement on the design day within a period of no more than 24 hours (but taking more than 16 hours), without use of supplementary heaters. |
| 2.3 | Are the heating services to the building bivalent/multivalent? | | Select 'bivalent', 'multivalent' or 'no' as appropriate. A 'bivalent' system is a heating system in which the heating services are supplied by two different heat sources. A 'multivalent' system is a heating system in which the heating services are supplied by three or more different heat sources. |
| **3. REGULATIONS AND APPROVALS** | | | |
| 3.1 | i. Have all regulations been met and approvals obtained (including planning approval as required)? | 4.1 | Confirm that all relevant regulations and approvals have been obtained. |
| | ii. If installed in England, does the installation comply with MCS 020 where permitted development is required (air source heat pumps only)? | 4.4.8 | Confirm that the requirements of MCS 020 have been meet (air source heat pumps only). MCS 020 only applies to installations installed in England. |
| **4. HEATING CALCULATIONS** | | | |
| 4.1 | i. Has a heat loss calculation been carried out for every heated room? | 4.2.1a, b, c | Confirm that a heat loss calculation has been carried out for every room that is to be heated. |
| | ii. Heat loss calculator used (name and version) | | Enter details of the heat loss calculator used including name and version number. Note that MIS 3005 compliant heat loss calculators must comply with BS EN12831 (UK National Annex). |
| | iii. Design external temperature (°C) | | Enter the design external temperature used in the heat loss calculation. Refer to 4.2.1b and Table 2 in MIS 3005. |
| | iv. Design ground temperature (°C) (for solid floor losses only) | | If the building has a solid floor confirm the average design ground temperature. Refer to 4.2.1b,c MIS 3005. If the building does not have a solid floor enter N/A. |
| | v. Design internal temperature(s) (°C) | | Enter the design internal temperature(s) used in the heat loss calculation. The individual design temperature for each room to be heated must be listed. Refer to 4.2.1b,c MIS 3005. An example of how this should be completed - bedroom 1 - 21, bedroom 2 - 21, bathroom - 18. |
| | vi. Total building heat loss in kW | | Enter the total heat loss of the building in kW. NOTE see 70kW guidance paper as this may be an area of the property as opposed to the whole building. |
| 4.2 | If the installation has been designed for intermittent heating, what uplift factor has been applied to the building heat loss when sizing the: | Notes on section 4.2.1- part d | If the installation has been designed for intermittent heating, state what uplift factor has been applied to the building heat loss to allow for intermittent heating when sizing the heat pump and emitters.<br><br>The uplift factor means the ratio between building heat loss used for sizing and the building heat loss as calculated for the design day. For example, if an additional allowance of 20% has been included for intermittent heating then the uplift factor is 1.2, and if the building heat loss calculated for the design day was 10kW the building heat loss used for sizing used for sizing is 12kW. Normally the same uplift factor would be used for both the heat generator and emitters. See 2.2 above for definition of intermittent heating. |
| | i. Heat source | | |
| | ii. Heat emitters | | |
| 4.3 | i. Has the DHW system been designed by considering the number and types of points of use and anticipated consumption within the property? | 4.2.3 – 4.2.5 | If the installation is intended to provide water heating, assess requirements and estimate performance. |
| | ii. Has the reheat time of the hot water storage vessel been estimated and agreed with the customer? | | This question relates to clause 4.2.3 in MIS 3005. You are required to confirm that you have met this clause. |
| 4.4 | Have the implications of the system design on the costs associated with providing space heating and domestic hot water to the building been explained verbally and in writing to the customer? | 4.2.6 | Confirm that the cost implications have been explained both verbally and in writing to the customer. |
| **5. HEAT EMITTER DESIGN** | | | |
| 5.1 | i. Lowest of the oversize factors or pipe spacing (as appropriate) for the existing emitters that are to be used | 4.2.10 – 4.2.12<br><br>MCS021 Heat Emitter Guide for Domestic Heat Pumps | Refer to the MCS 021 Heat Emitter Guide. For radiators and convectors use the Temperature of the Space Heating Emitter Circuit (TSHEC) to look up the oversize factor. TSHEC is described as 'Heating circuit flow temperature' in the HEG. For underfloor heating use the TSHEC to look up the pipe spacing.<br><br>When any existing heat emitters are to be re-used, the heat output from each of them under standard conditions must be determined. To do this refer to the document "Tables of Heat Emitter Outputs".<br><br>Establish the oversize factors applicable to the emitters to be re-used, and select the lowest of them. Any newly installed emitters must be selected using the oversize factor applicable to the emitter installation as a whole.<br><br>Produce trial emitter system design for chosen temperature. In conjunction with client, agree that the design is feasible and affordable; otherwise re-design at a higher trial temperature. Choose final TSHEC, based on the worst performing room, with client's agreement (ensuring this temperature is suitable for the emitter type, and bearing in mind the influence on costs).<br><br>If radiators and convectors, the oversize factor should be entered as single figure up to two decimal places (i.e. 1.20). If underfloor heating the pipe spacing should be entered as a figure up to 3 |
| | ii. What heat emitters are installed? (list all that apply using HEG) | | Referring to the emitter types listed in the Heat Emitter Guide, list all heat emitters installed. |
| | iii. Floor covering (If underfloor heating) | | If underfloor heating is installed list type of floor covering(s) i.e. Wood, carpet |
| | iv. Room heat losses in watts (W) (or w/m2 together with floor areas) | | List heat losses for all rooms to be heated. |
| | v. Has a blending valve been installed to reduce the water temperature in the heat emitters? | | Confirm whether a blending valve has been installed to reduce the temperature of water leaving the heat pump to the final chosen TSHEC. |
| | vi. Temperature (°C) of the water leaving the heat pump when supplying space heating at the design external temperature? | | Use the Heat Emitter Guide to look up the TSHEC and temperature star rating corresponding to the oversize factor applicable to the emitter installation as a whole. If there is no exact correspondence choose the 5°C temperature step higher and the number of stars lower. |

| | | | |
|---|---|---|---|
| | vii. Temperature Star Rating for the whole heating system | | Use the Heat Emitter Guide to look up TSHEC and temperature star rating corresponding to the oversize factor applicable to the emitter installation as a whole. If there is no exact correspondence choose the 5°C temperature step higher and the number of stars lower.<br><br>NOTE (a): The Temperature Star Rating must be determined by the temperature ($T_{FSH}$) of the water leaving the heat pump when supplying space heating at peak design conditions (i.e., at the lowest external design temperature)<br>NOTE (b): If a blending valve has been installed, $T_{FSH}$ may NOT be the same as the temperature at which the emitters have been designed to operate (TSHEC).<br>NOTE (c): The Temperature Star Rating should be recorded as follows:<br>"6-star" when $T_{FSH}$ = 35°C or lower; "5-star" when $T_{FSH}$ = 36-40°C; "4-star" when $T_{FSH}$ = 41-45°C; "3-star" when TFSH = 46-50°C; "2-star" when $T_{FSH}$ = 51-55°C; "1-star" when $T_{FSH}$ = 56-60°C; "None" when $T_{FSH}$ > 60°C. |
| | viii. Has the customer been provided with a copy of the calculations carried out for the Heat Emitter Guide? | | Confirm that a copy of the calculations carried out for the HEG including justification of the Temperature Star Rating and if possible methods for improvement. |
| **6. HOT WATER SYSTEM** | | | |
| 6.1 | i. Is hot water provided by the heat pump? | 4.2.3 – 4.2.7<br>4.2.6 | Confirm the hot water needs of the building and select a hot water storage vessel of adequate volume and suitable heat exchanger according to the heat pump manufacturers' and / or cylinder manufacturers'/suppliers' recommendations.<br><br>Confirm whether hot water service is to be provided by the heat pump (fully / partly / not at all) excluding any immersion heater, and whether or not an immersion heater is to be fitted. |
| | ii. Maximum flow temperature (°C) of the heat pump while providing hot water | | |
| | iii. Percentage of hot water supplied by the heat pump excluding the immersion heater | | |
| | iv. Volume of the cylinder in litres | | |
| | v. Note evidence for volume of cylinder selected | | |
| | vi. Is the cylinder including the heat exchanger designed to operate with a heat pump? | | |
| **7. HEAT PUMP SELECTION** | | | |
| 7.1 | i. Manufacturer of the installed heat pump | | Confirm whether the heat pump is to provide the FULL heating service or only PARTIAL heating service.<br><br>The FULL heating service means that the heat pump will supply at least as much heat as the building heat loss under design conditions, taking account of external temperature and the flow temperature to heat emitters. The heat output from the heat pump must not include heat supplied from any supplementary heaters. The manufacturer's performance data must be consulted to confirm performance under these conditions.<br><br>If the heat pump provides a PARTIAL heating service the multiple heat sources must be integrated under a single control system and the proportion of the annual heat requirement from the heat pump alone must be calculated. Select a heat pump of suitable size from the MCS approved list. |
| | ii. Model of the installed heat pump | | |
| | iii. MCS product certification number of the heat pump | | |
| | iv. Heat output from the heat pump in kW (excluding heat from any supplementary heaters) at the design external and design flow temperatures | 4.2.1.c | |
| | v. Does the heat pump provide a full or partial heating service? | 4.2.2 | |
| | vi. If partial, what is the percentage (%) of annual space heating requirements met by the heat pump (excluding supplementary heaters)? | Appendix E, Box [102 / 101] | |
| | vii. Does the heat pump provide full or partial water heating? | | |
| | viii. If partial, what is the percentage (%) of annual hot water requirements met by the heat pump (excluding supplementary heaters)? | Appendix E, Box [202 / 201] | |
| **8. DESIGN OF GROUND HEAT EXCHANGER** | | | |
| 8.1 | i. Has the customer been provided with a completed copy of Table 3 from MIS 3005? | 4.2.16 – 4.2.23 | Record the design of the ground heat exchanger, if a Ground Source Heat Pump has been fitted. If this section is not applicable then please select N/A. |
| | ii. Annual energy (kWh/y) assumed for the ground heat exchanger design | | |
| | iii. Confirm that: | | |
| | a. the flow of thermal transfer fluid is turbulent in the ground heat exchanger active elements | | |
| | b. the closed-loop ground collector system pumping power at the lowest operating temperature is less than 3% of the heat pump heating capacity | | |
| | c. the method used is location specific taking account of UK average ground temperatures | | |
| | d. the temperature of the thermal transfer fluid entering the heat pump been designed to be not less than 0°C at all times for 20 years | | |
| | iv. Type of ground heat exchanger | | |
| **9. SYSTEM PERFORMANCE CALCULATIONS AND ANNUAL ENERGY FIGURES** | | | |
| 9.1 | i. Annual space heating demand (kWh/yr) | Appendix E, Box [101] | Enter your calculations relating to system performance and annual energy figures.<br><br>MIS 3005 requires that you calculate the annual space heating demand and water heating demand, taking into account customer requirements, using a design worksheet and any suitable method. Determine the percentage of the annual space and water heating demand that will be supplied by the heat pump (excluding any auxiliary heaters and immersion heater), the electricity consumed by the heat pump (excluding auxiliary/immersion heaters), the electricity consumed by the auxiliary/immersion heaters, the fuel consumed by other heat sources, and the product seasonal performance (SCOP/SPER/SPF) for the heat pump (combined space and water heating performance including the auxiliary/immersion heaters). |
| | ii. Annual water heating demand (kWh/yr) | Appendix E, Box [201] | |
| | iii. Percentage of space heating and water heating demand provided by the heat pump (excluding auxiliary and immersion heaters) | Appendix E, Box [301] | |
| | iv. Annual electricity consumption of the heat pump (excluding auxiliary and immersion heaters) (kWh/yr) | Appendix E, Box [303] | |
| | v. Annual electricity consumption of auxiliary and immersion heaters (kWh/yr) | Appendix E, Box [304] | |
| | vi. Annual energy consumption of other heat sources (kWh/yr) | Appendix E, Box [305] | |
| | vii. Product Seasonal Performance (SCOP/SPER/SPF) of the heat pump | Appendix E, Box [306] | |
| 9.2 | i. Is the installation intended for the domestic RHI? | | Confirm whether the installation is intended for the domestic RHI.<br><br>If it is intended that the installation should qualify for RHI payments, find the annual space and water heating demand shown on the Energy Performance Certificate (EPC), calculate the amount of qualifying heat supplied by the heat pump, find the product seasonal performance (SCOP/SPER/SPF) as required for RHI purposes, and calculate the qualifying renewable heat. Record the value calculated. |
| | ii. If EPC available, maximum qualifying renewable heat (kWh/yr) from the Energy Performance Certificate? | Appendix E, Box [507] | |
| **10. INSTALLATION** | | | |
| 10.1 | i. Does the installation conform to the design? | | Confirm that the heat emitters and heat pump have been installed in accordance with the design. |
| | ii. Have all manufacturers' instructions been followed including installation location and condensate drainage (as appropriate)? | | |
| | iii. Where the requirements of MIS 3005 exceed those of the manufacturer, have the requirements of MIS 3005 been met? | | |
| 10.2 | If intended as domestic RHI installation: | 4.2.8 and MCS Domestic RHI Metering | Confirm that client has been made aware of any metering needed to qualify for RHI payments and, if required by client, the installation conforms fully to the MCS Domestic RHI Metering |

| | | | |
|---|---|---|---|
| | i. Does the installation conform to the MCS Domestic RHI Metering Guidance? | Guidance | Guidance |
| | ii. What is the outcome of Procedure A in the MCS Domestic RHI Metering Guidance? | | |
| | iii. Is the installation meter ready? If not, please state why. | | |
| | iv. If not meter ready, please state why. | | |
| 10.3 | For ground source heat pumps: | | |
| | i. Has the system been flushed, purged, filled and pressure tested according to MIS 3005 v4.0 section 4.5.5 a) to d)? | 4.5.5 a) to d) | Confirm that the requirements of MIS 3005 have been met in full. If the system is not a ground source heat pump then |
| | ii. What make and type of antifreeze has been added to make up the thermal transfer fluid? | 4.5.5 e) | |
| | iii. Is the antifreeze mixed to at least -10 °C and has it been tested twice with a refractometer? | 4.5.5 g) | |
| | iv. Has the recommended biocide been added in the quantity specified? | 4.5.5 f) | |
| **11. COMMISSIONING AND HANDOVER** | | | |
| 11.1 | i. Explain how the controls have been set to ensure that the system operating temperature is no higher than $T_{FSH}$ at the design external temperature | | Explain what temperature limiting controls have been installed and how controls have been set to ensure that the system operating temperature is no higher than $T_{FSH}$ at the design external temperature.<br><br>$T_{FSH}$ is the temperature of the water leaving the heat pump when supplying space heating. |
| | ii. Record the control settings | | Record what controls are used to limit operating temperature to be no higher than $T_{FSH}$ at the design external temperature. Record the control settings for the system as designed and initially commissioned. |
| 11.2 | i. Has the heat pump and other components of the system been commissioned according to the manufacturers' instructions and system design parameters? | | Commission the installation.<br>(i) Confirm that the heat pump and other components of the system have been commissioned according to the manufacturers' instructions and the system design parameters;<br>(ii) Attach a label, close to the heat pump, to show the water temperature at which the system has been designed to operate (TFSH) and the required control settings to achieve it. |
| | ii. Has a label been attached to the system in accordance with MIS 3005? | 4.5.2 | |
| 11.3 | i. Have you given the customer a handover pack? | 4.6.1 | Provide and hand over the document pack. |
| | ii. State the issue number of MIS 3005 used | | Record the issue number of MIS 3005 |
| | iii. Have you informed the customer that they will receive an MCS installation certificate that they should keep with their handover pack? | | |

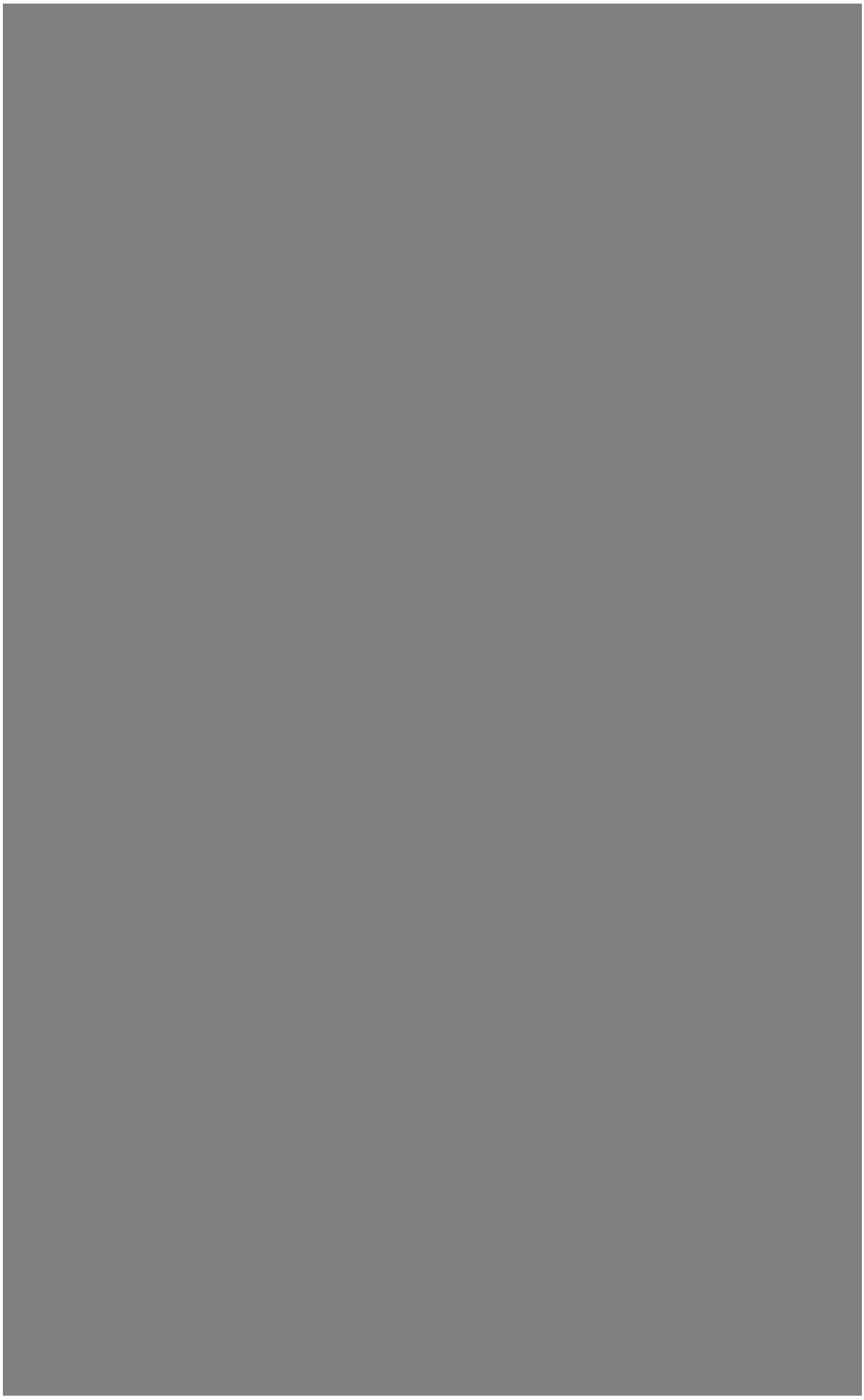
# MCS Compliance Certi

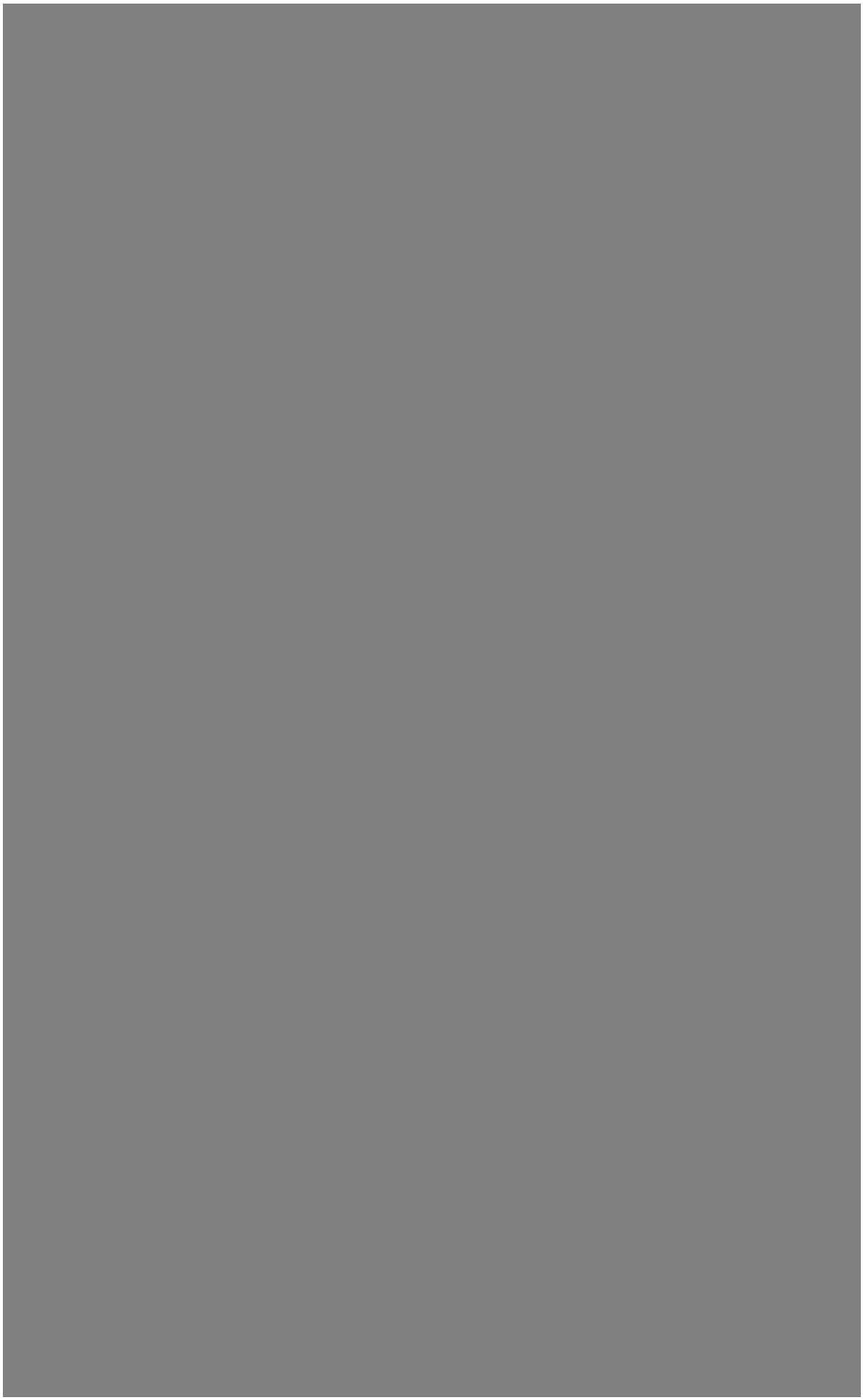
# Heat Pump

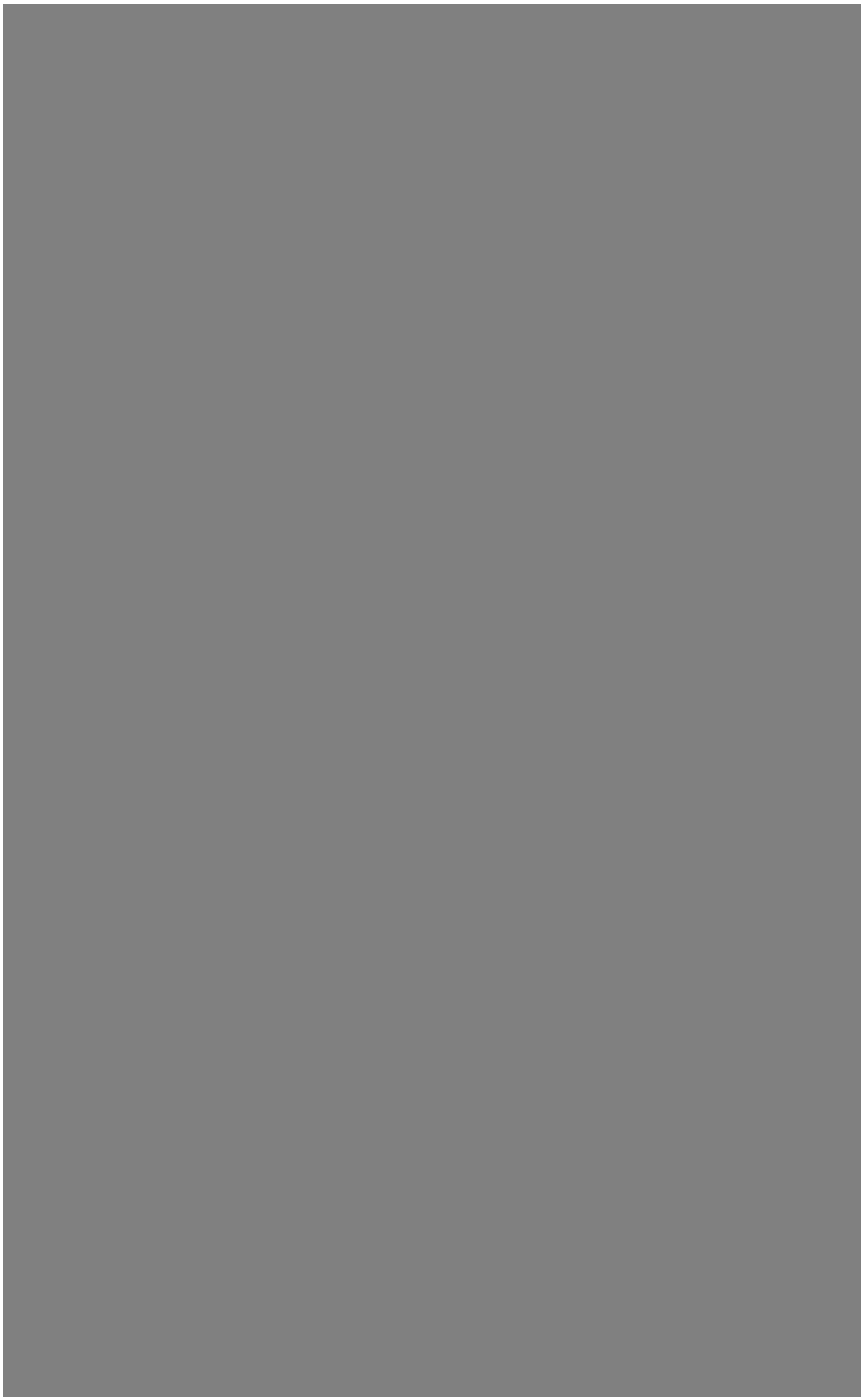
**NOTE: All fields require a value so please use N/A or 0 where question is not applicable.**

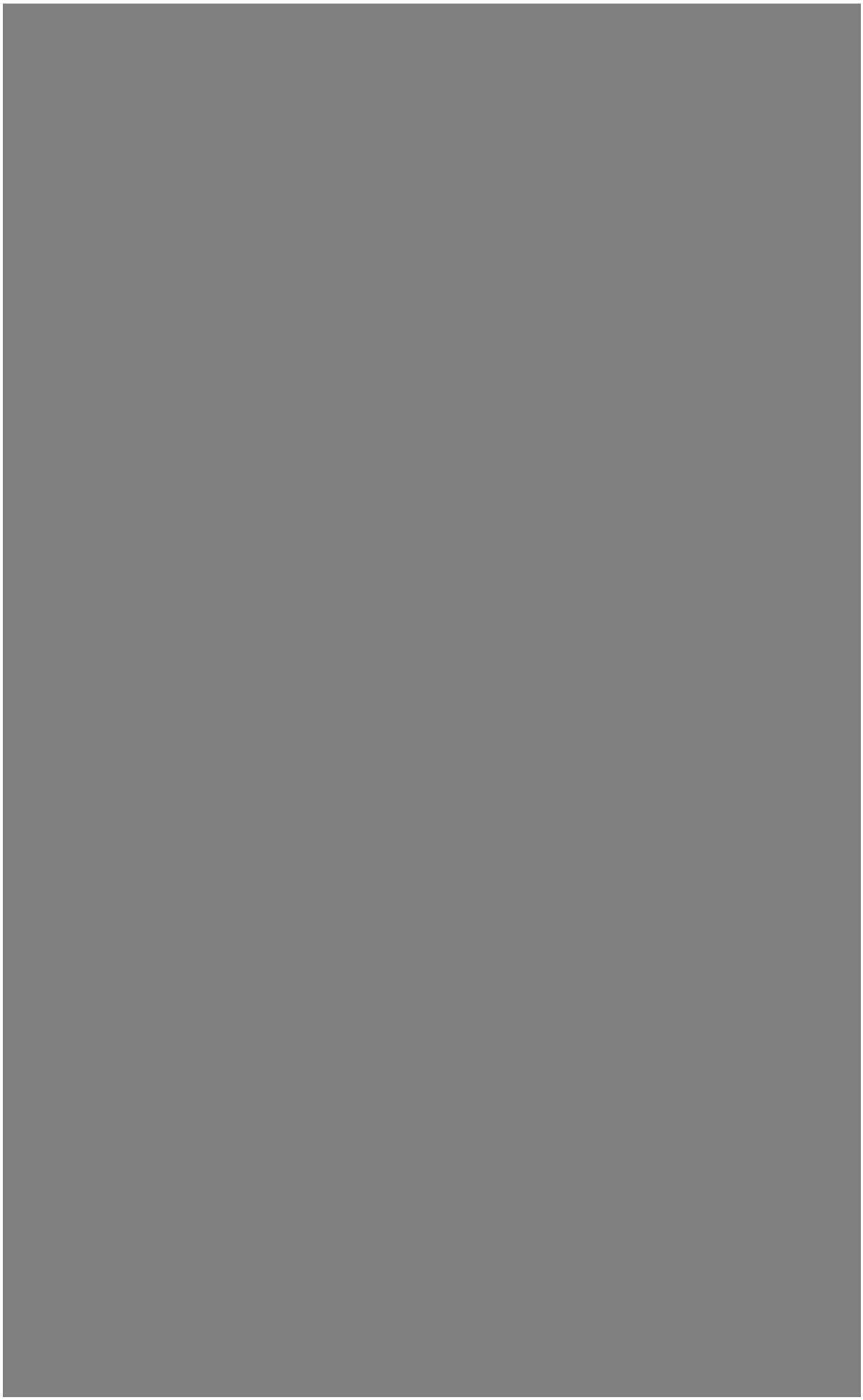
| | | |
|---|---|---|
| **1** | | **GENERAL INFORMATION** |
| | 1.1 | Name of owner |
| | 1.2 | Adress of installation |
| | | Line 1 |
| | | Line 2 |
| | | Line 3 |
| | | Line 4 |
| | | Postcode |
| | 1.3 | Adress of owner (if different to address of installation otherwise enter N/A) |
| | | Line 1 |
| | | Line 2 |
| | | Line 3 |
| | | Line 4 |
| | | Postcode |
| **2** | | **DESIGN INFORMATION** |
| | | i) Intermittent or Continuous heating? |
| | | ii) Design External Temperature (°C) |
| | | iii) Total Building Heat Loss at Design Condition (kW) |
| **3** | | **HEAT EMITTER INFORMATION** |
| | | i) What Heat Emitter types are installed? |
| | | ii) What is the temperature of water (°C) leaving the heat pump when supplying space heating at the design day condition? |
| | | iii) Has a copy of the room by room calculations and heat emitter selections been given to the client? |
| **4** | | **DOMESTIC HOT WATER** |
| | | i) What is the maximum design water temperature (°C) leaving the heat pump when in hot water heating mode? |
| | | ii) Has the DHWS reheat time been estimated and agreed with the customer? |
| **5** | | **IF GROUND SOURCE HEAT PUMP** |
| | | i) Type of ground heat exchanger: vertical/ horizontal/ slinky/ open loop<br>(if horizontal indicate minimum depth (m); if vertical indicate maximum depth (m)) |
| | | ii) Ground conductivity factor used |
| **6** | | **EPC** |
| | | i) EPC Number |
| | | ii) EPC annual space heating (kWh/yr) |
| | | iii) EPC annual hot water demand figure (kWh/yr) |

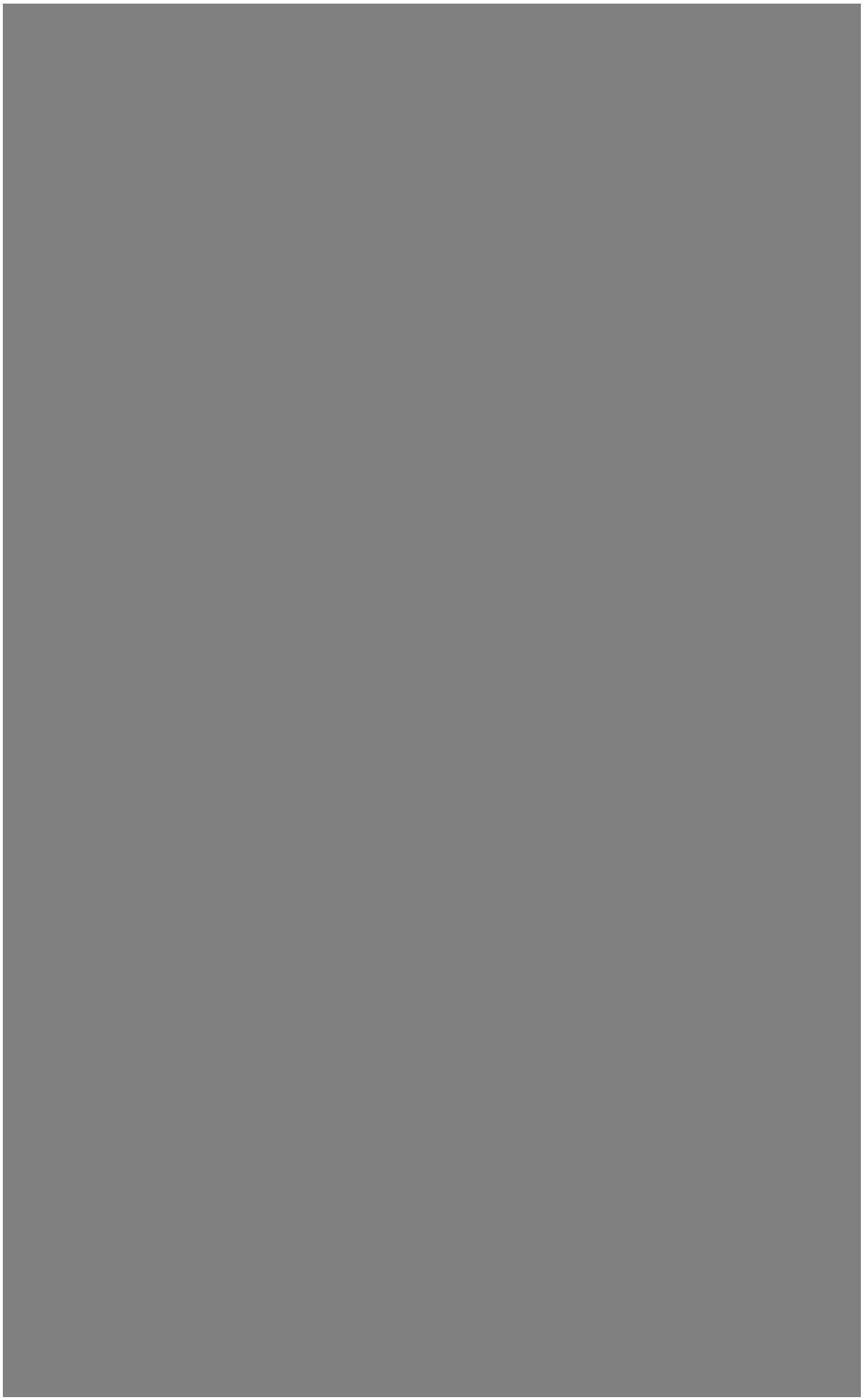
| 7 | I COMFIRM THAT: |
|---|---|
| | i) I am authorised to complete this certificate on behalf of the MCS |
| | ii) the customer will receive an MCS Installation Certificate within 10 |
| | iii) MIS 3005 scheme requirements have been met (state issue number of MIS 3005 used) |
| | iv) the installation complies with system design as per the contract |
| **8** | **MCS Contractor** |
| | i) Organisation Name: |
| | ii) Full Name and Job Title: |
| | iii) Date: |
| | iv) Signature: |

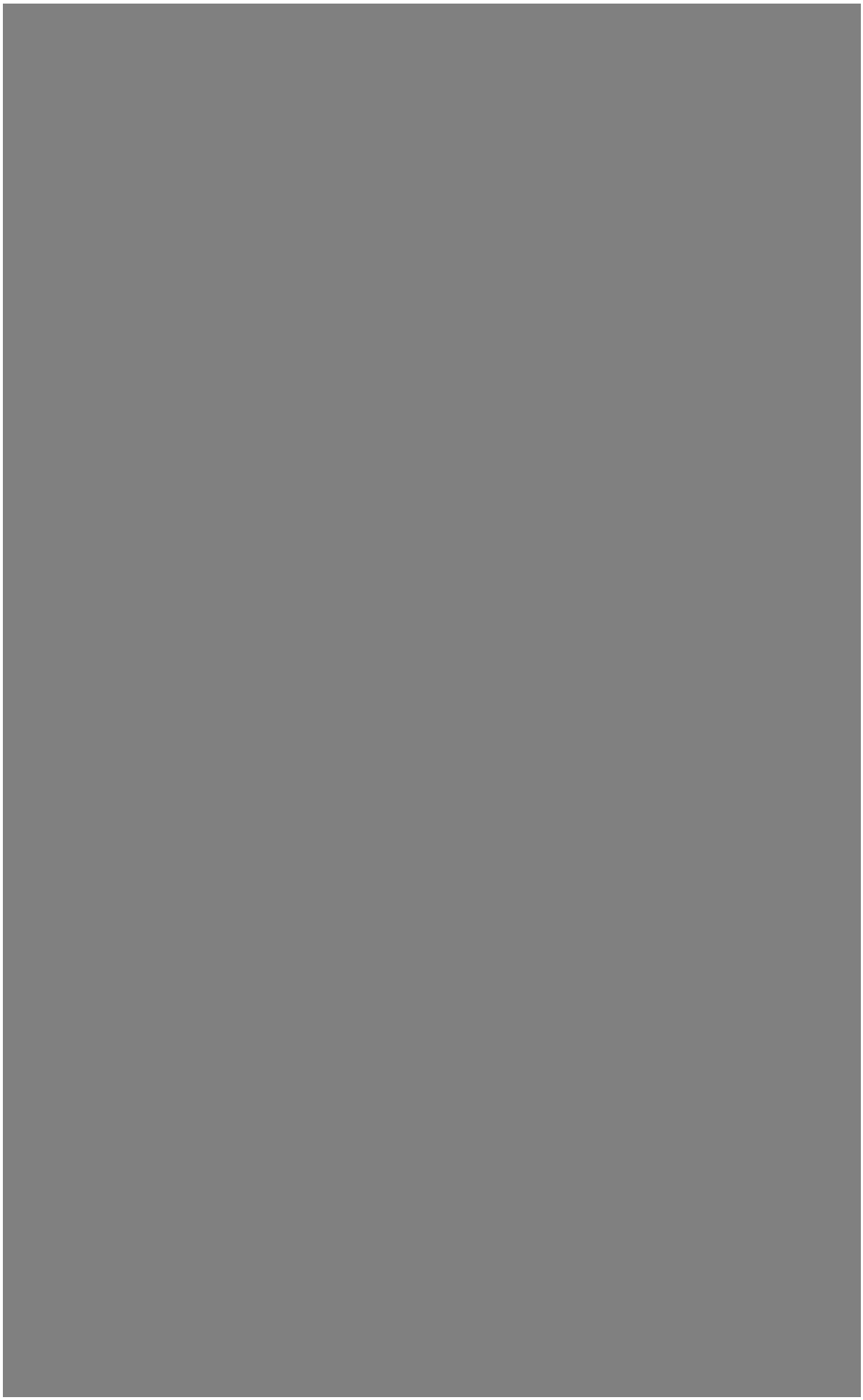


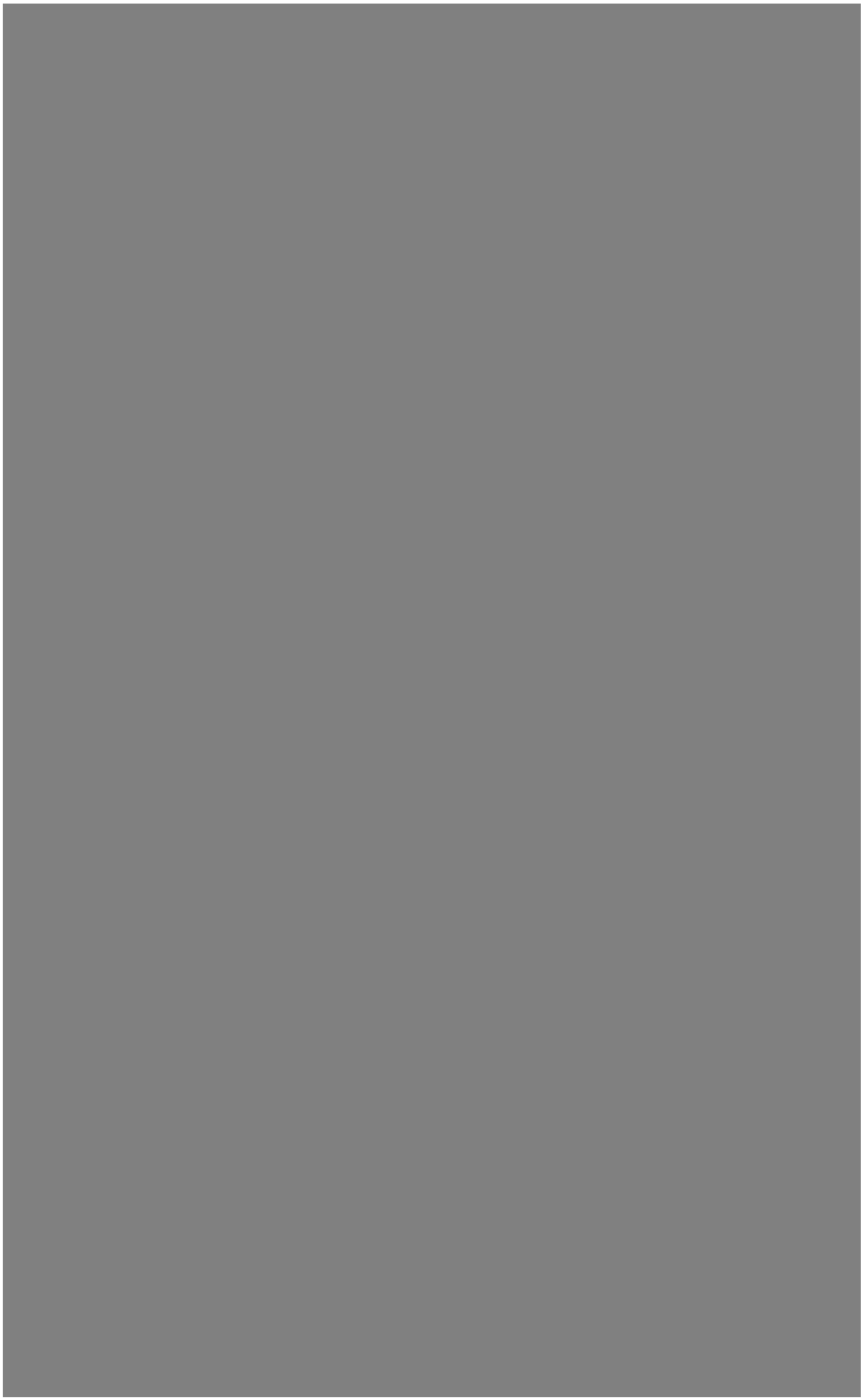


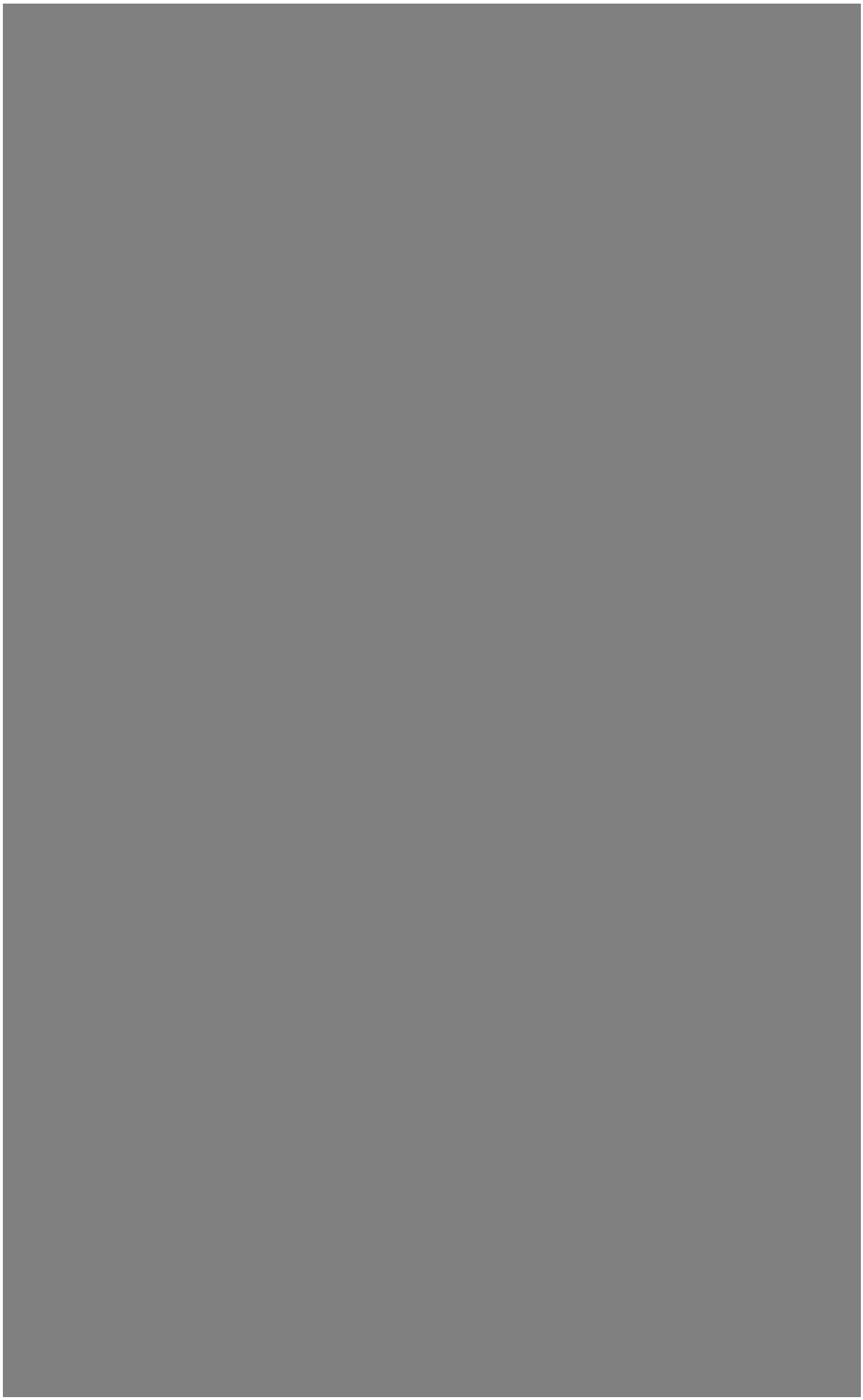


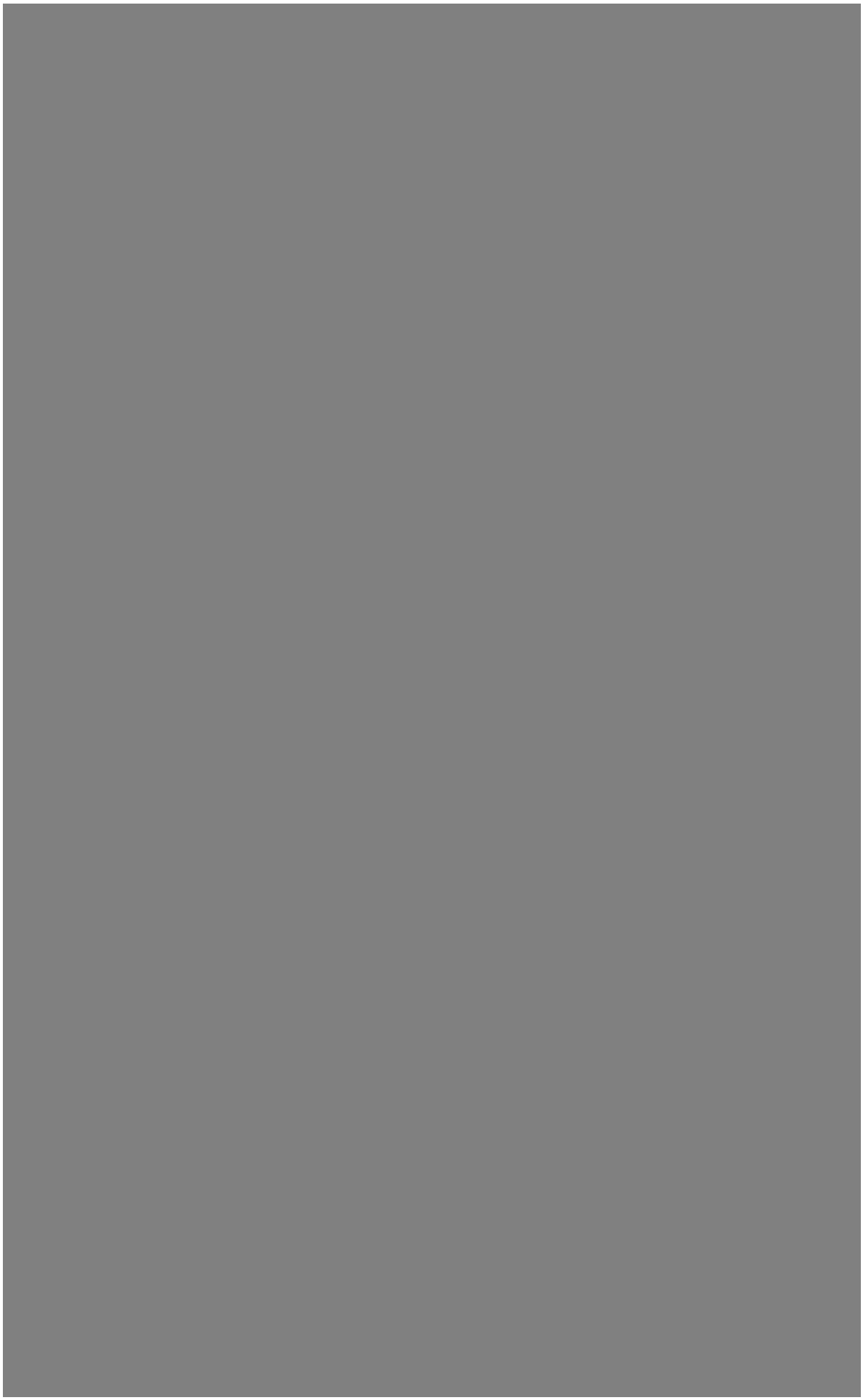


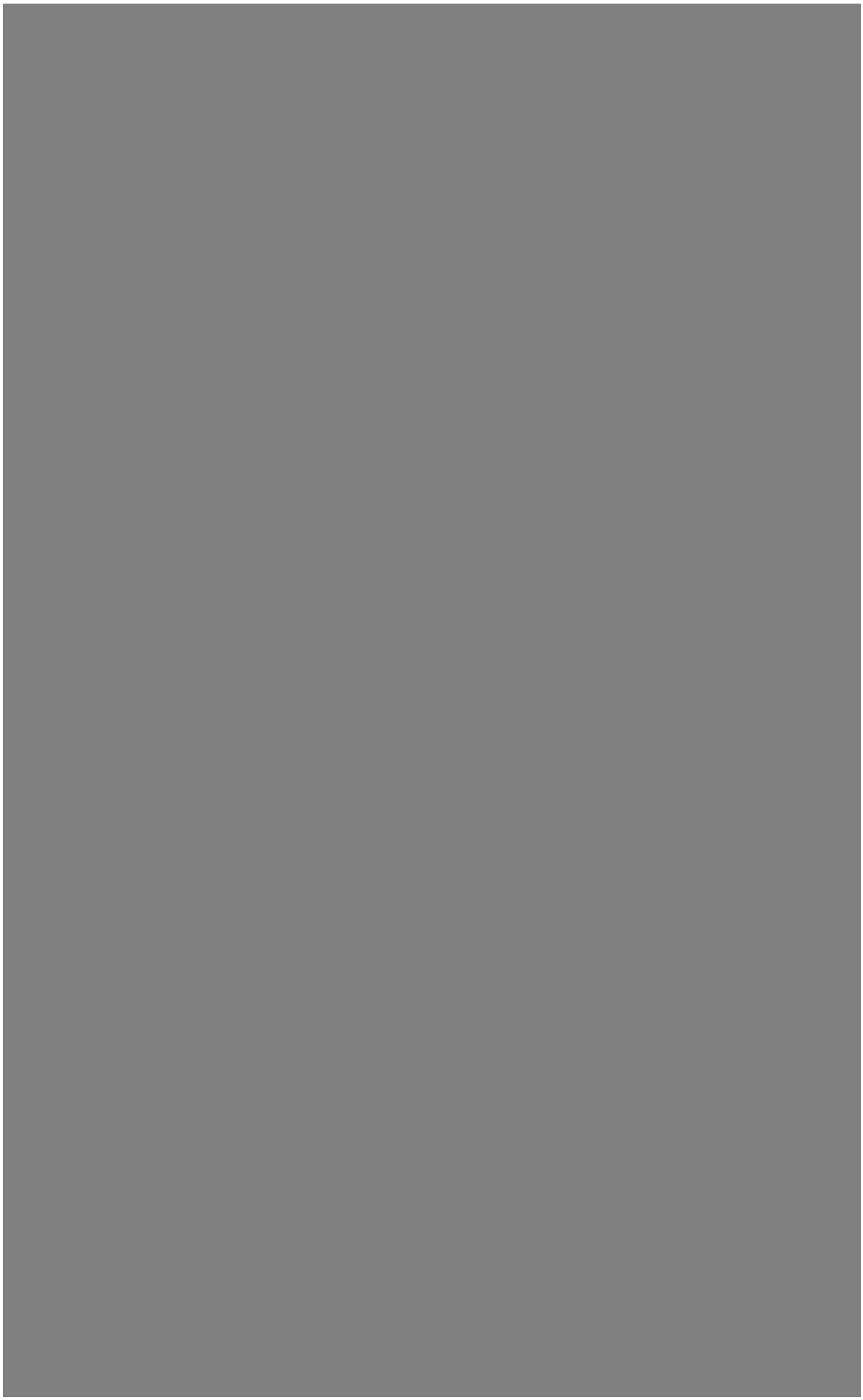


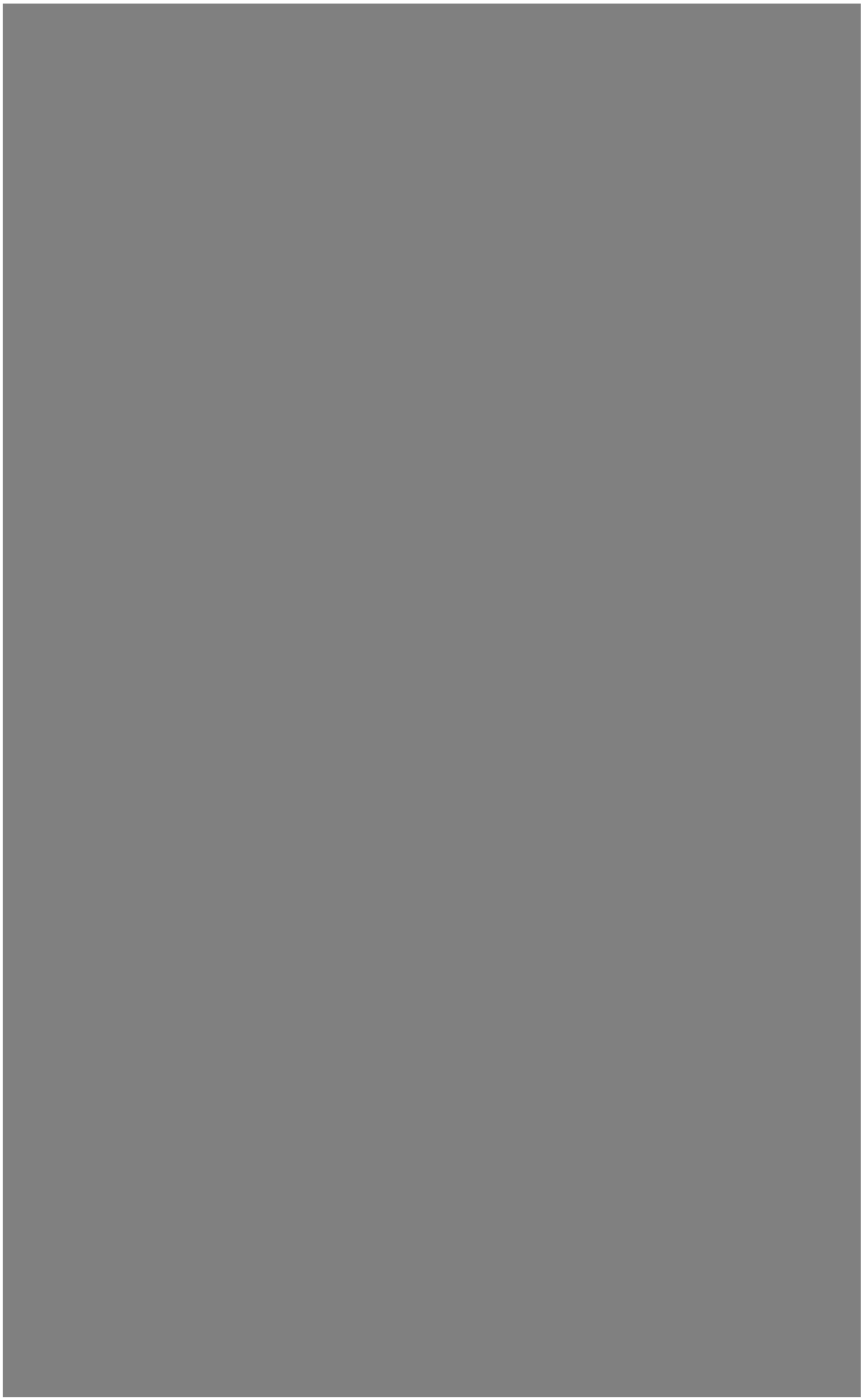


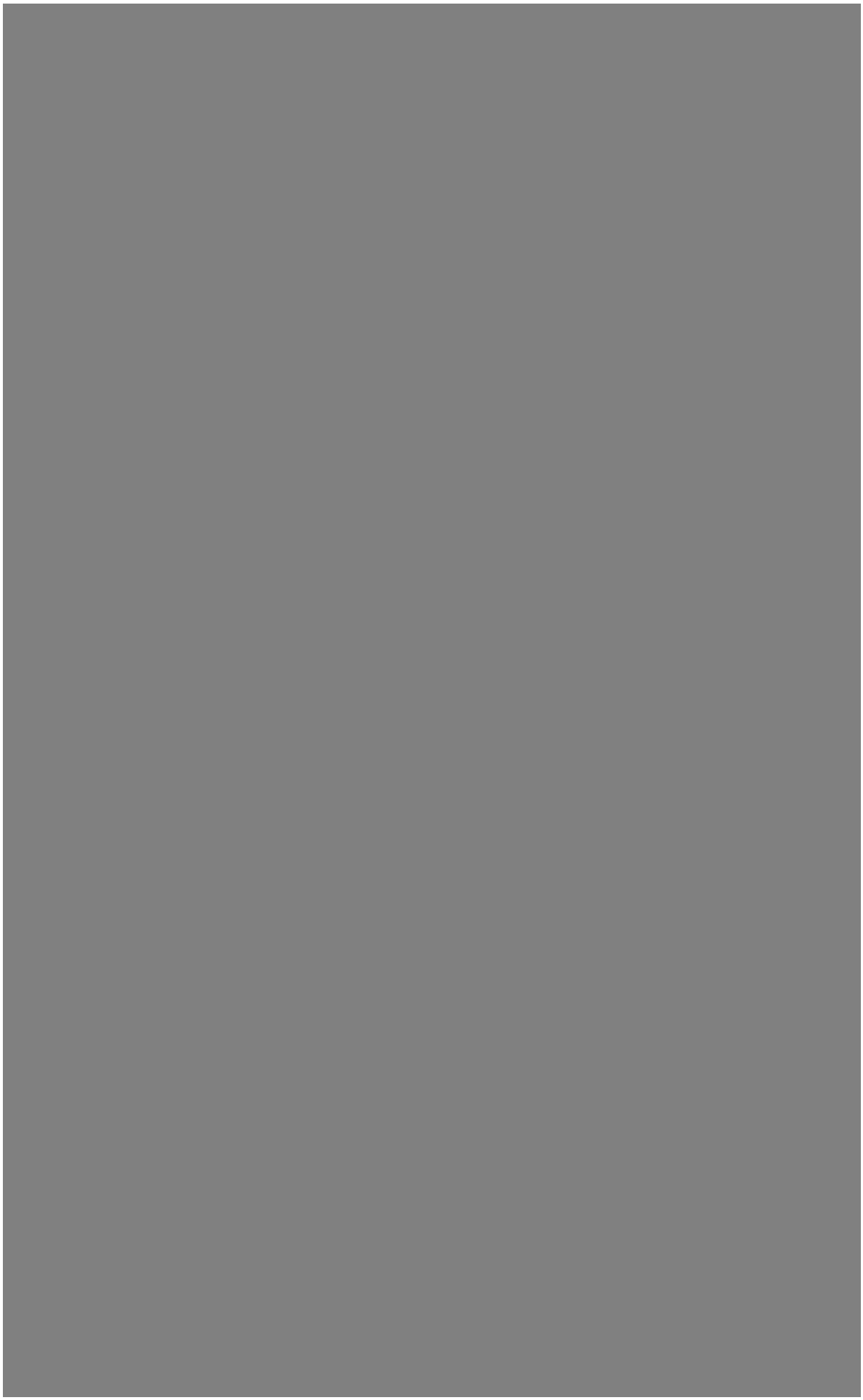


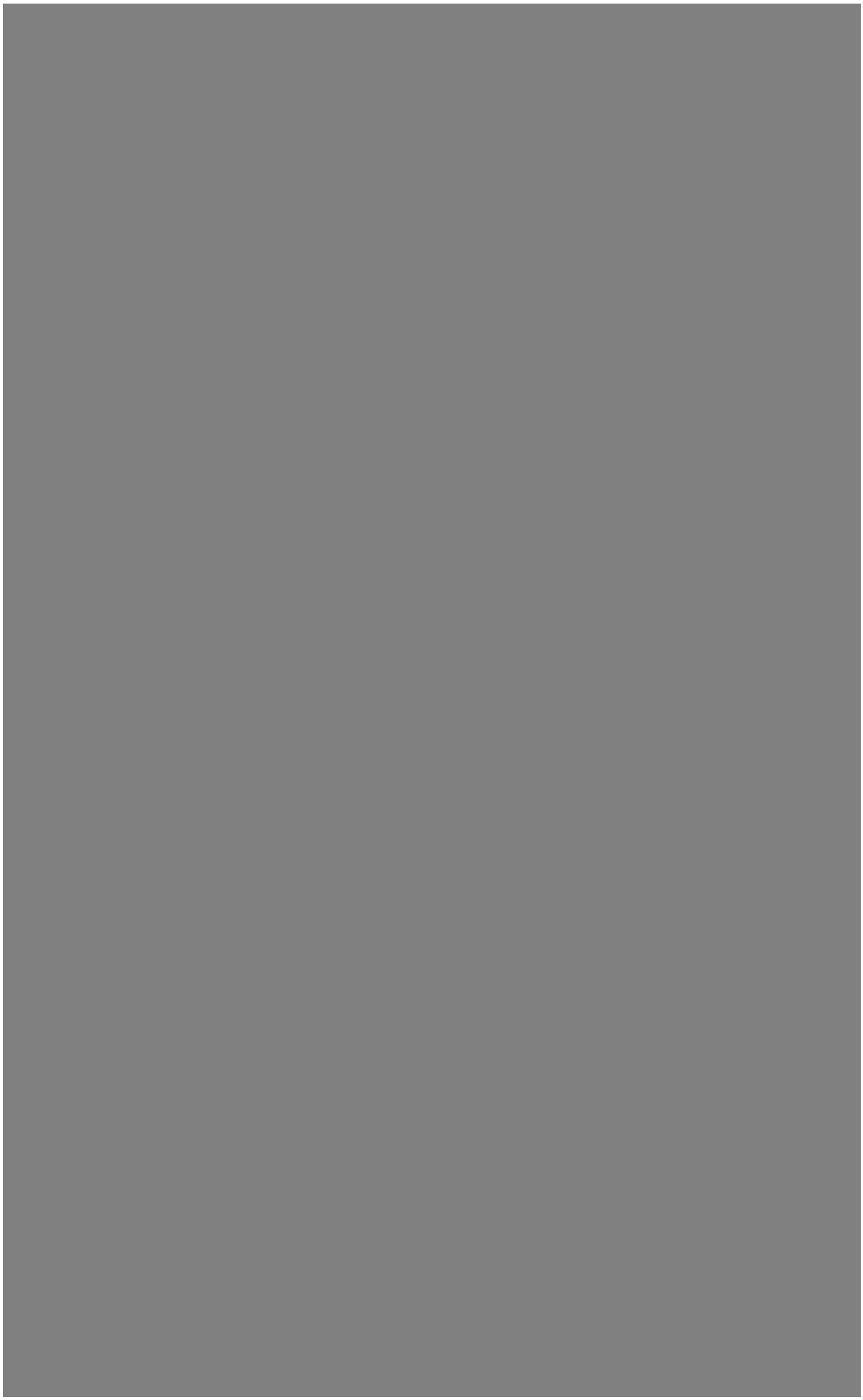


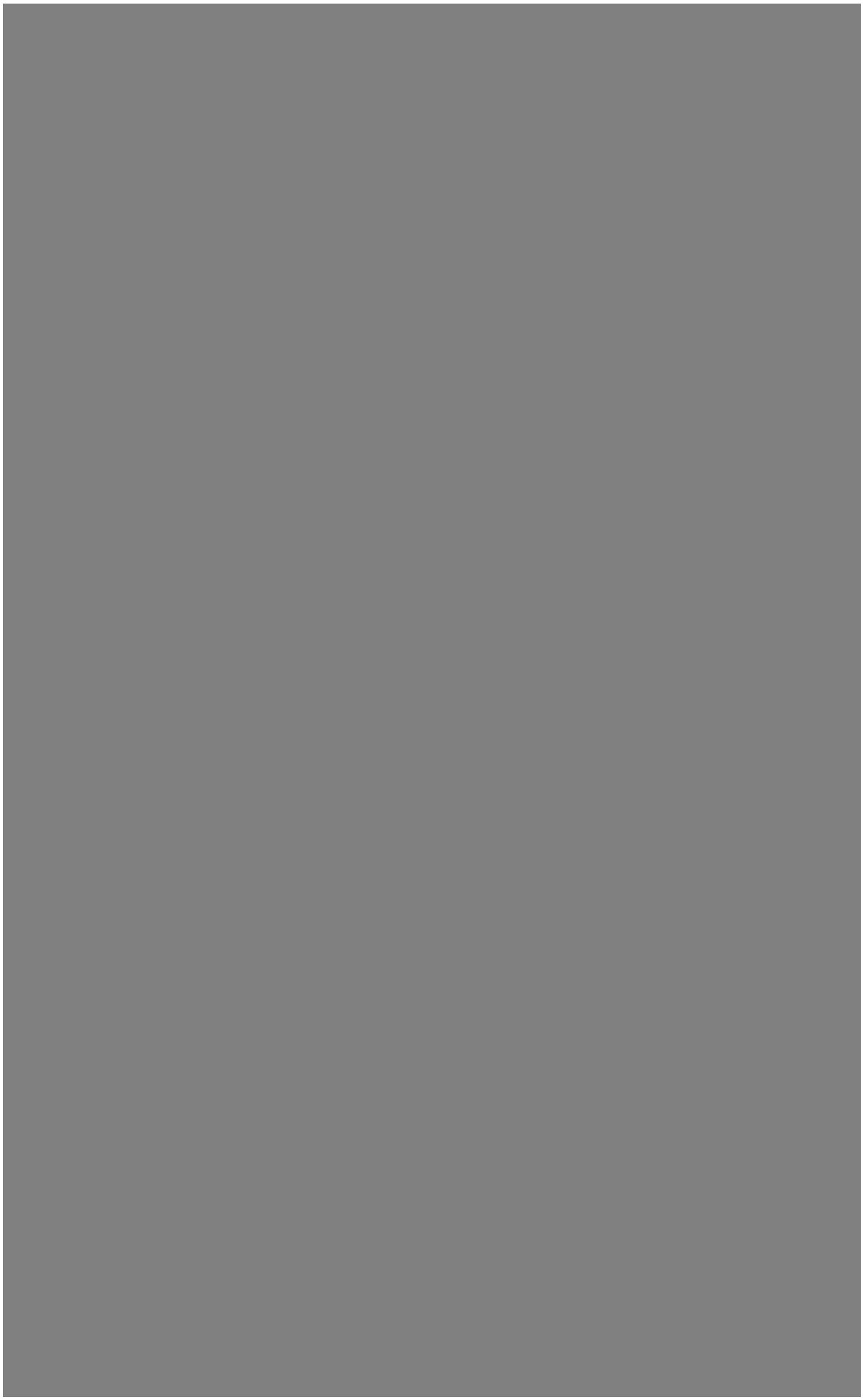


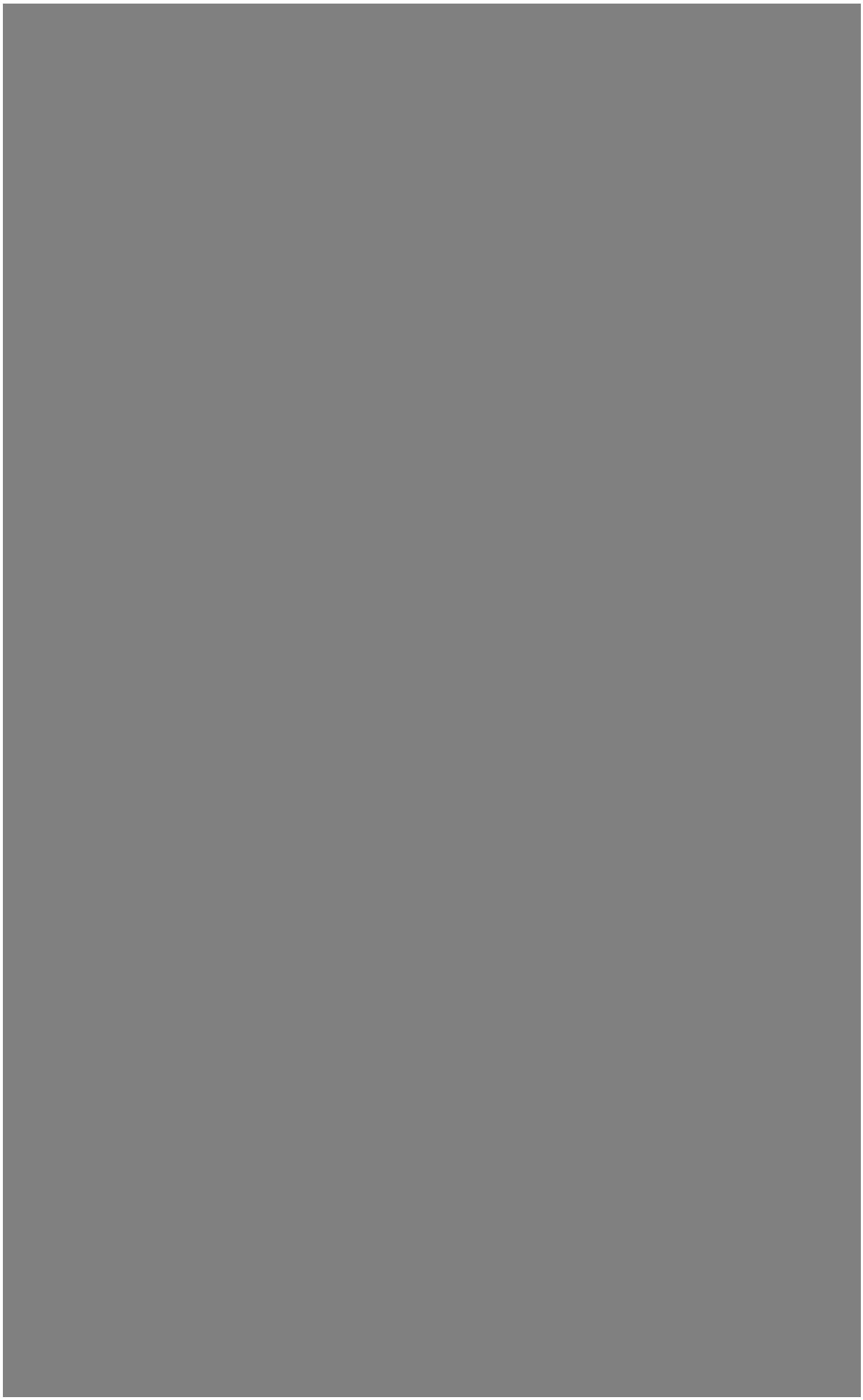


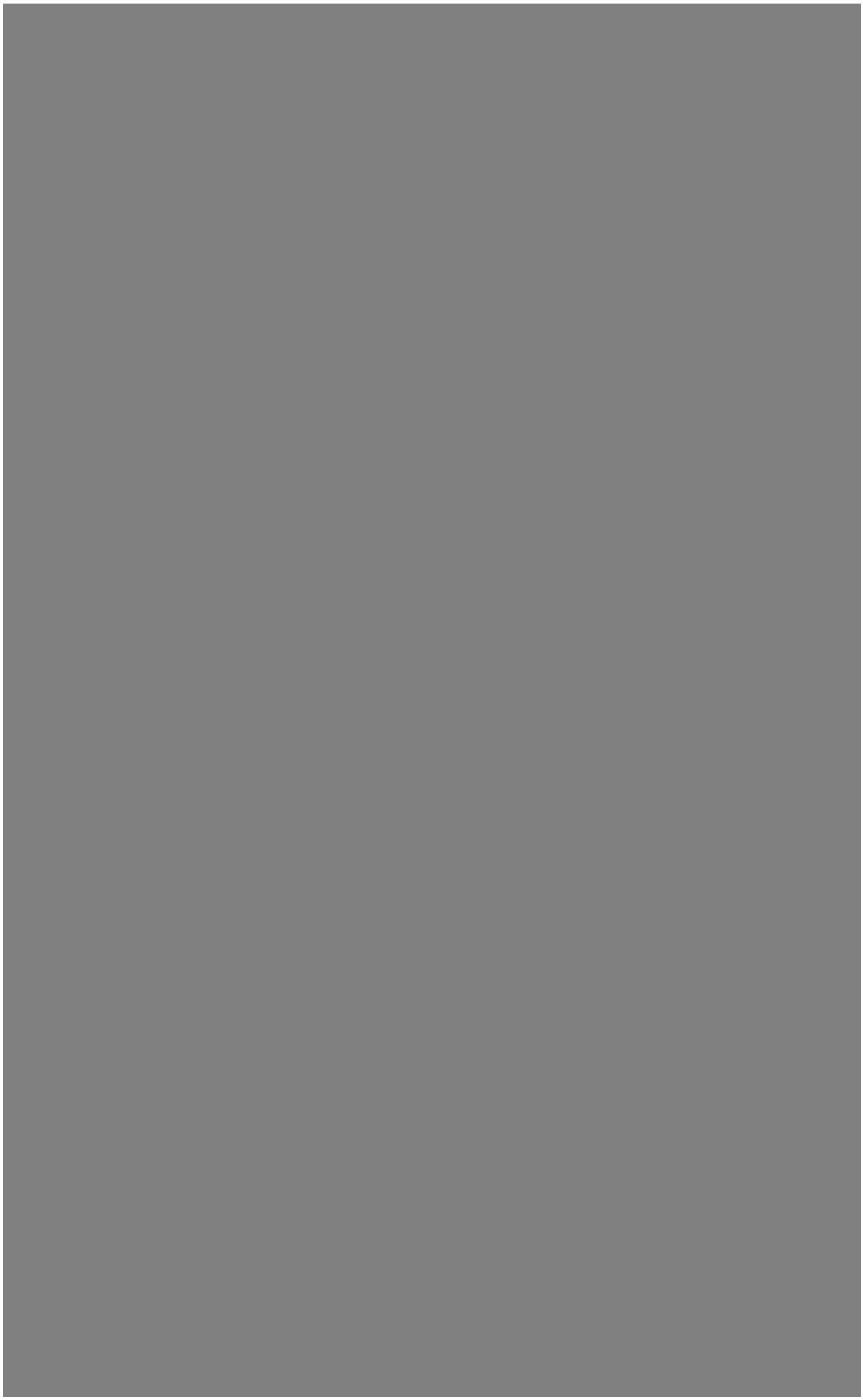


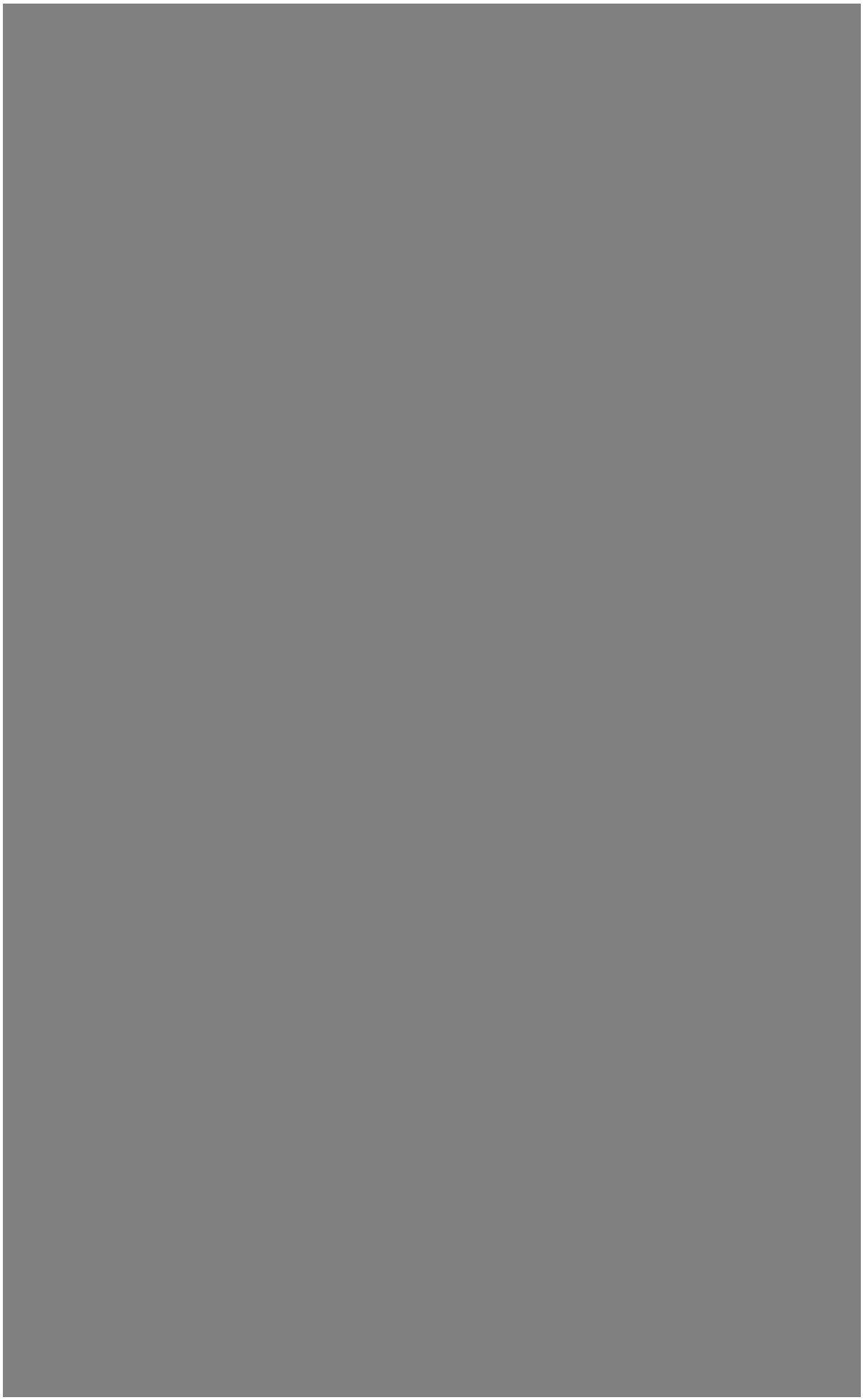


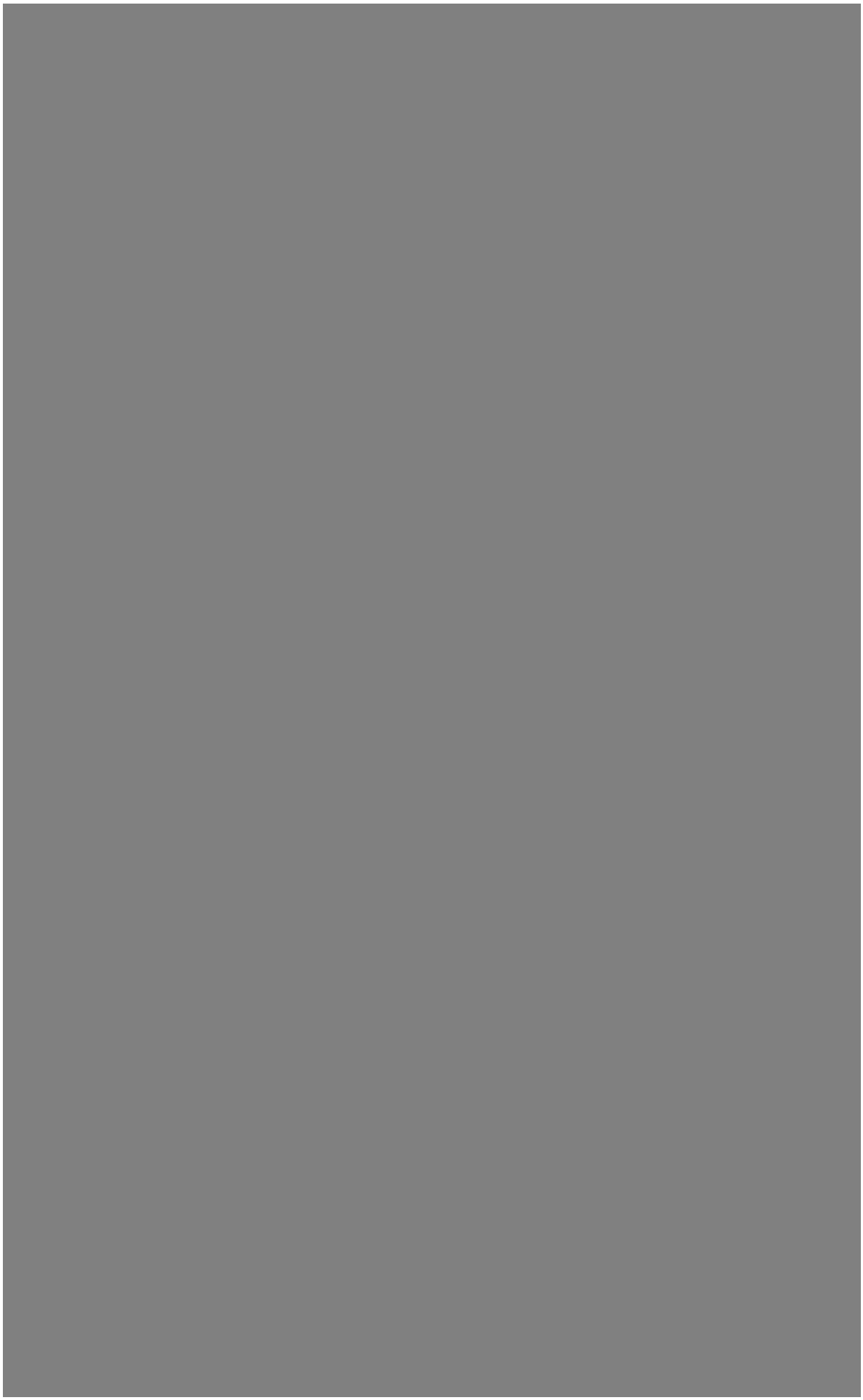


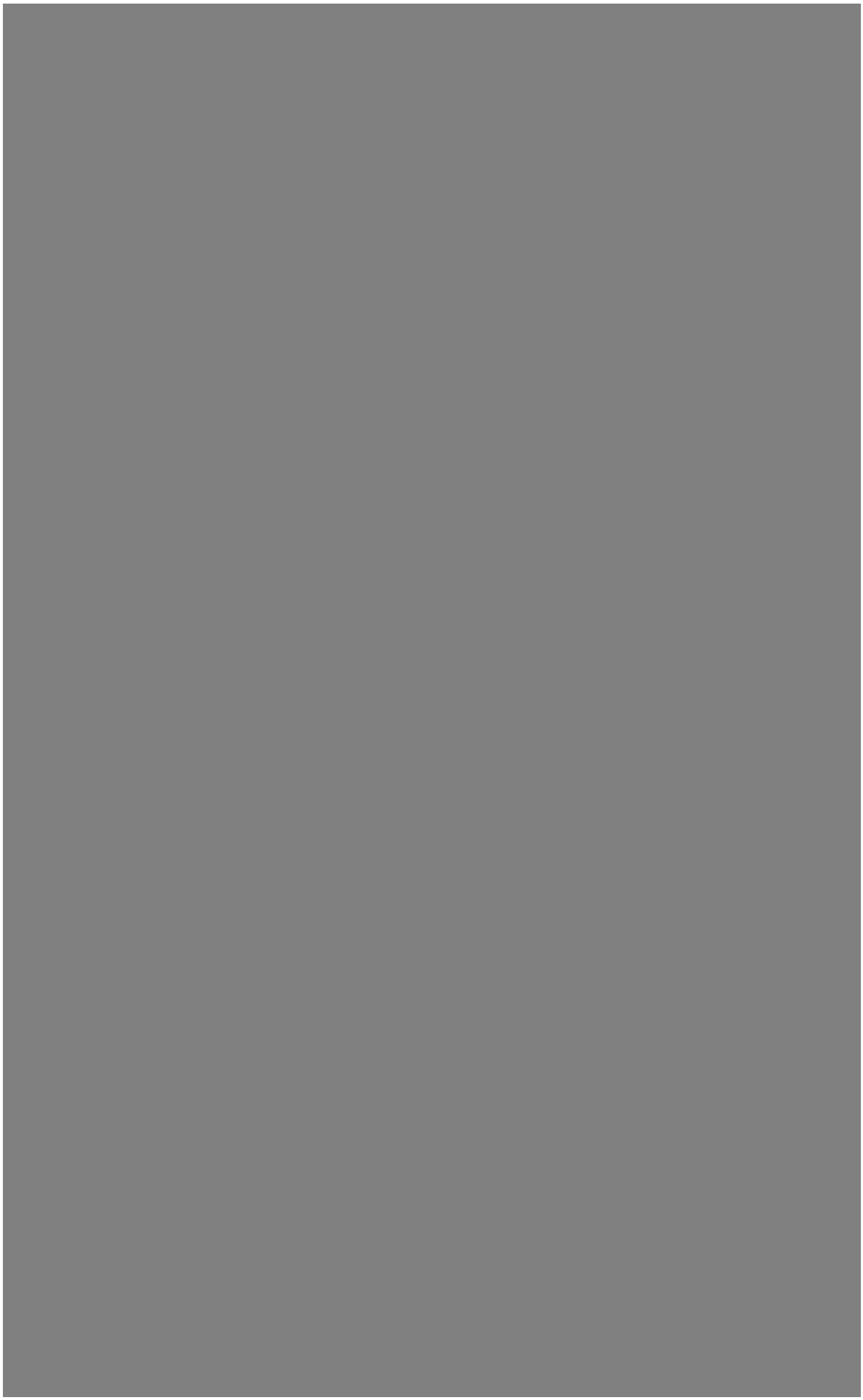


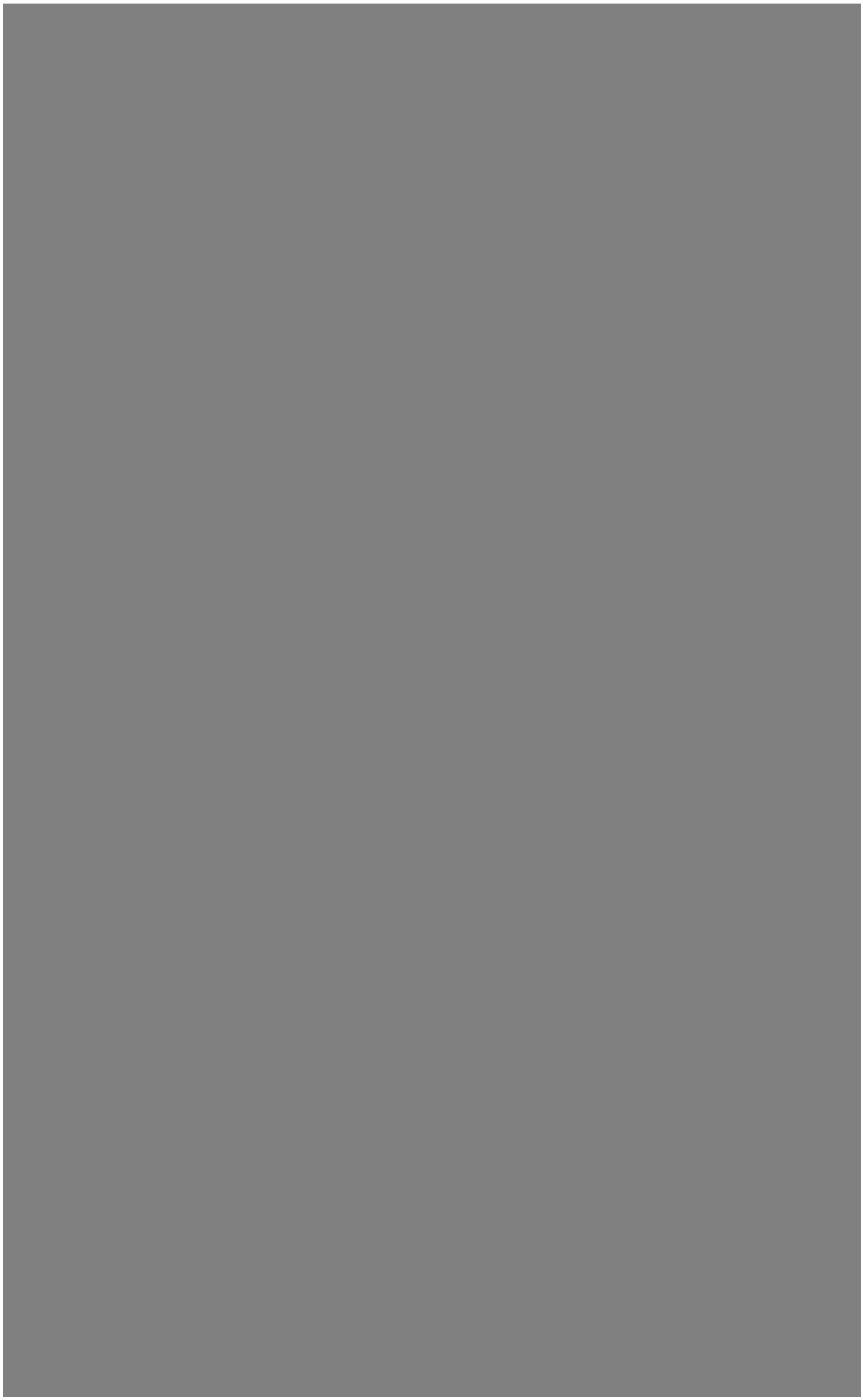


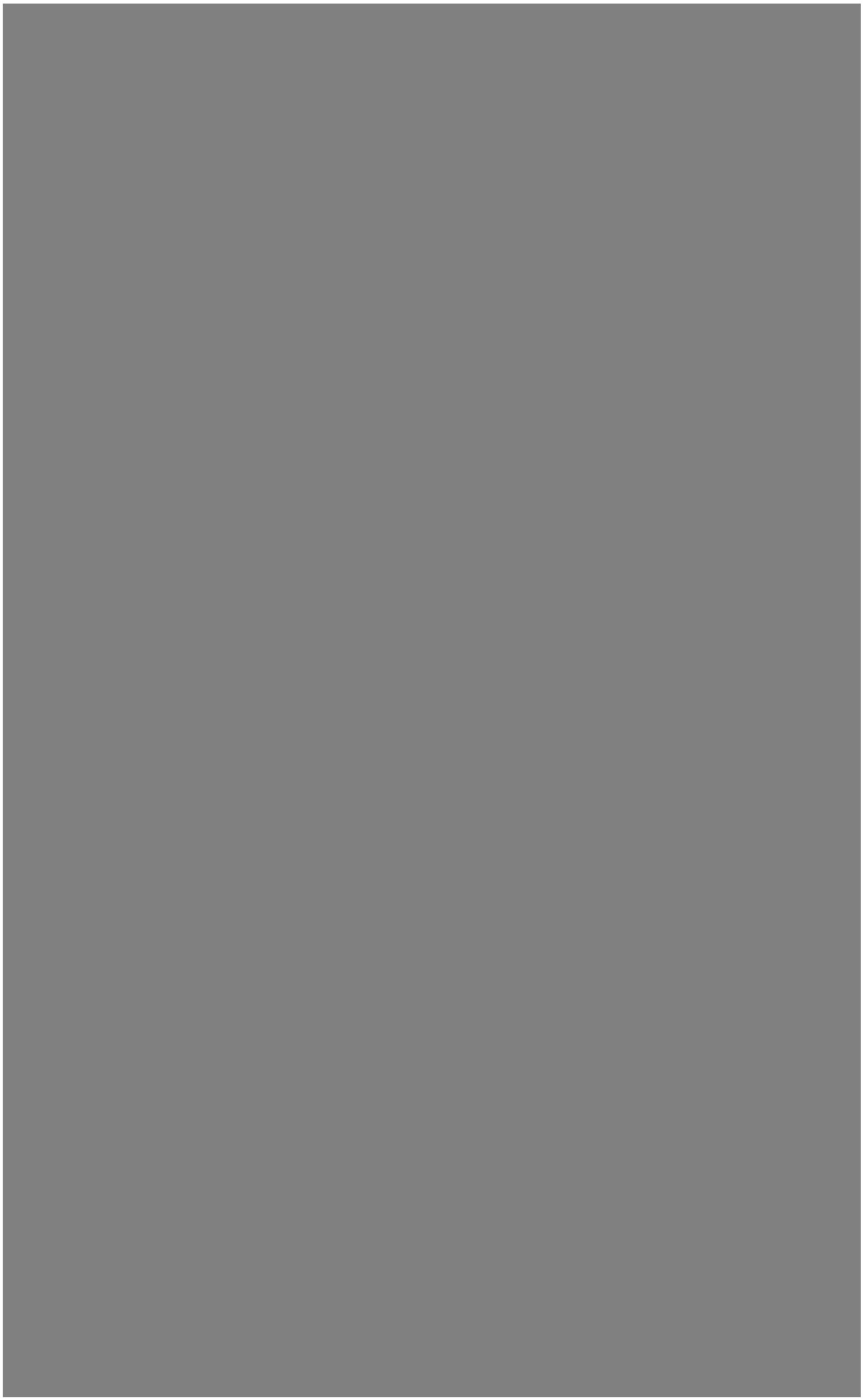


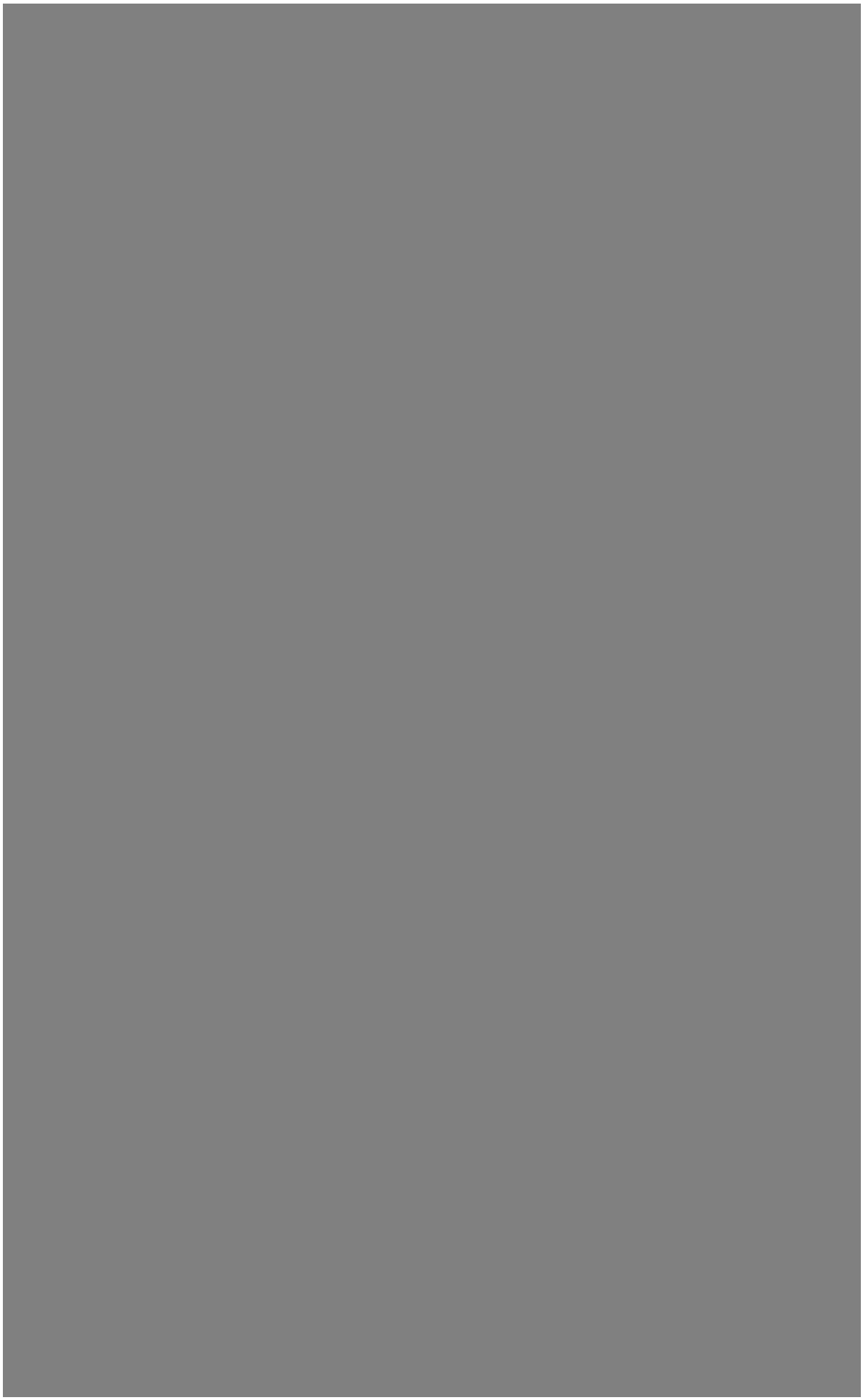


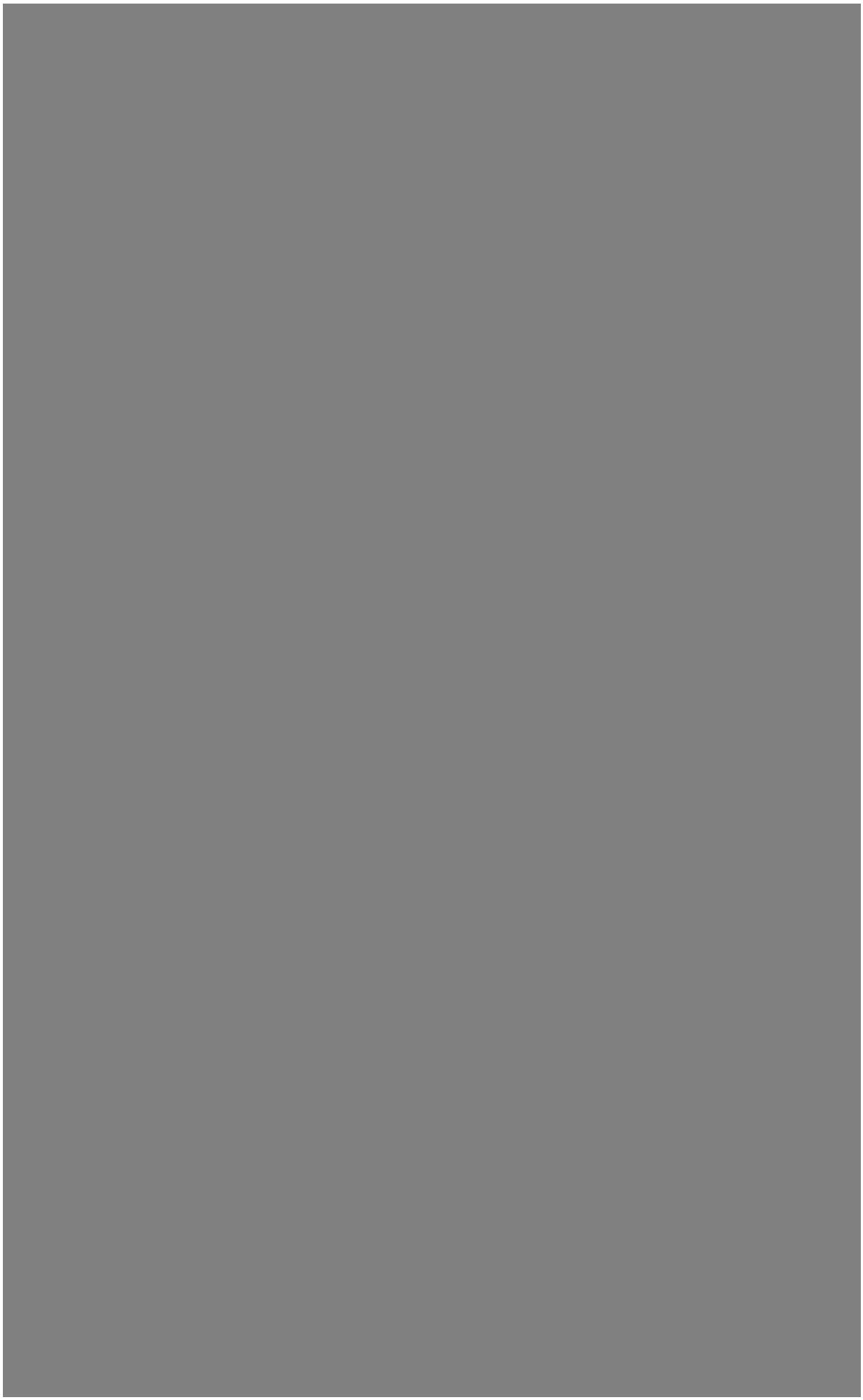


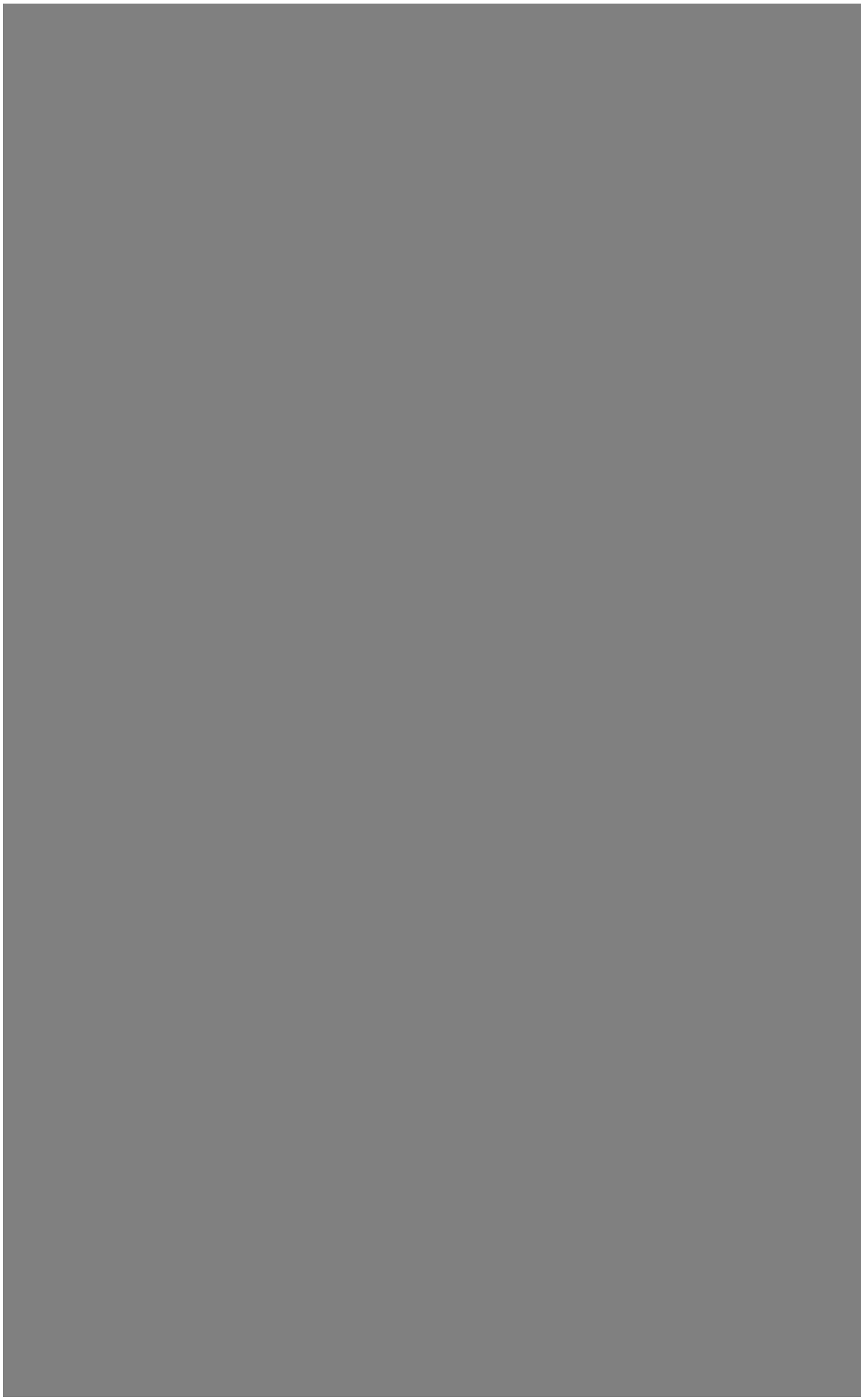


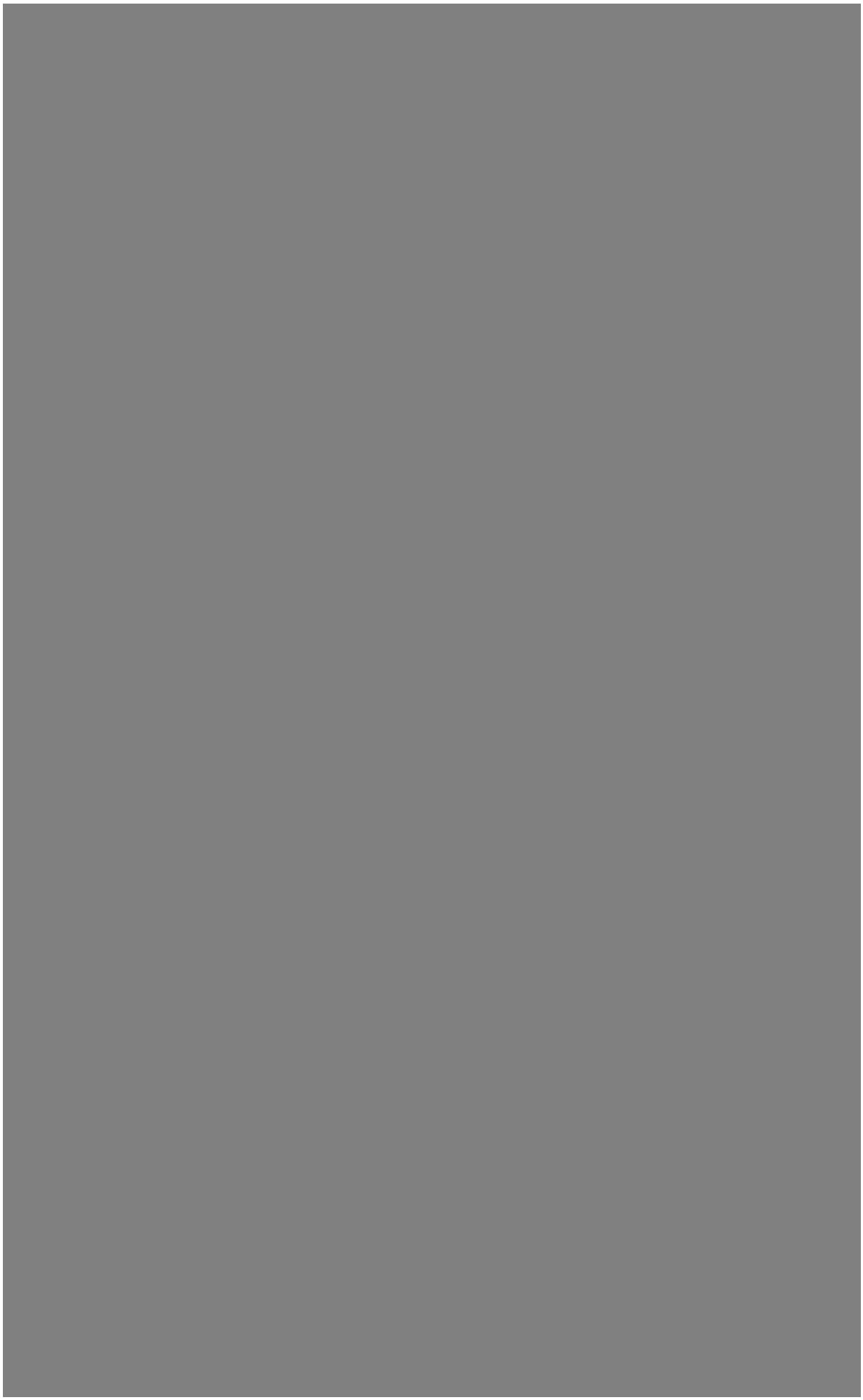


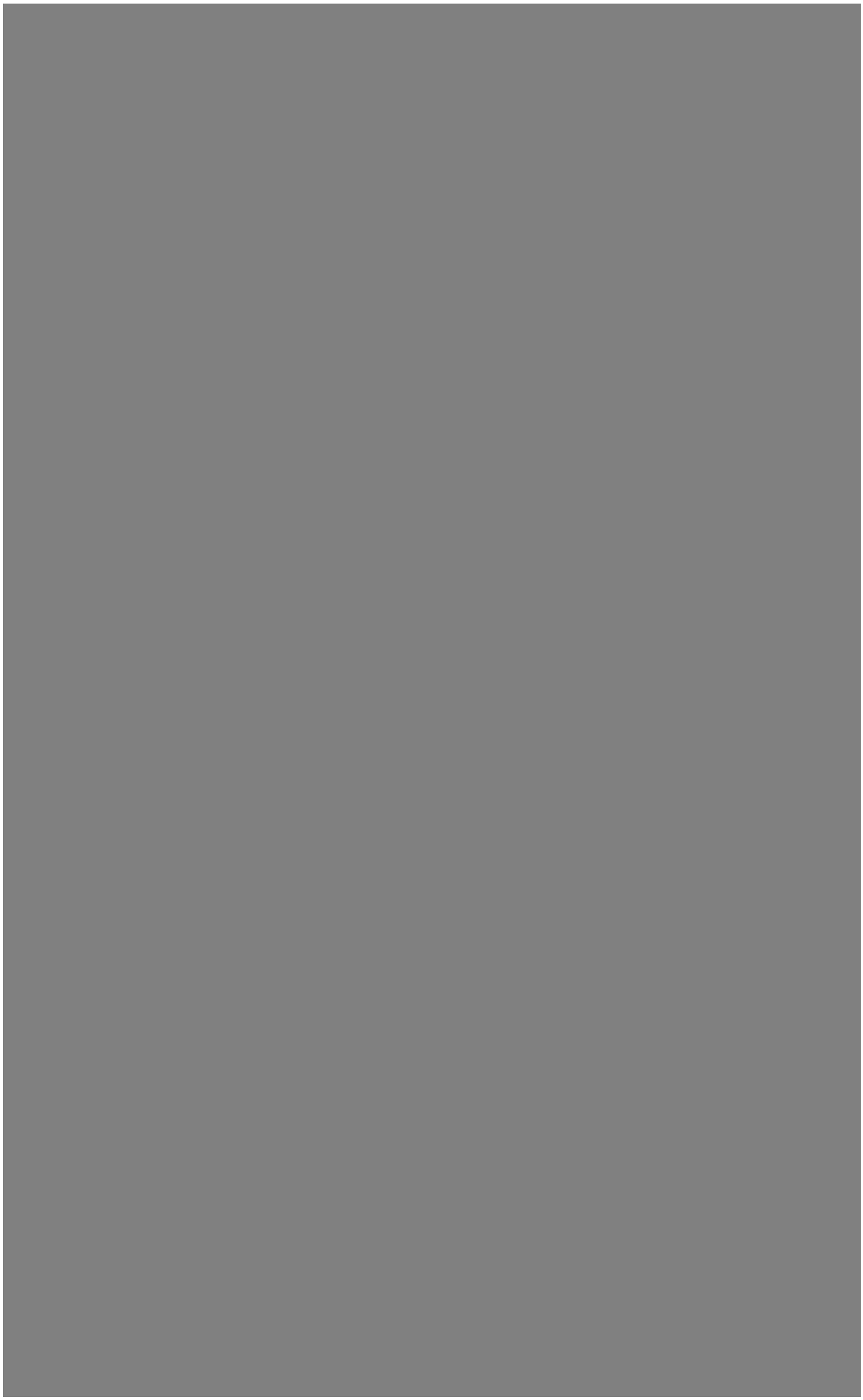


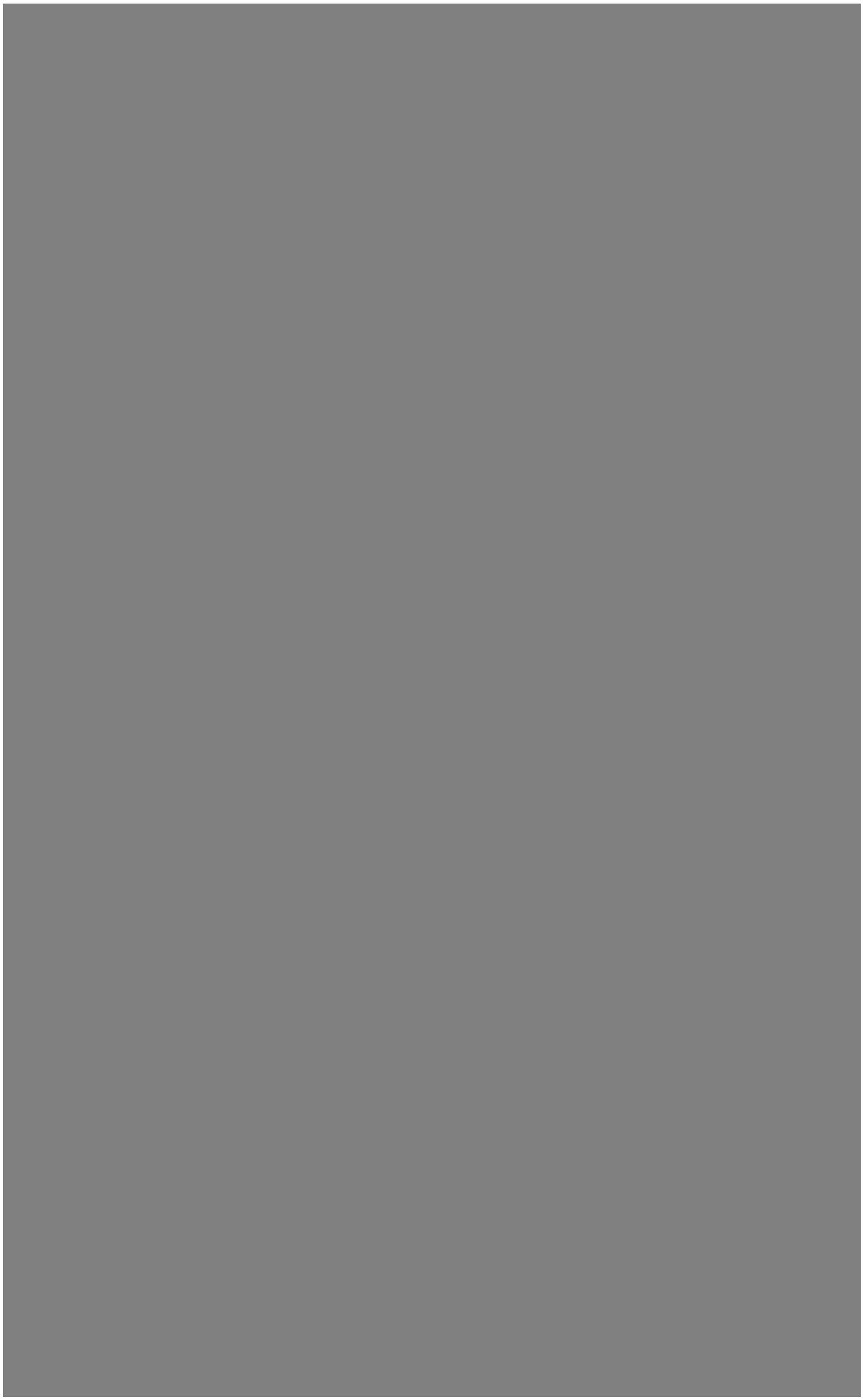


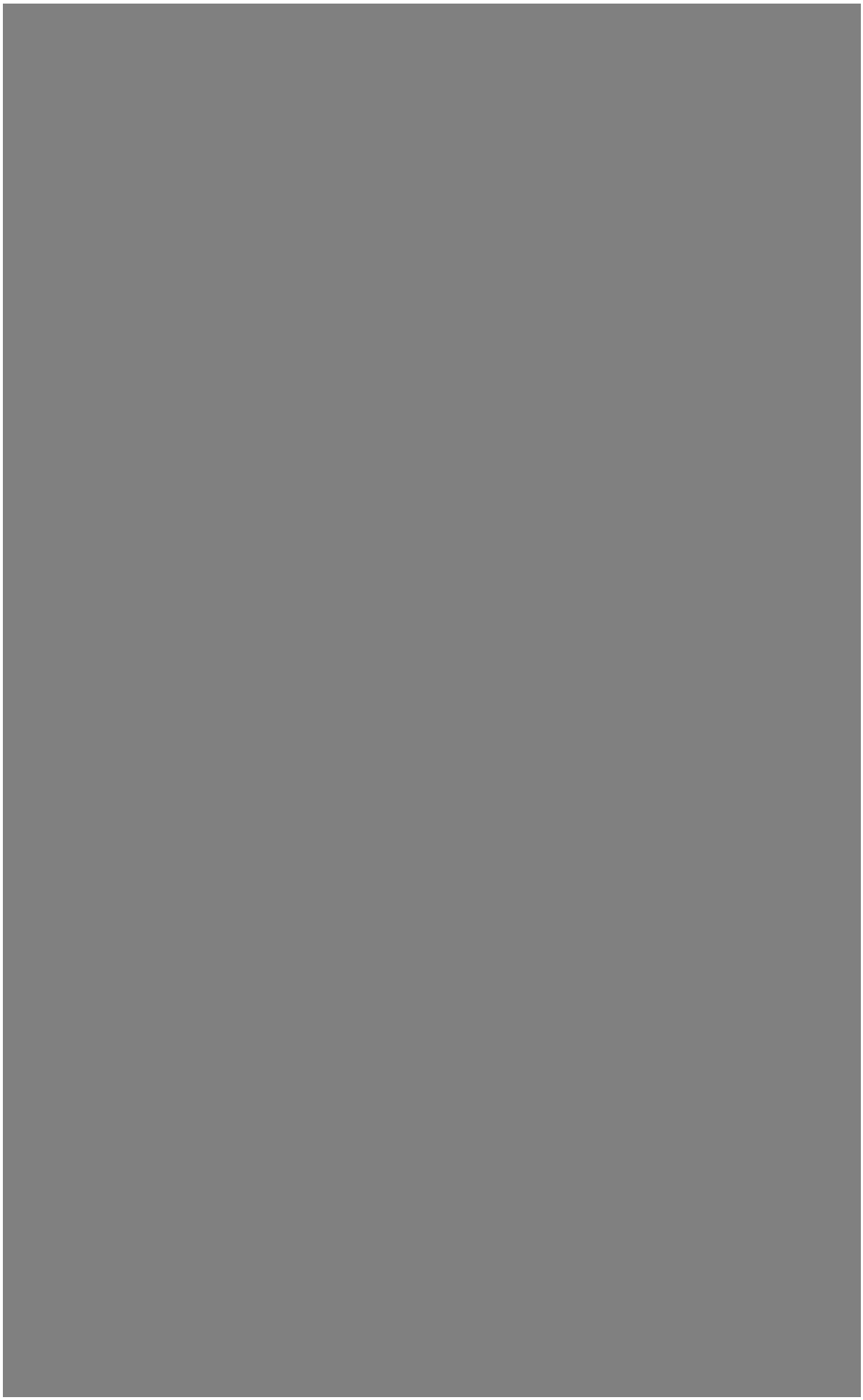


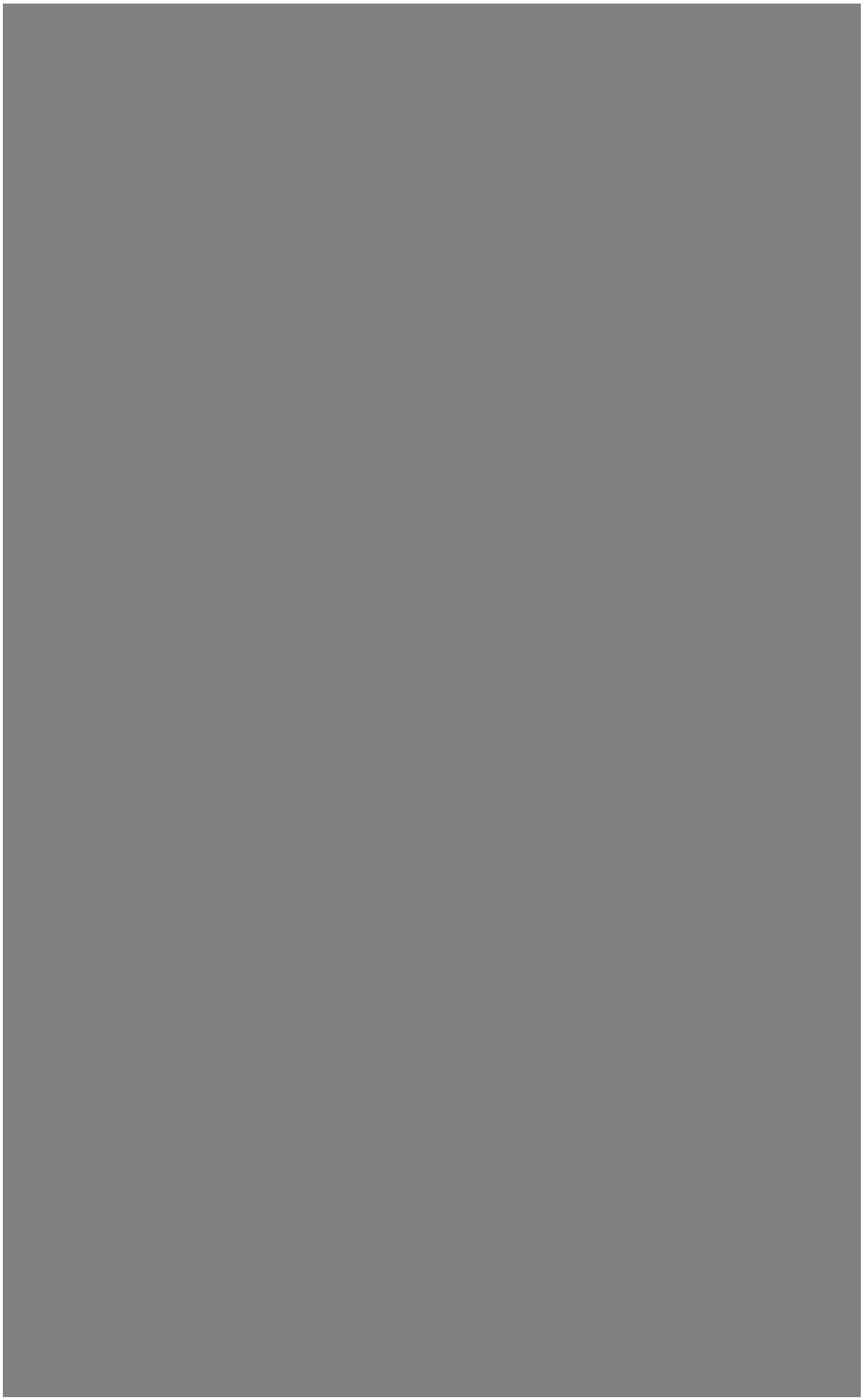


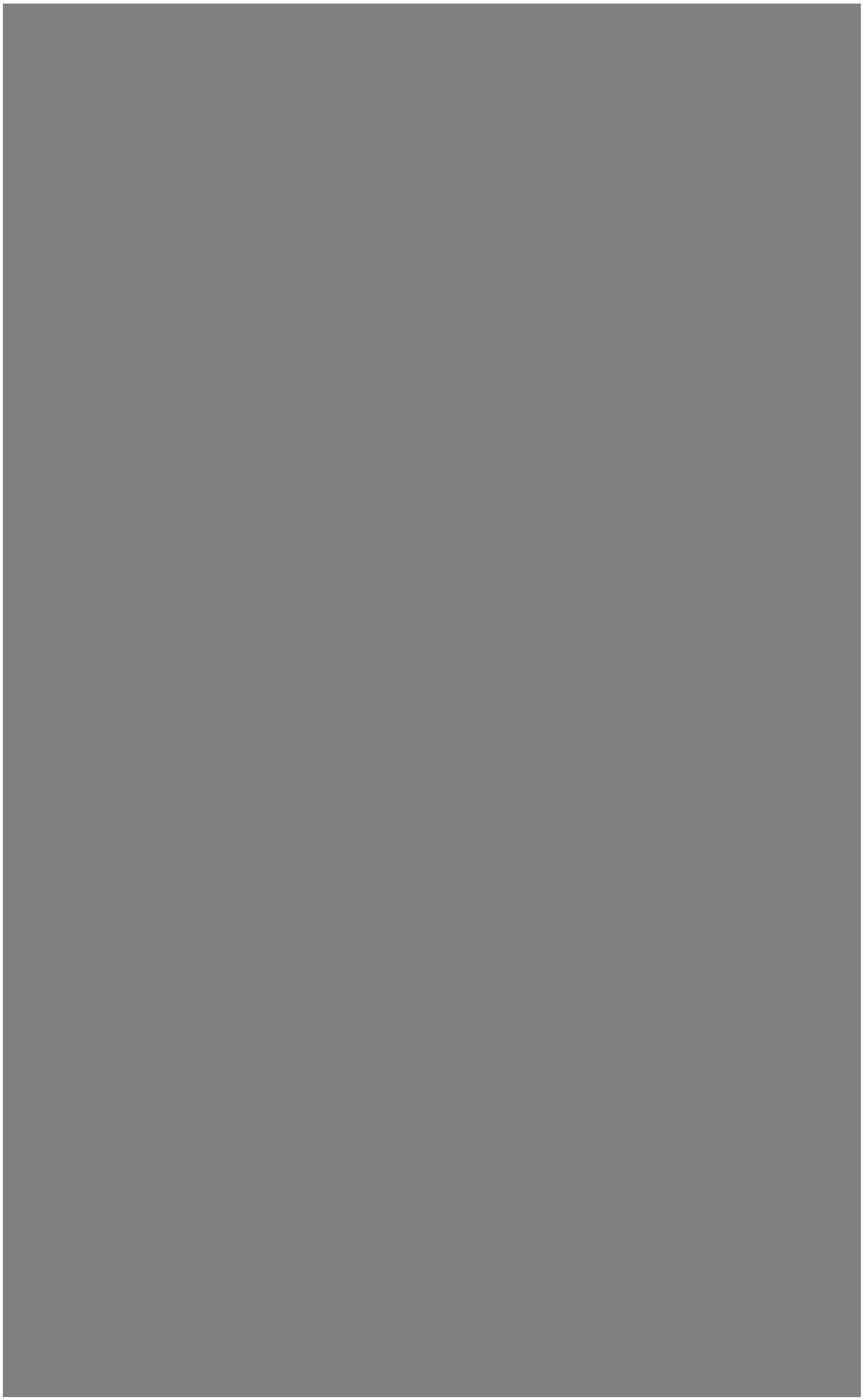


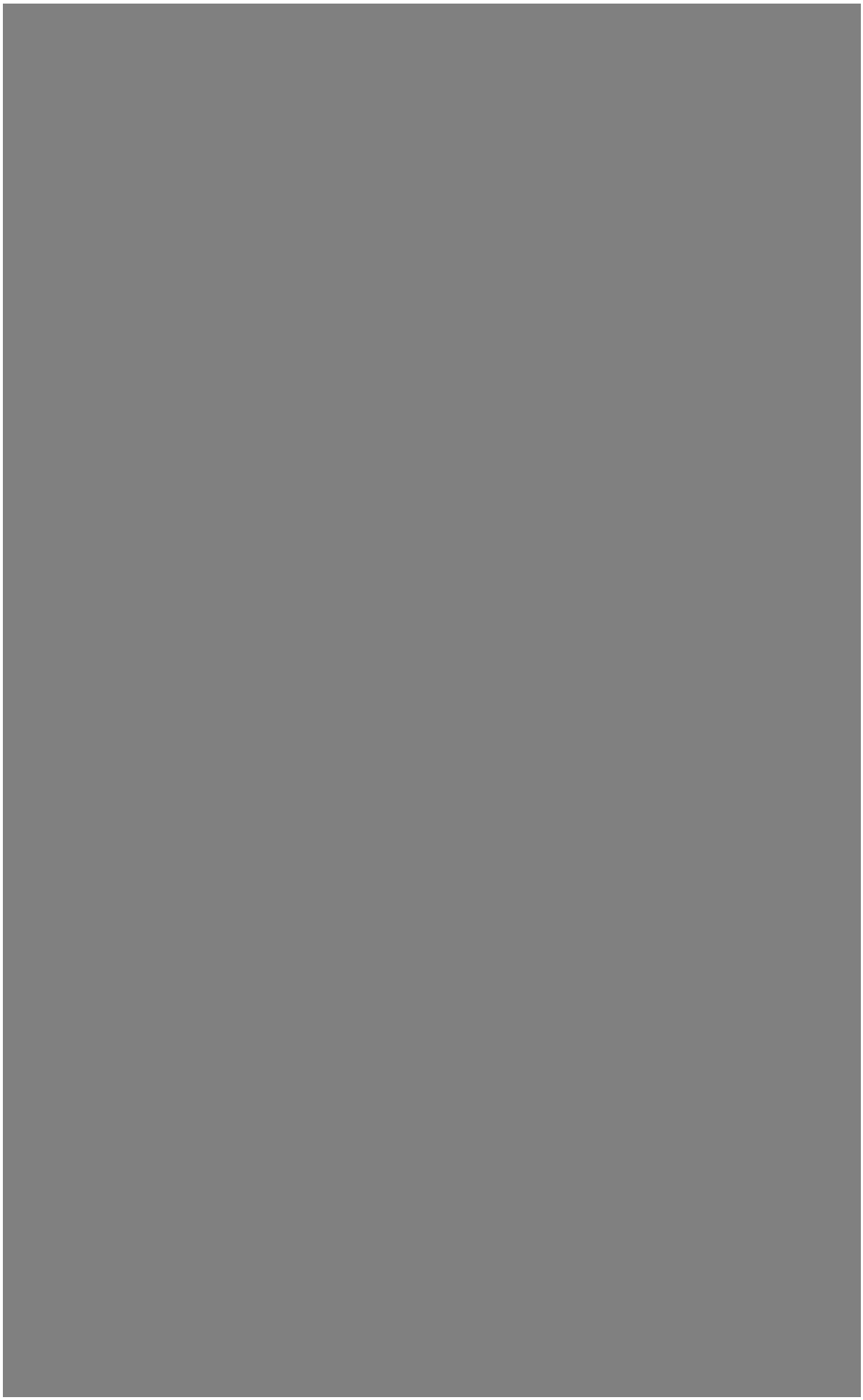


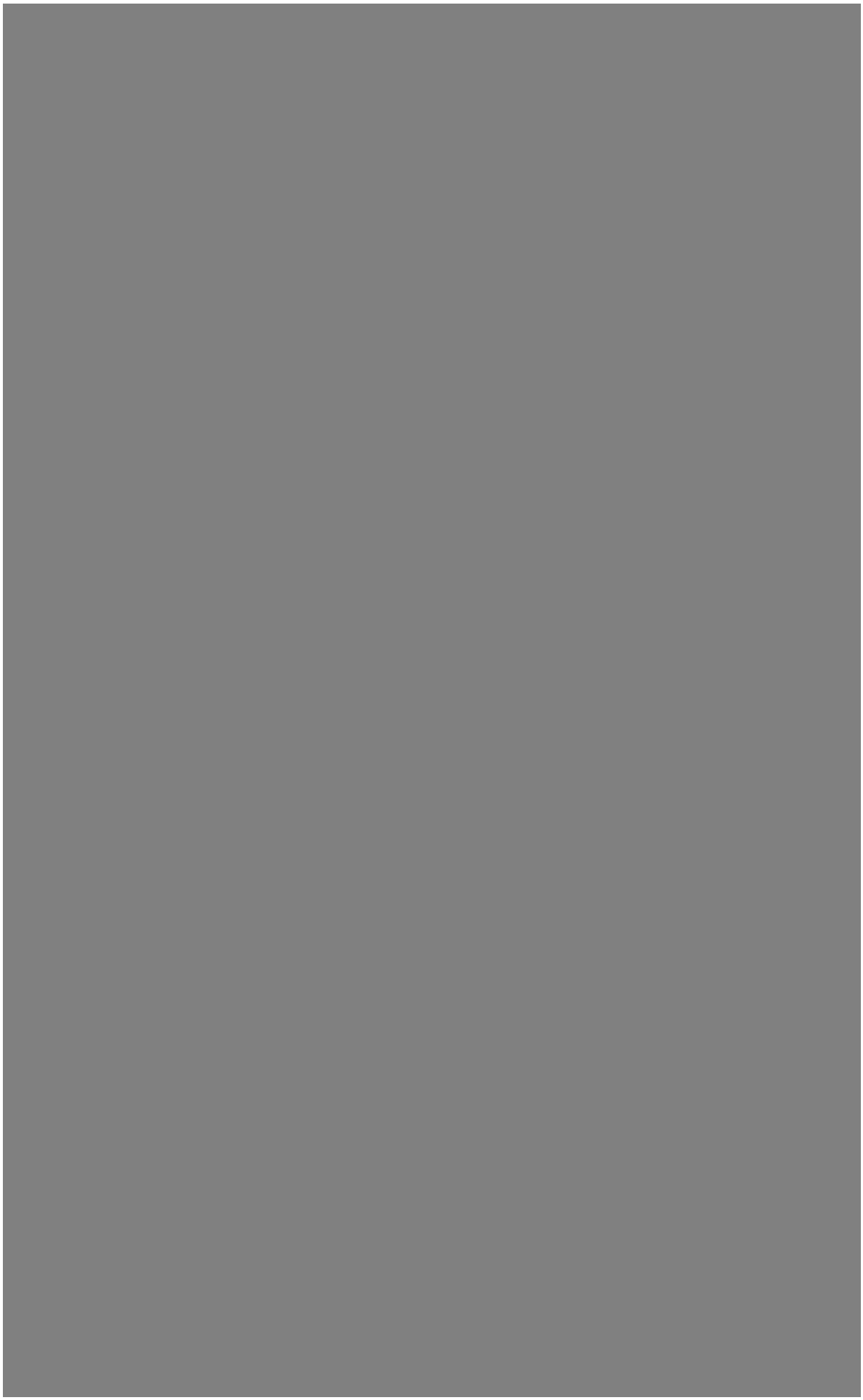


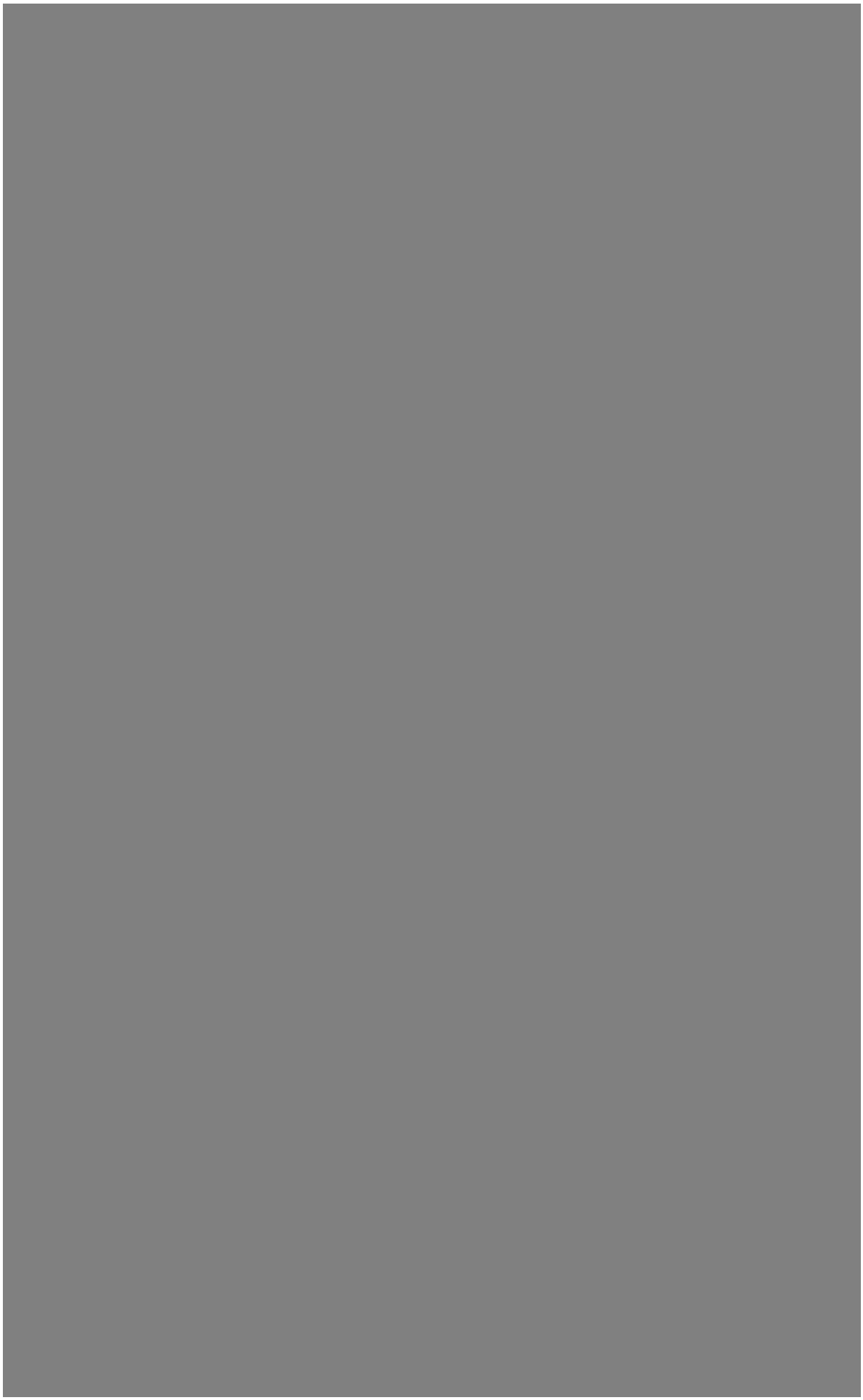


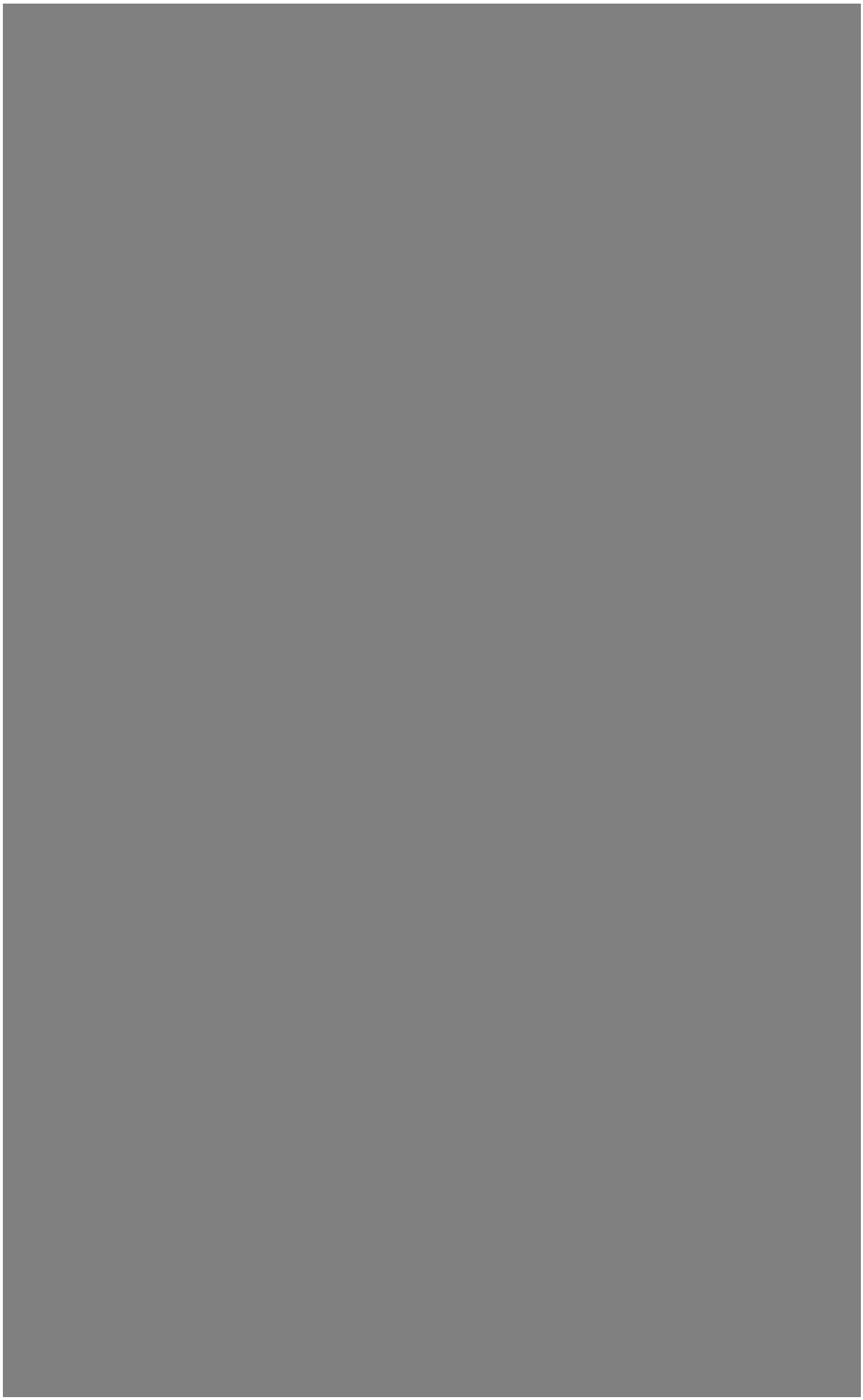


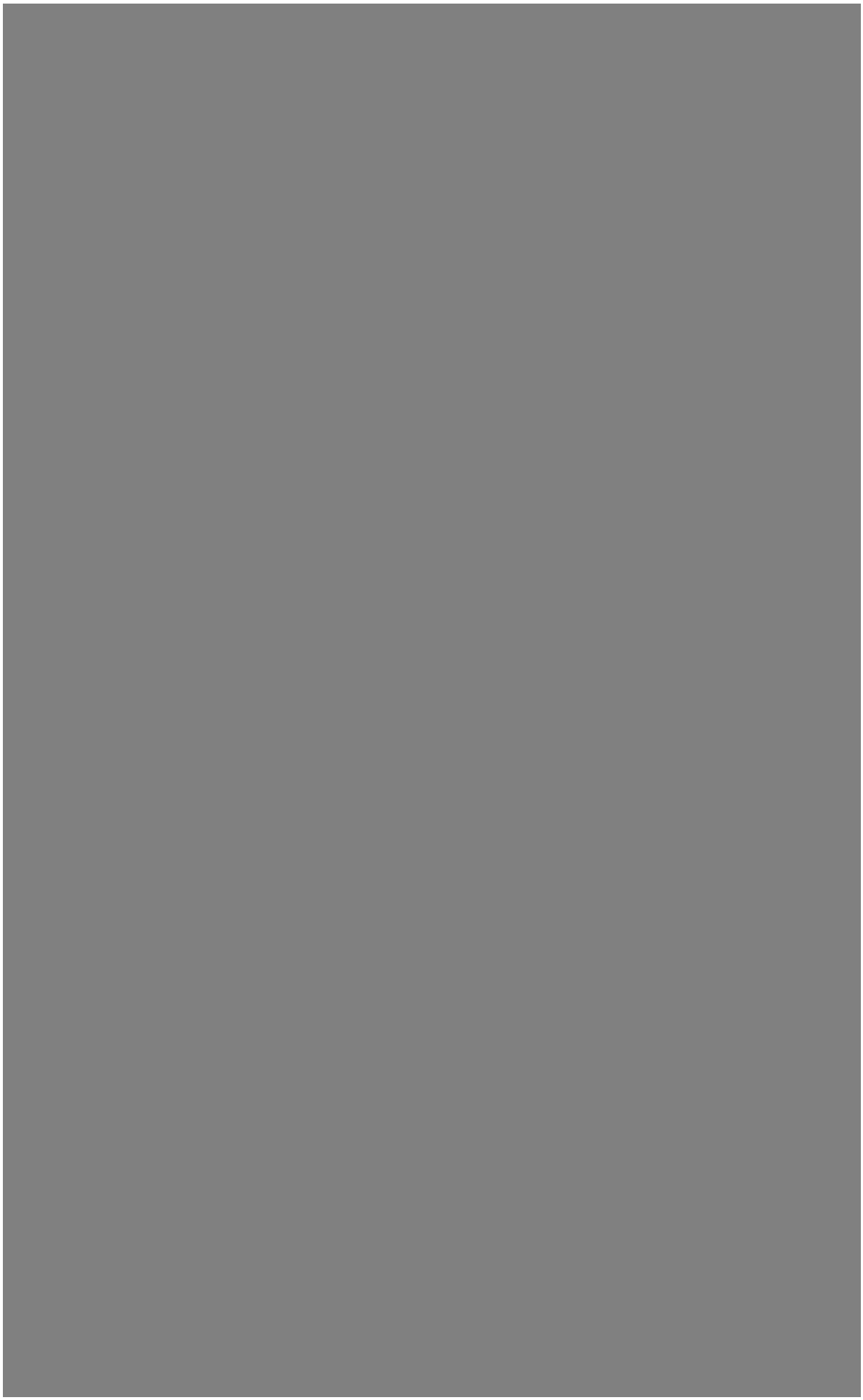


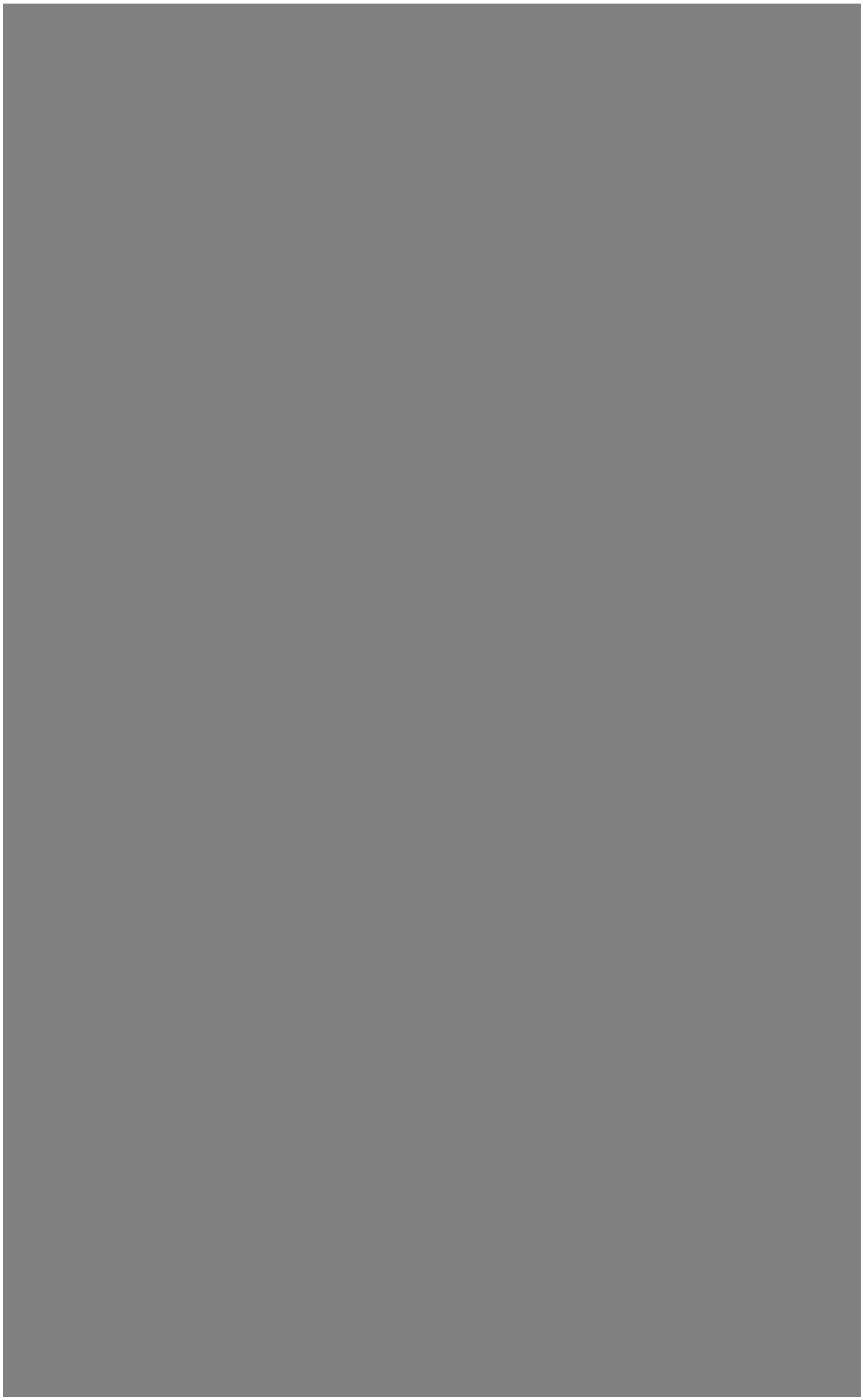


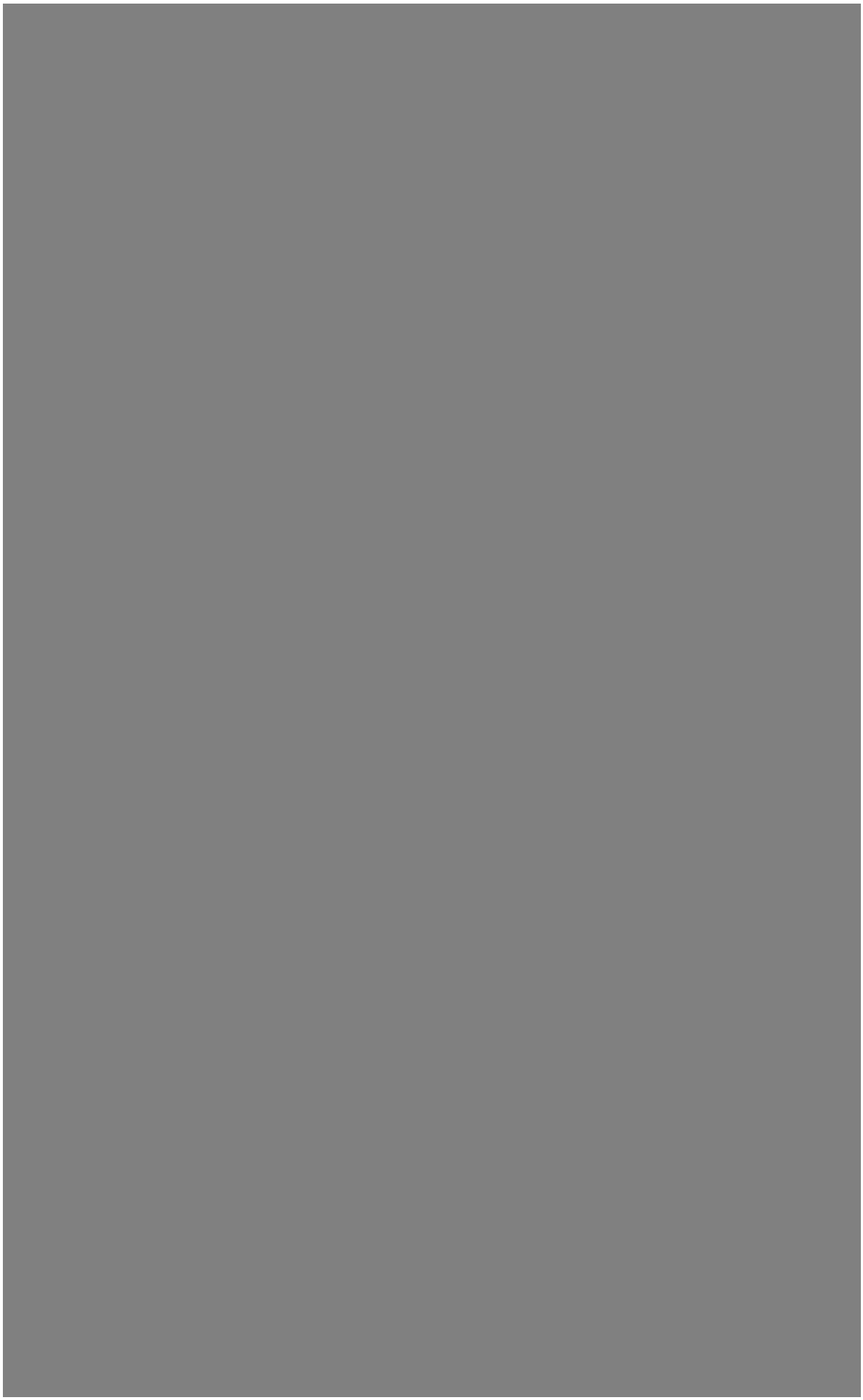


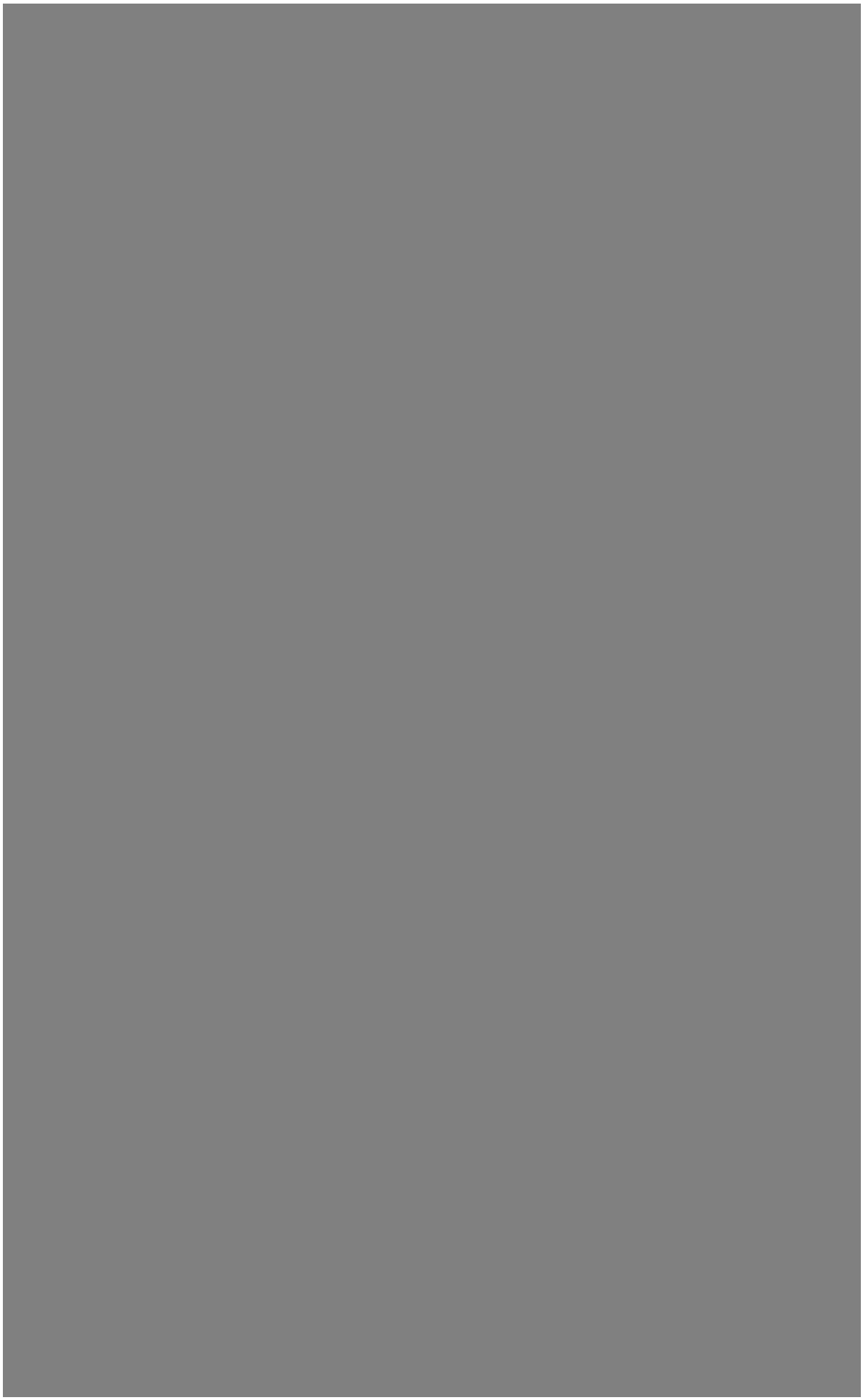


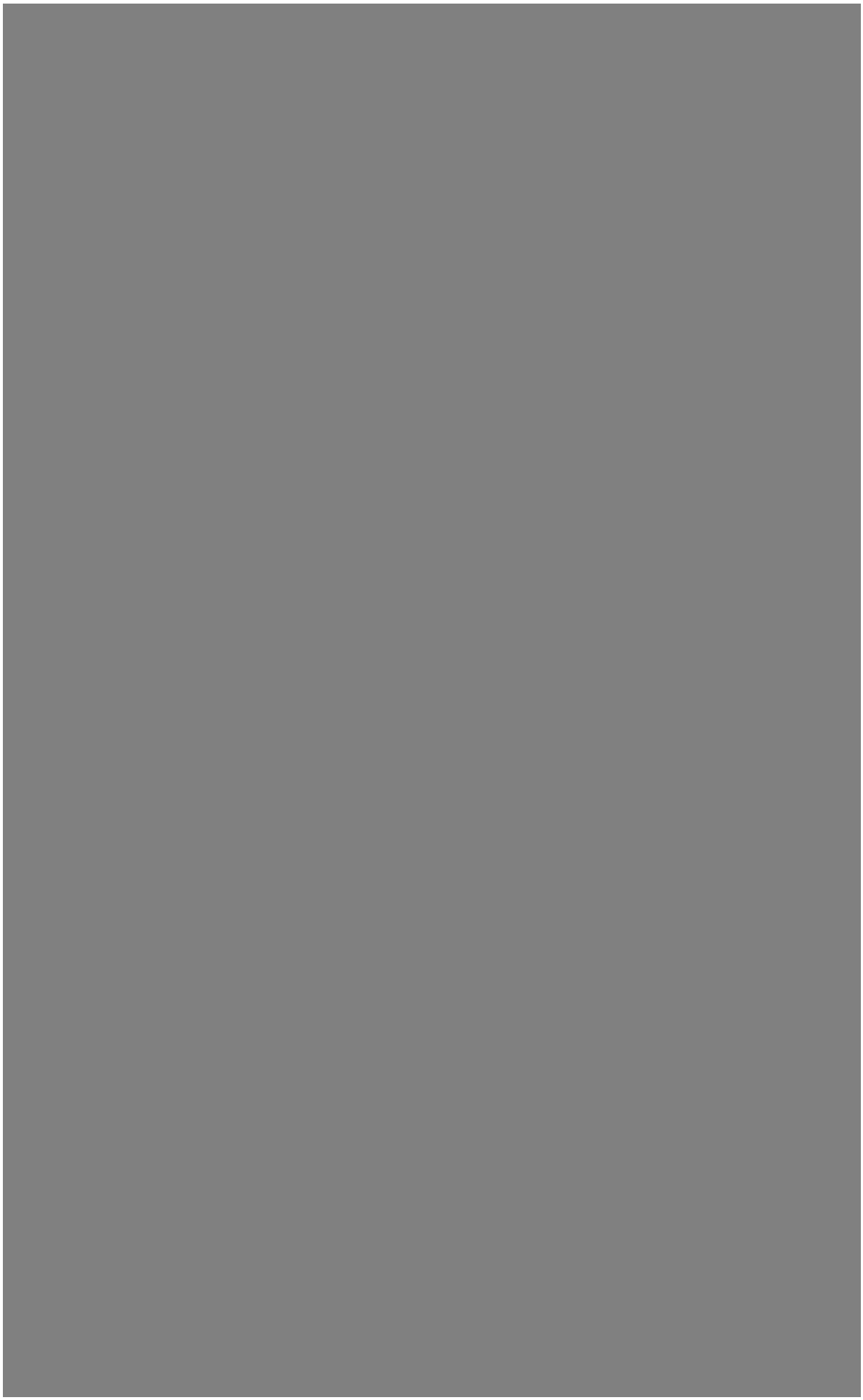


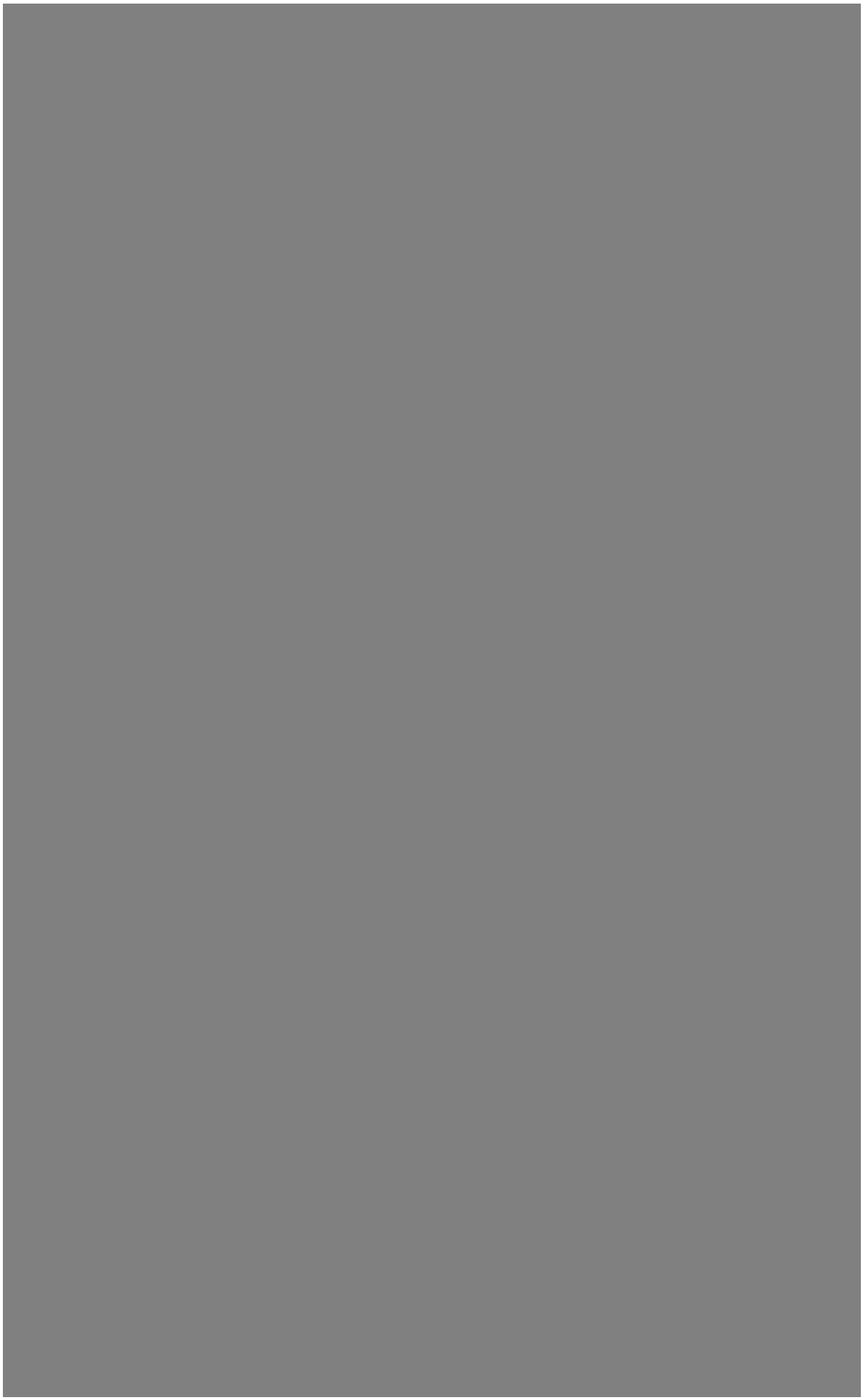


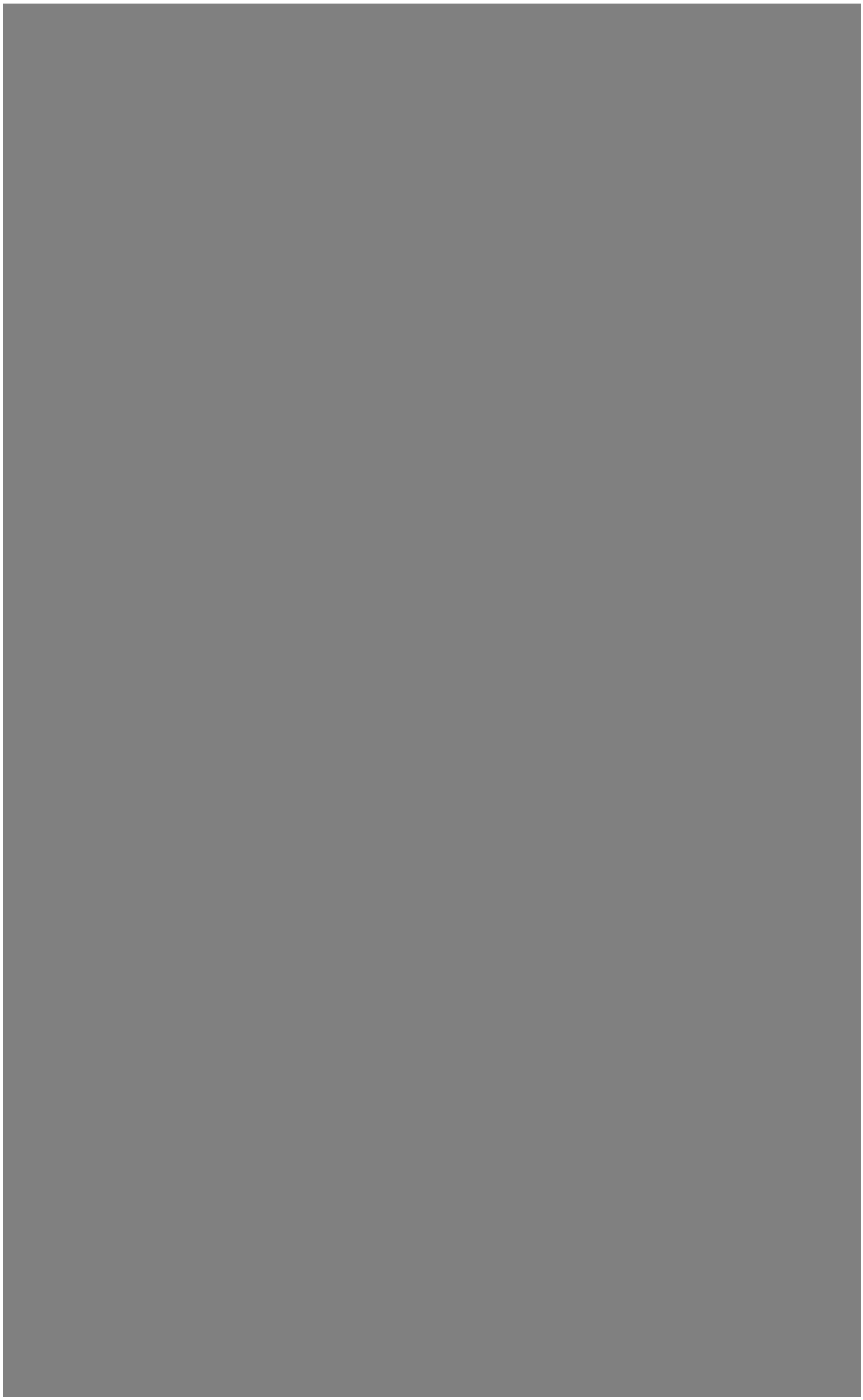


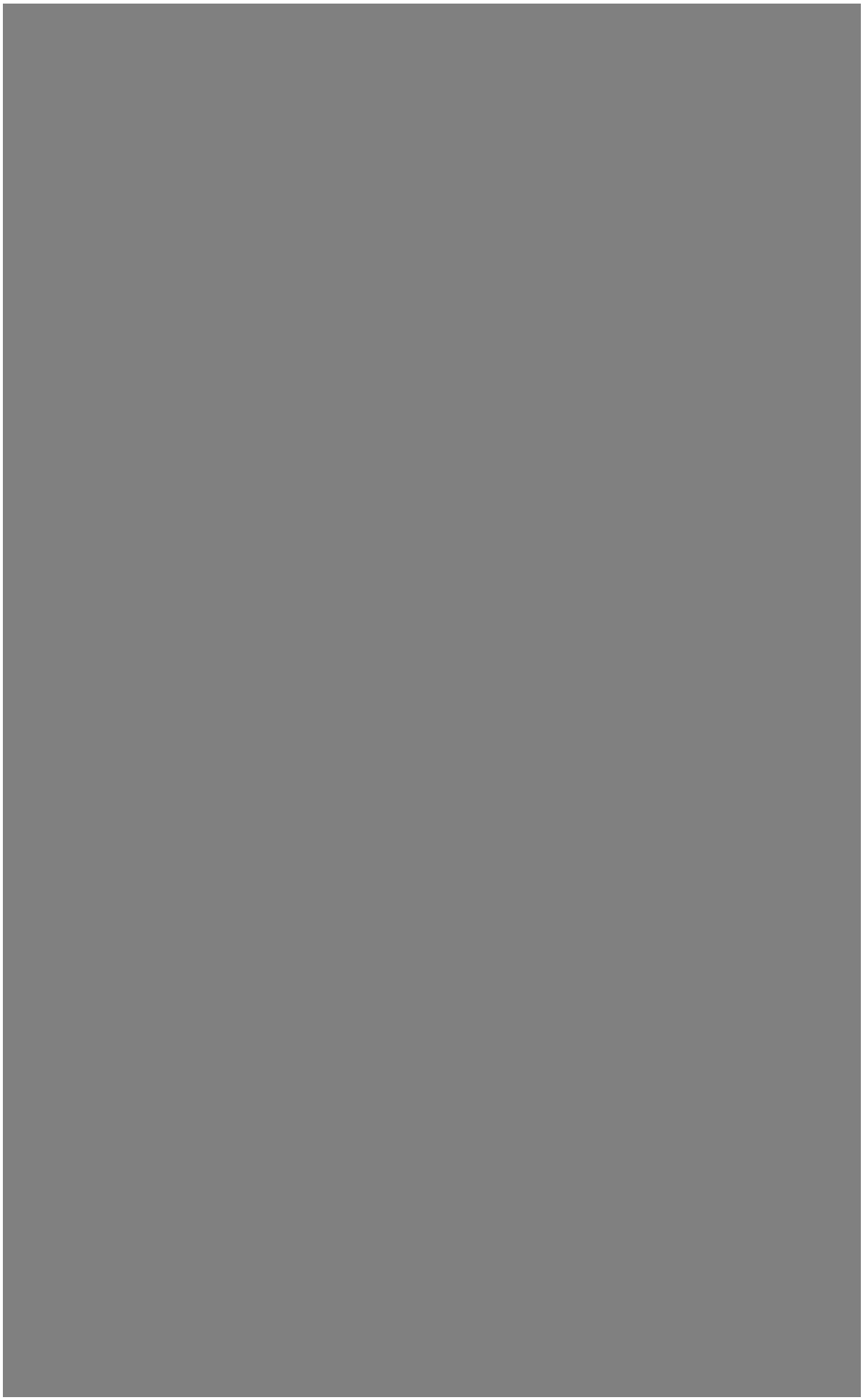


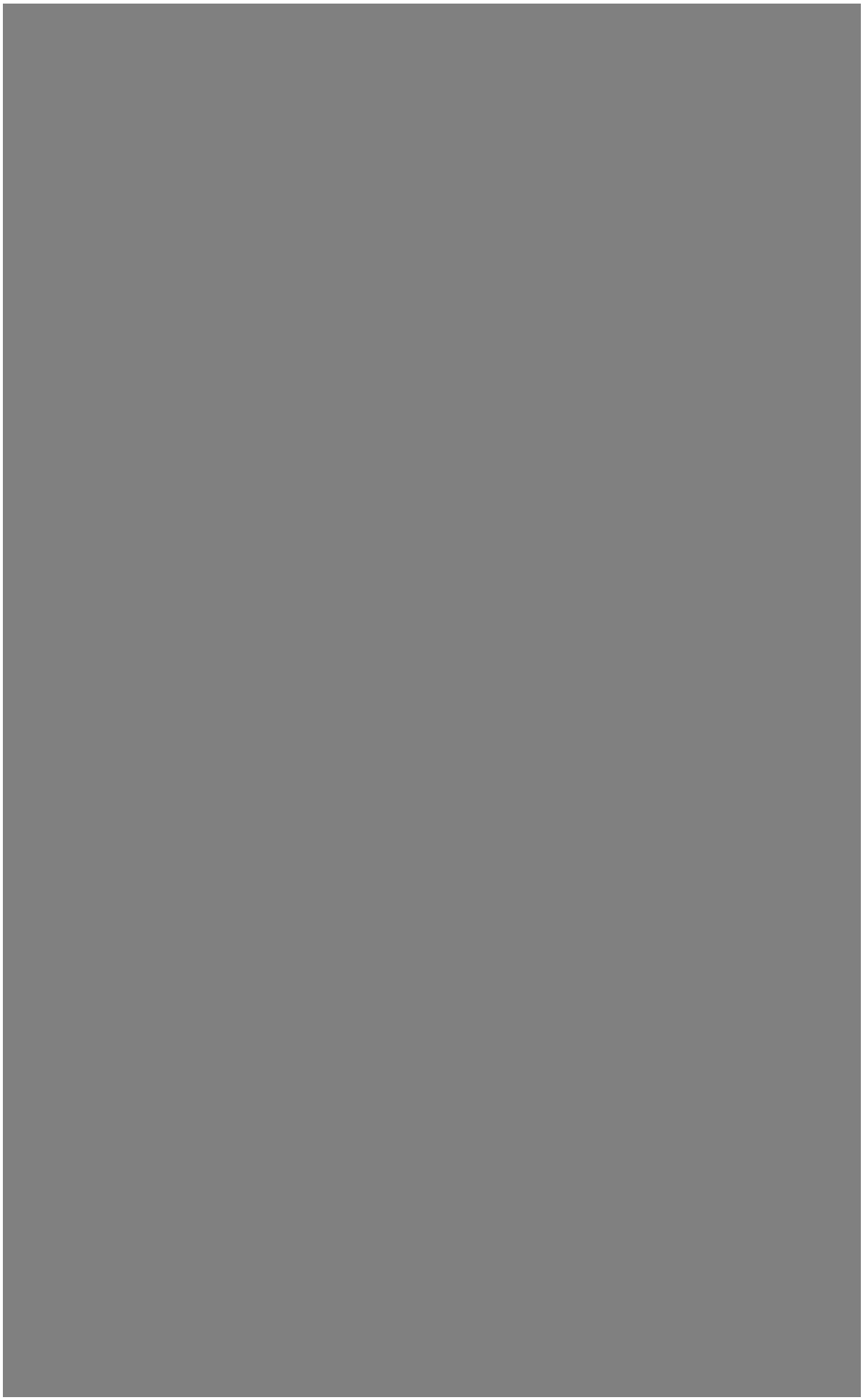


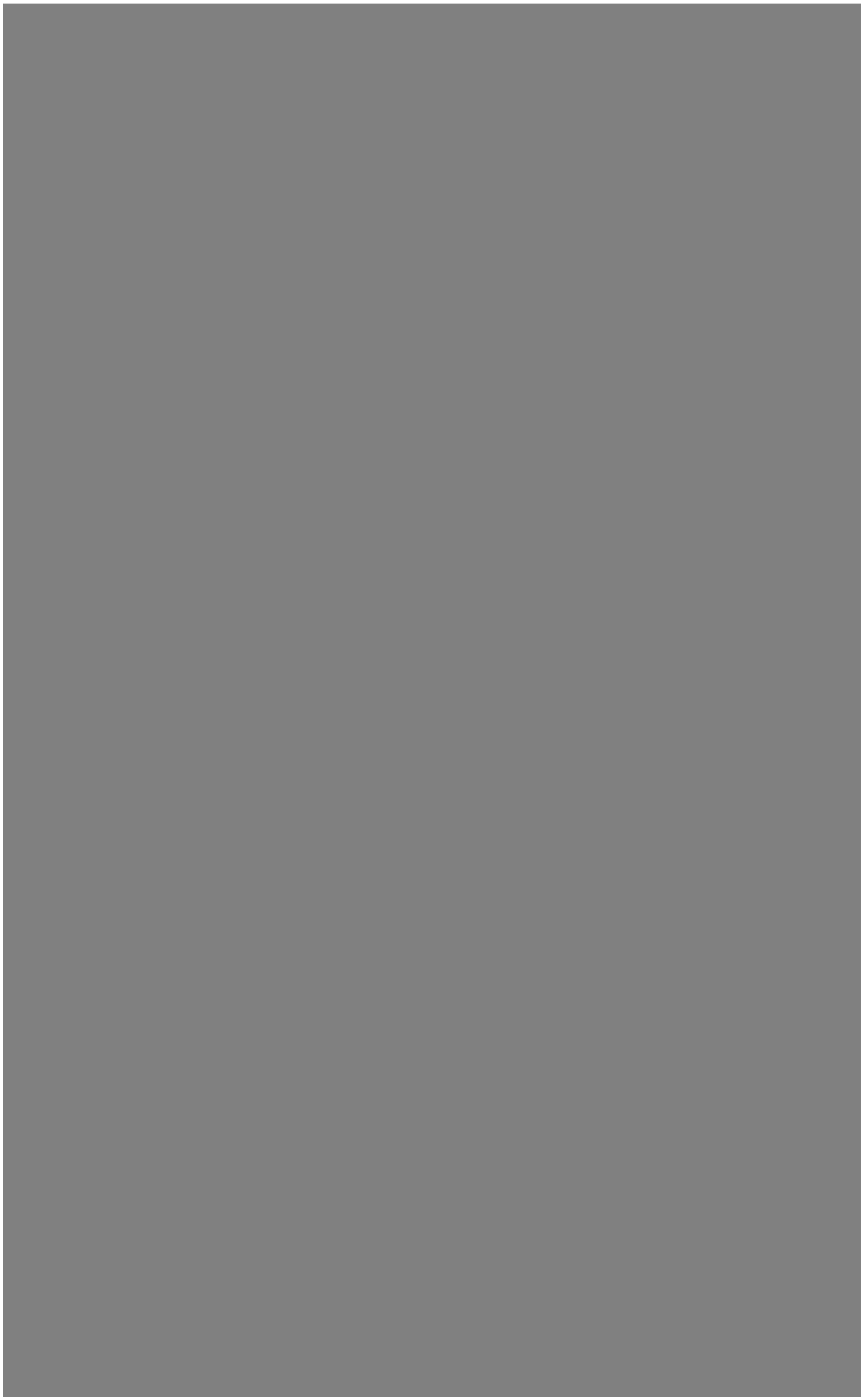


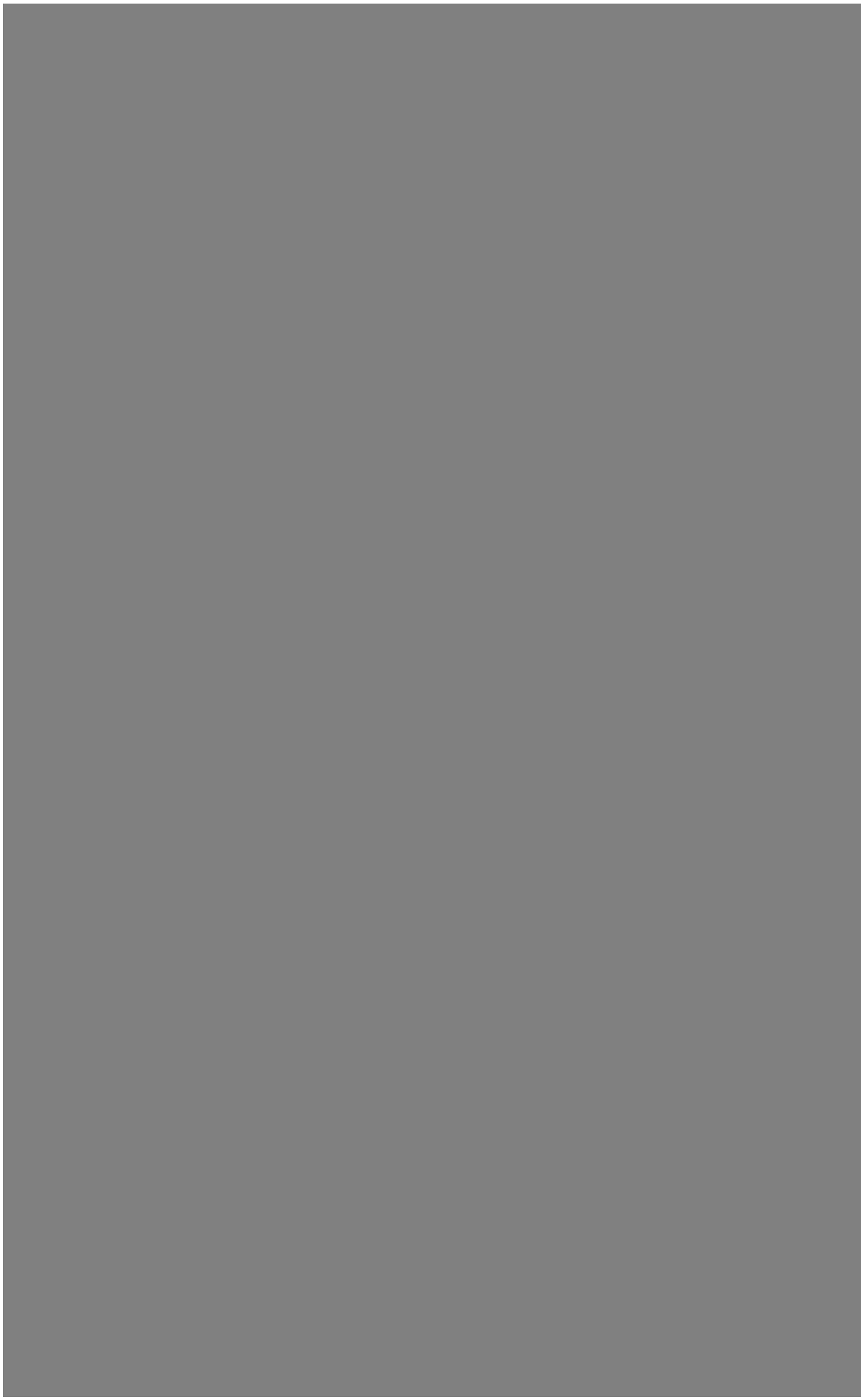


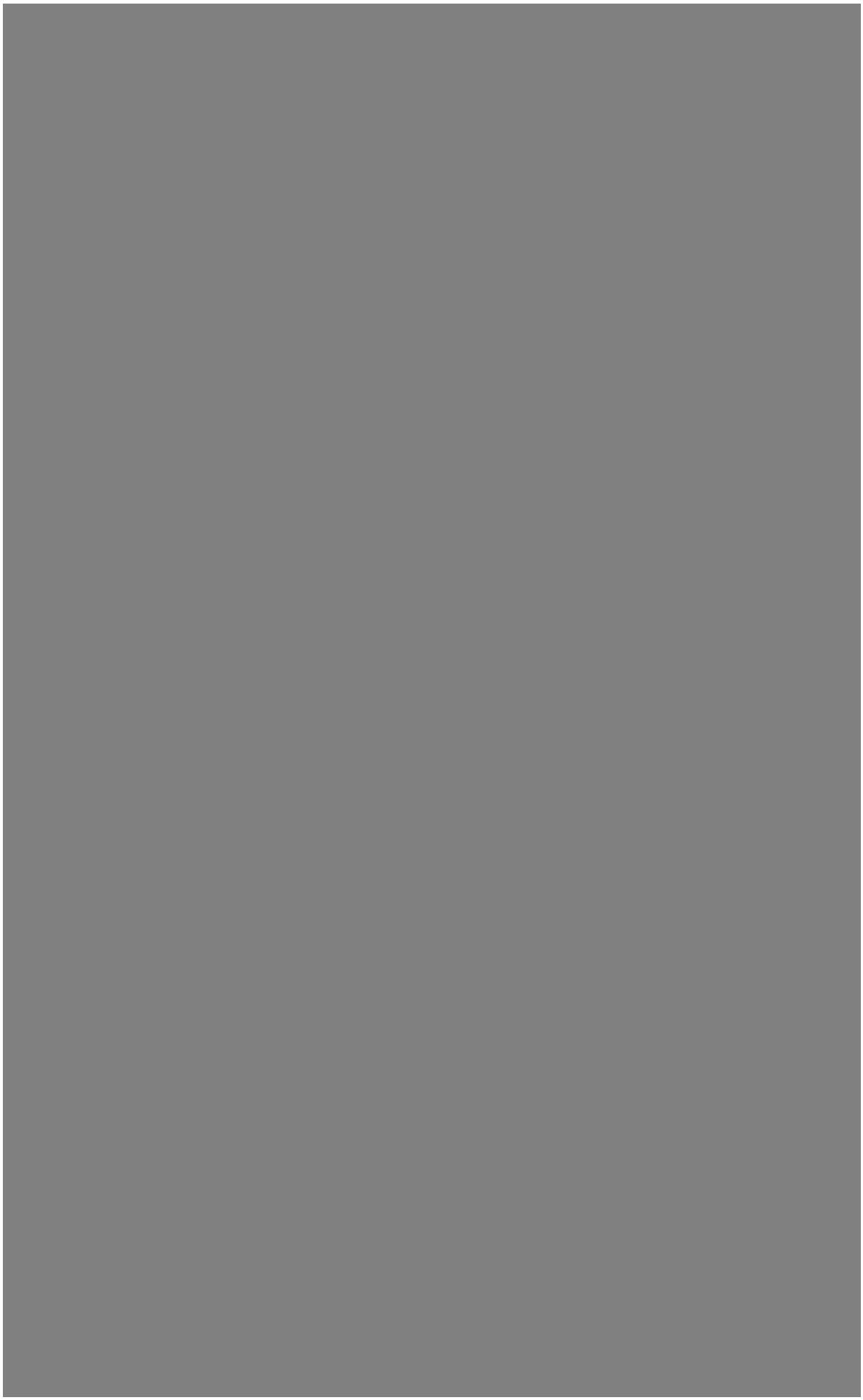


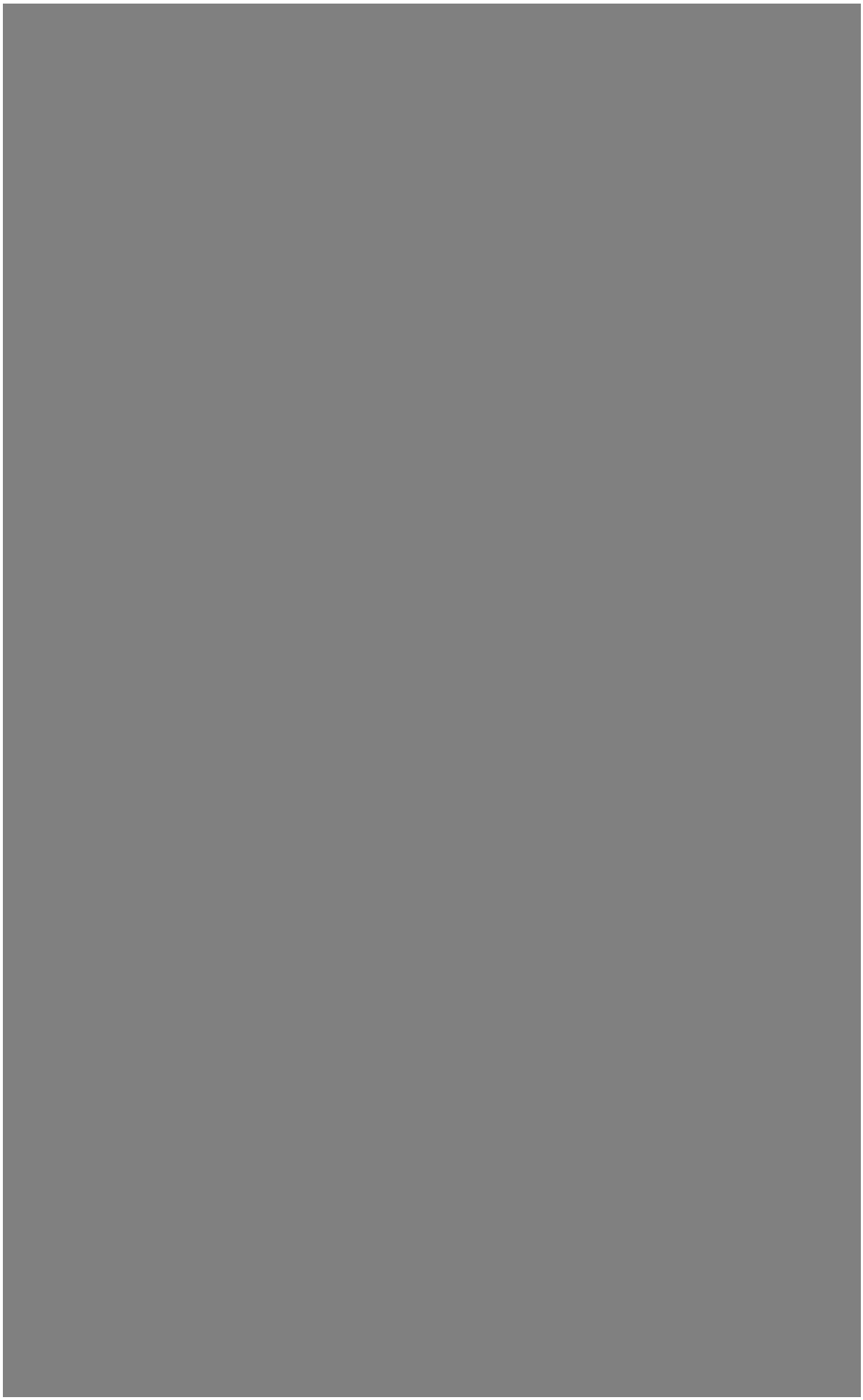


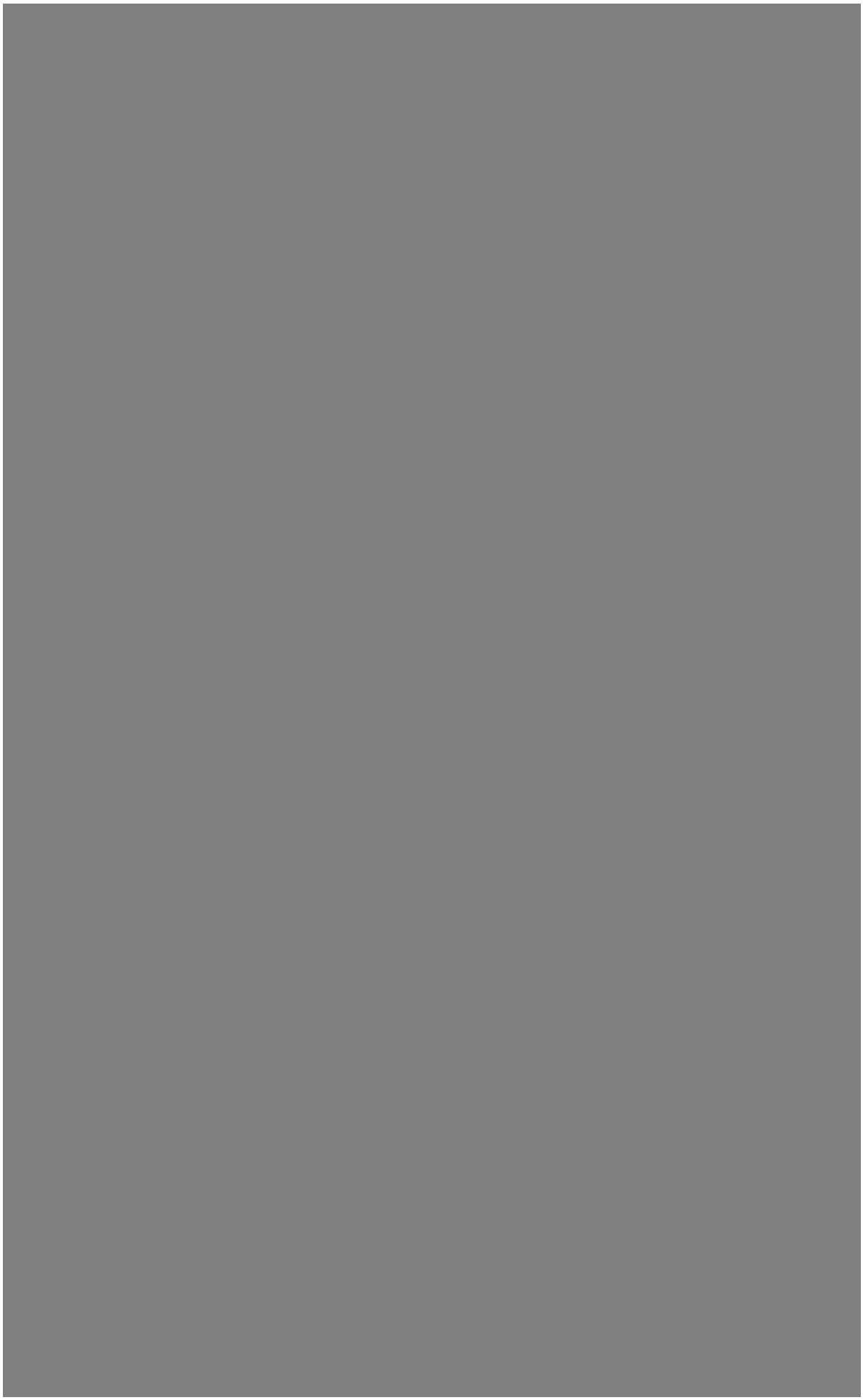


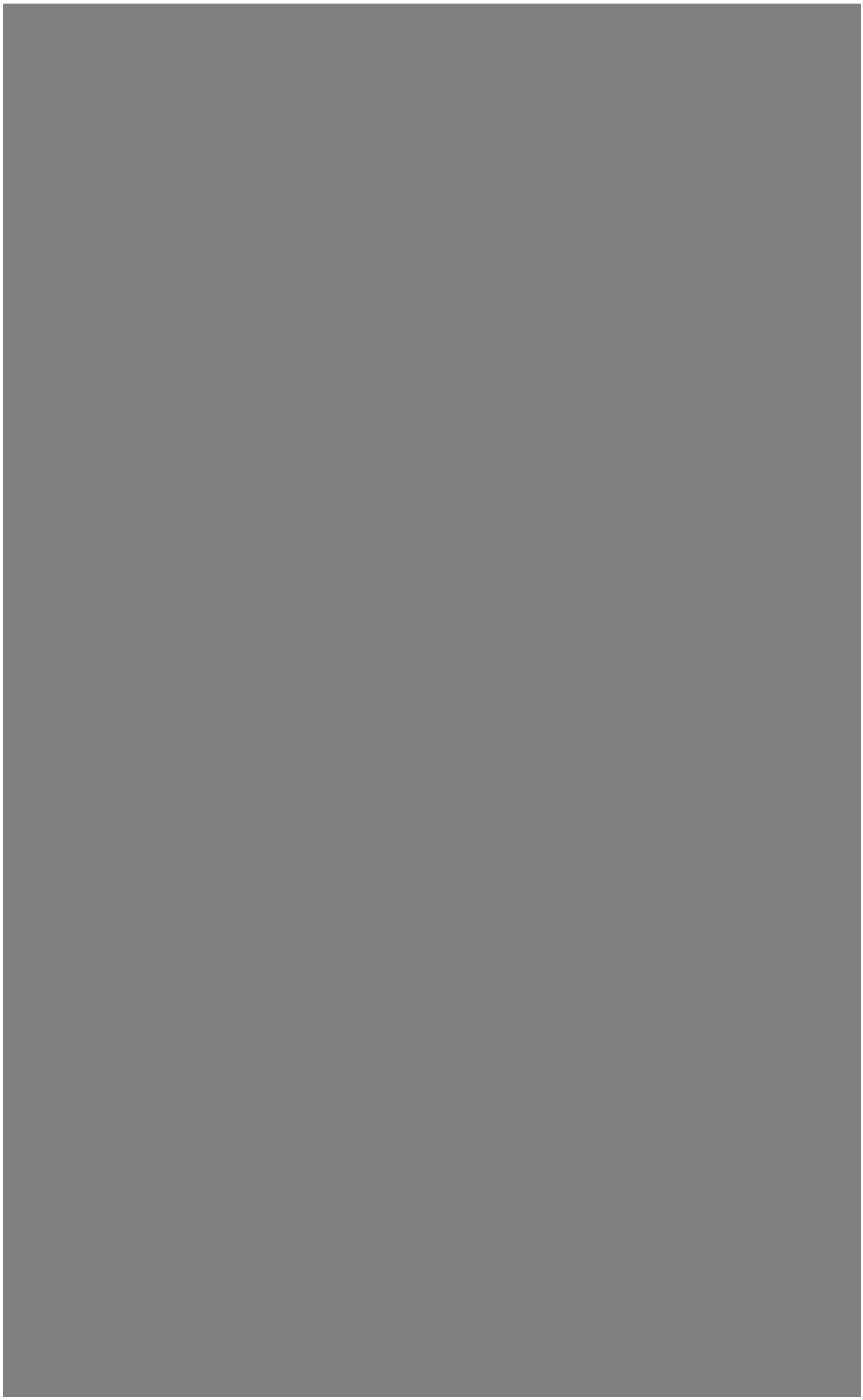


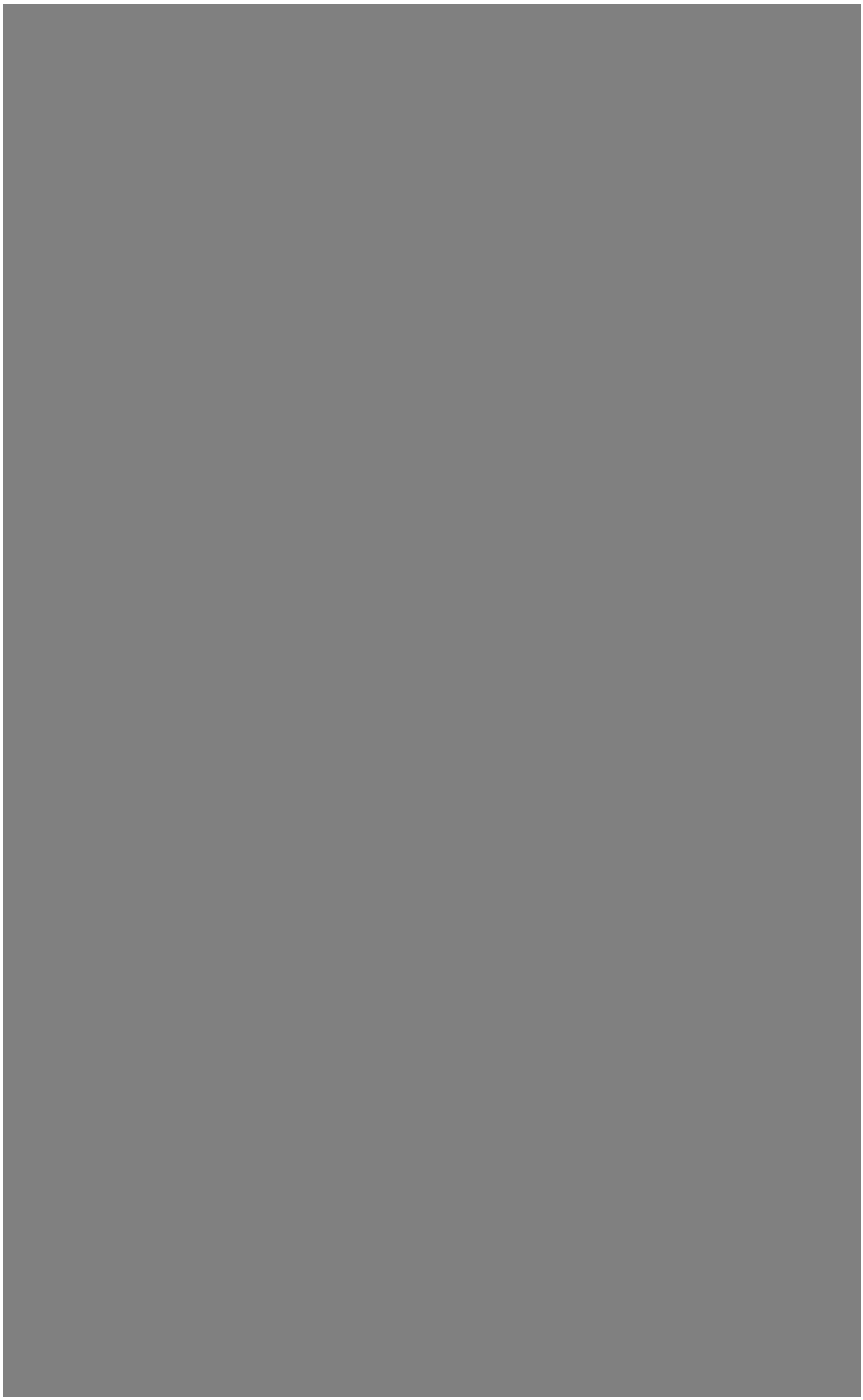


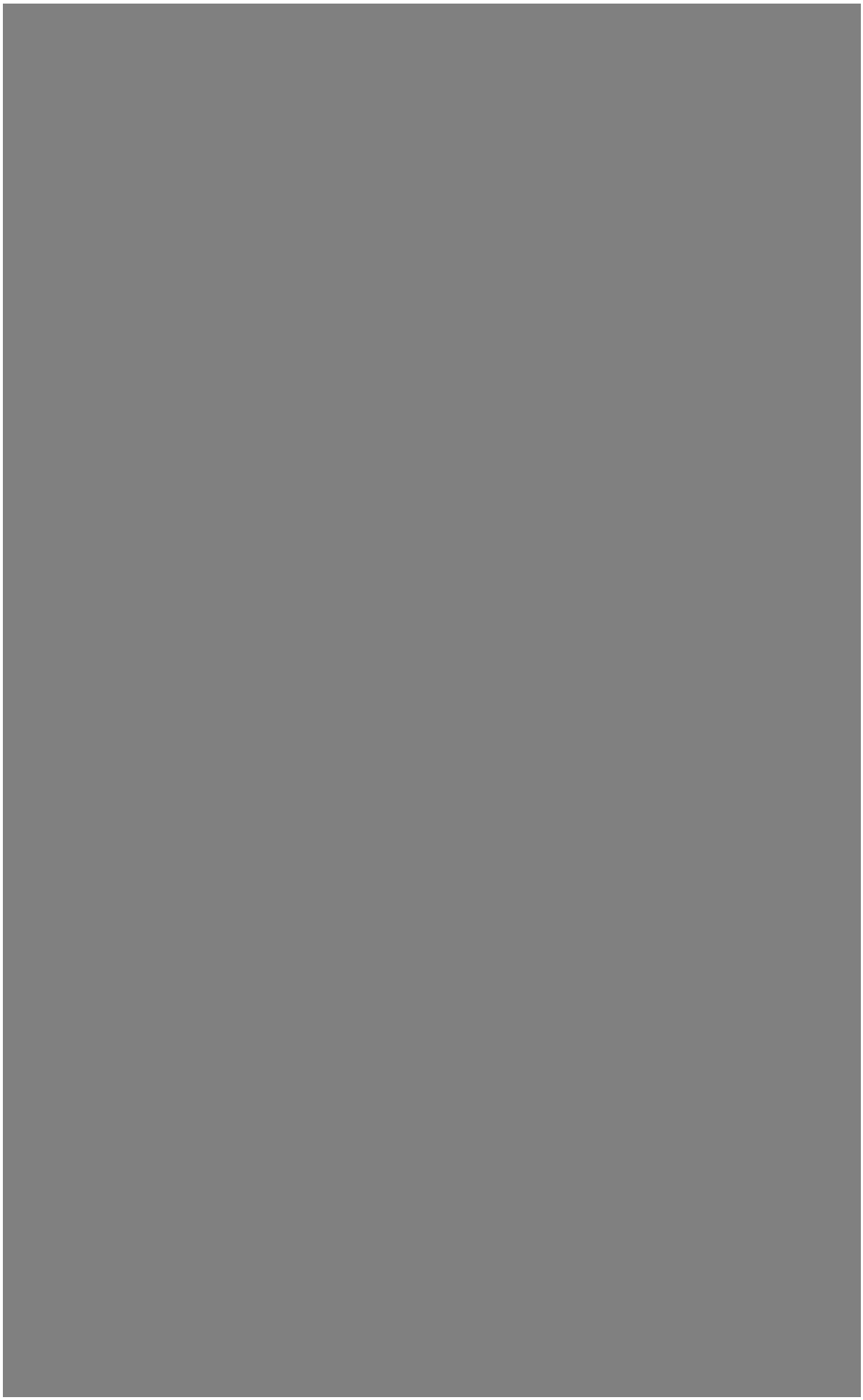


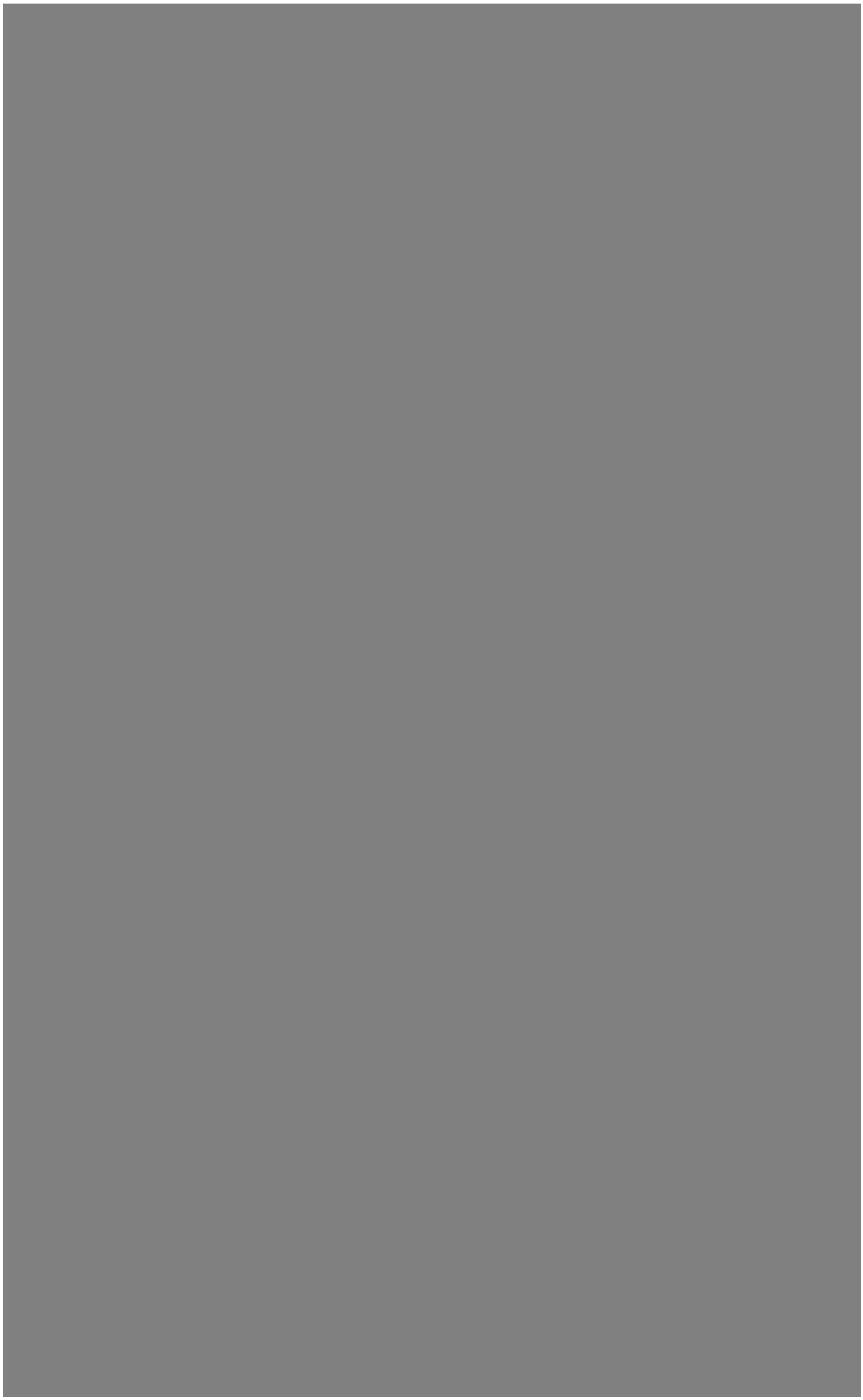


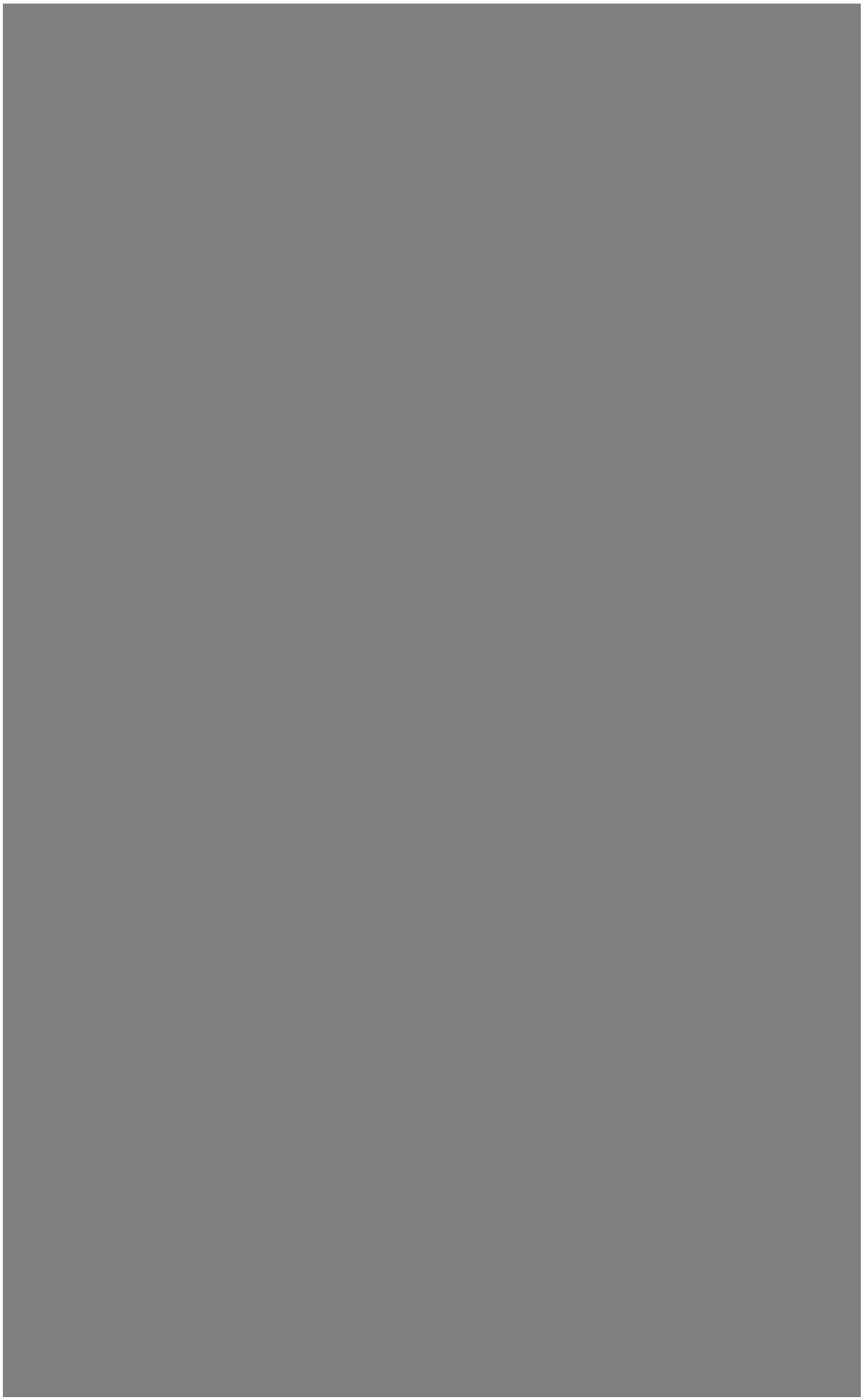


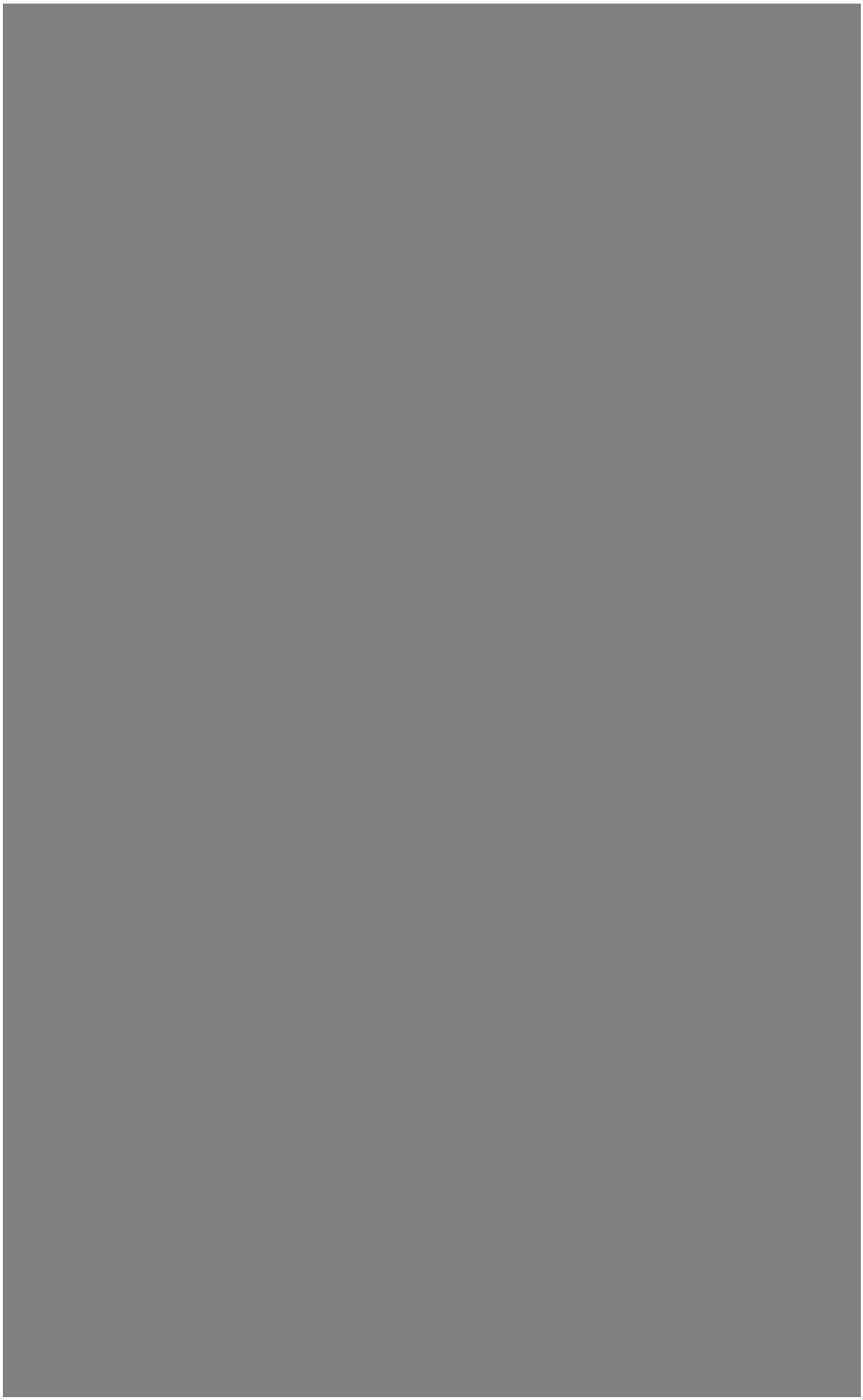


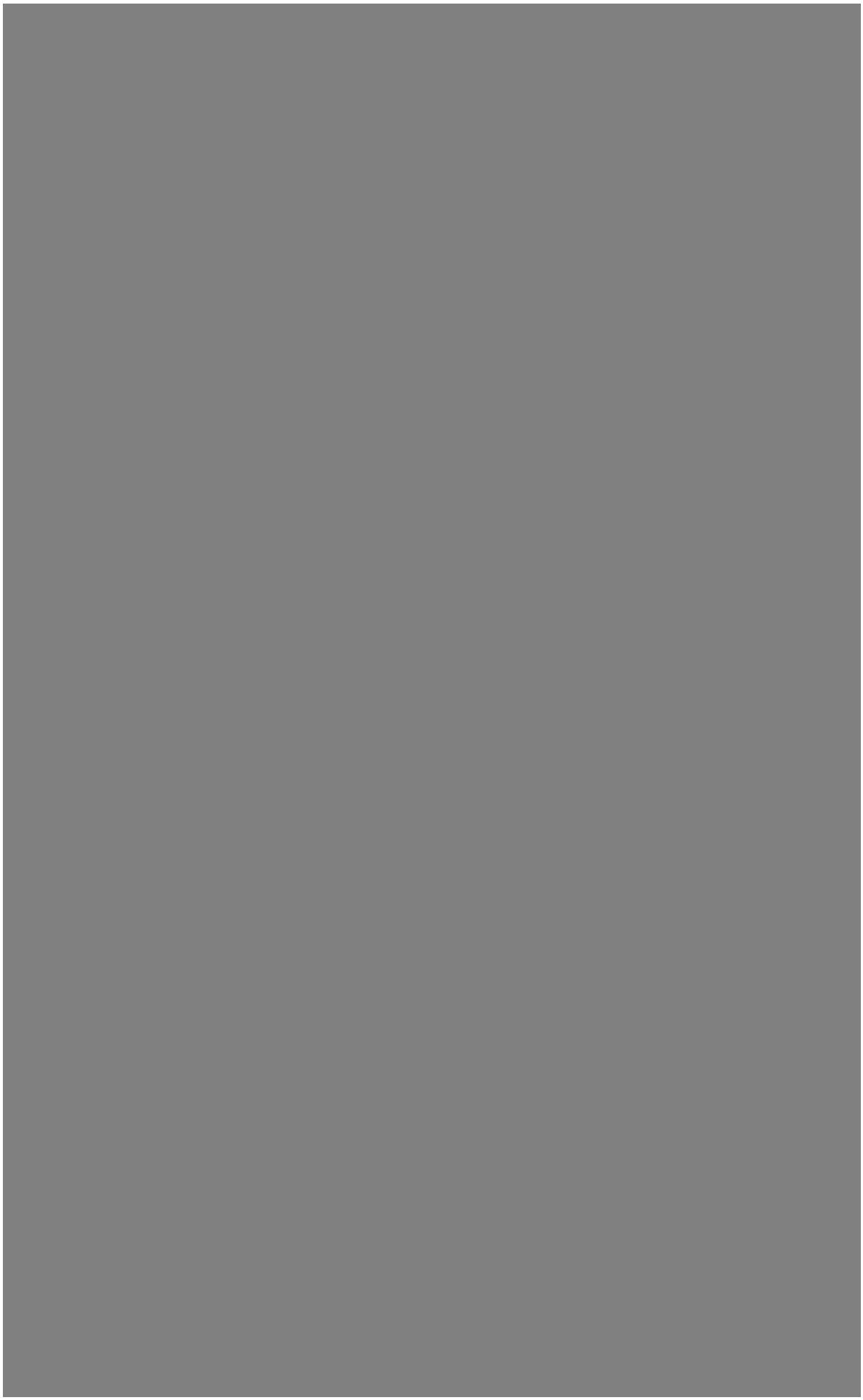


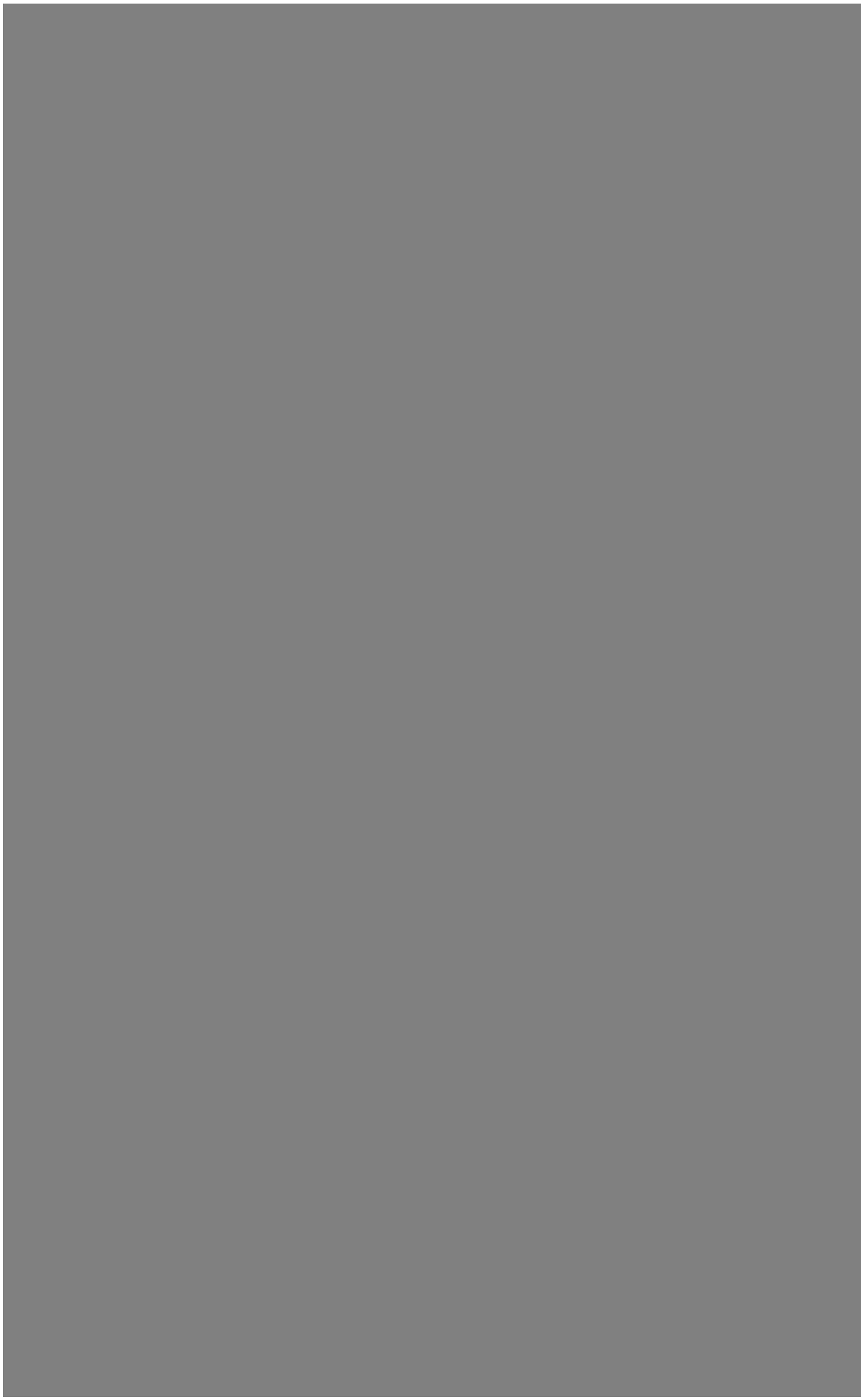


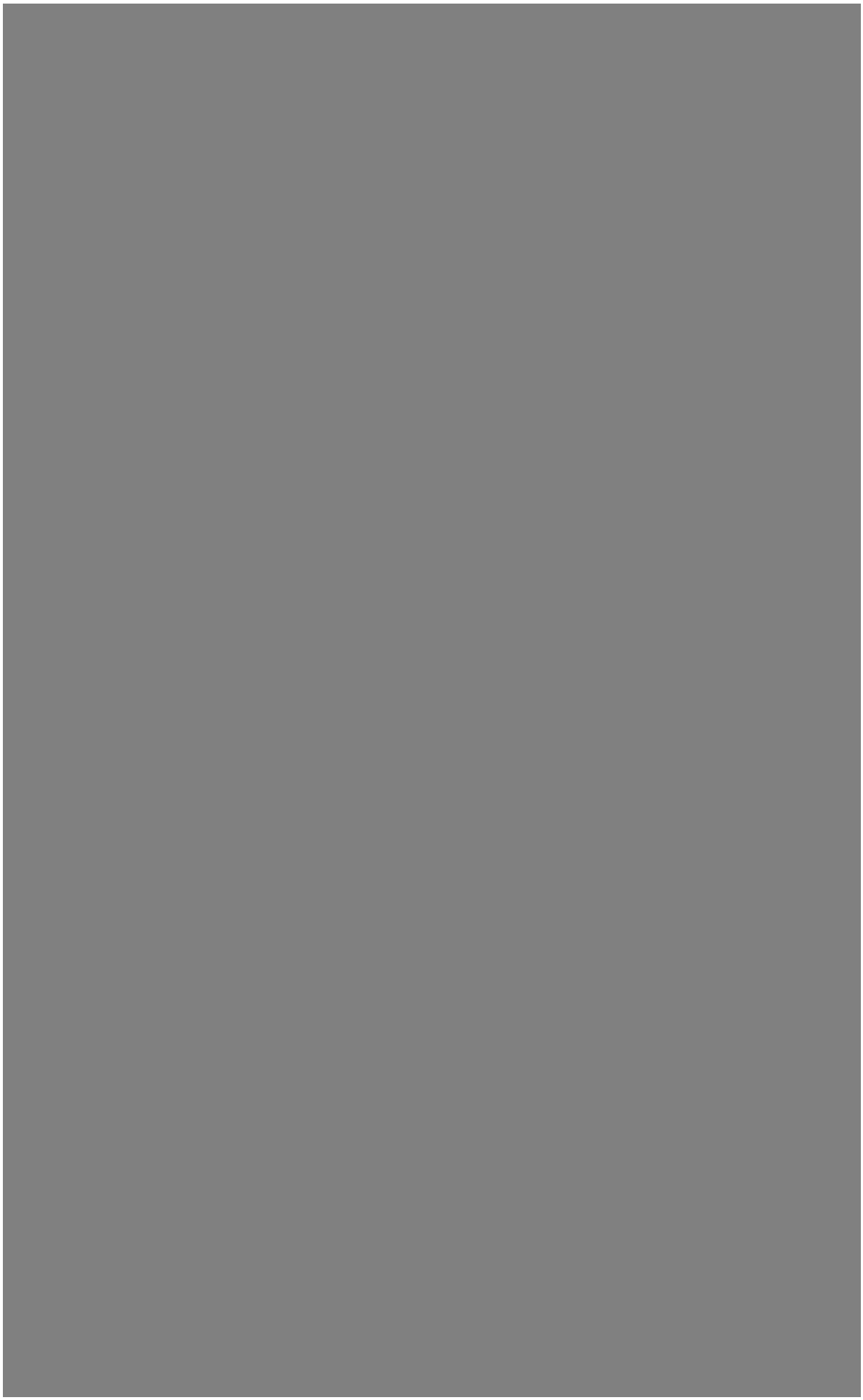


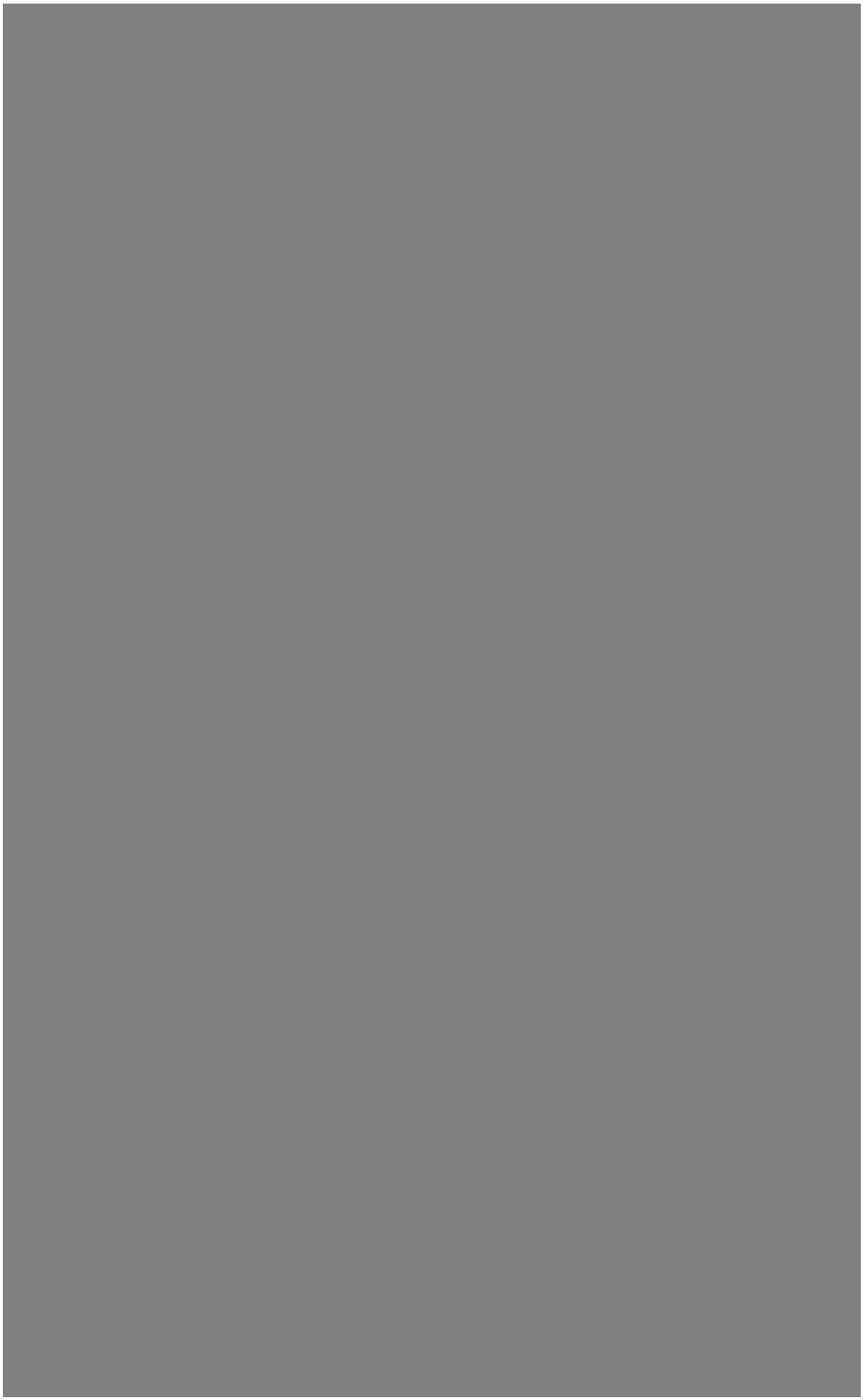


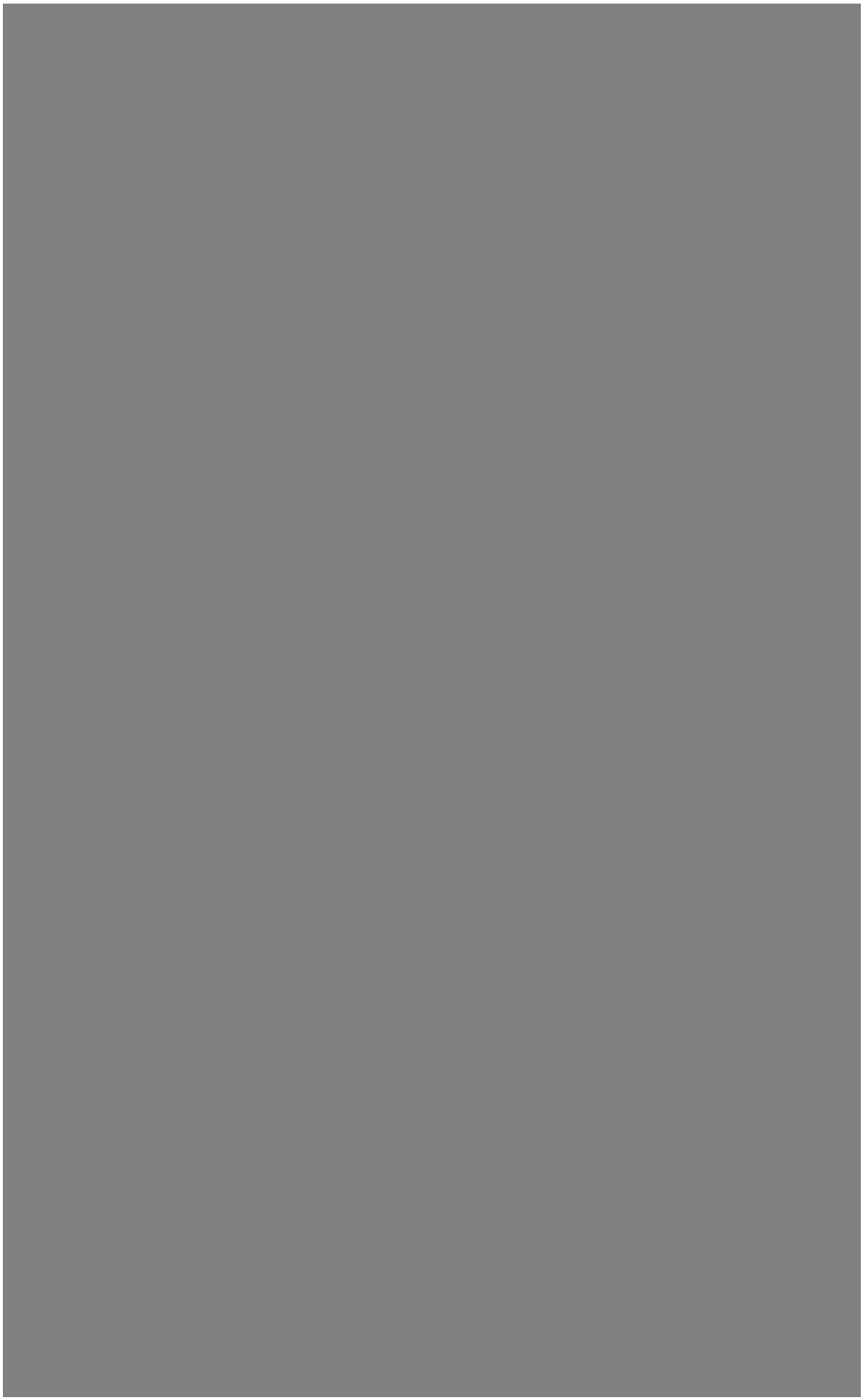


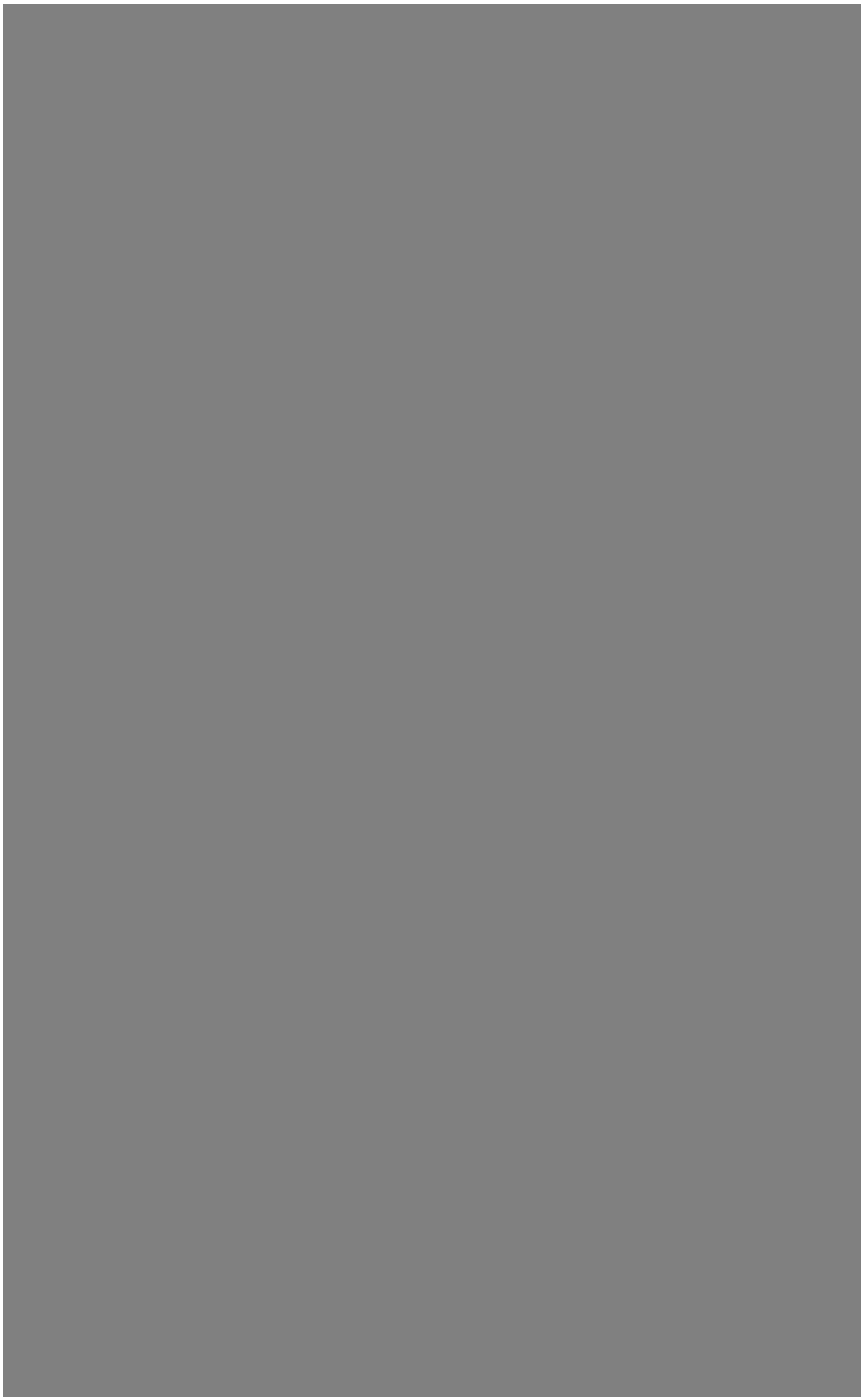


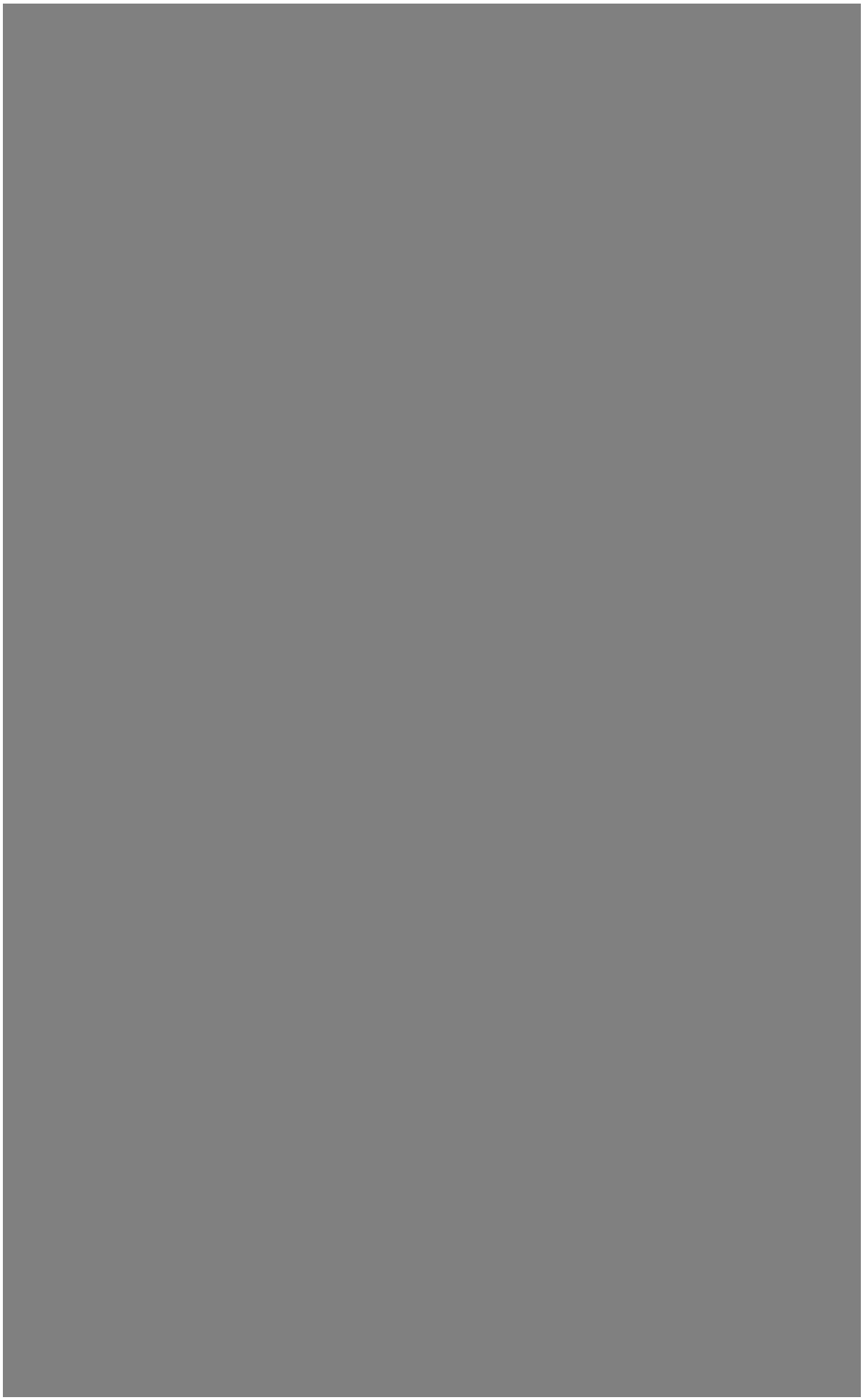


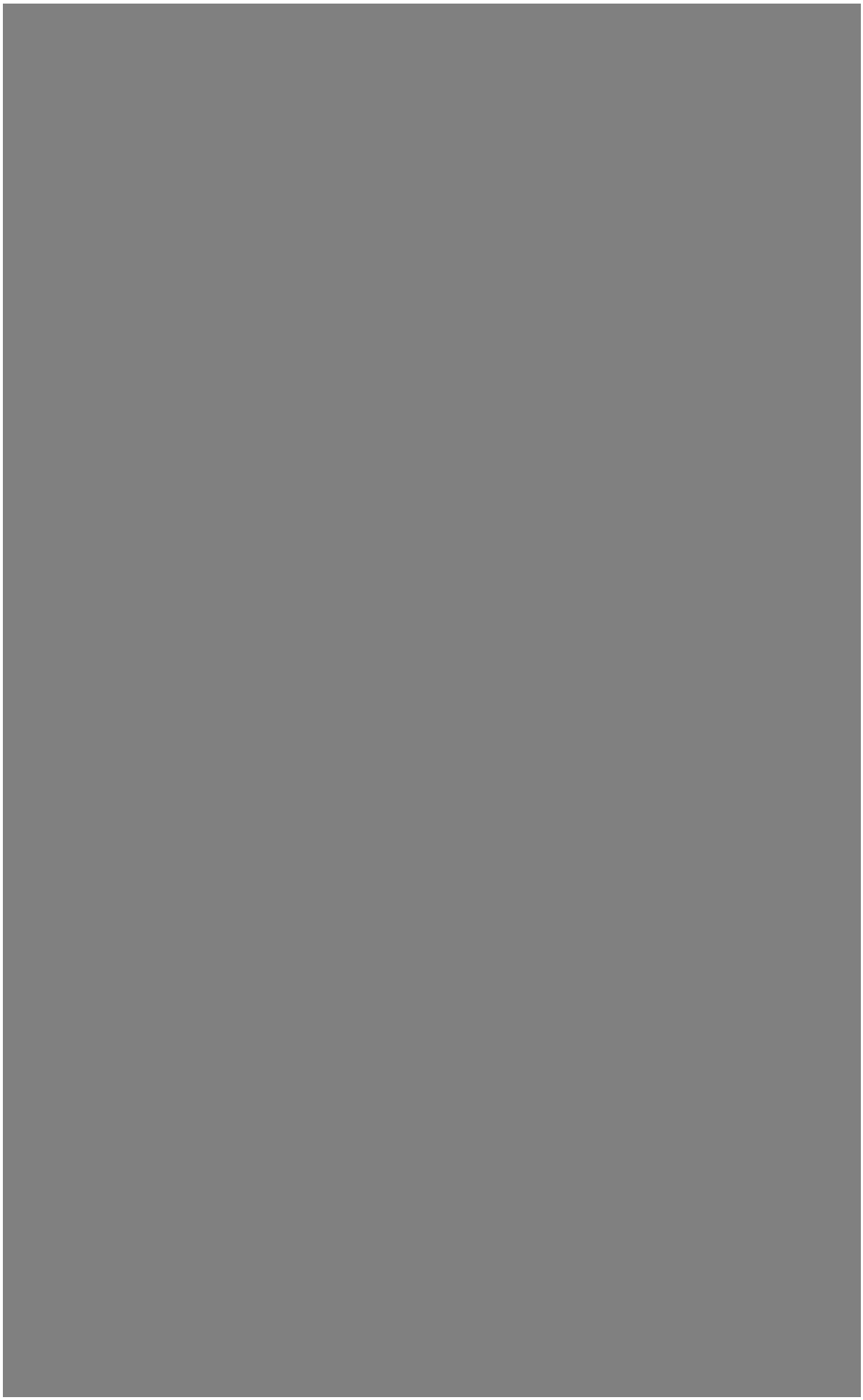


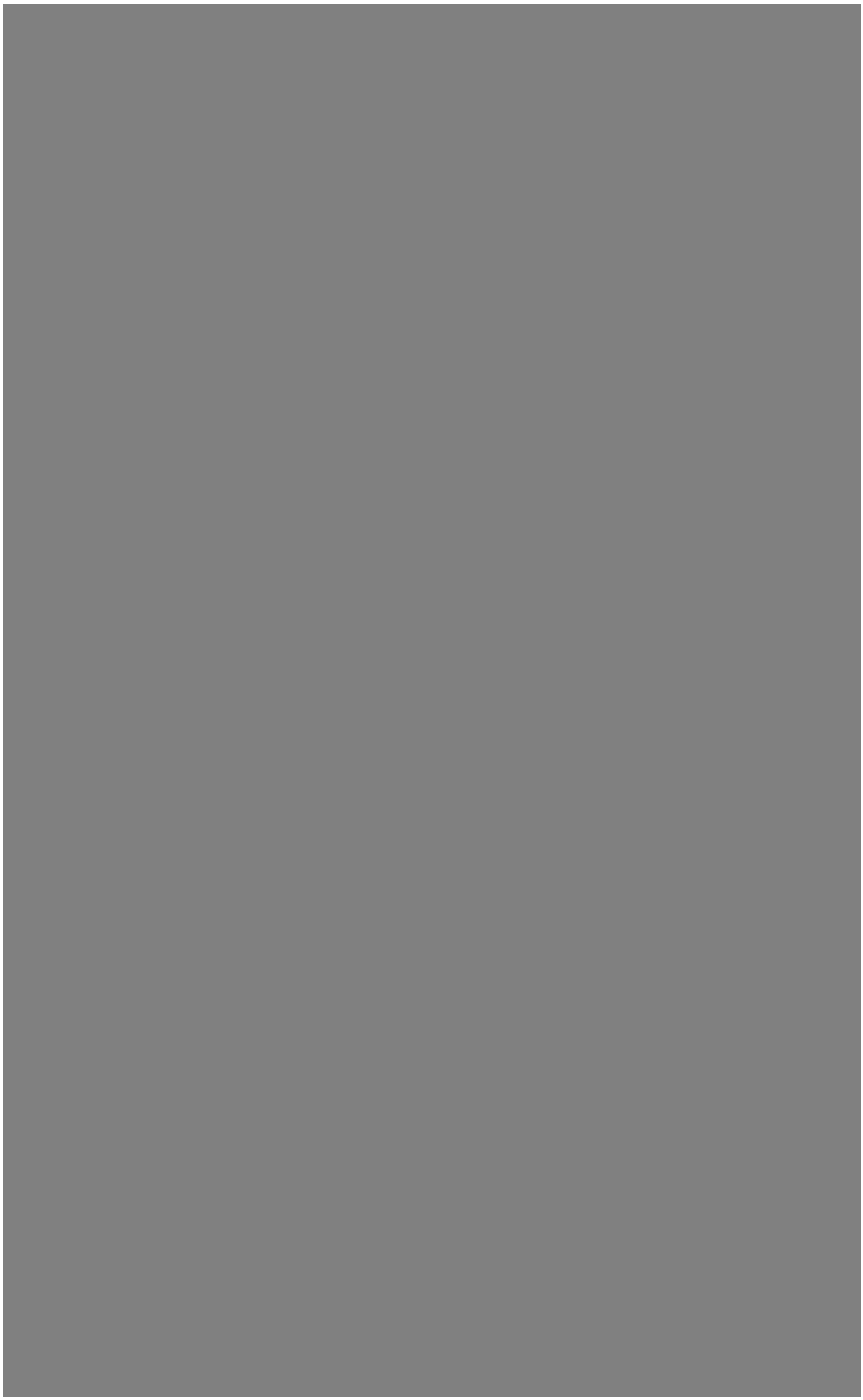


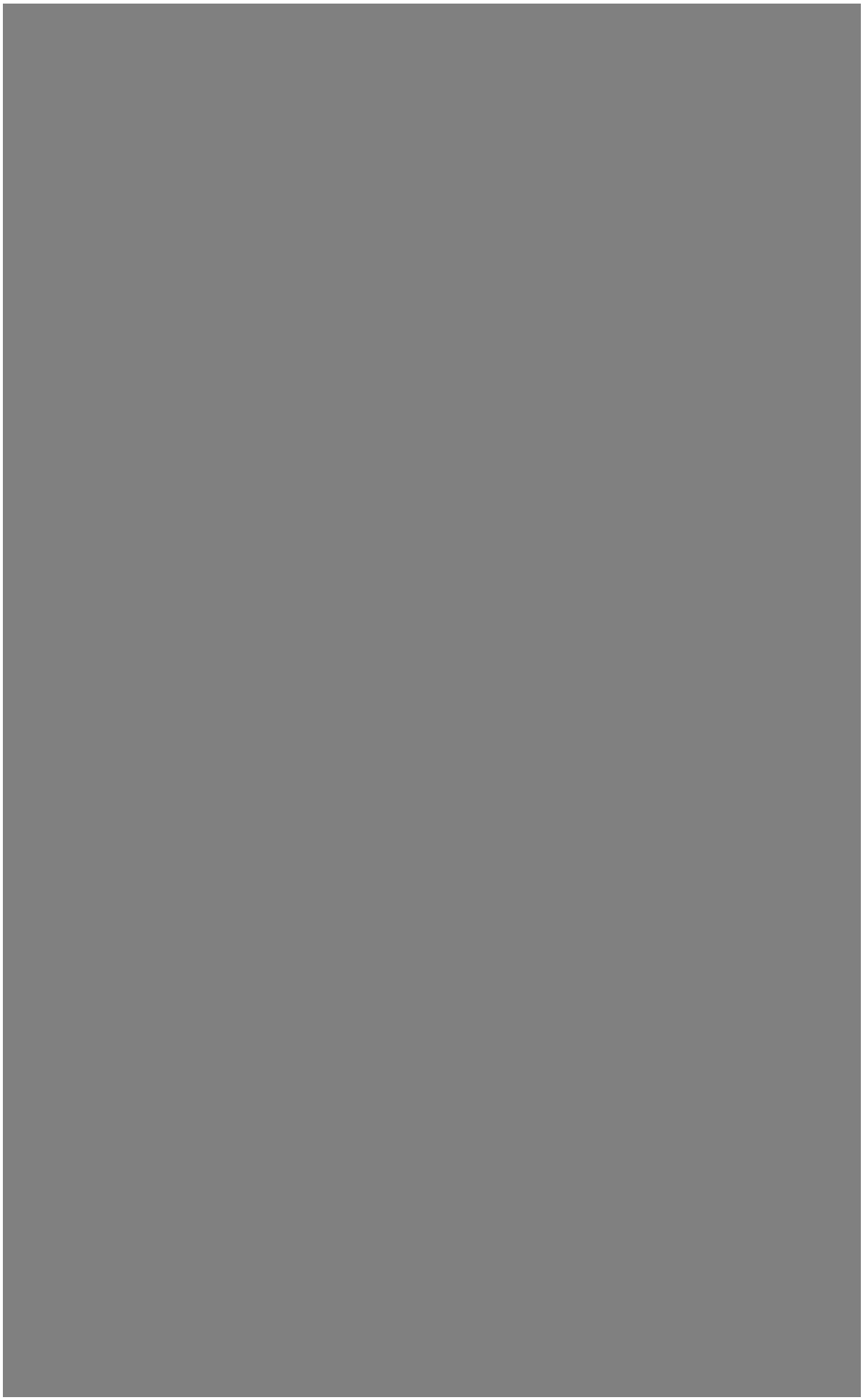


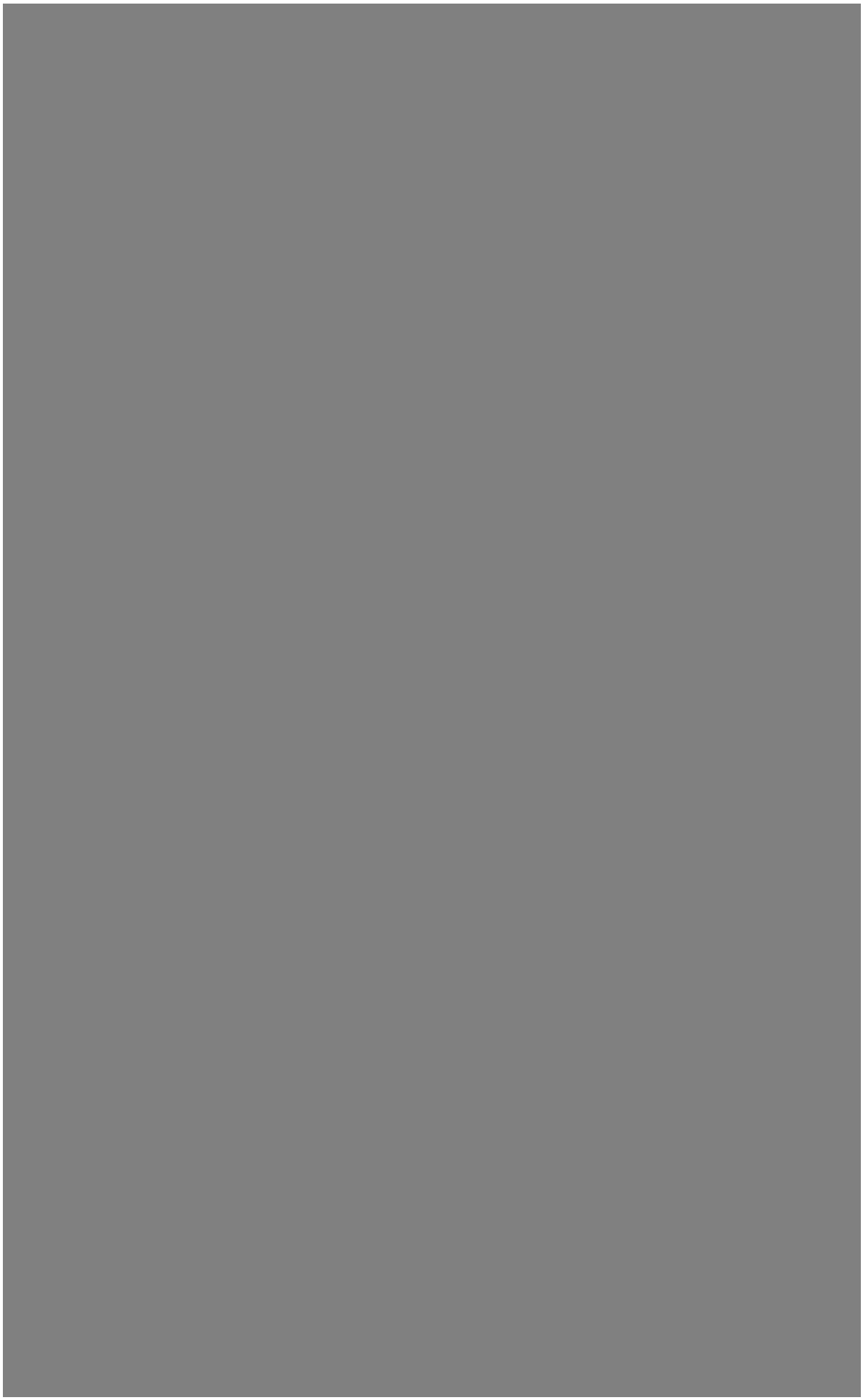


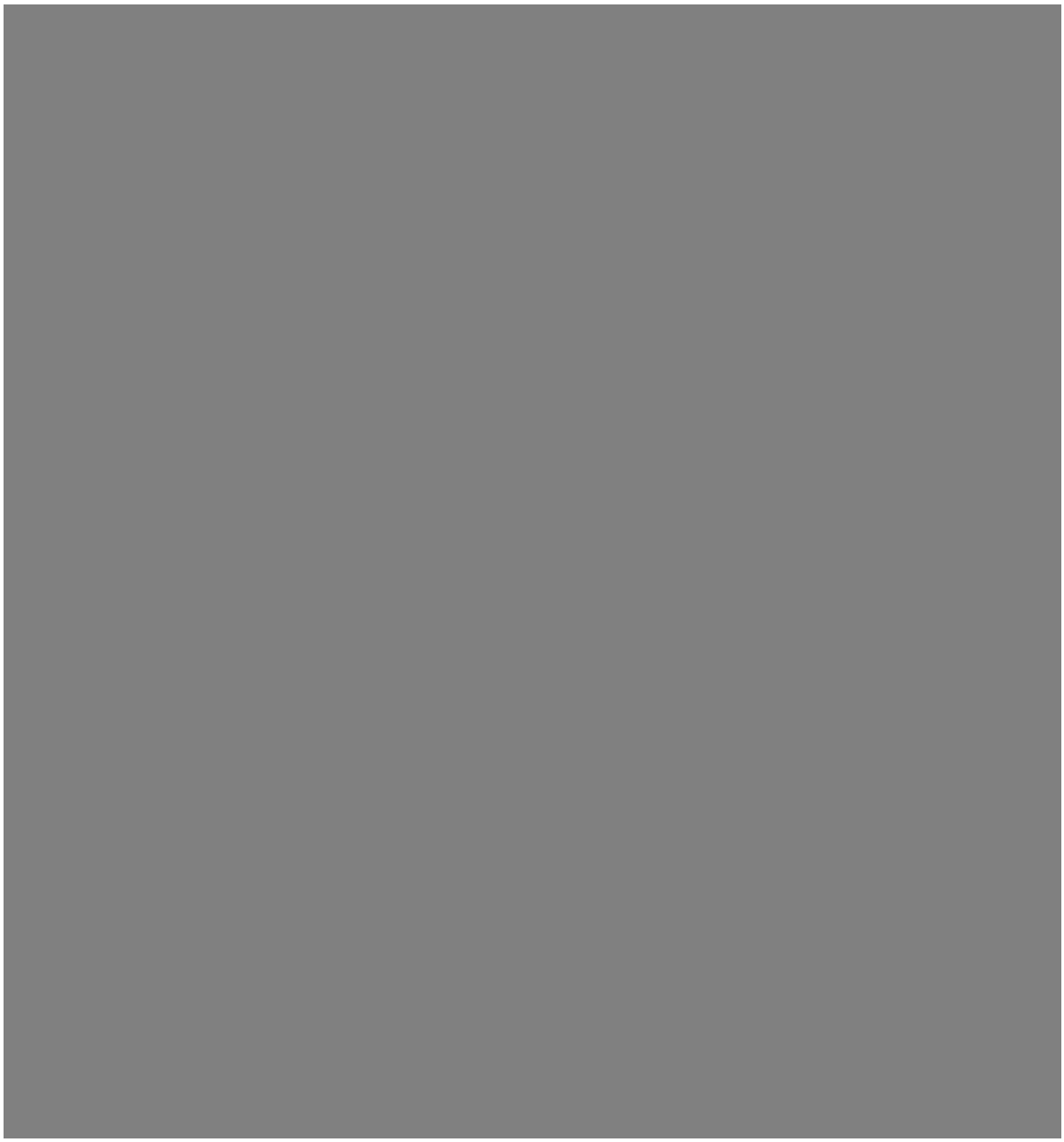




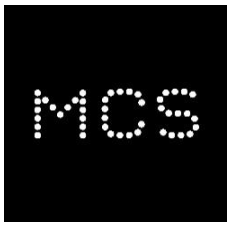








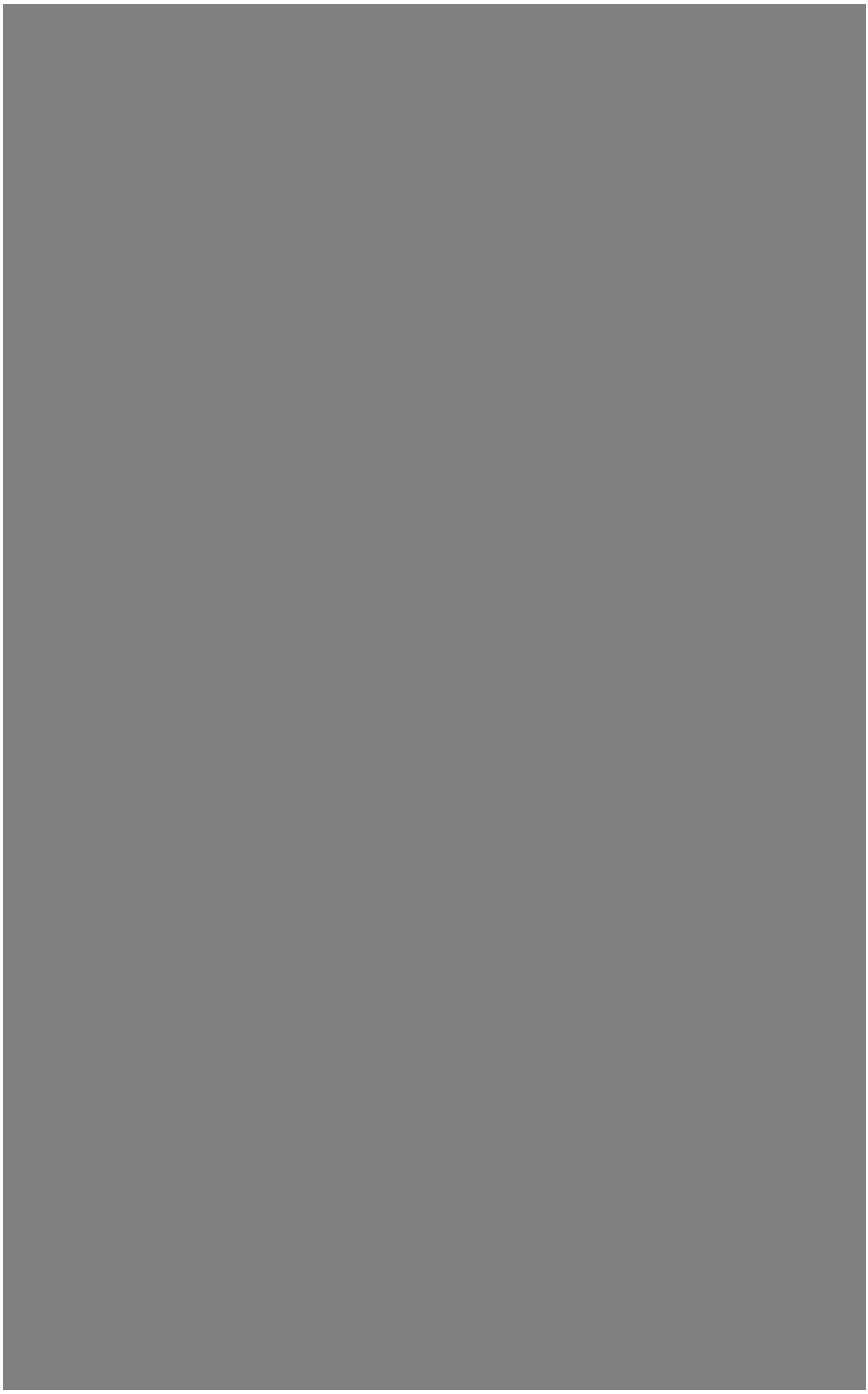
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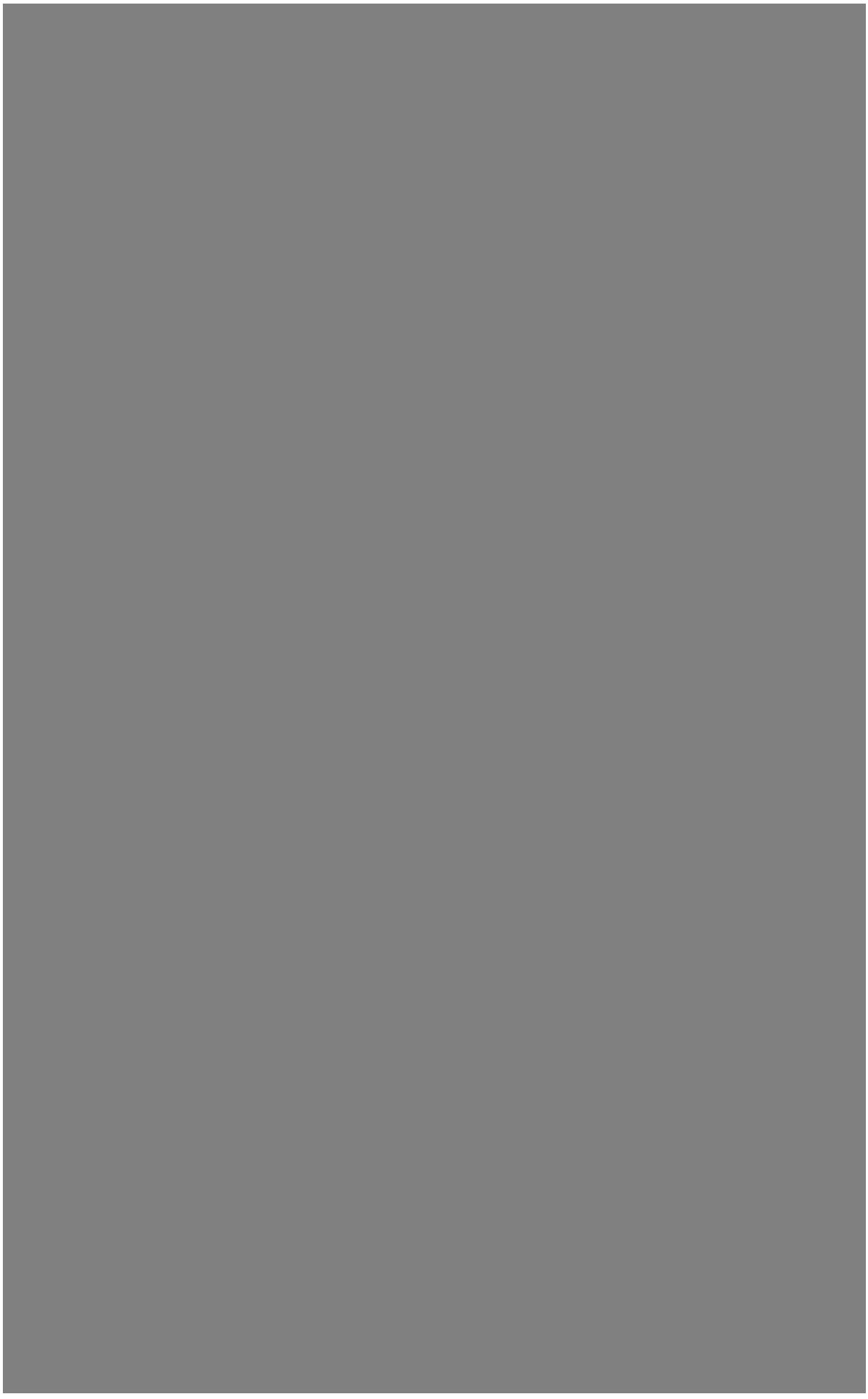


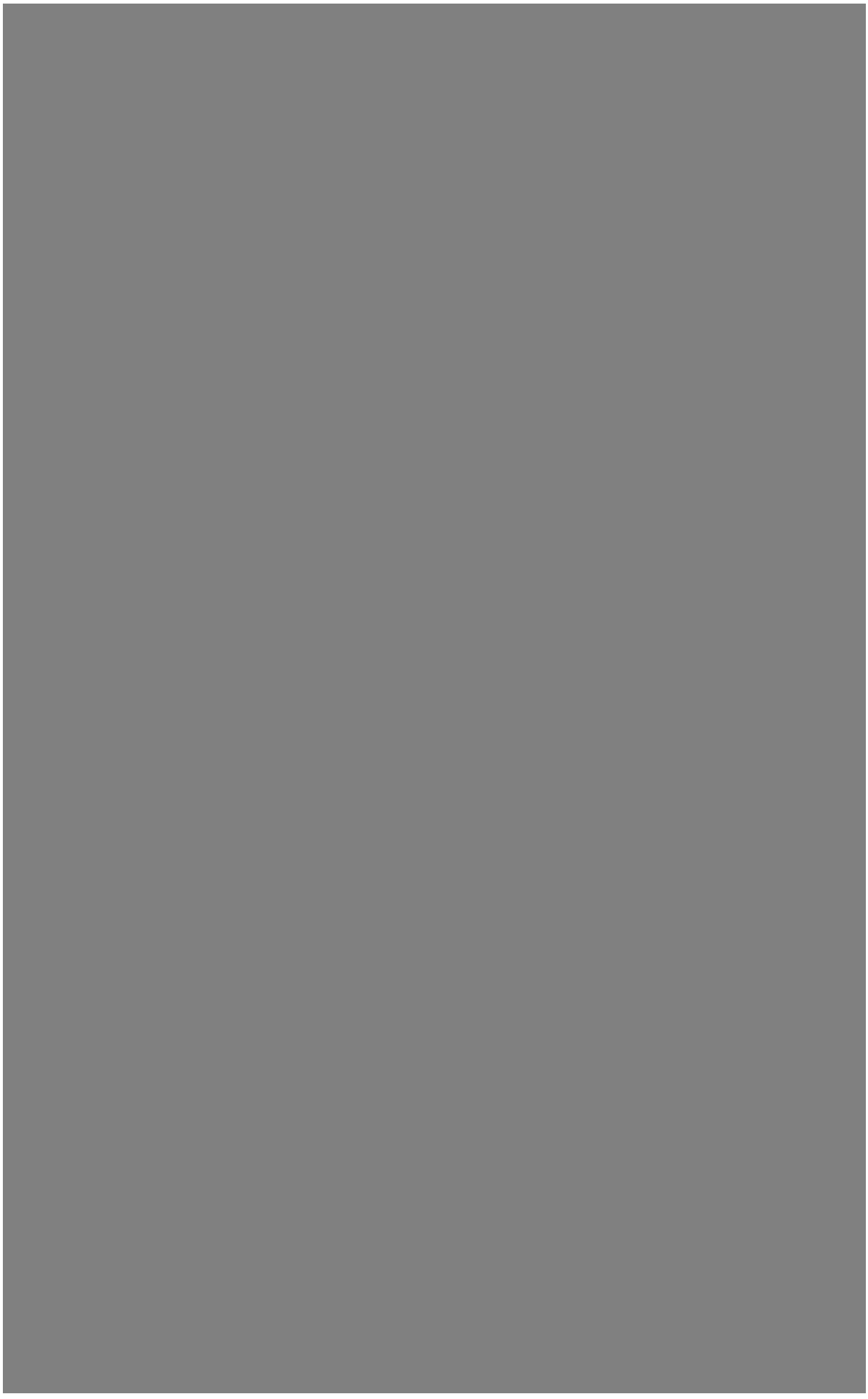

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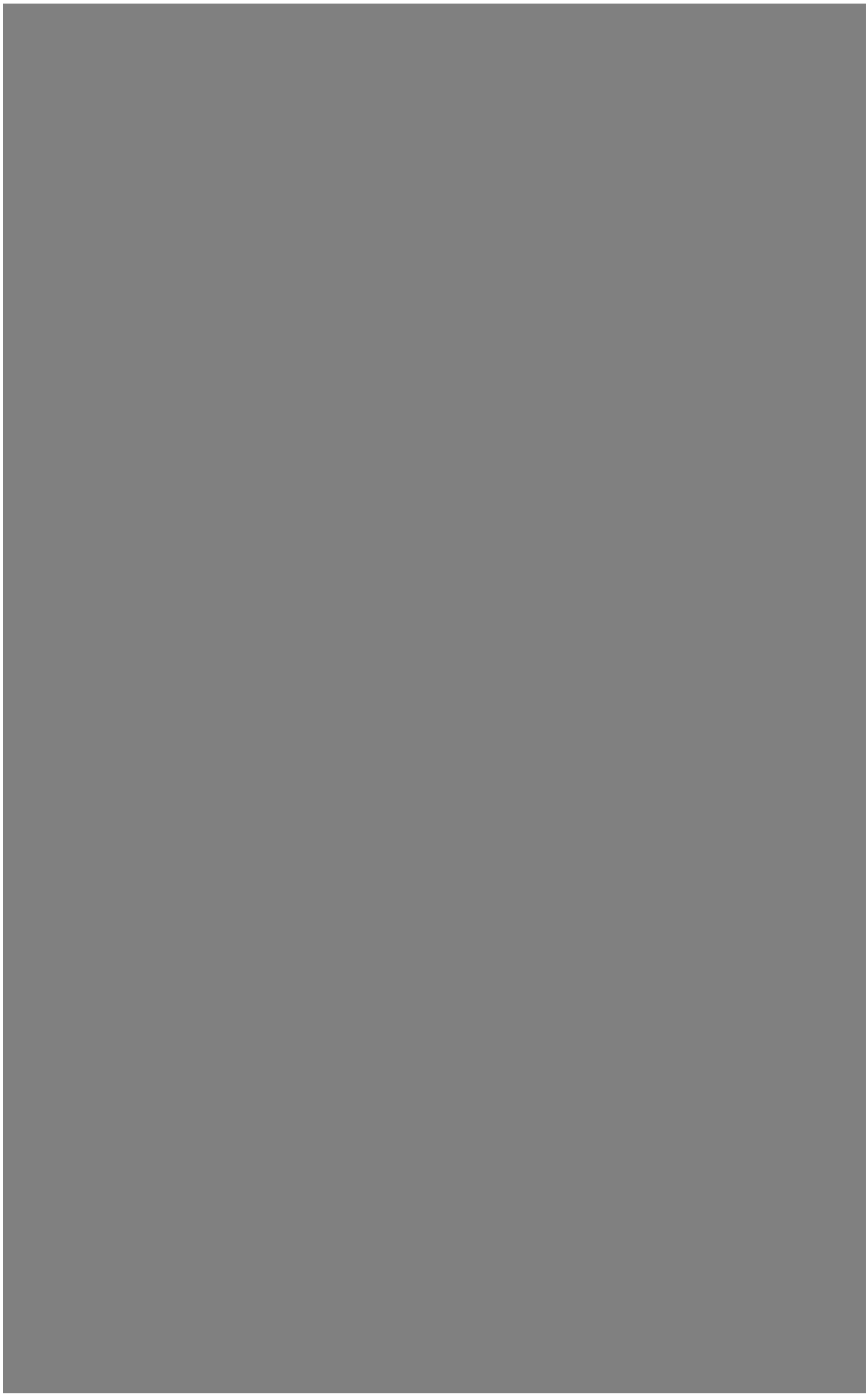
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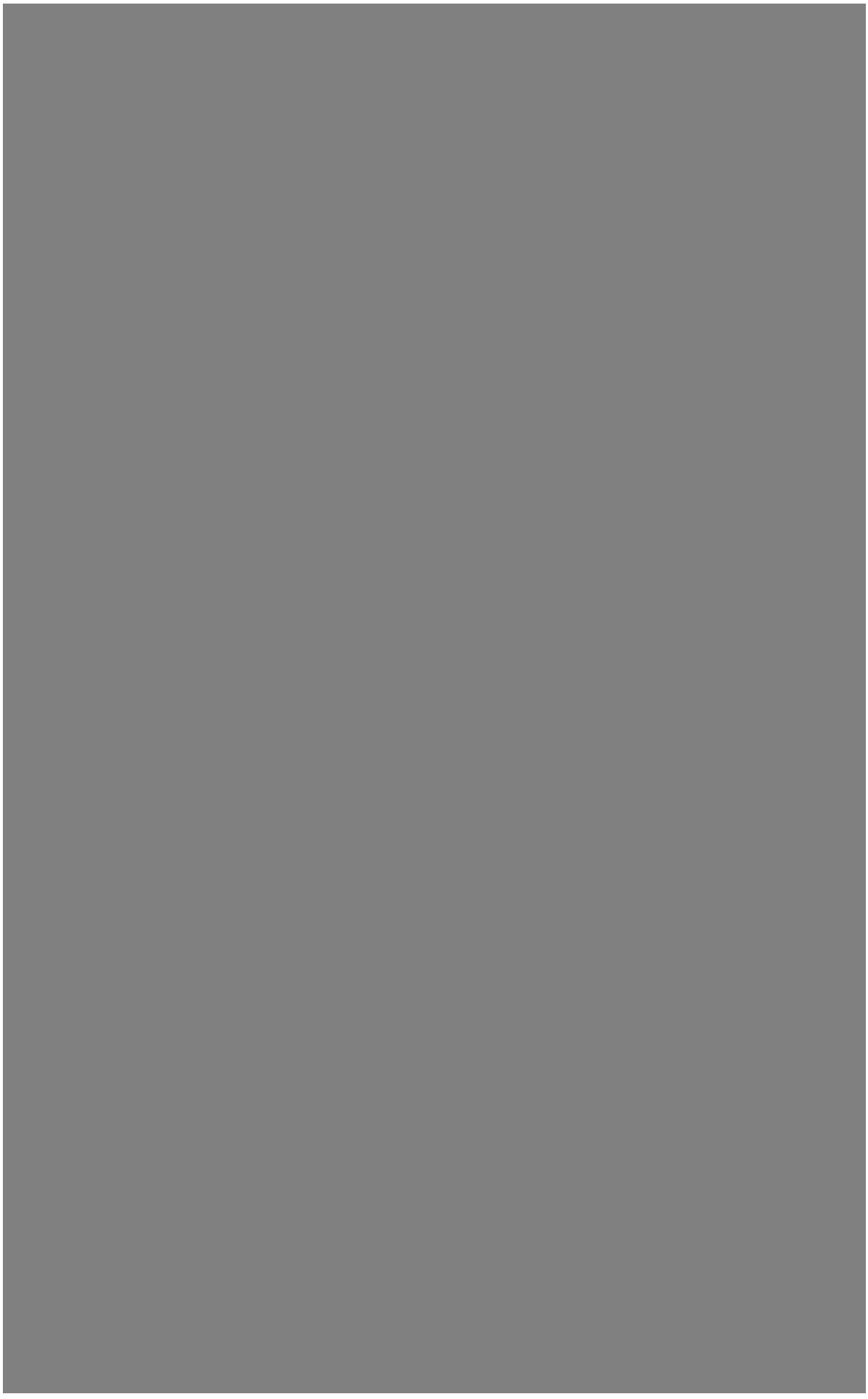
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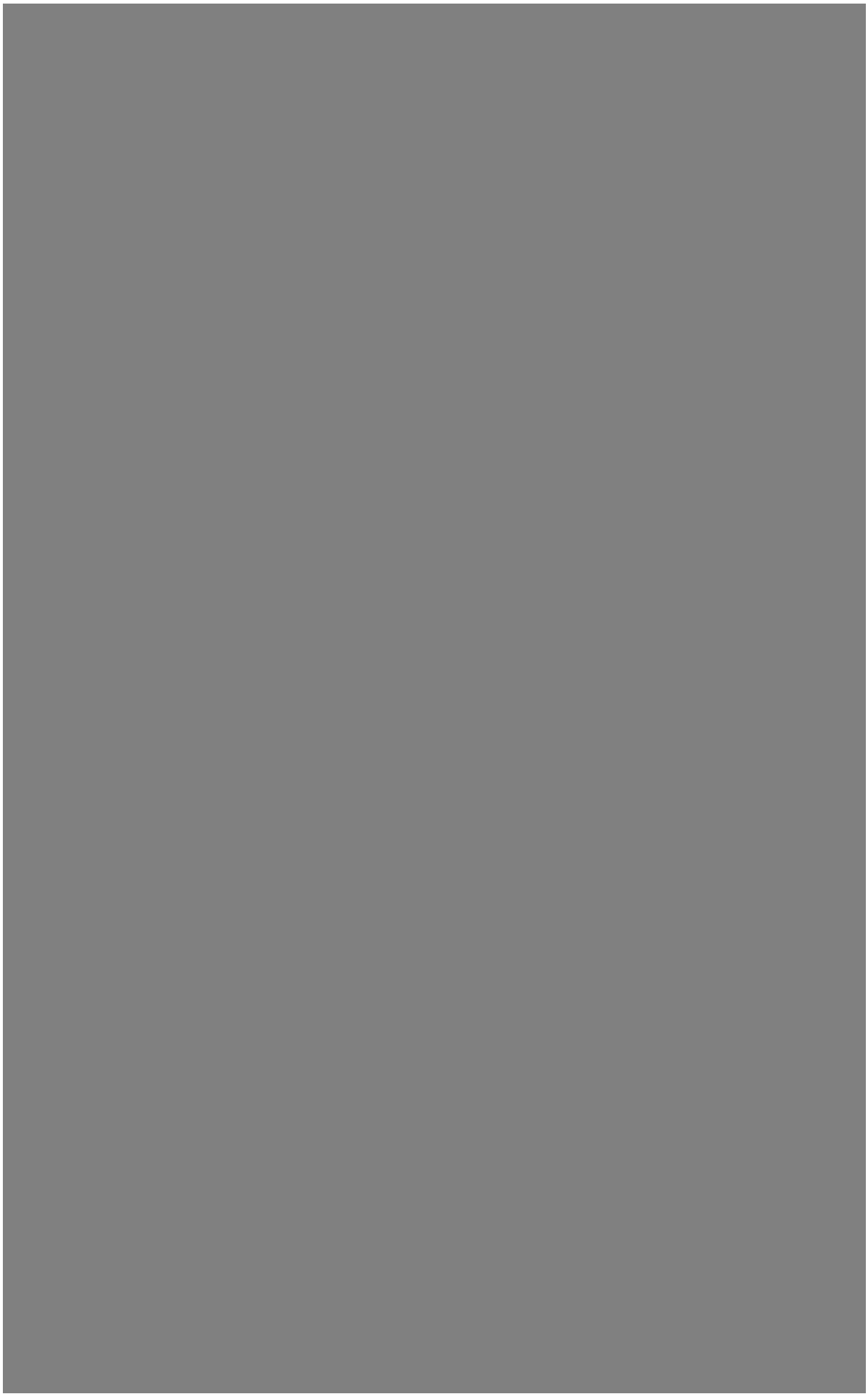


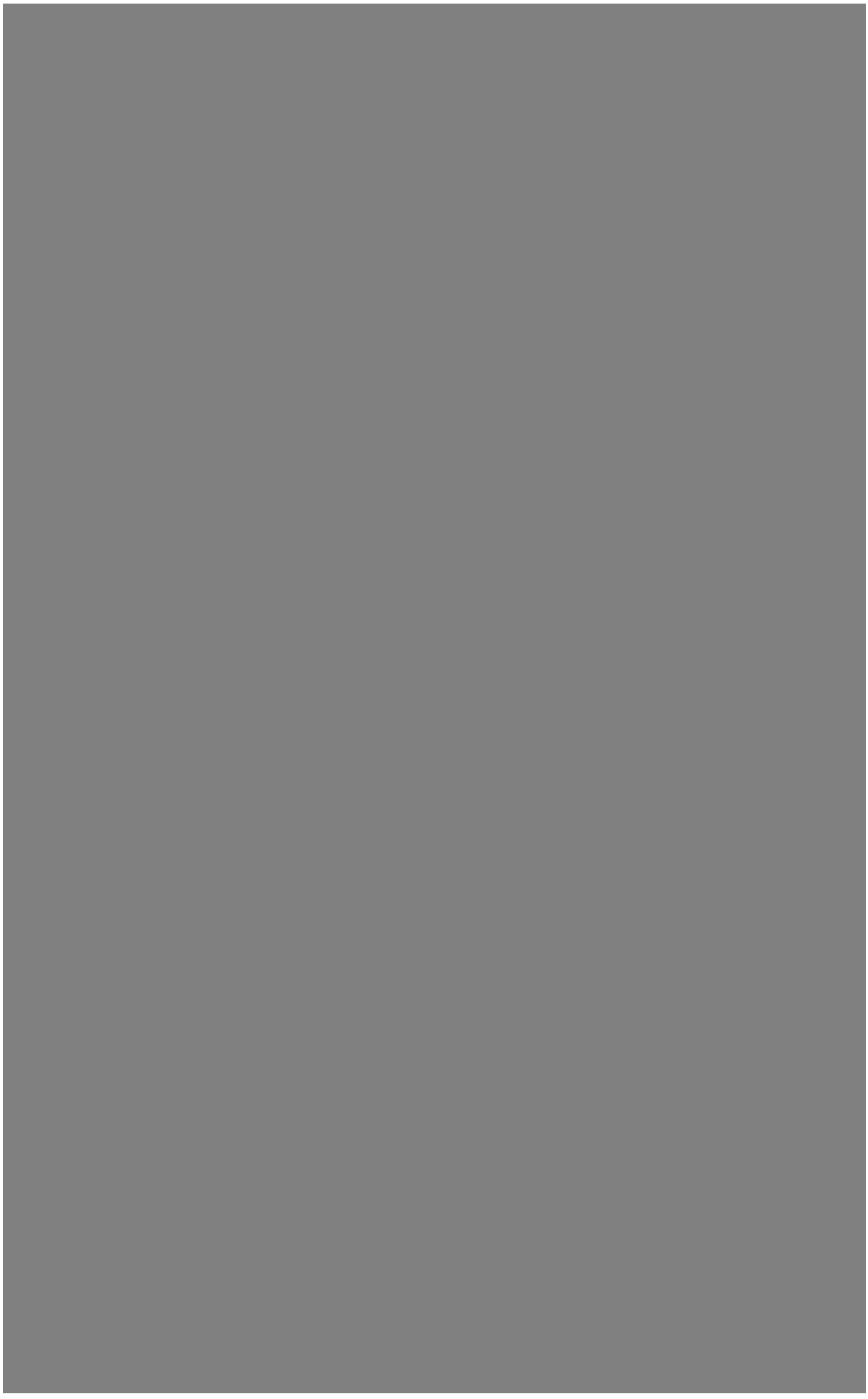


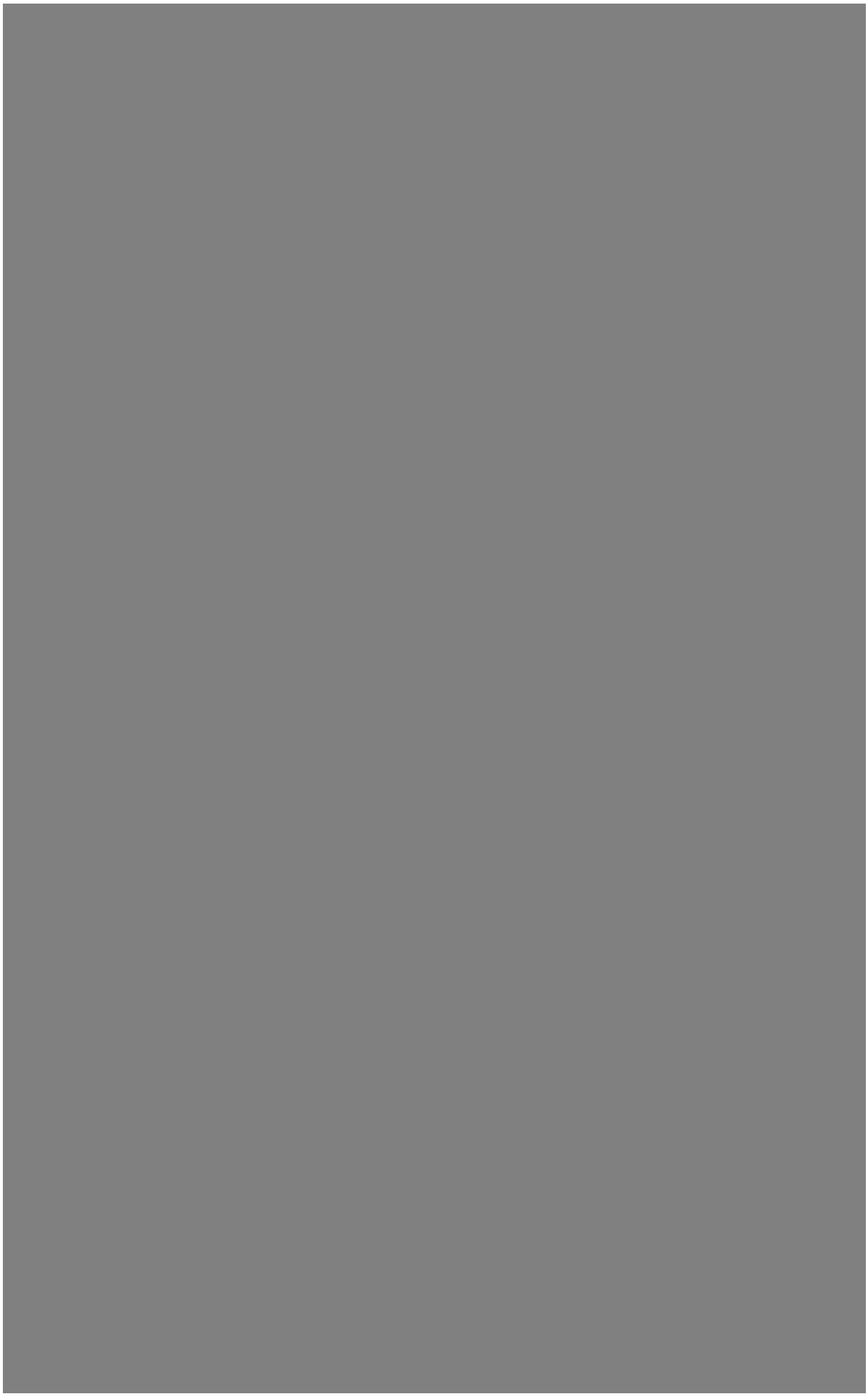


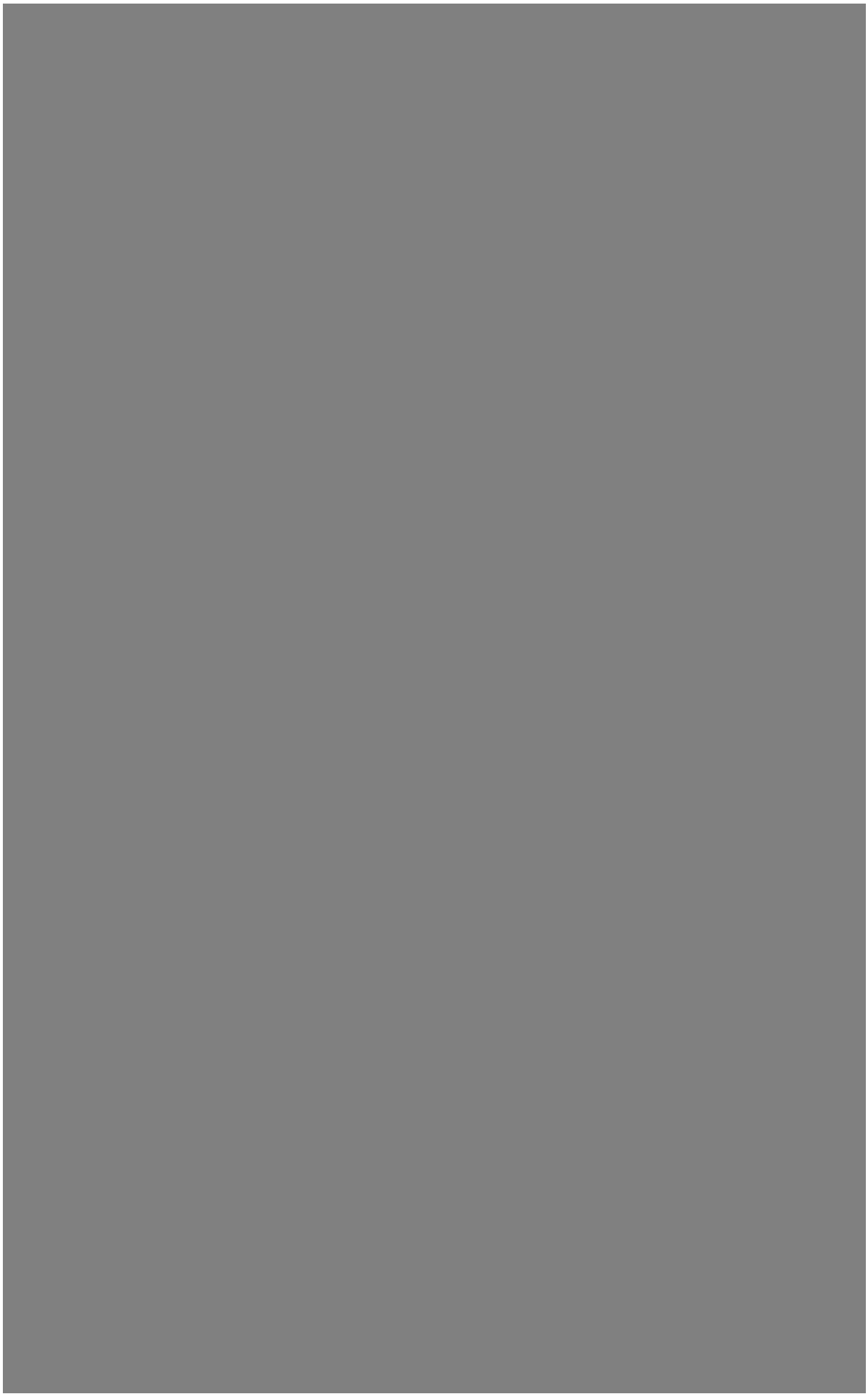


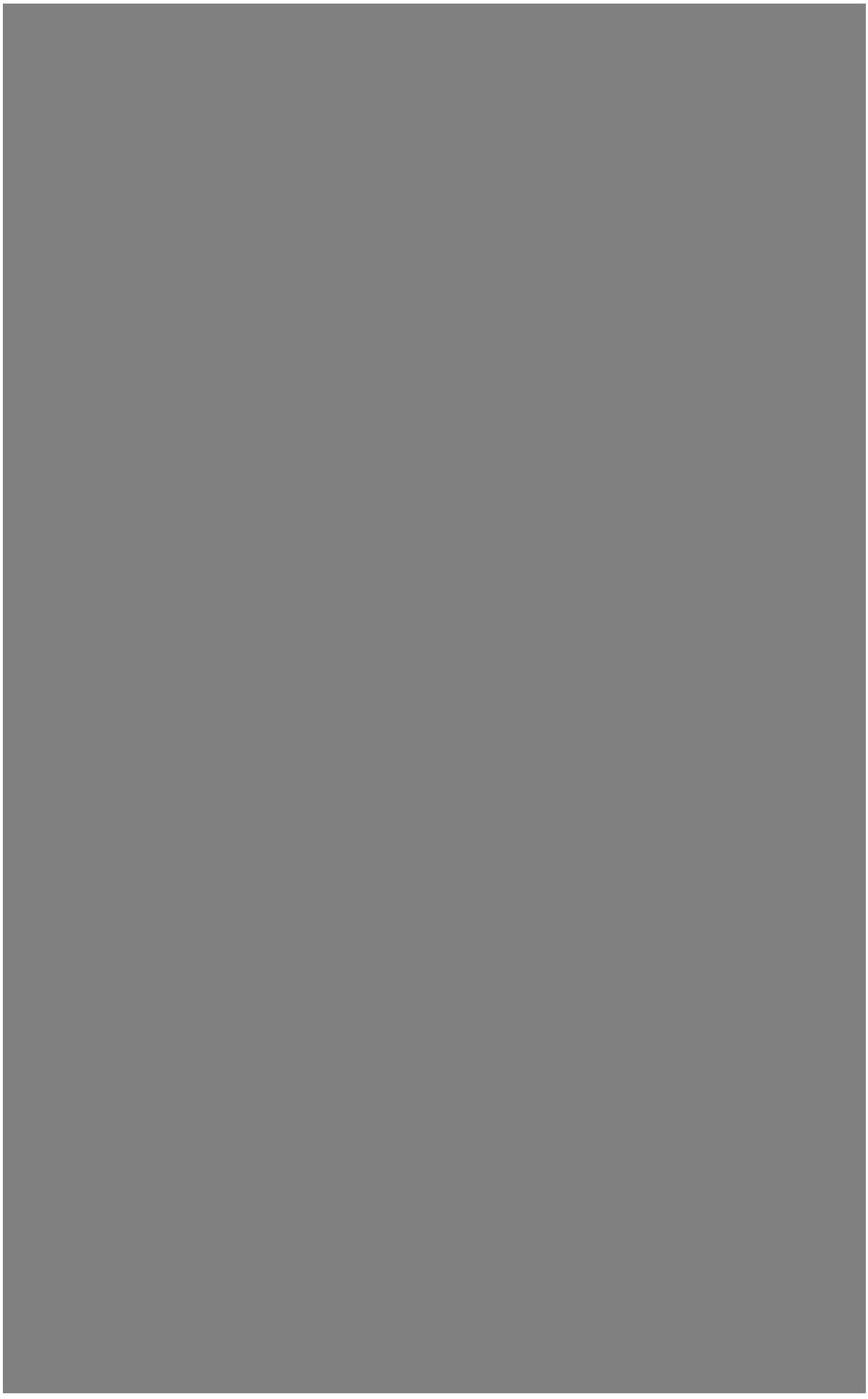


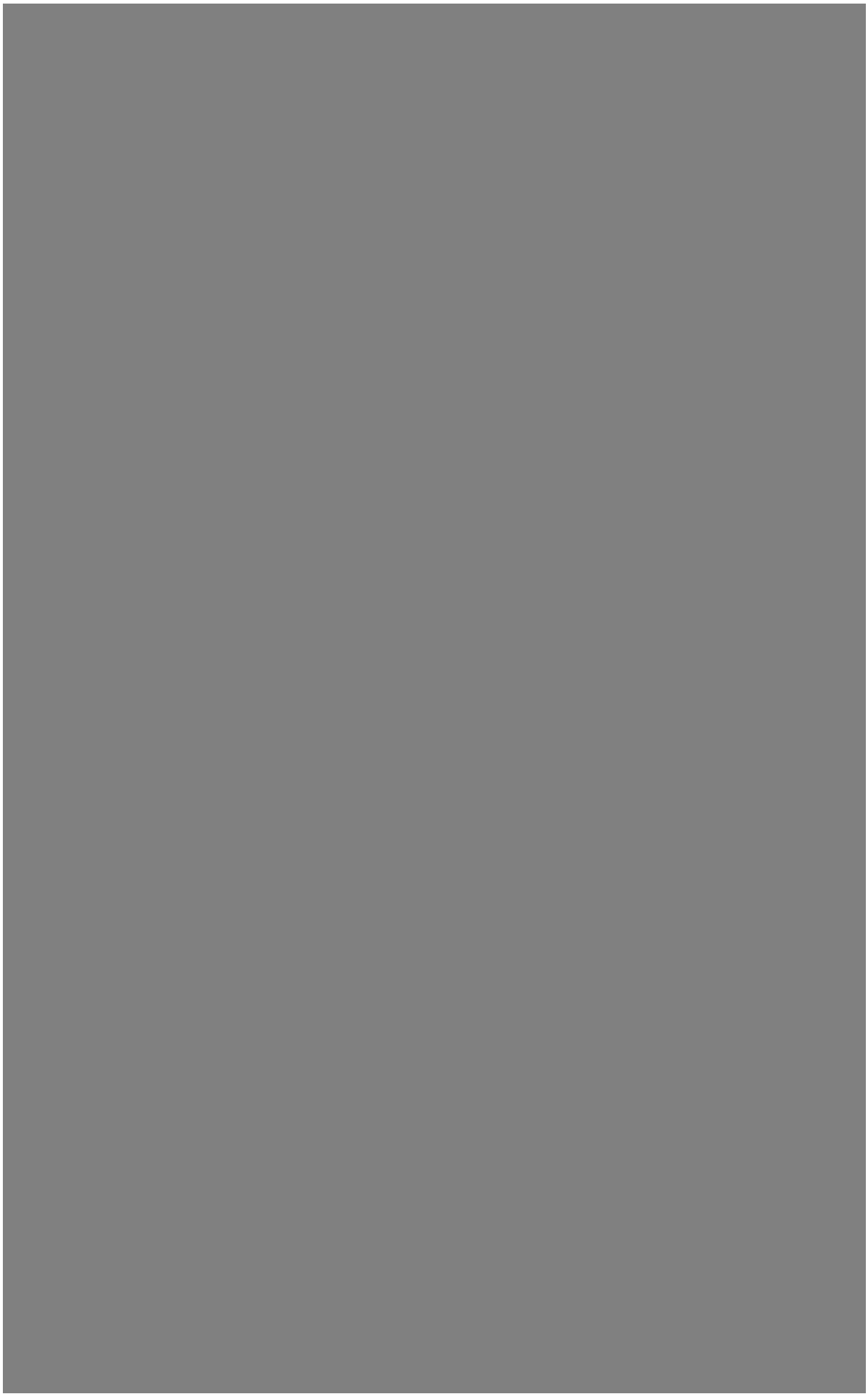


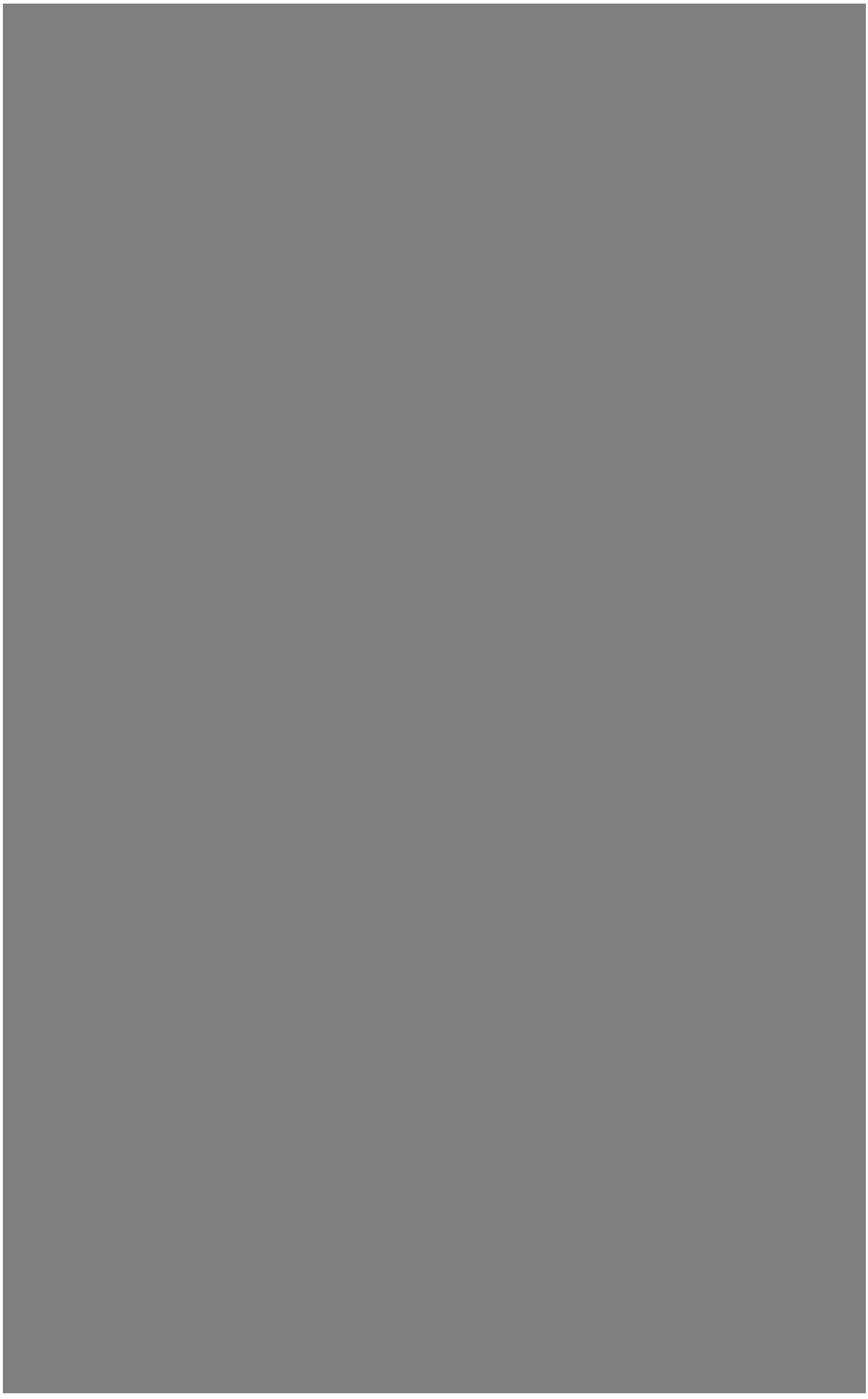


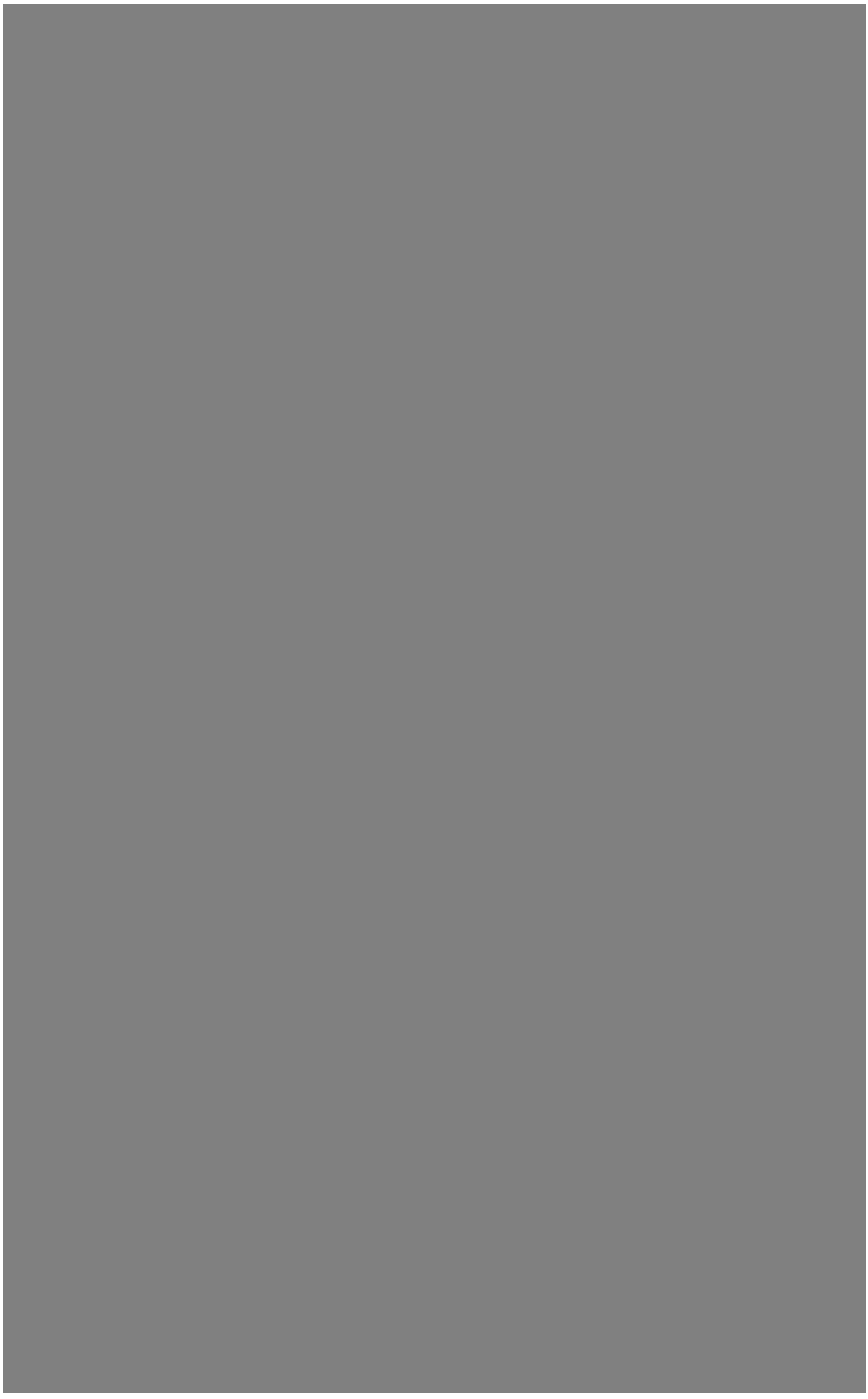


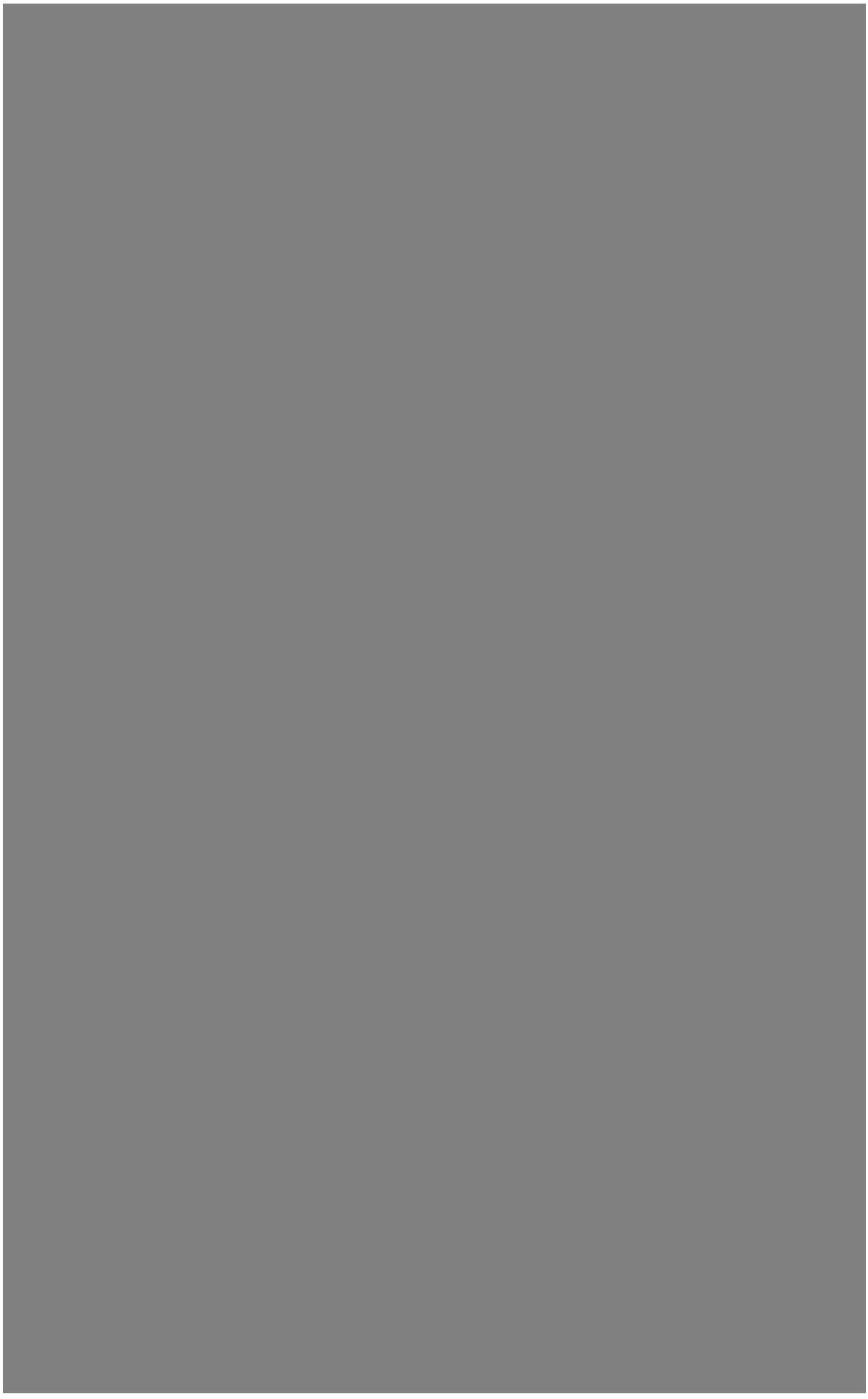


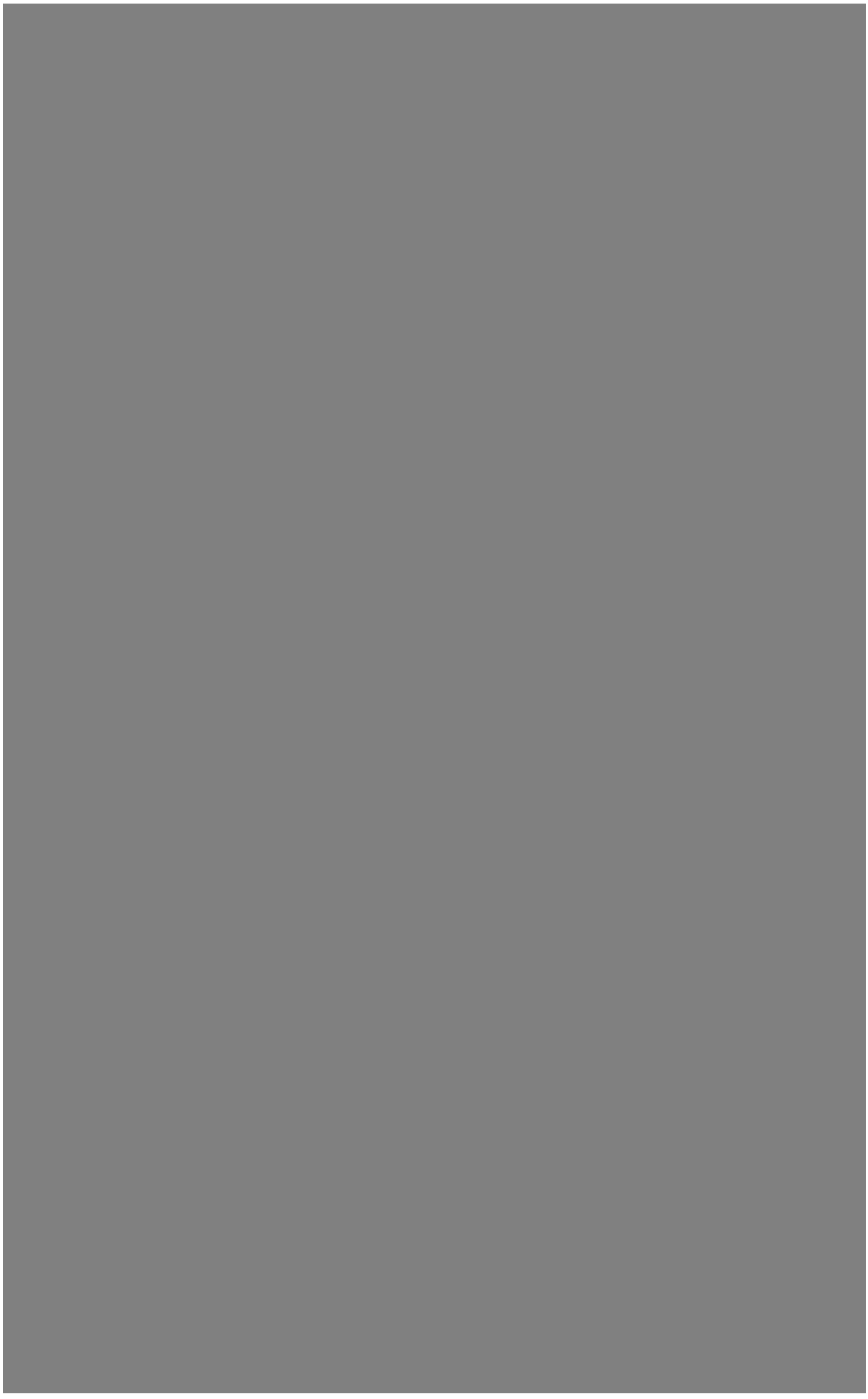


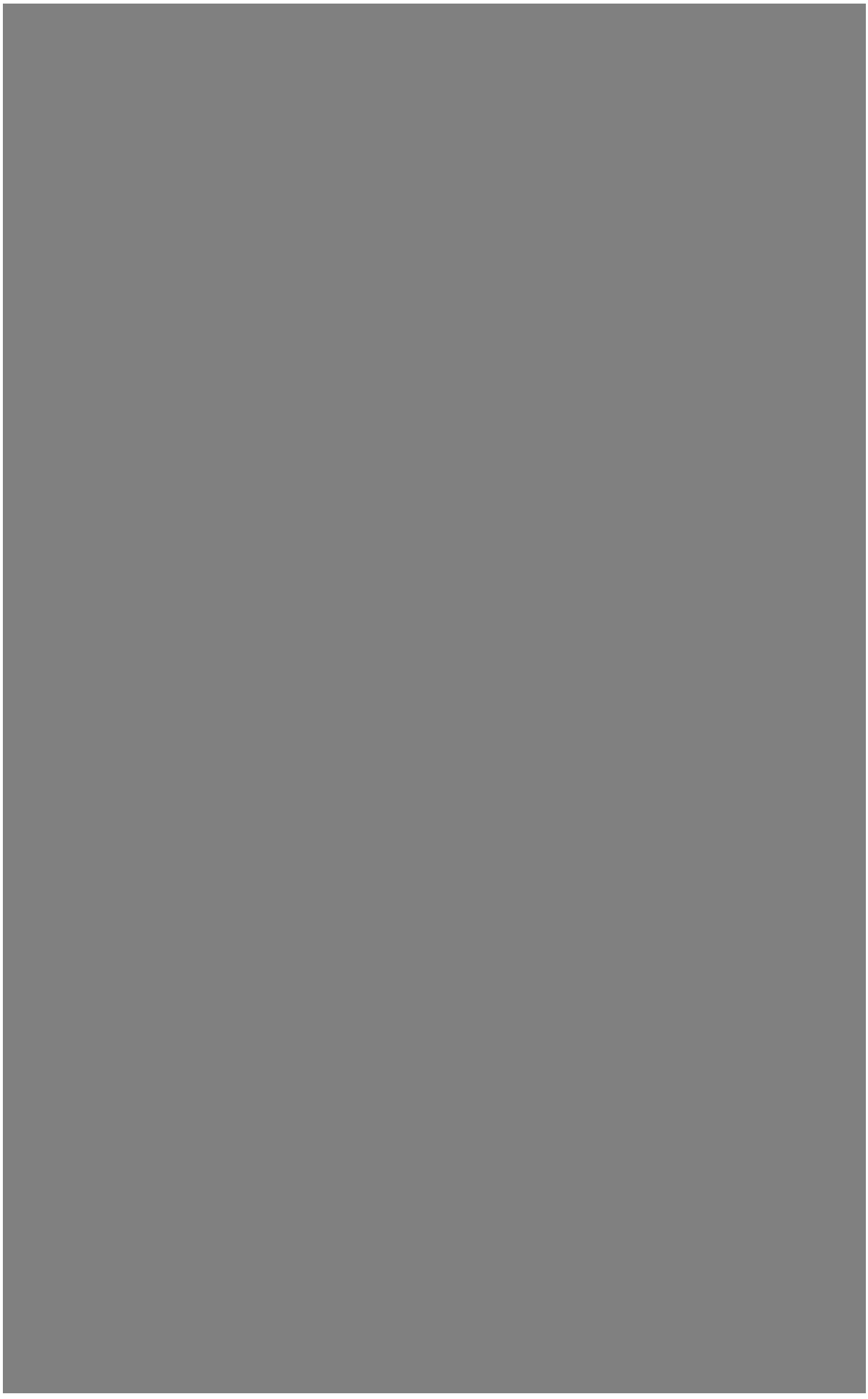


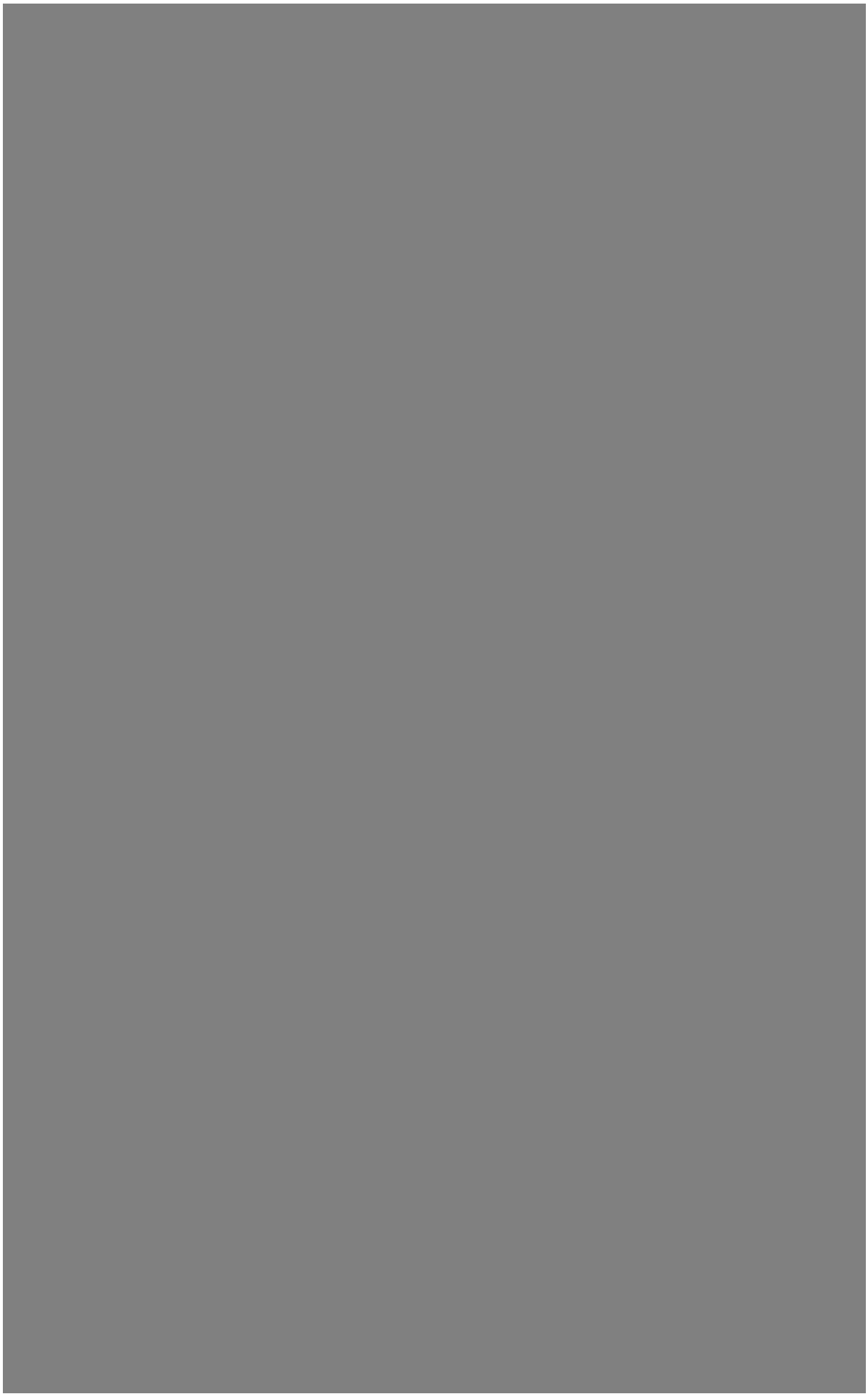


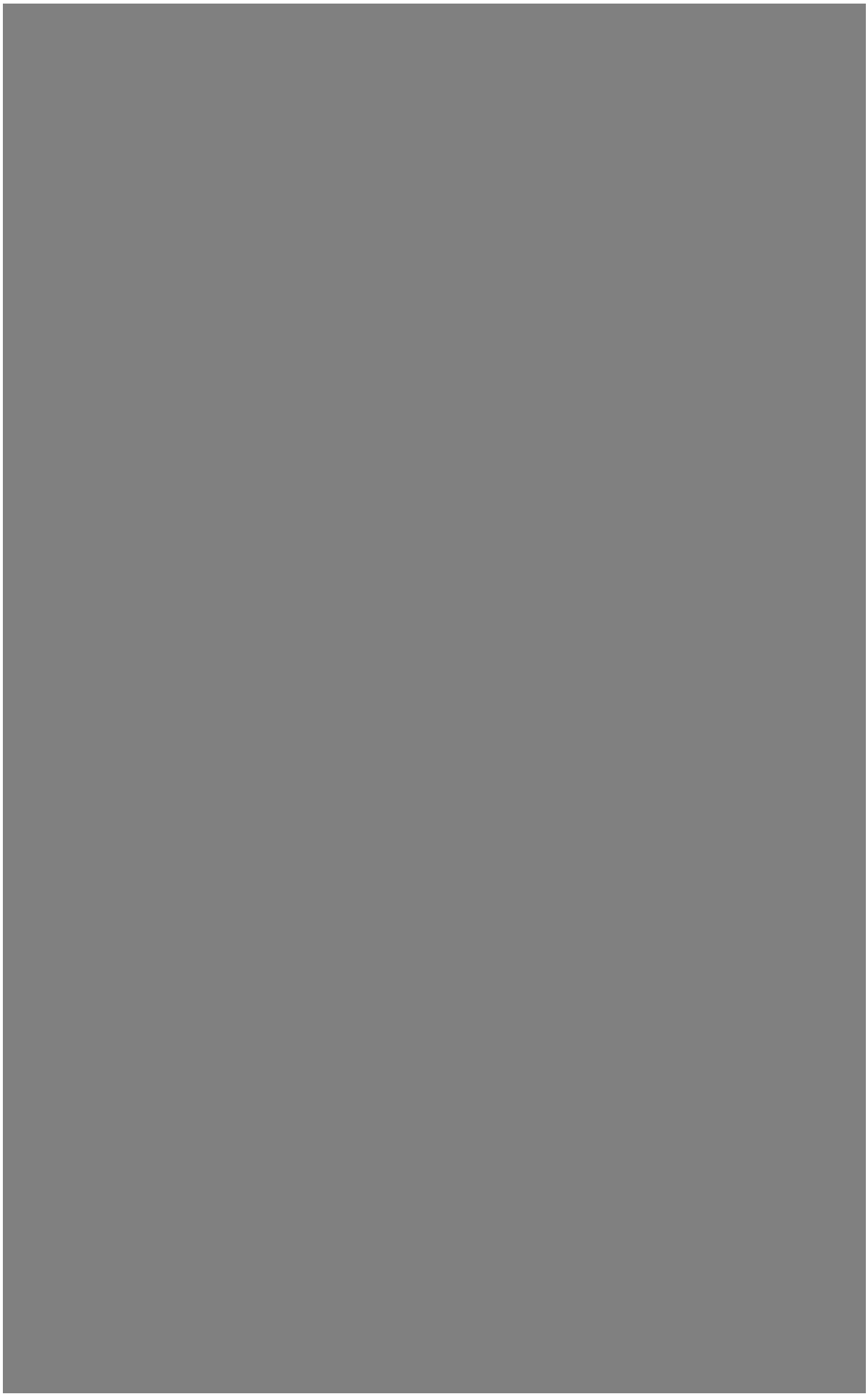


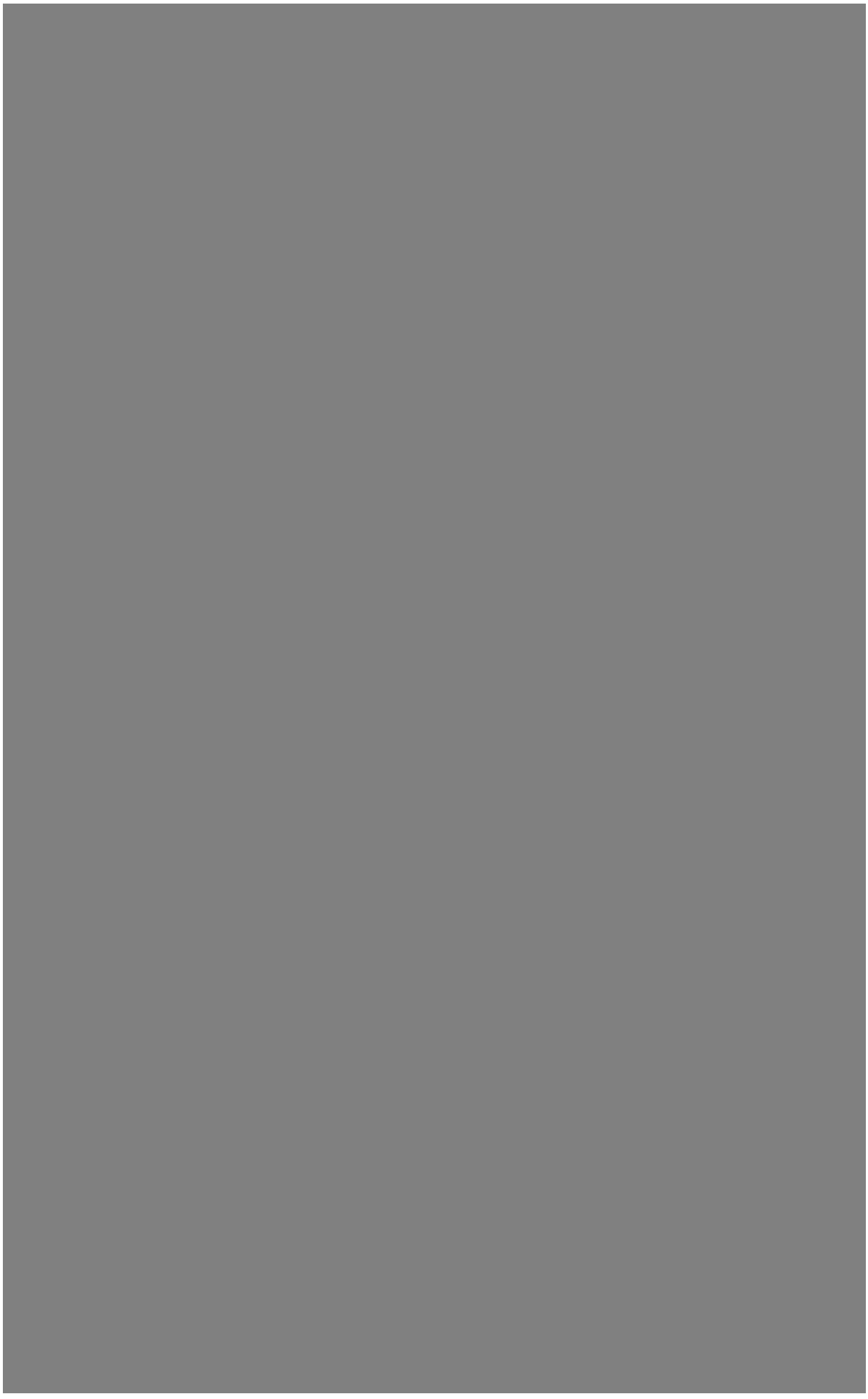


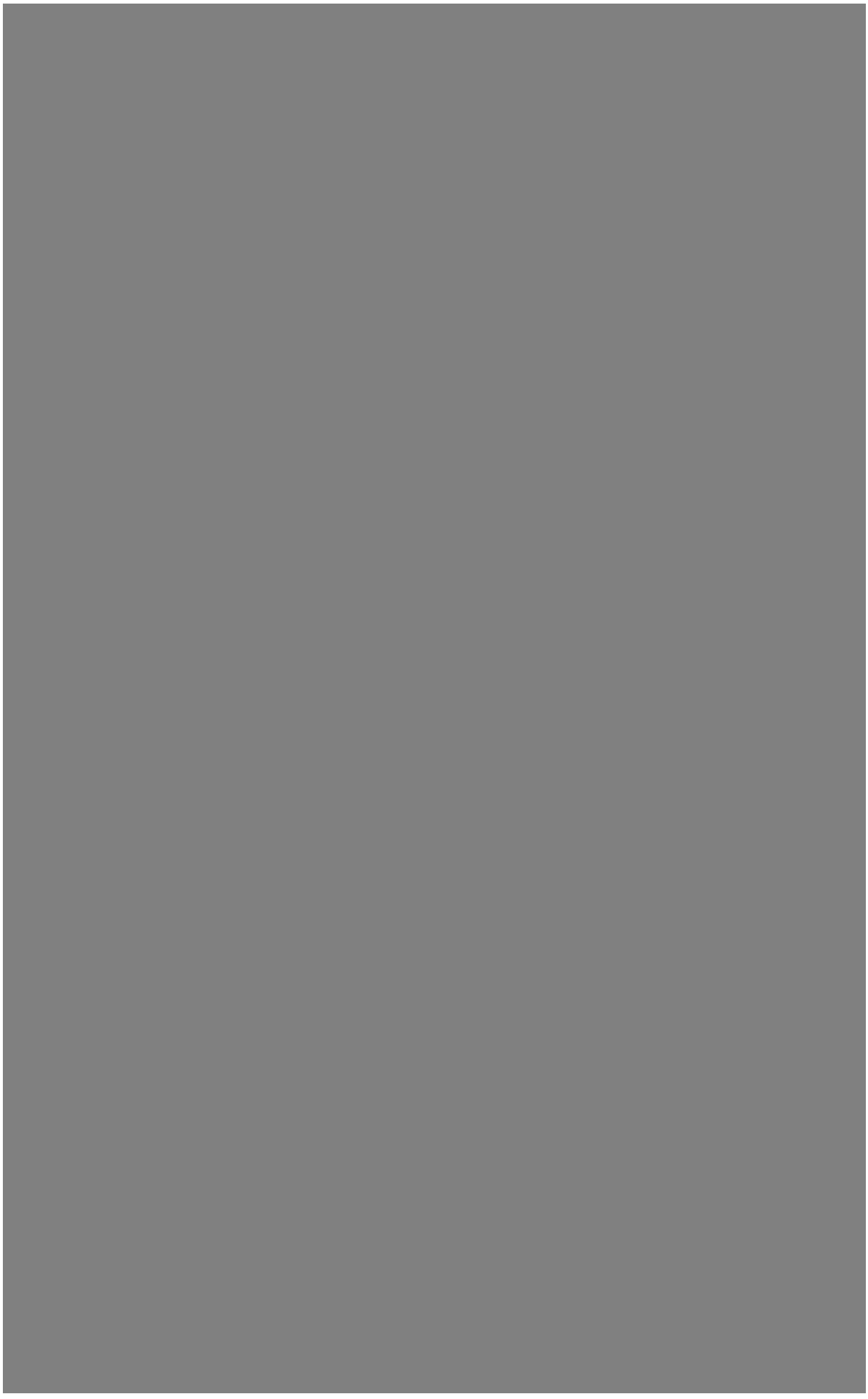


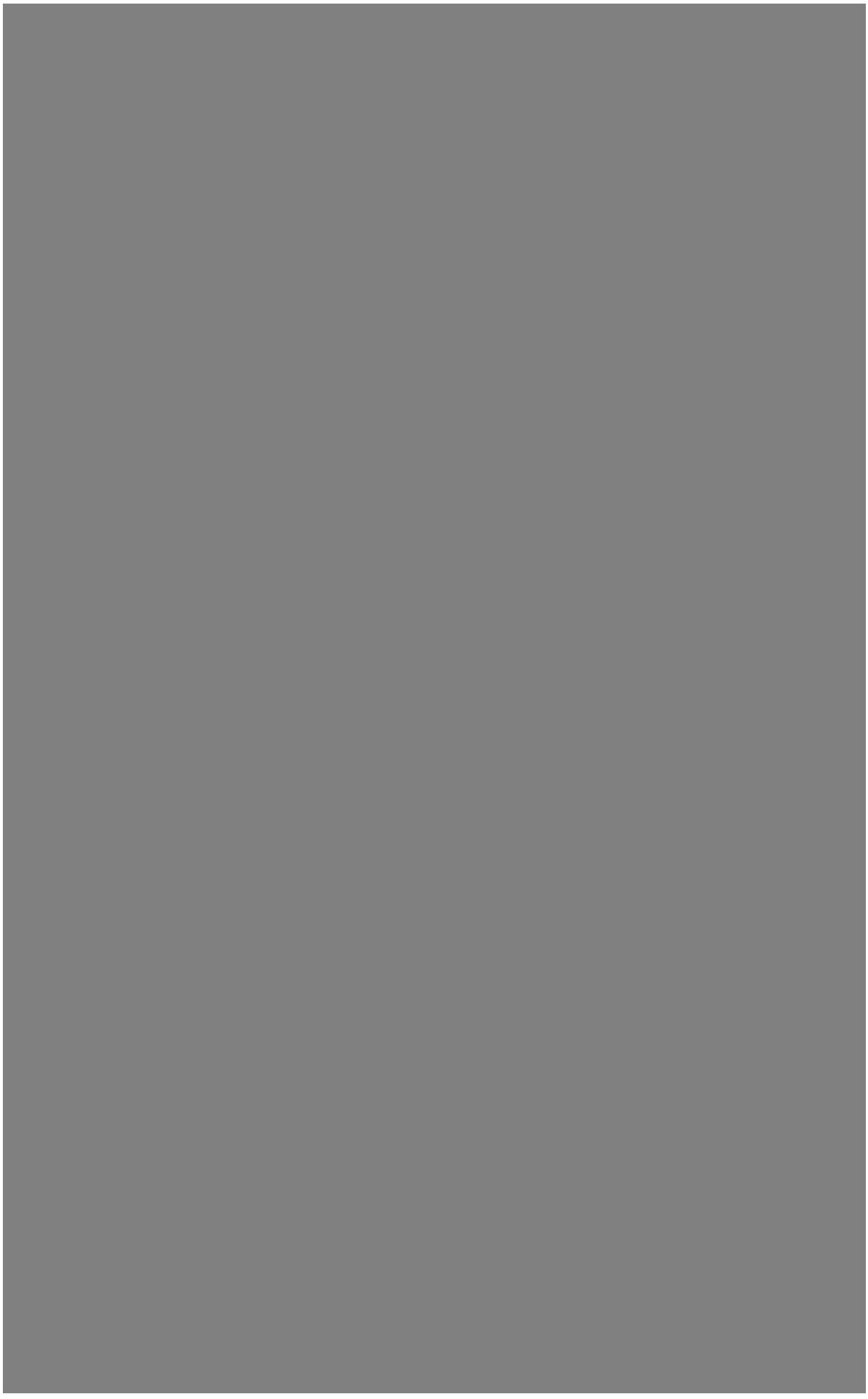


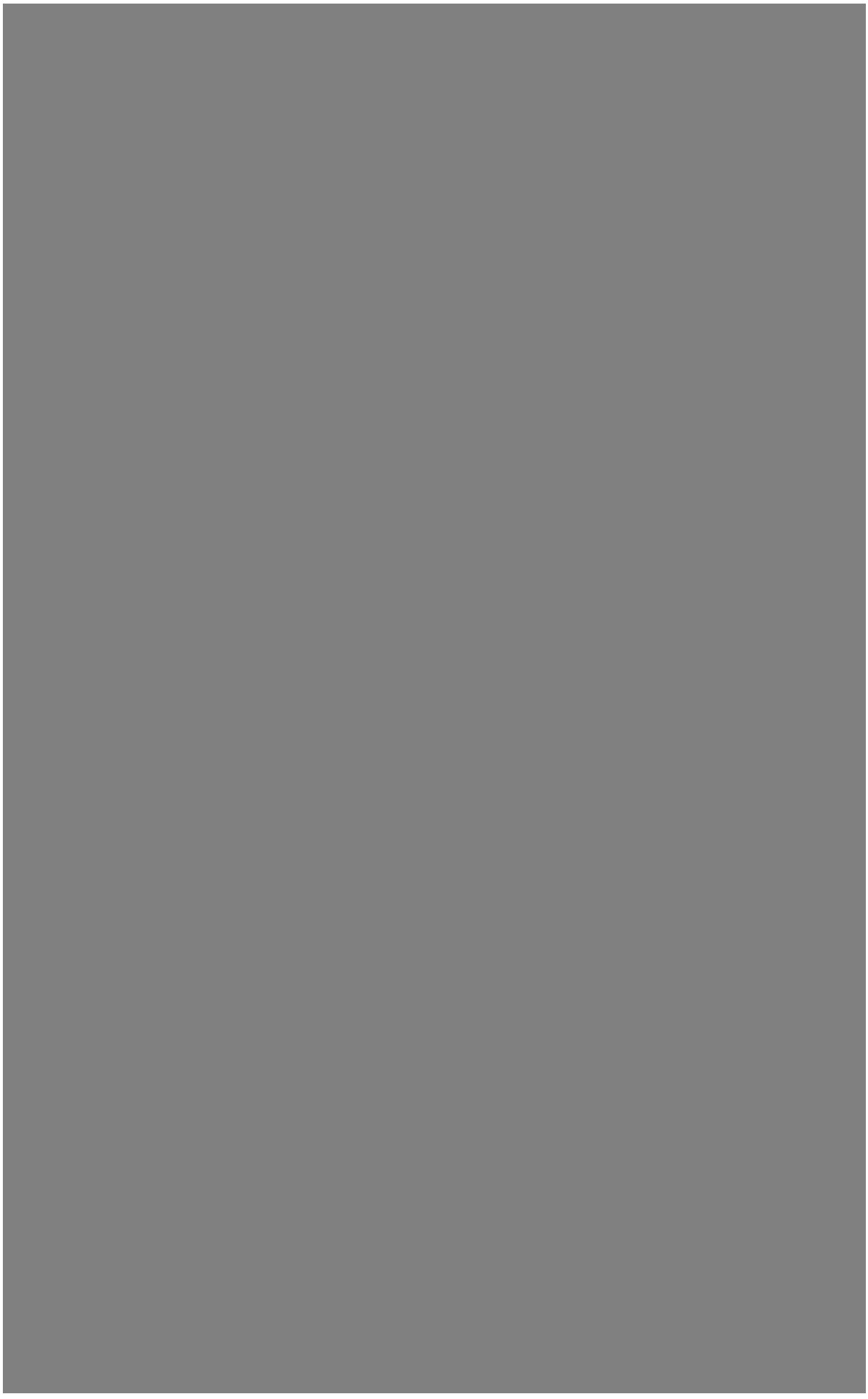


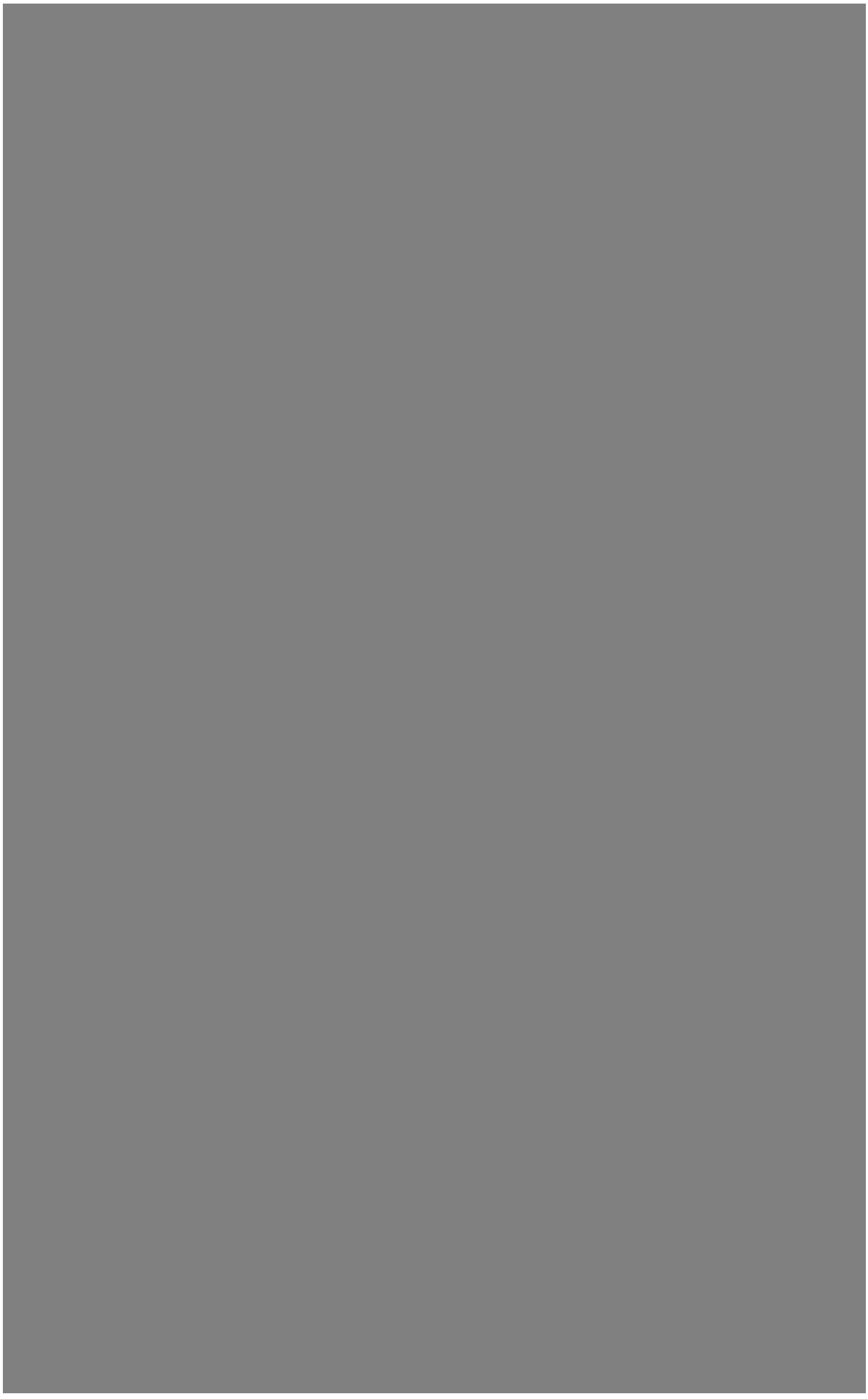


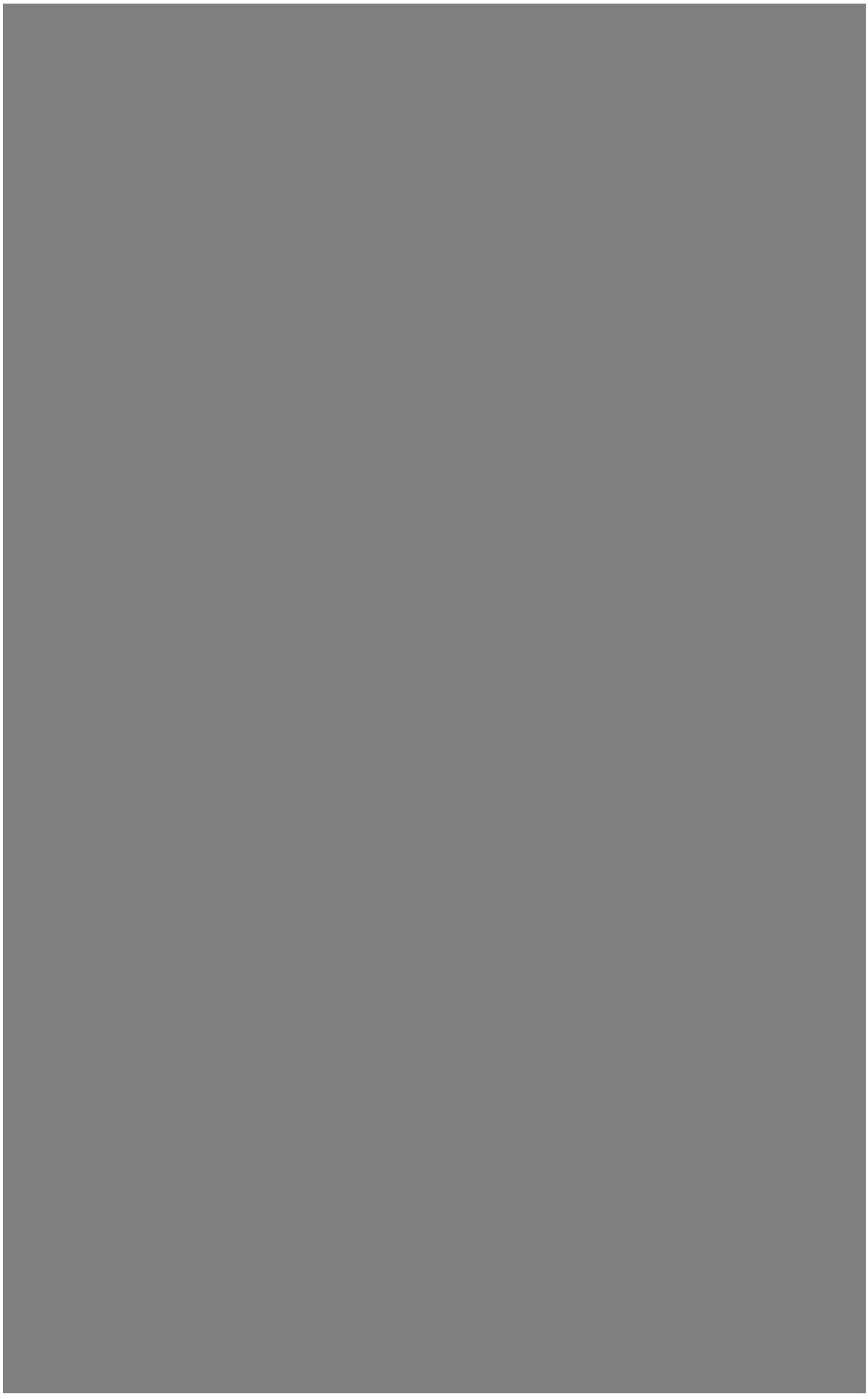


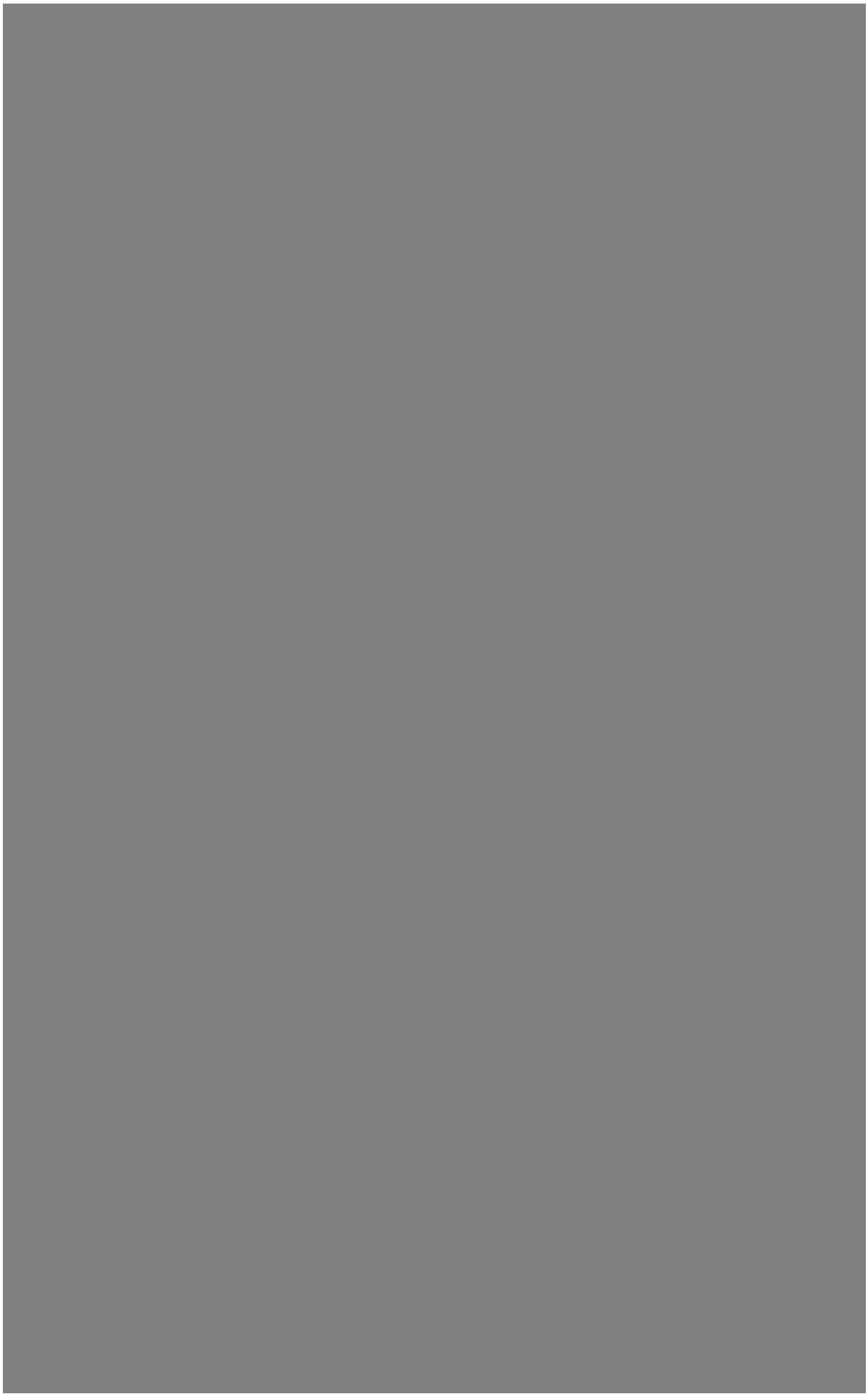


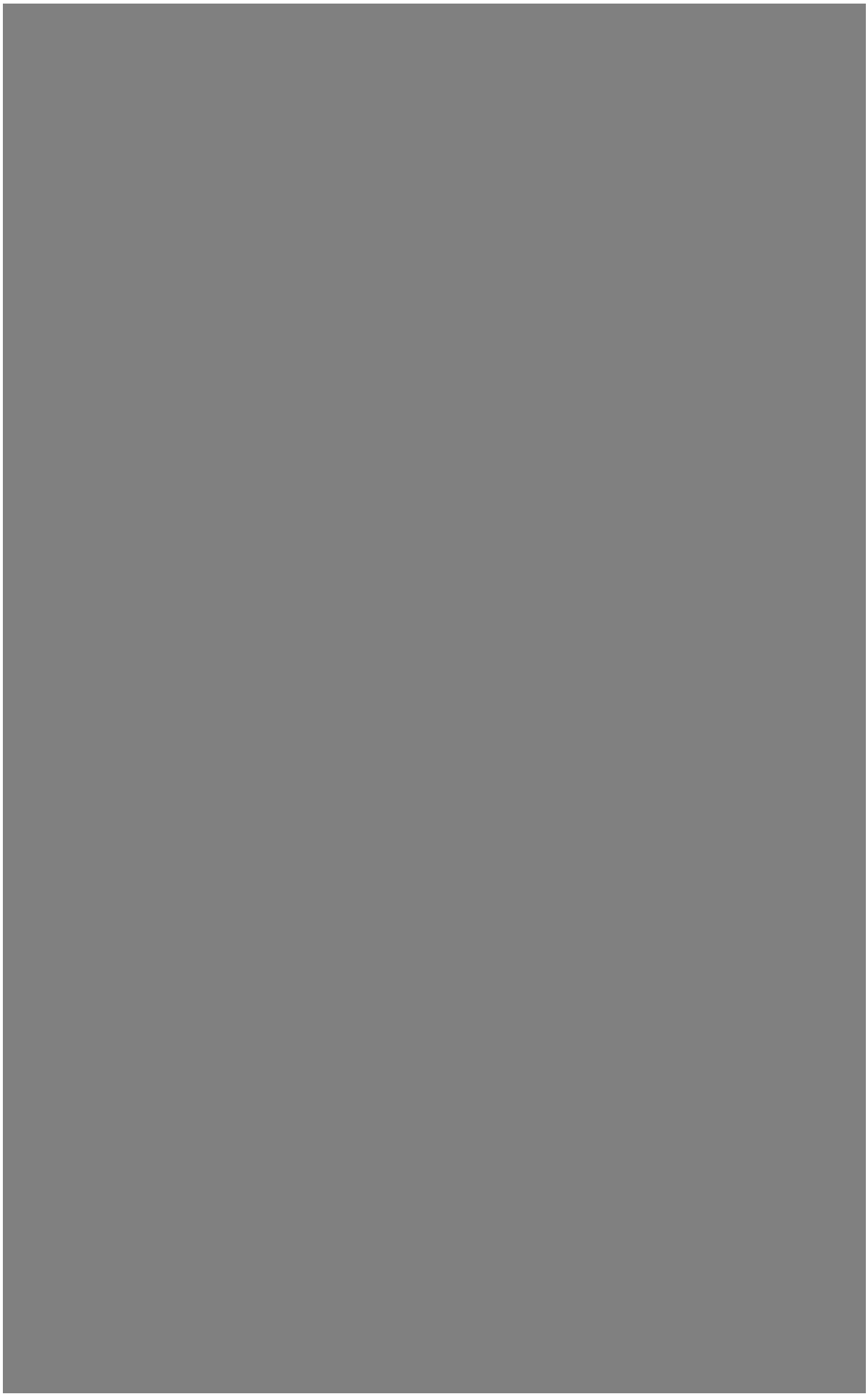


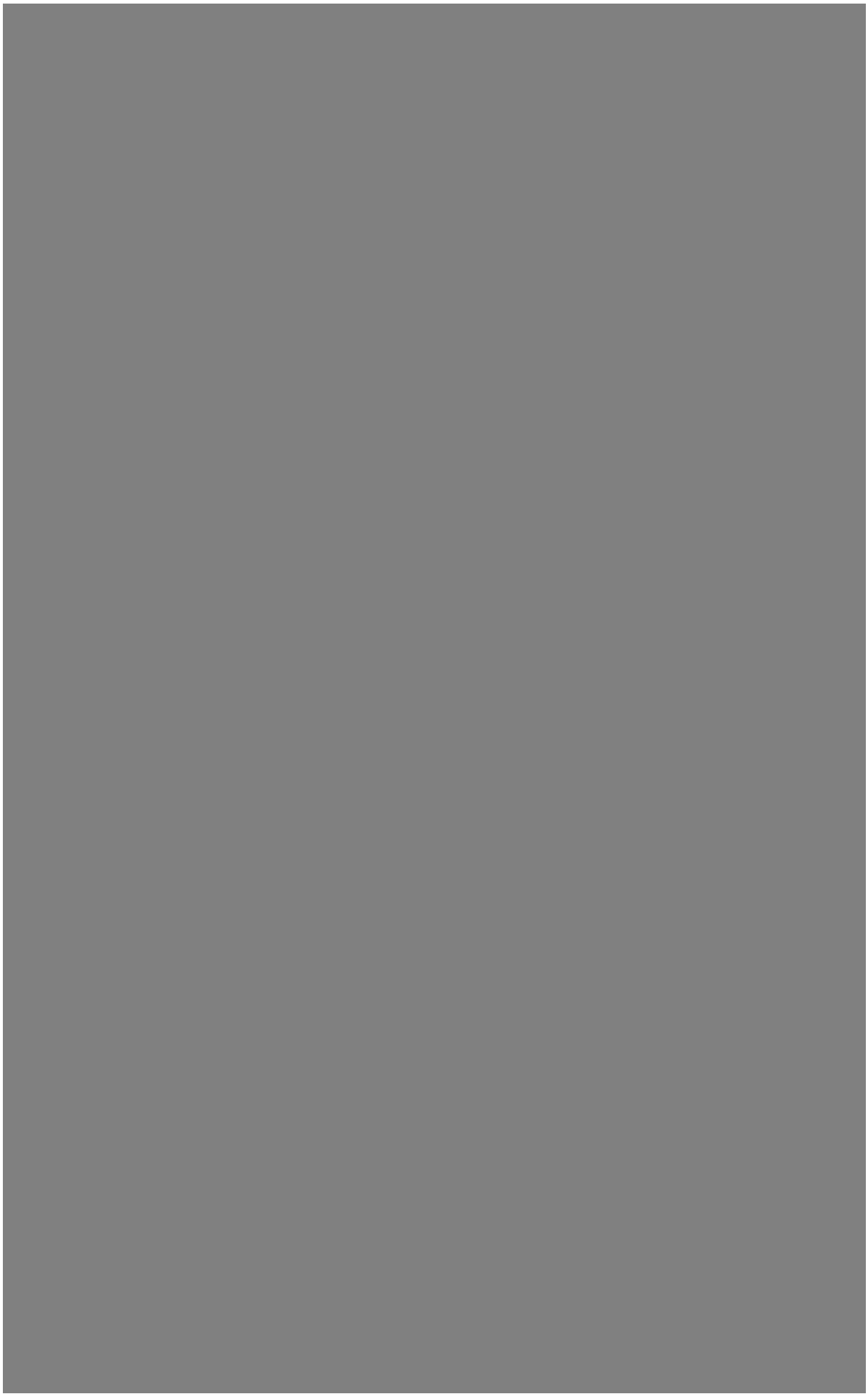


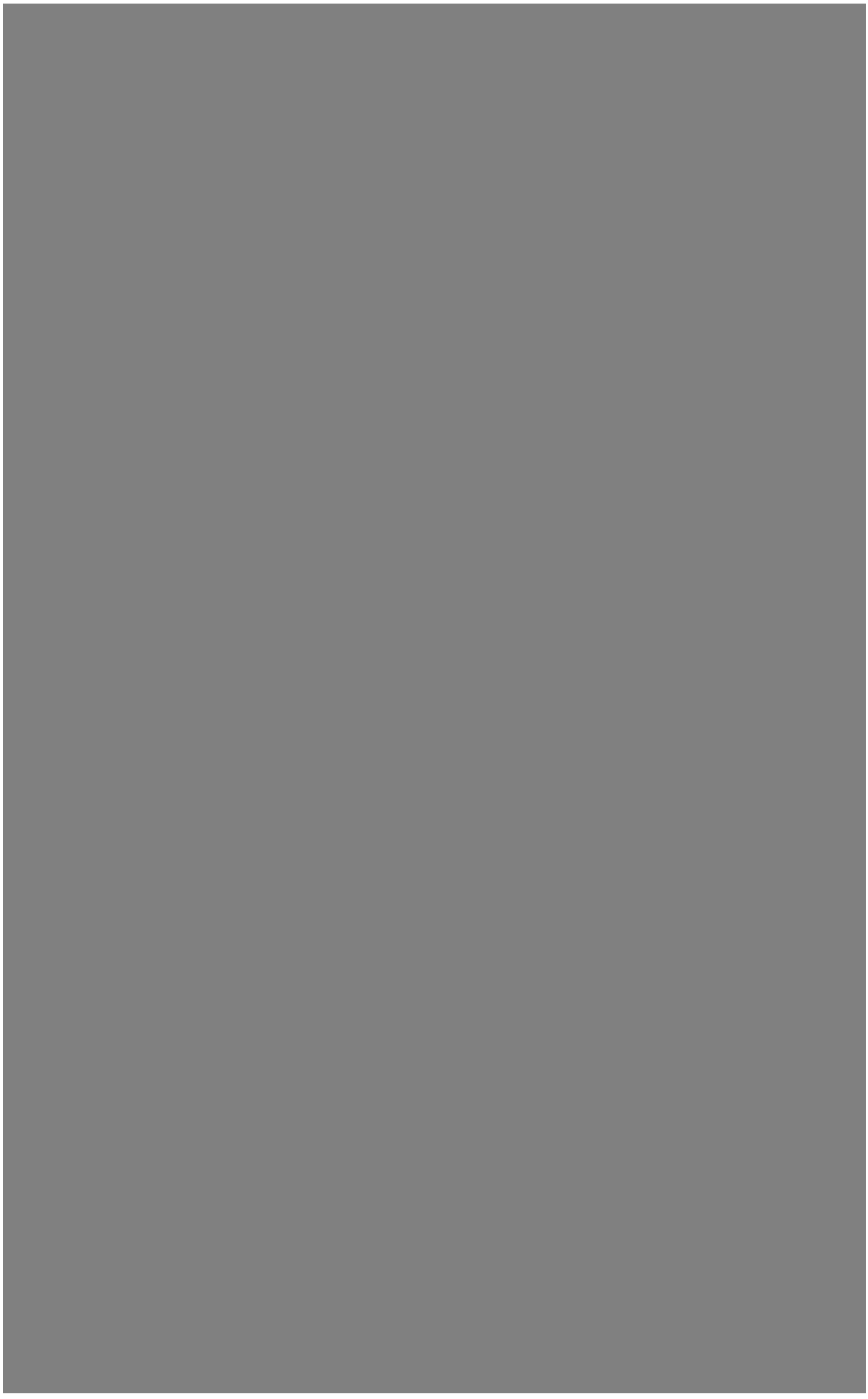


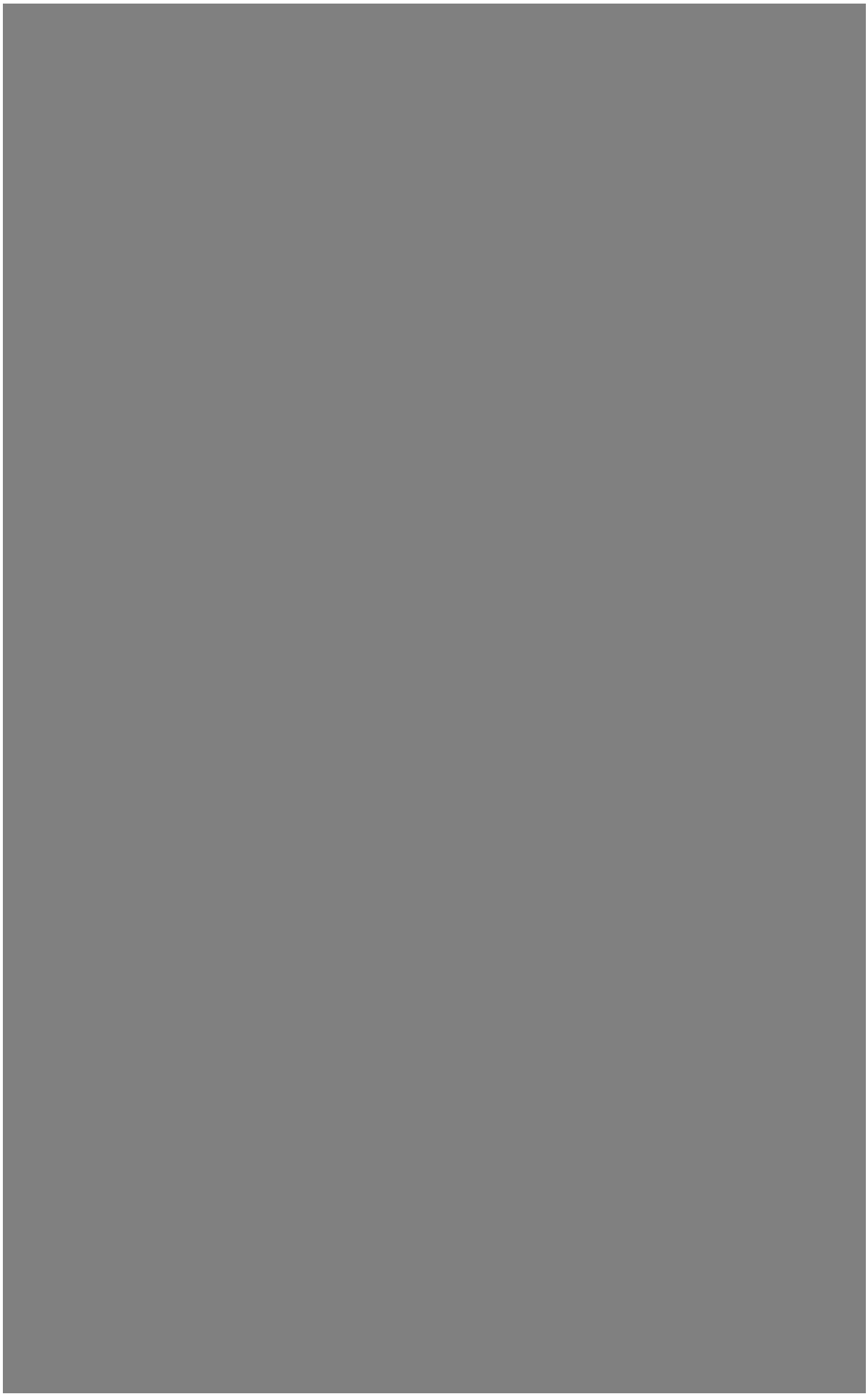


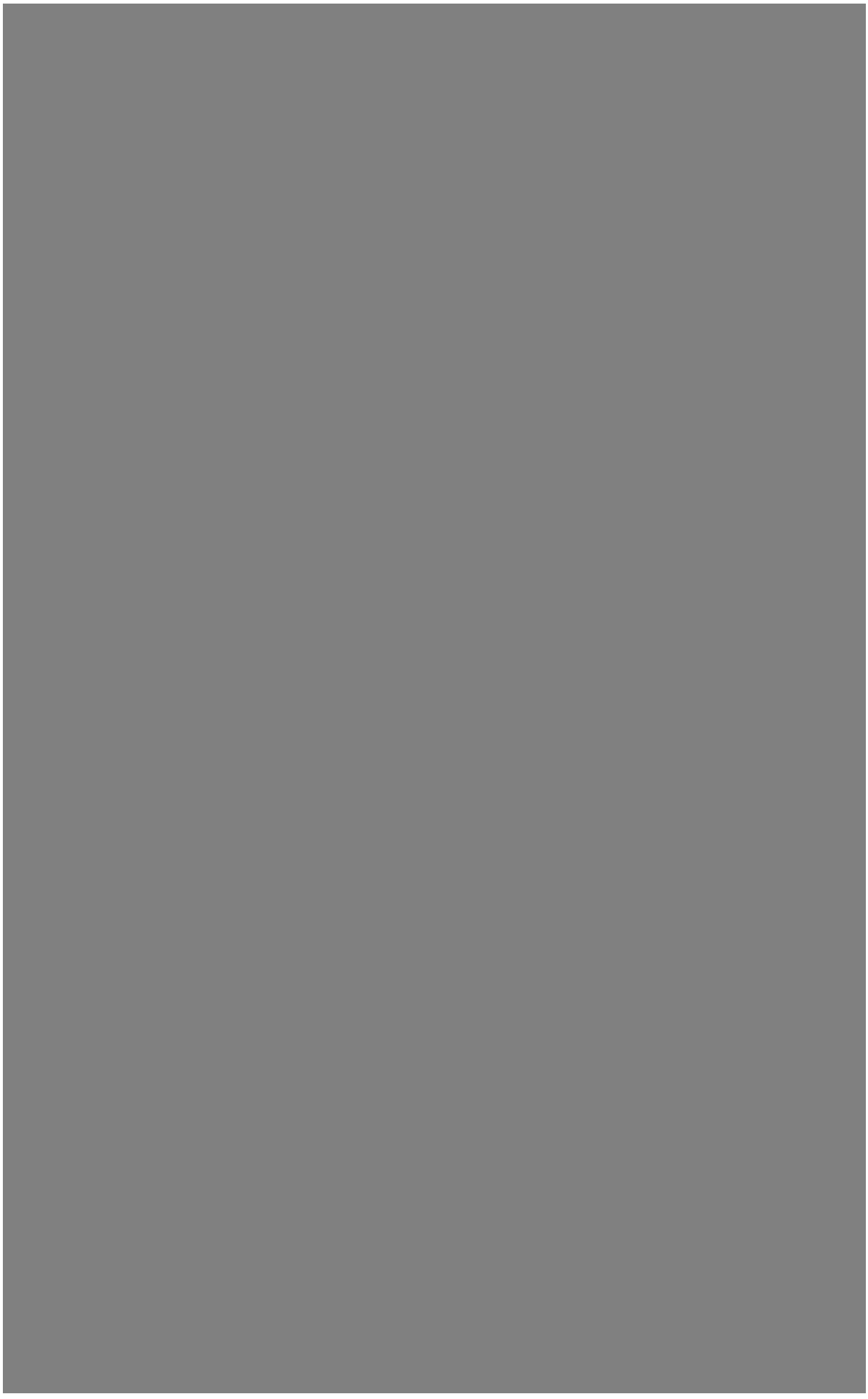


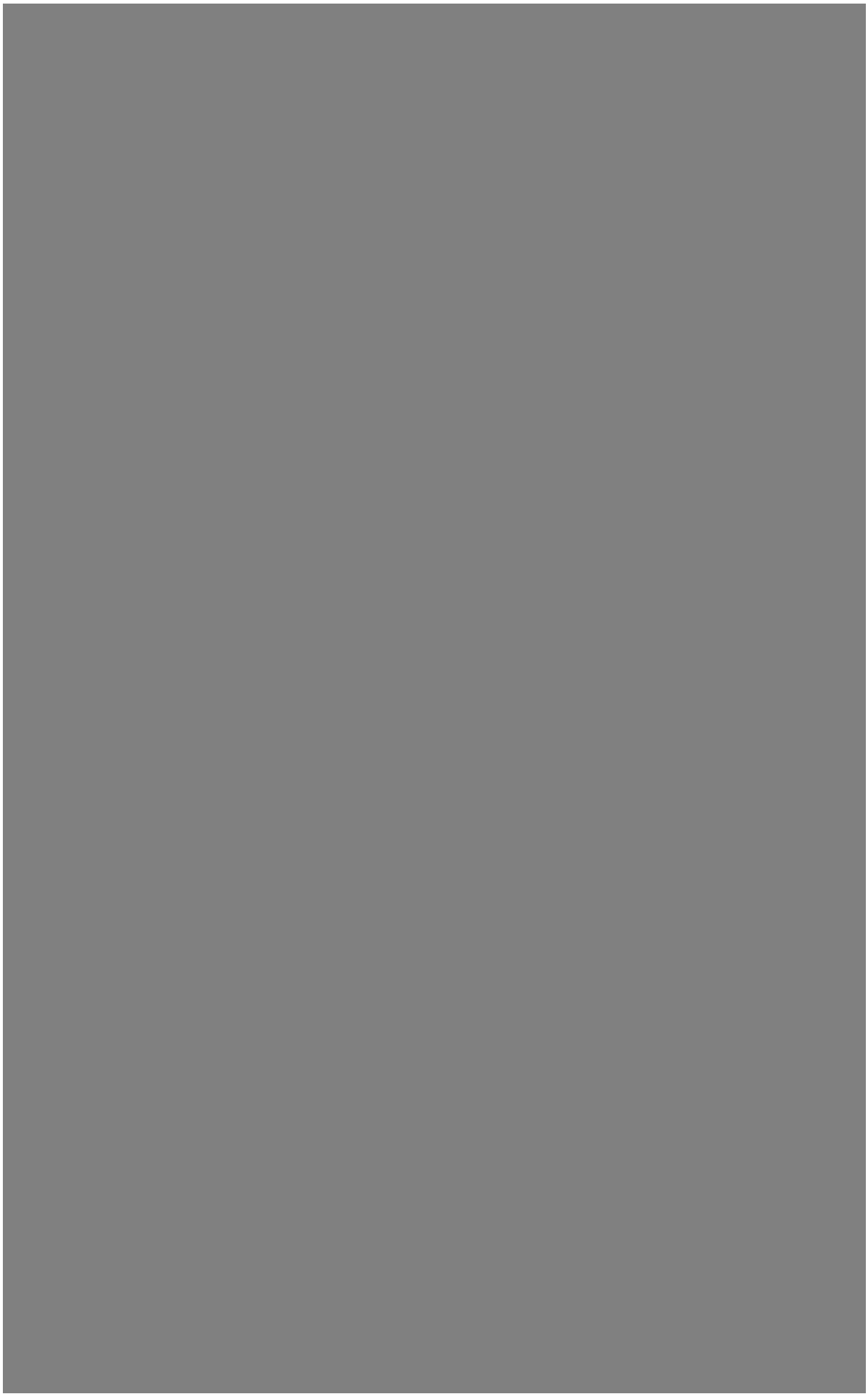


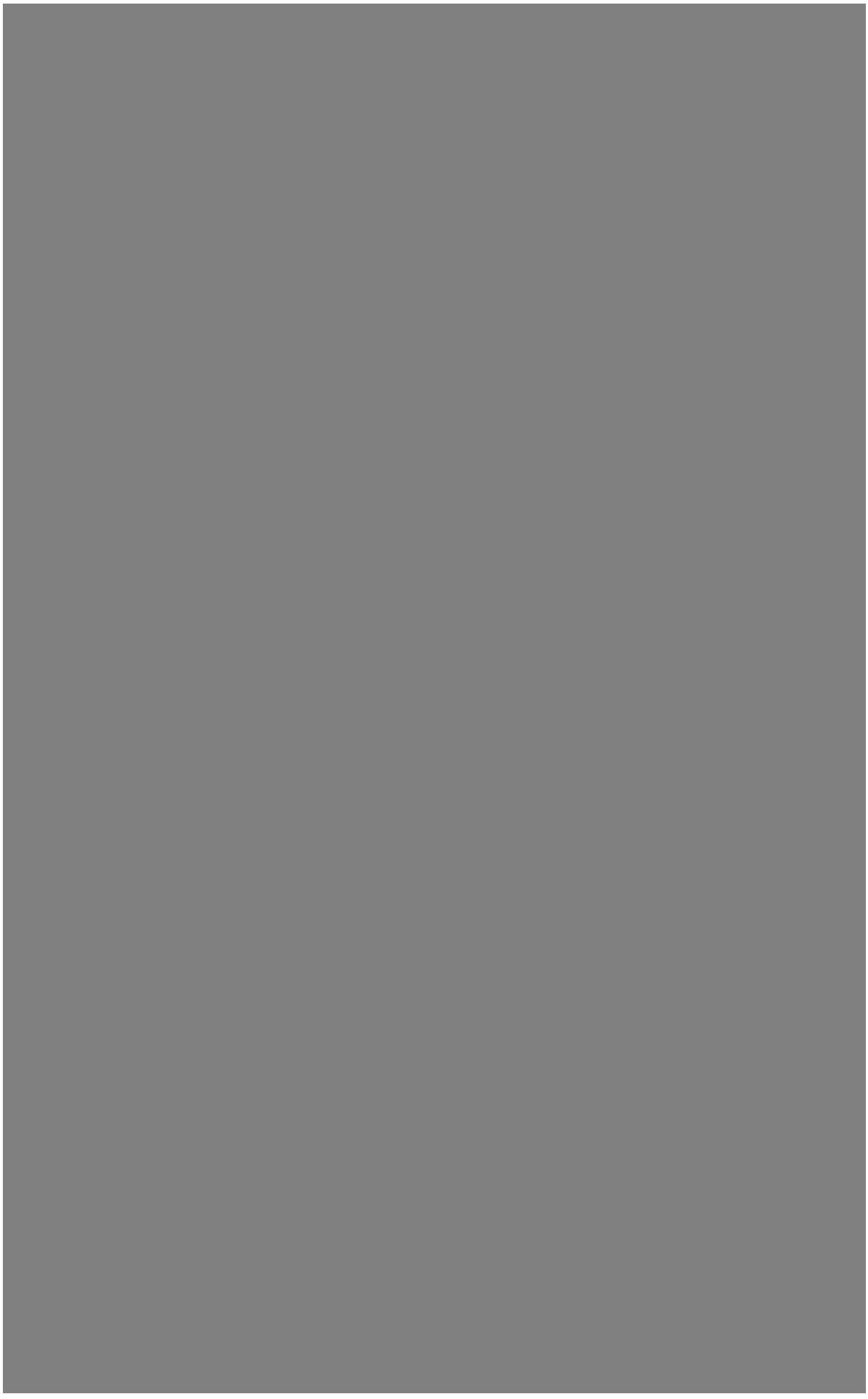


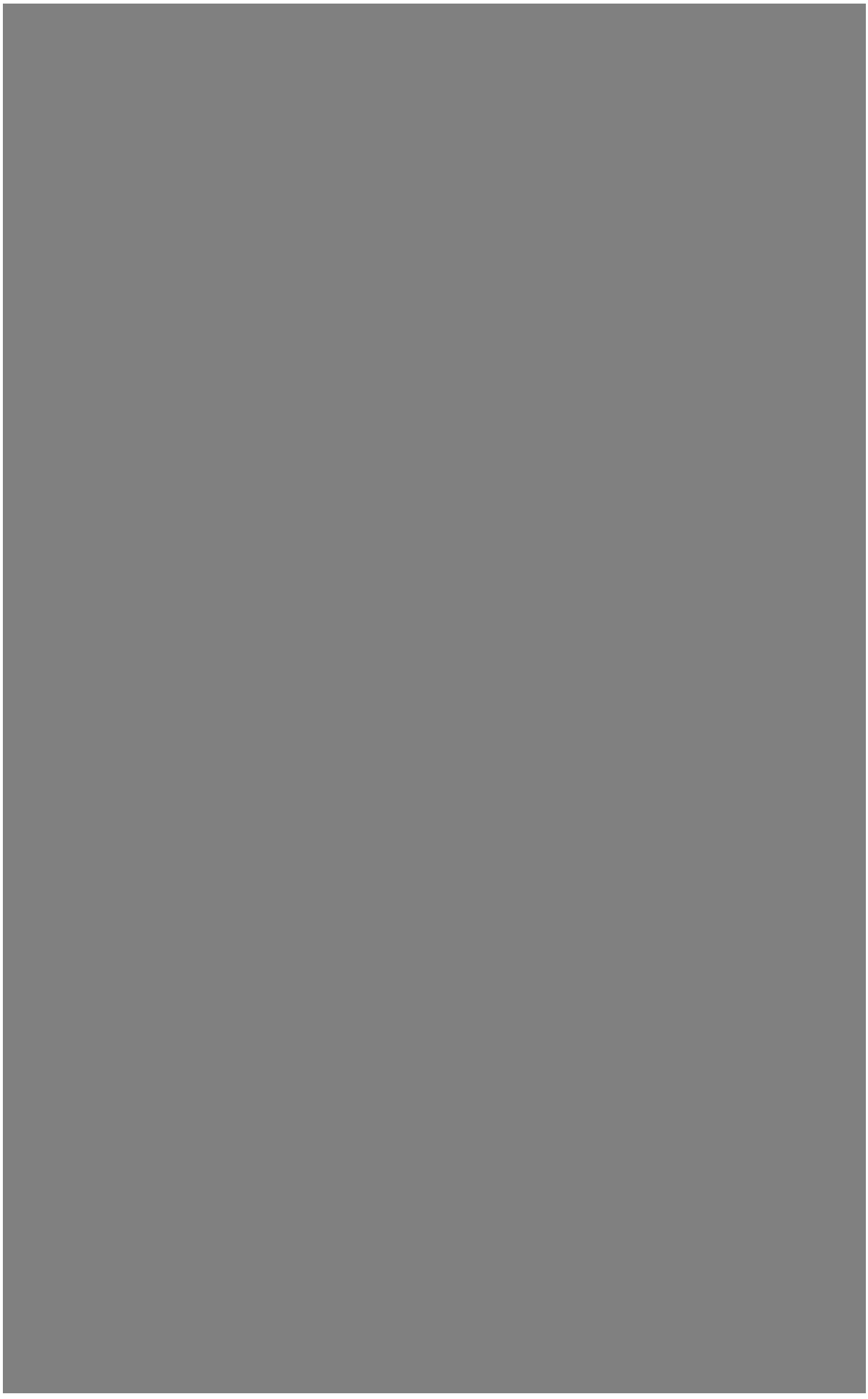


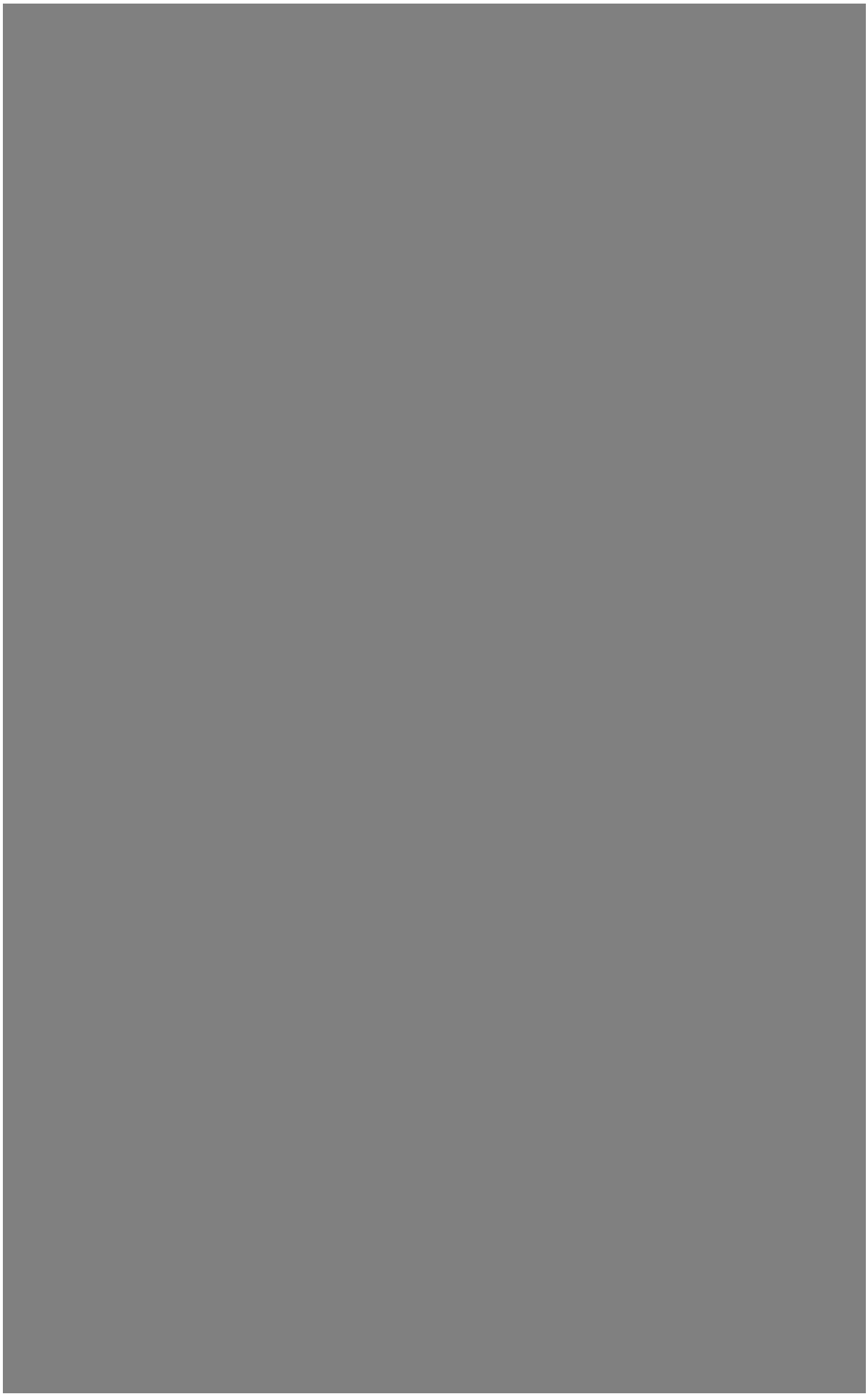


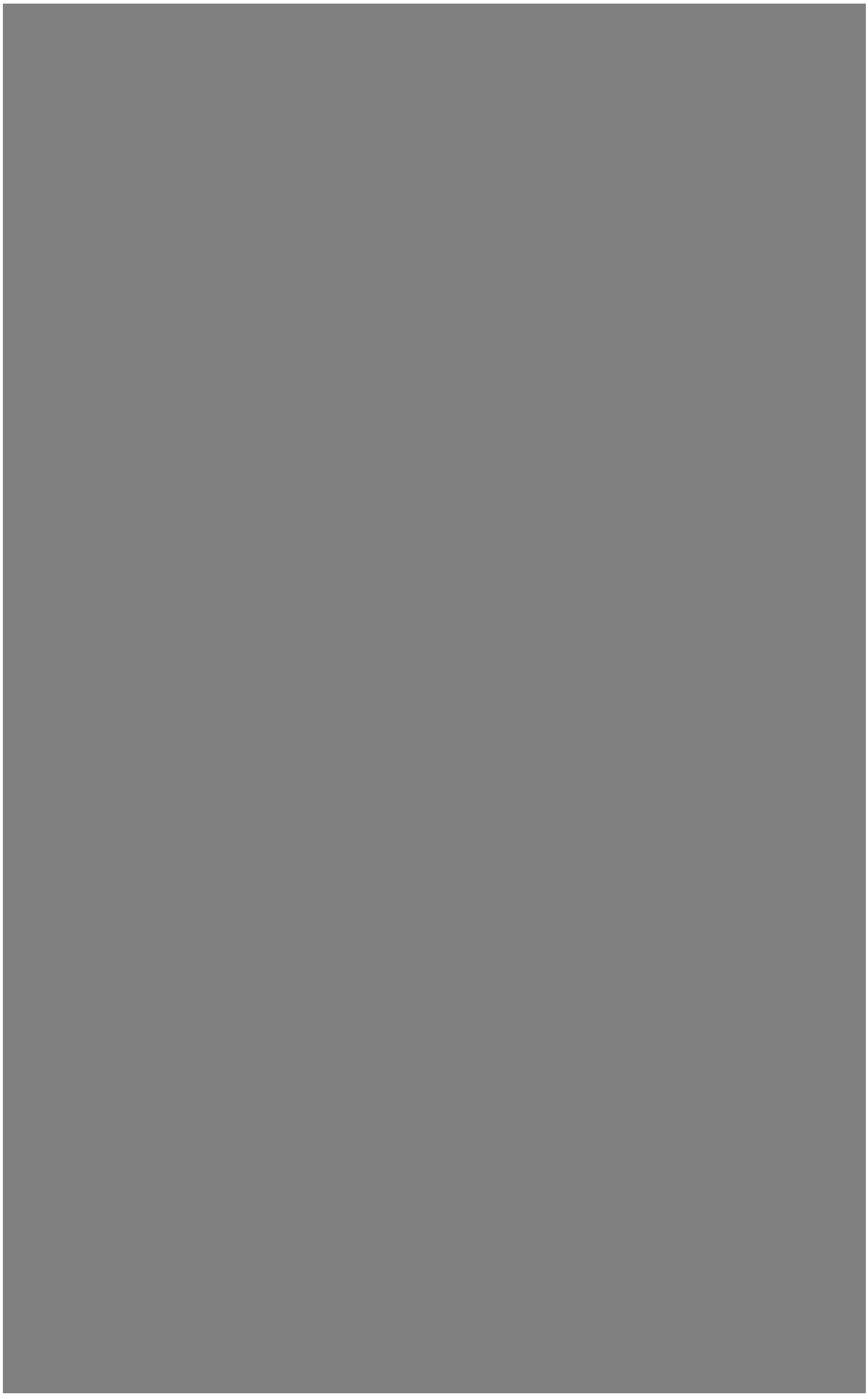


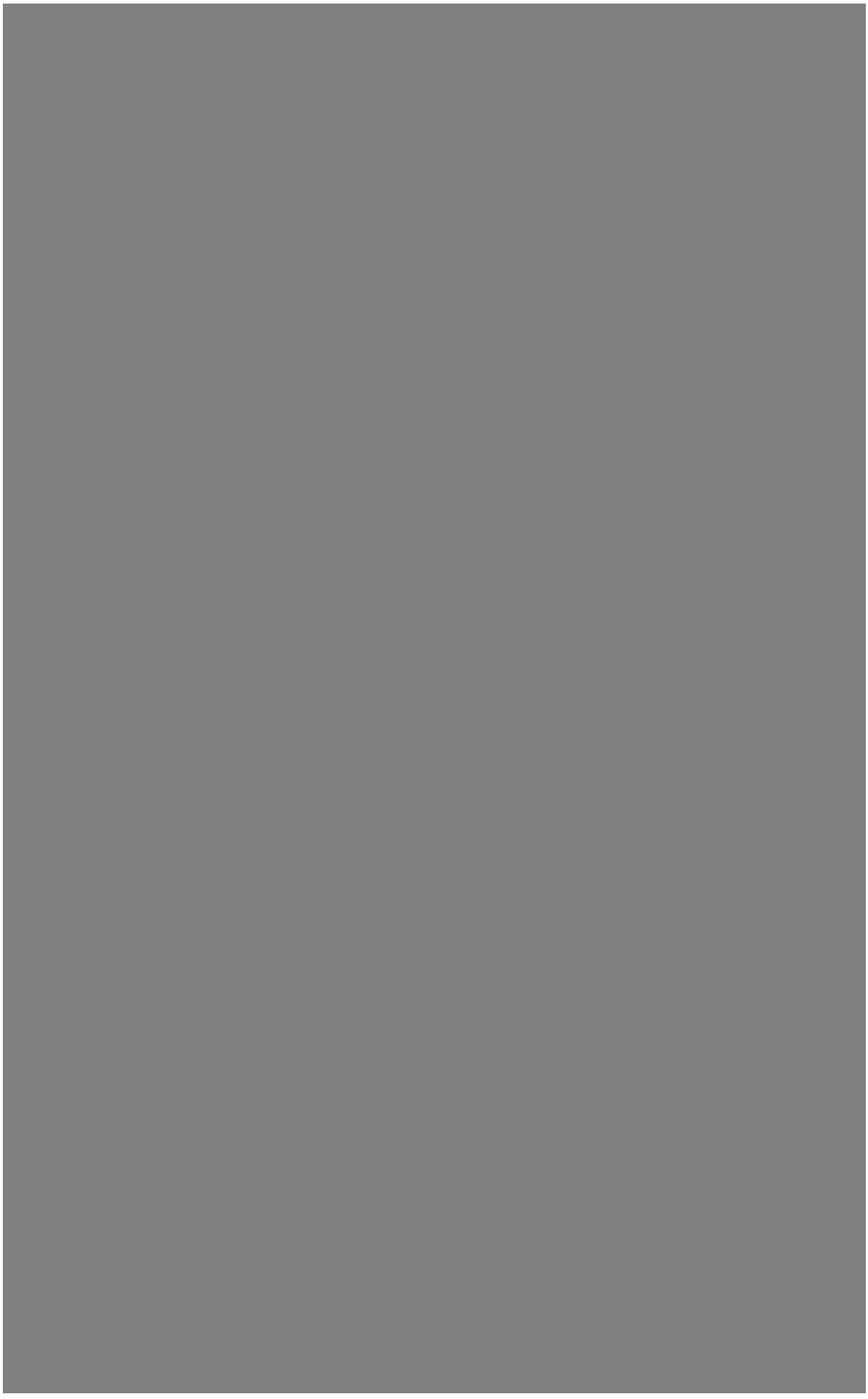


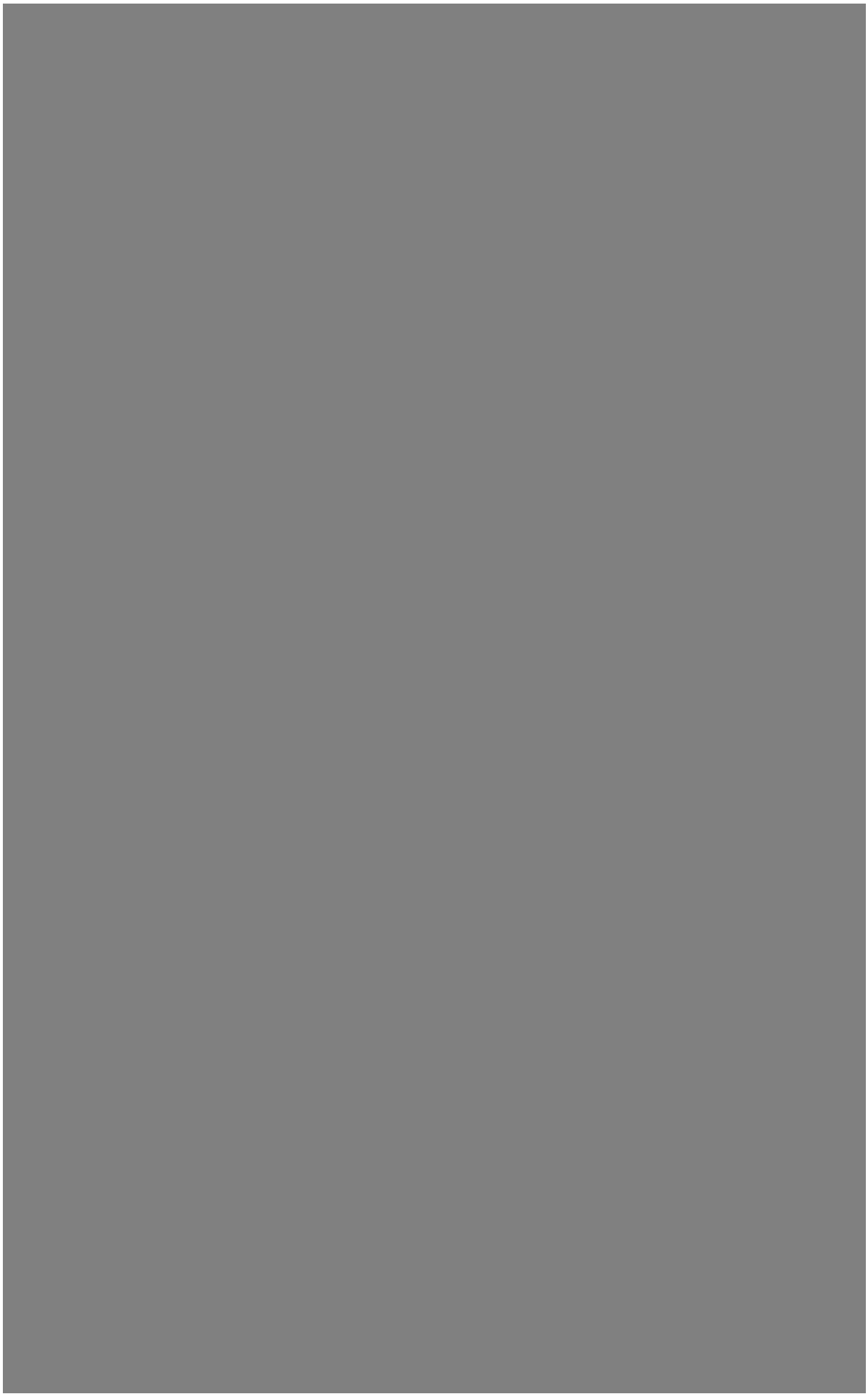


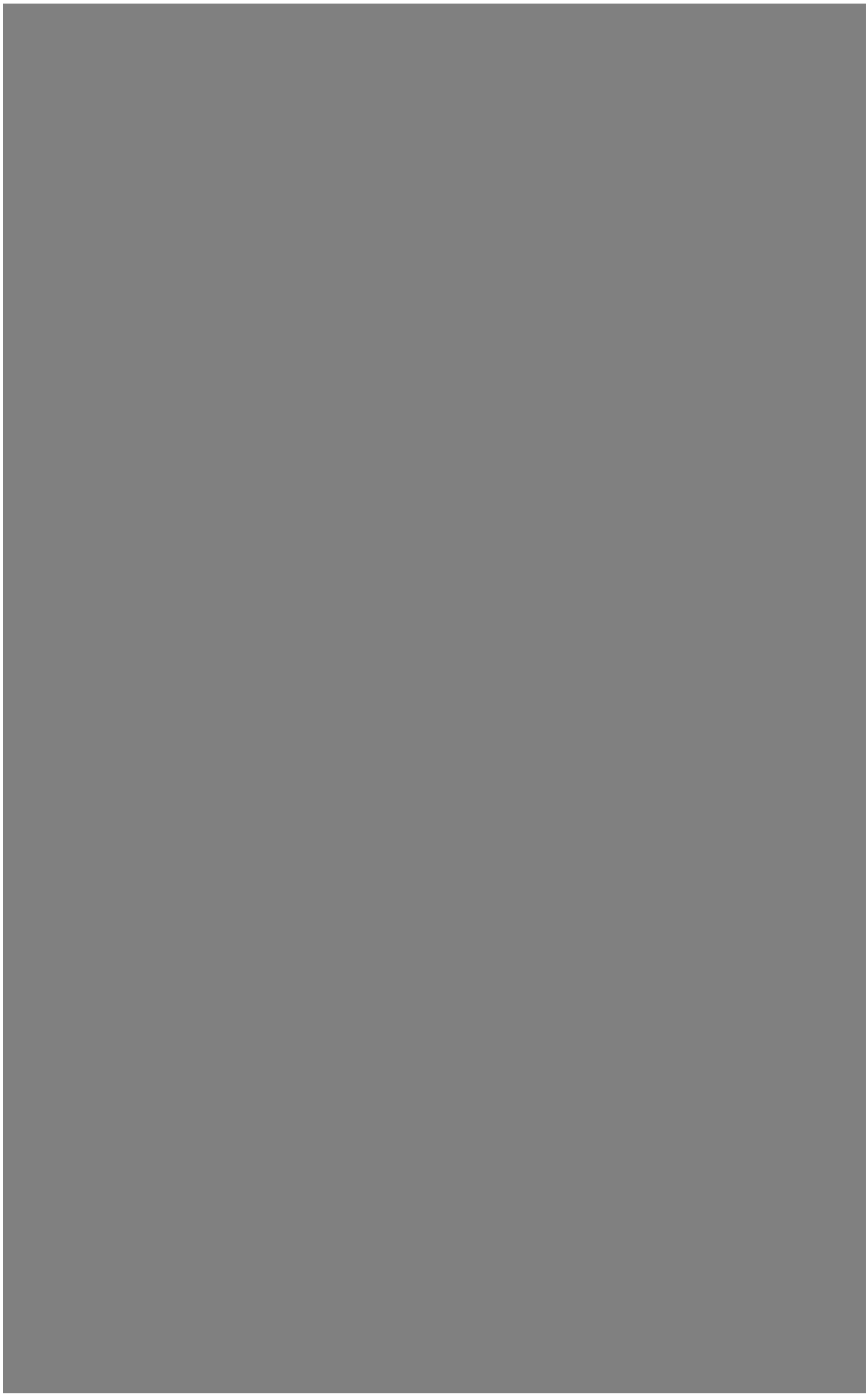


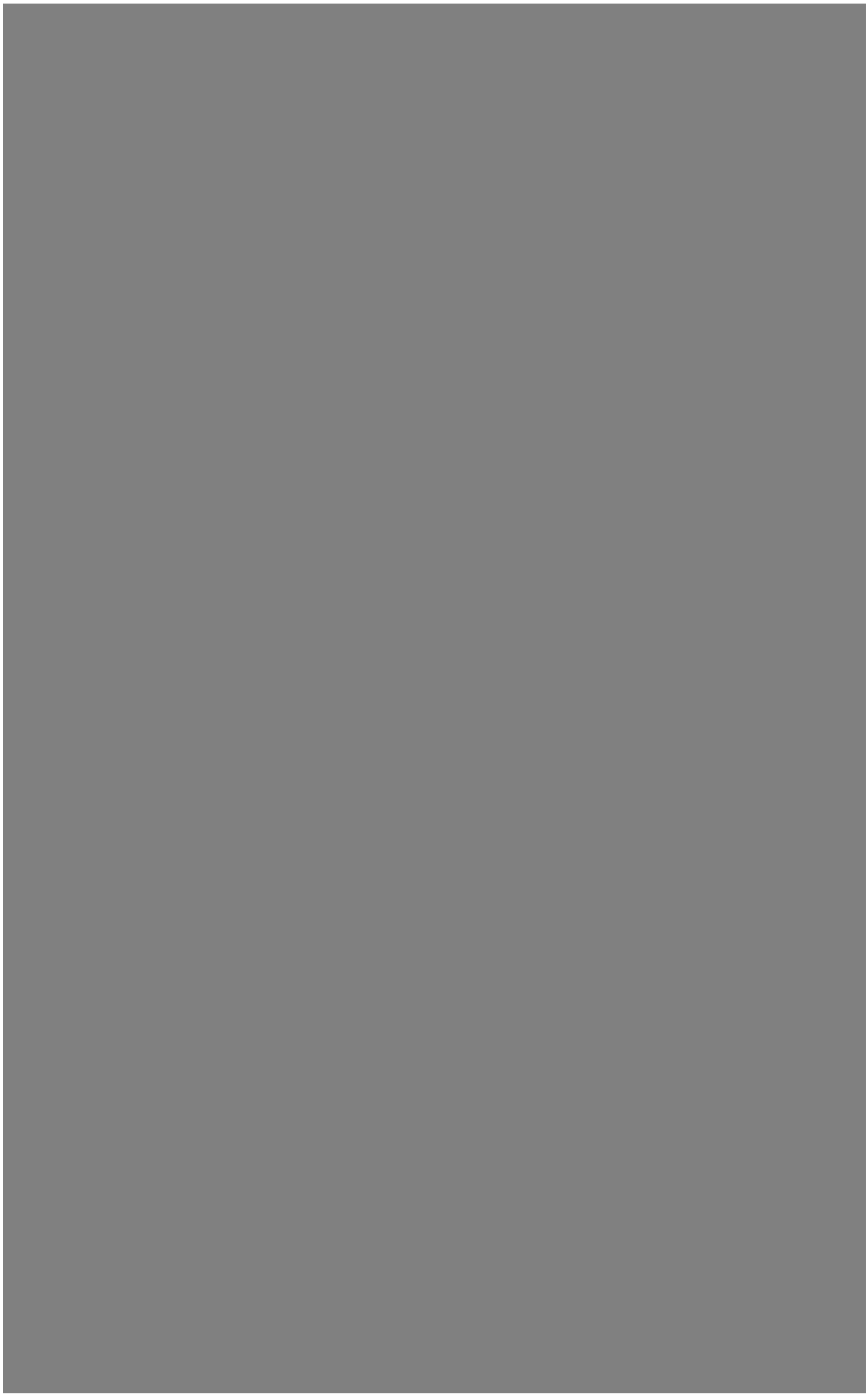


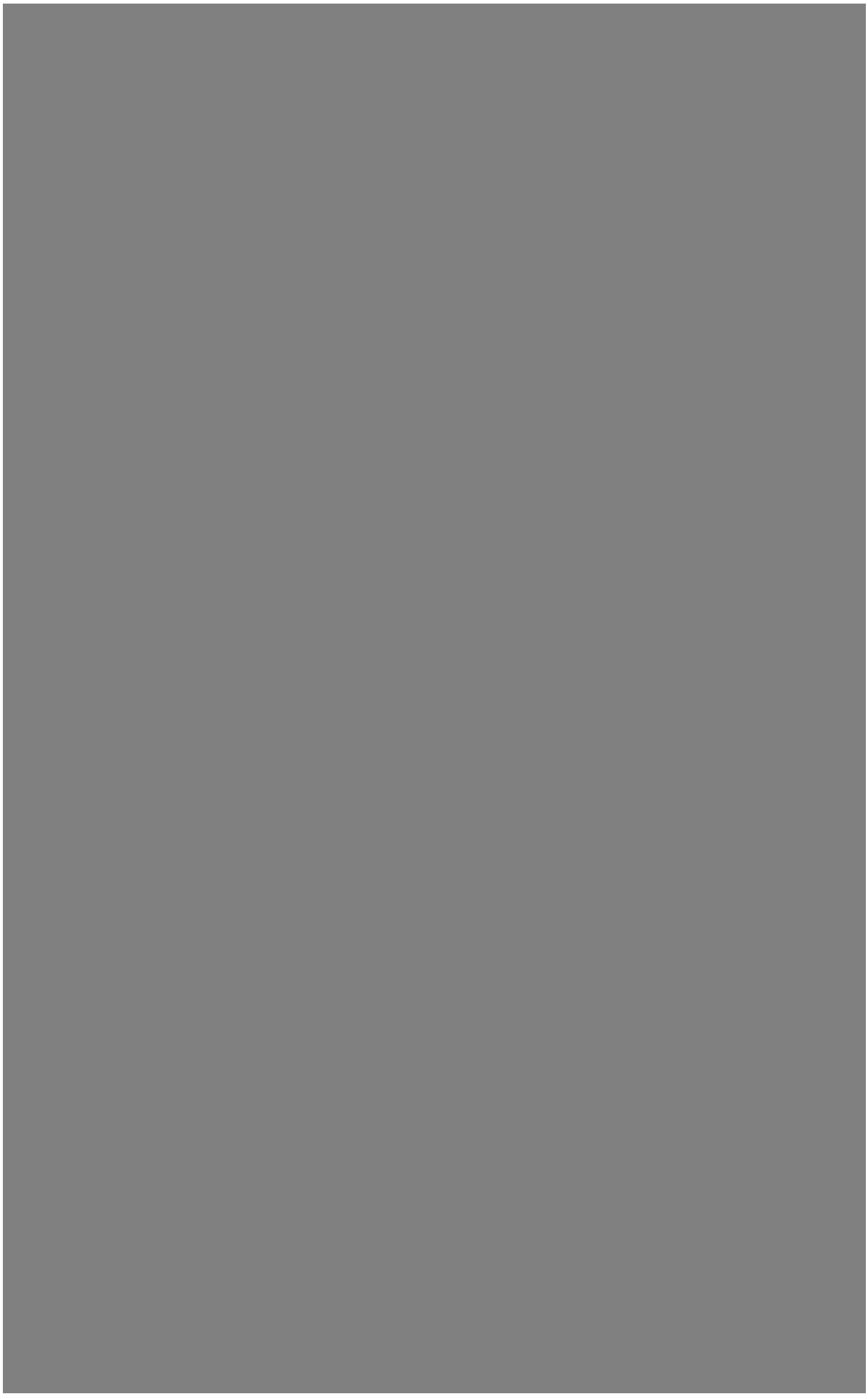


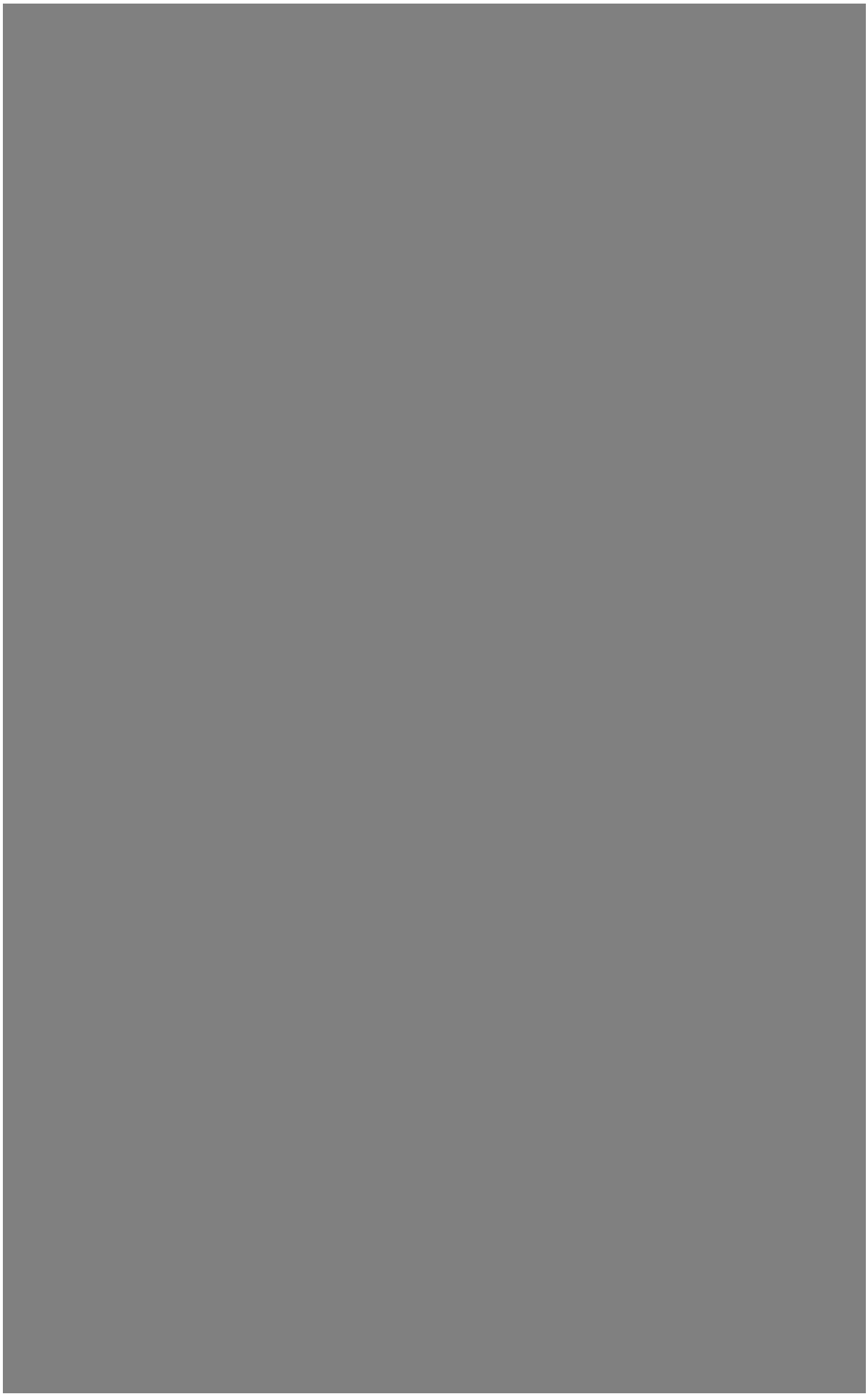


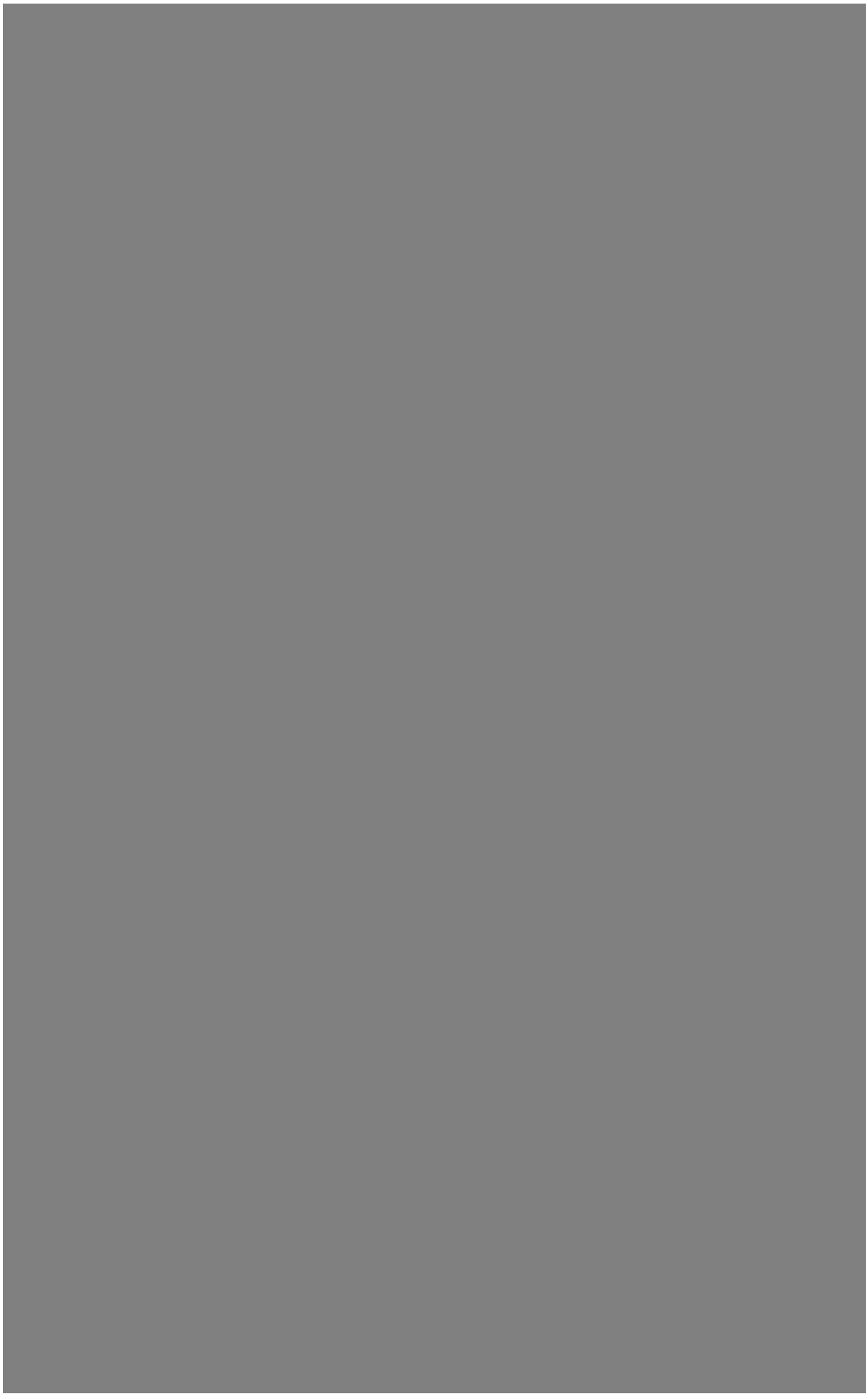


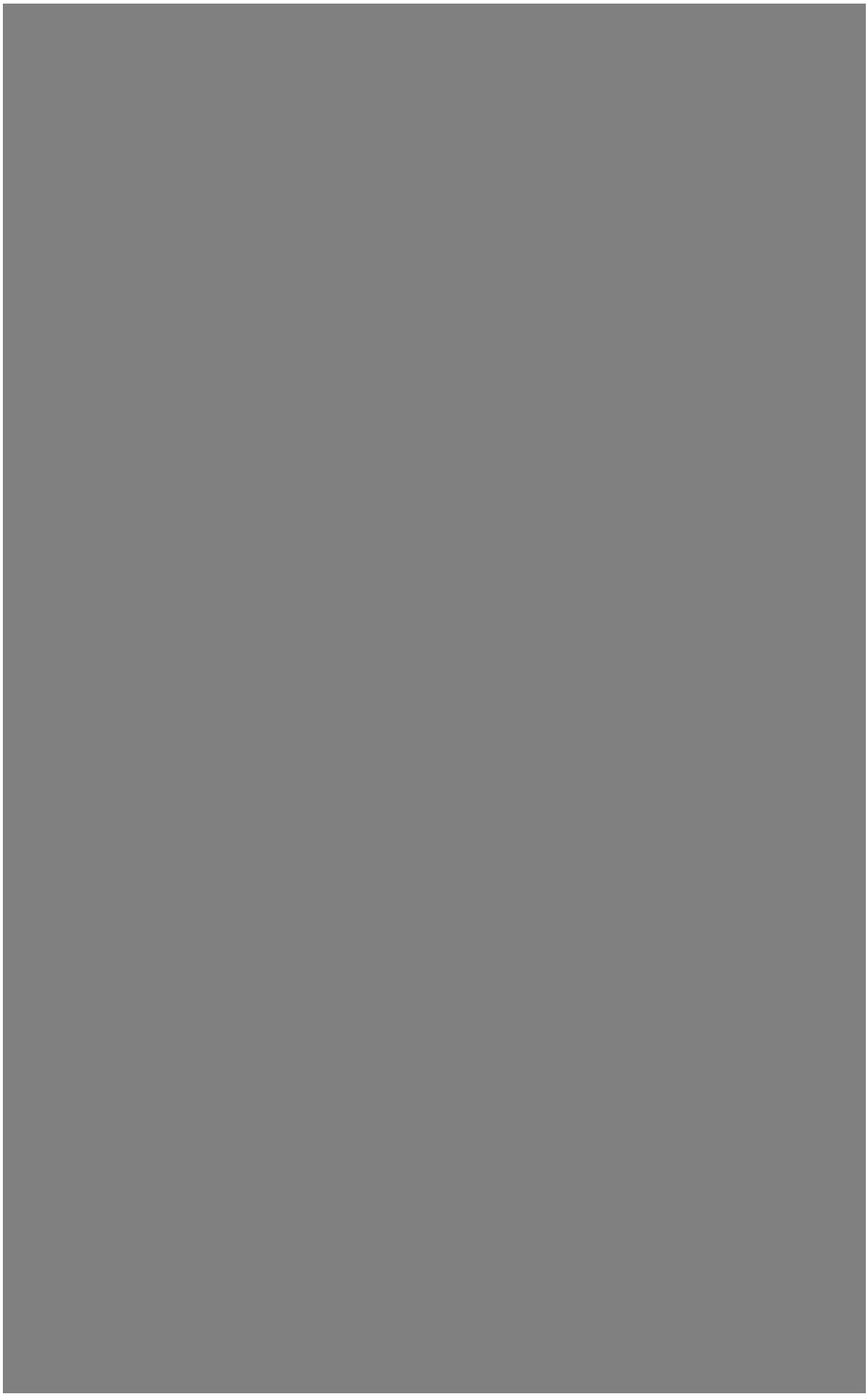


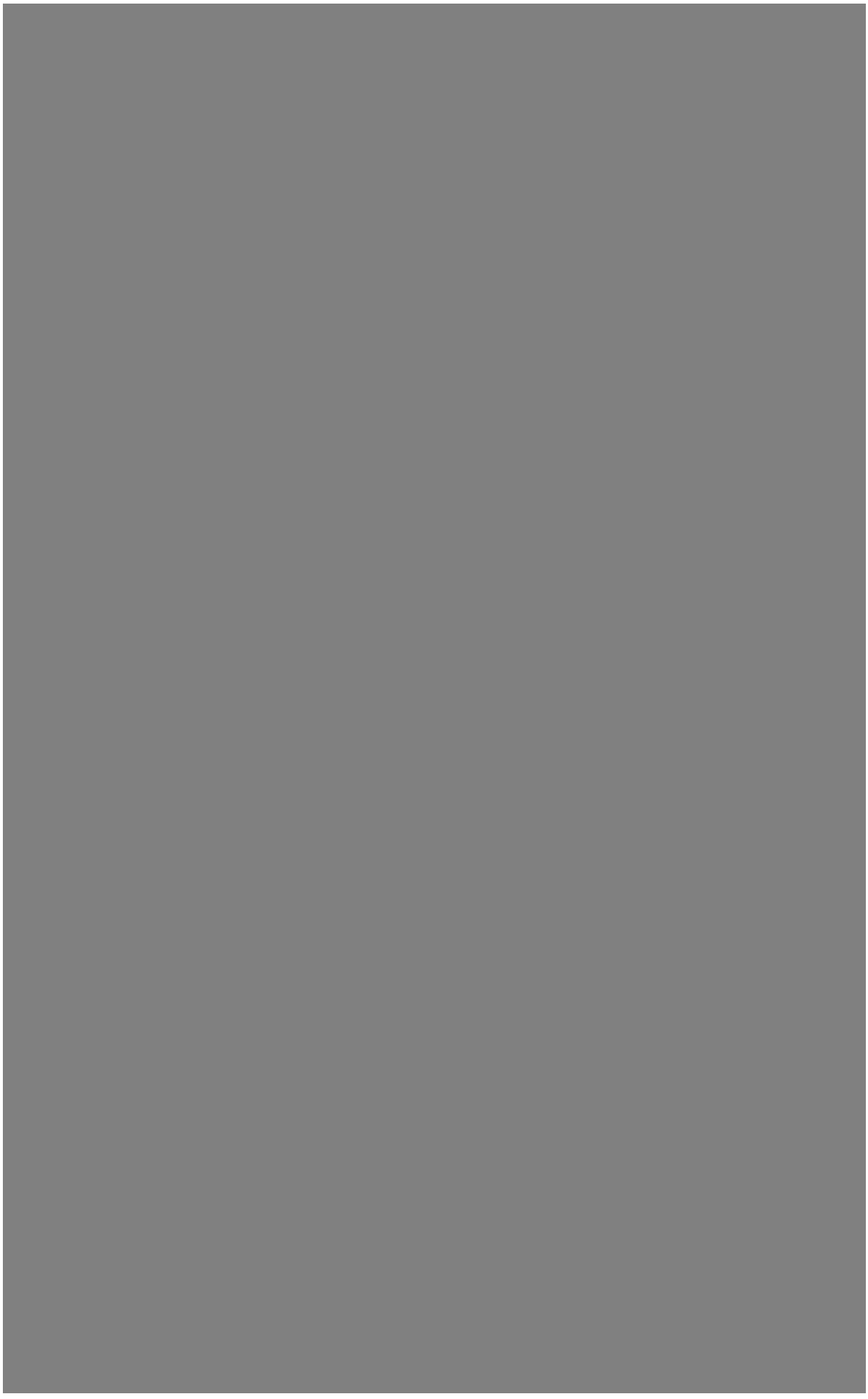


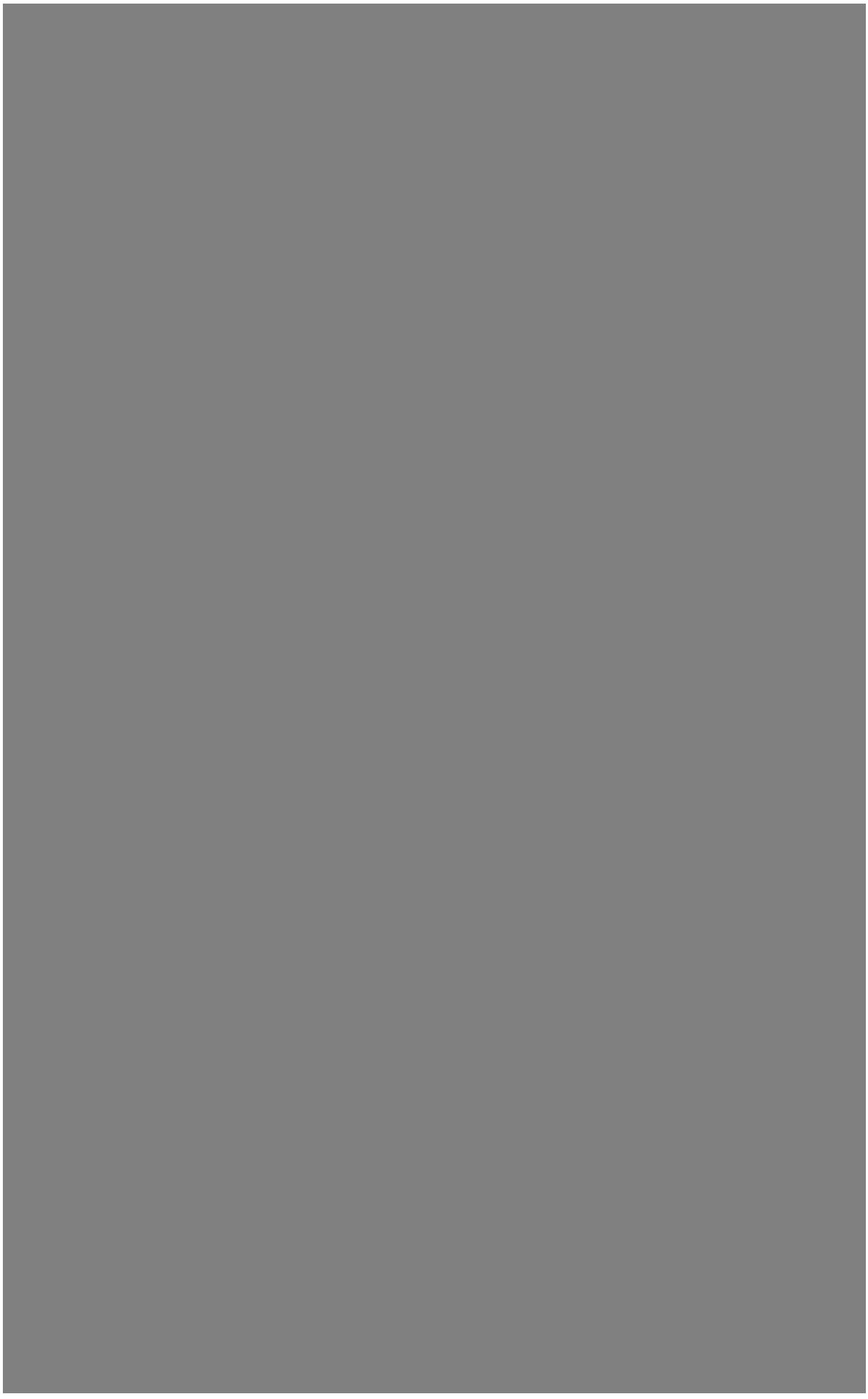


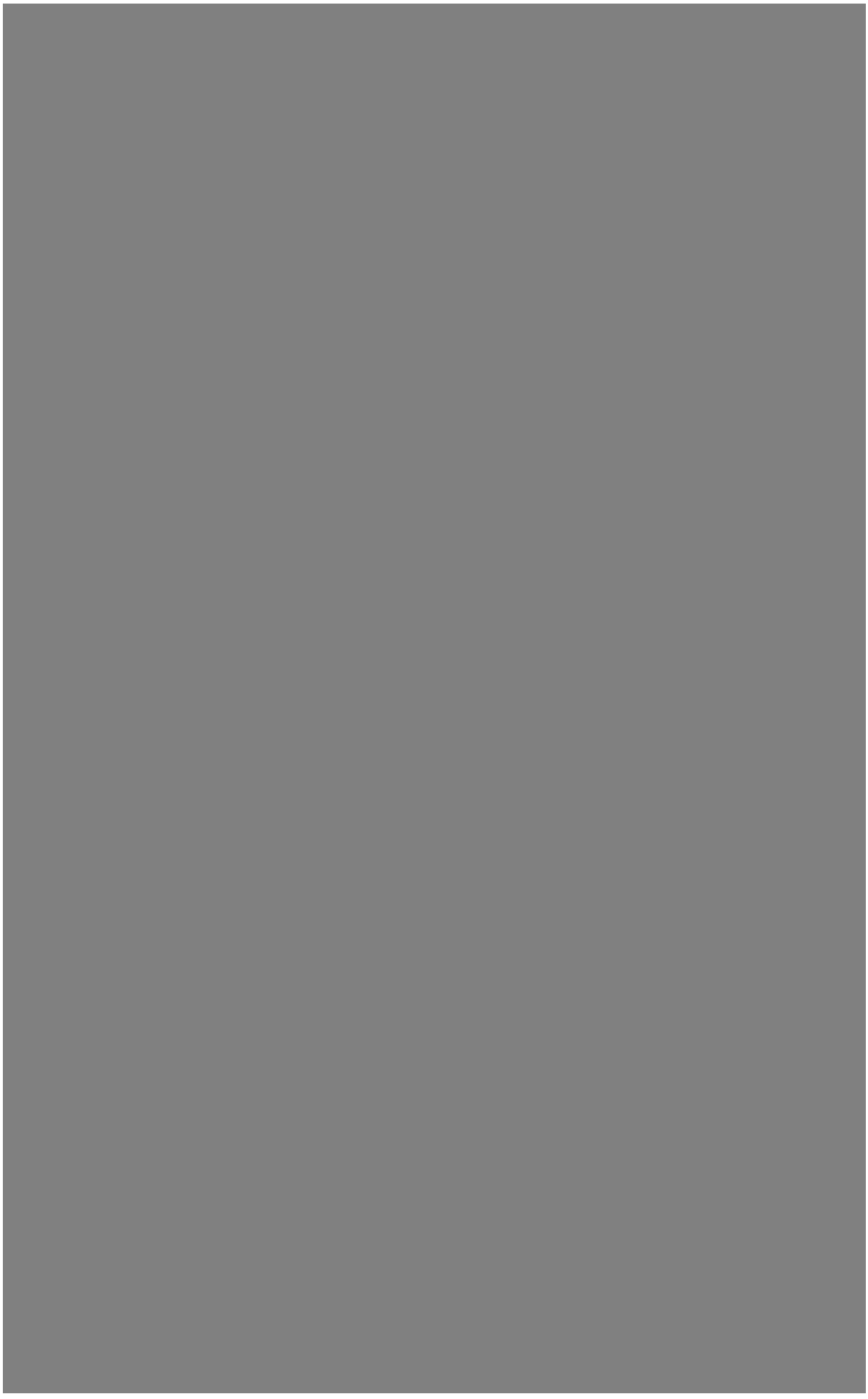


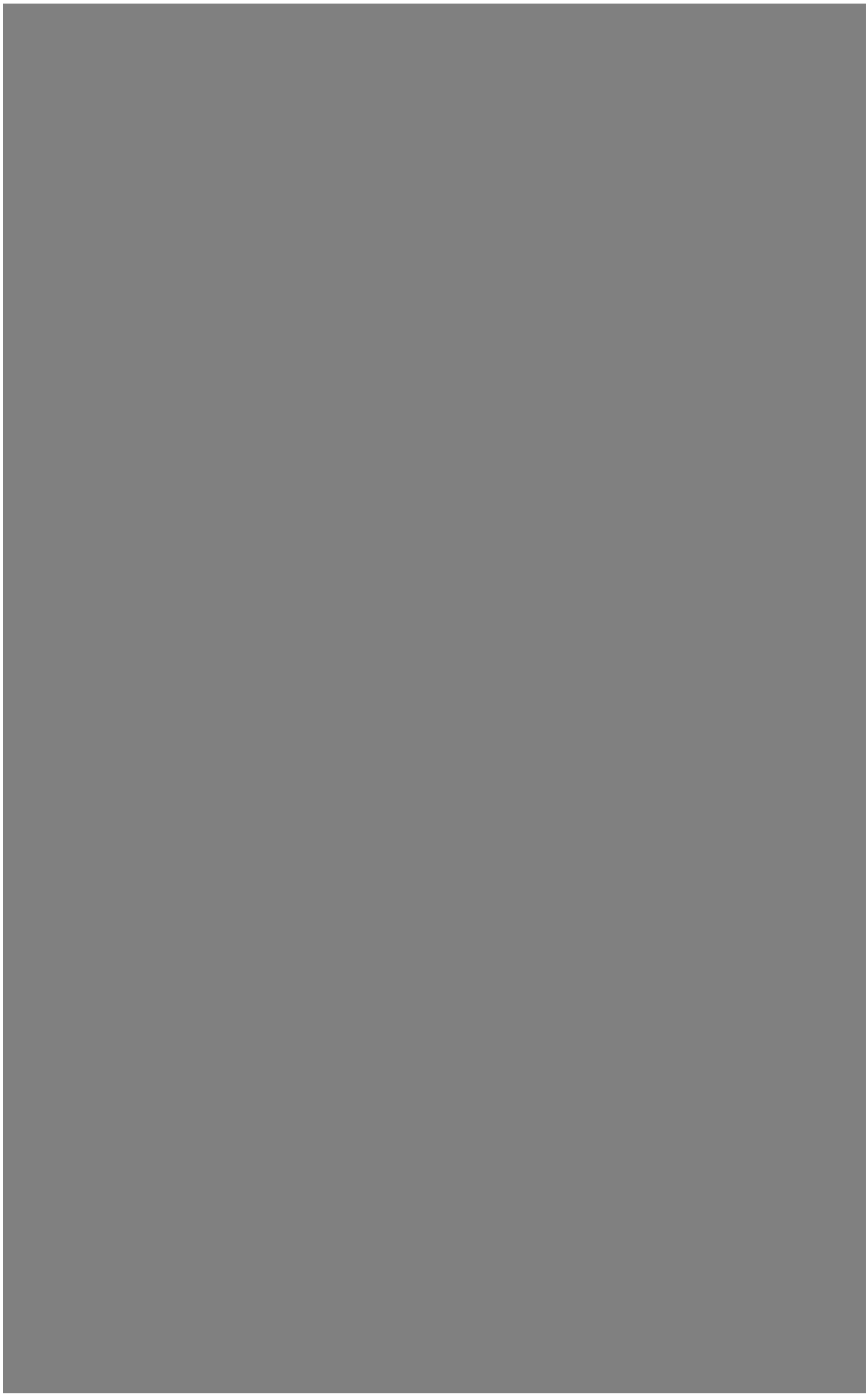


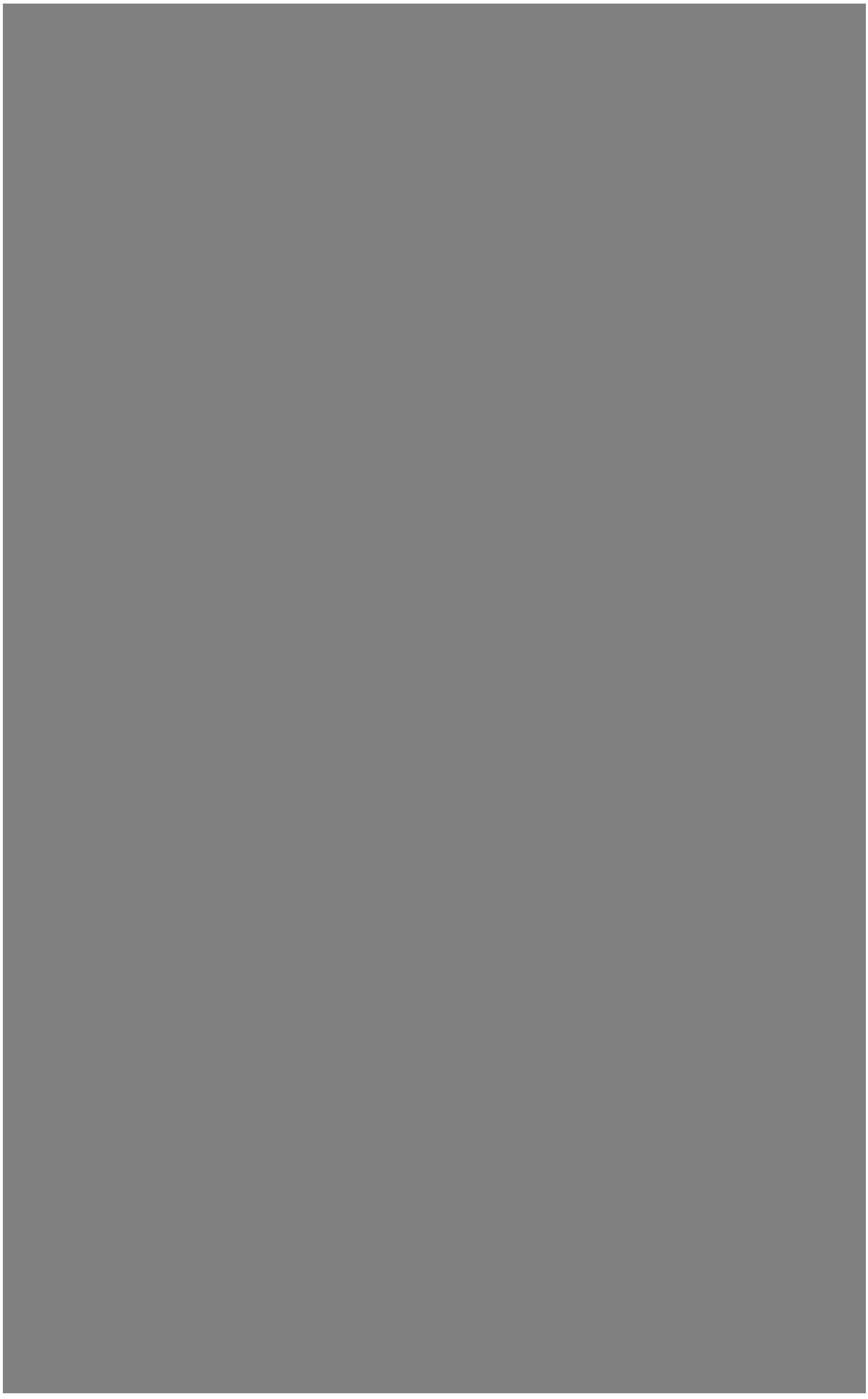


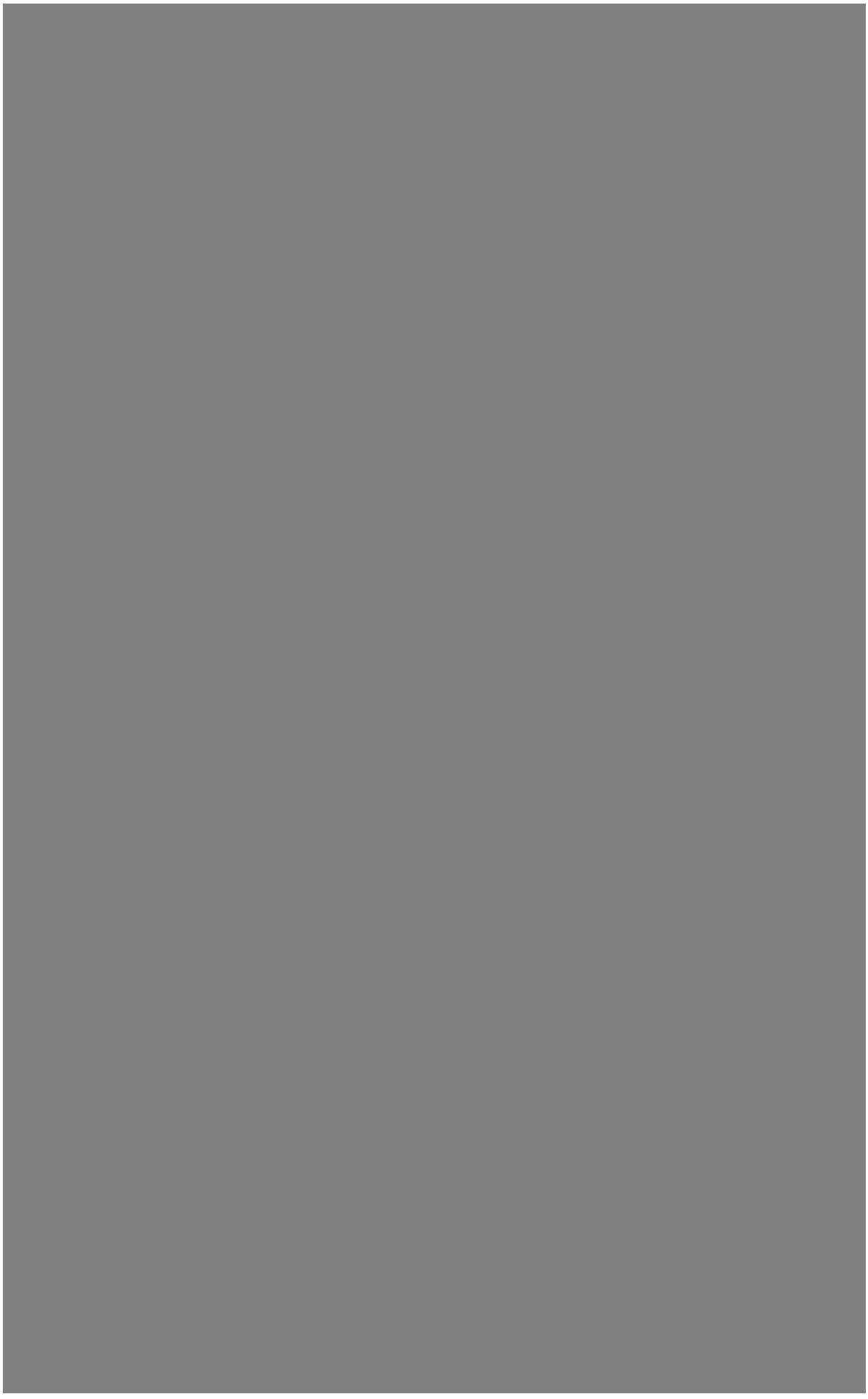


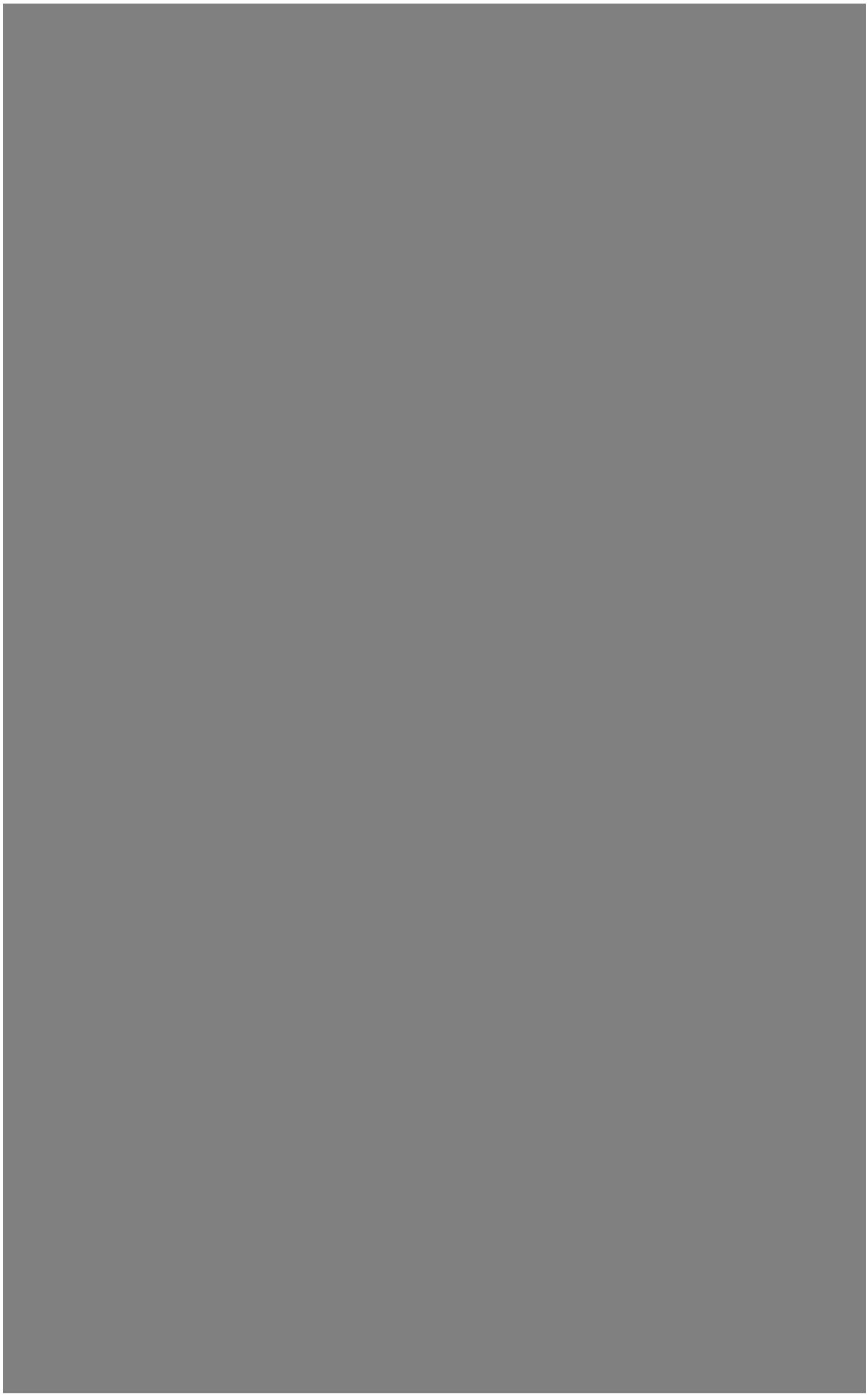


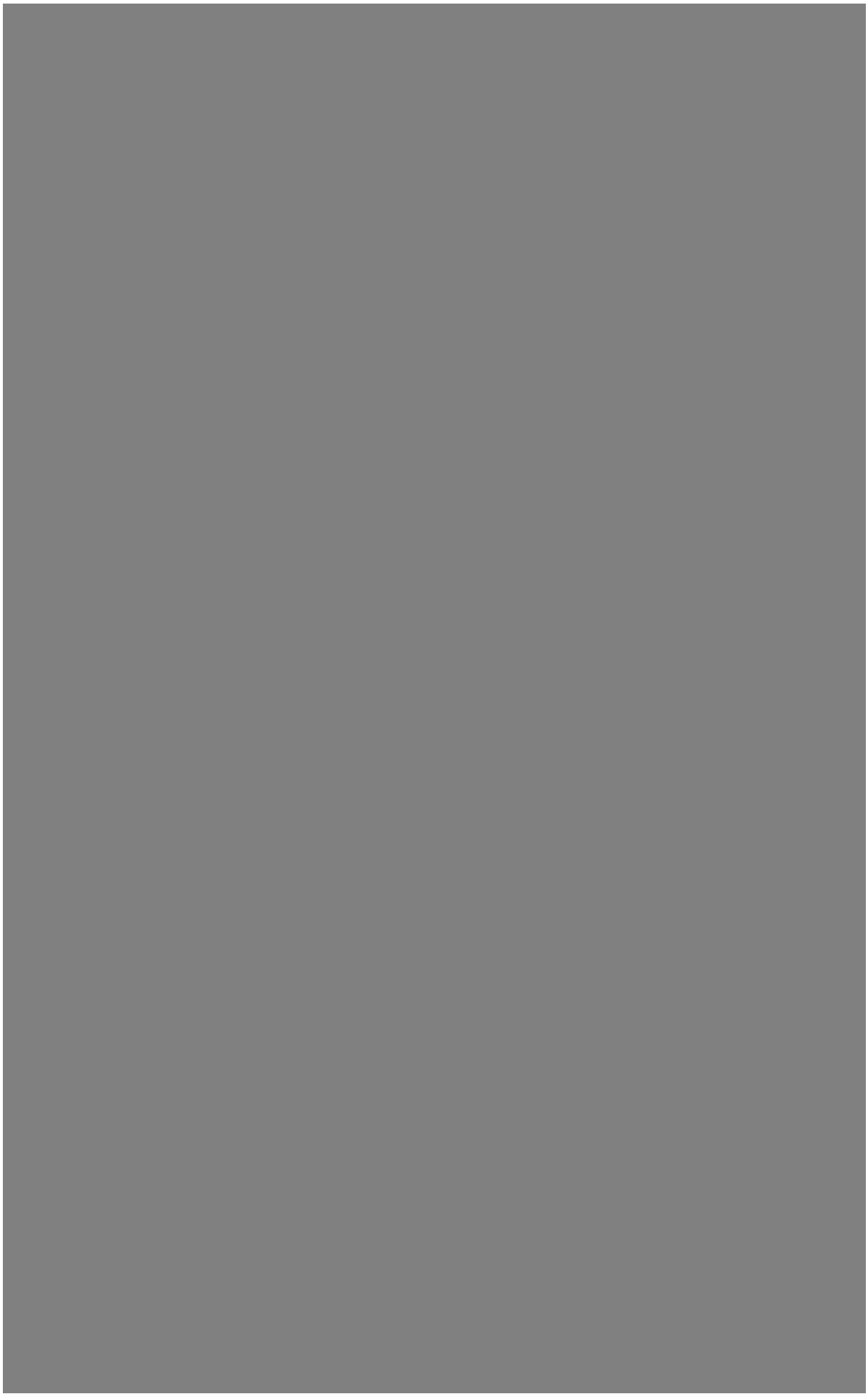


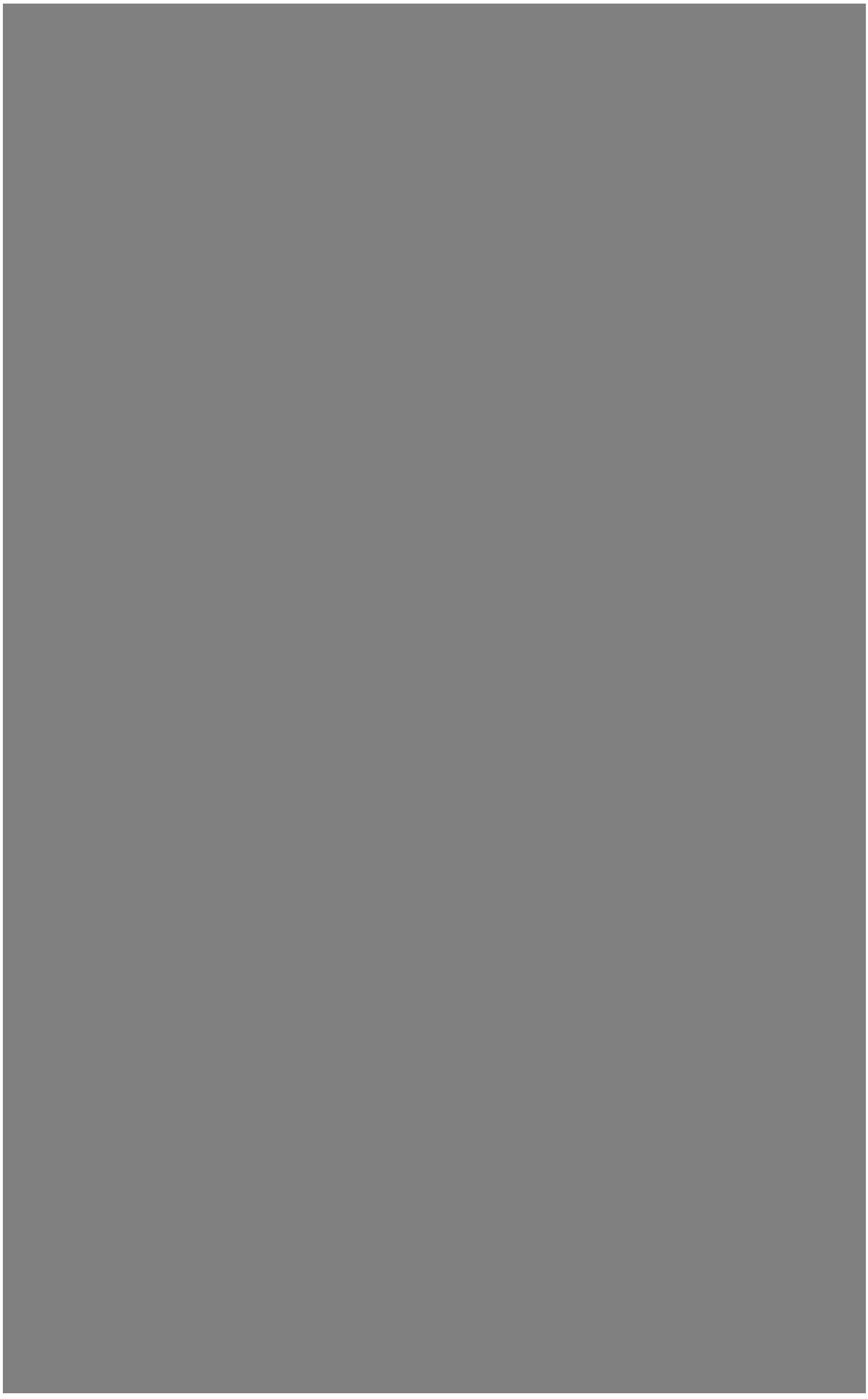


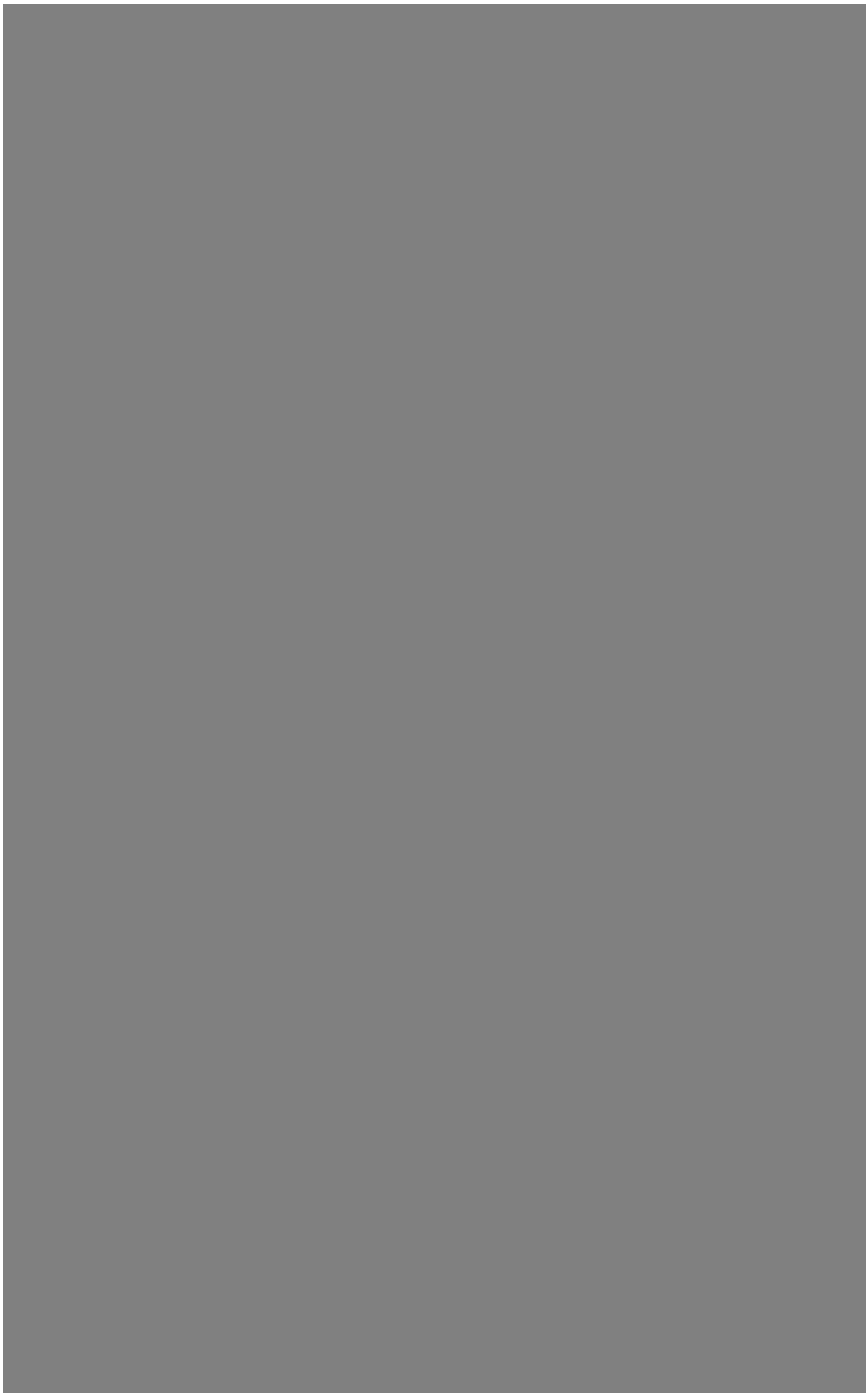


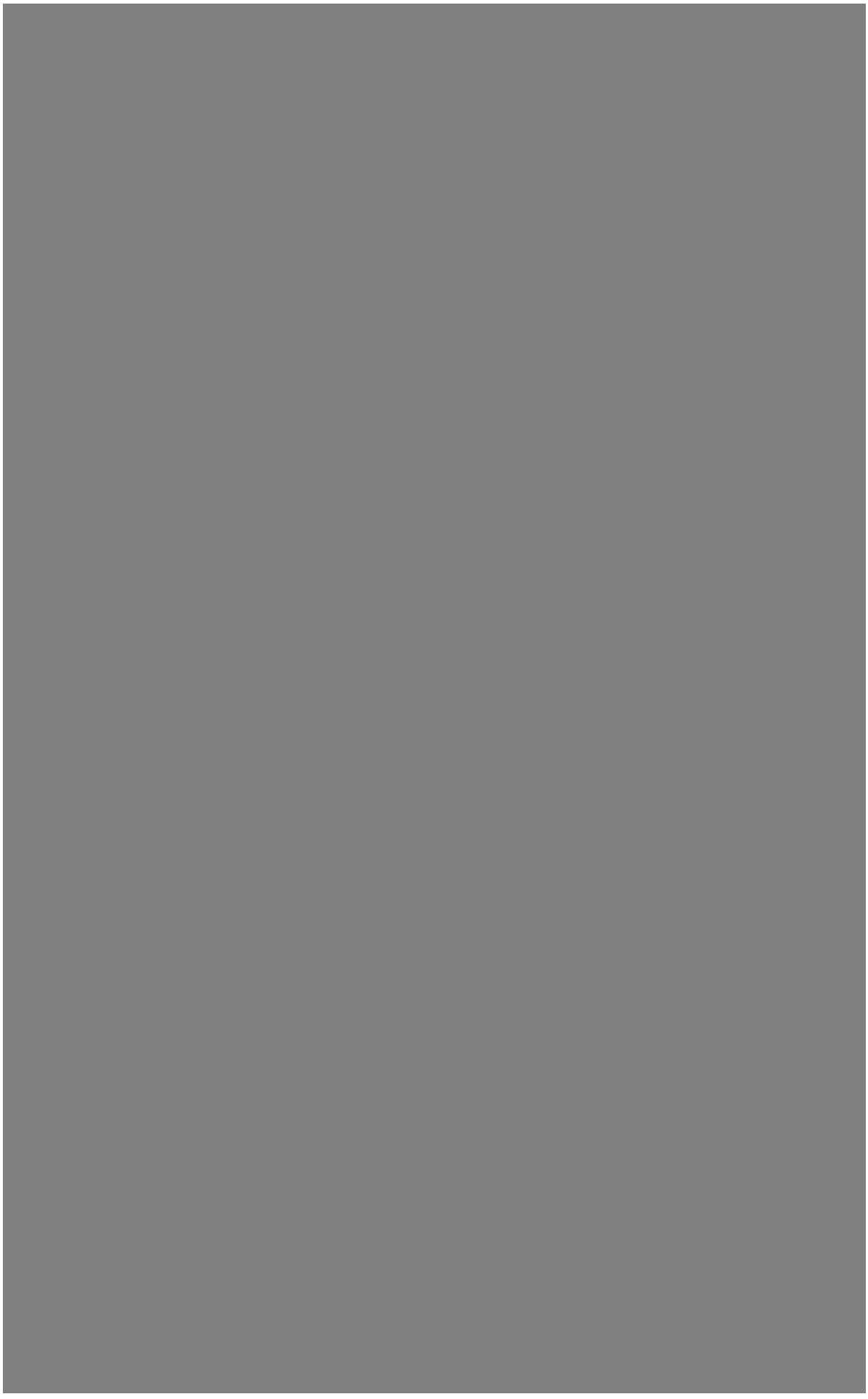


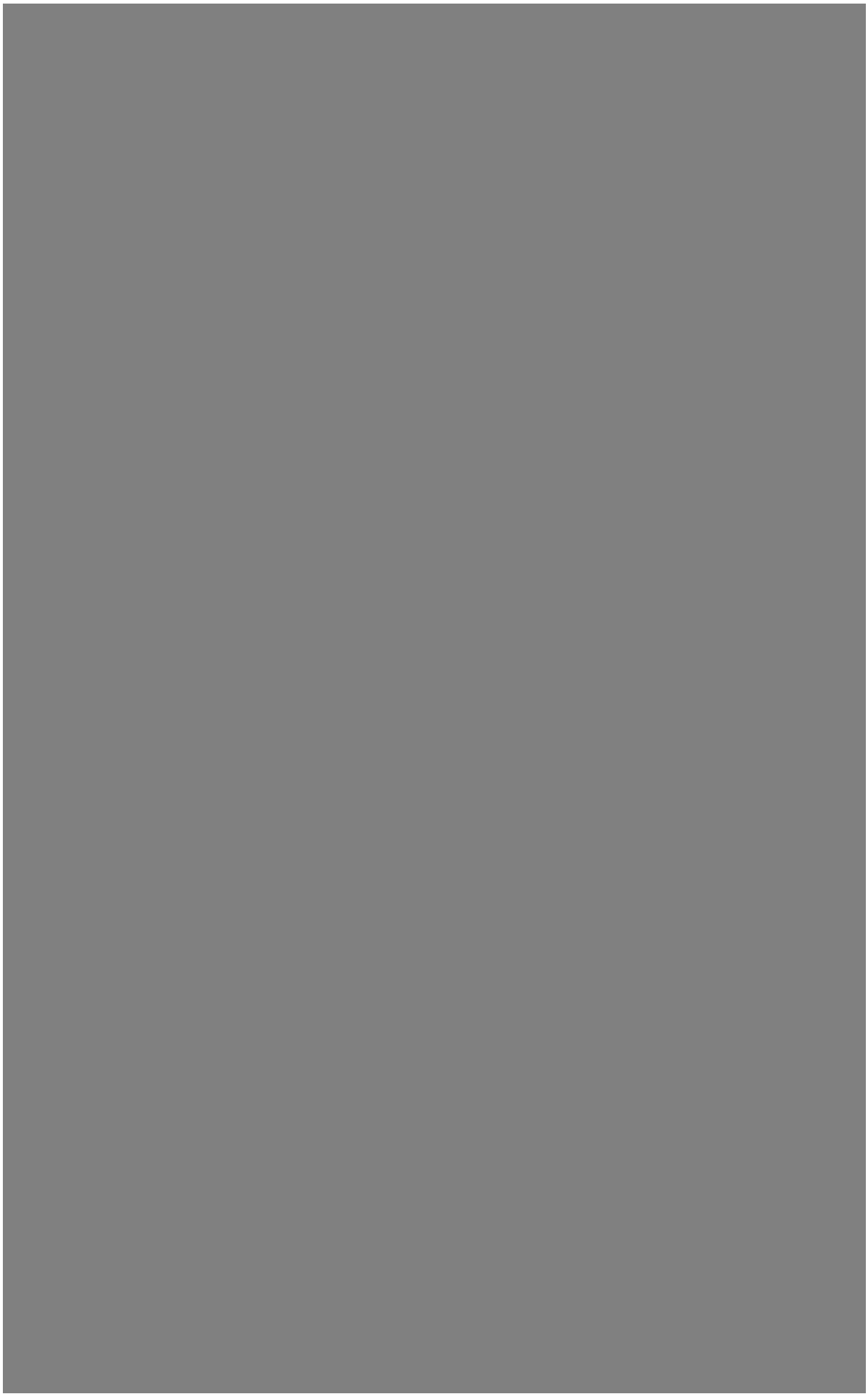


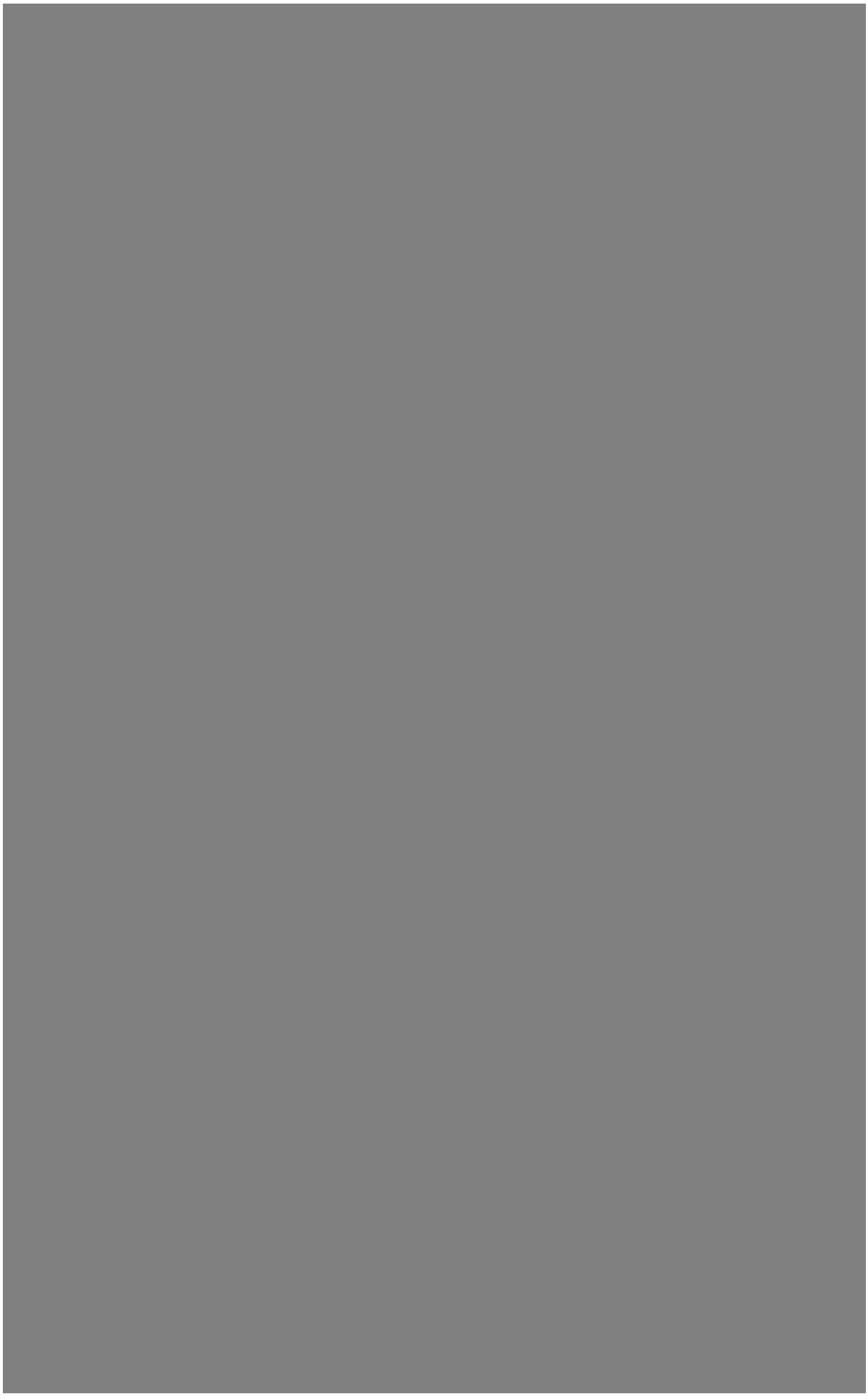


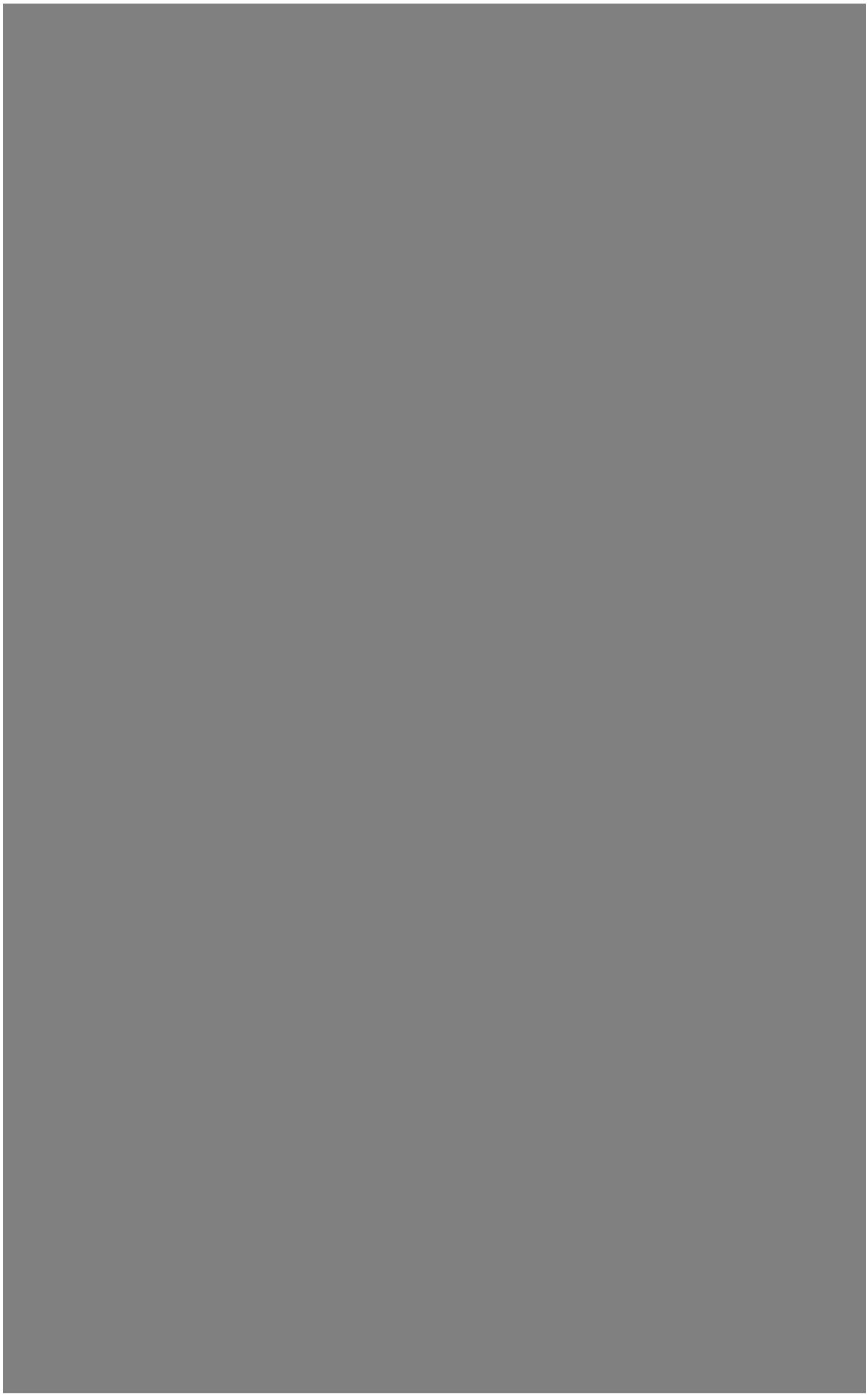


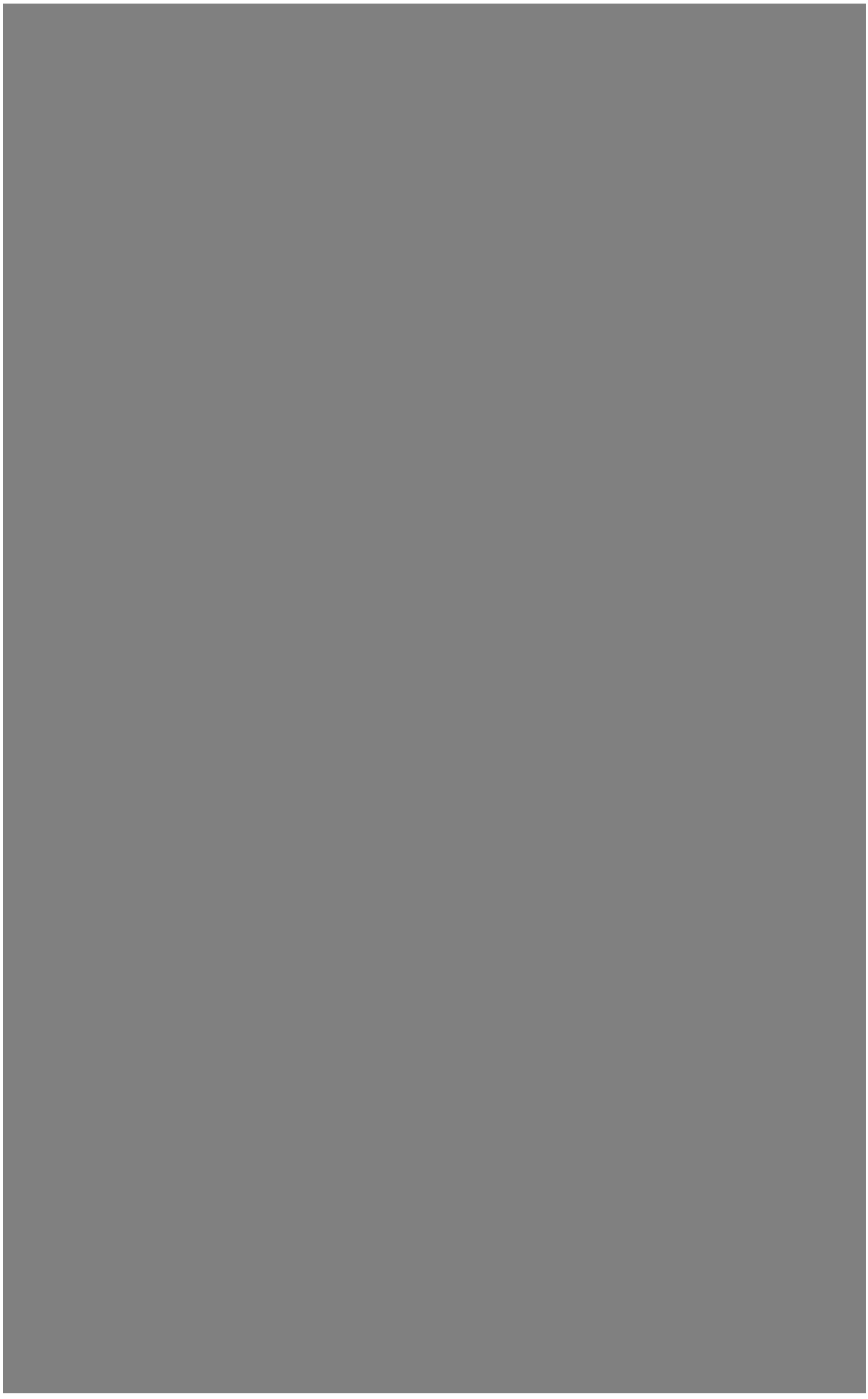


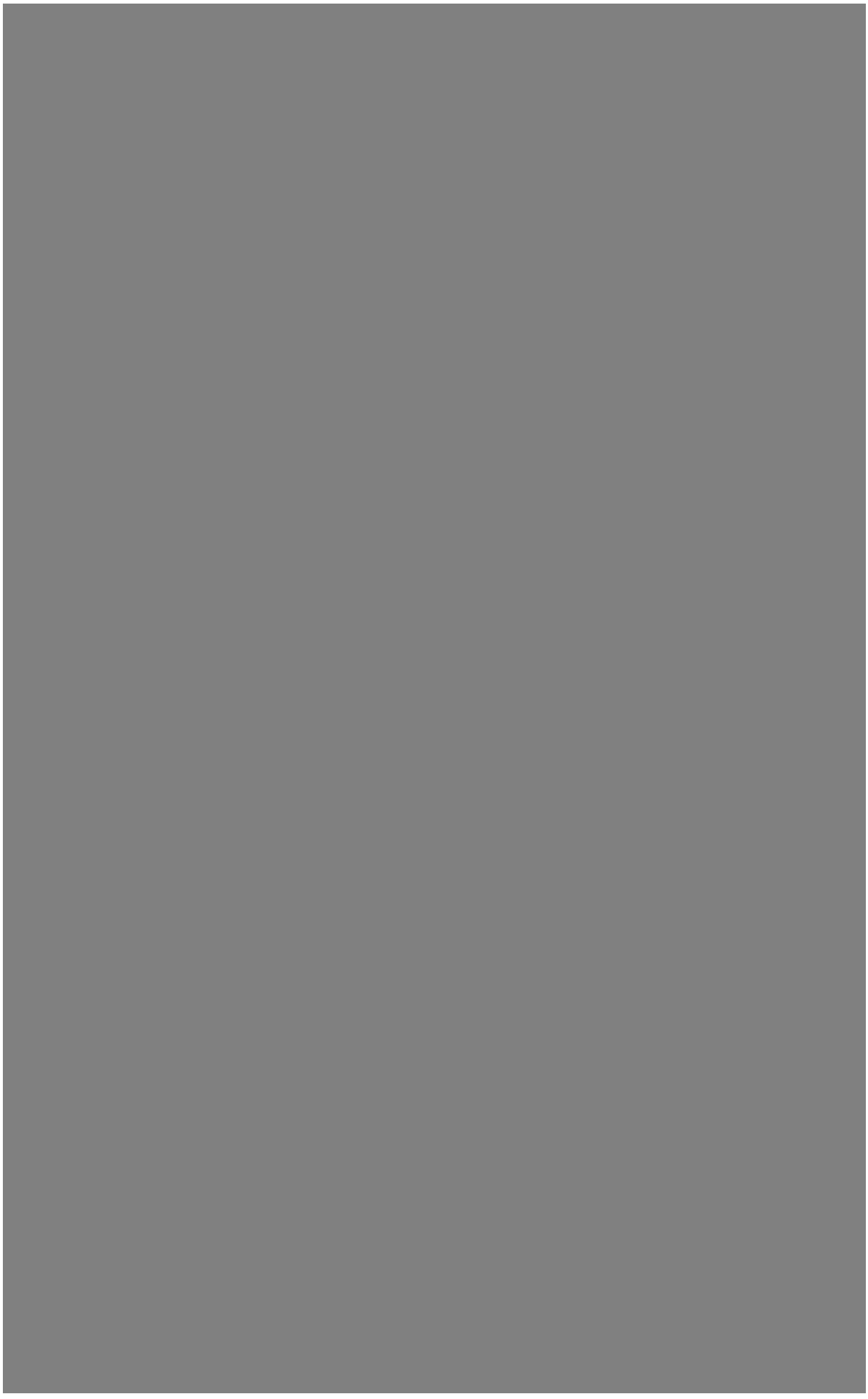


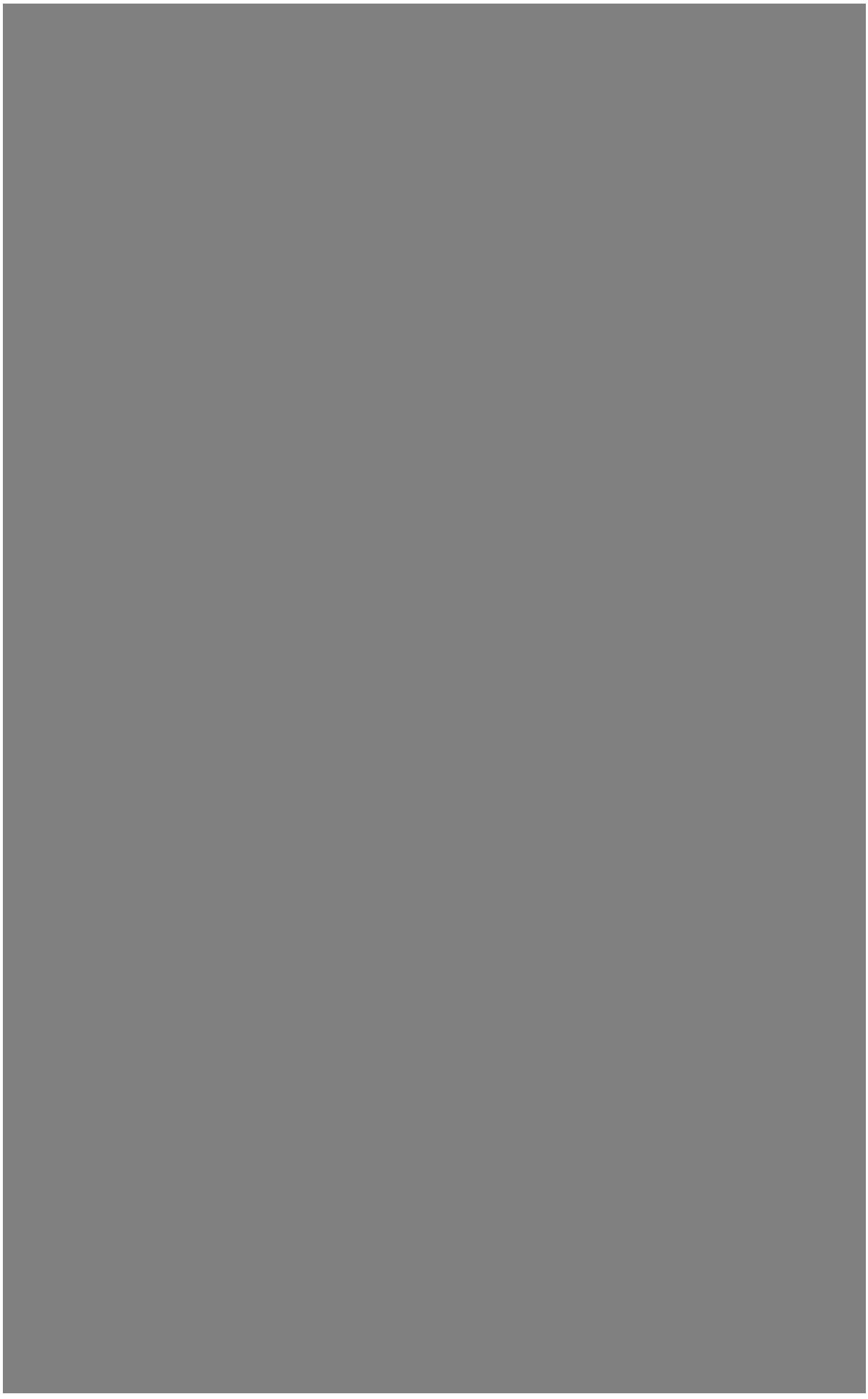


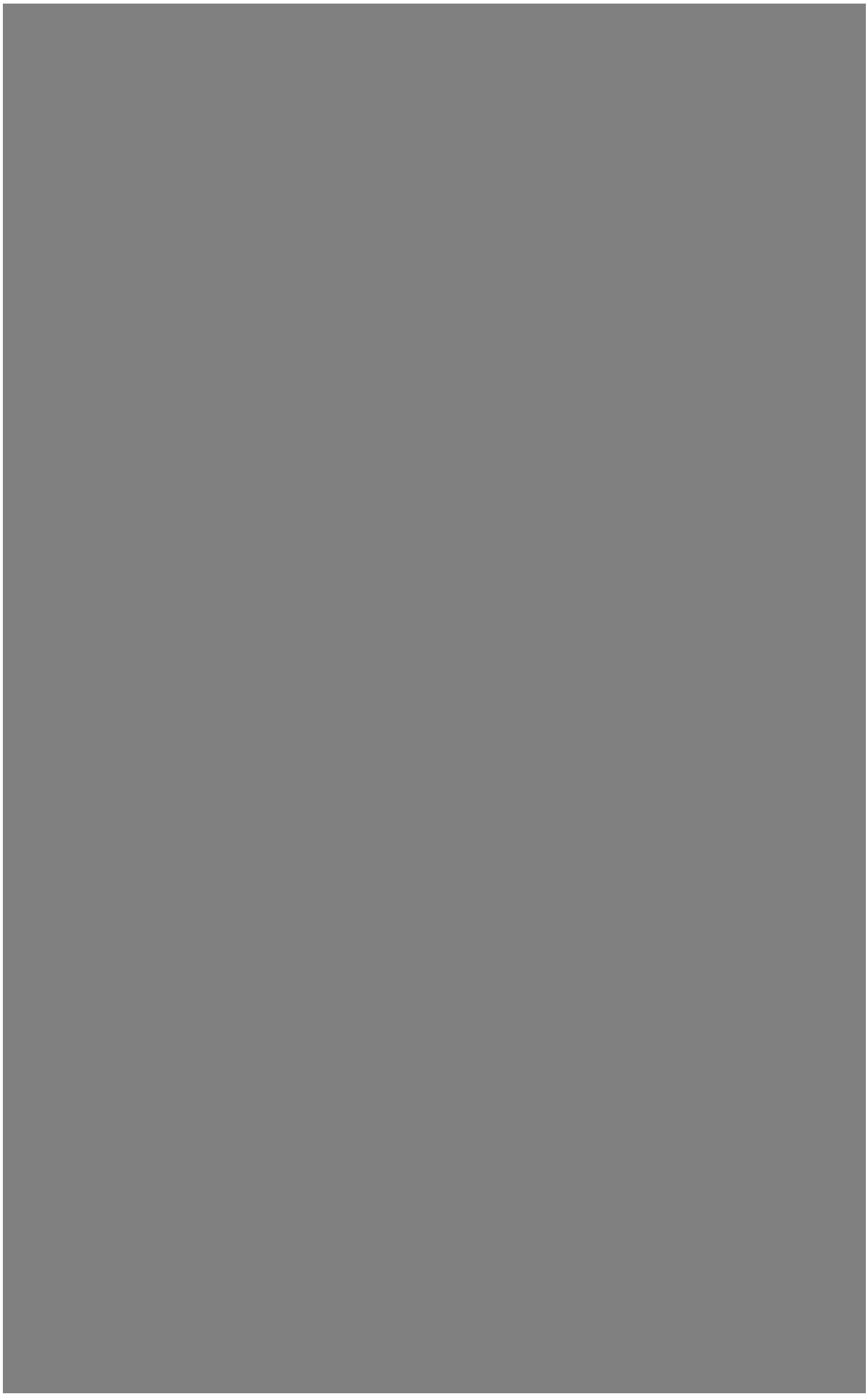


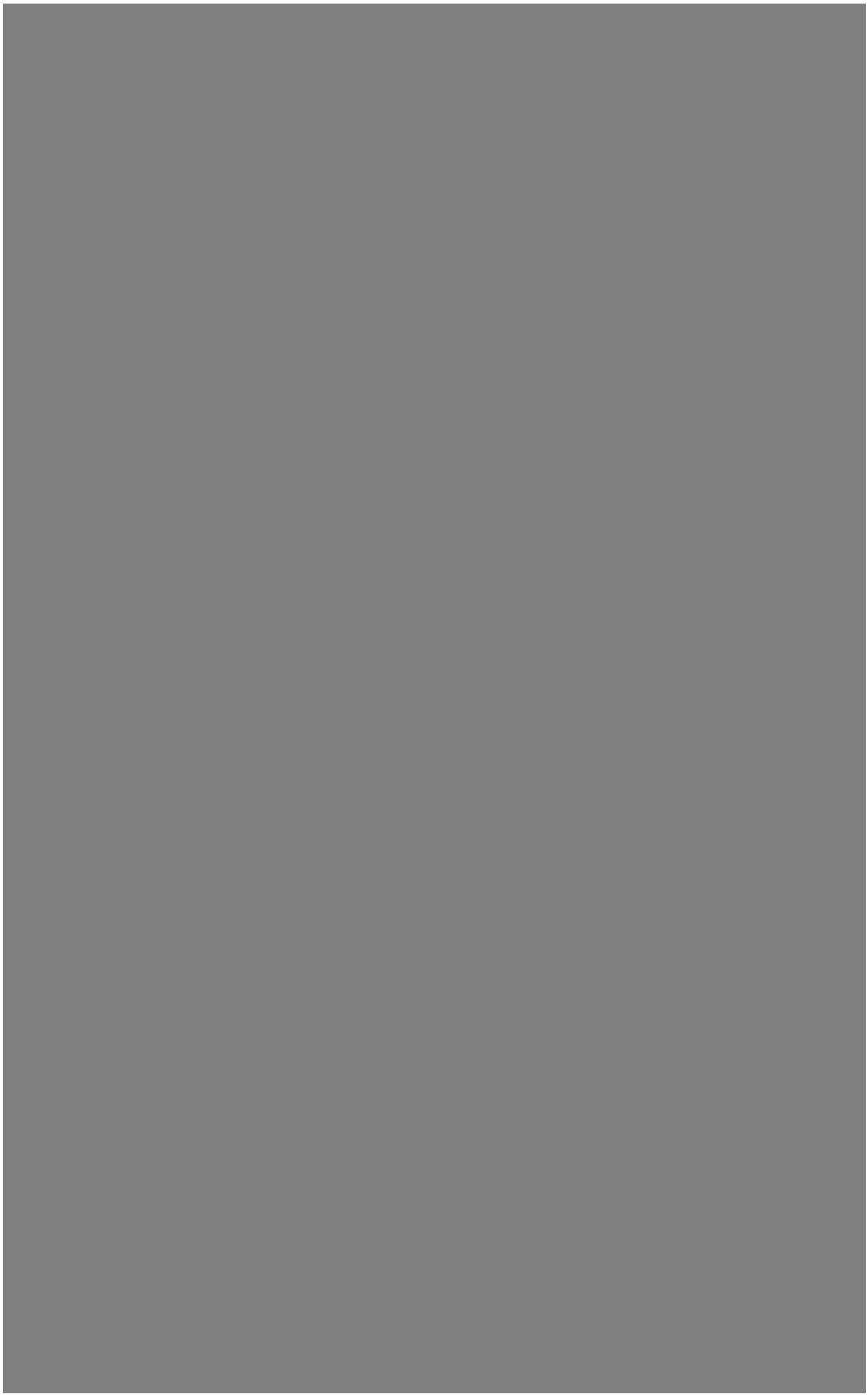


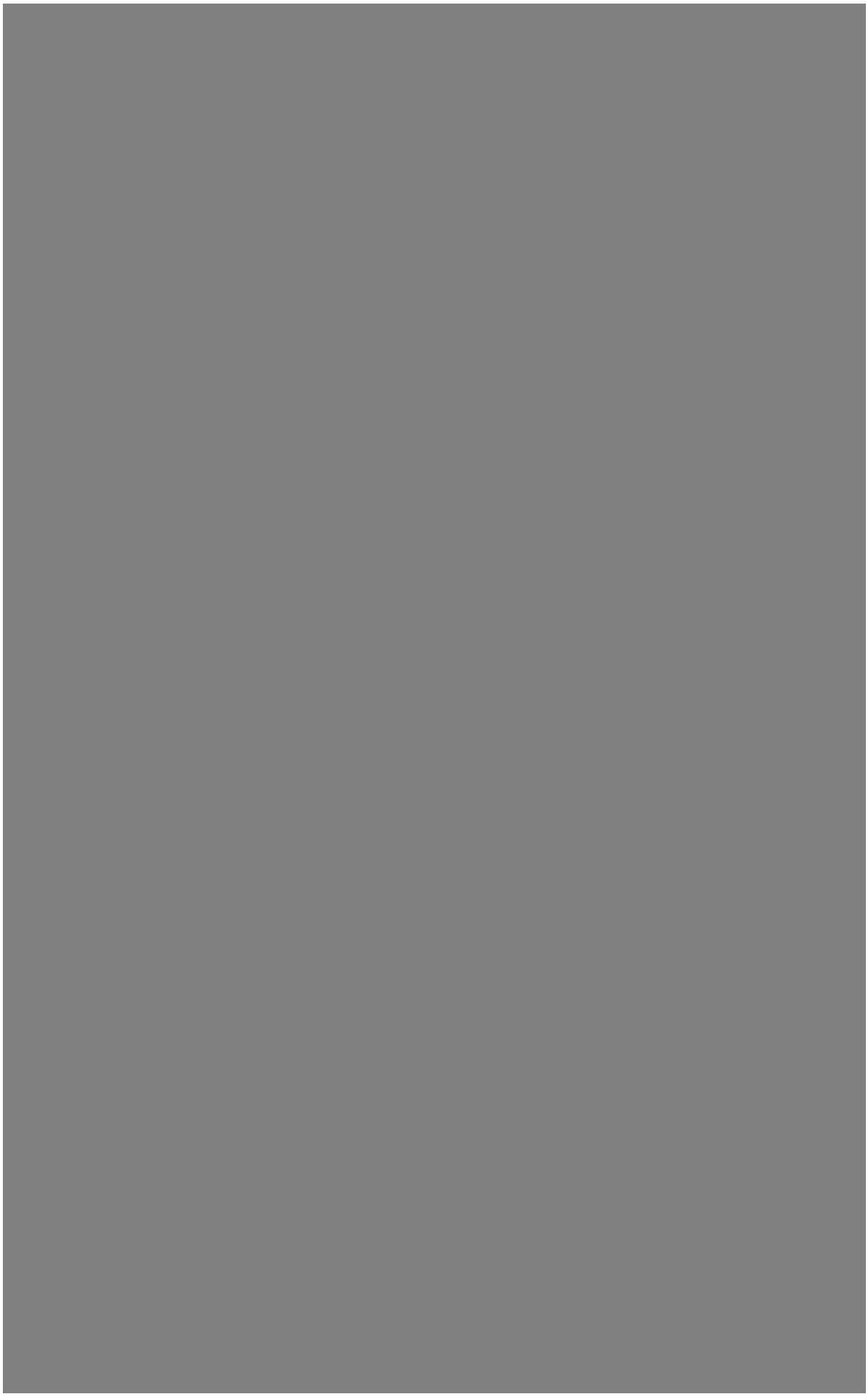


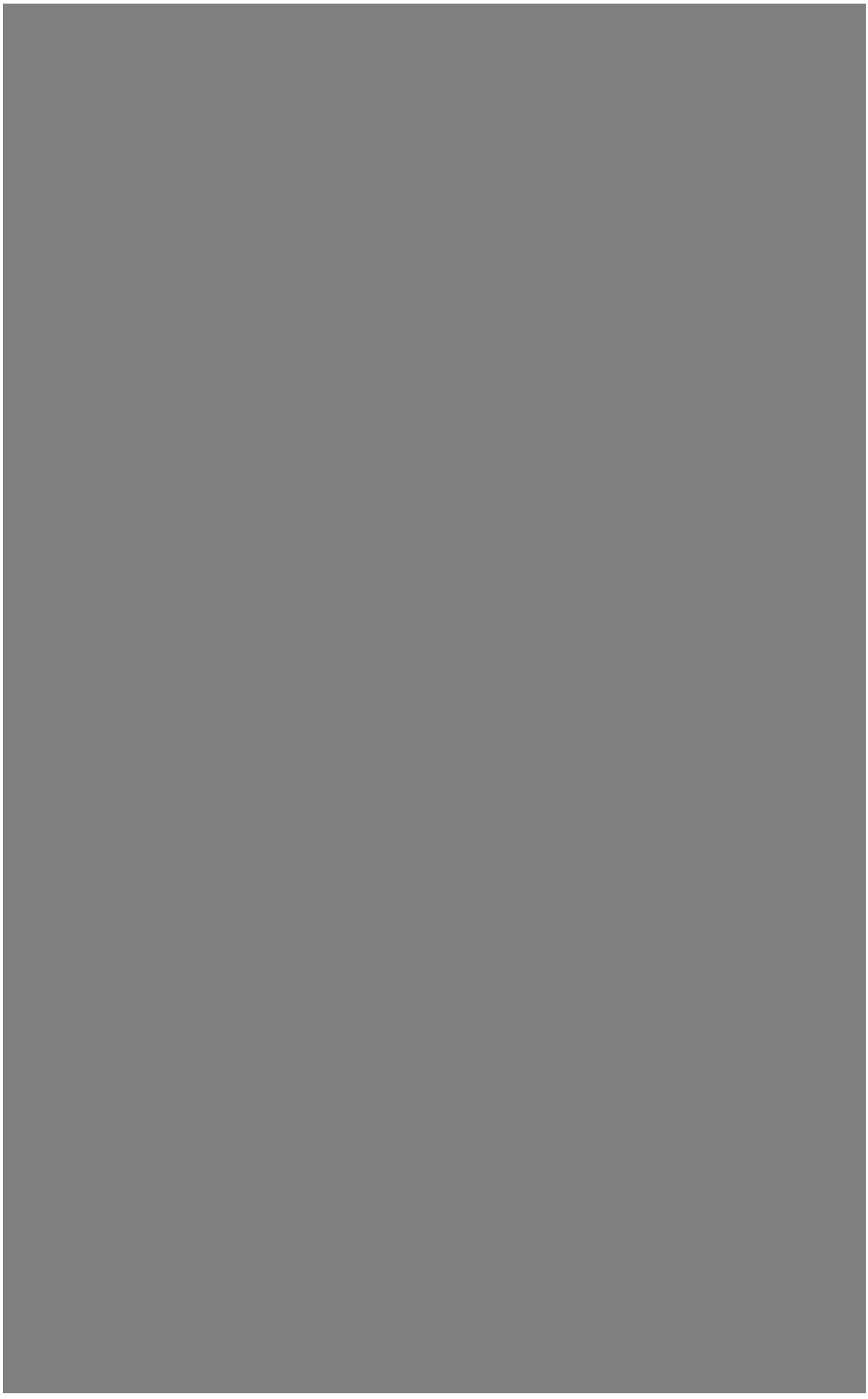


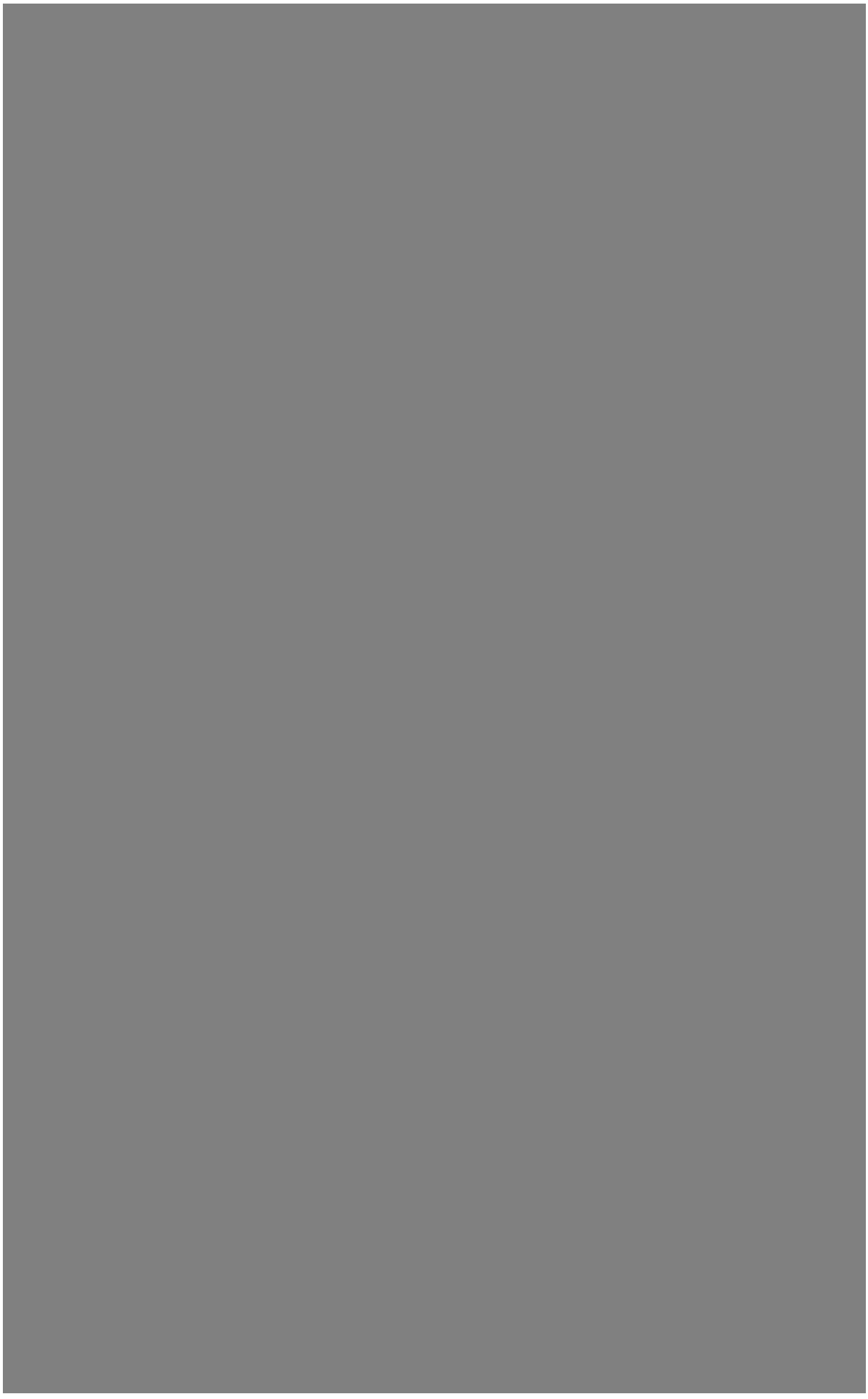


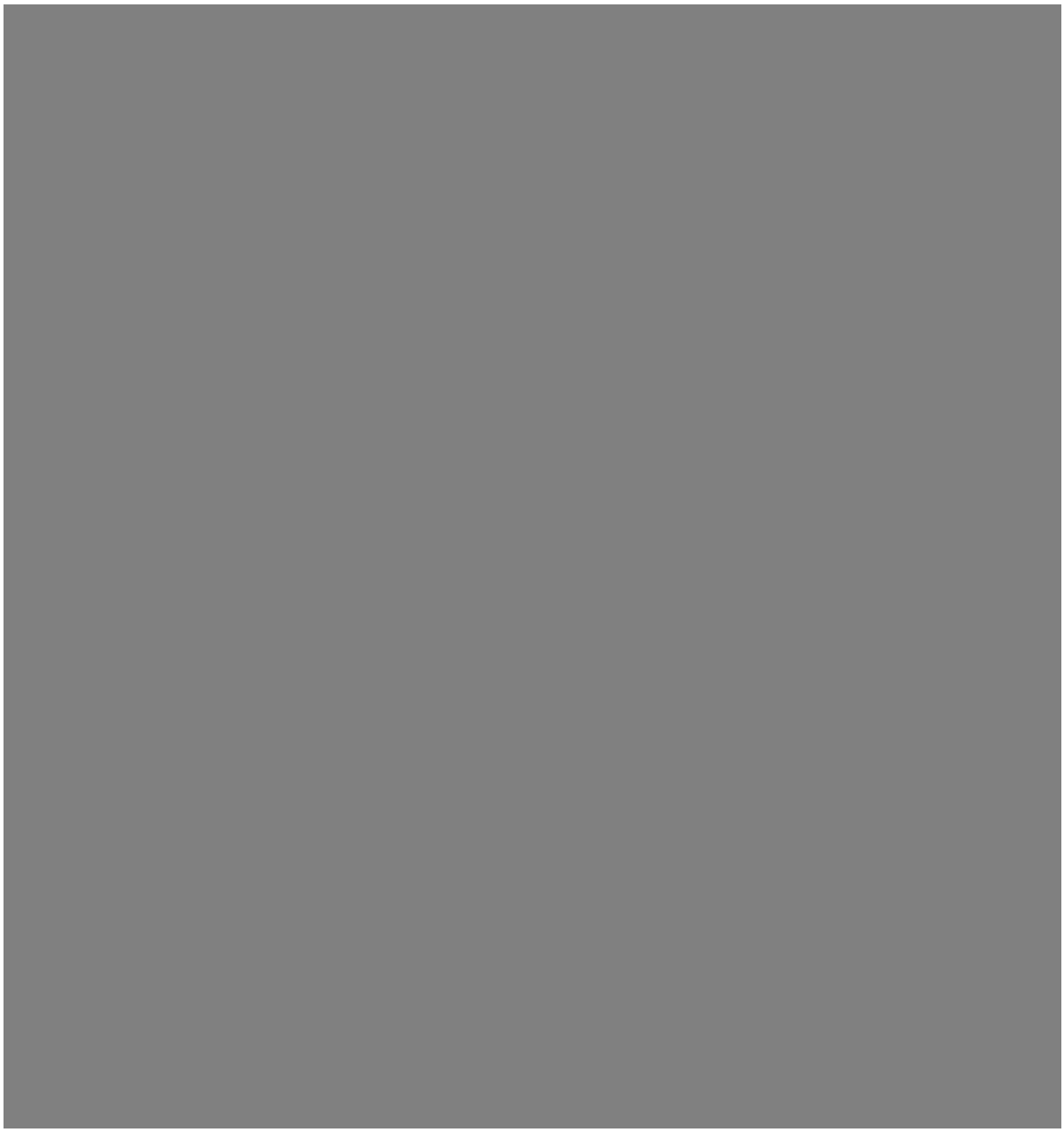


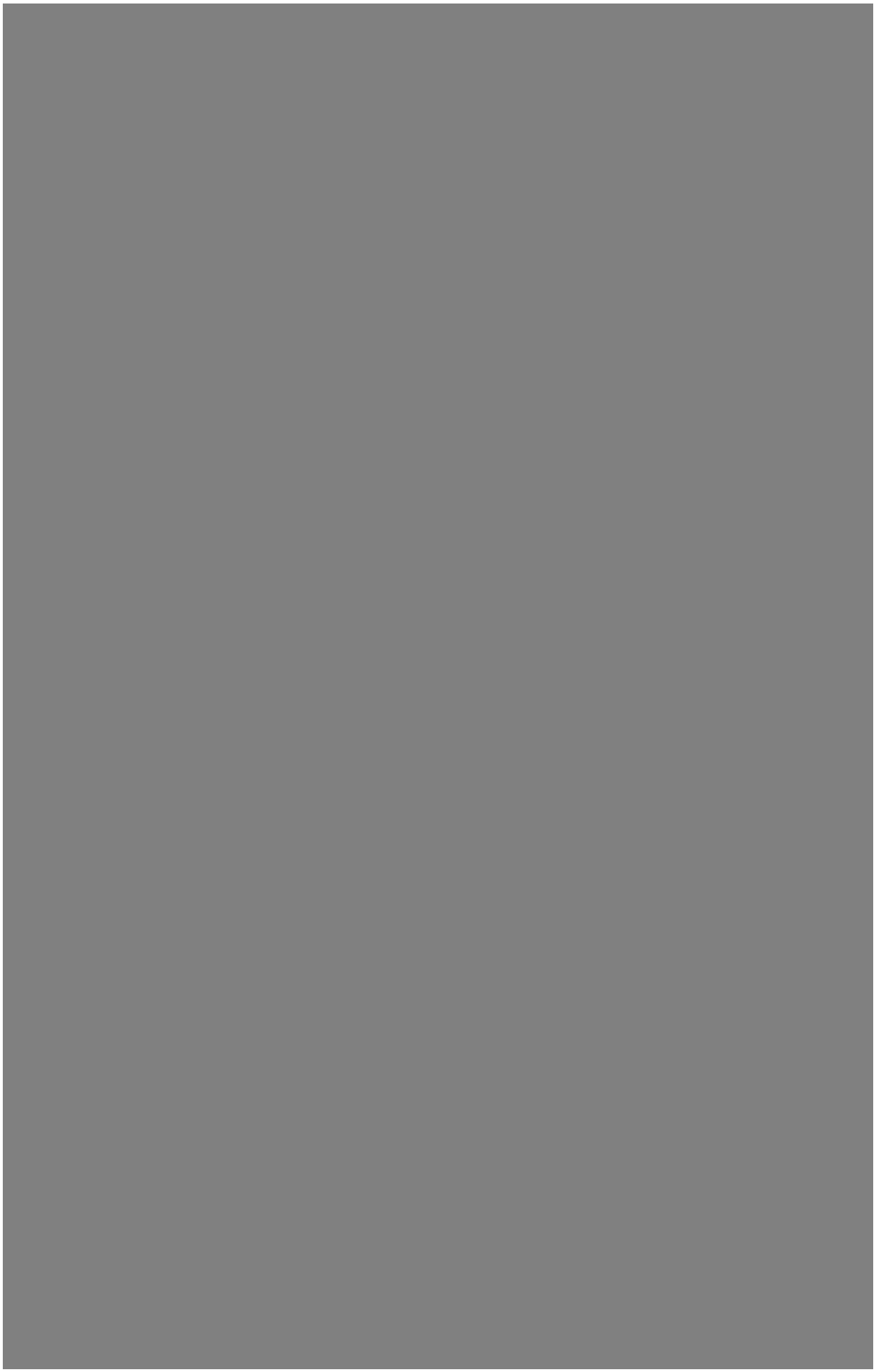


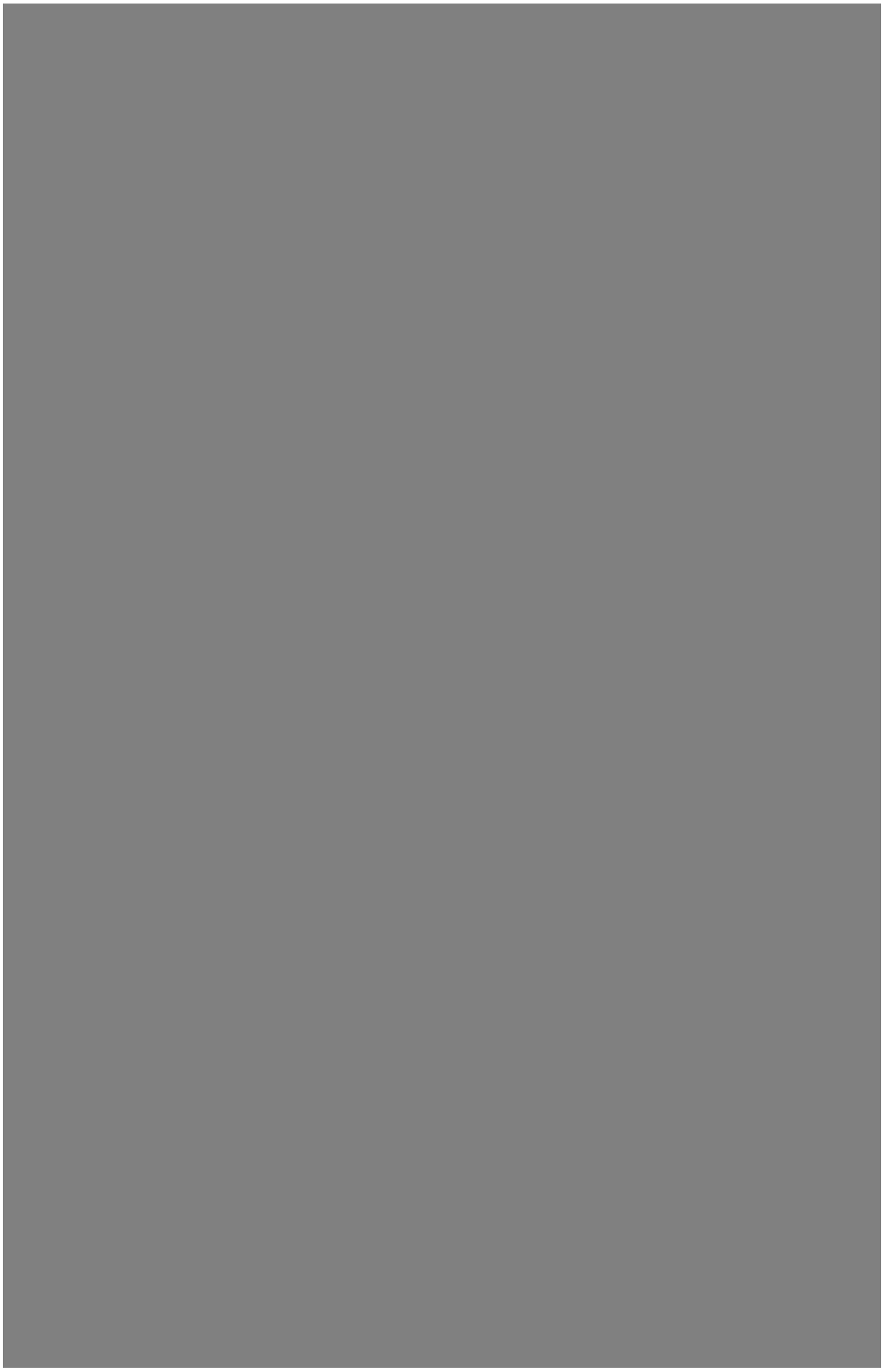


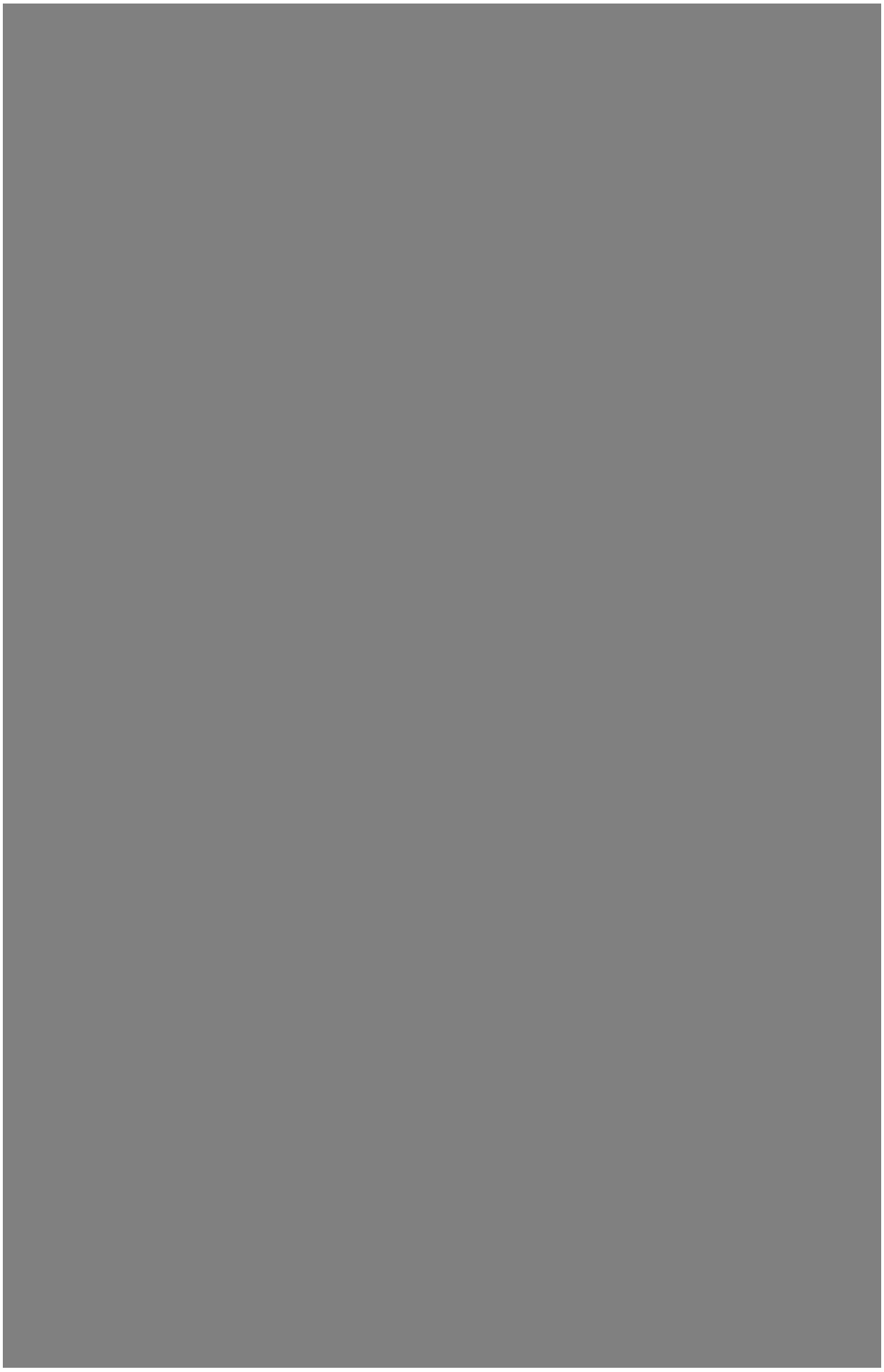


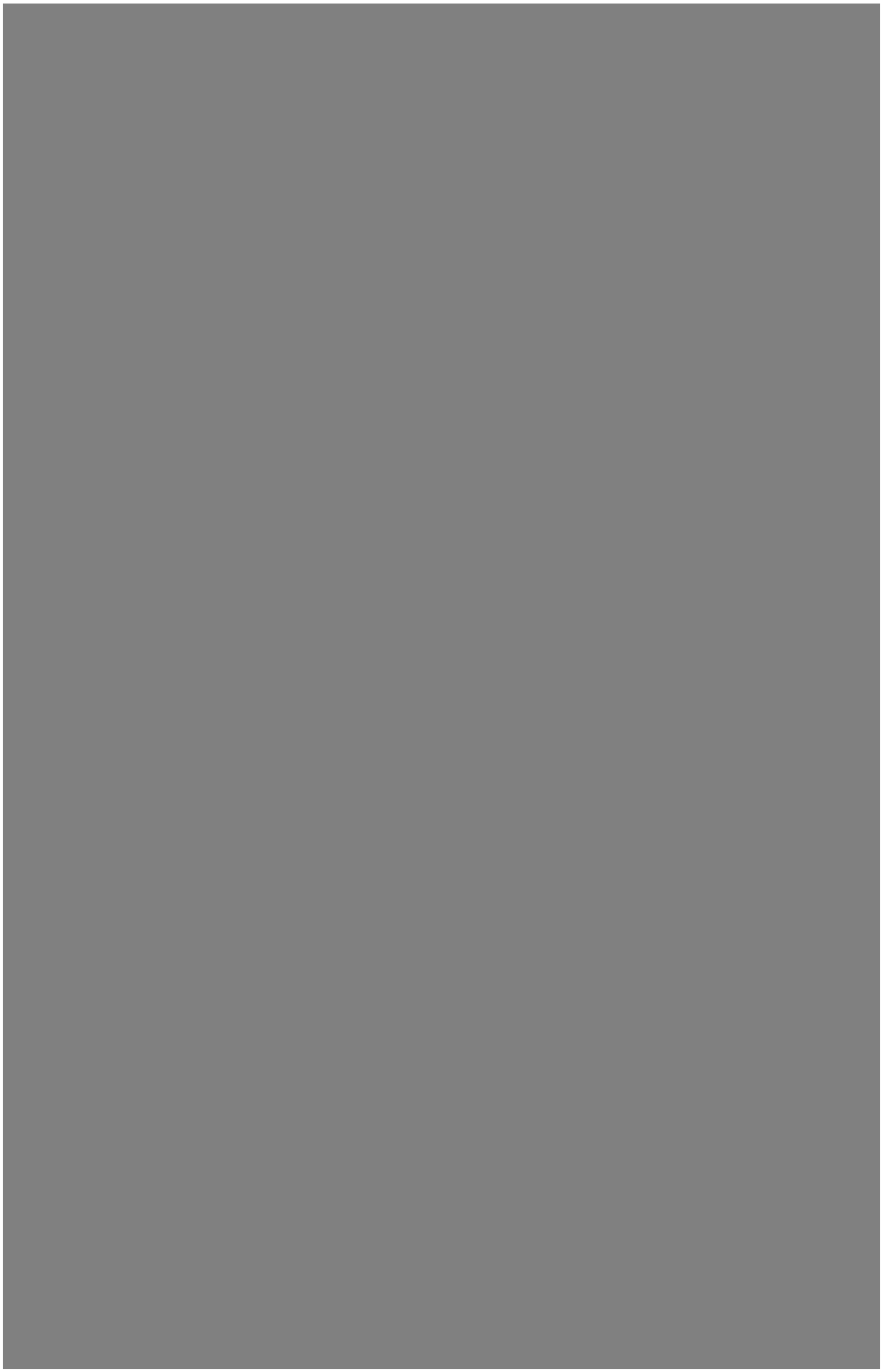


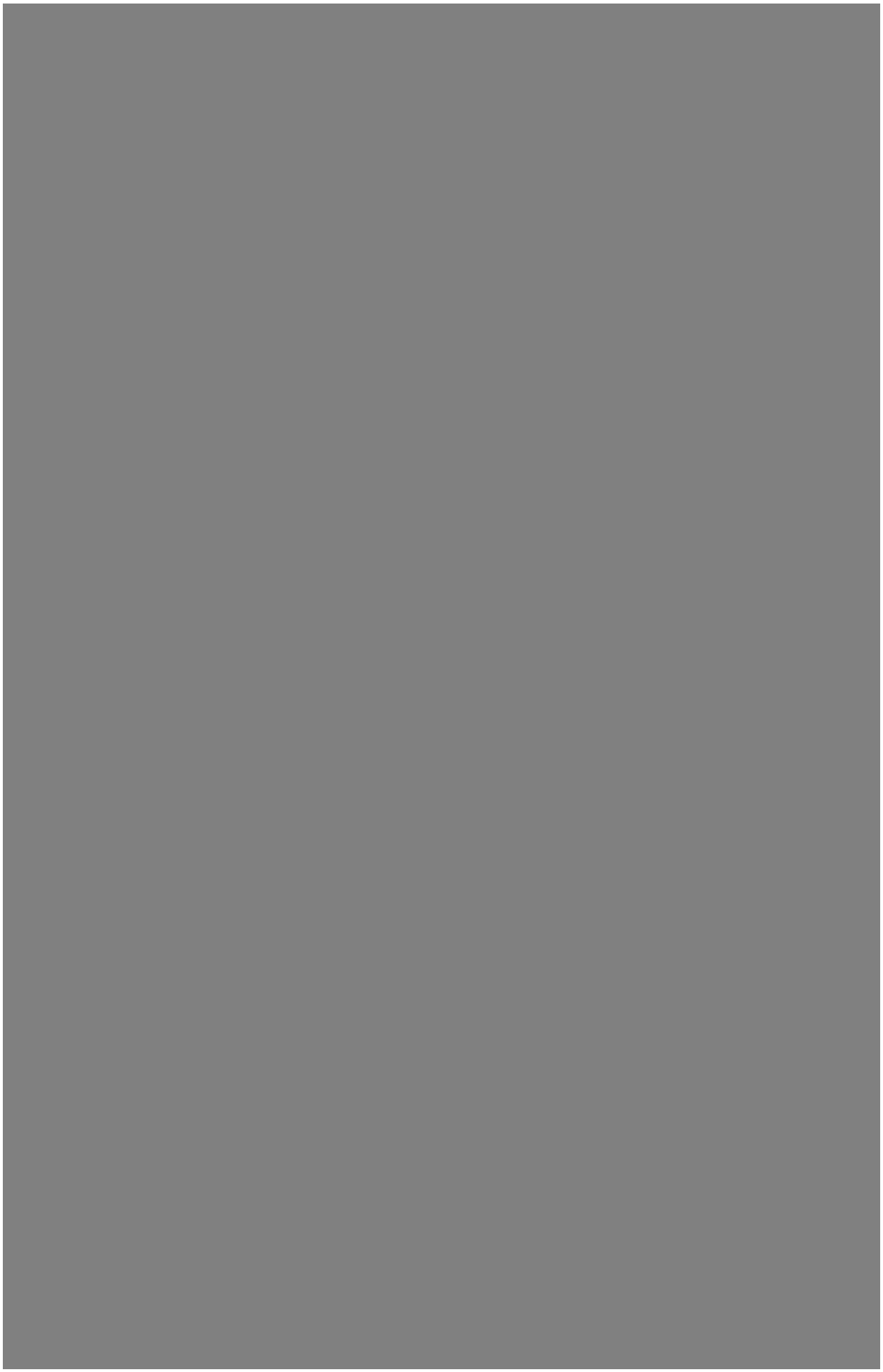


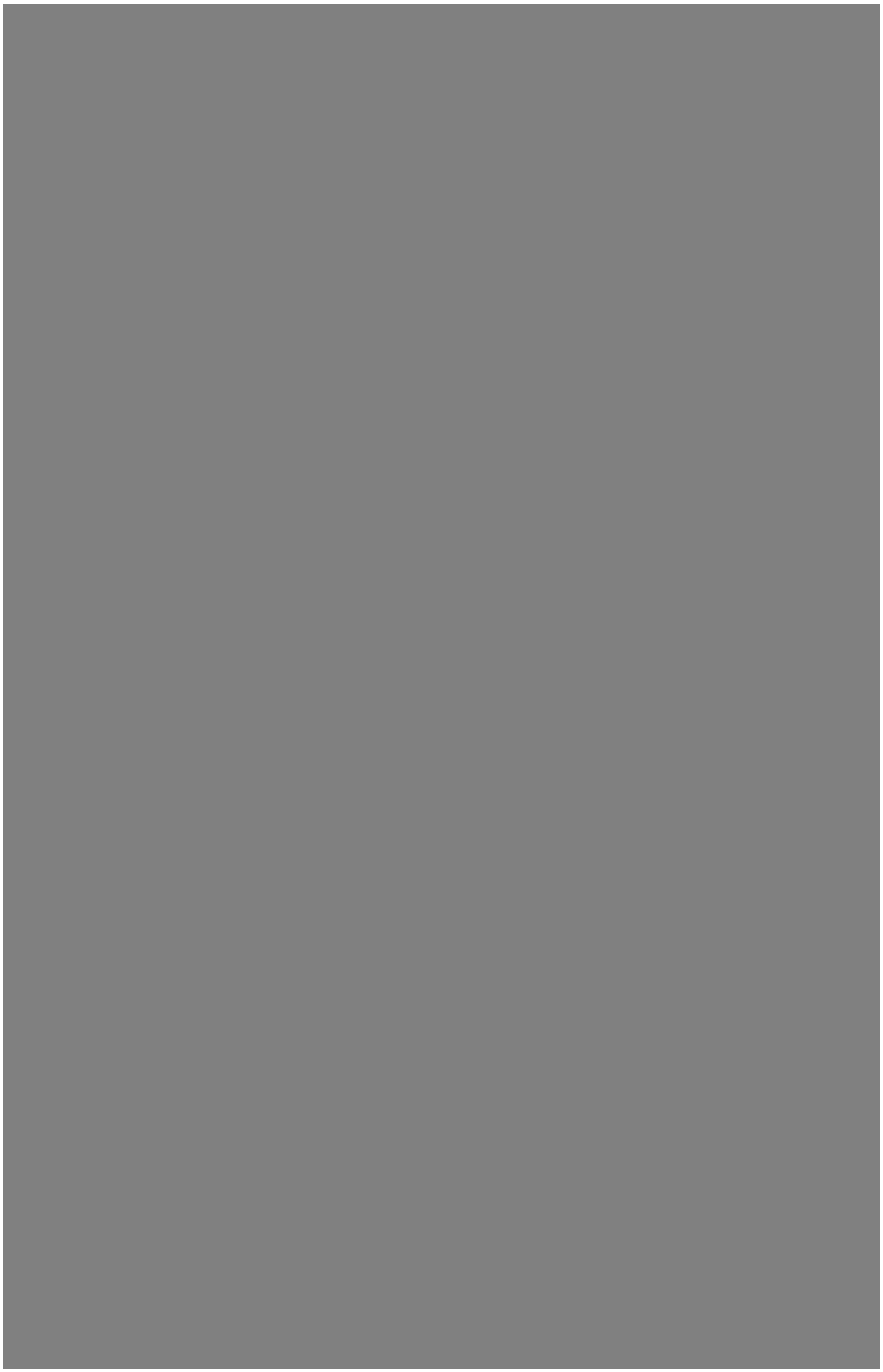


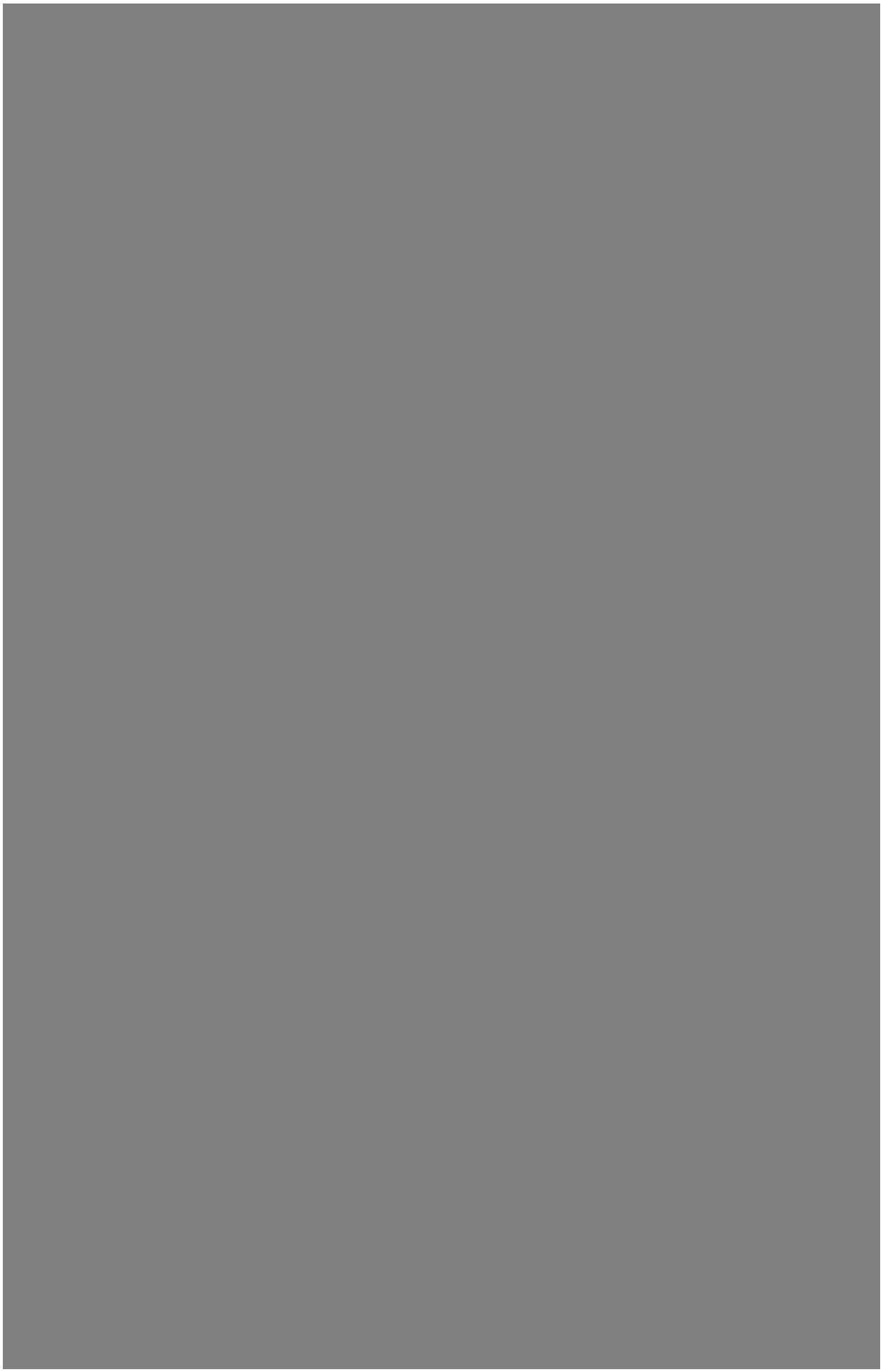


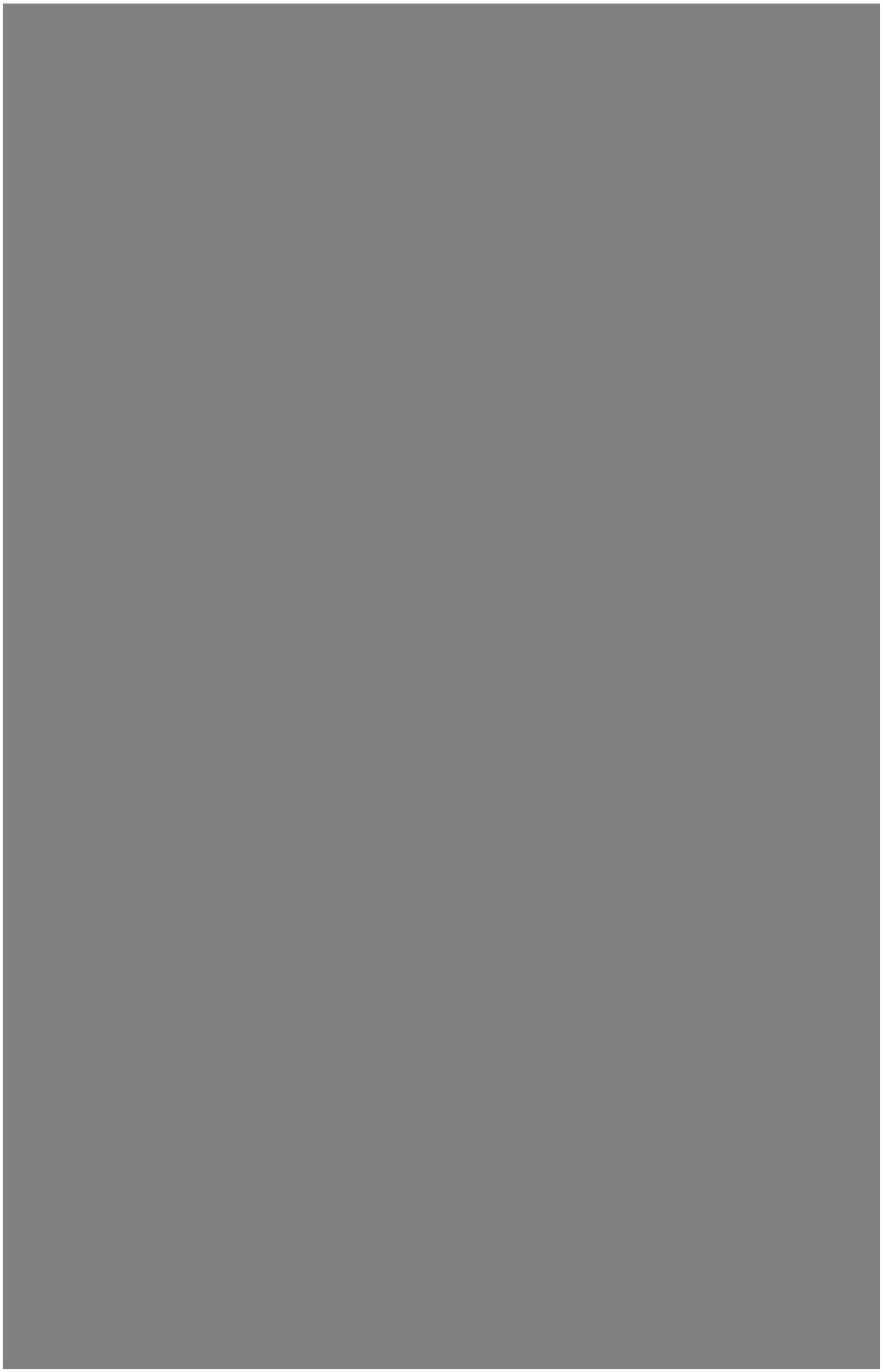


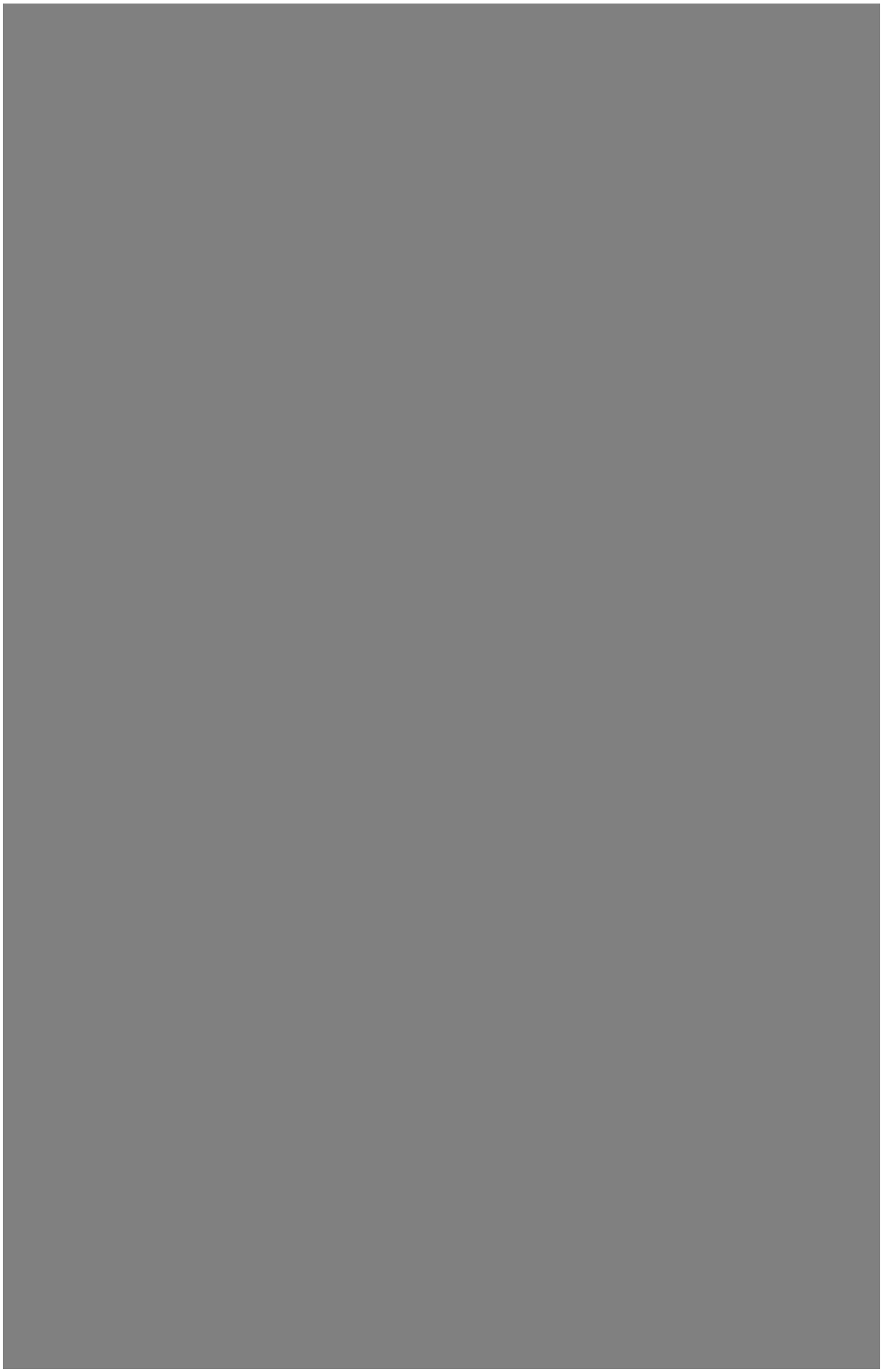


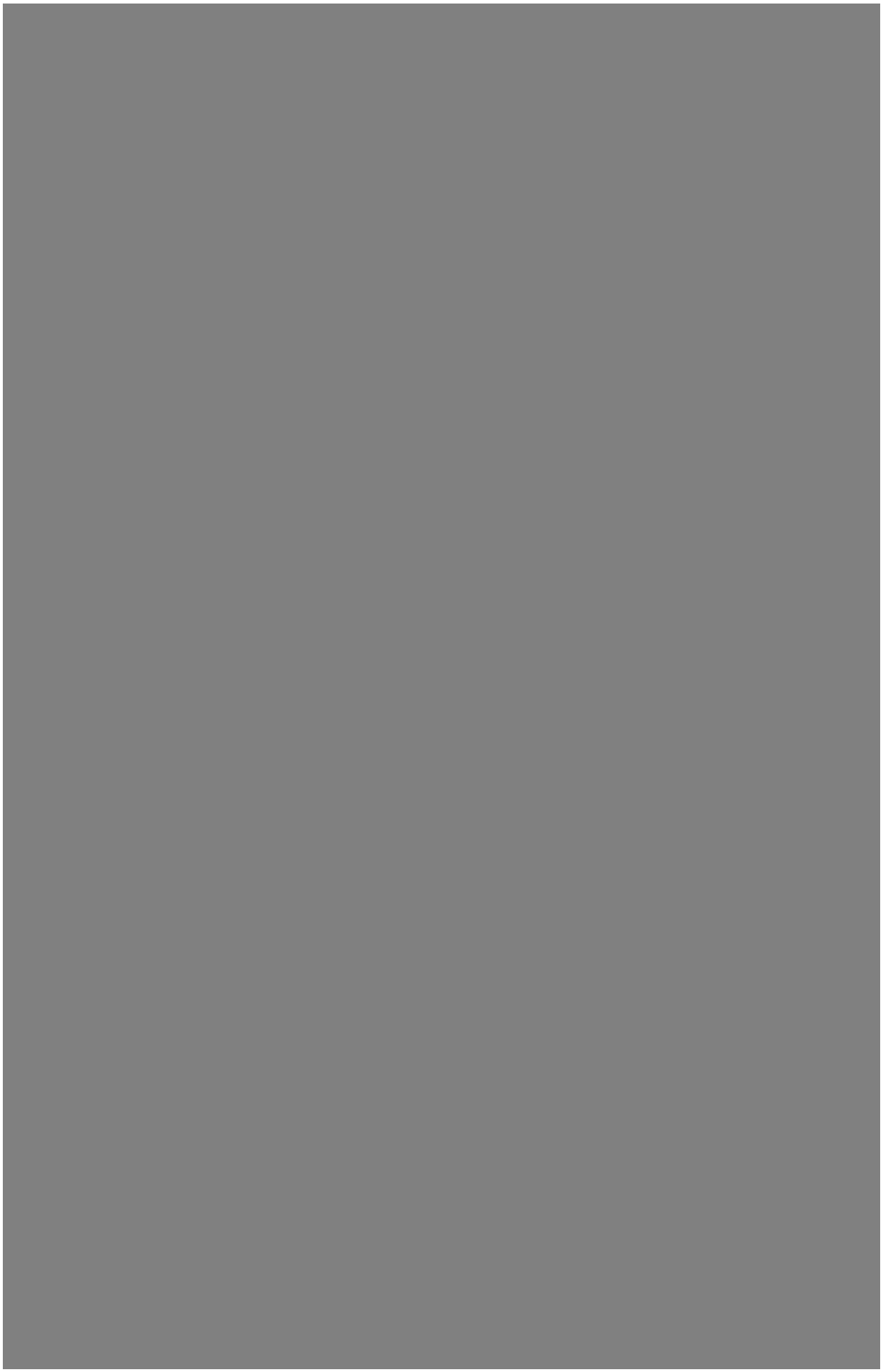


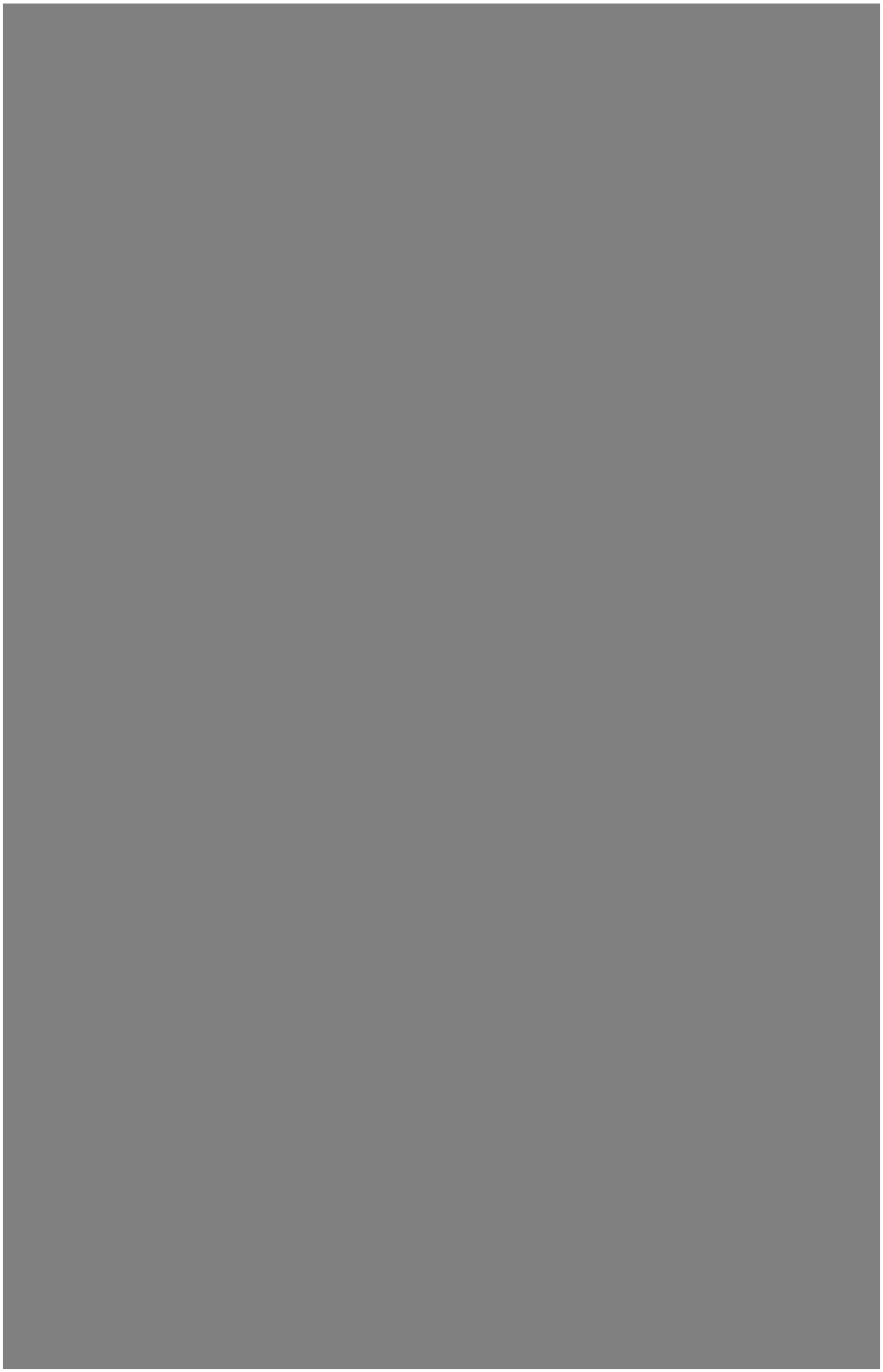


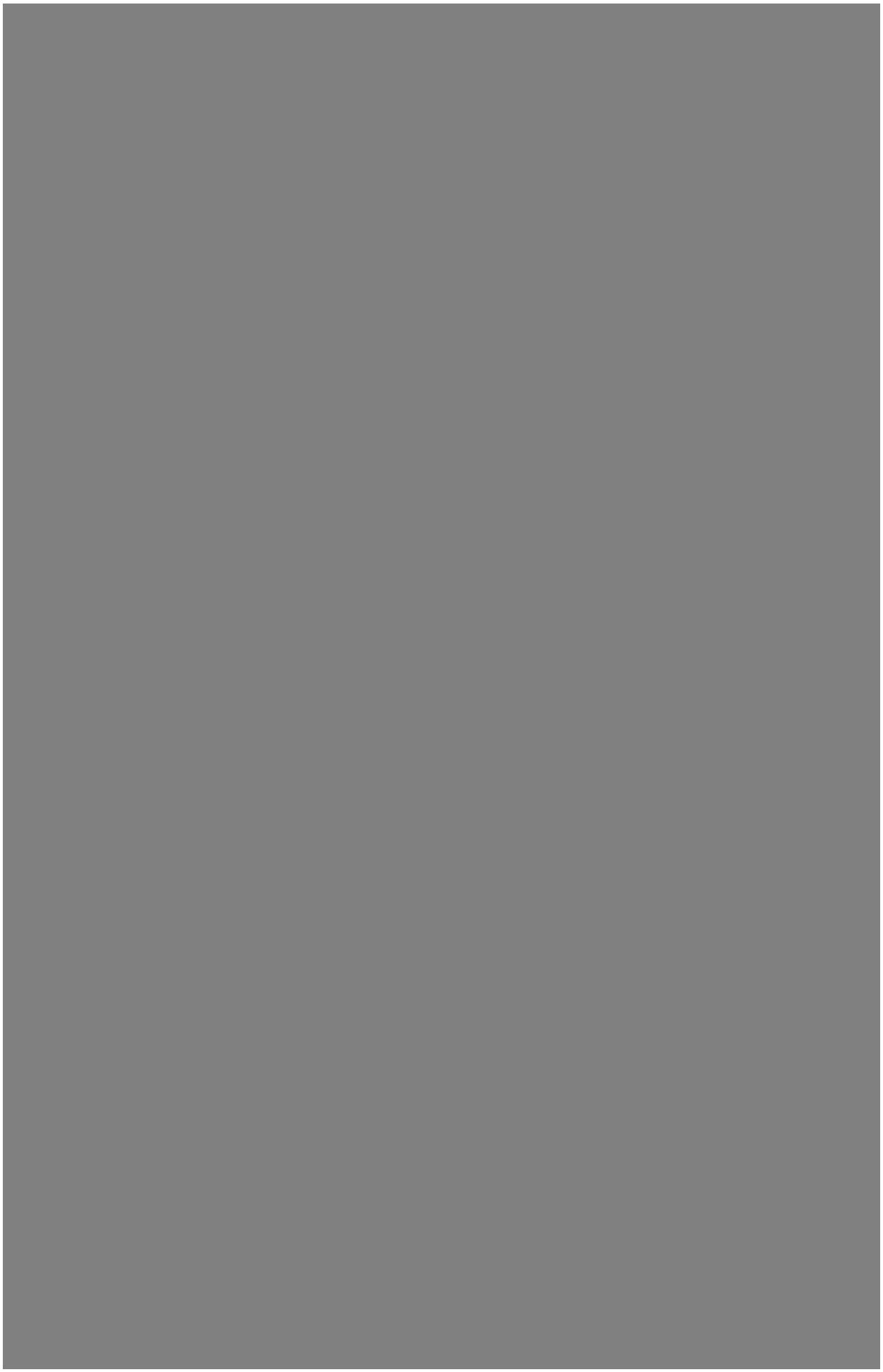


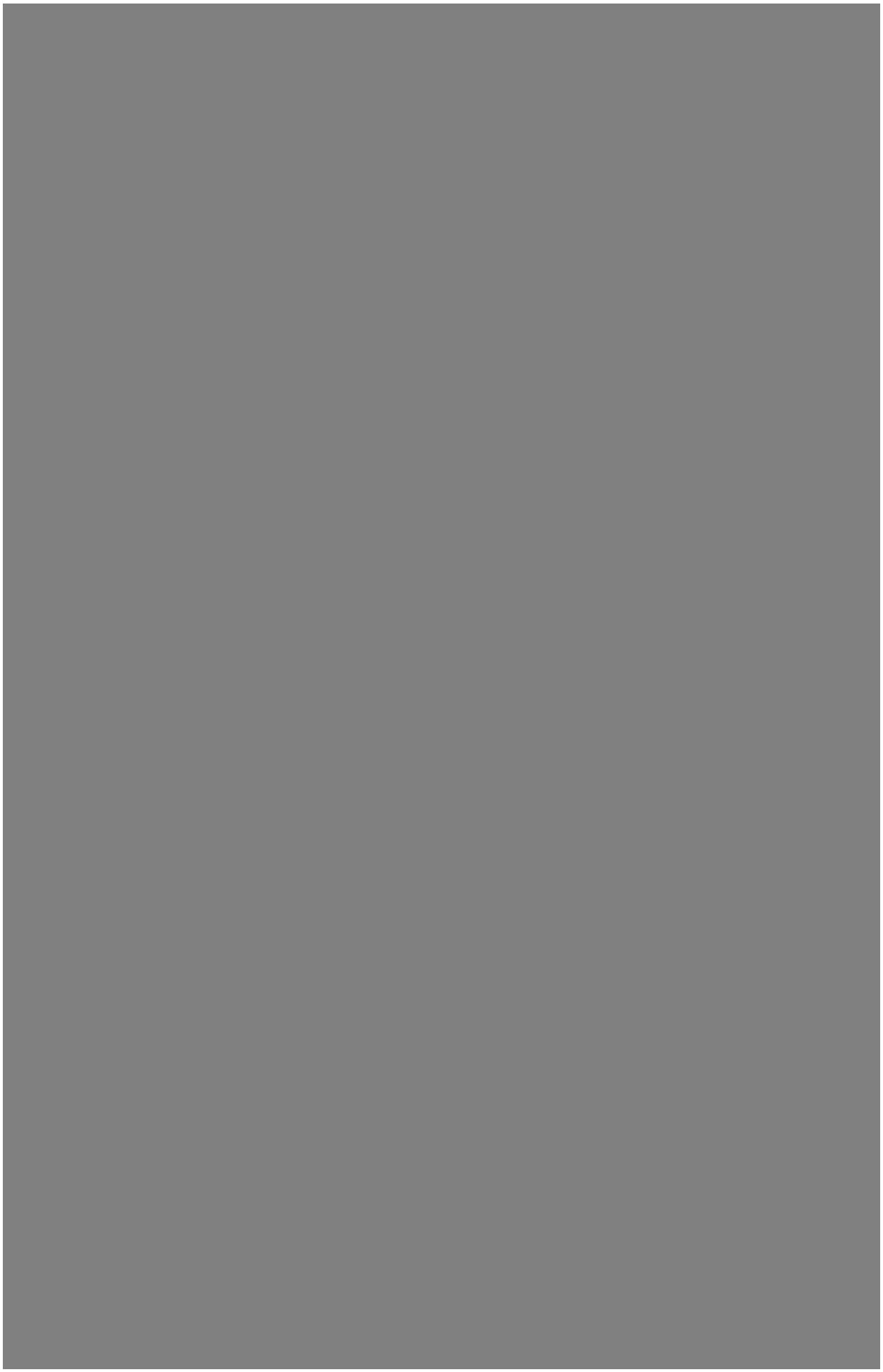


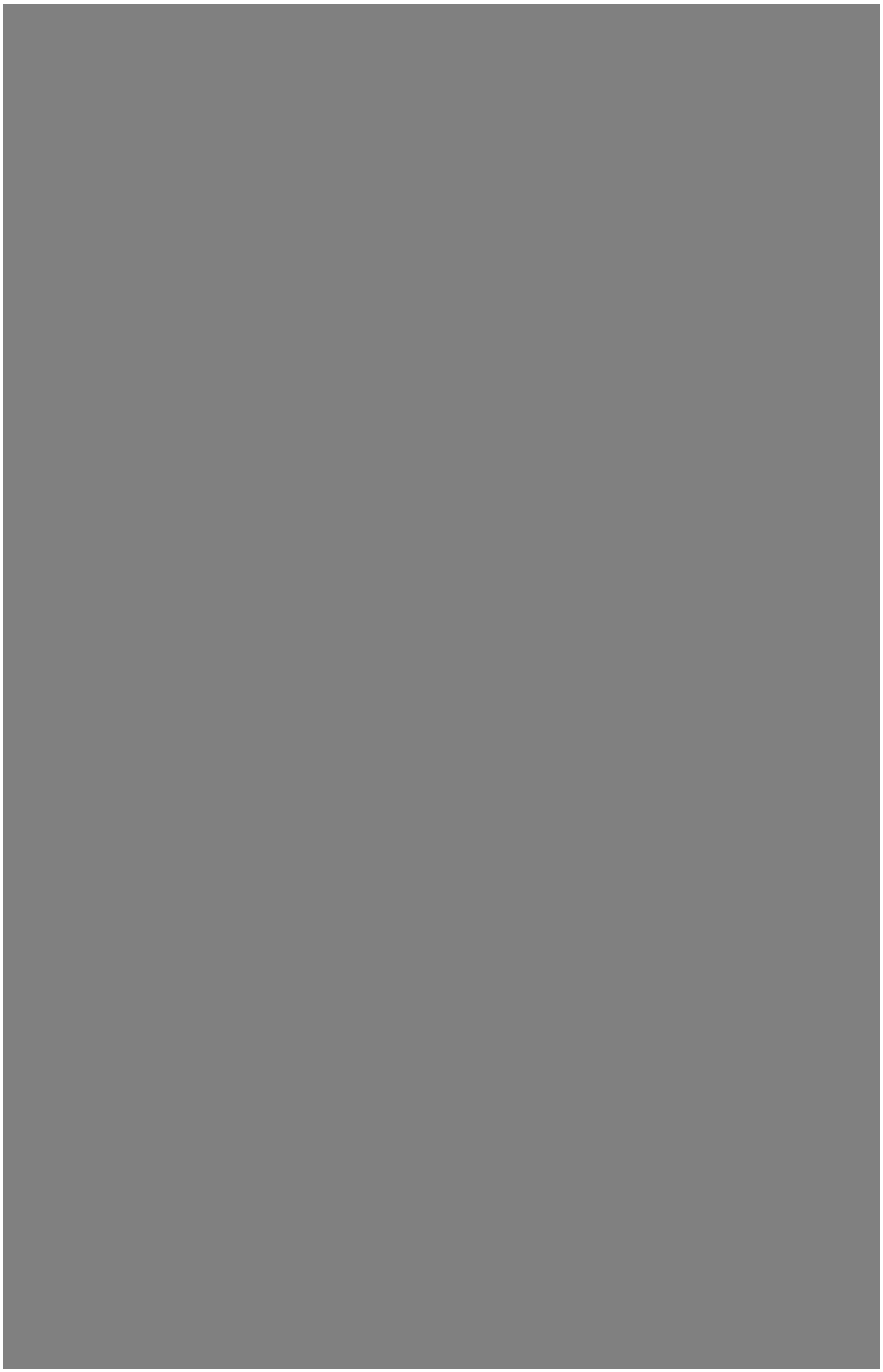


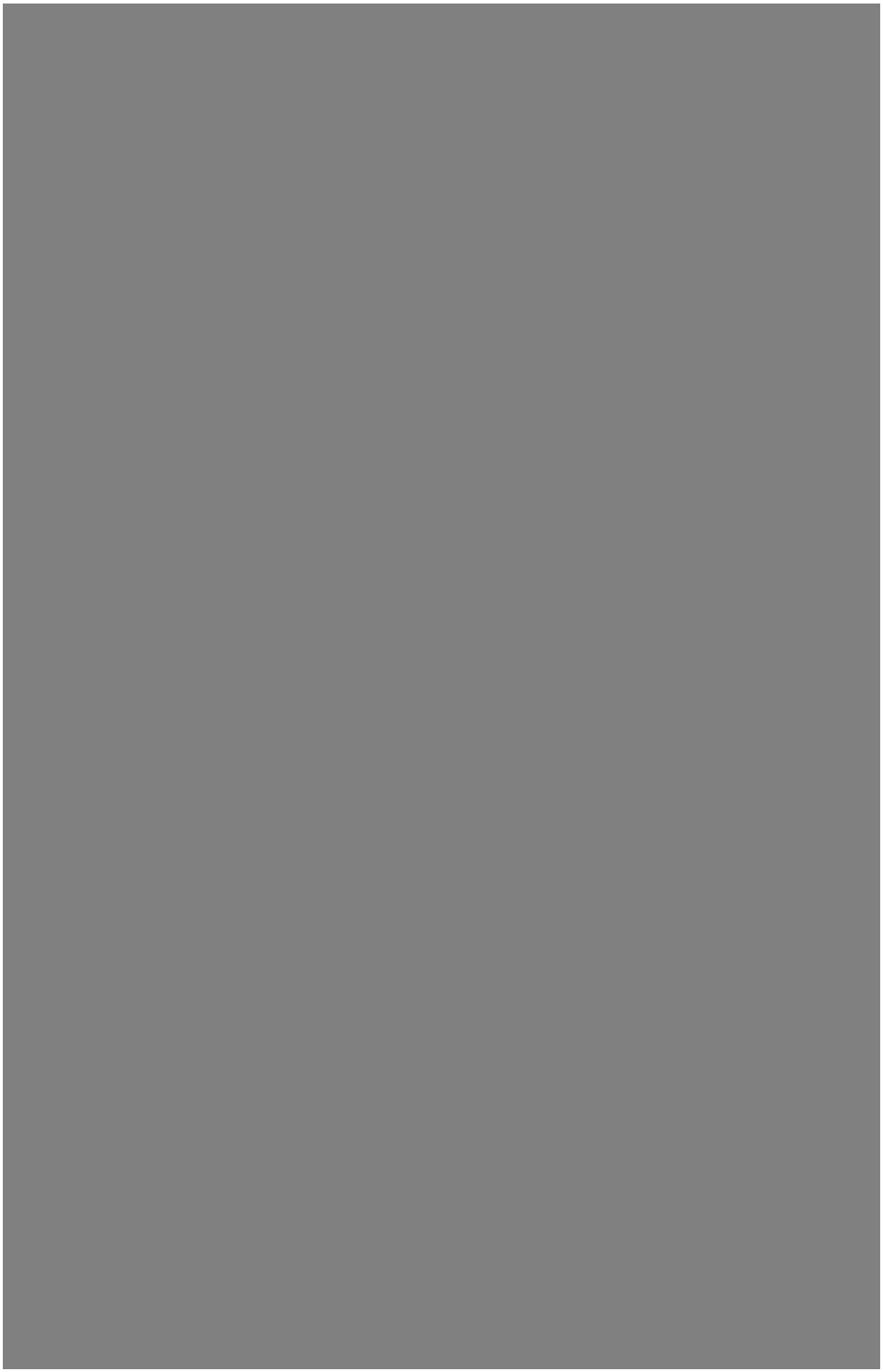


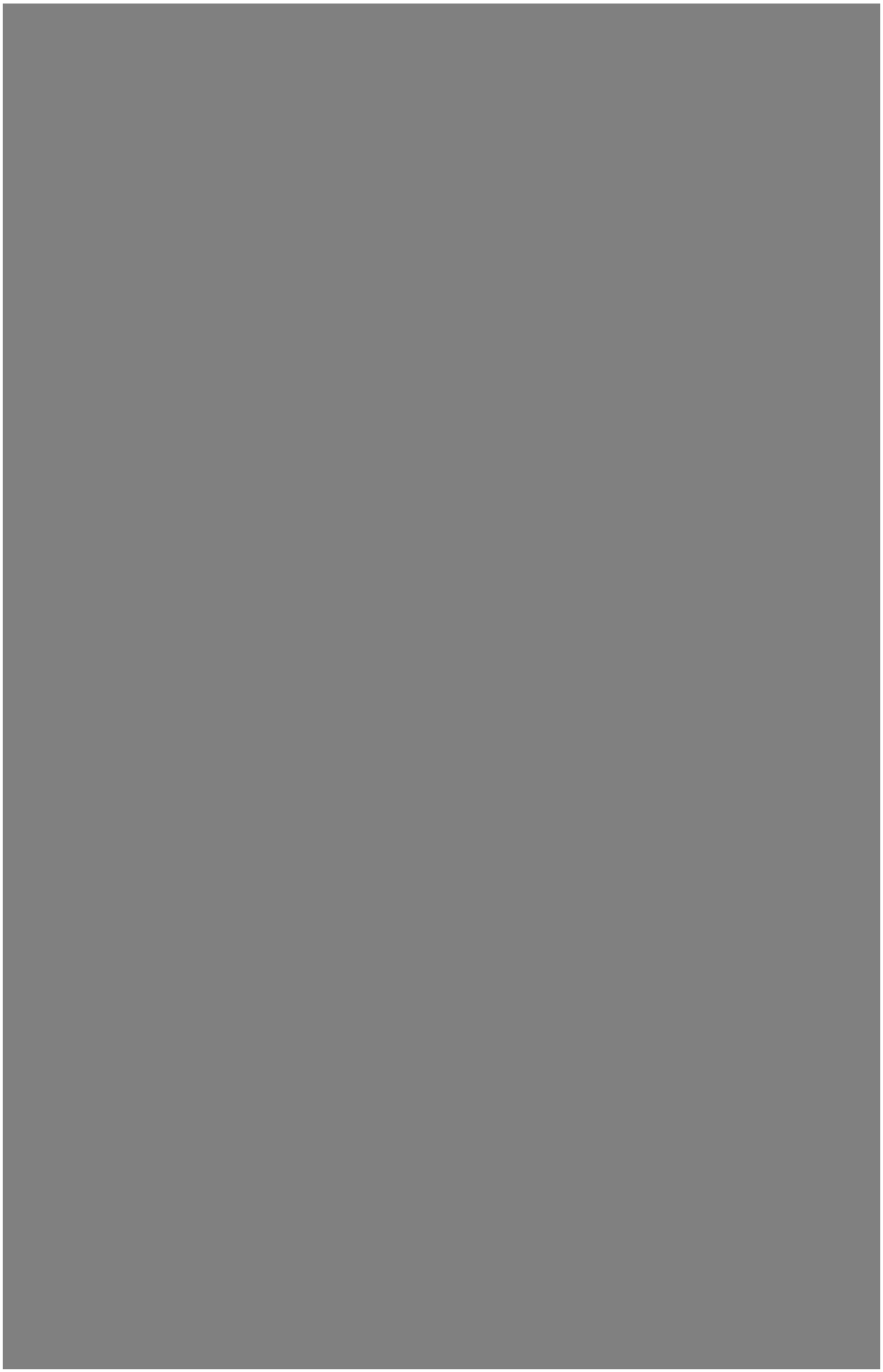


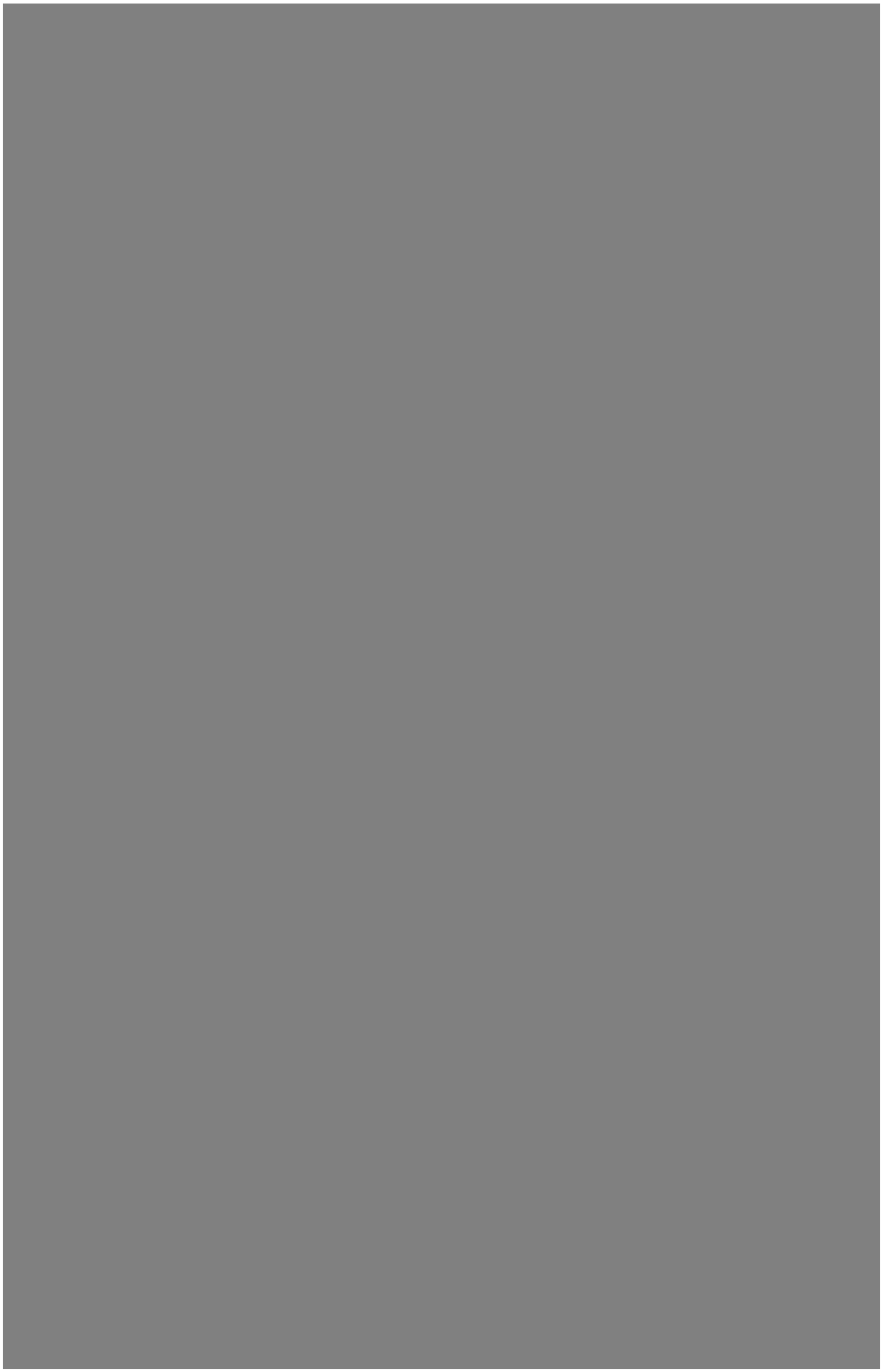


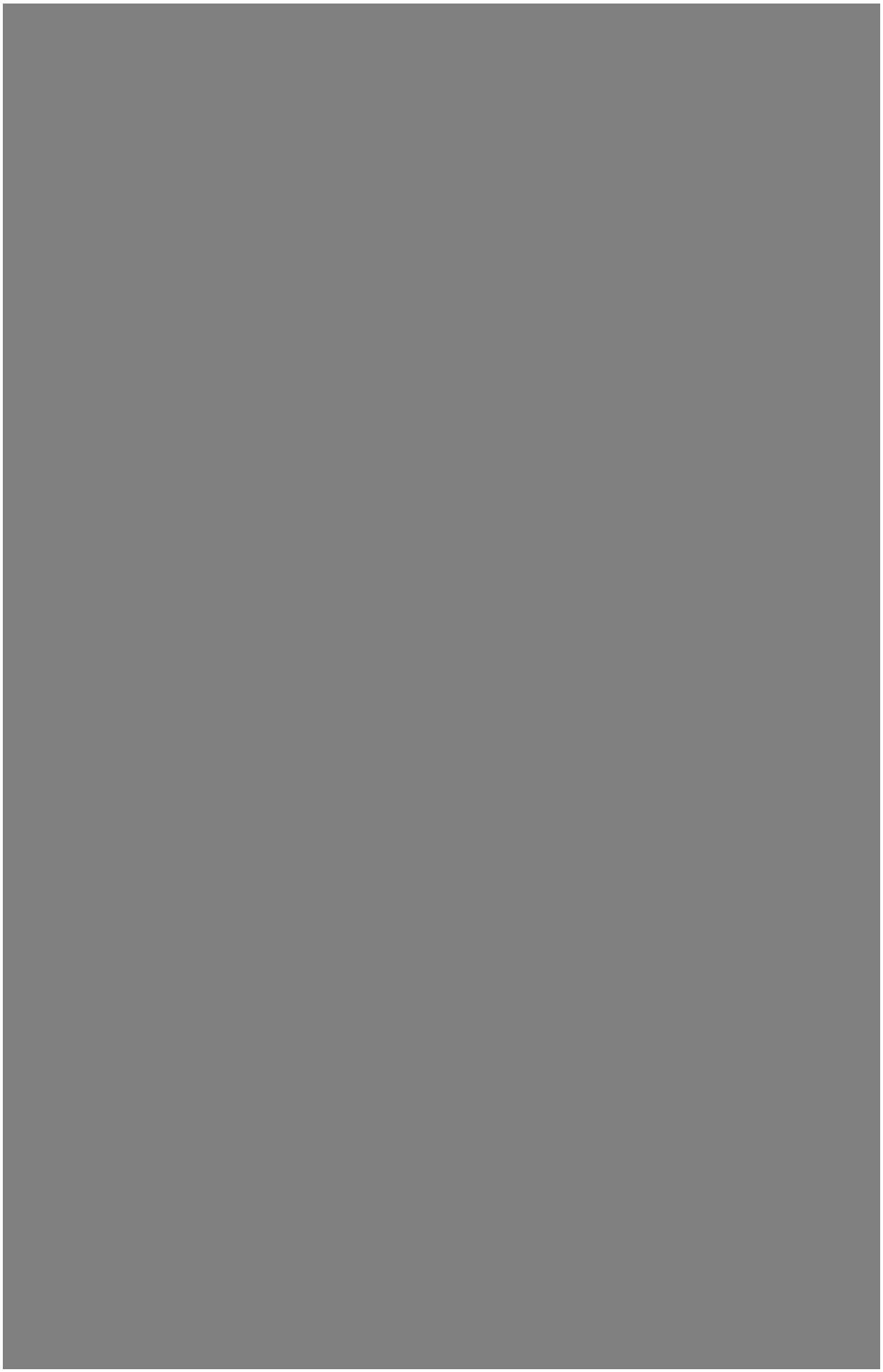


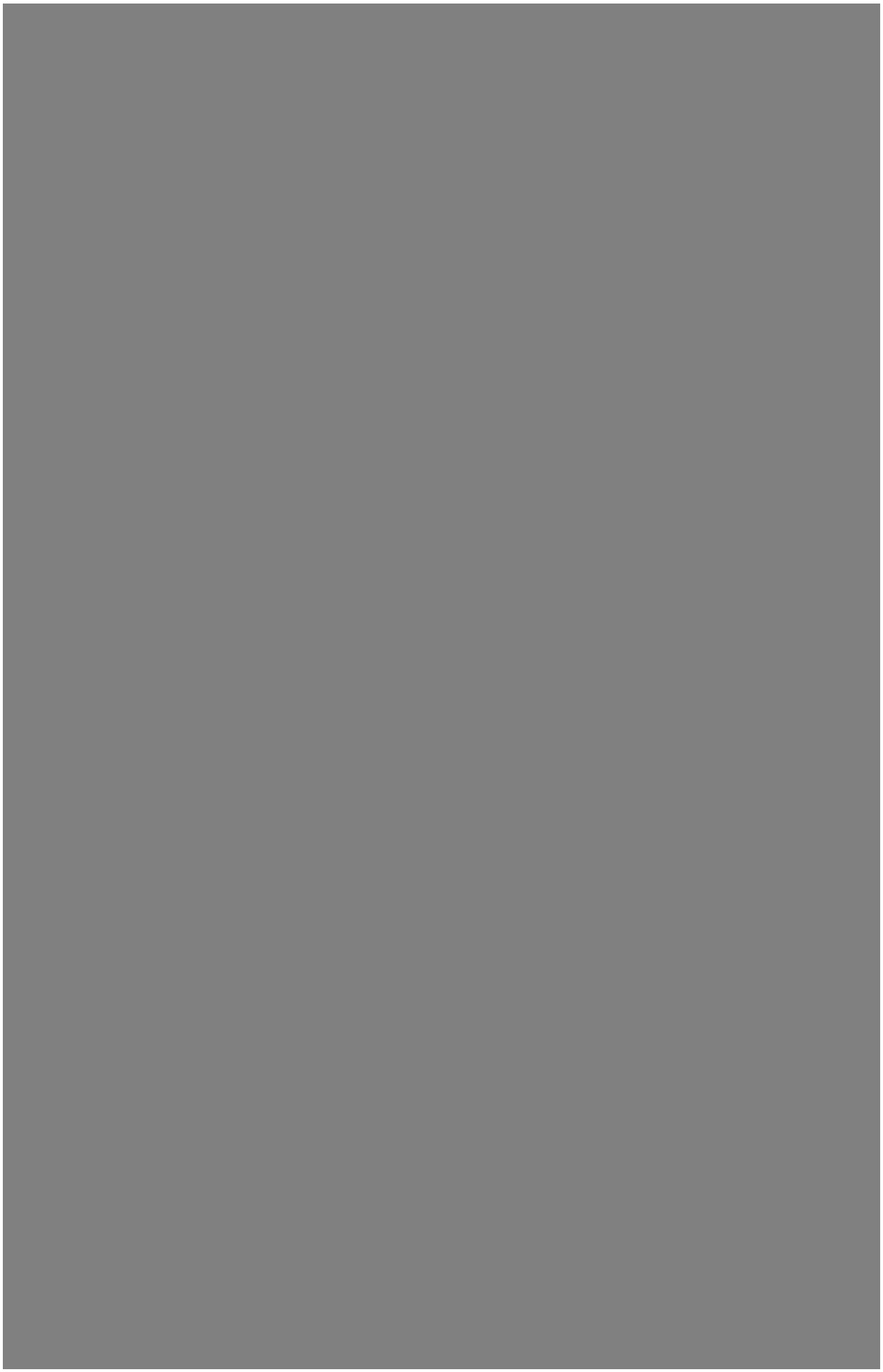


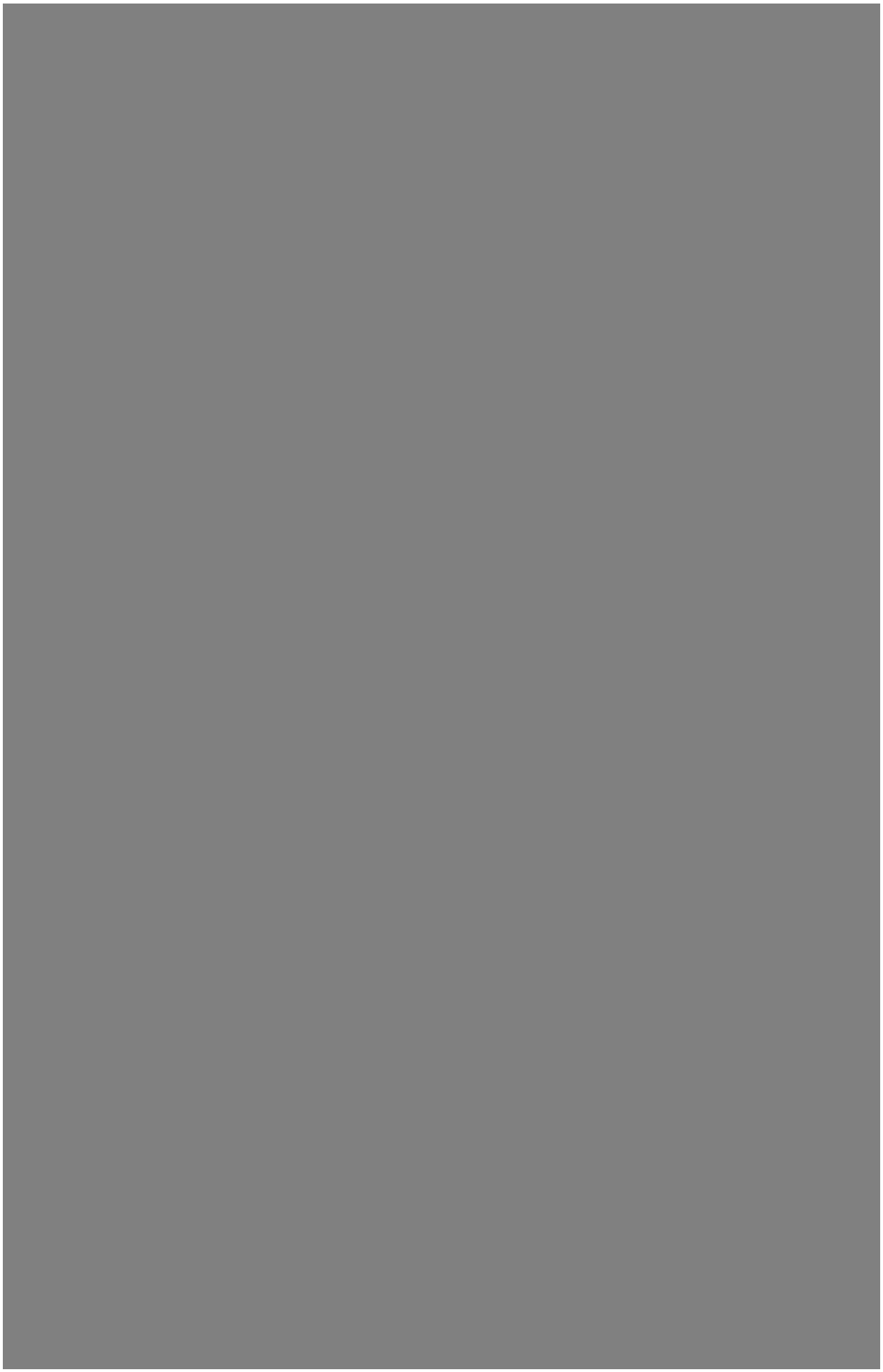


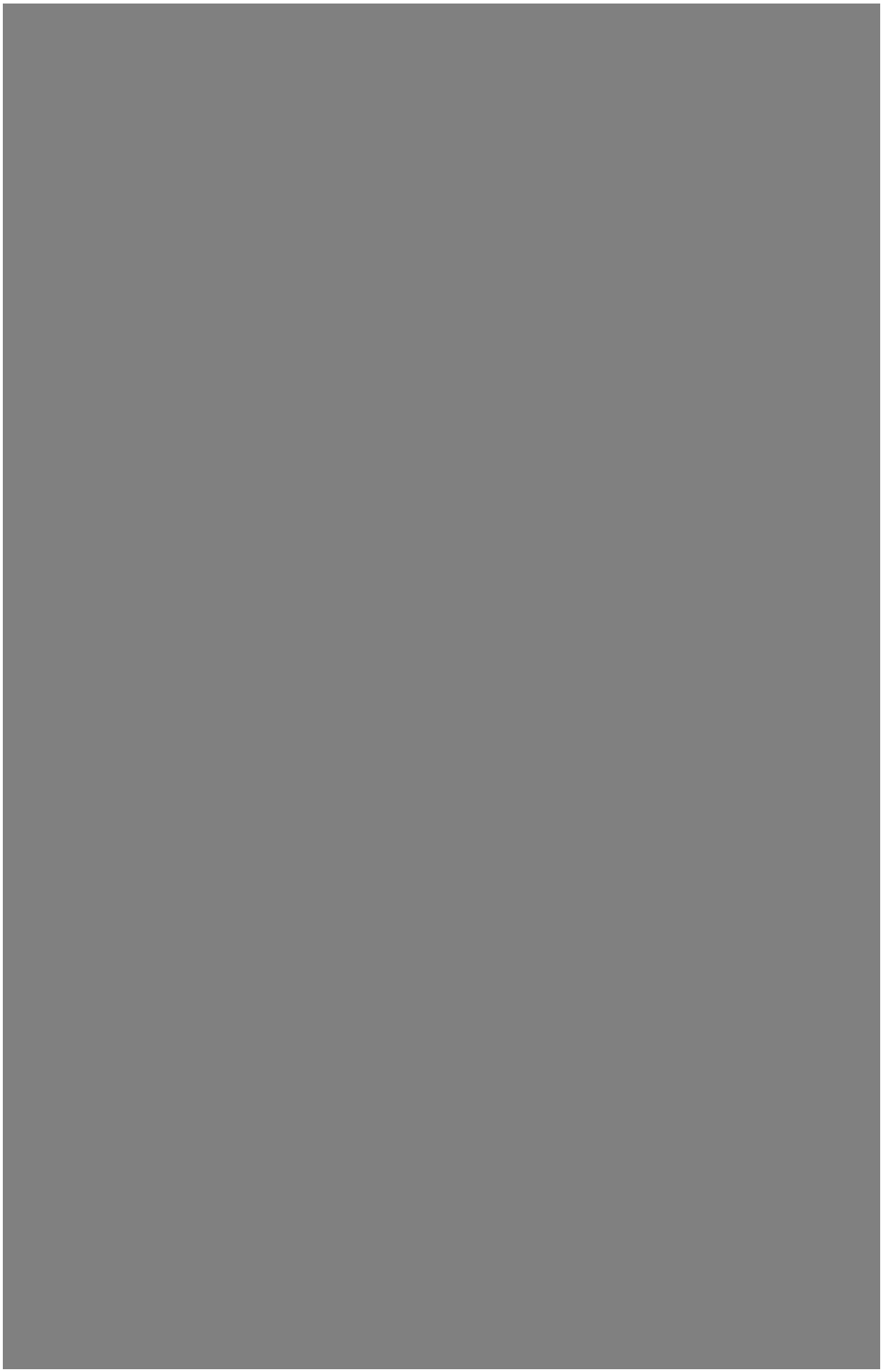


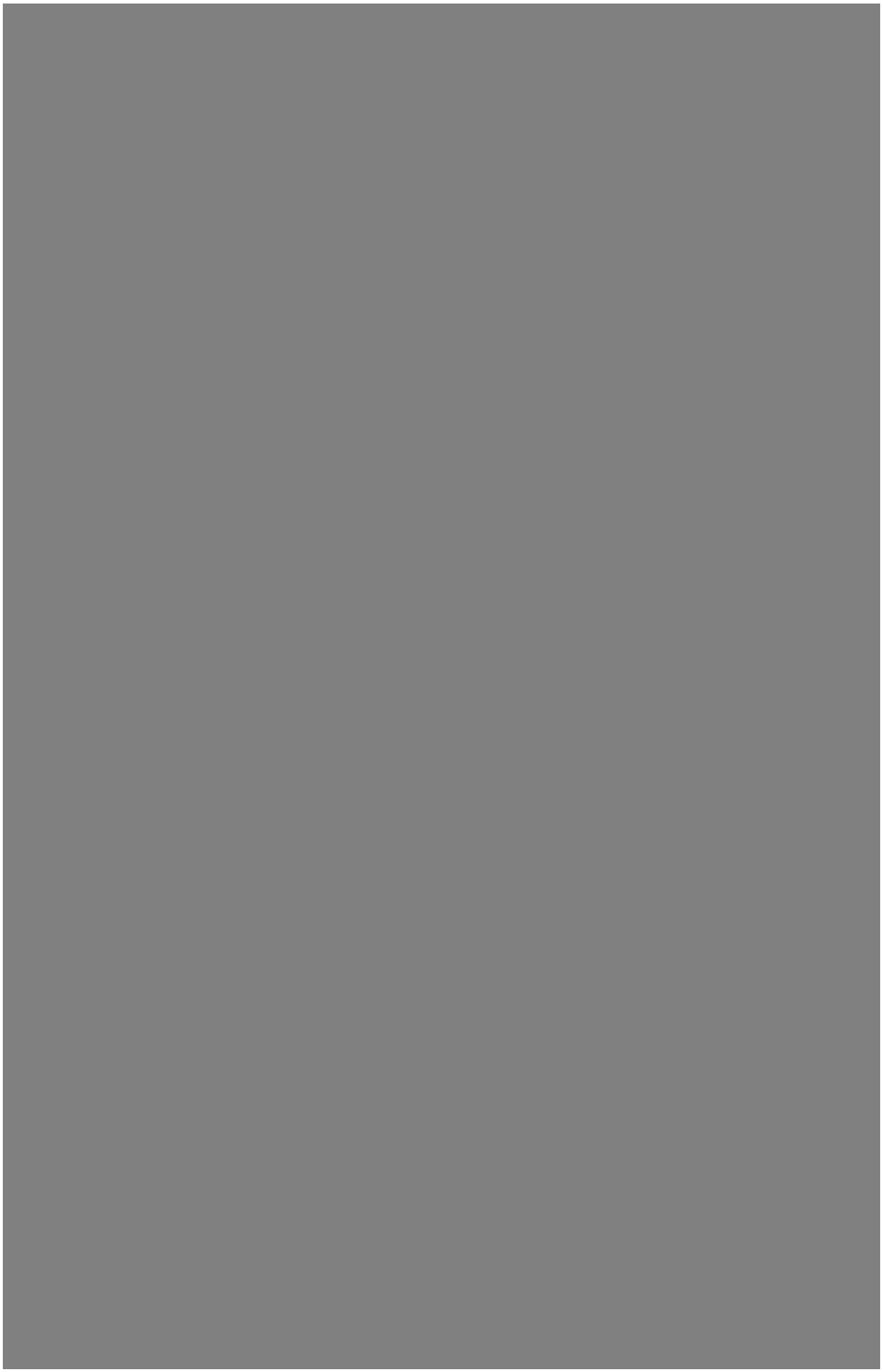


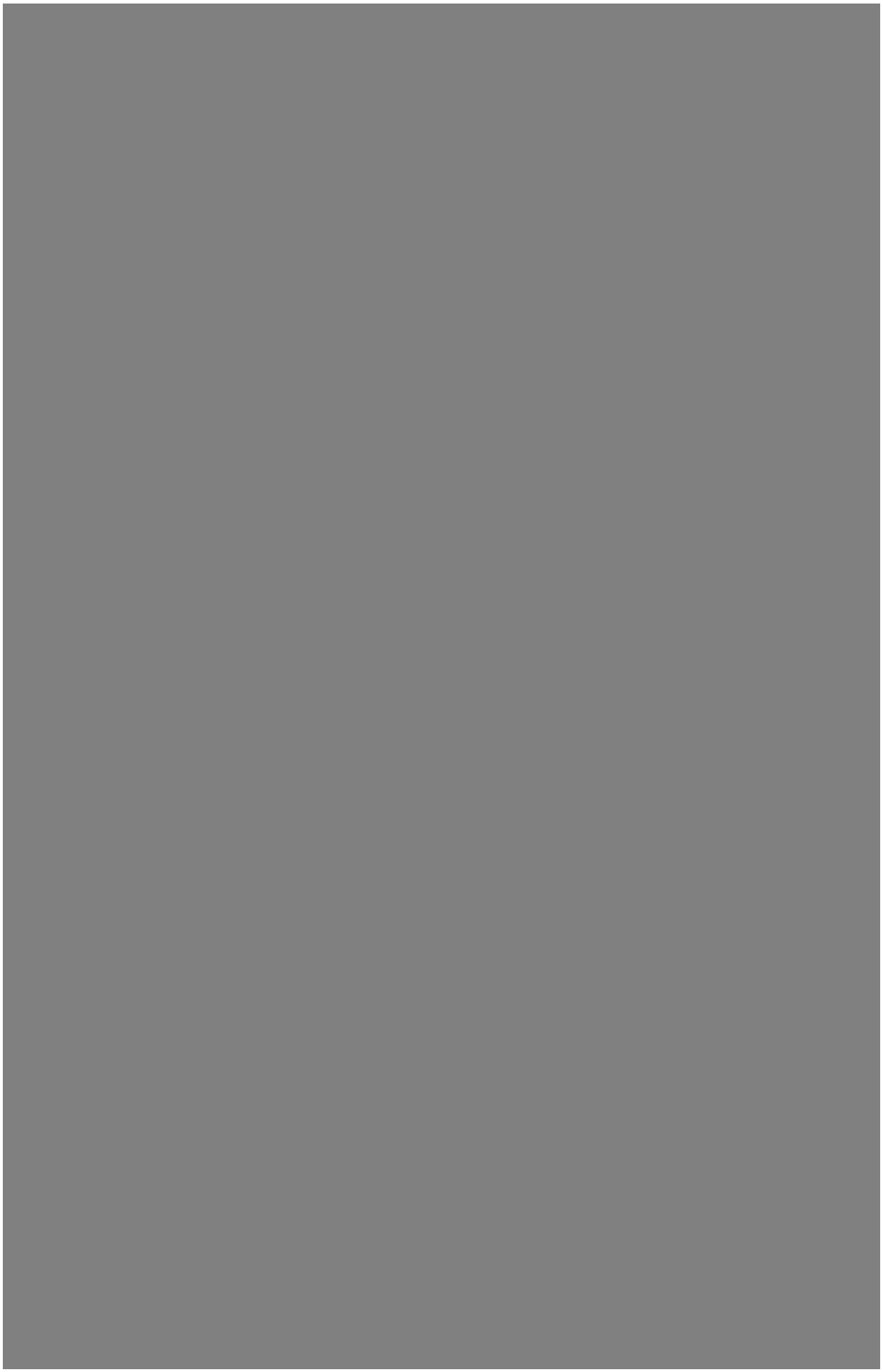


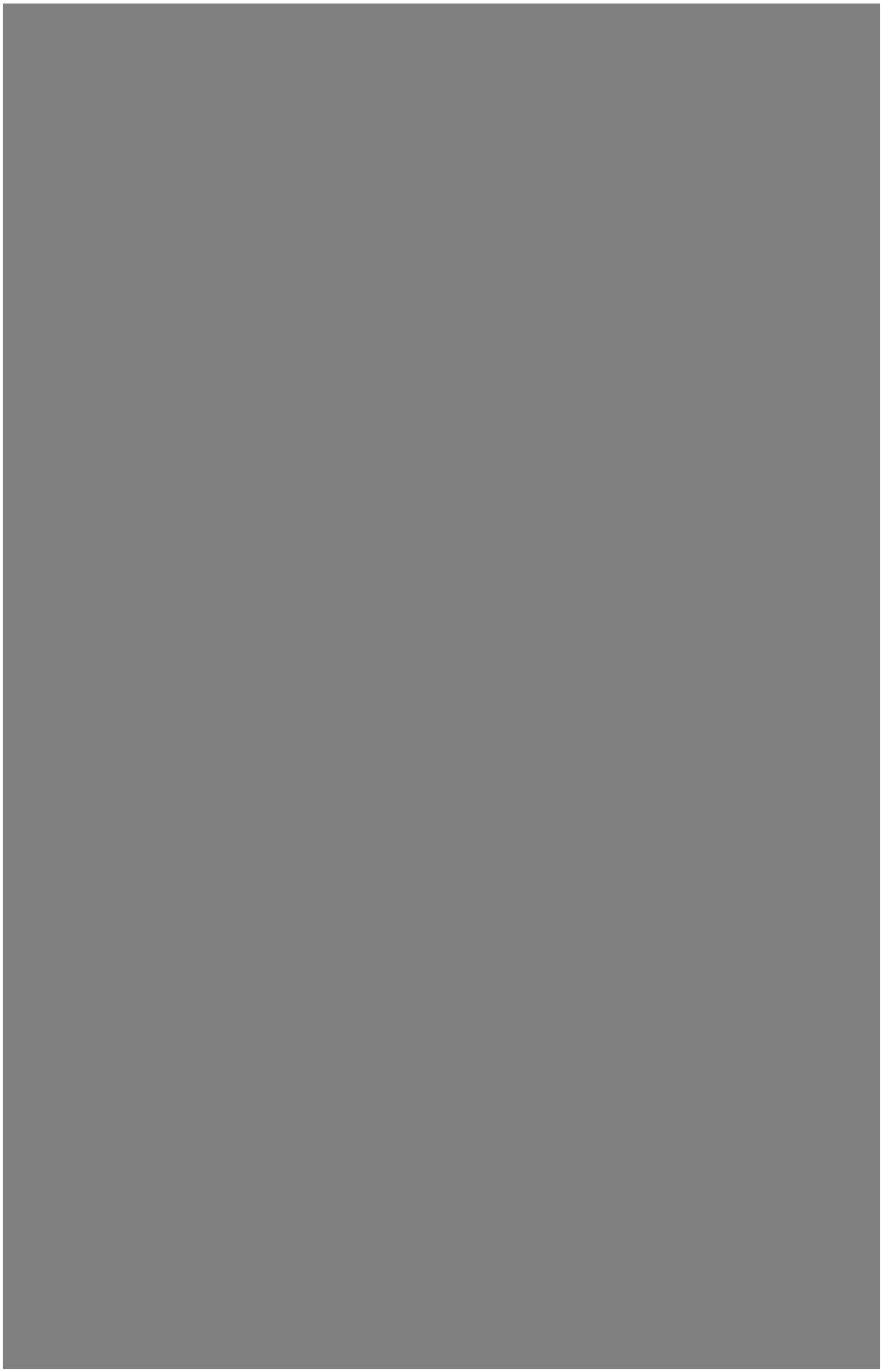


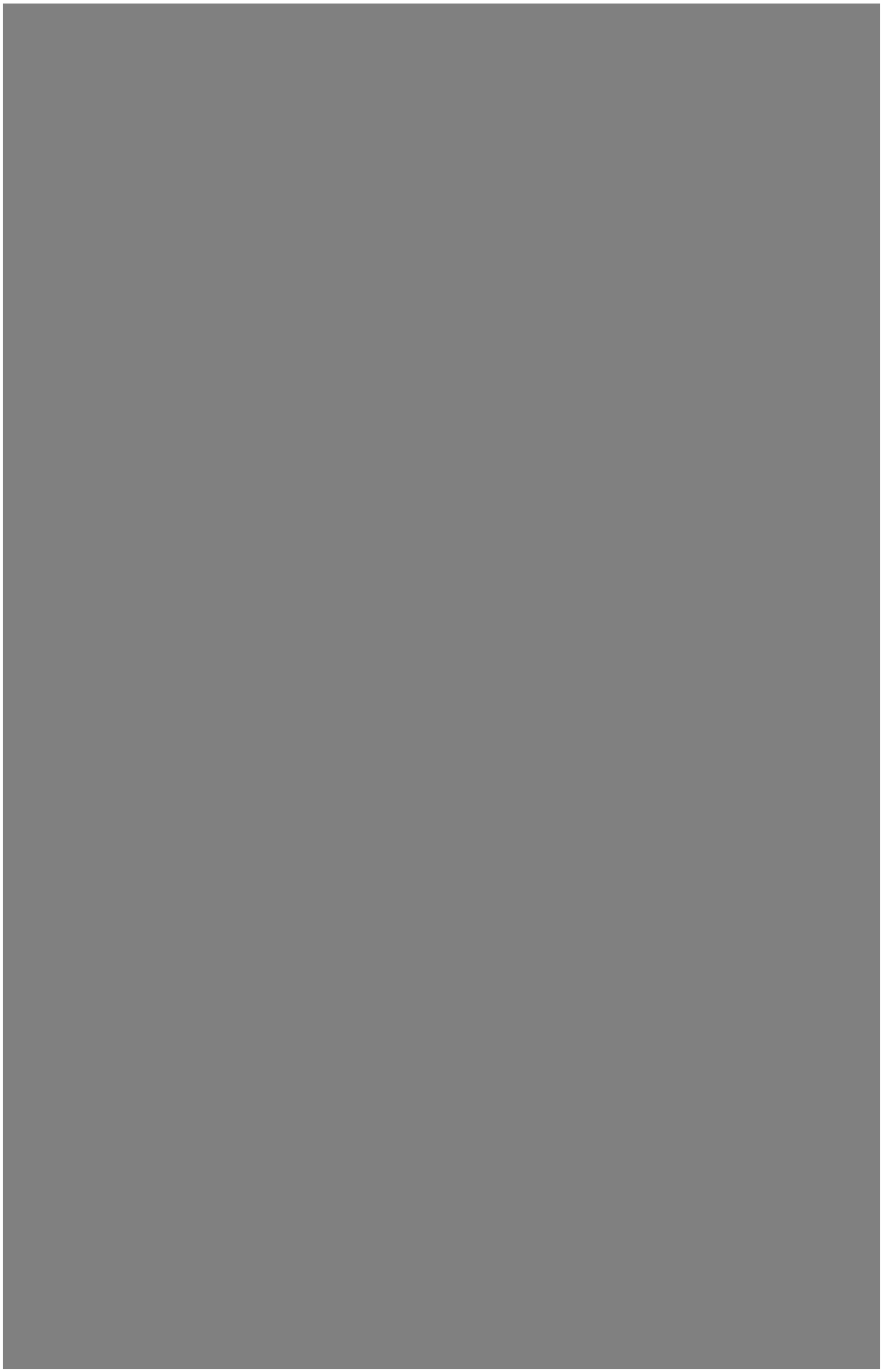


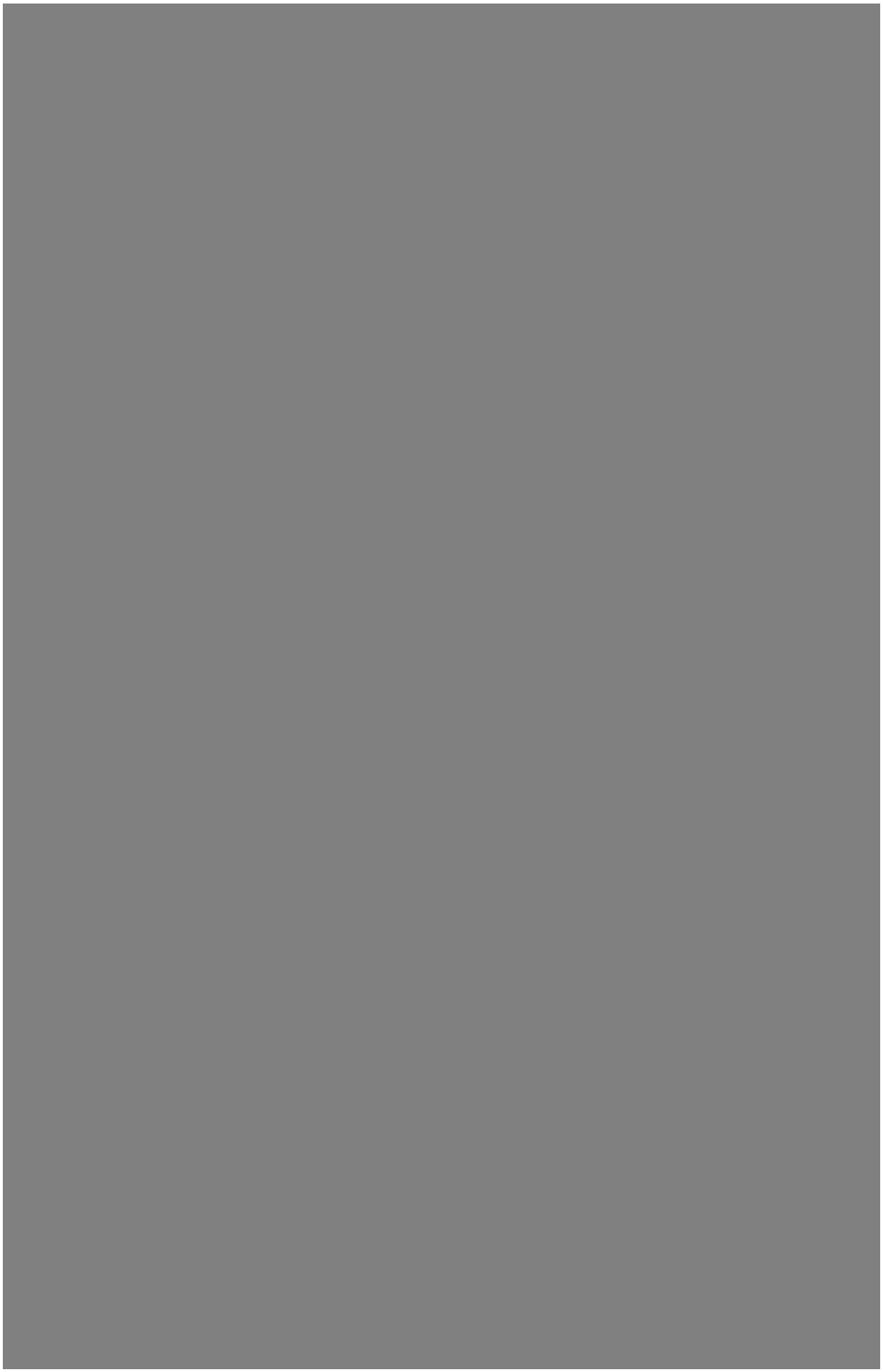


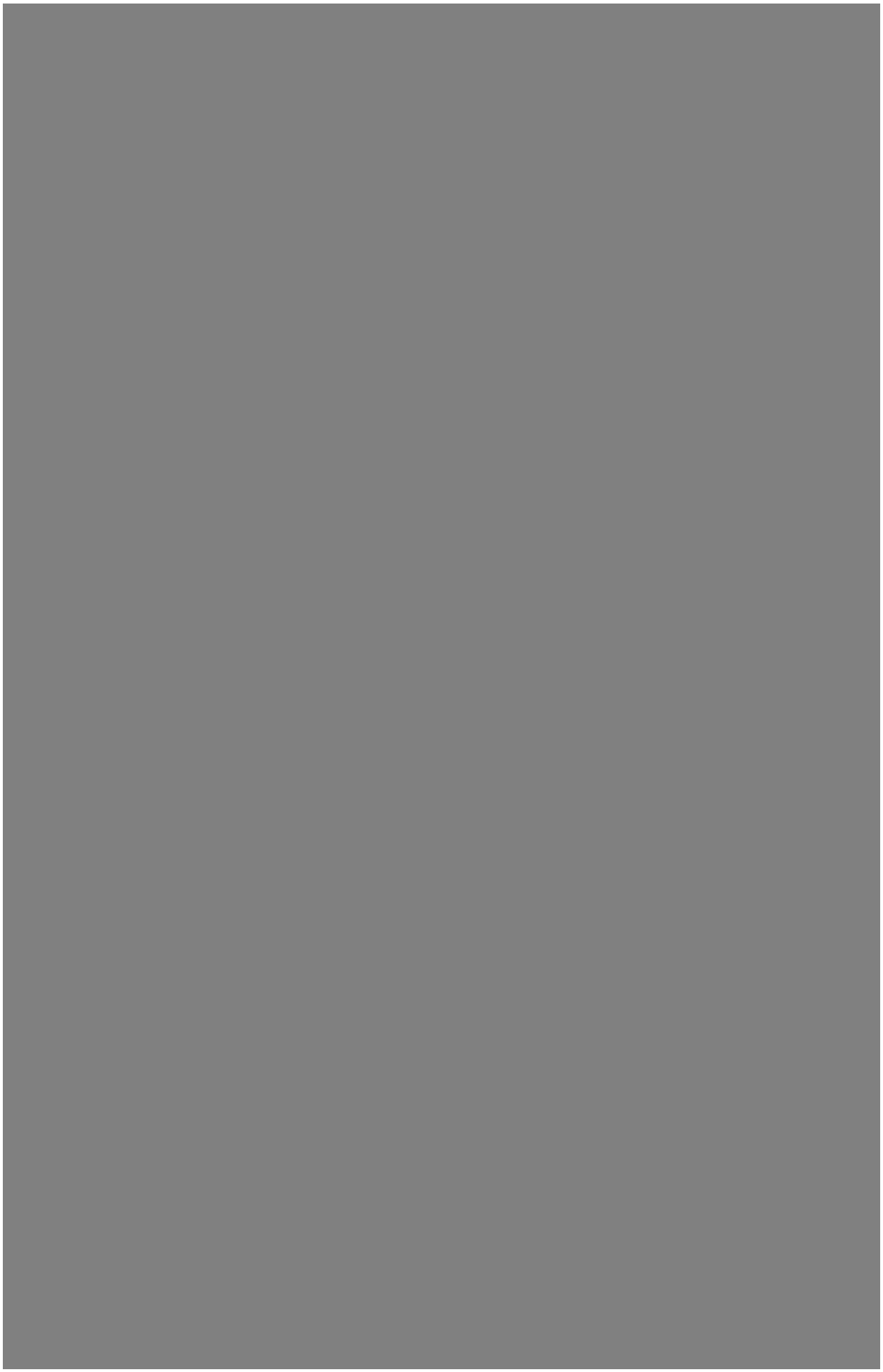


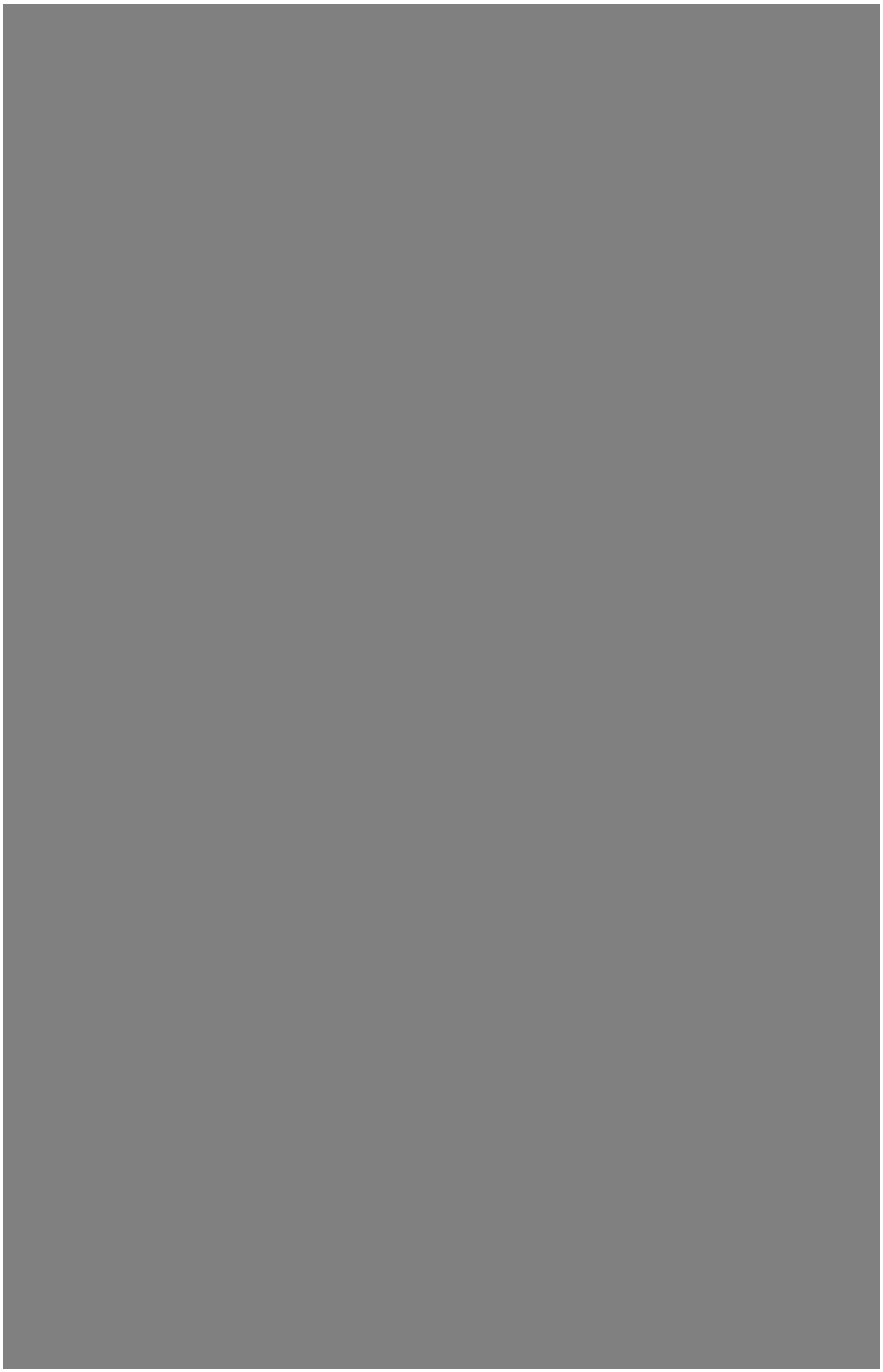


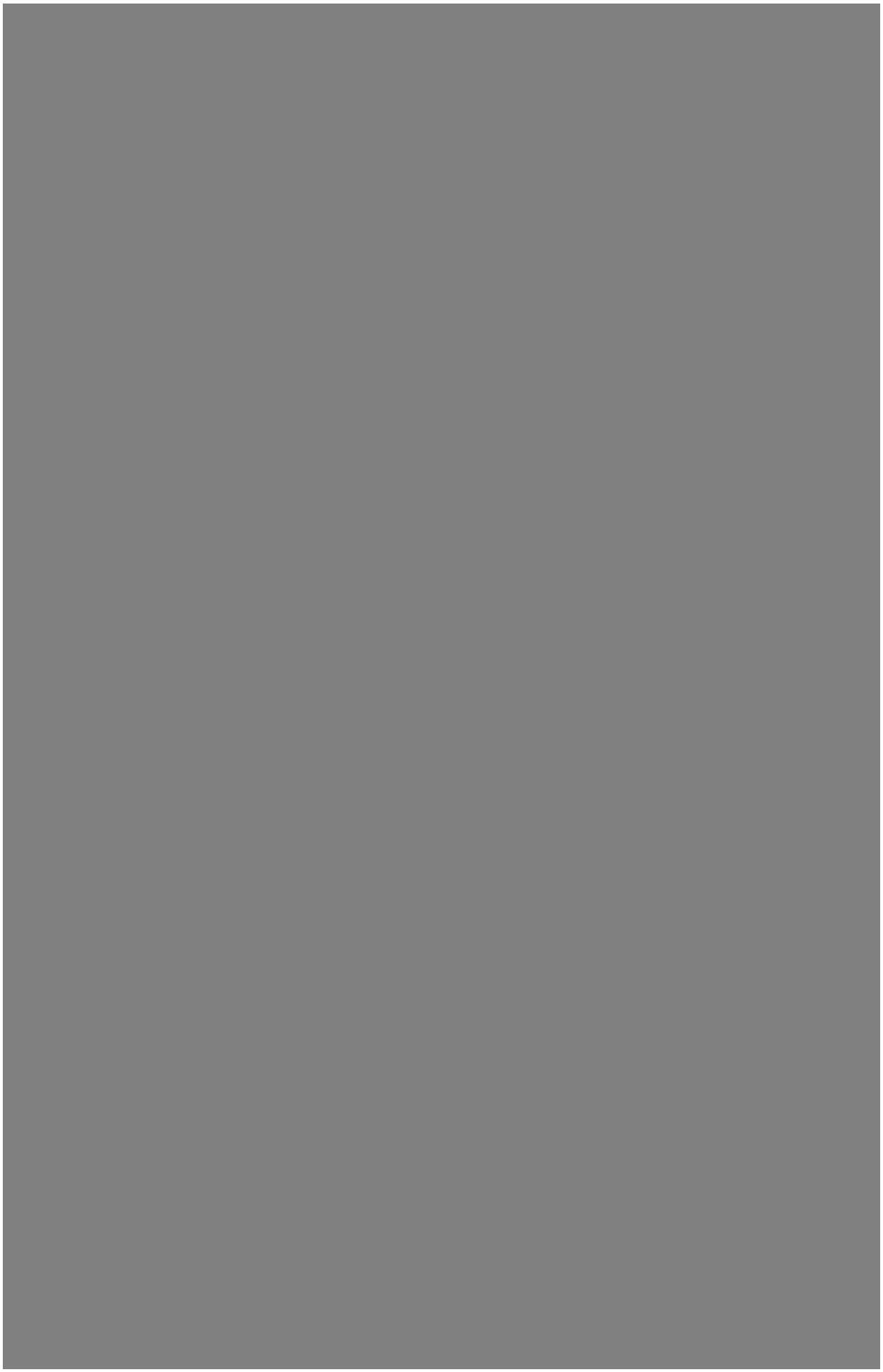


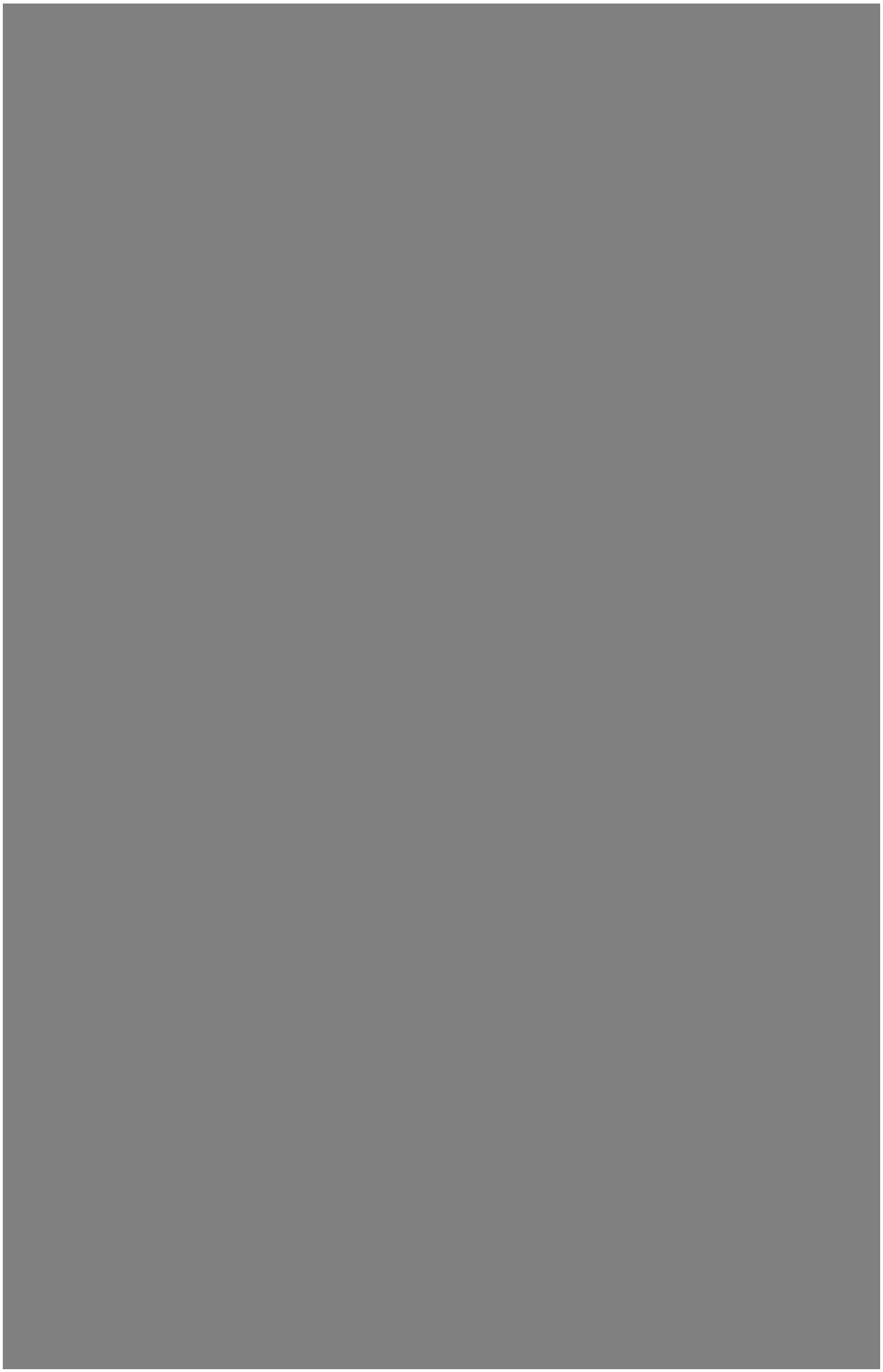


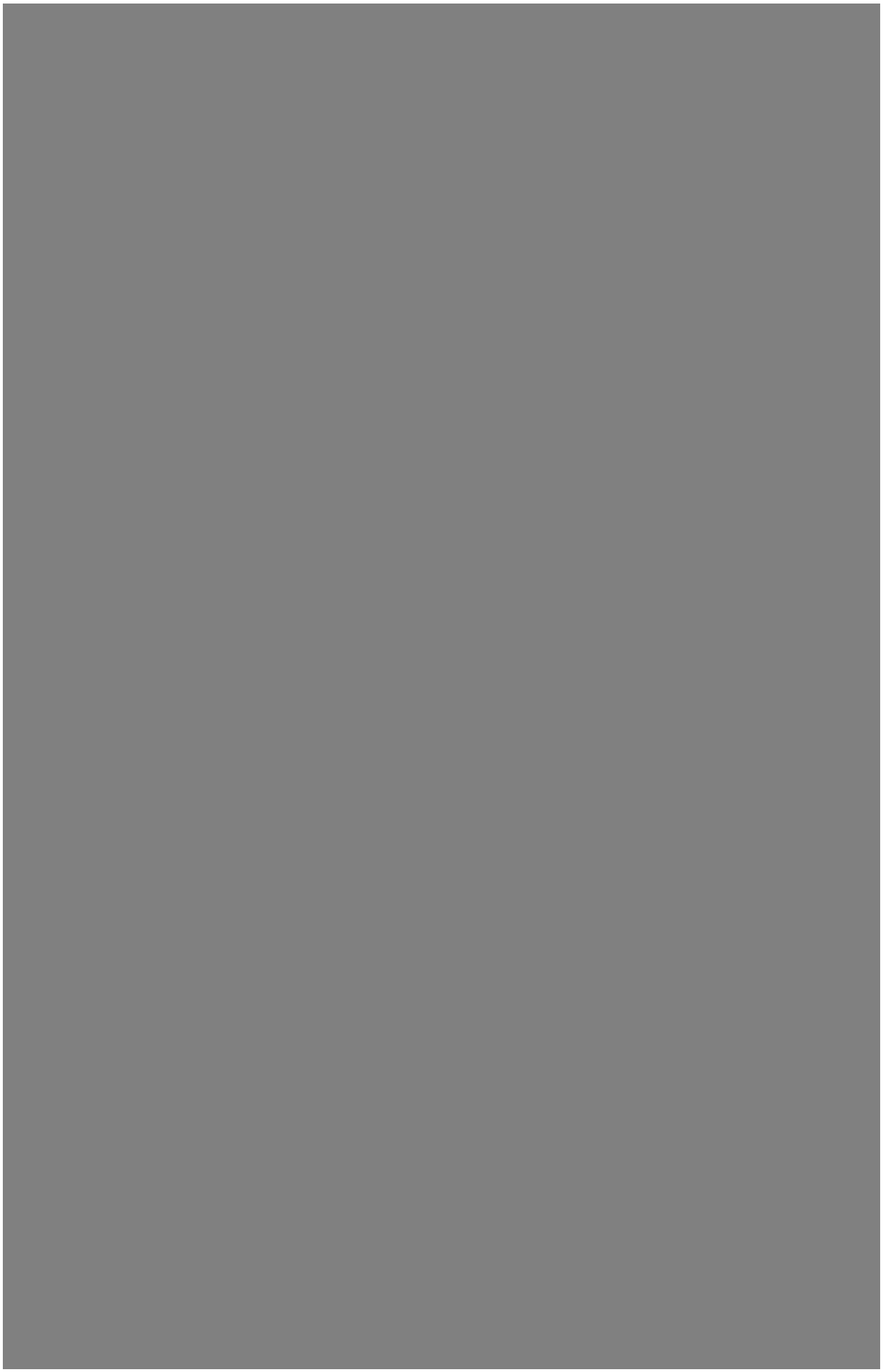


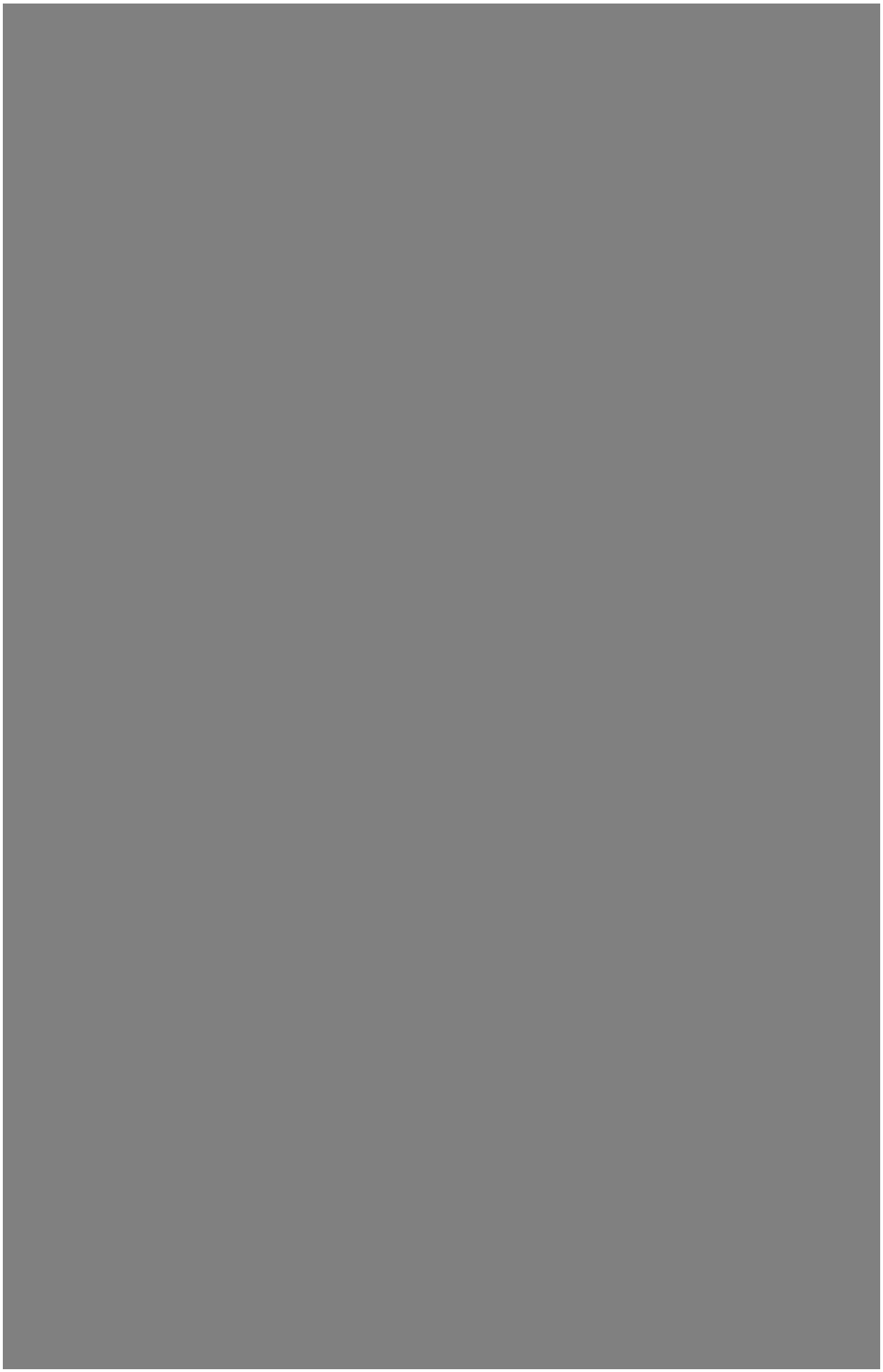


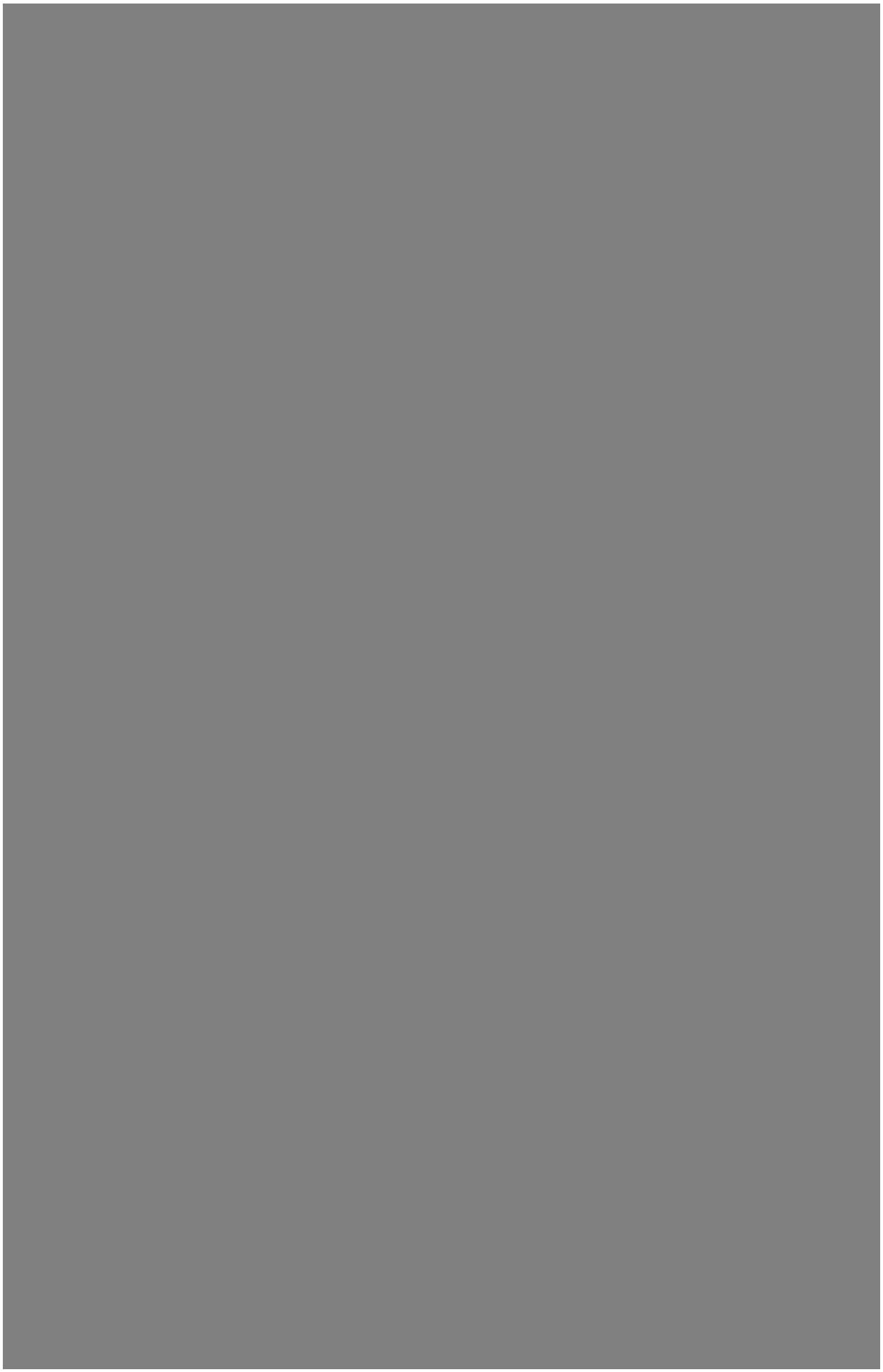


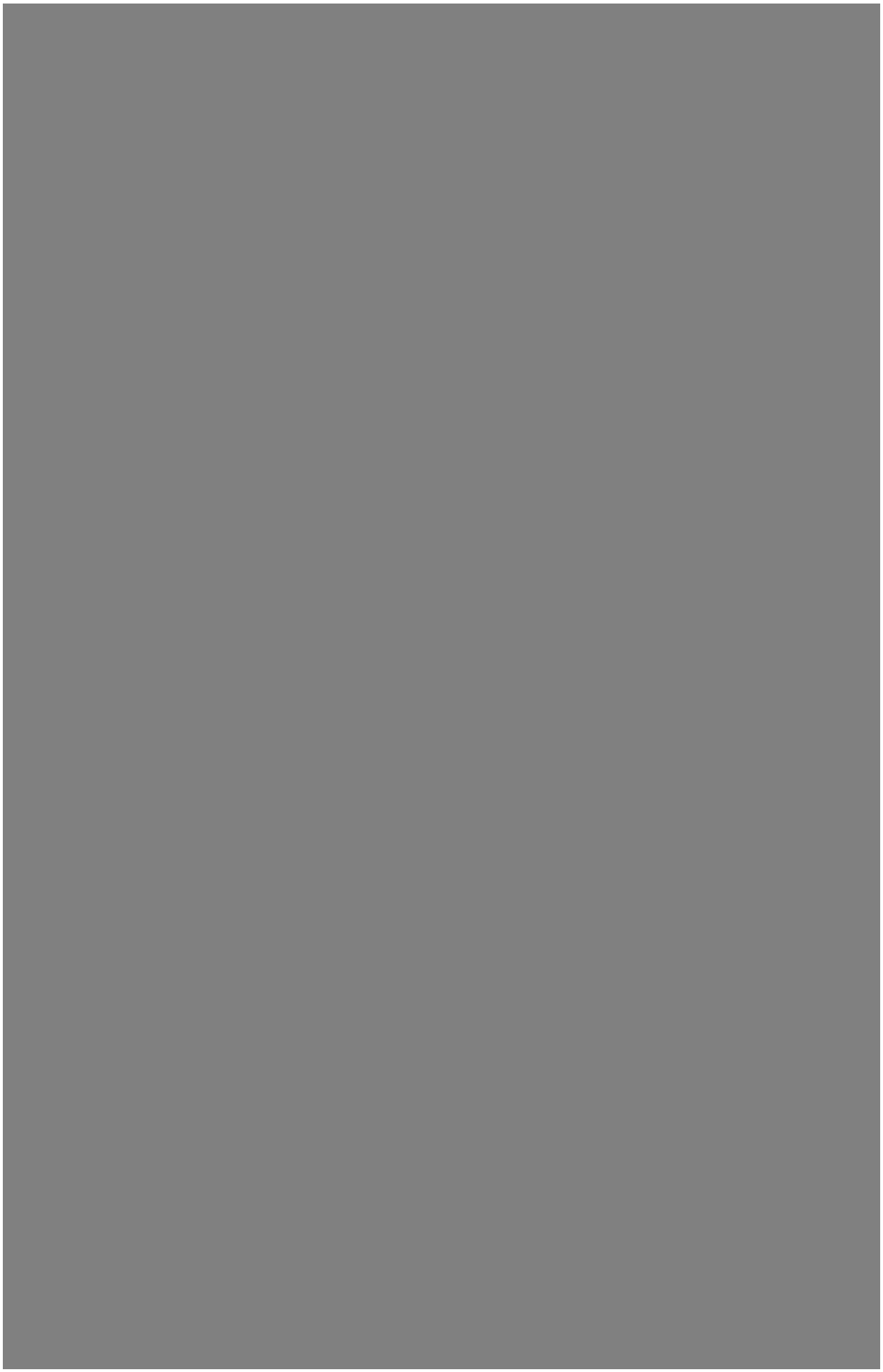


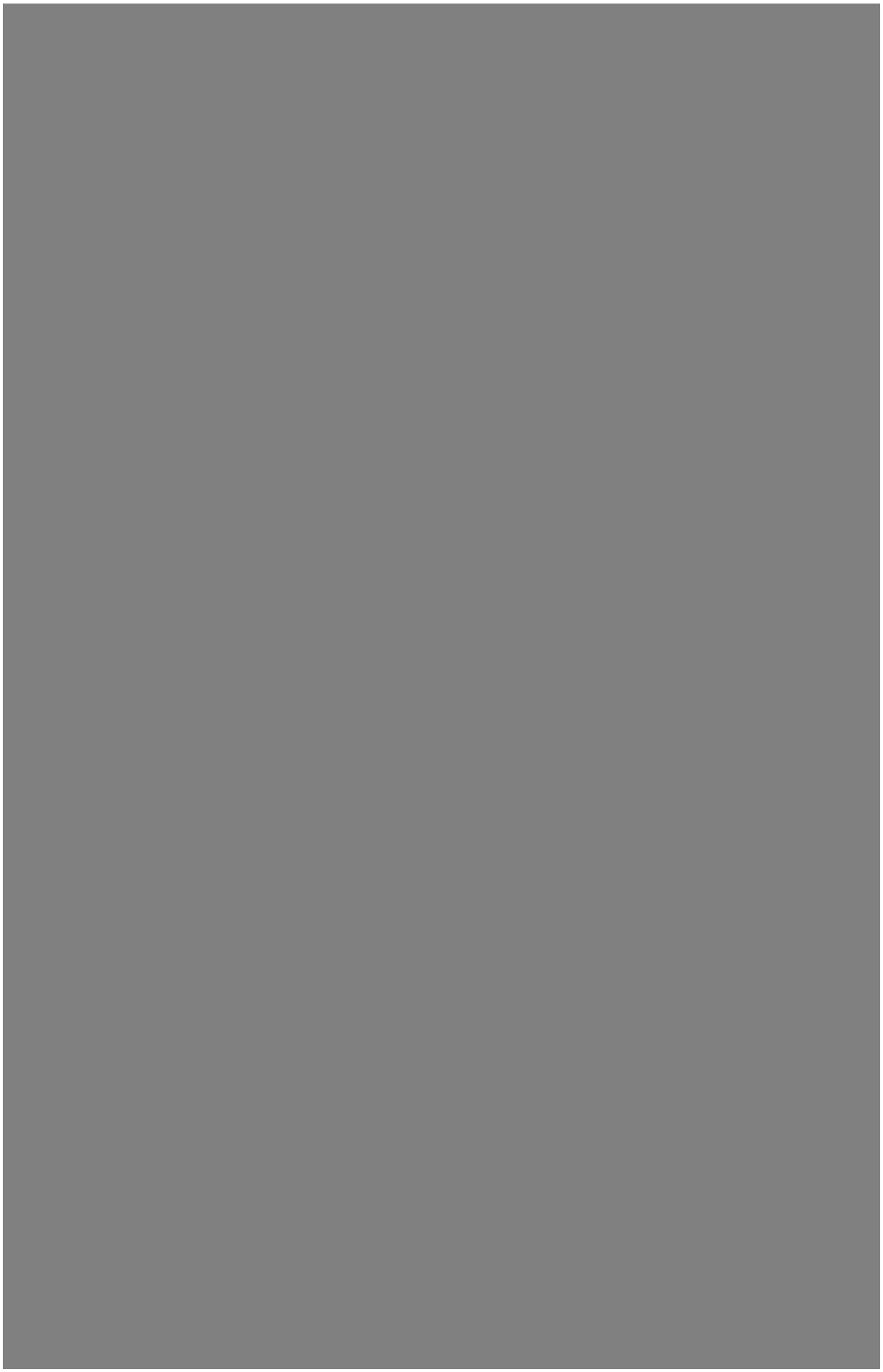


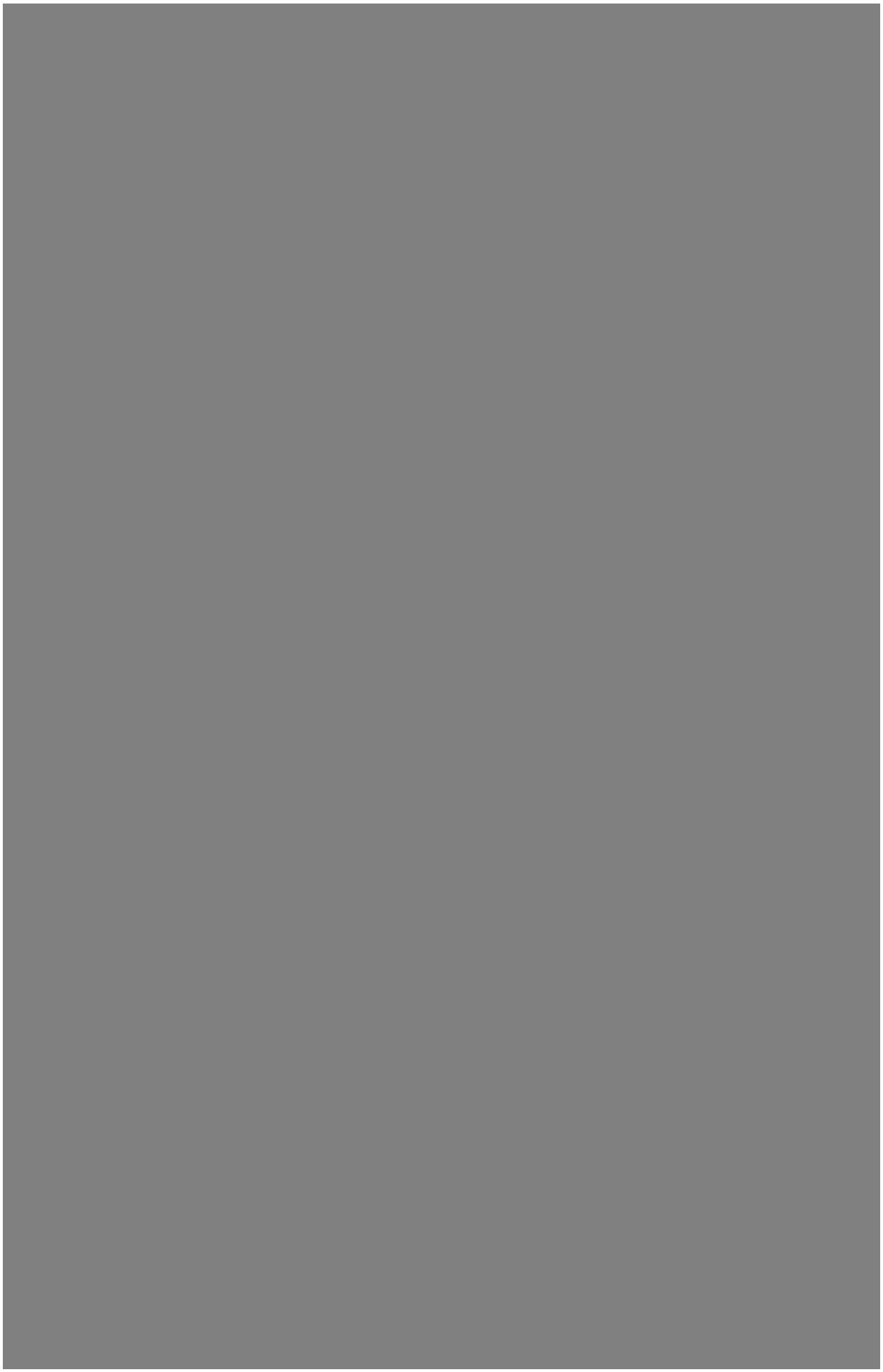


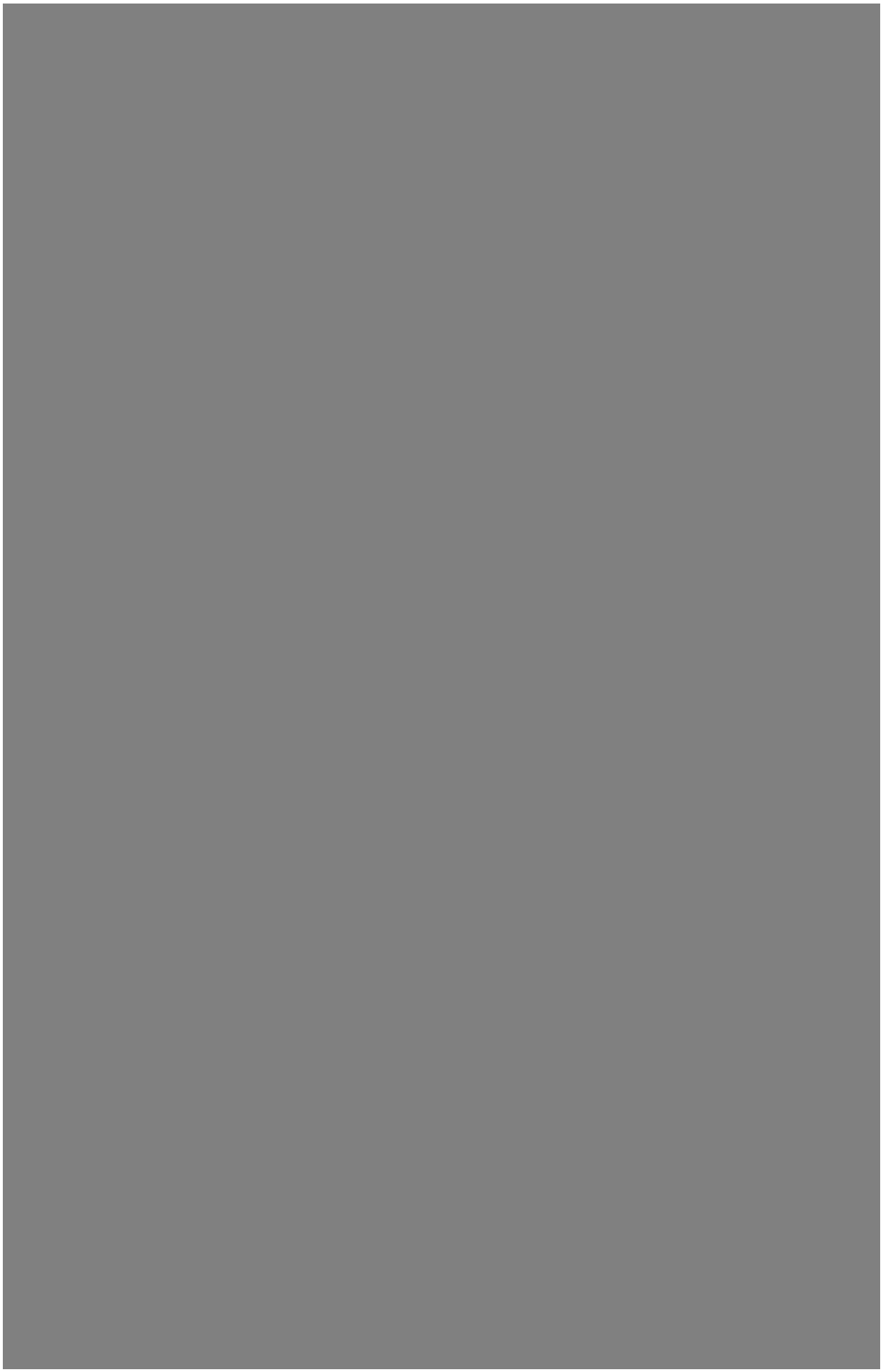


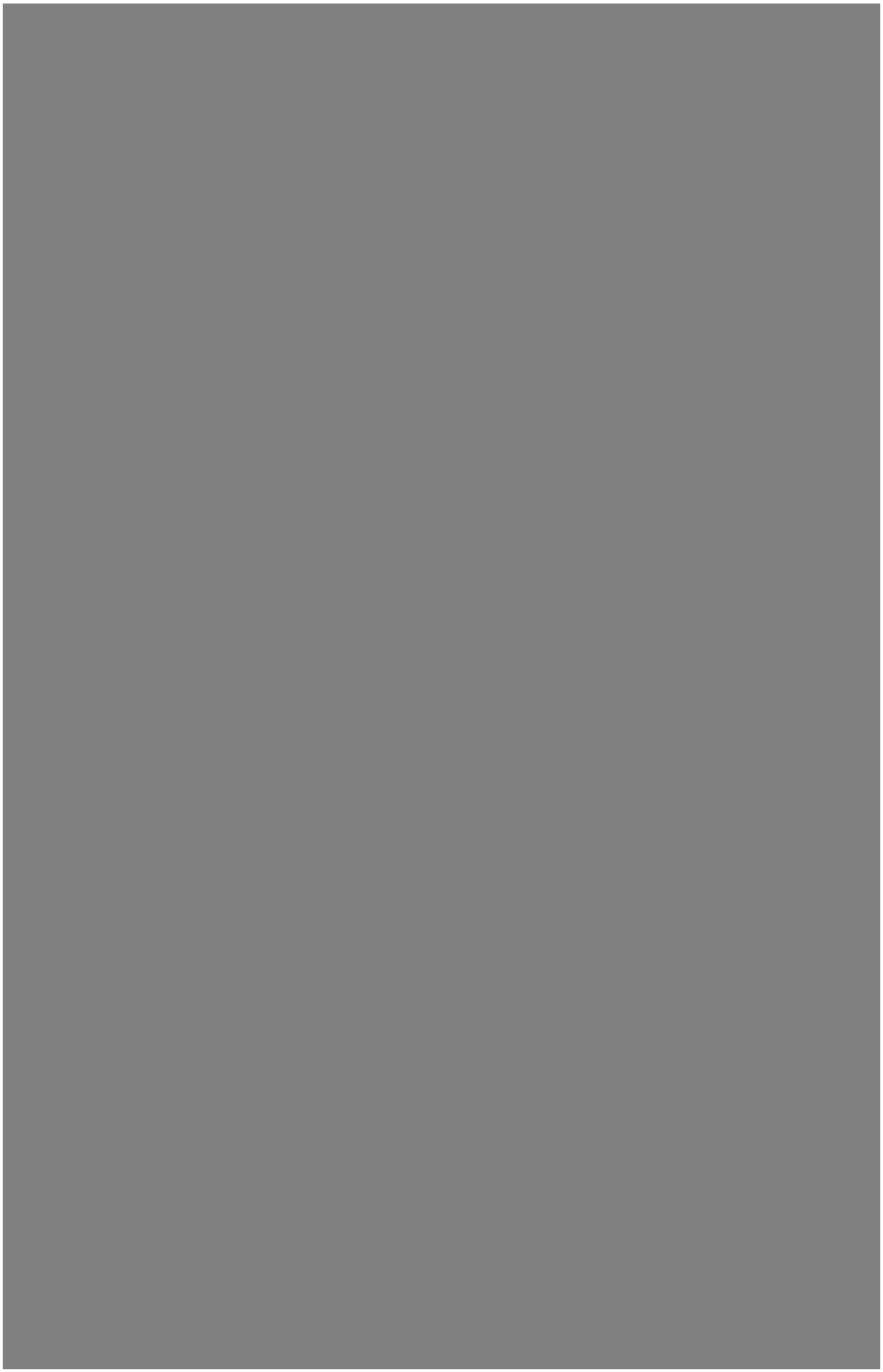


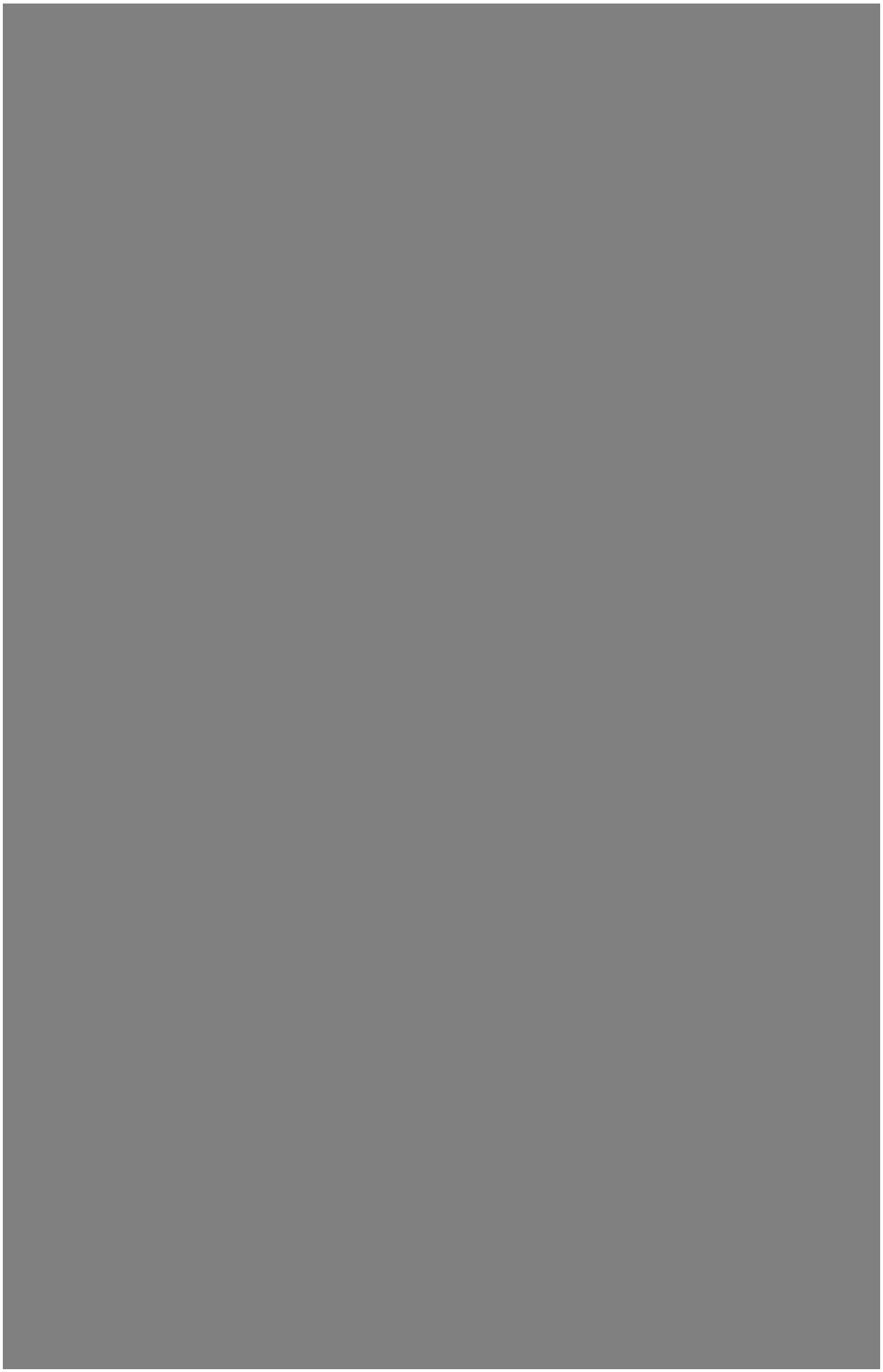


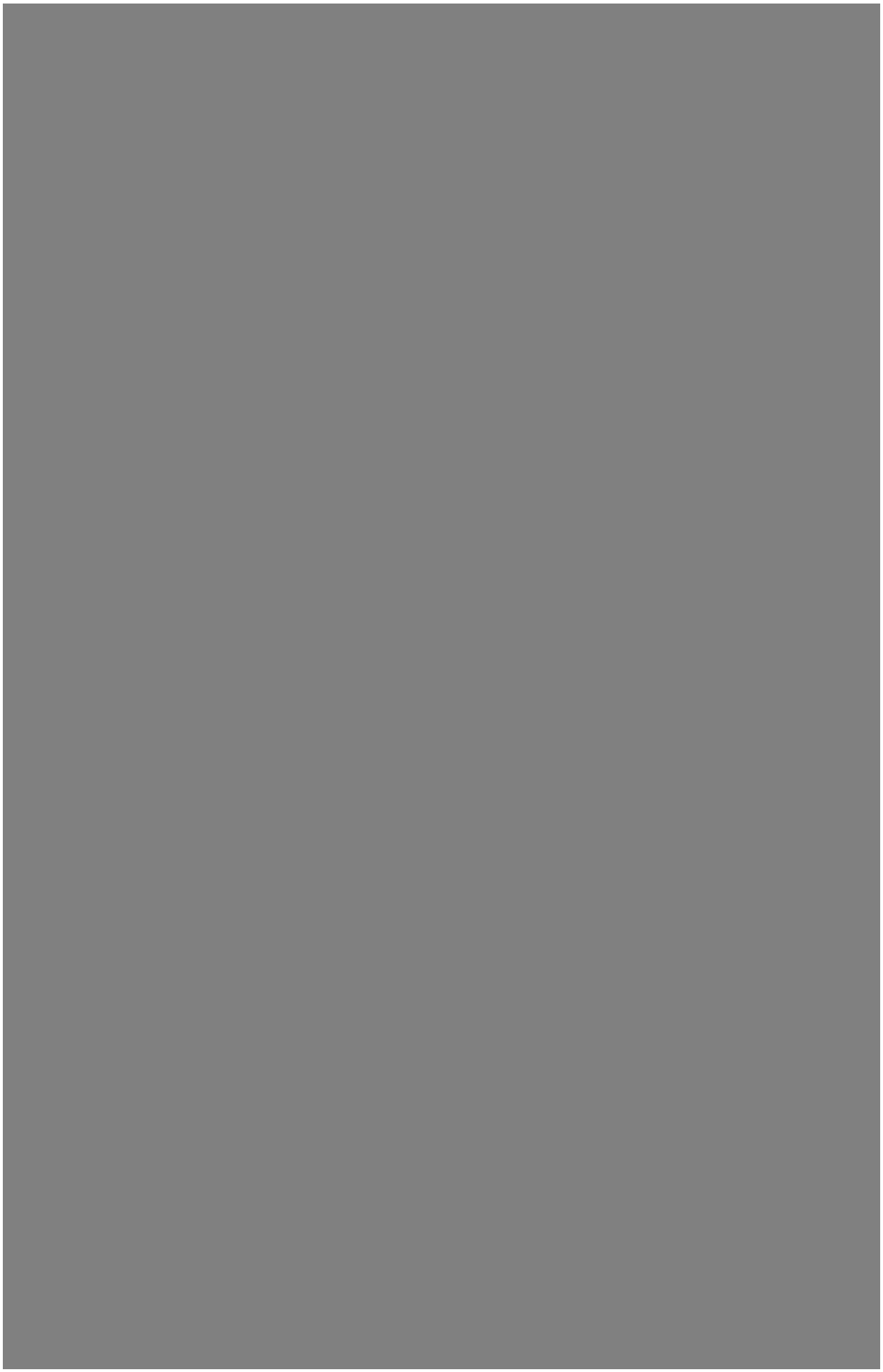


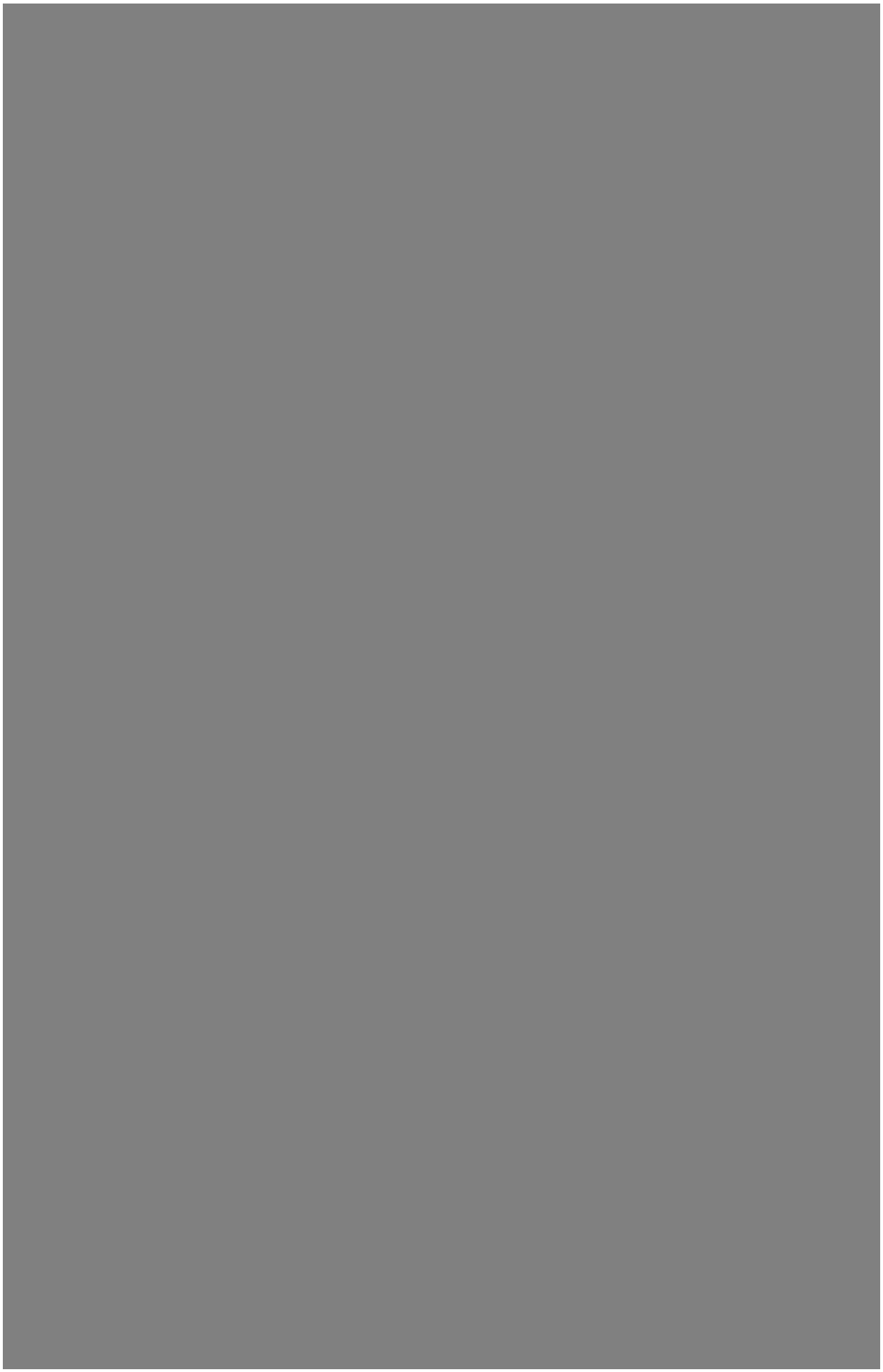


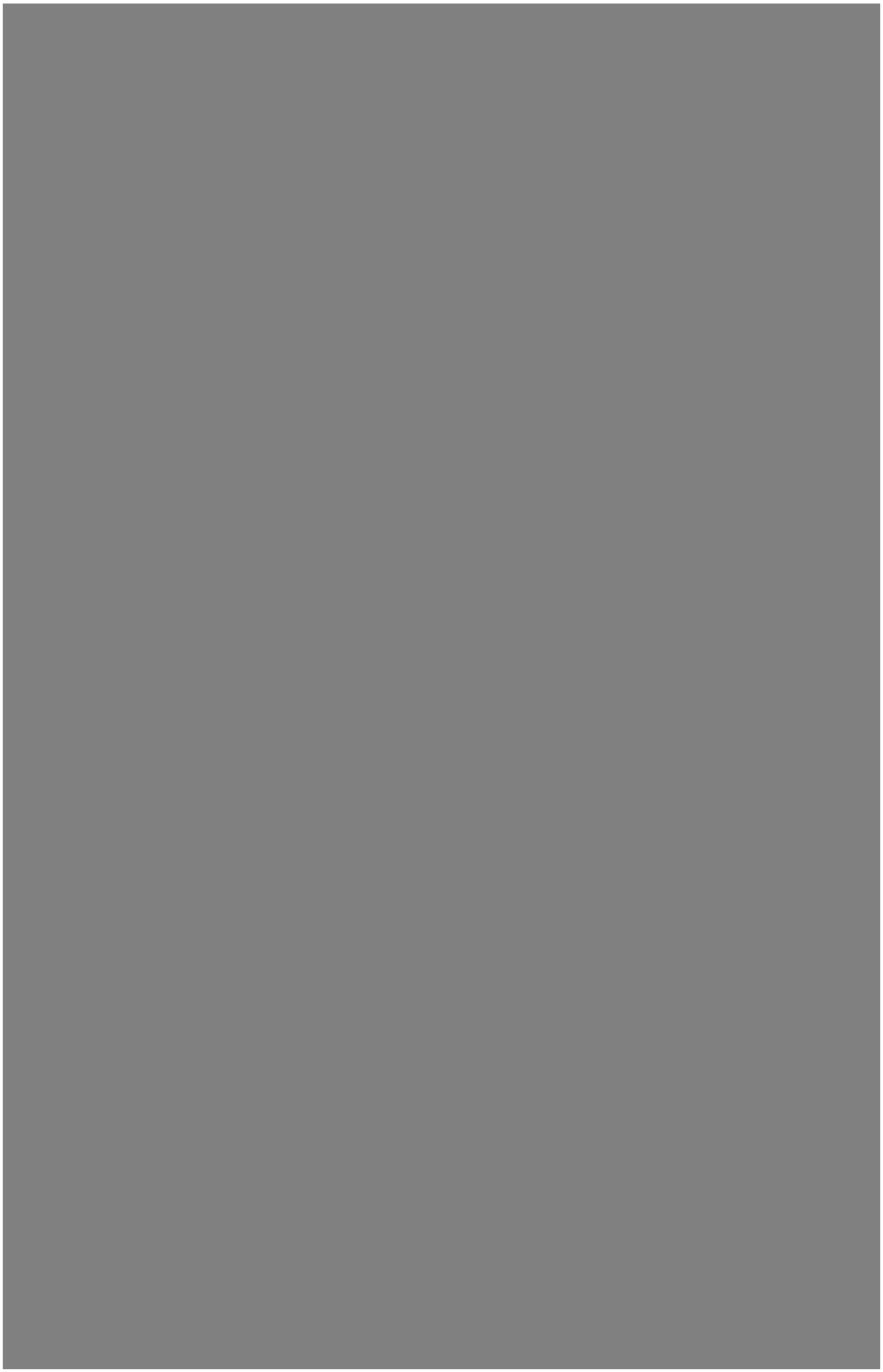


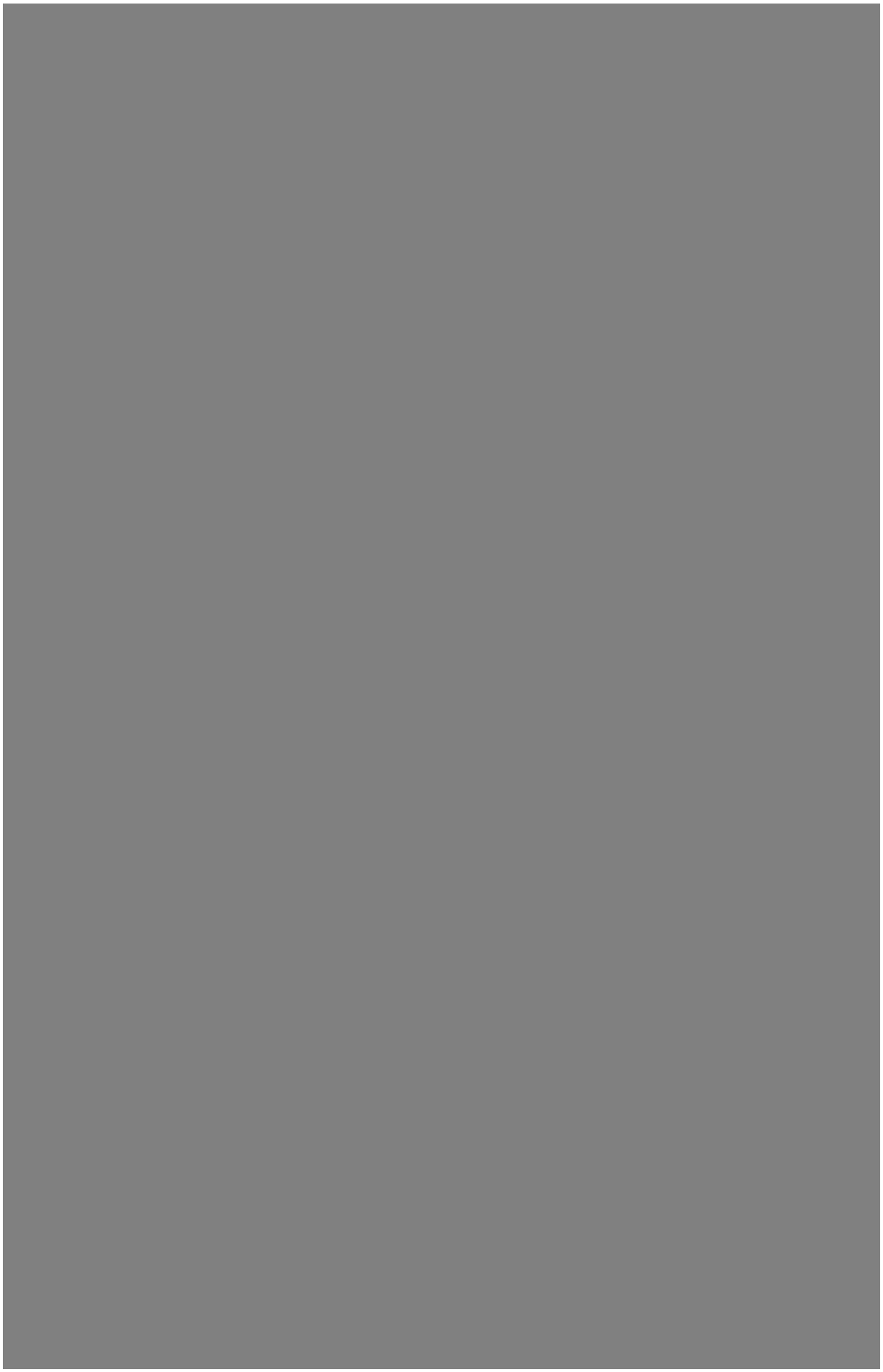


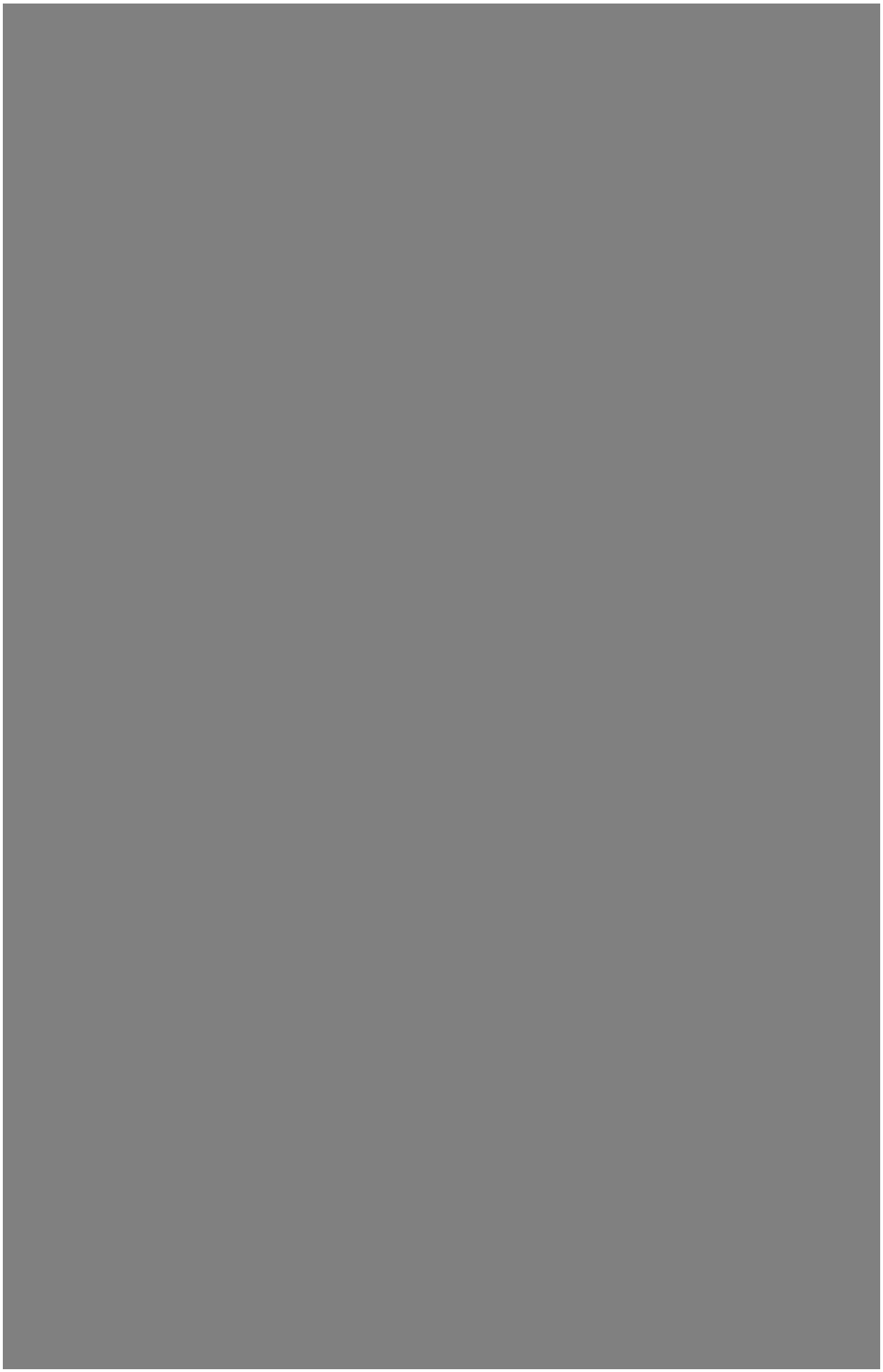


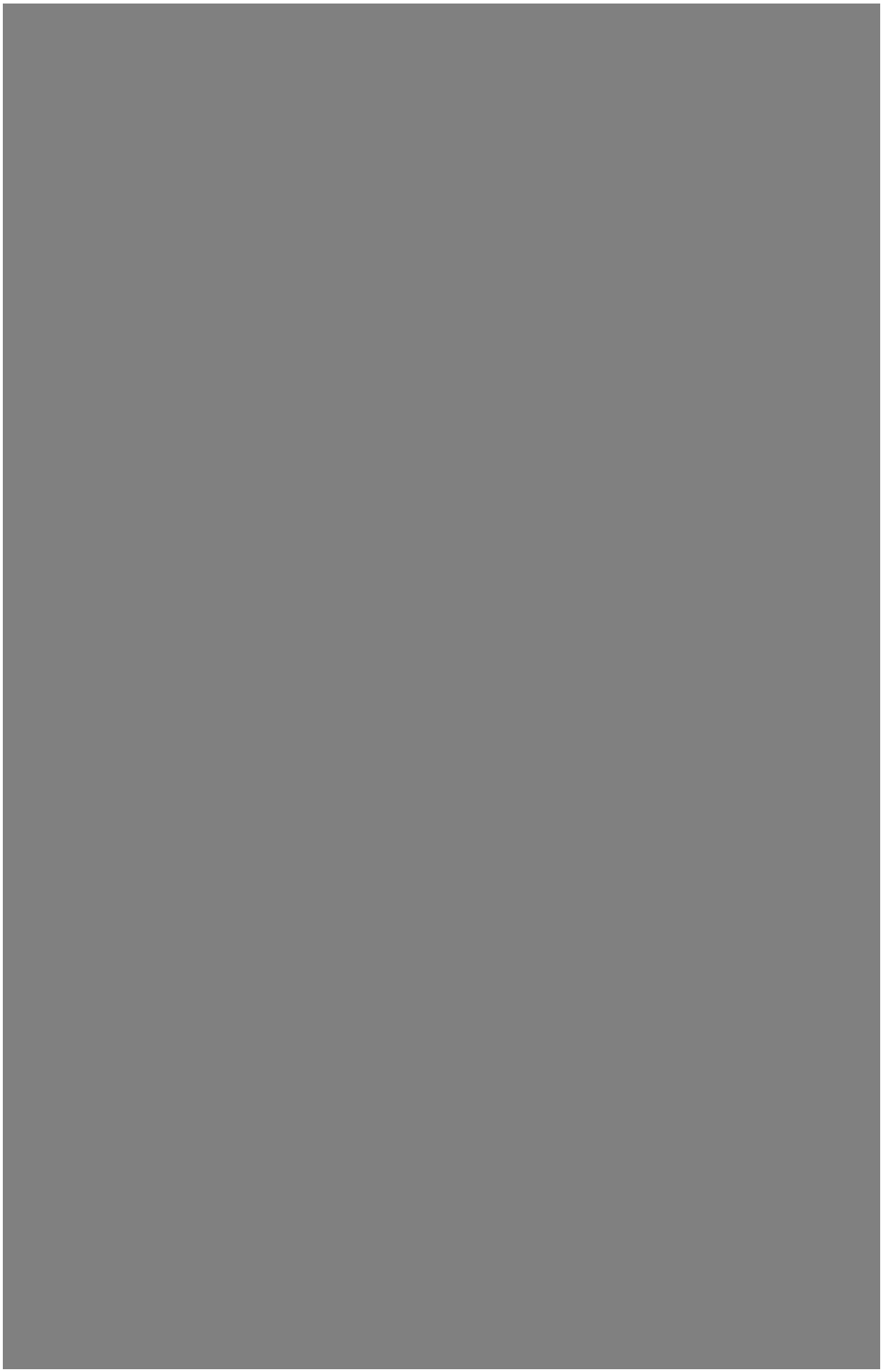


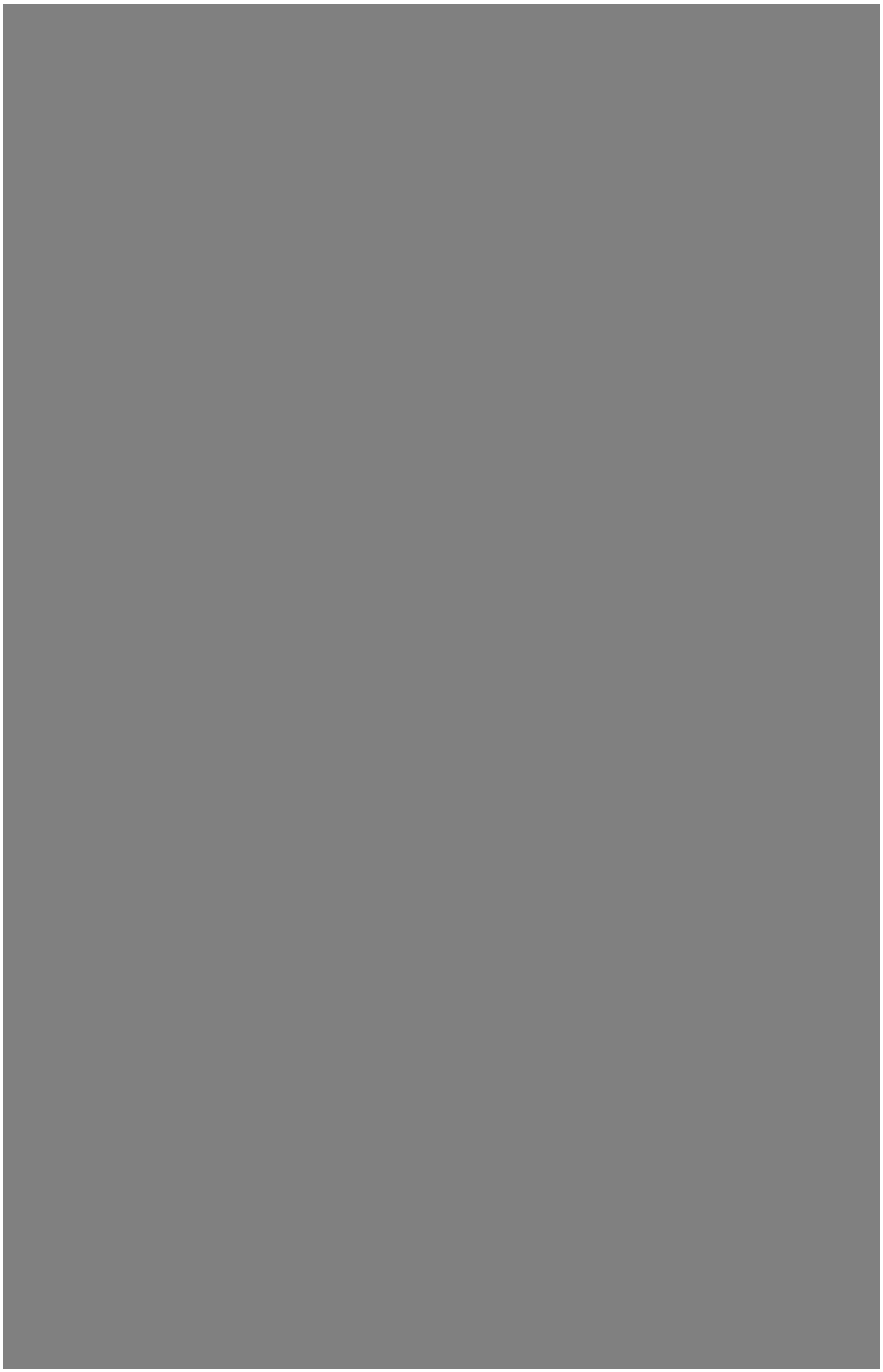


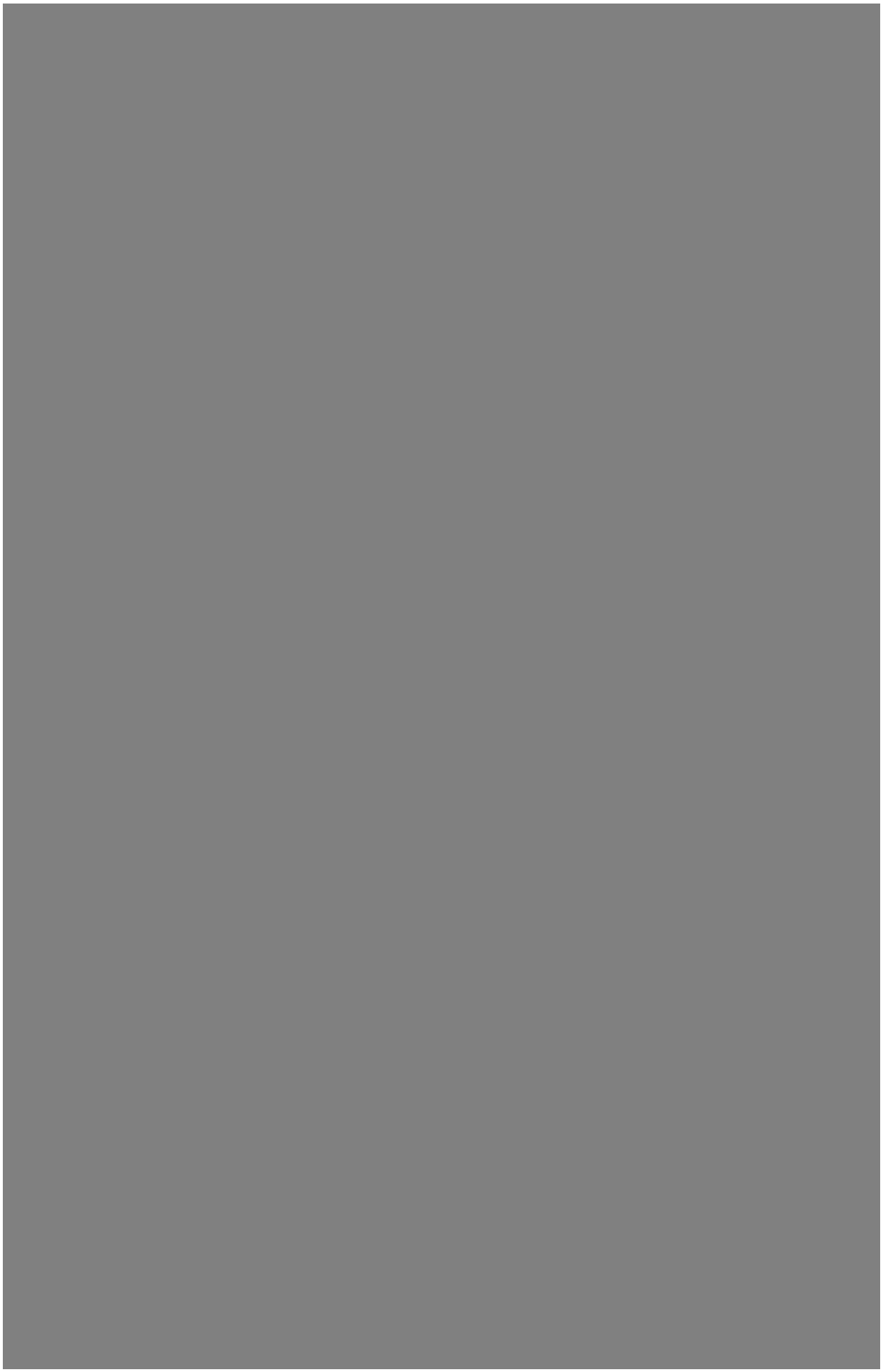


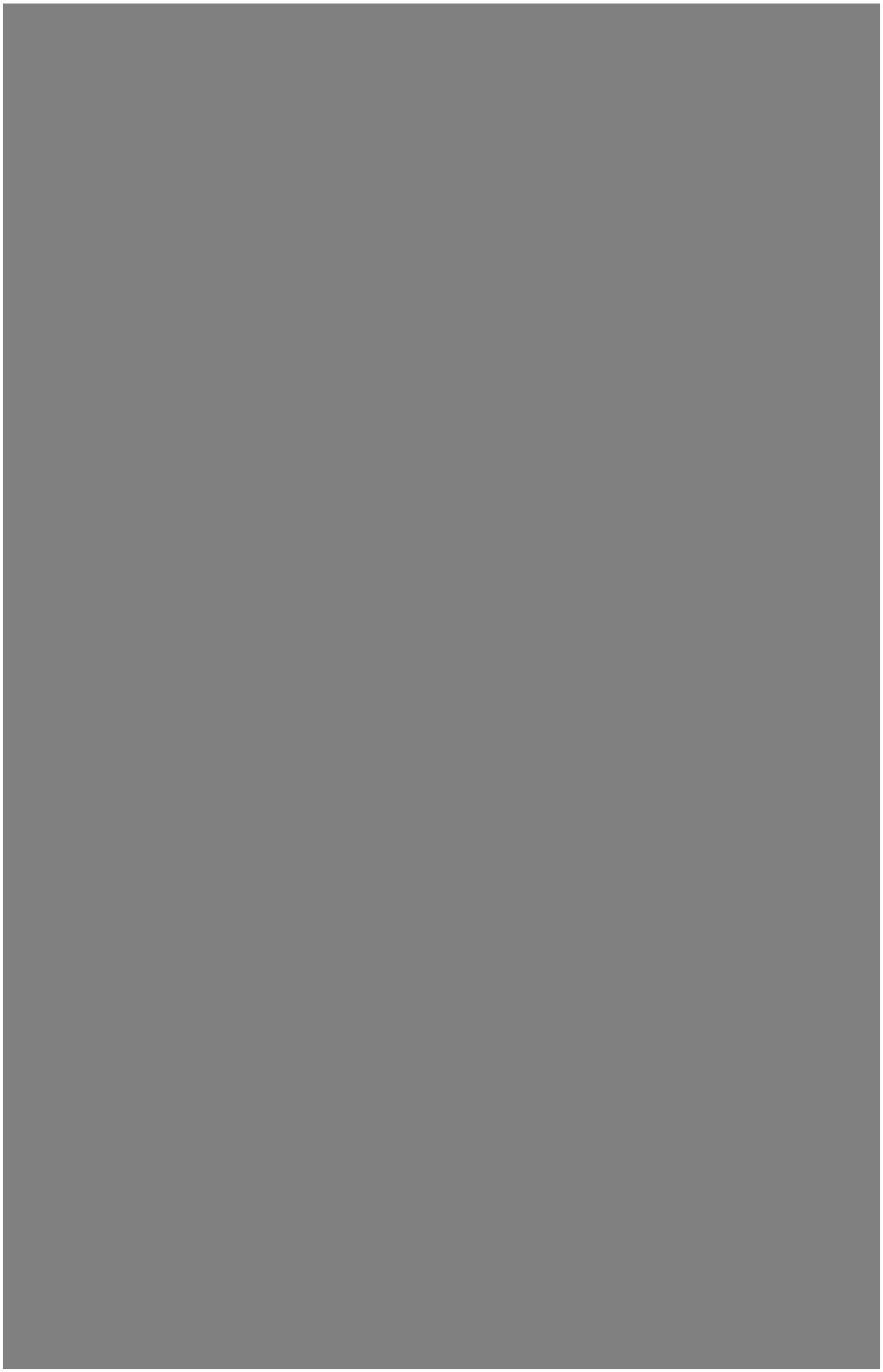


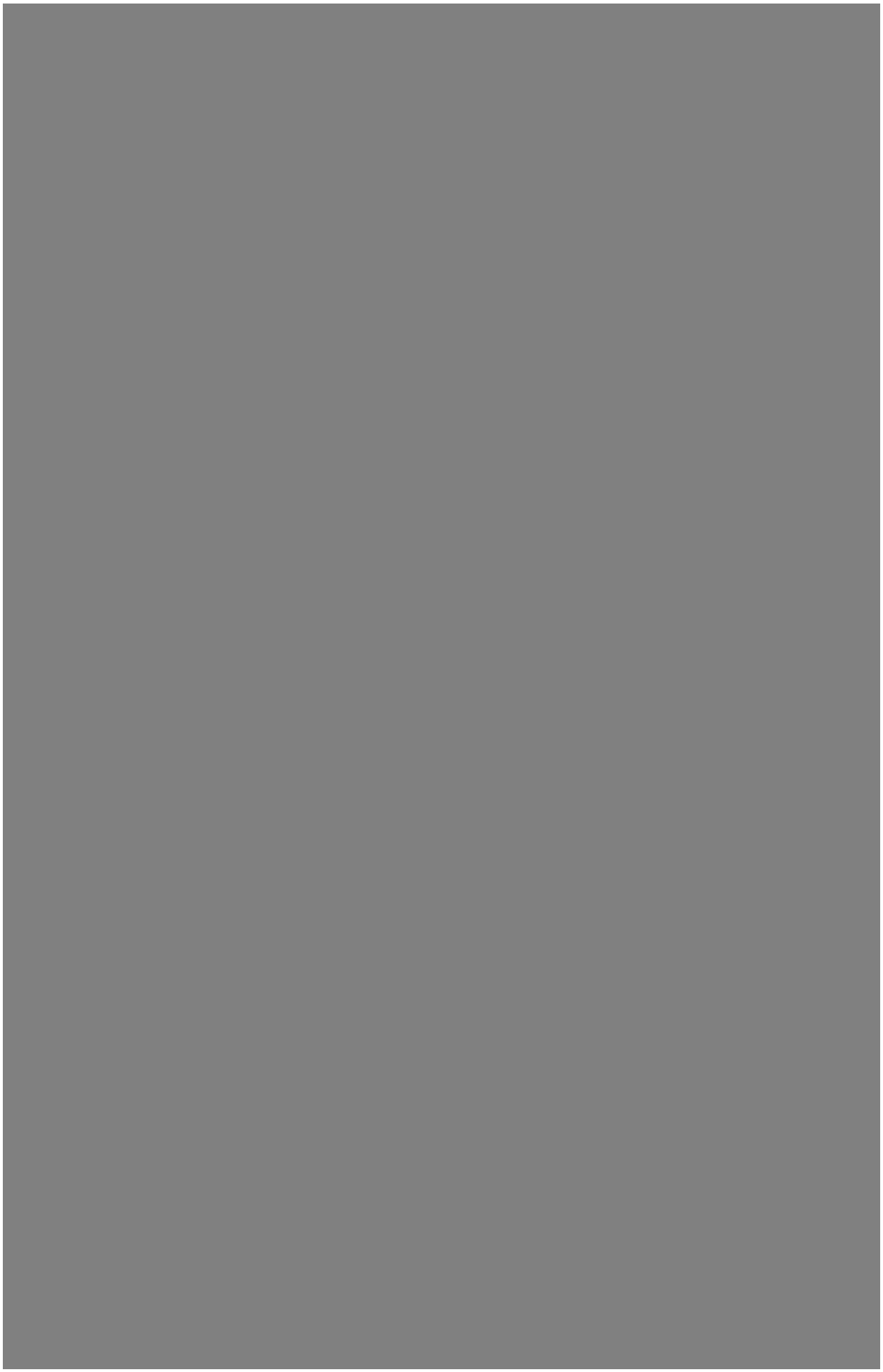


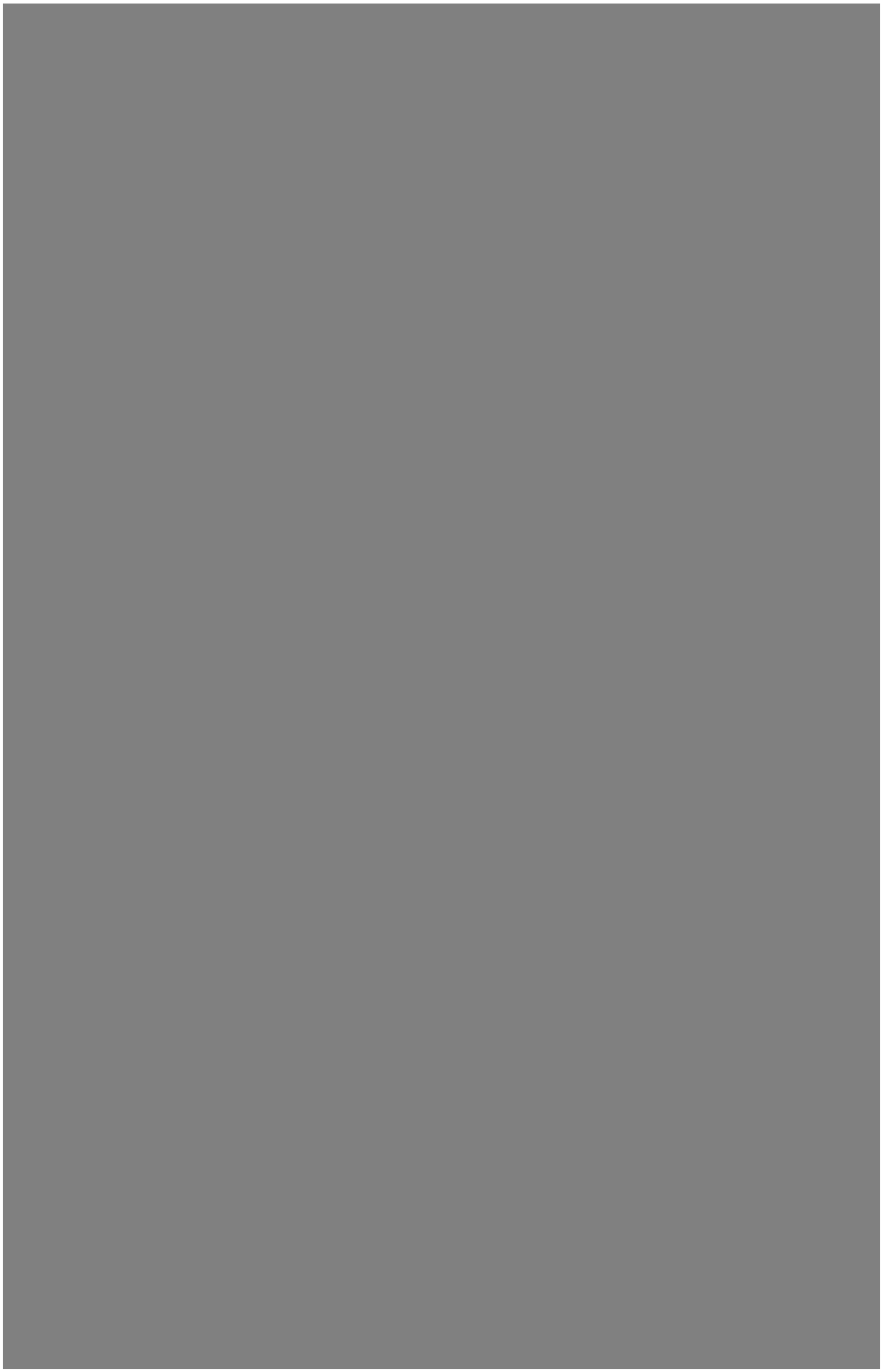


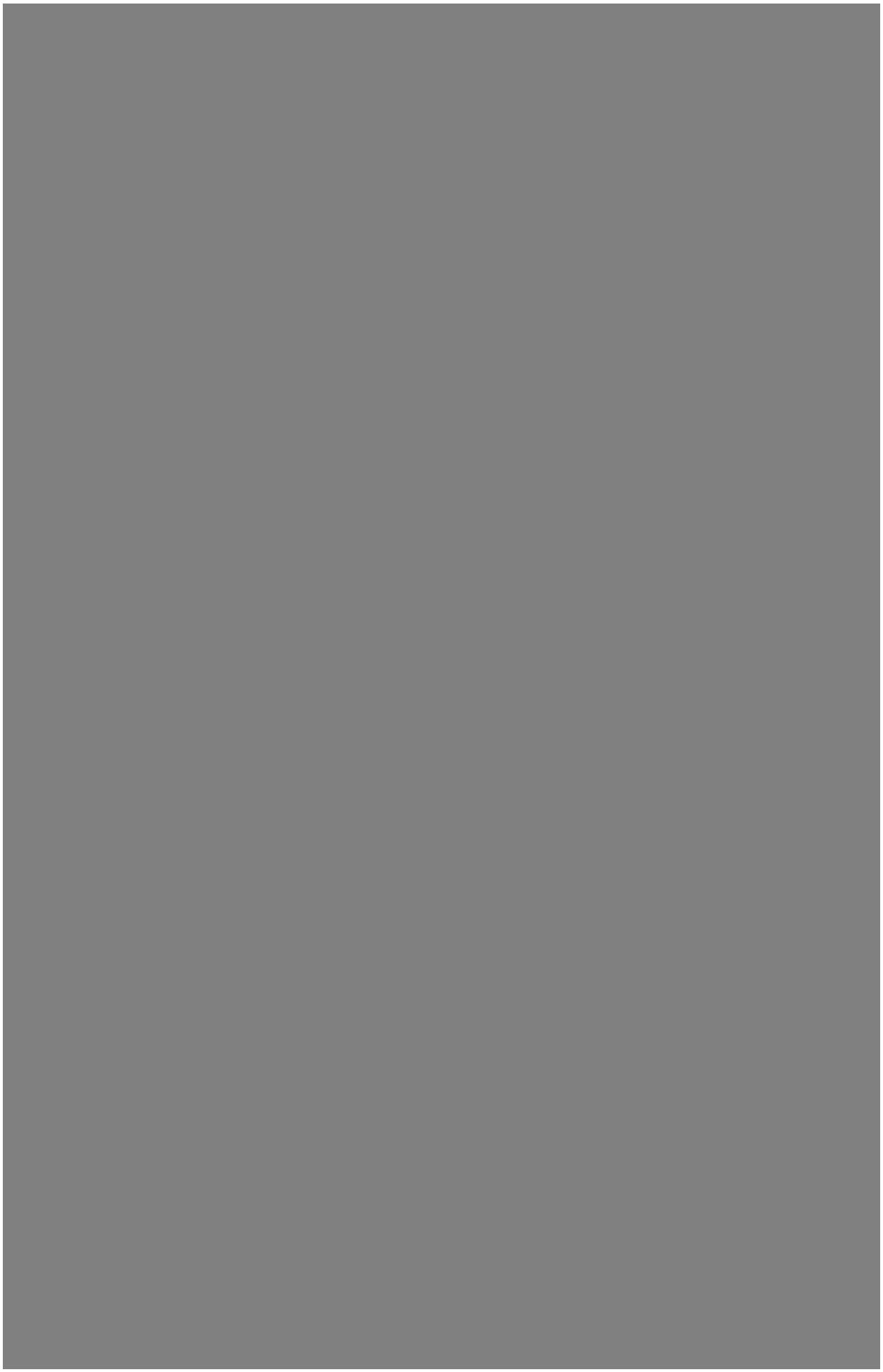


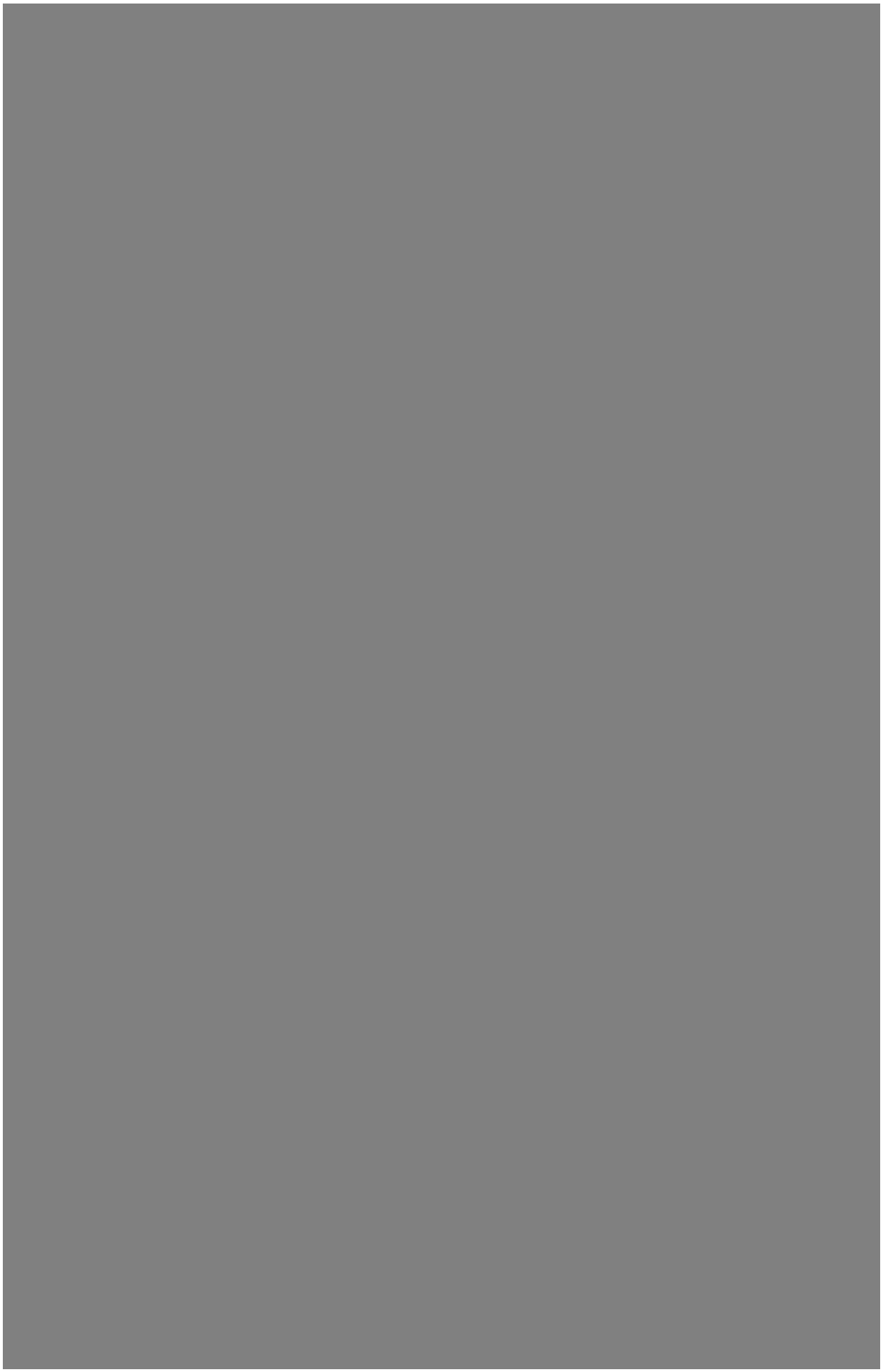


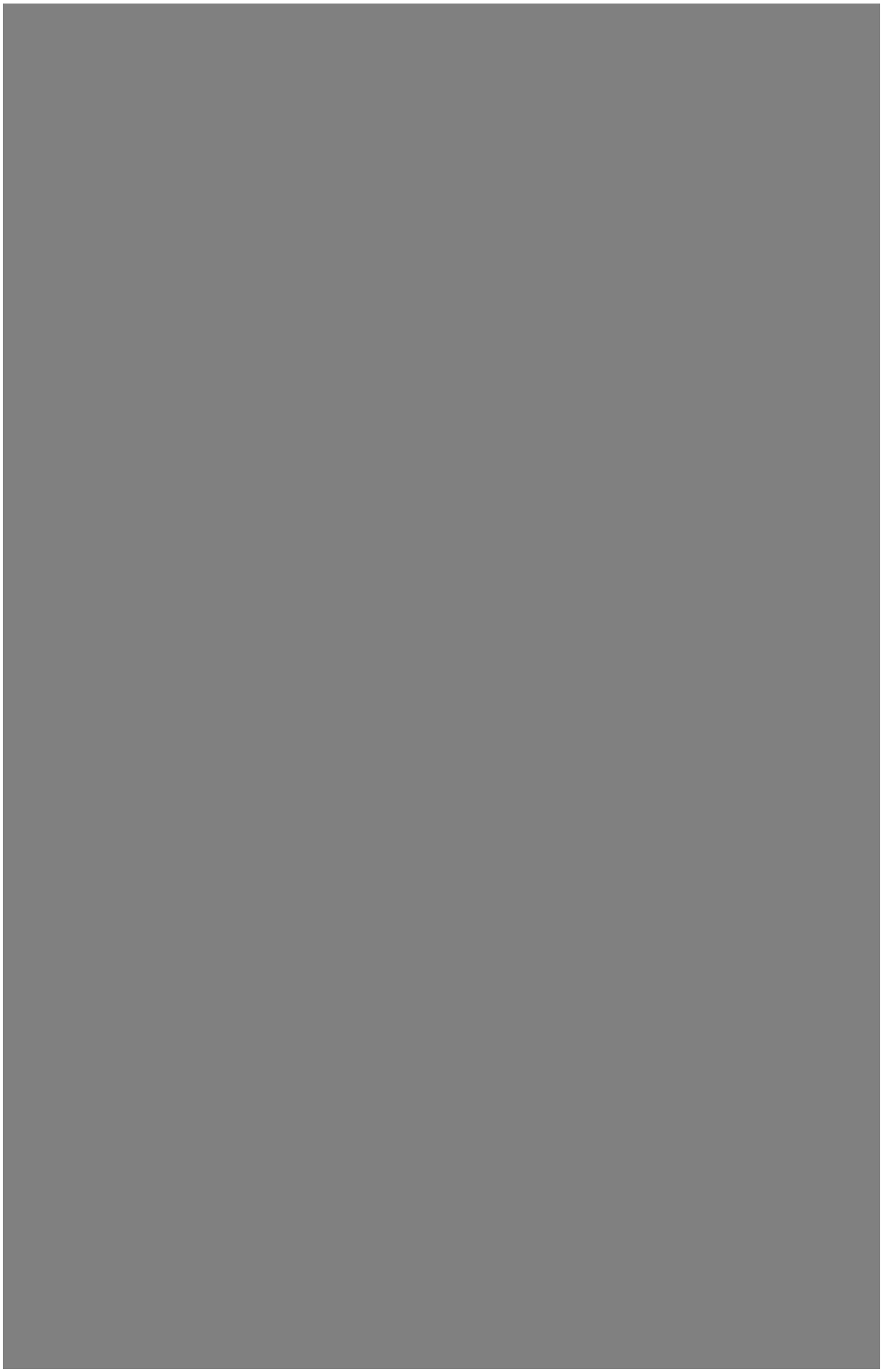


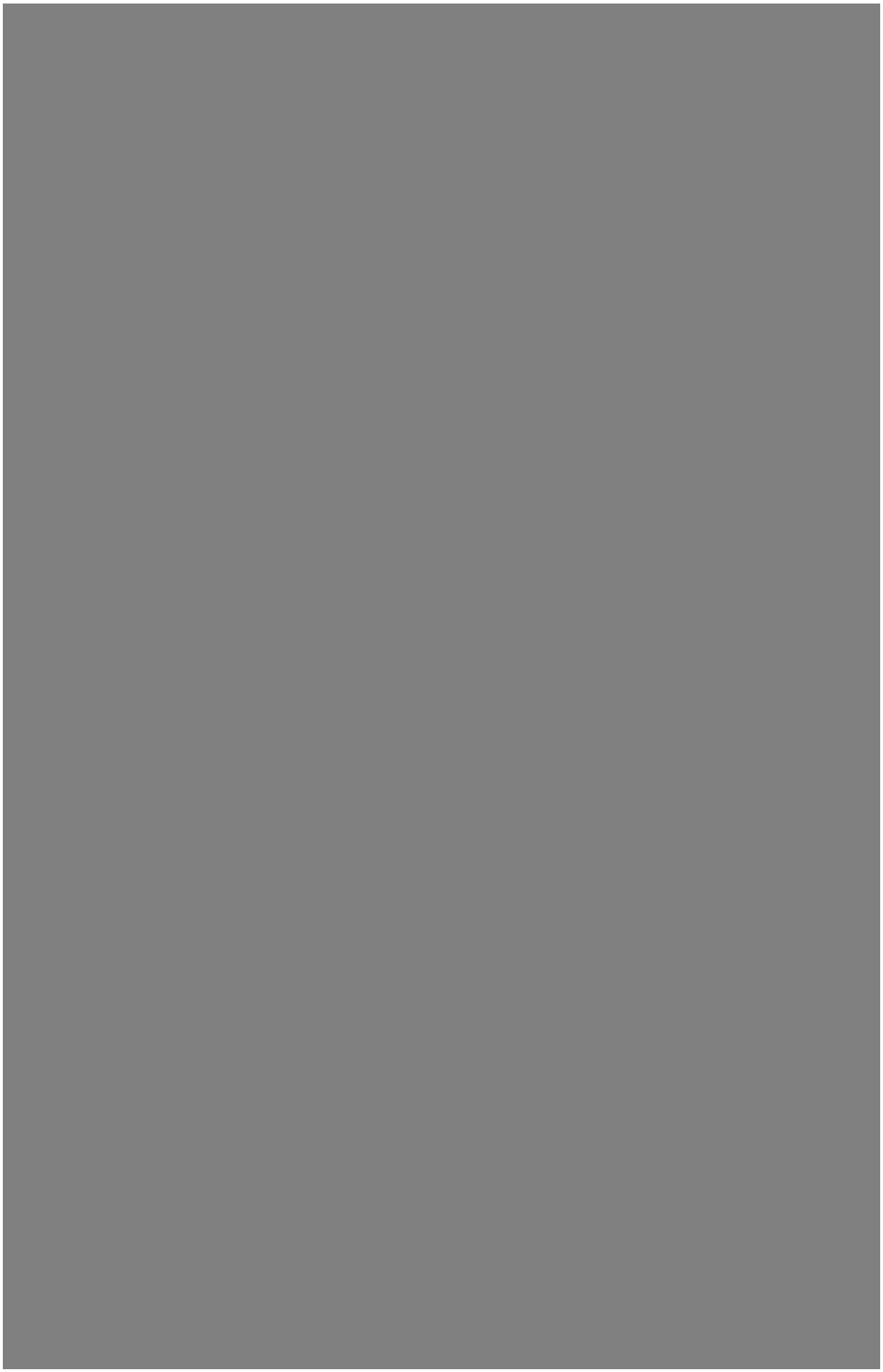


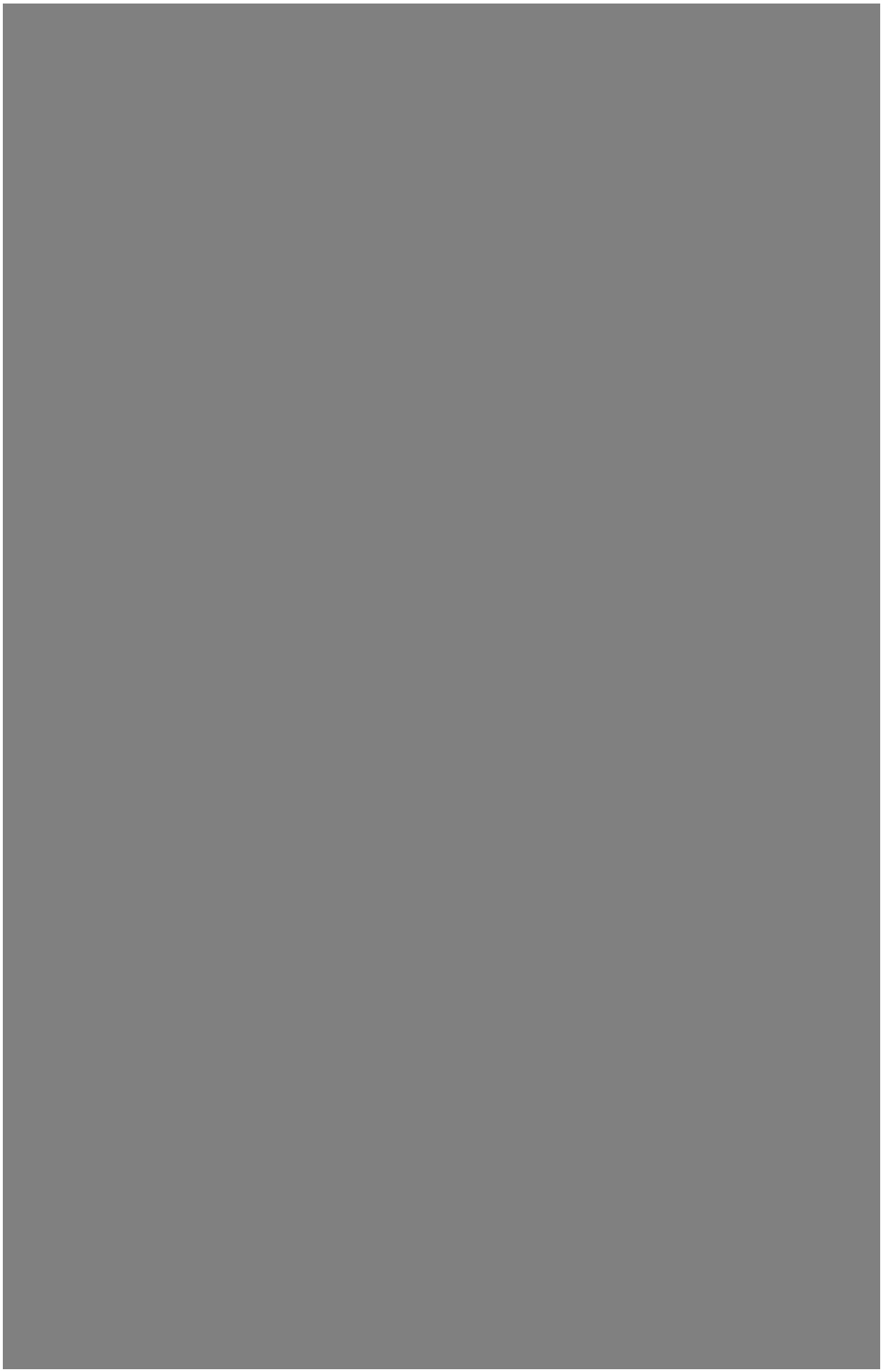


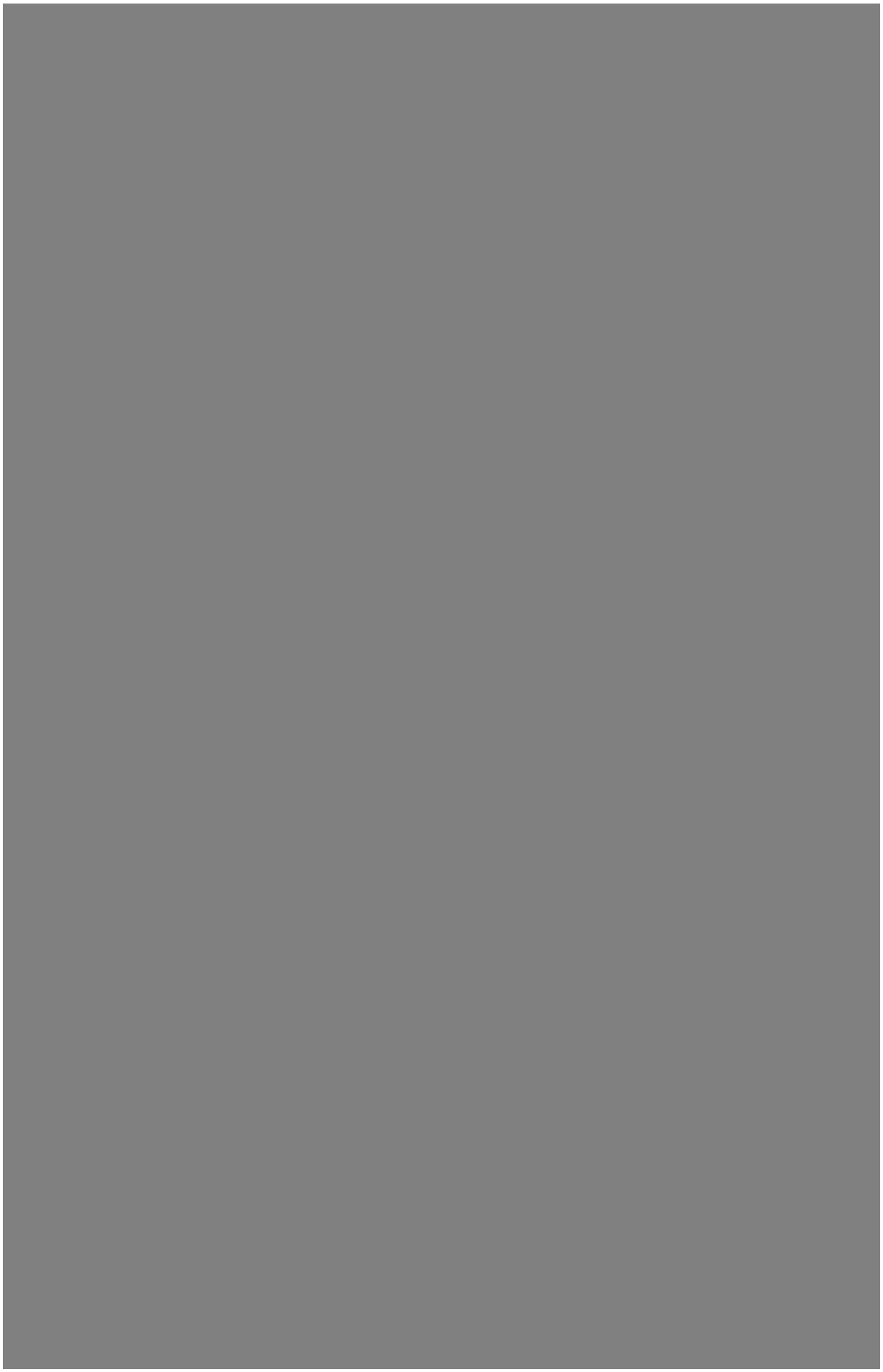


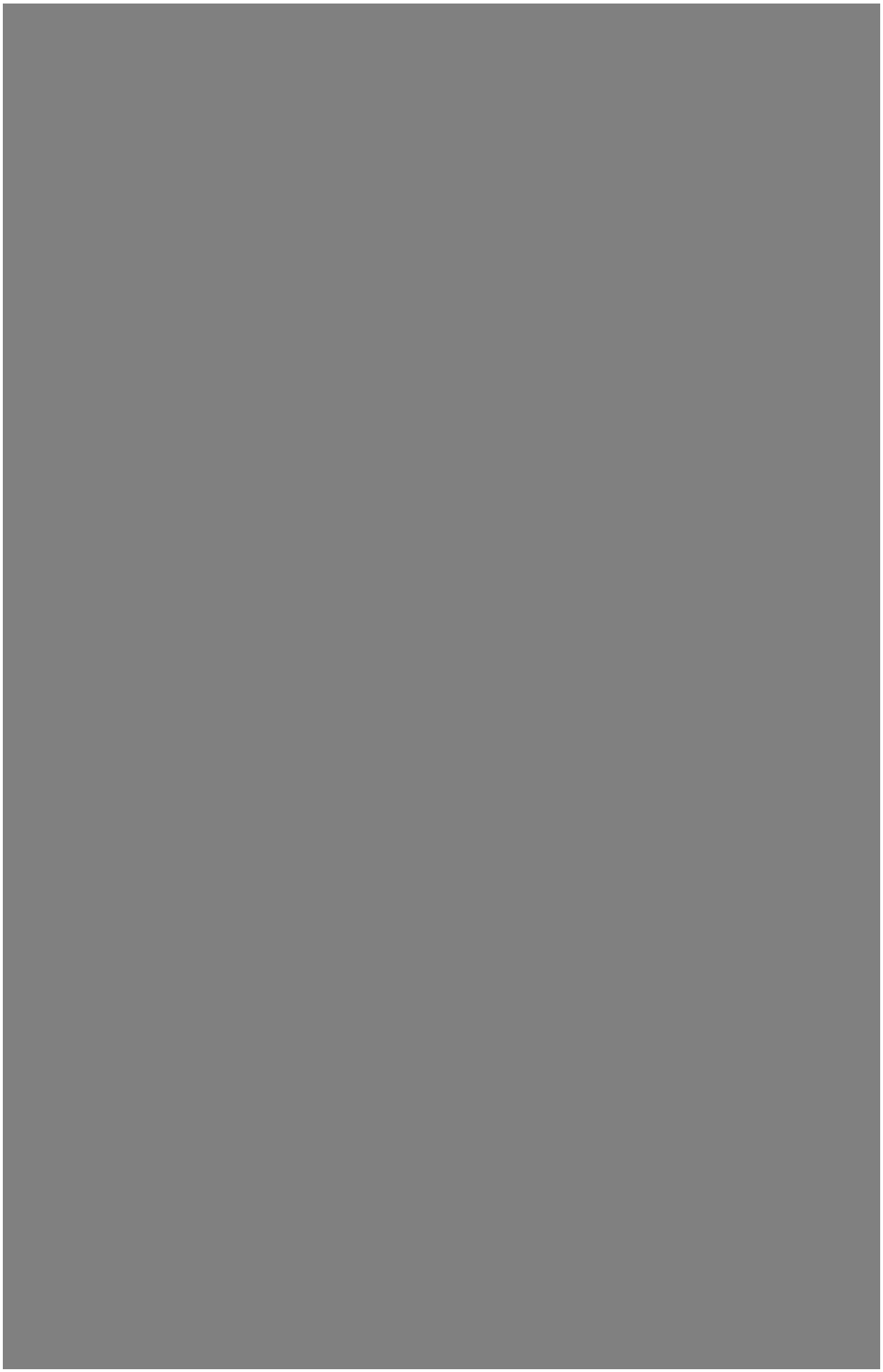


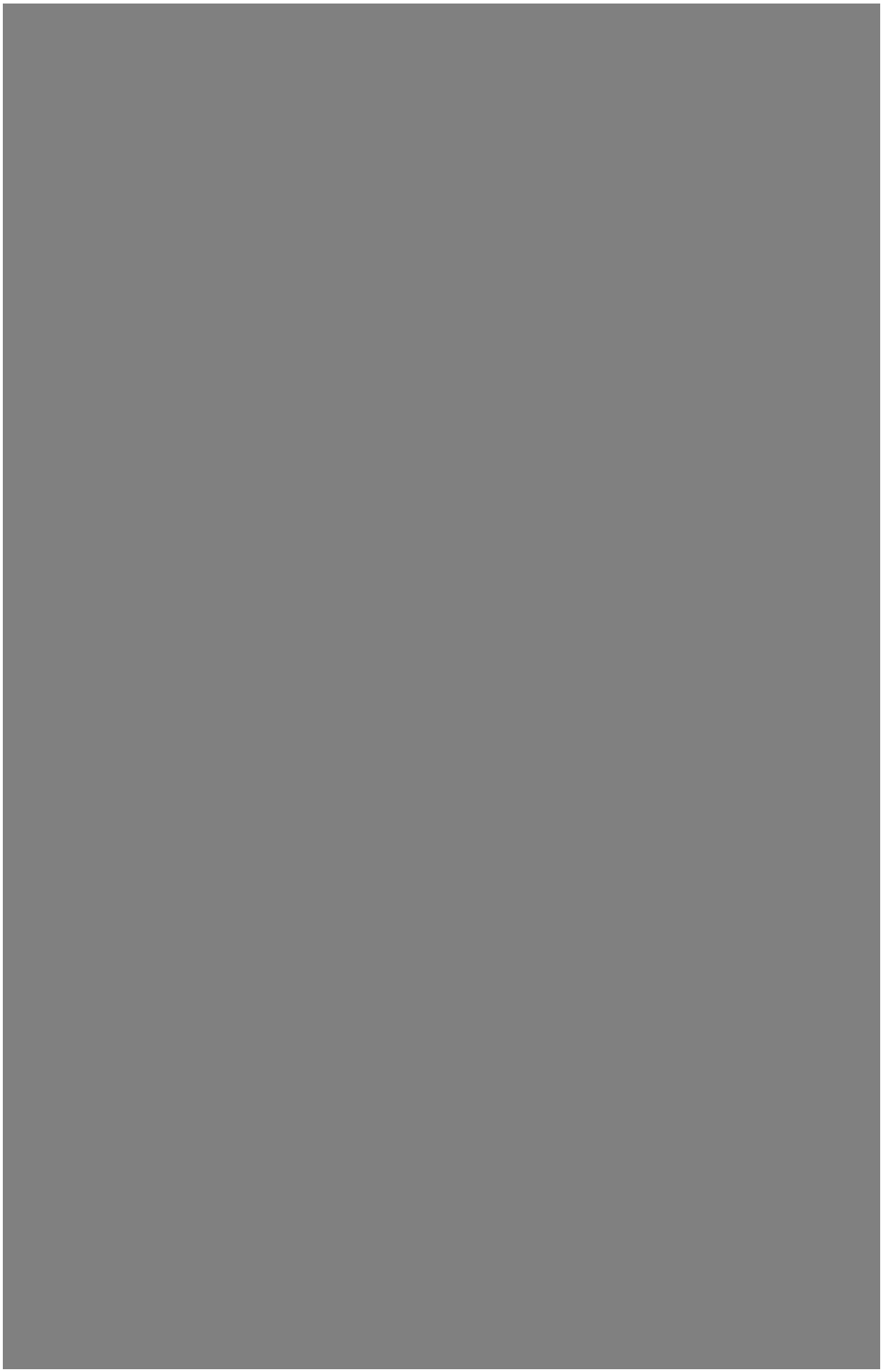


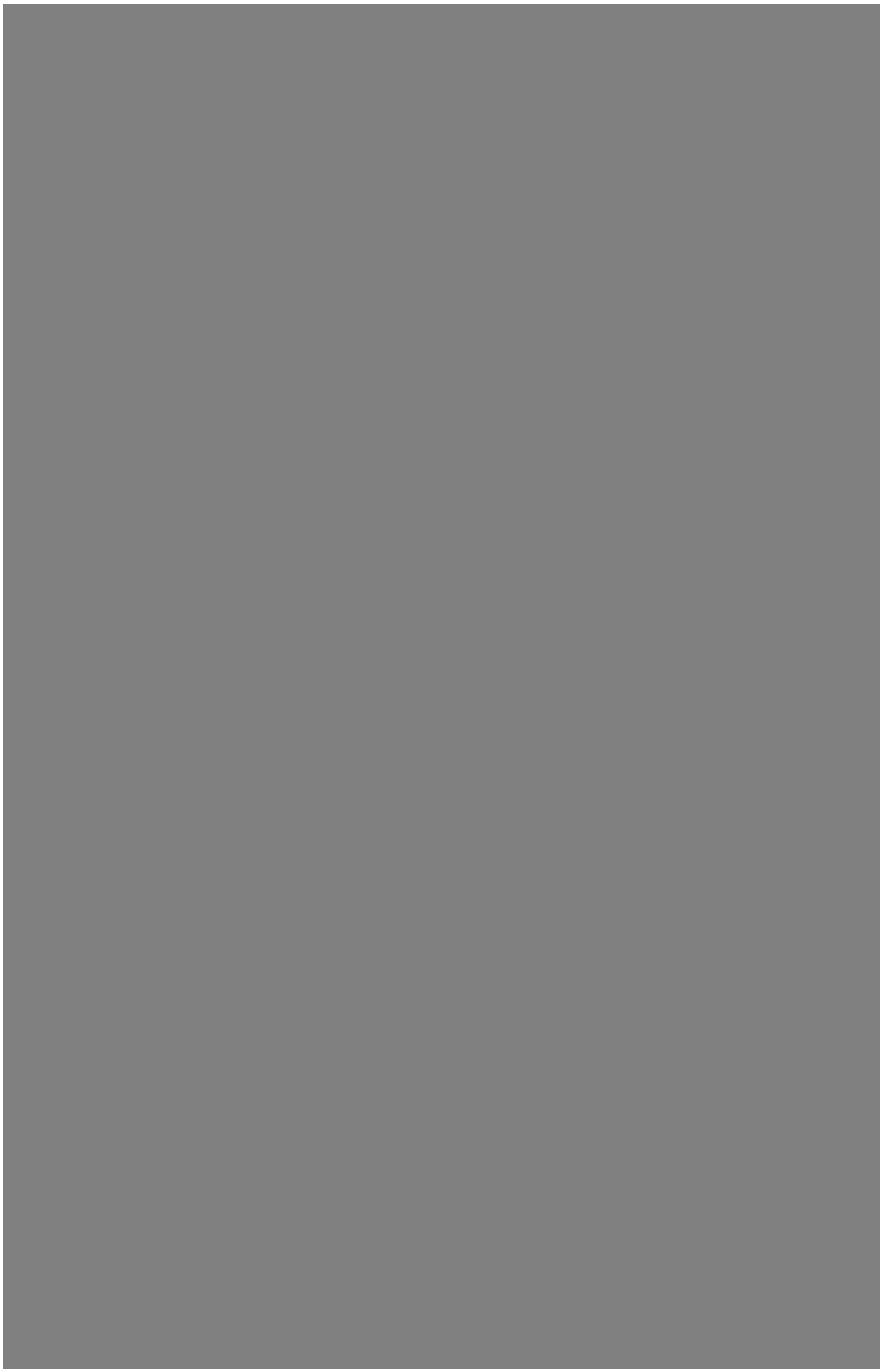


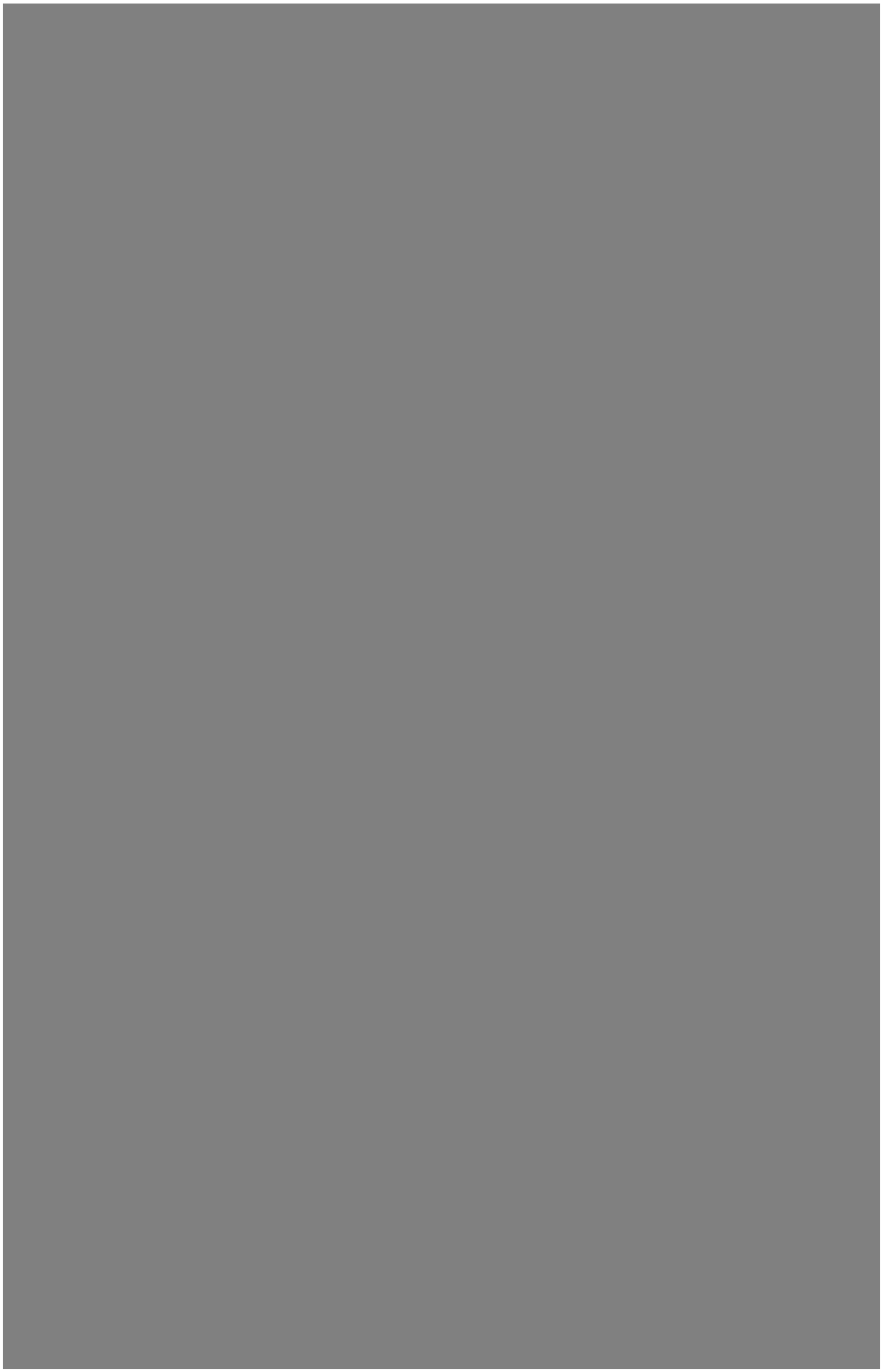


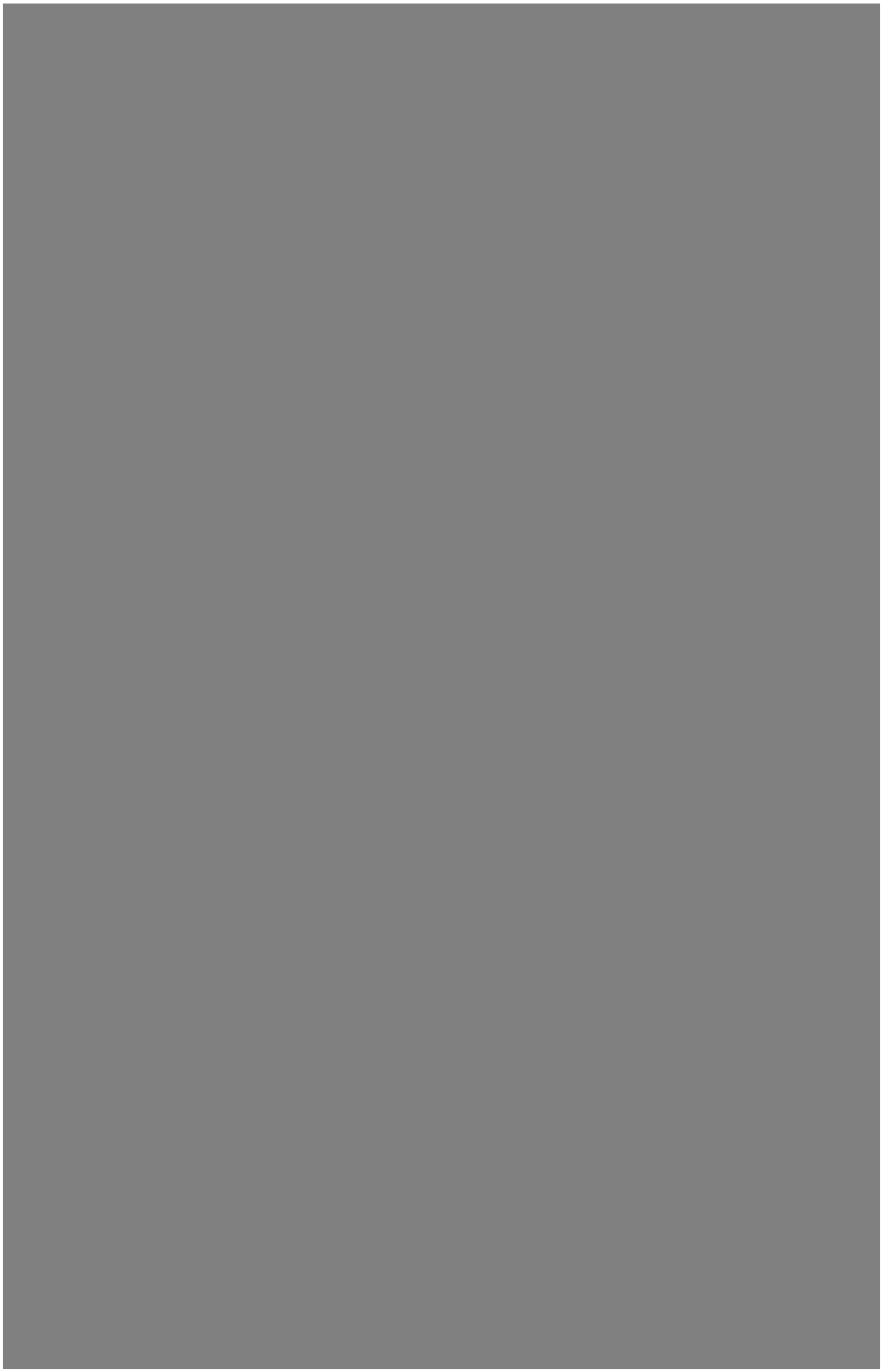


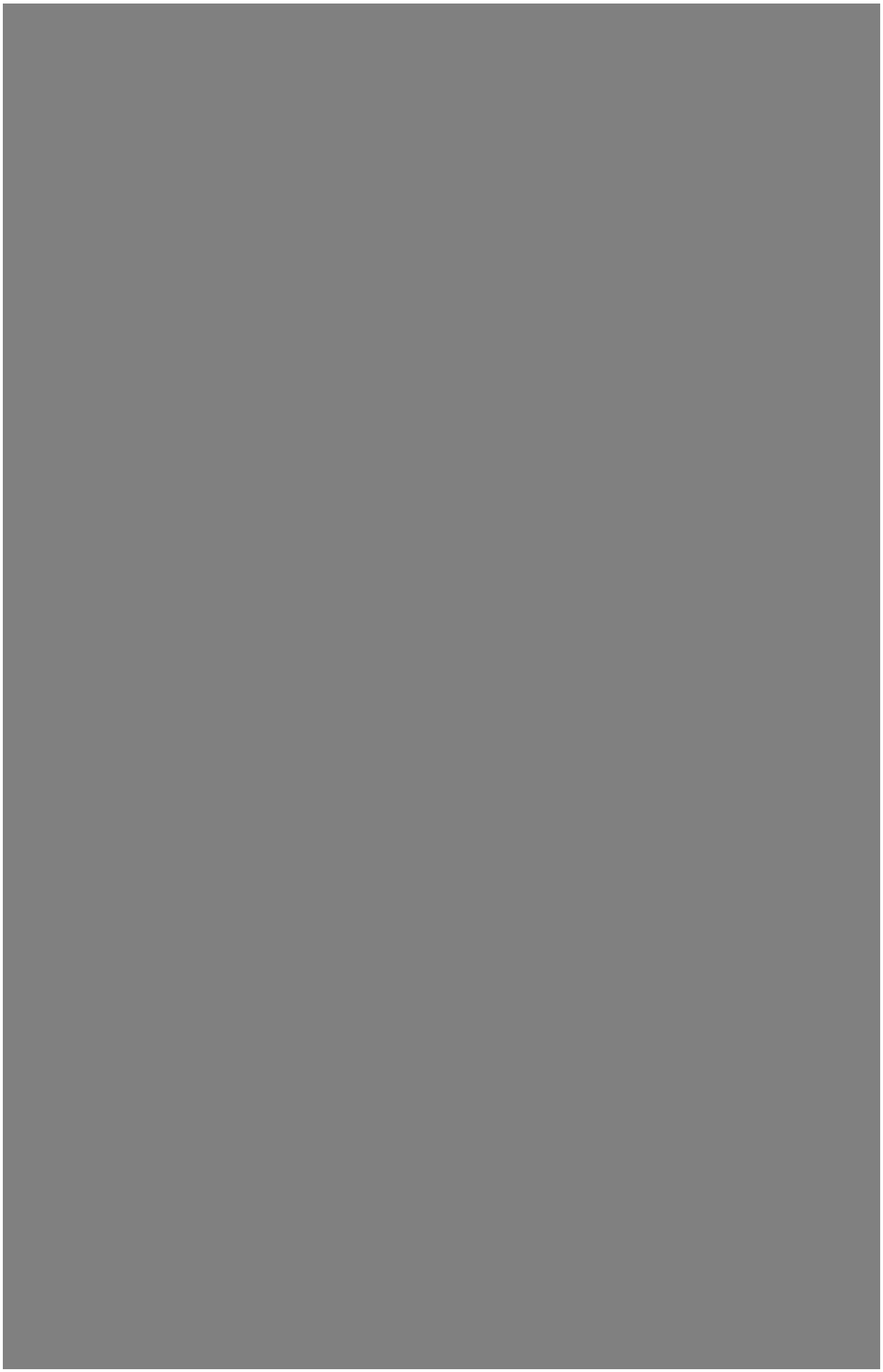


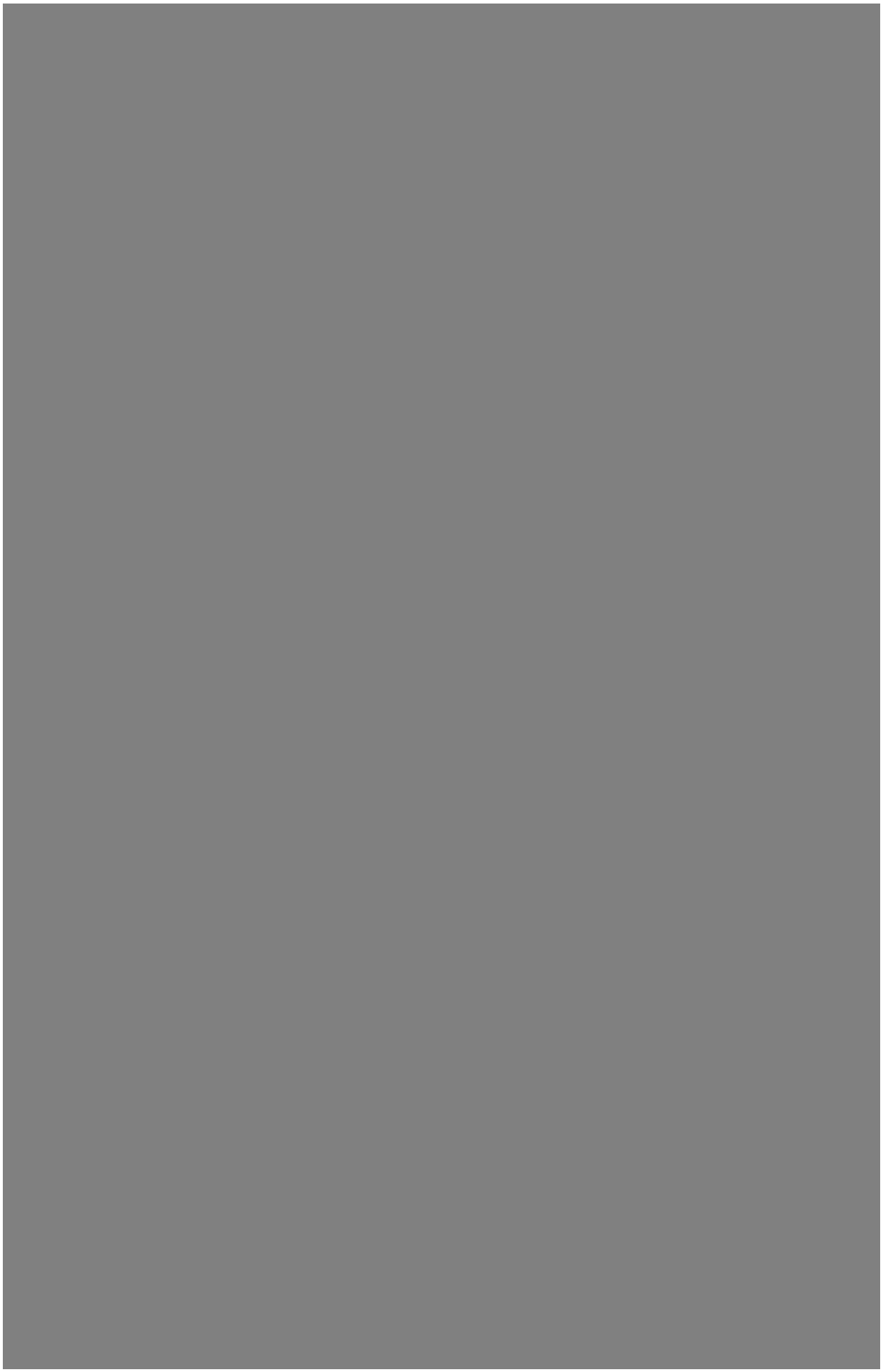


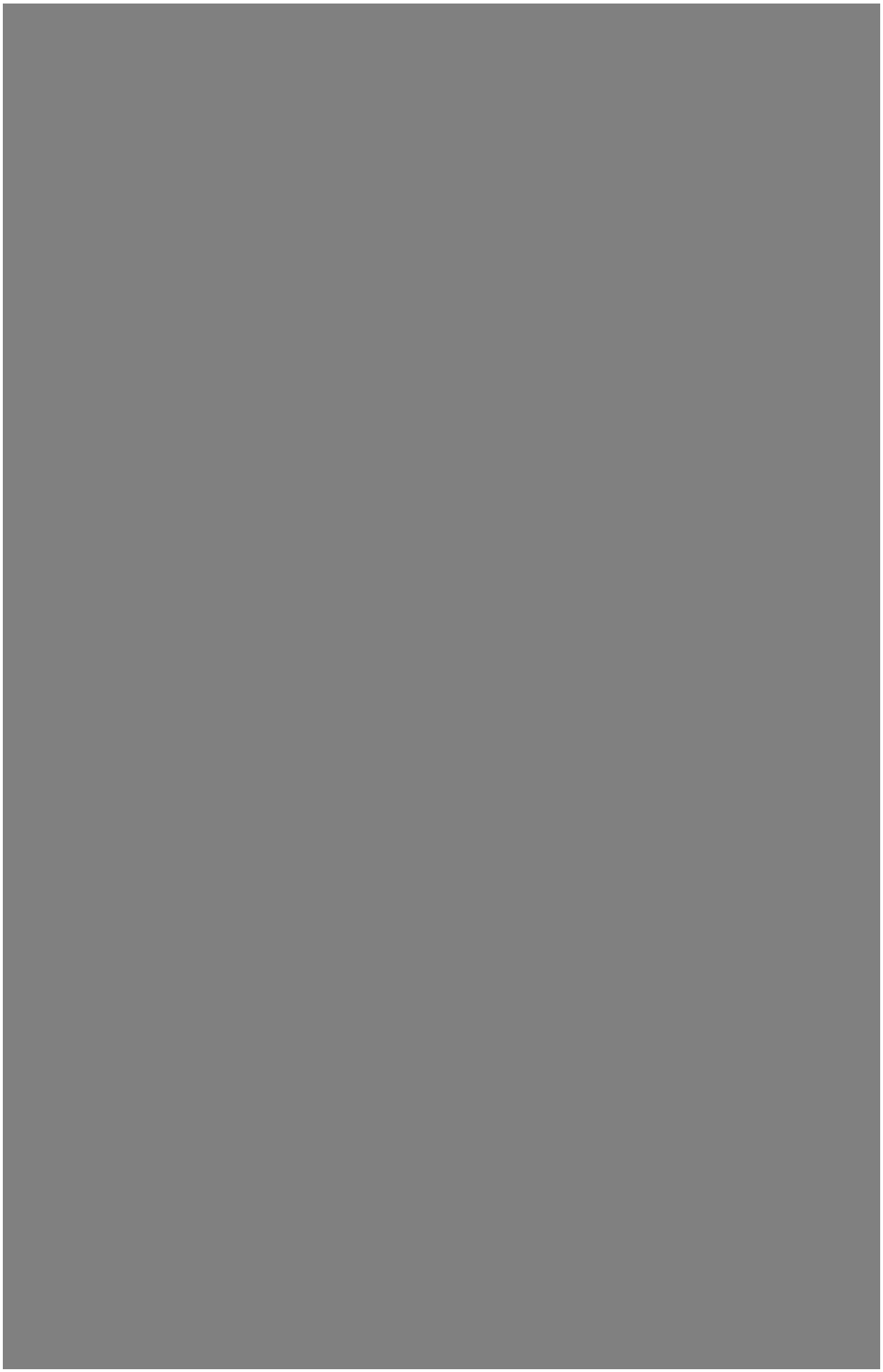


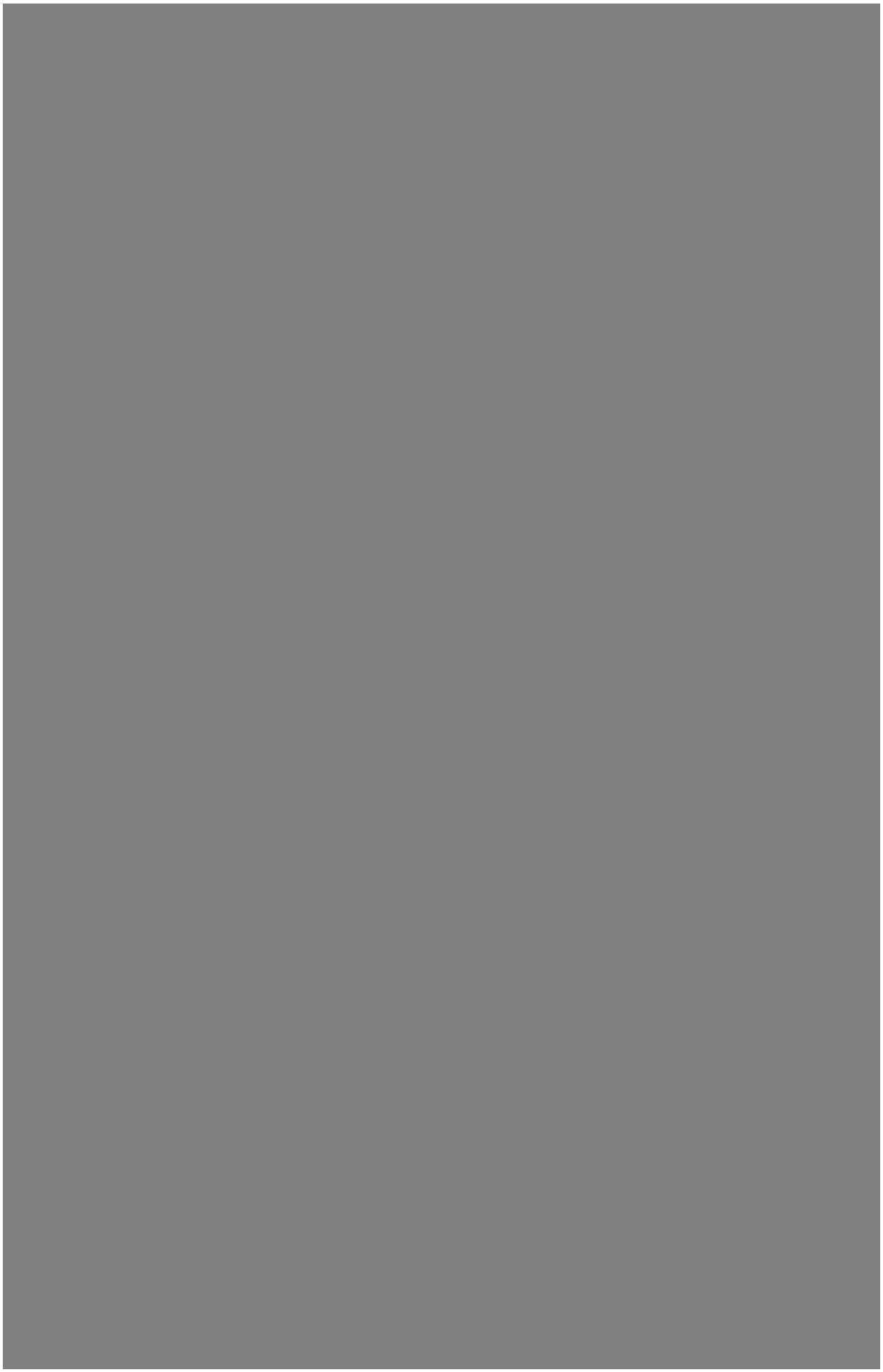


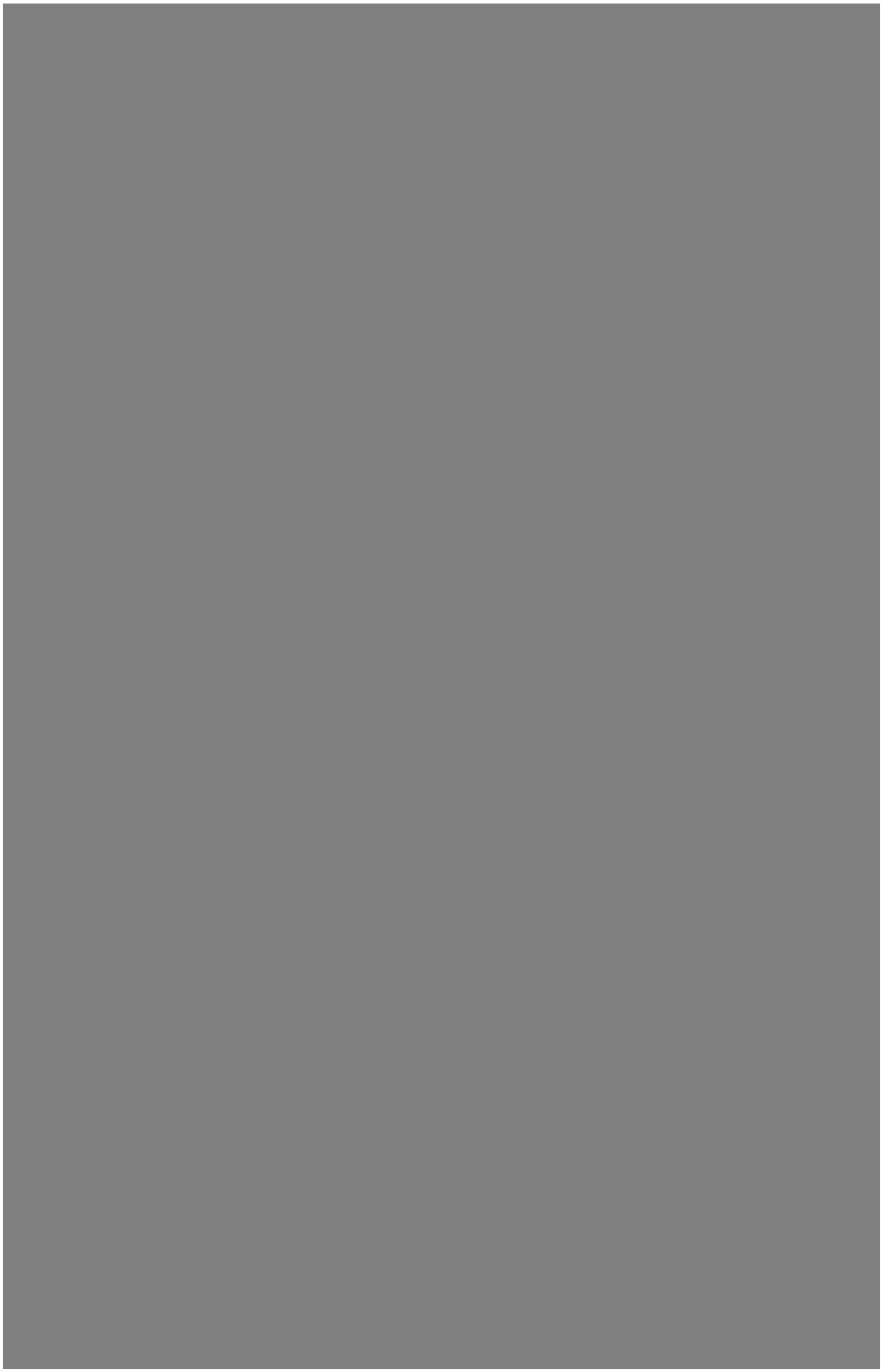


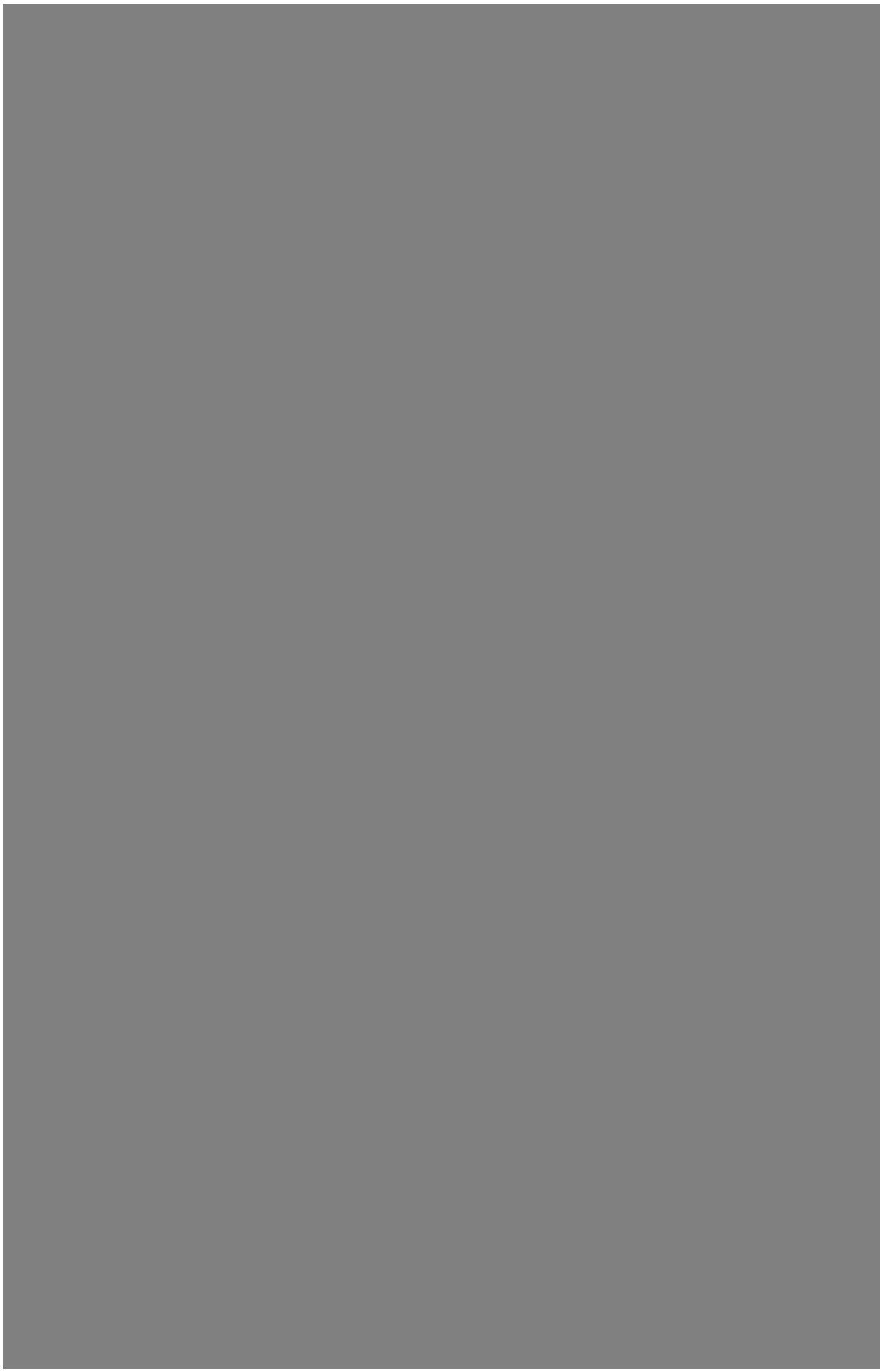


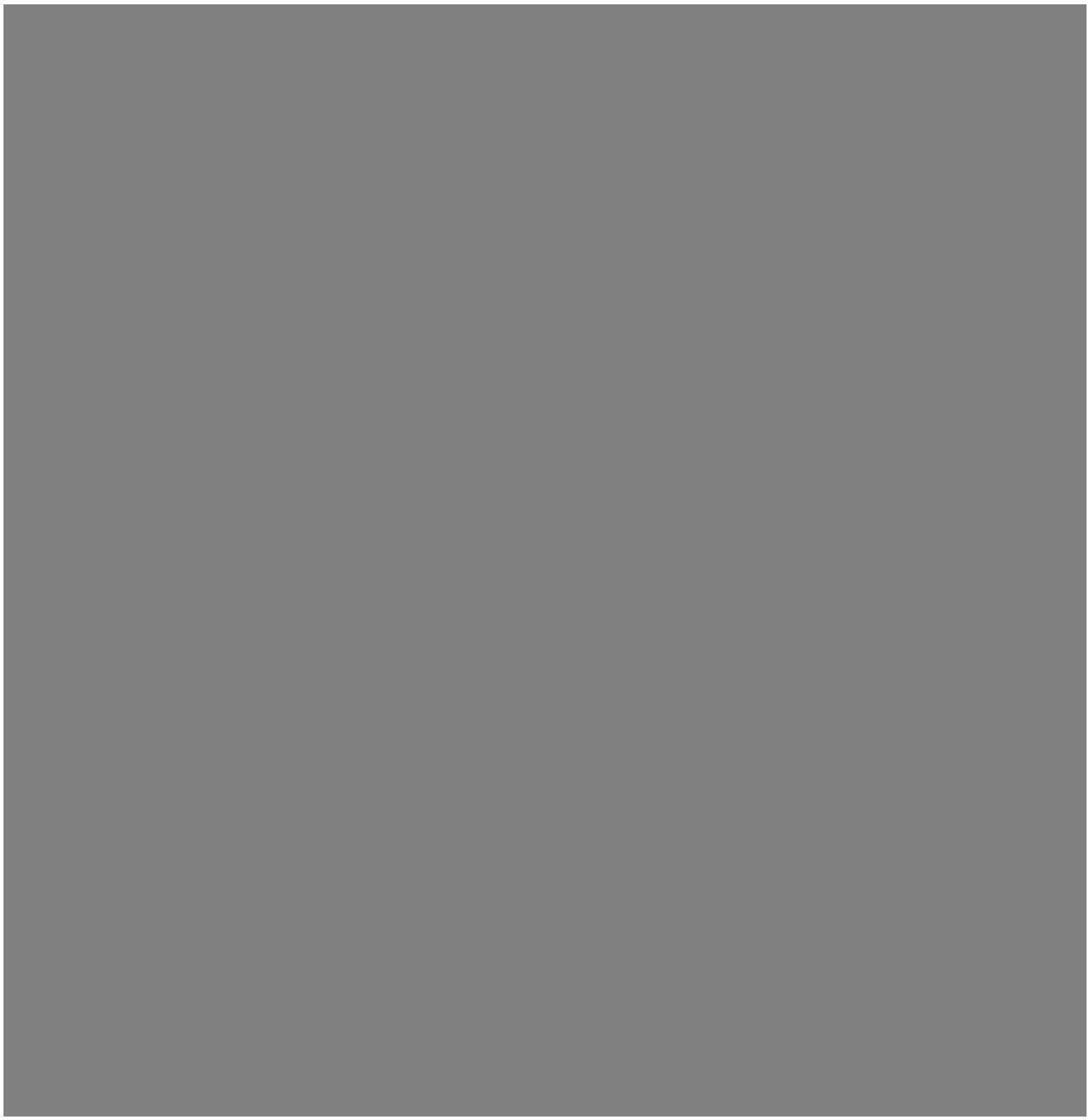


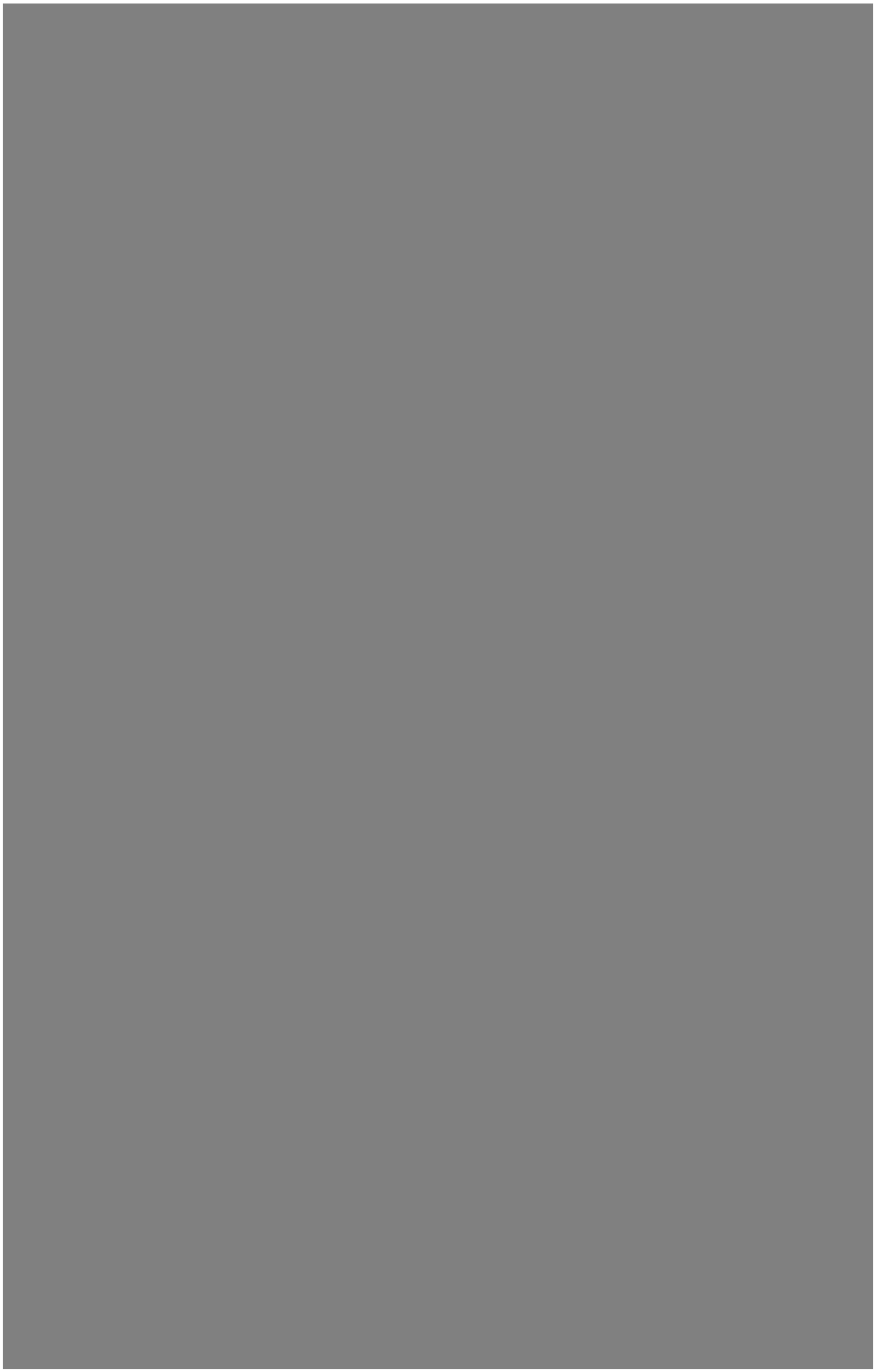


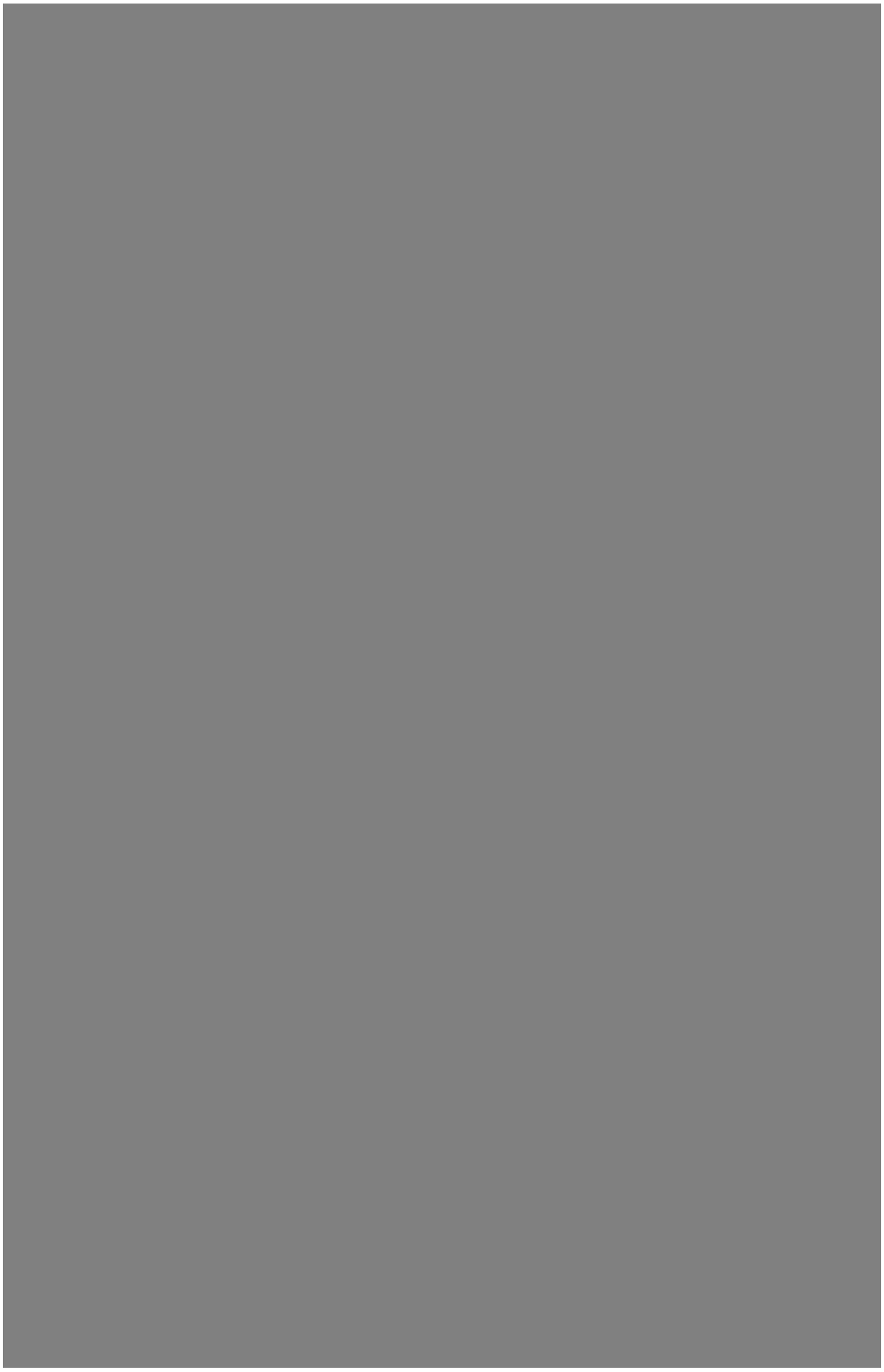


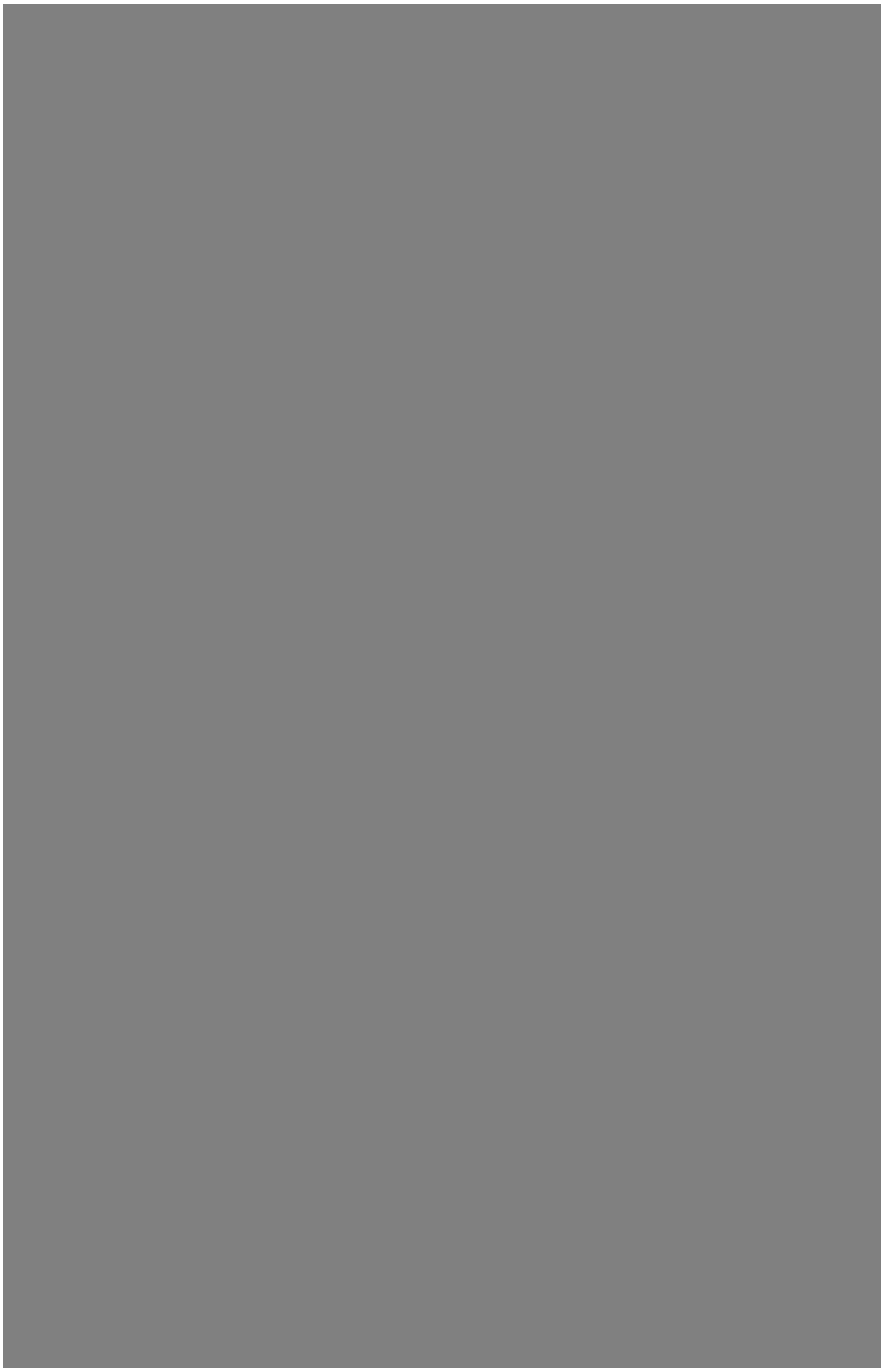


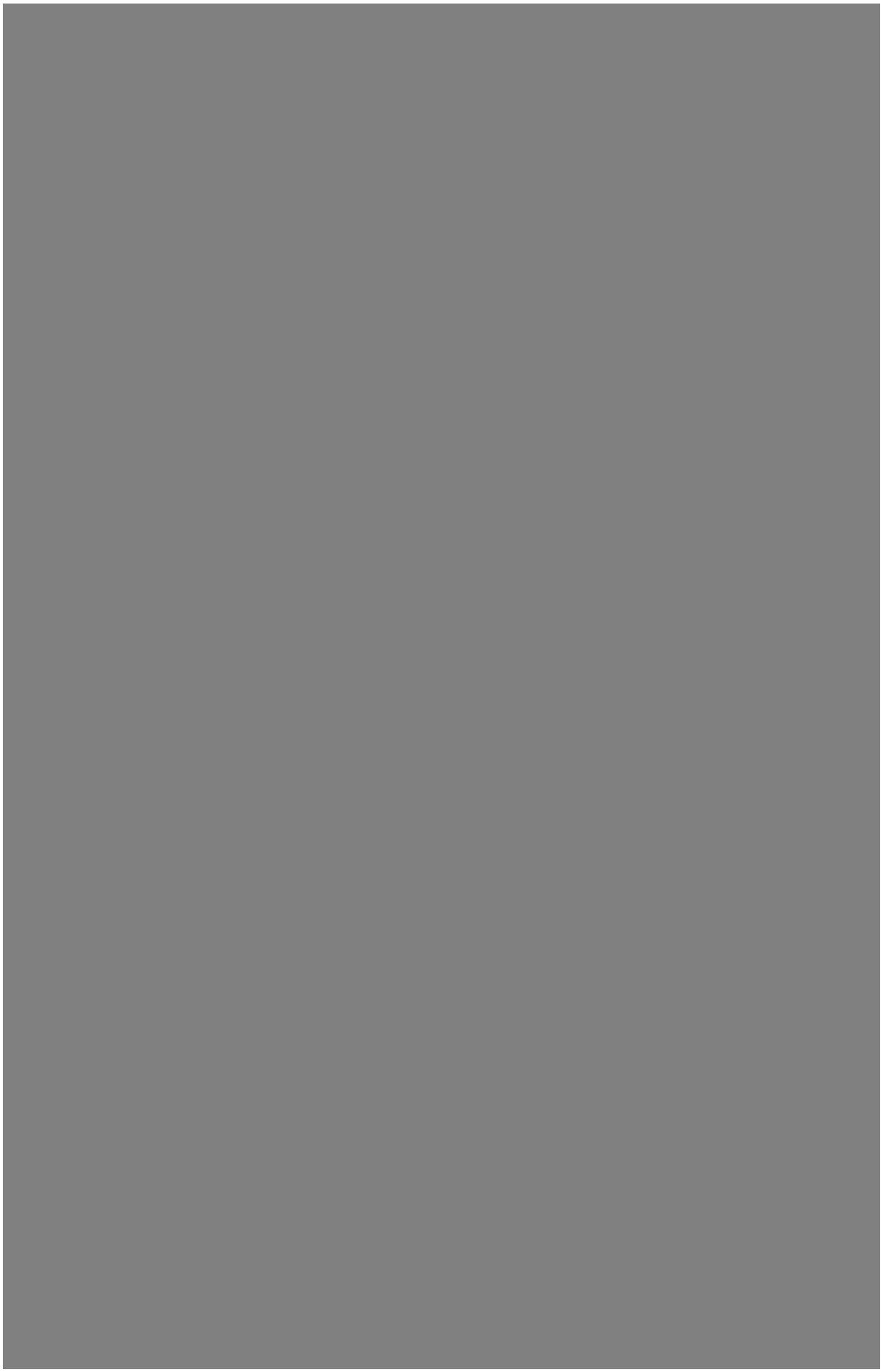


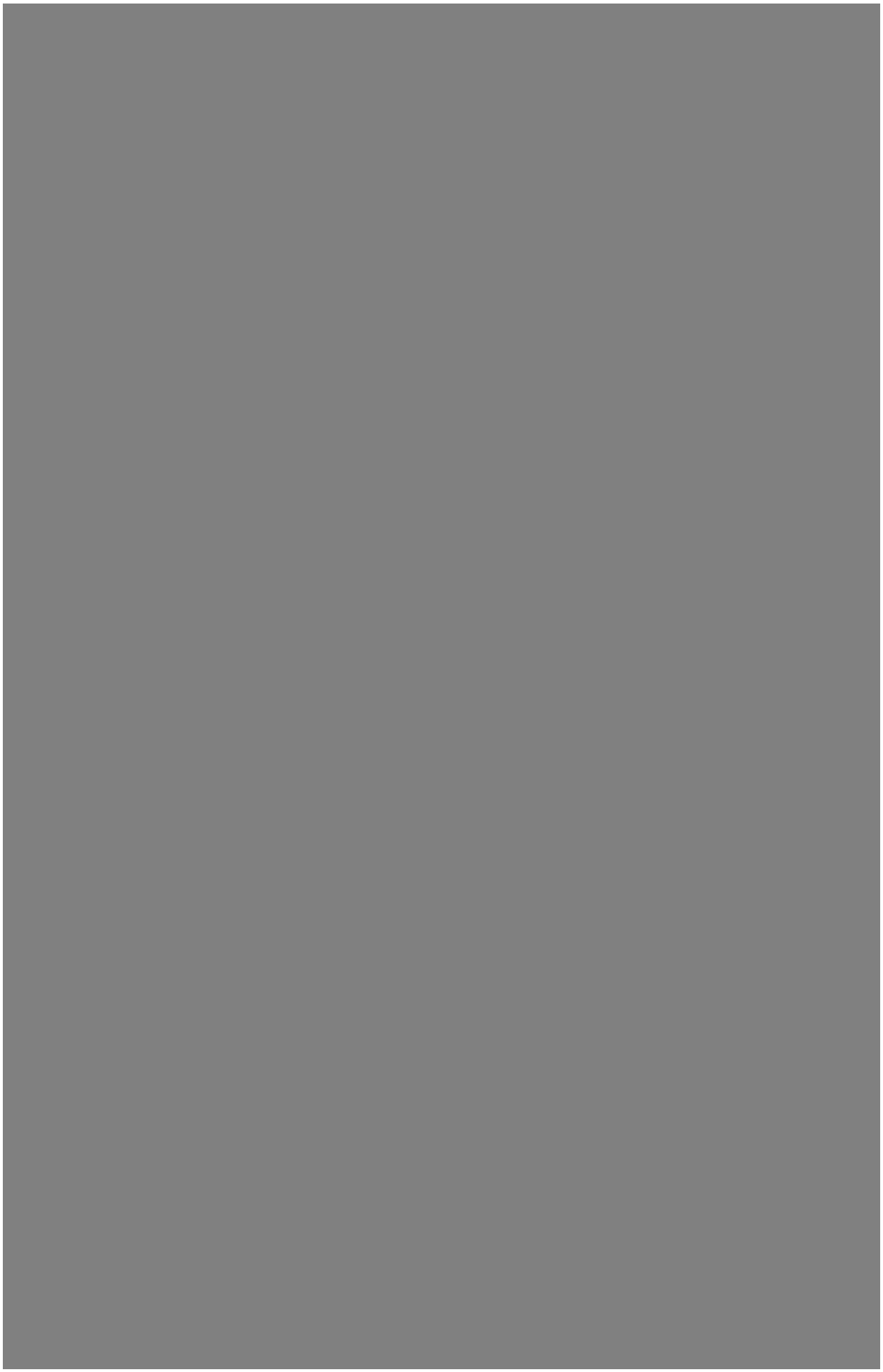


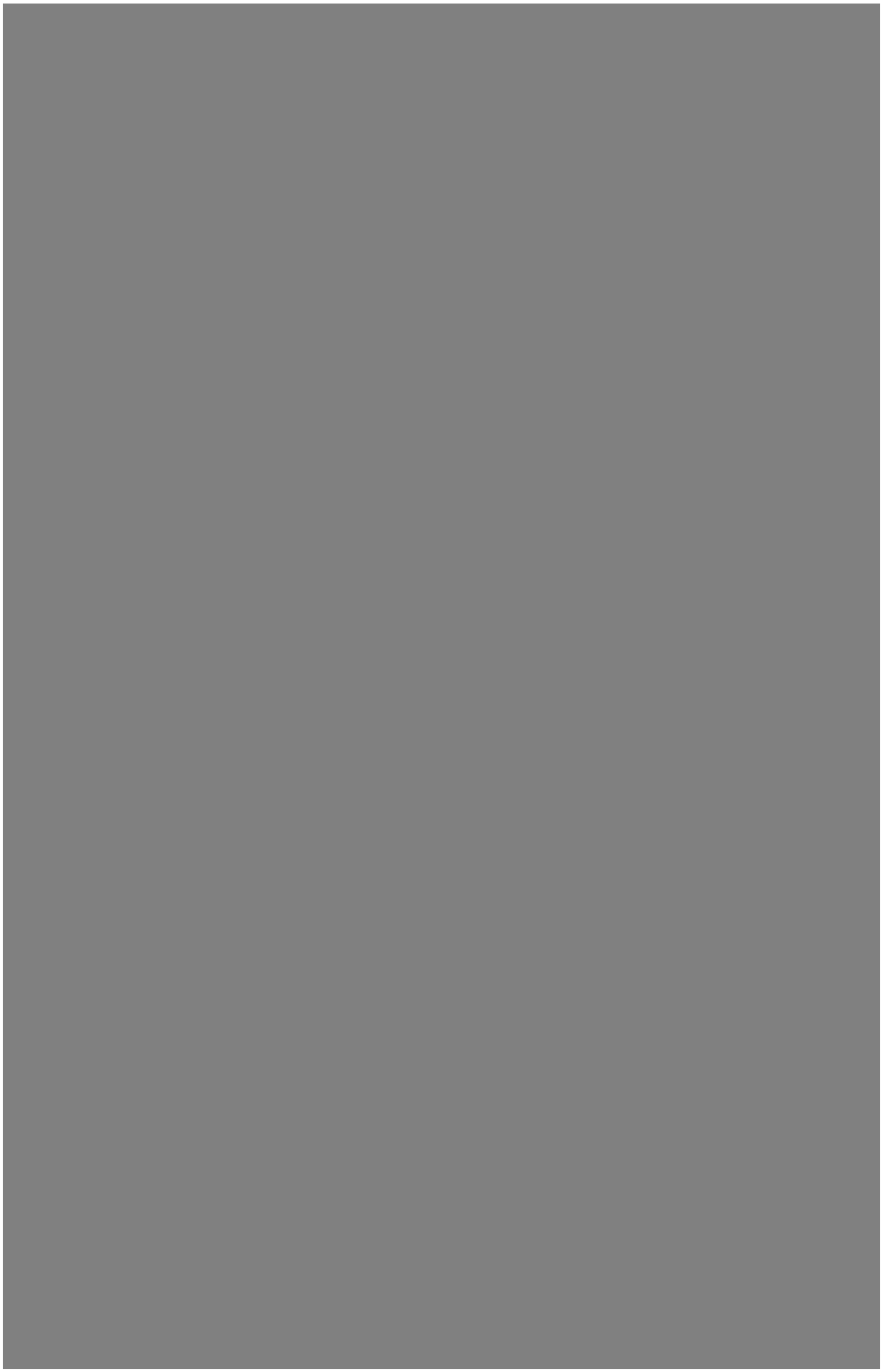


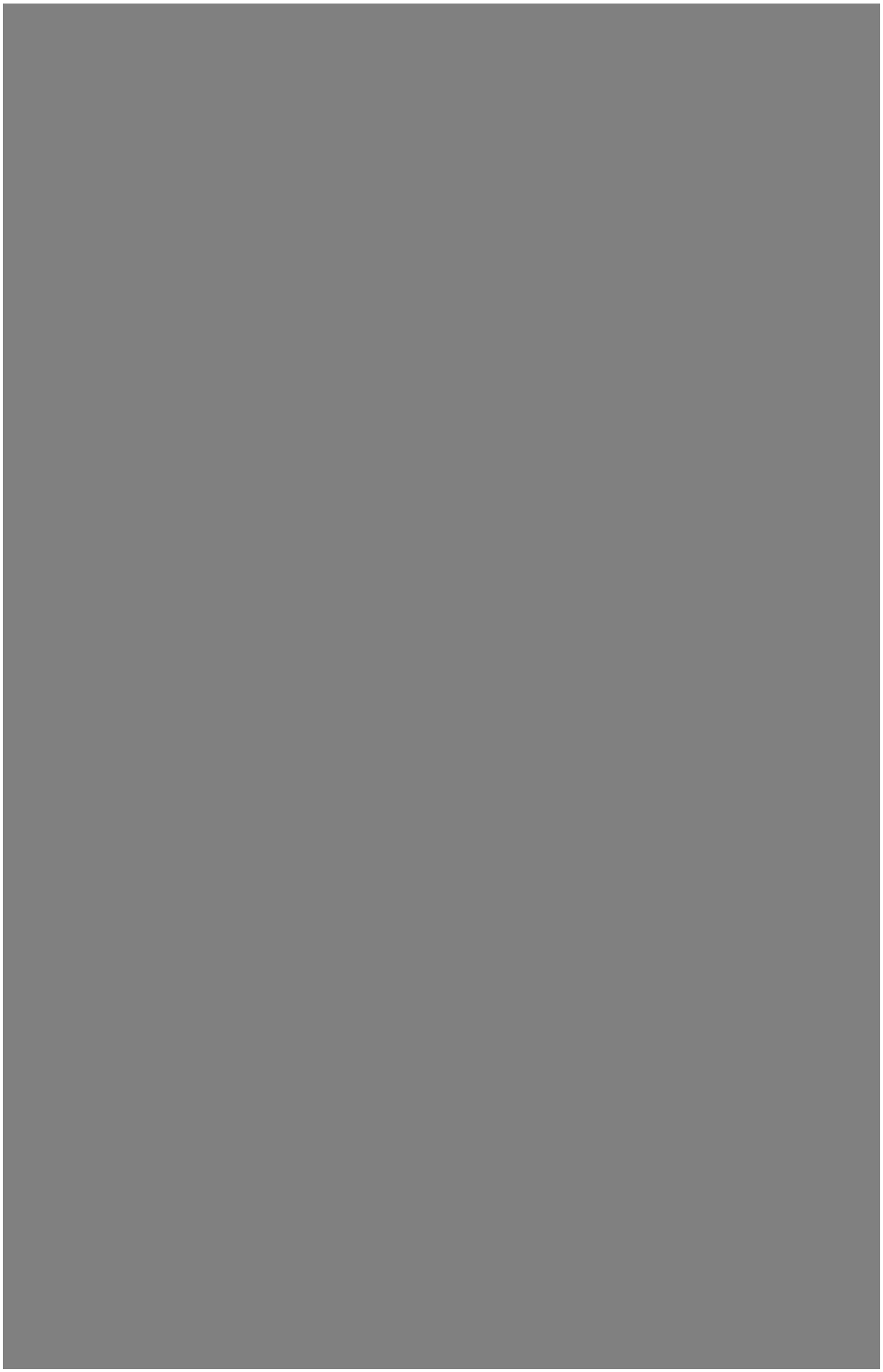


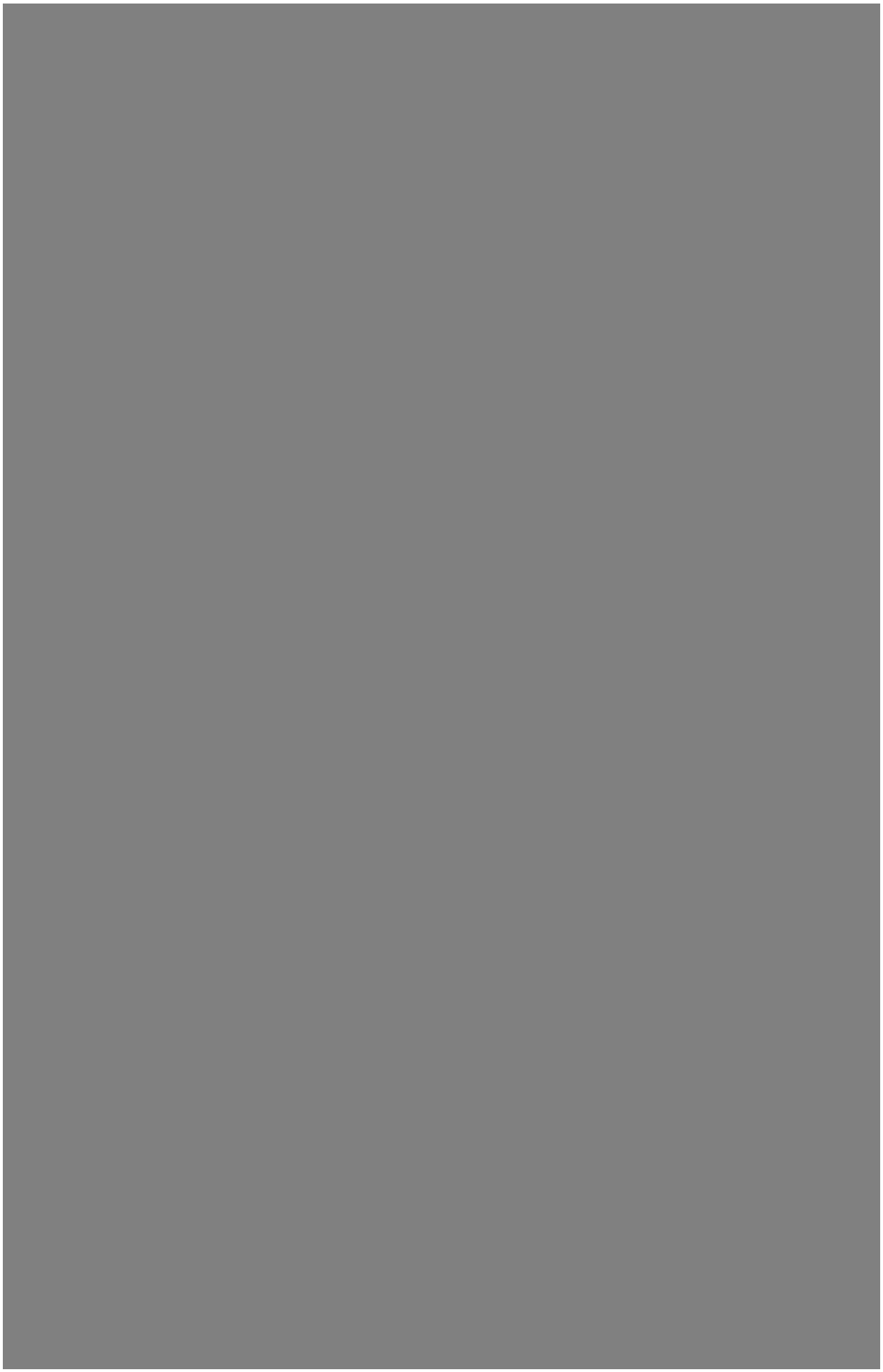


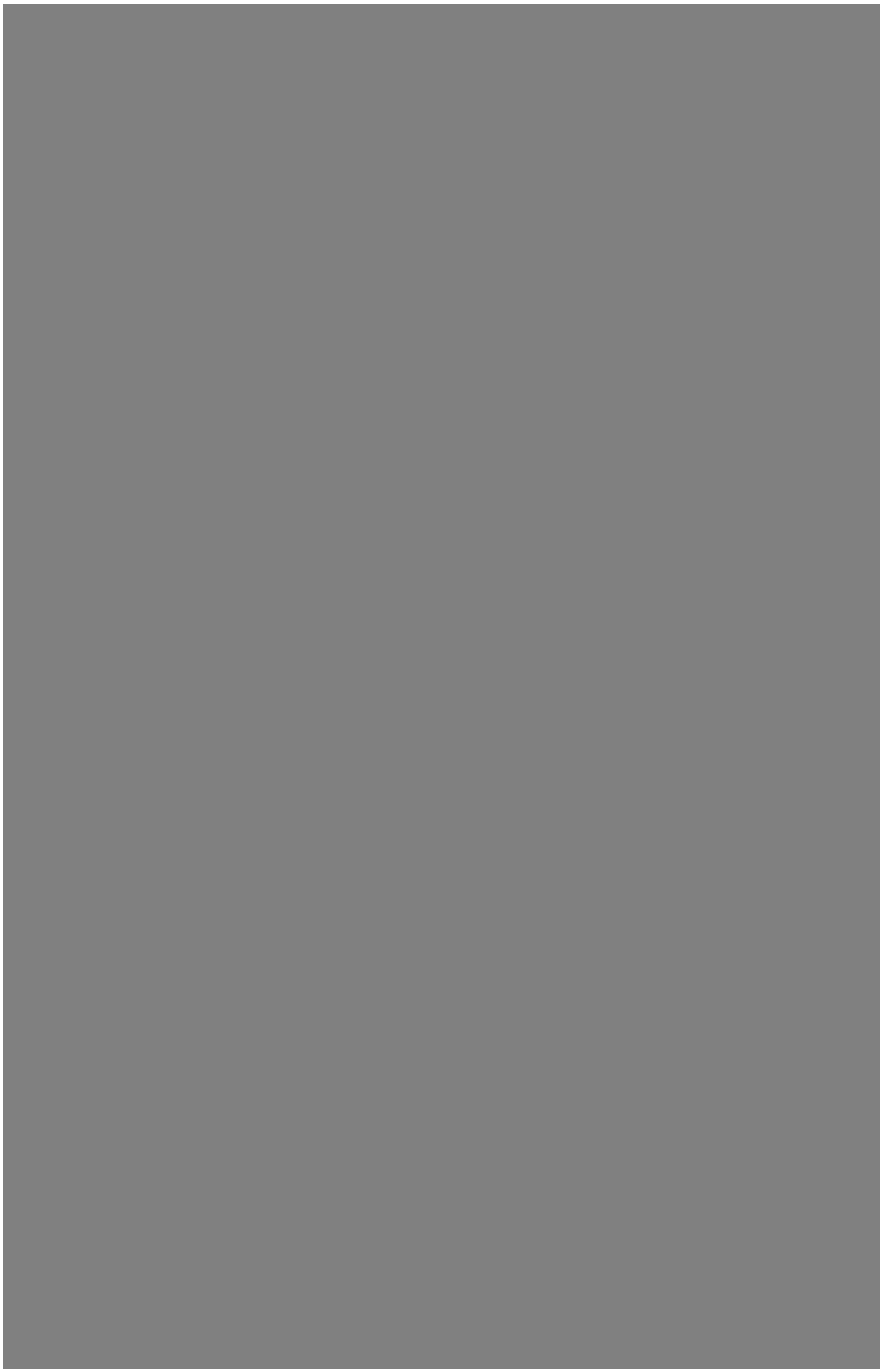


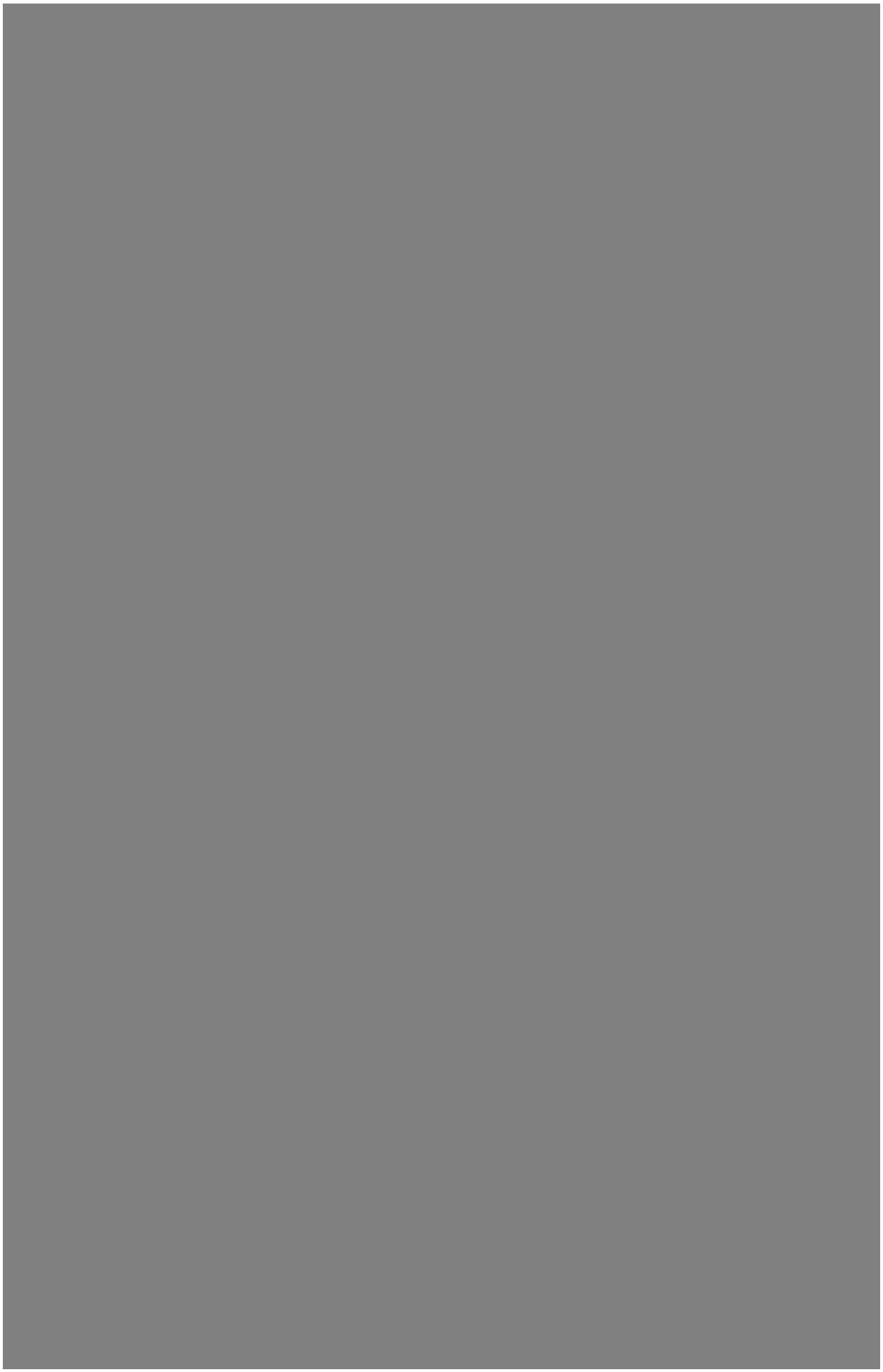


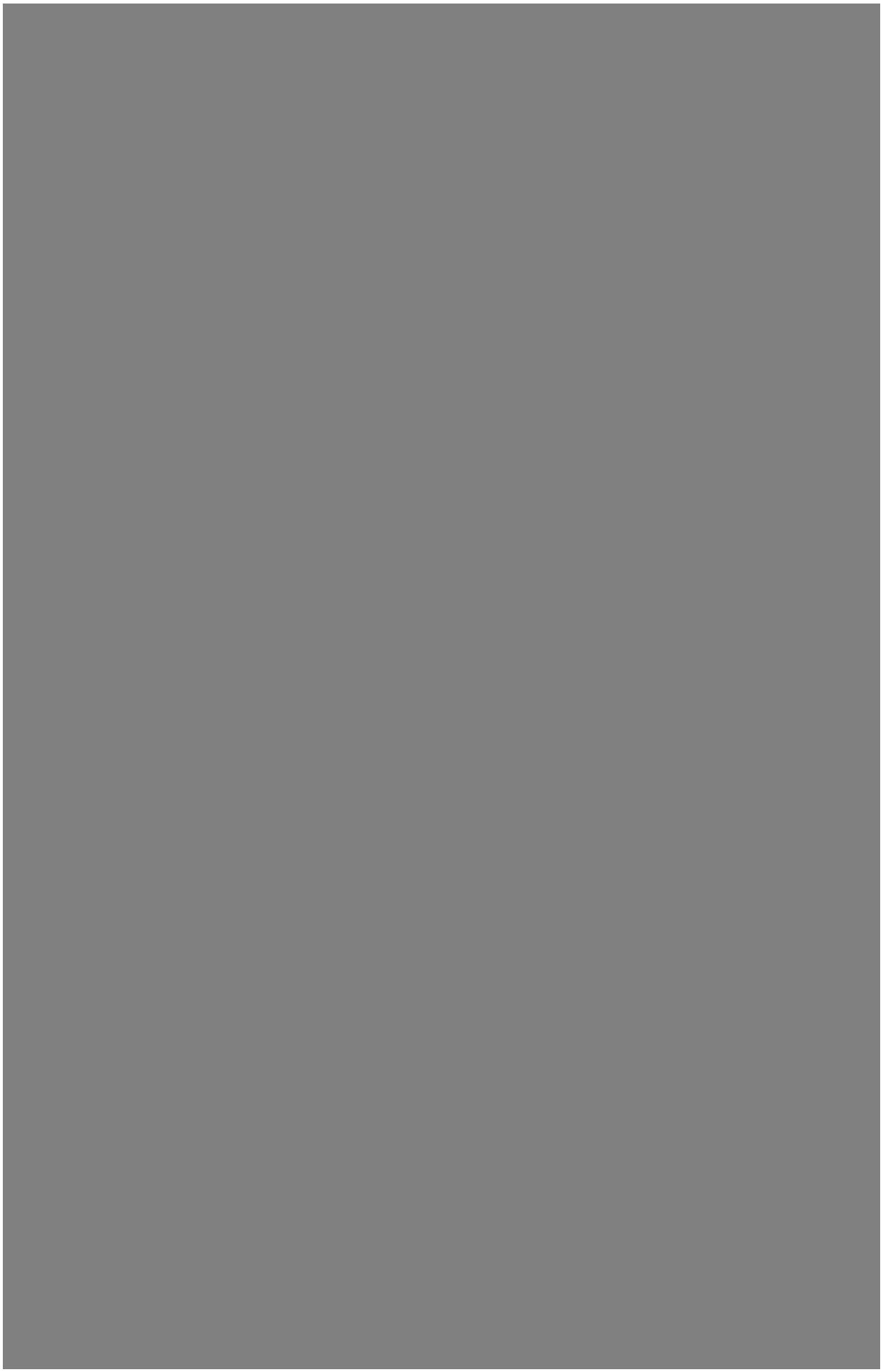


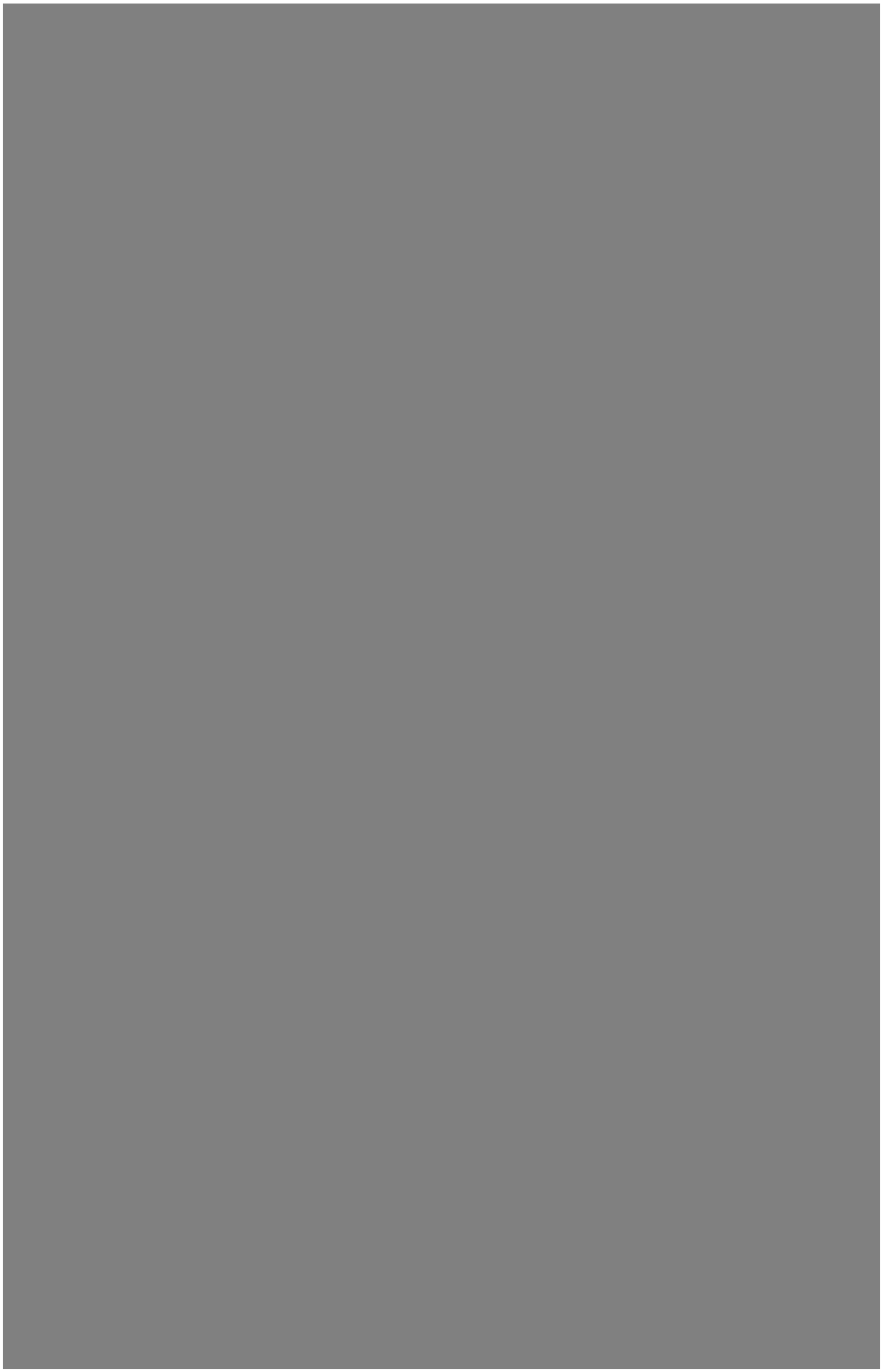


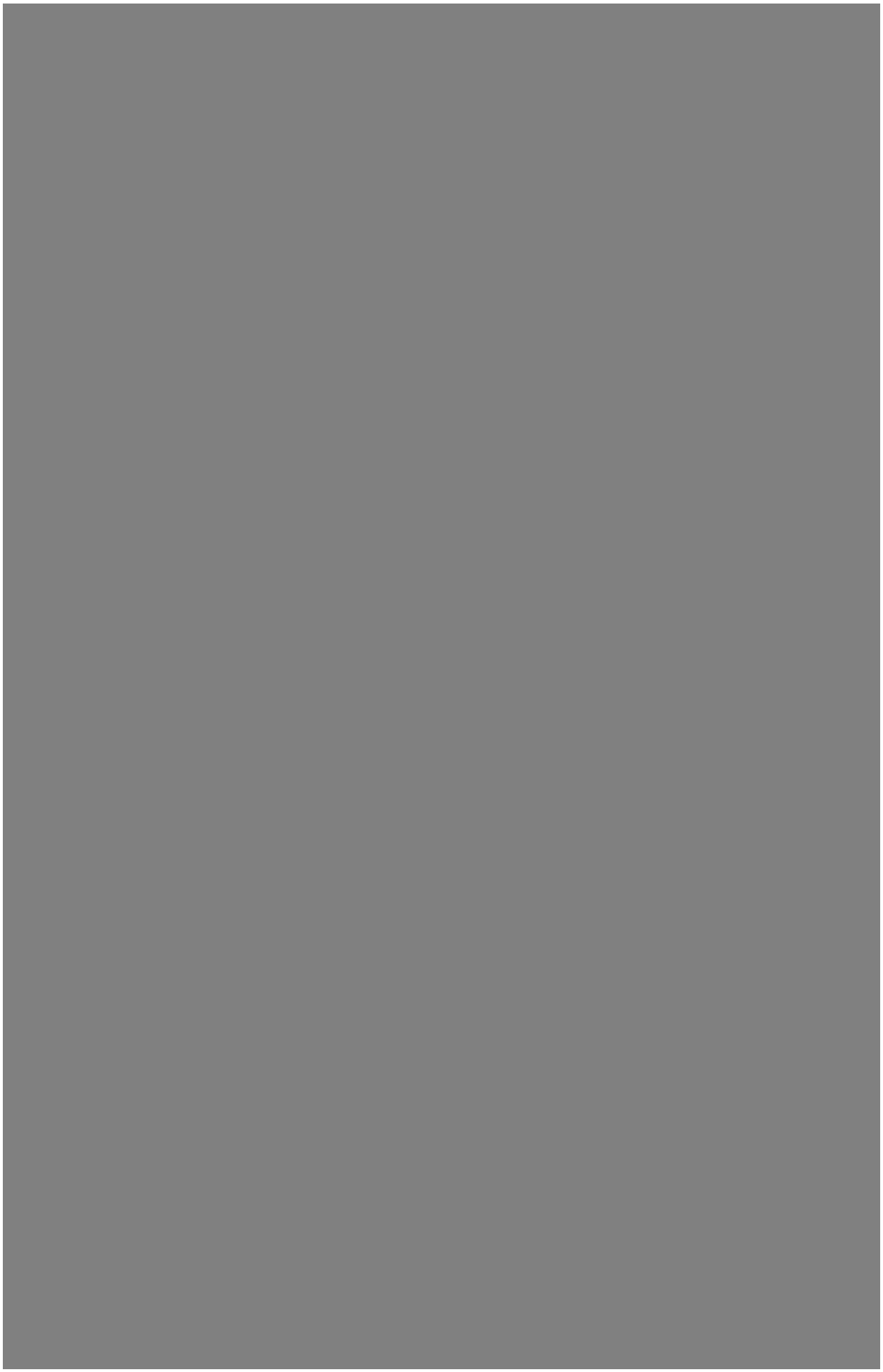


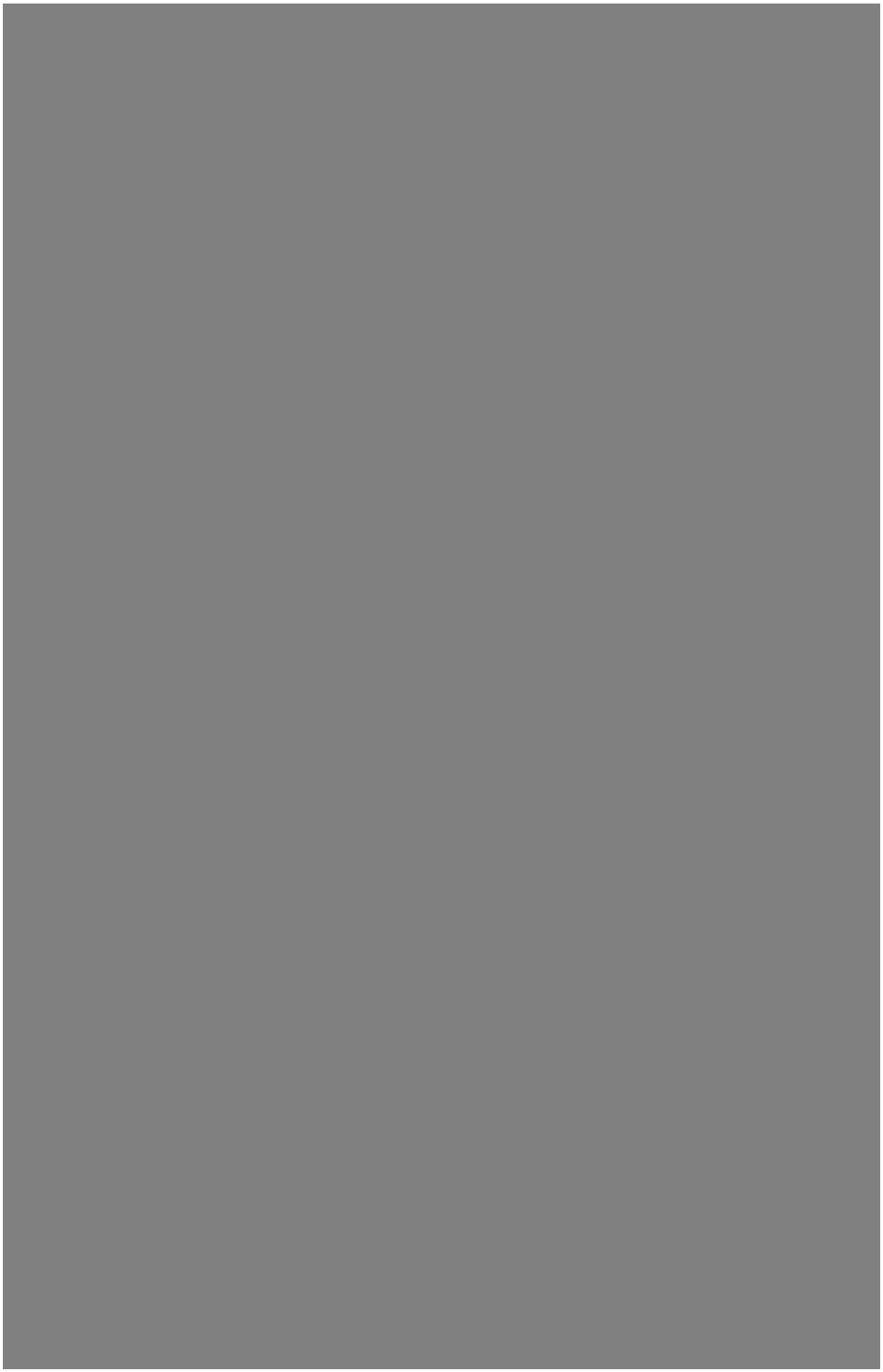


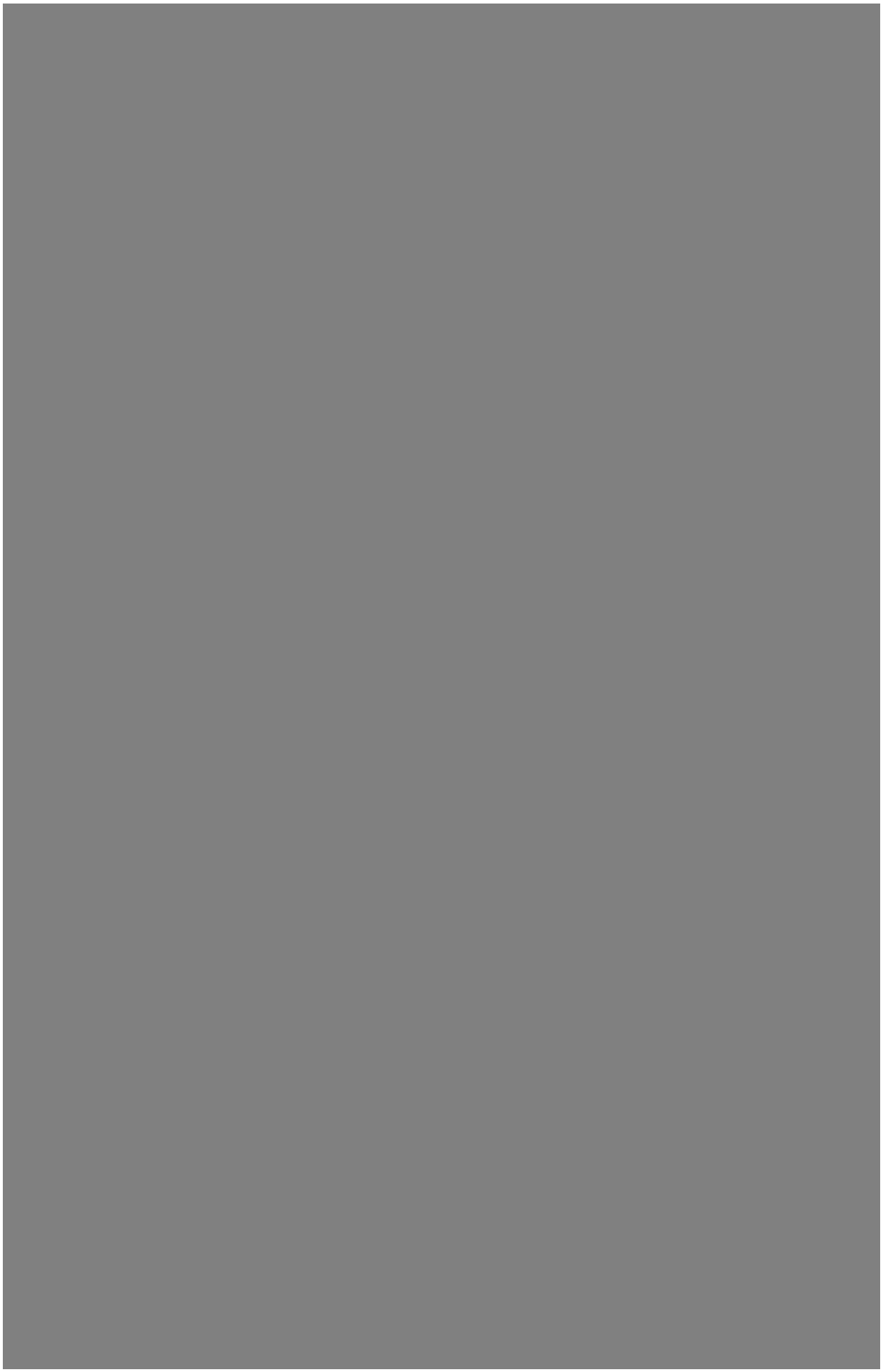


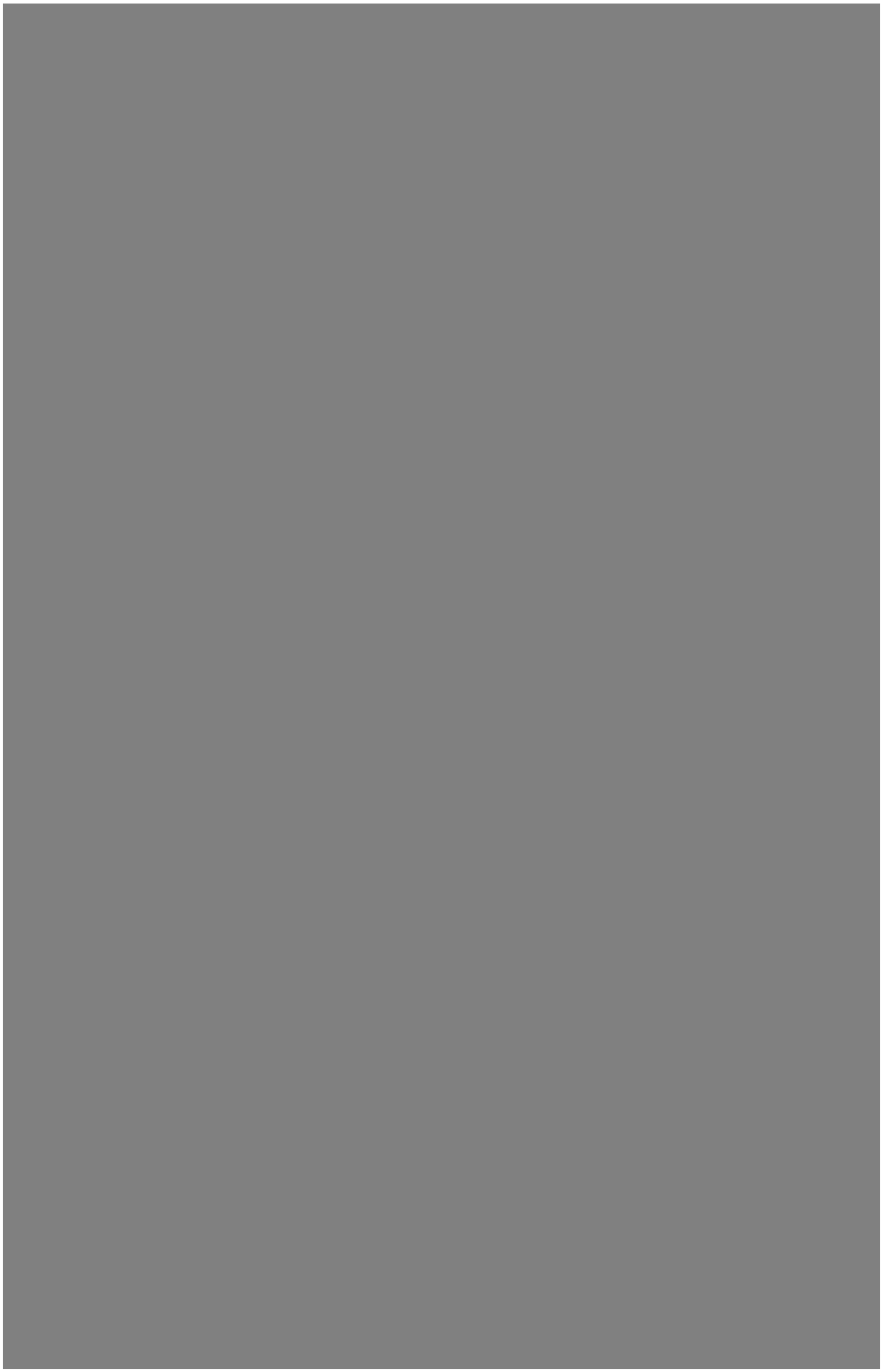


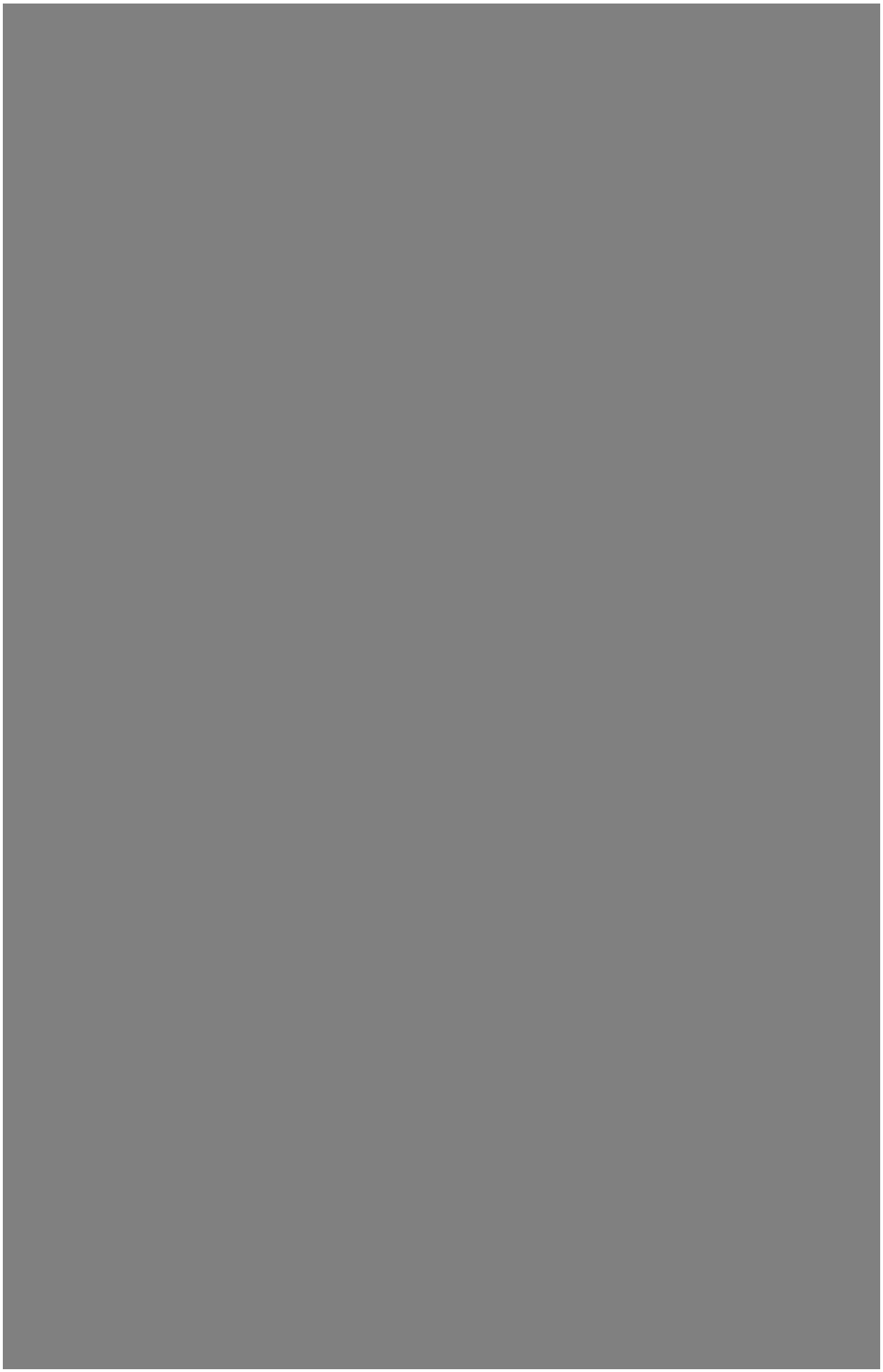


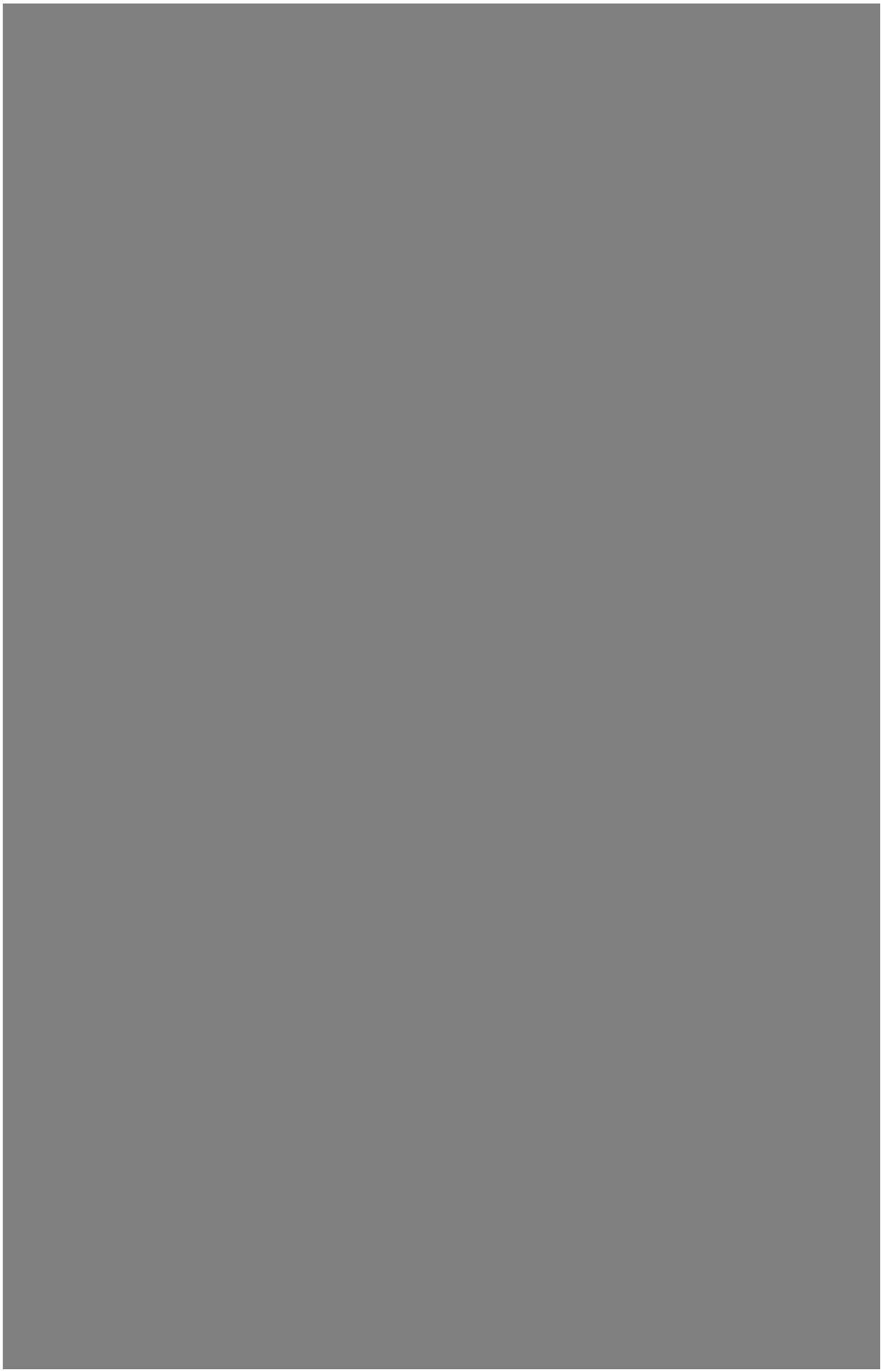


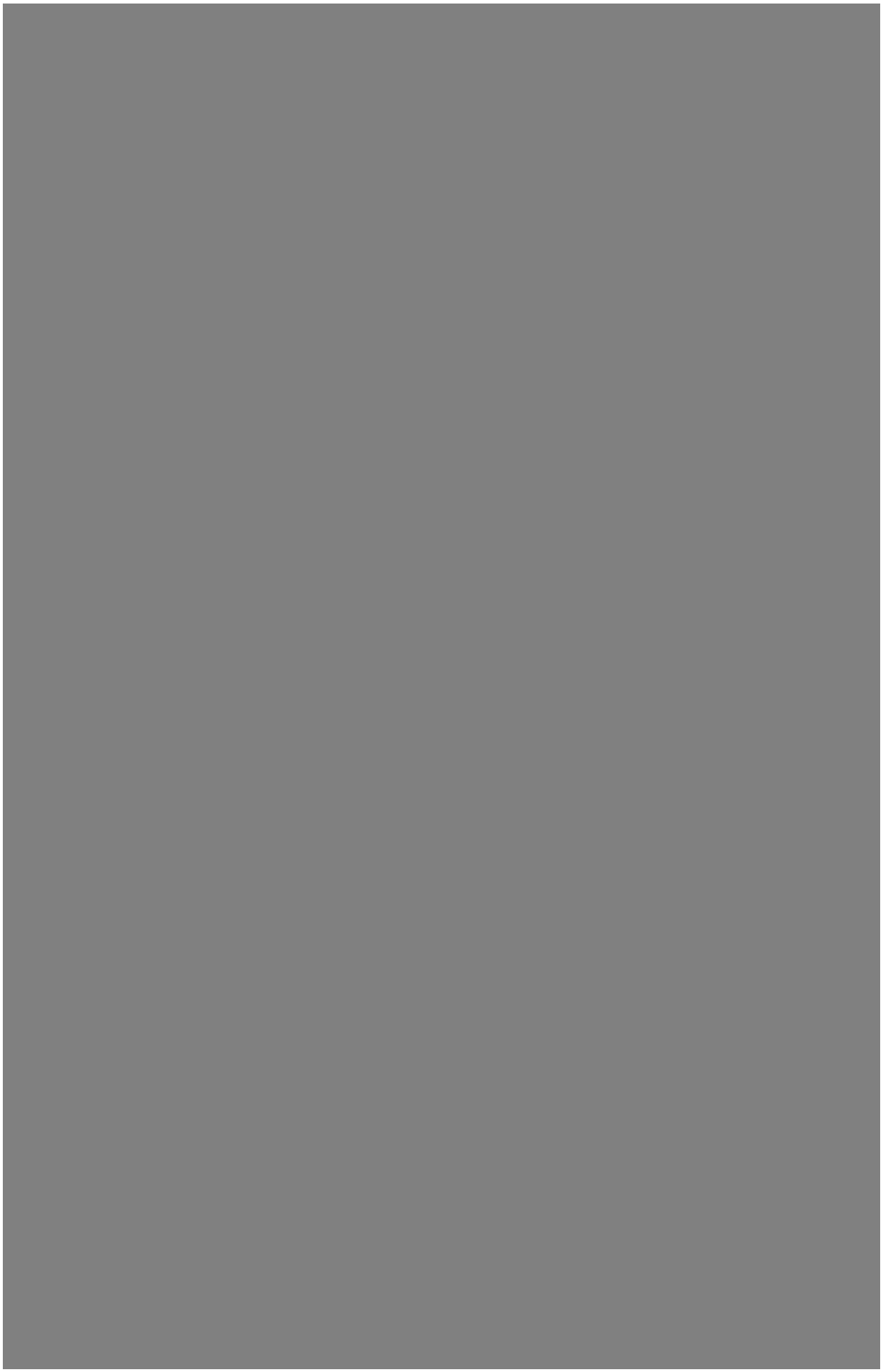


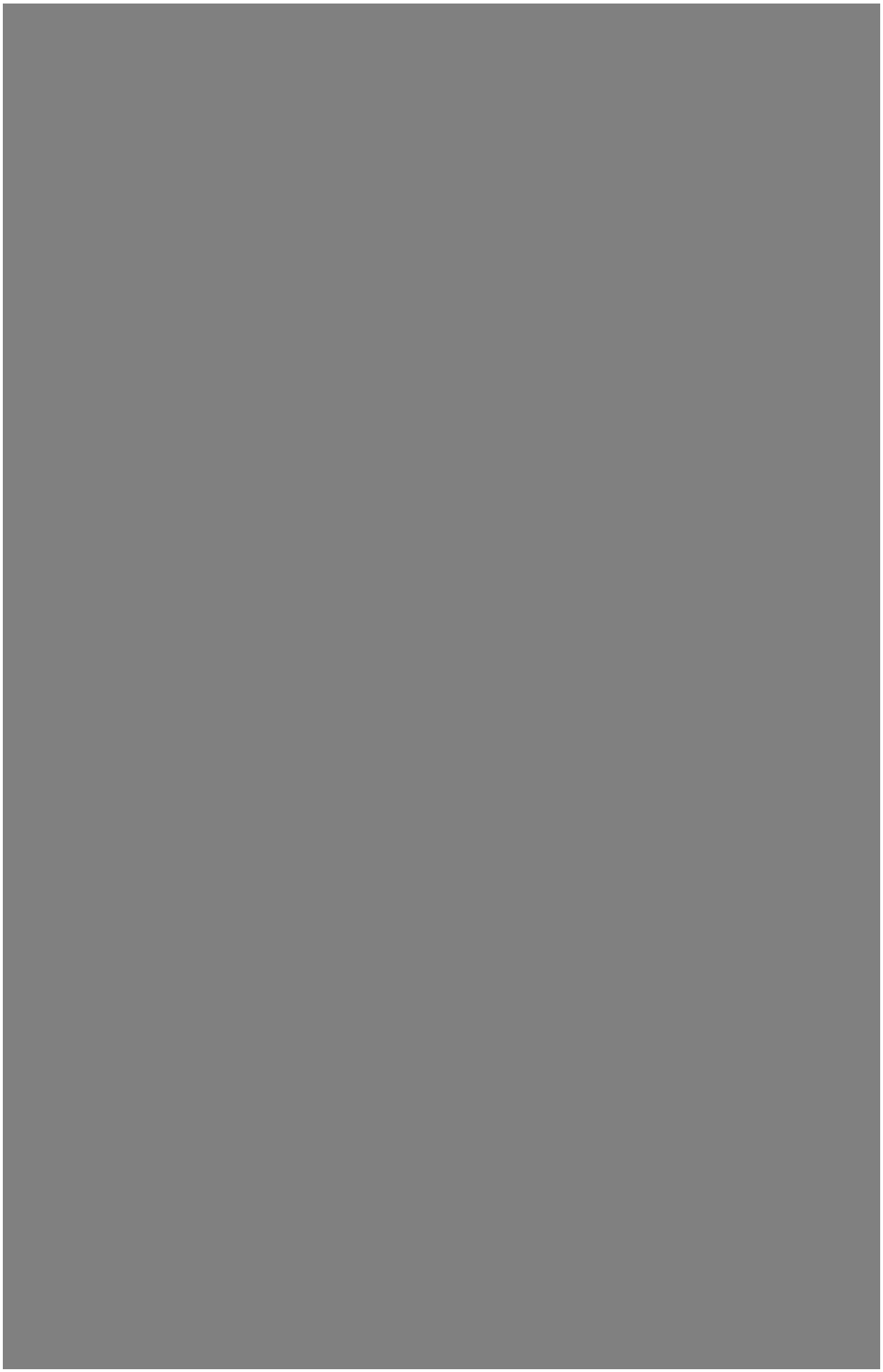


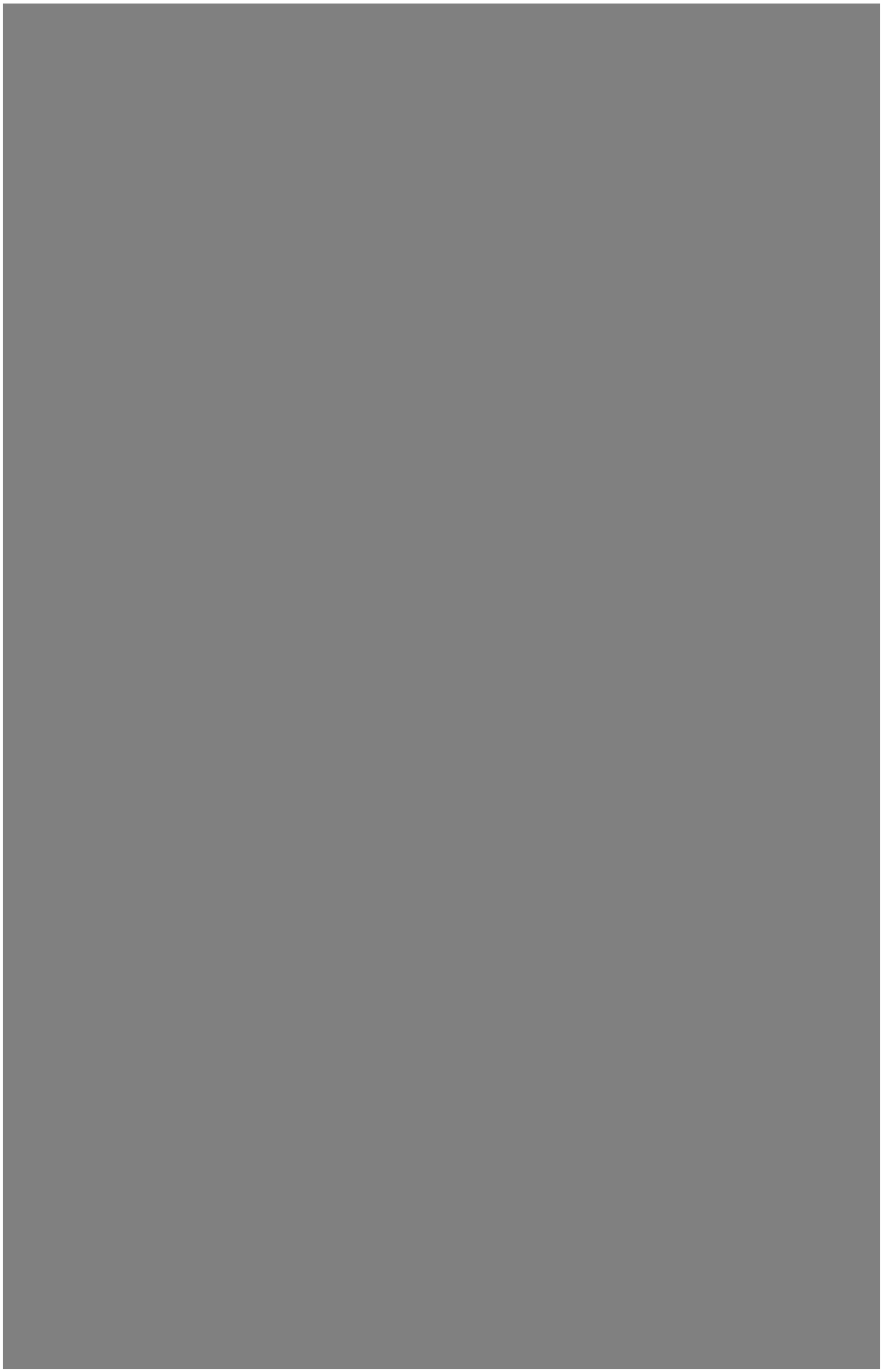


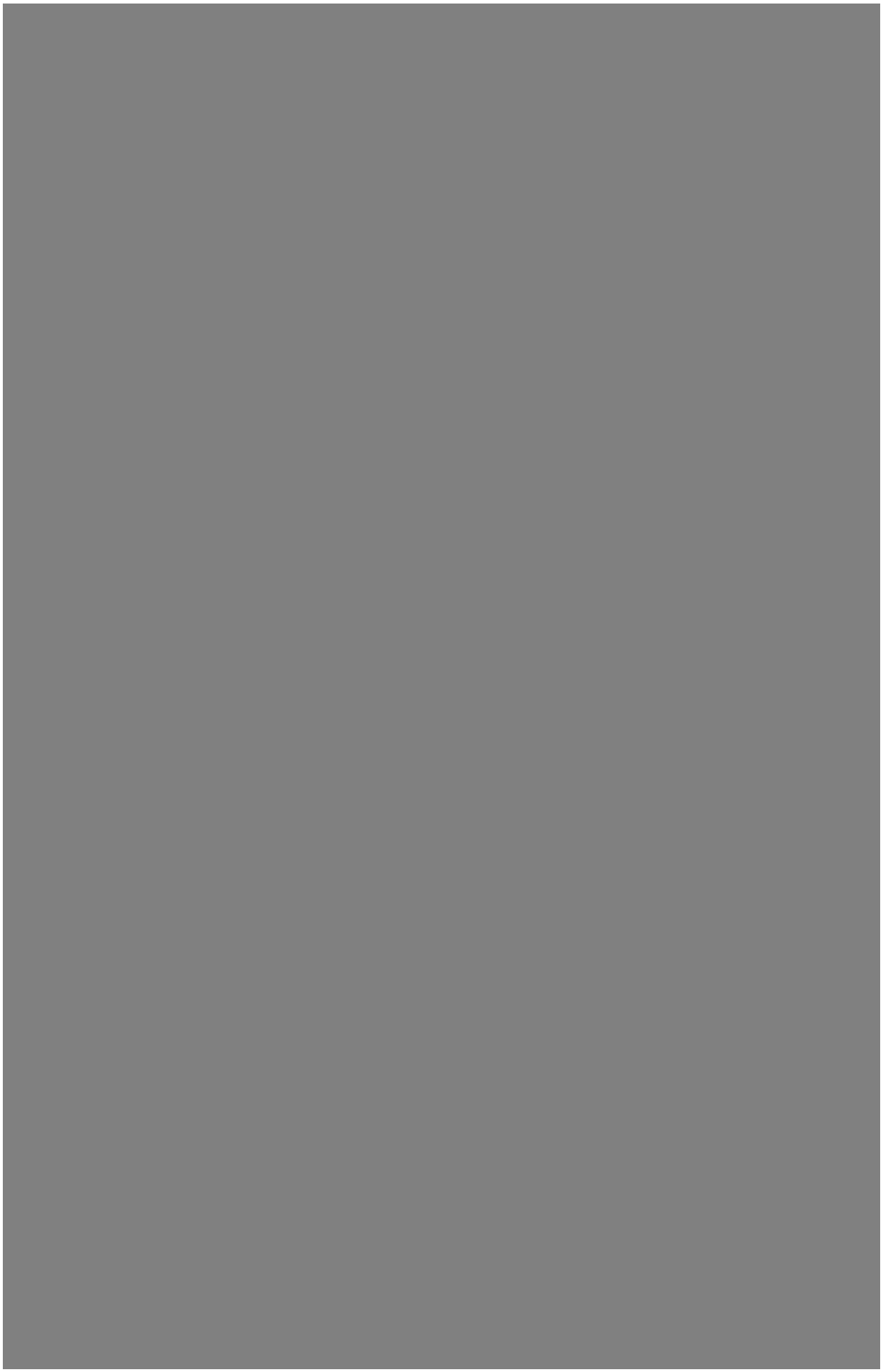


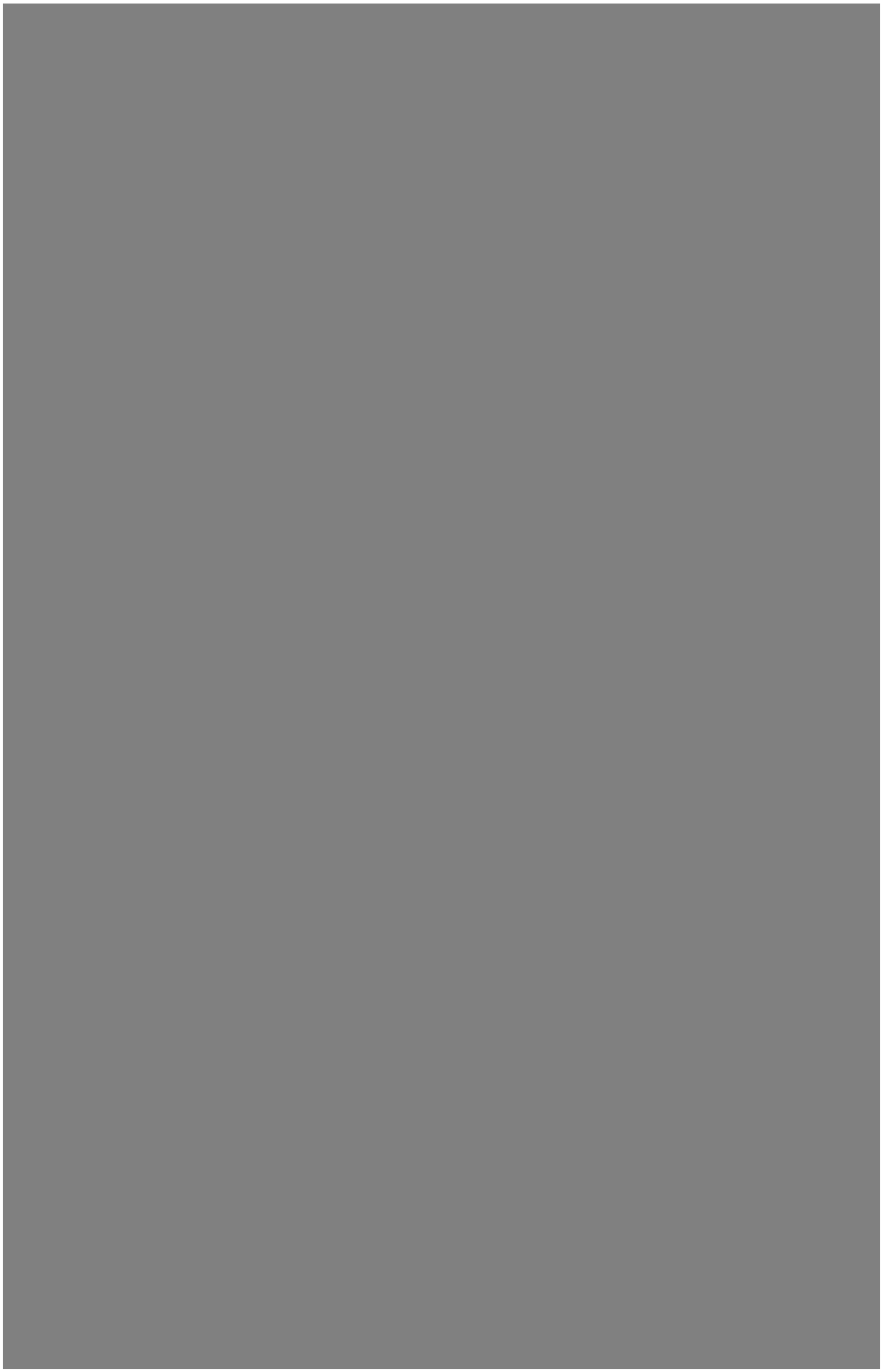


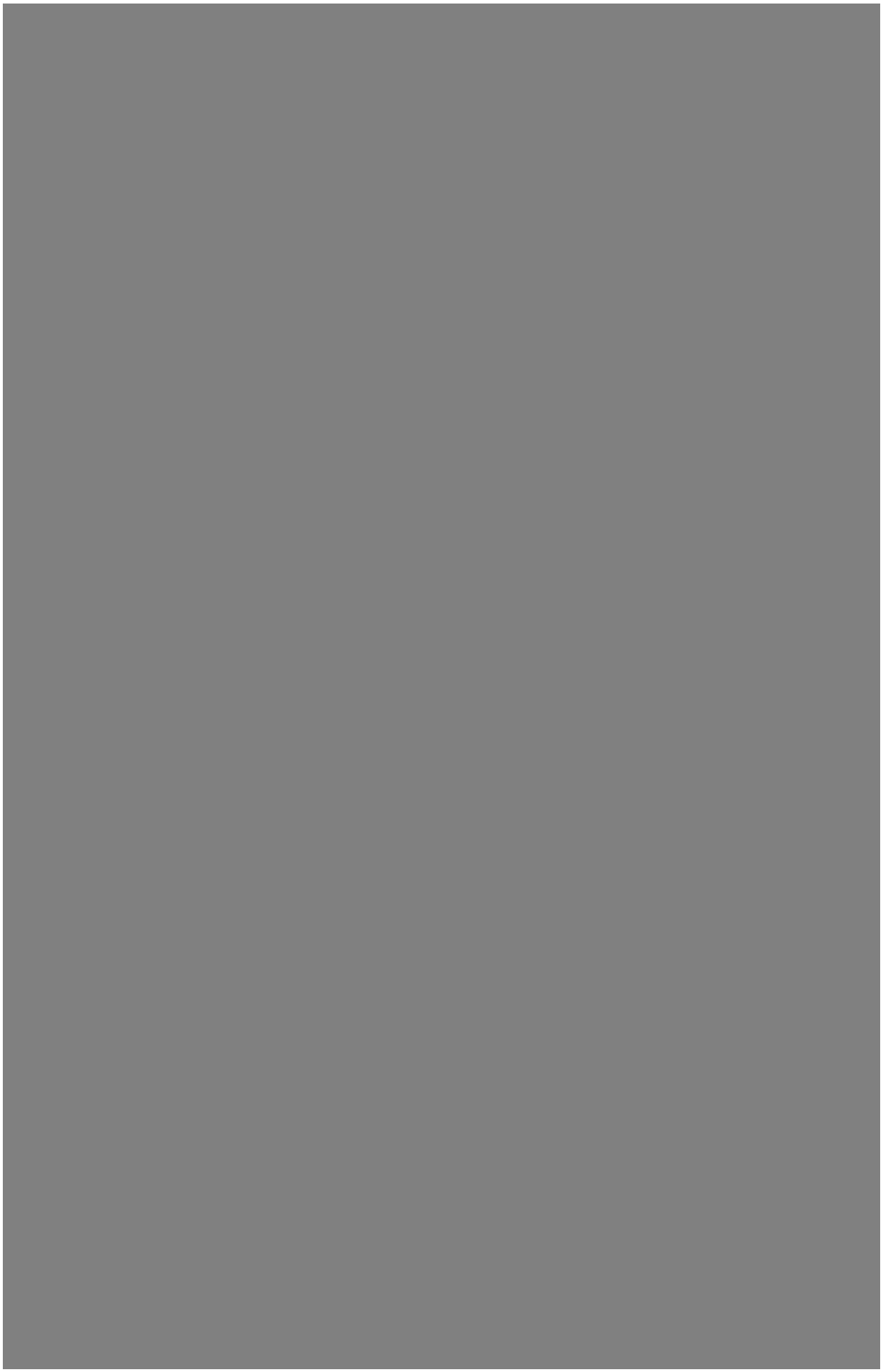


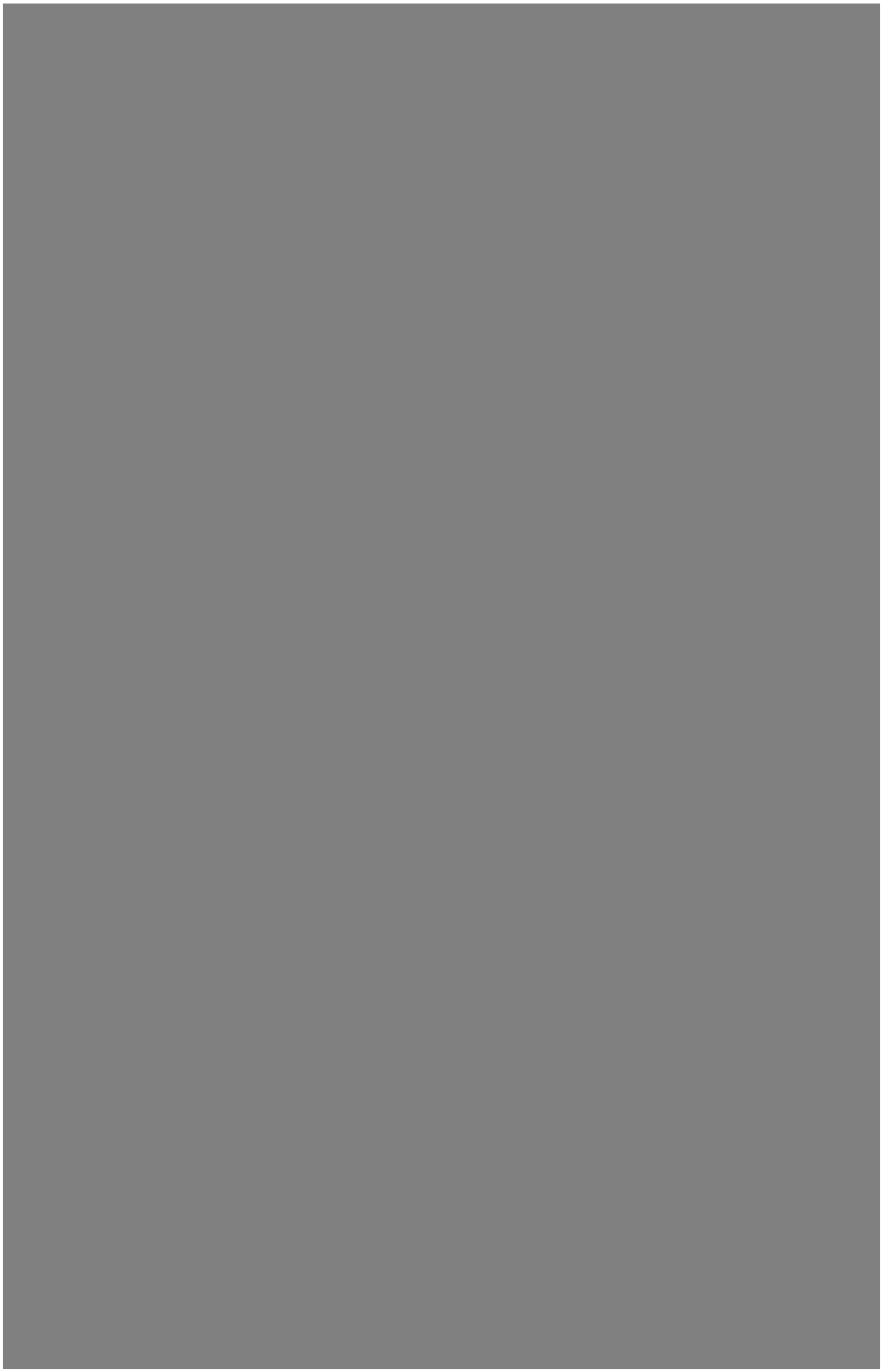


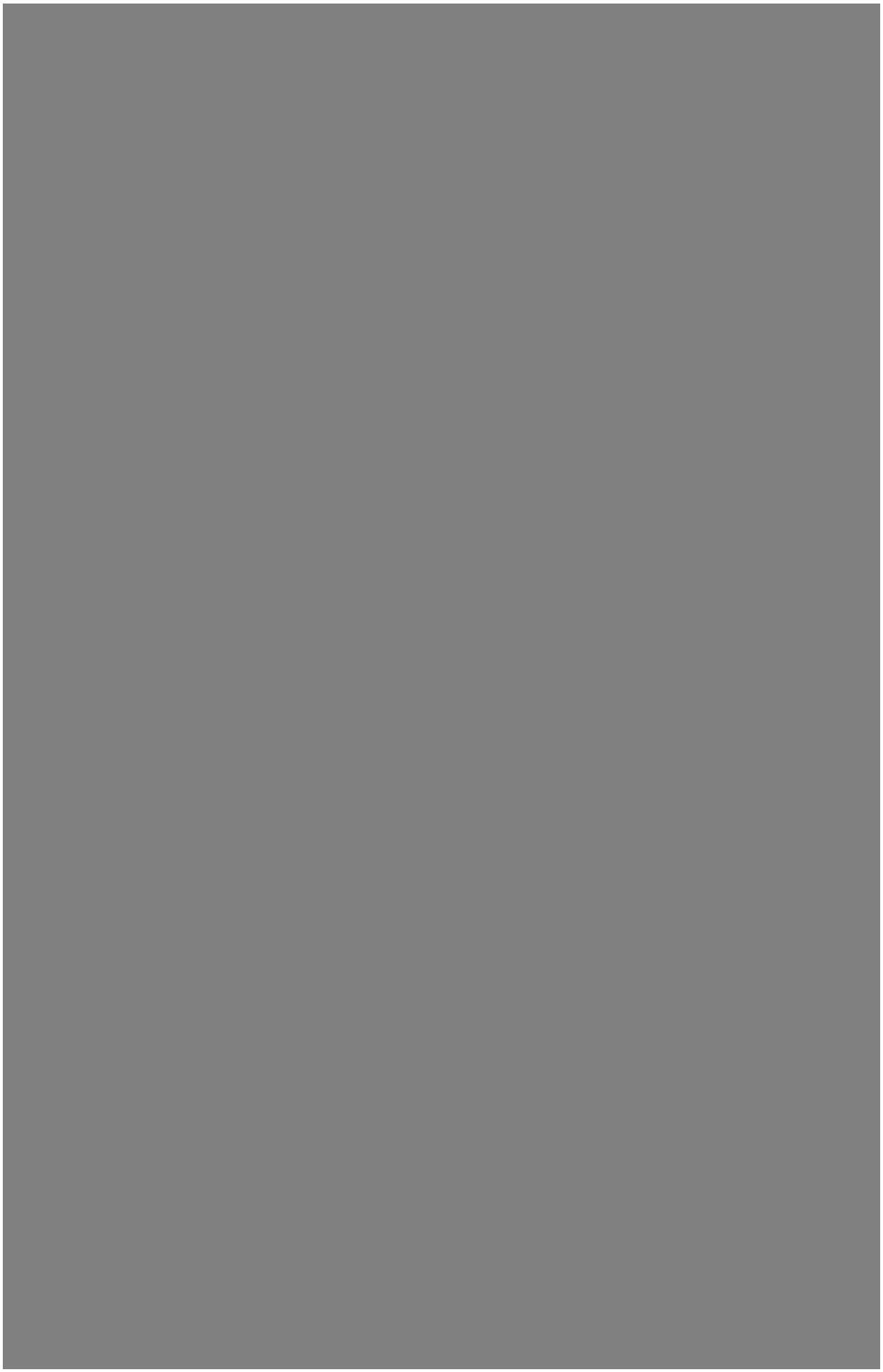


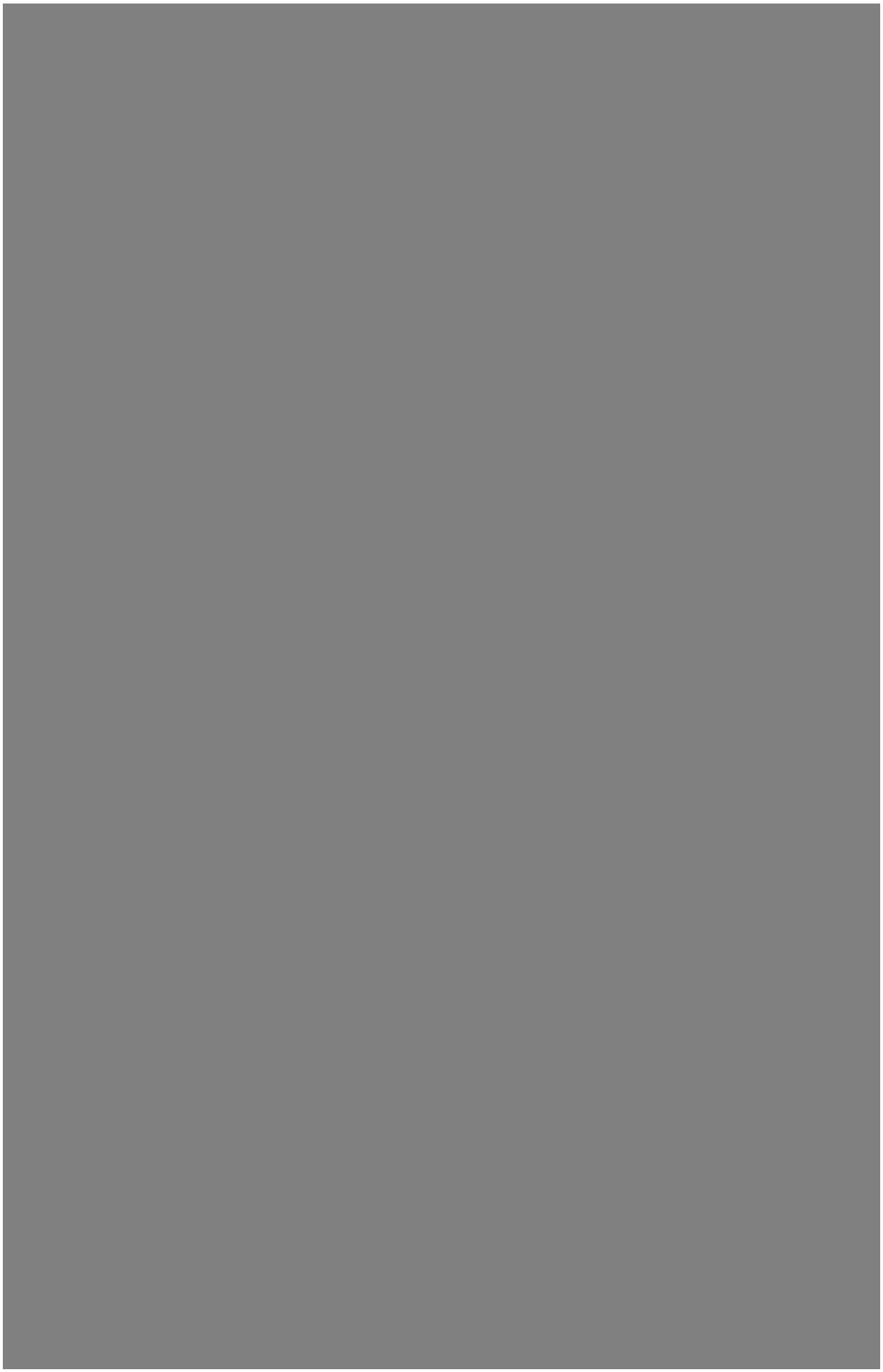


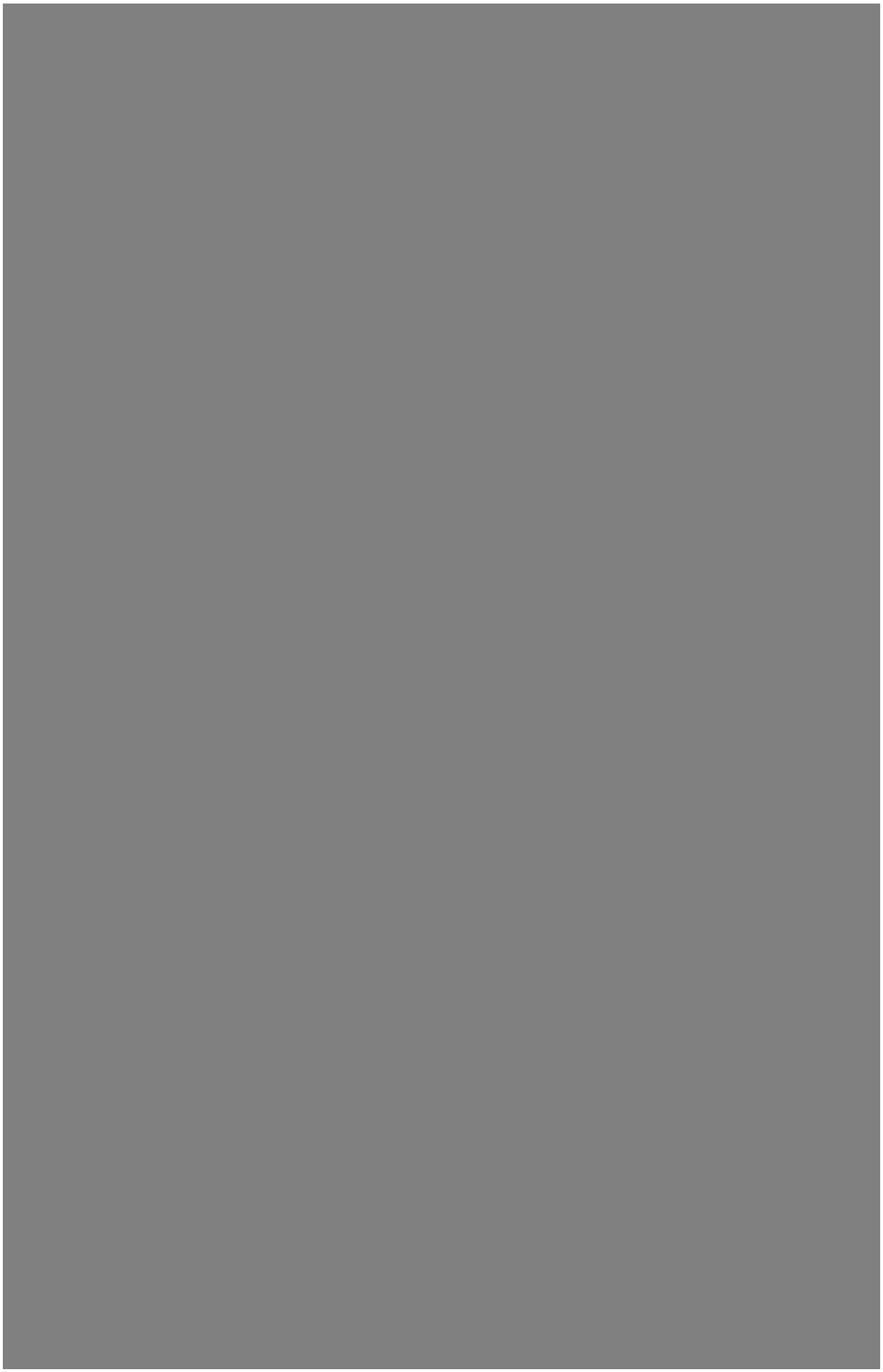


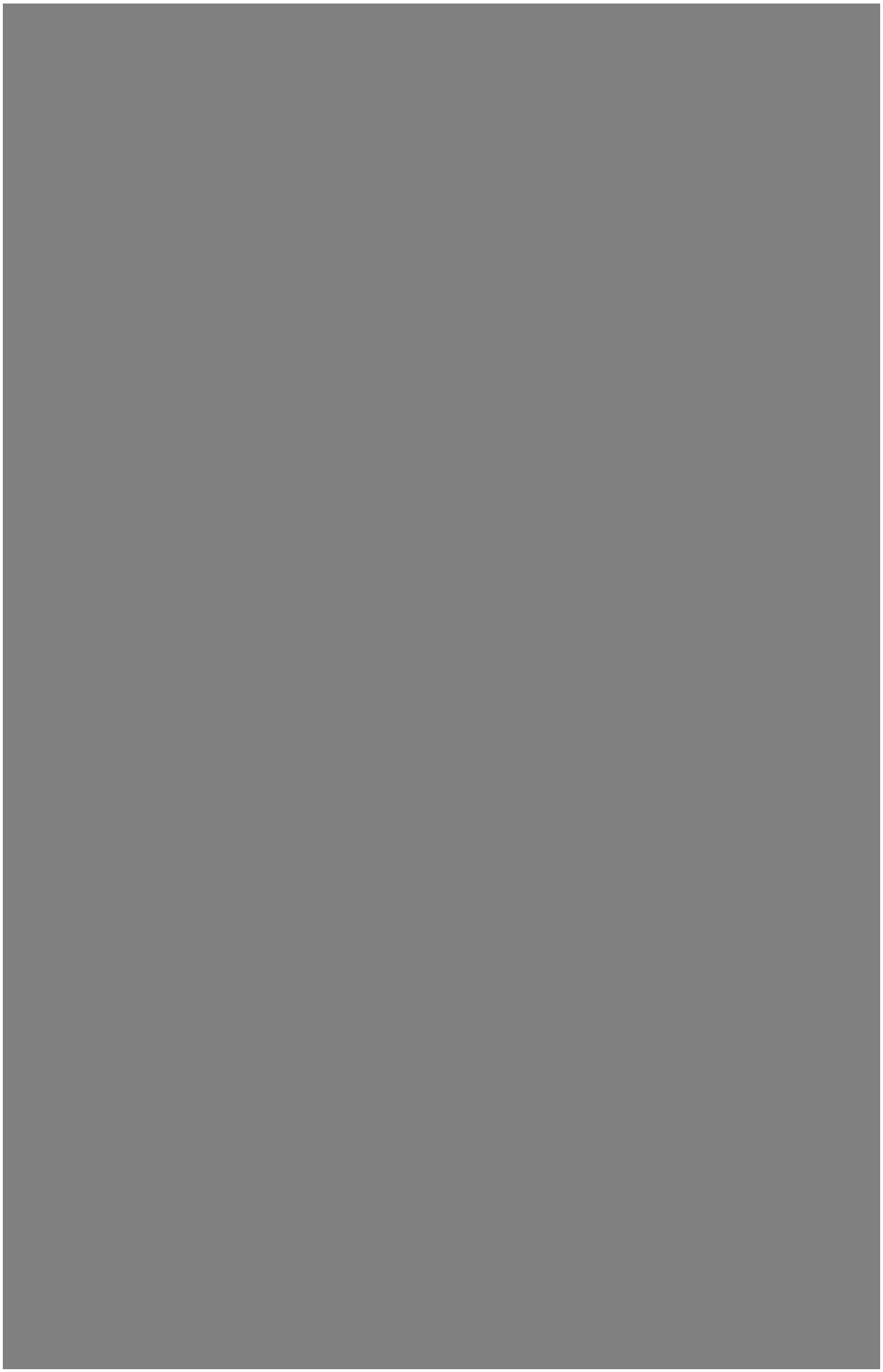


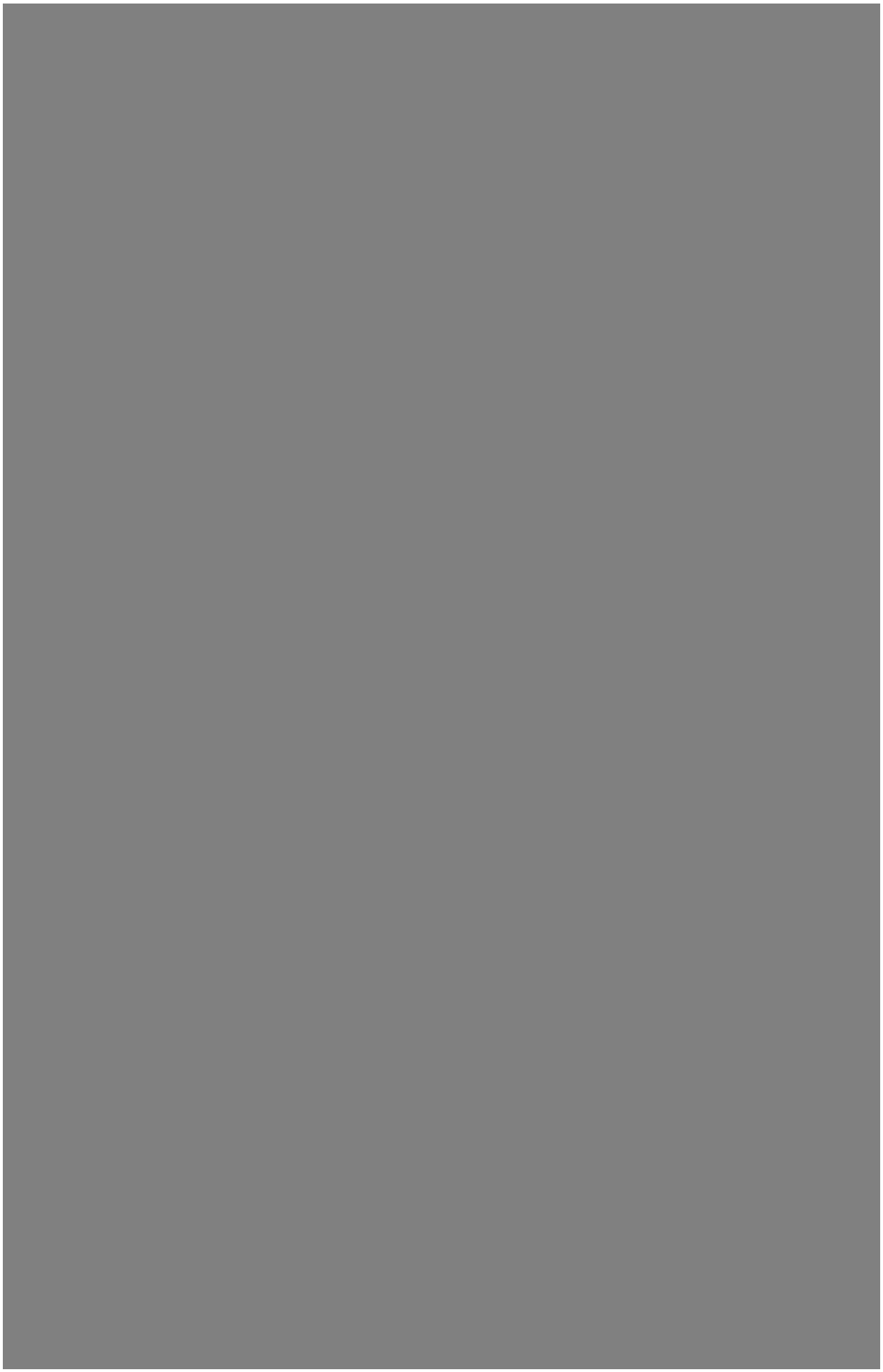


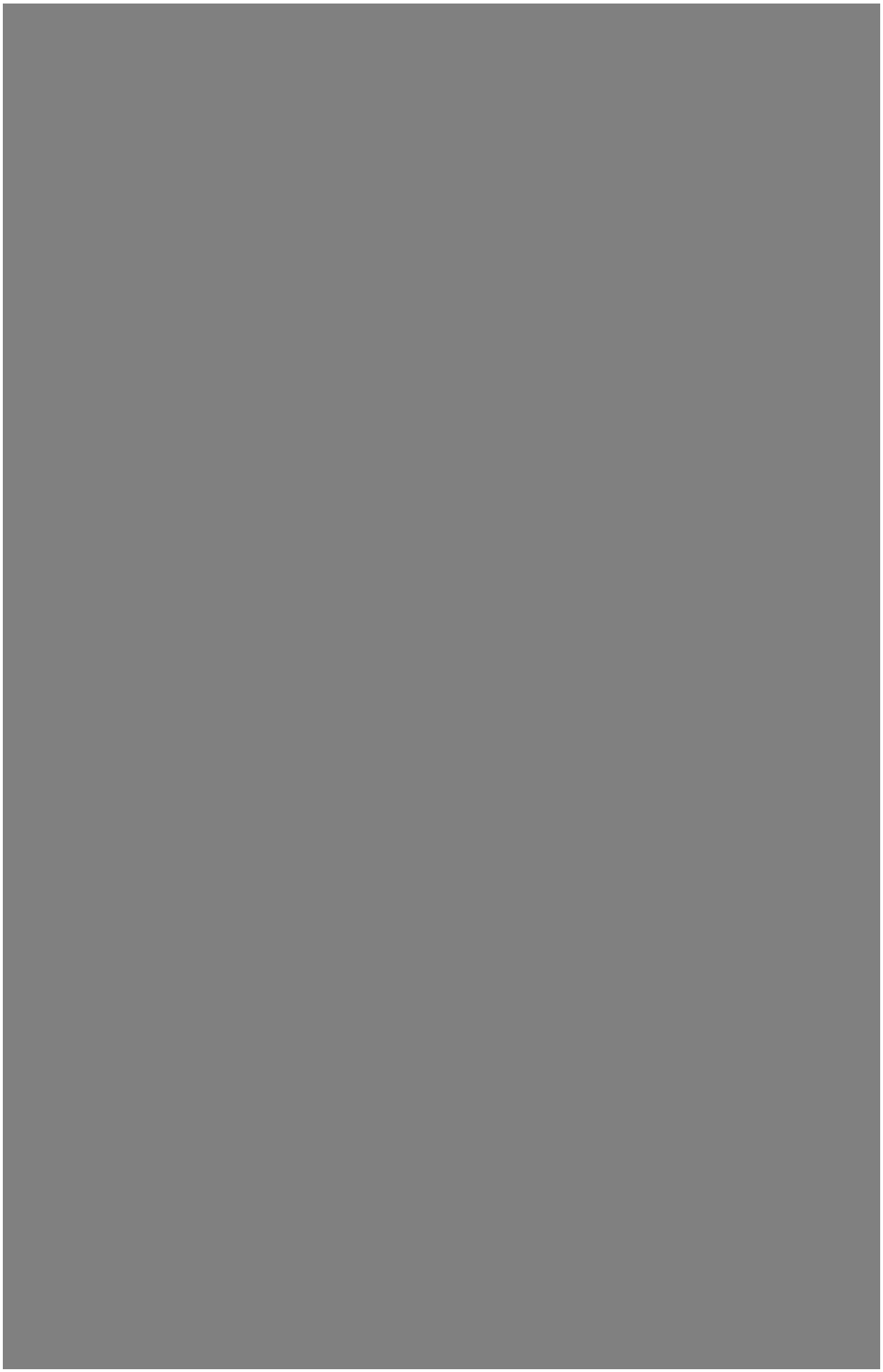


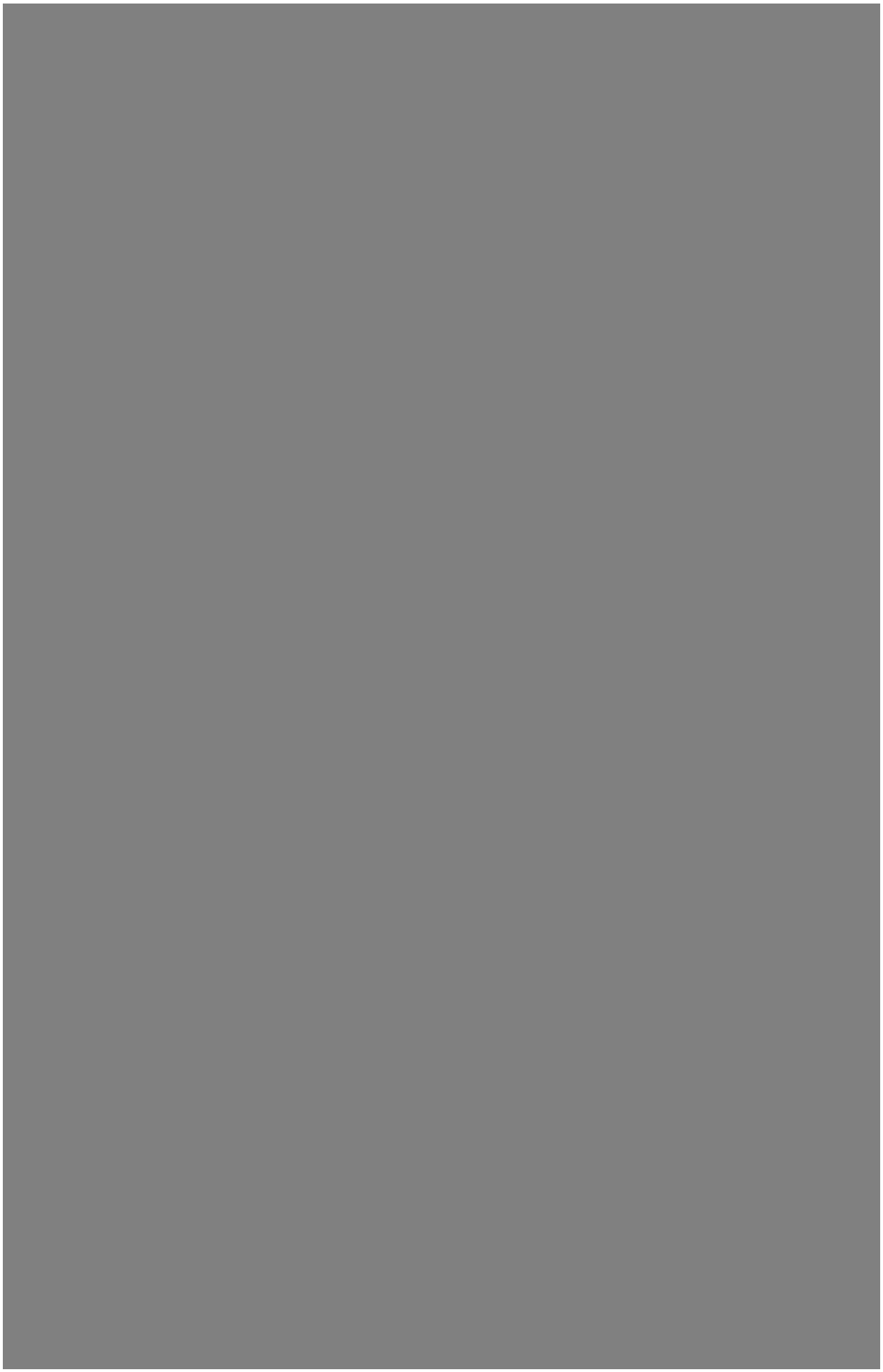


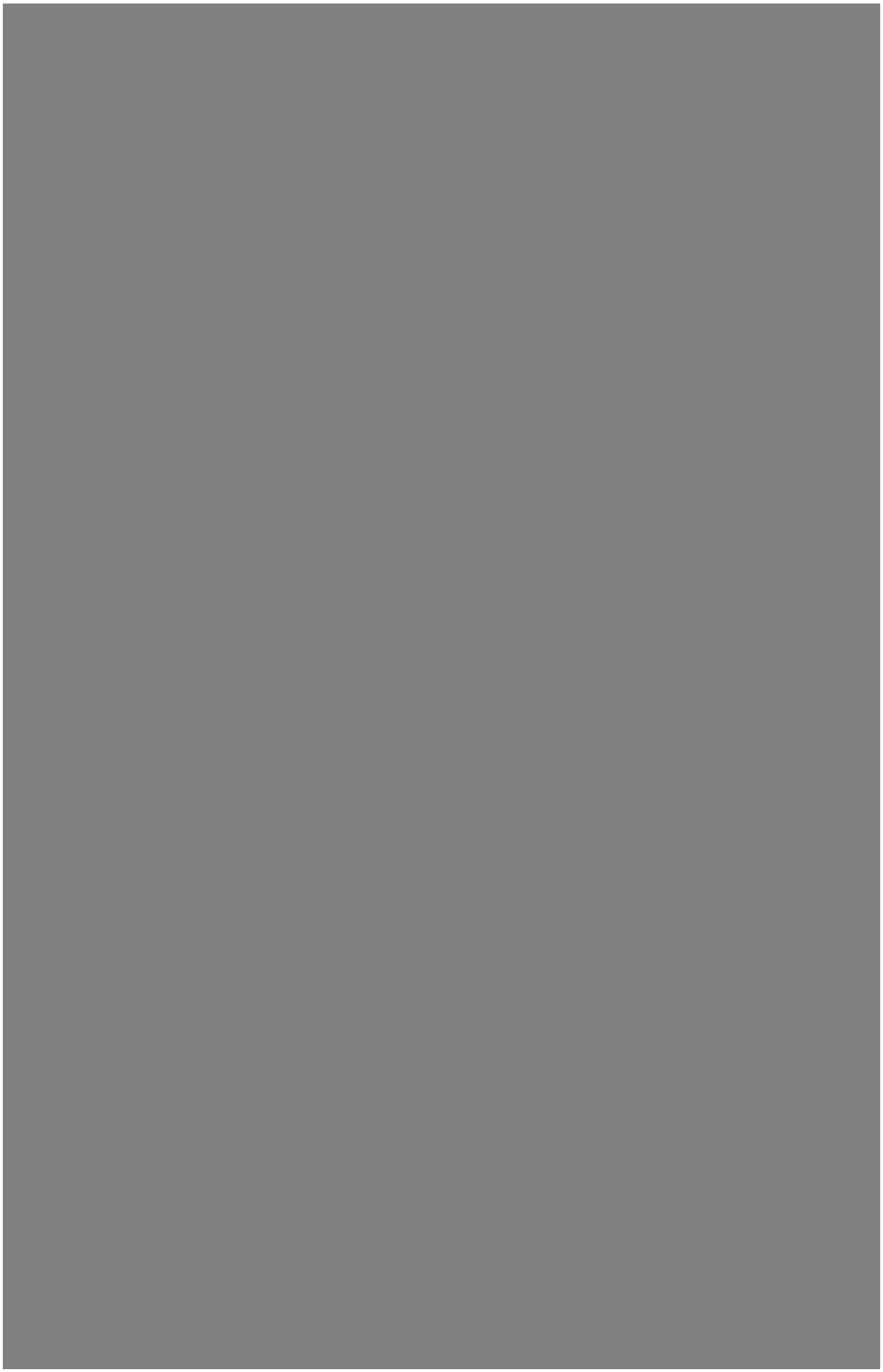


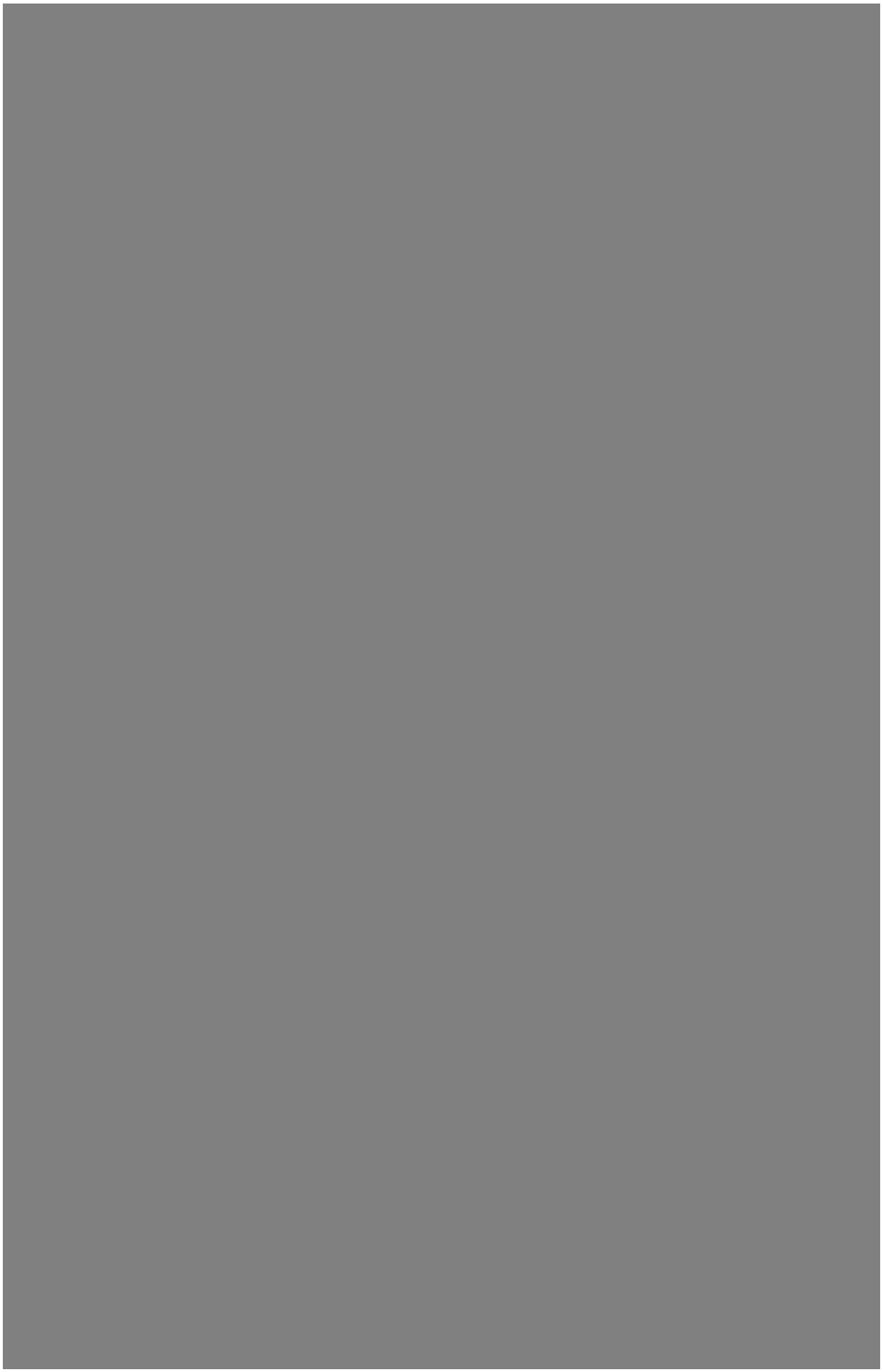


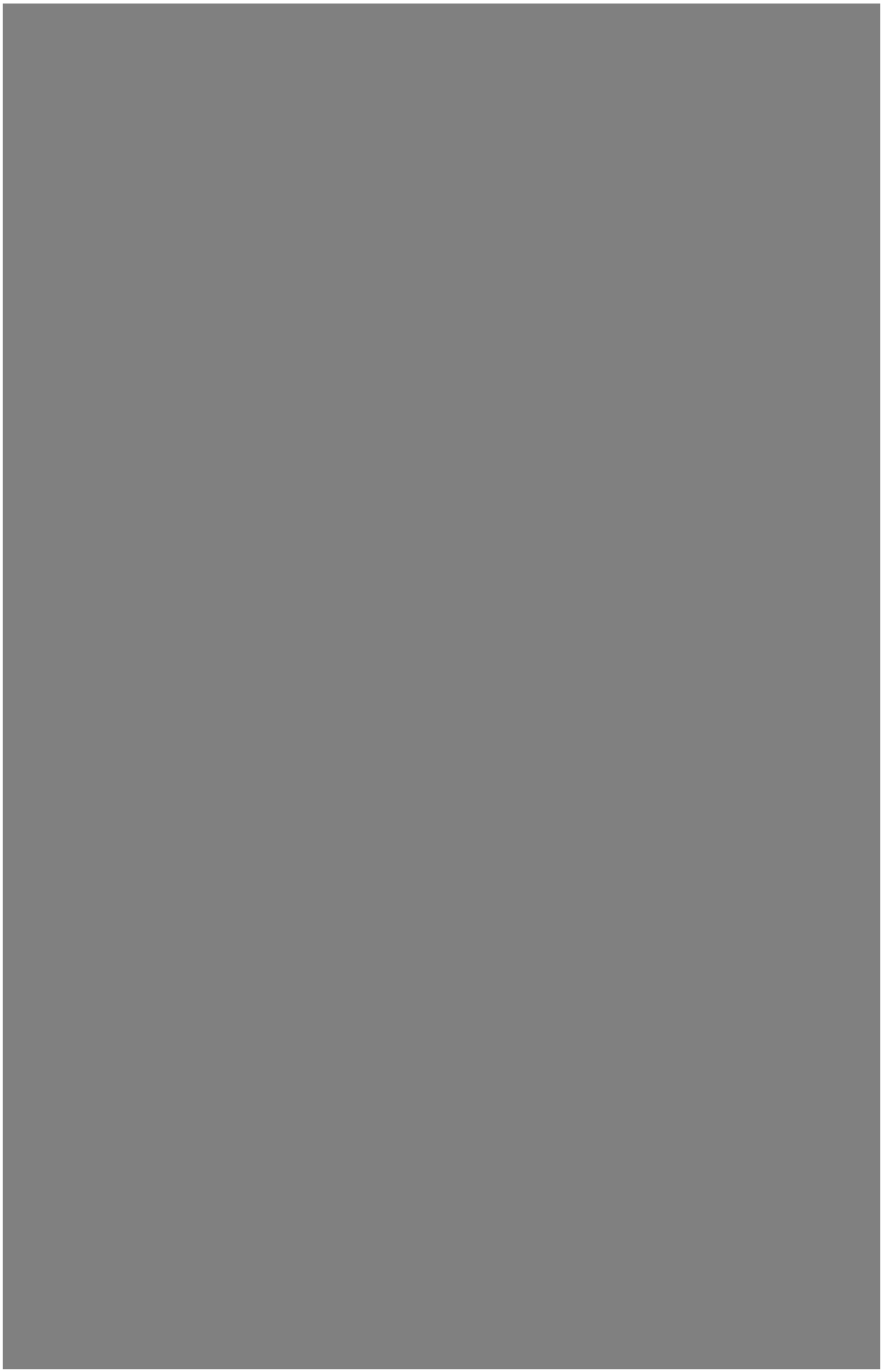


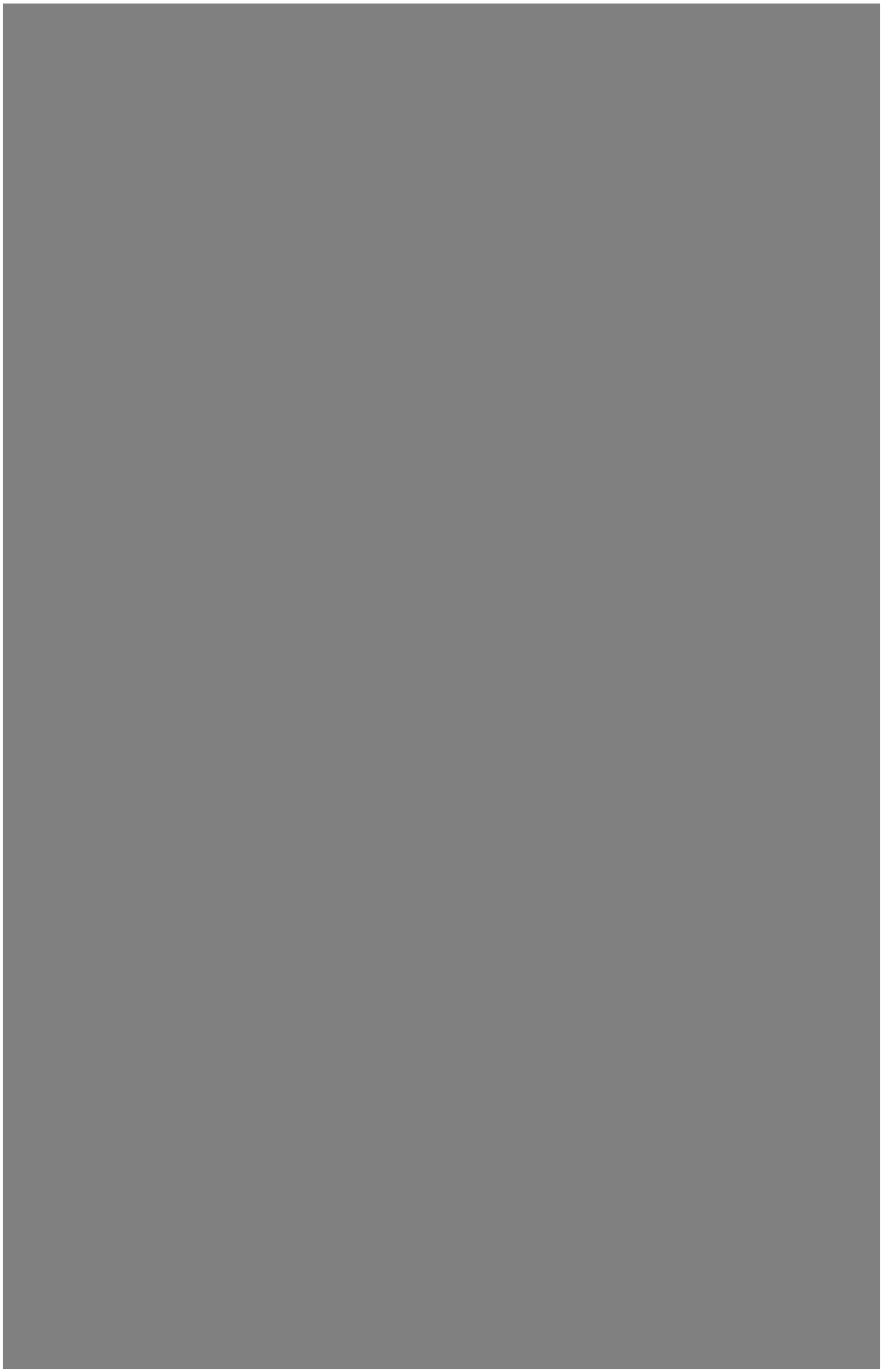


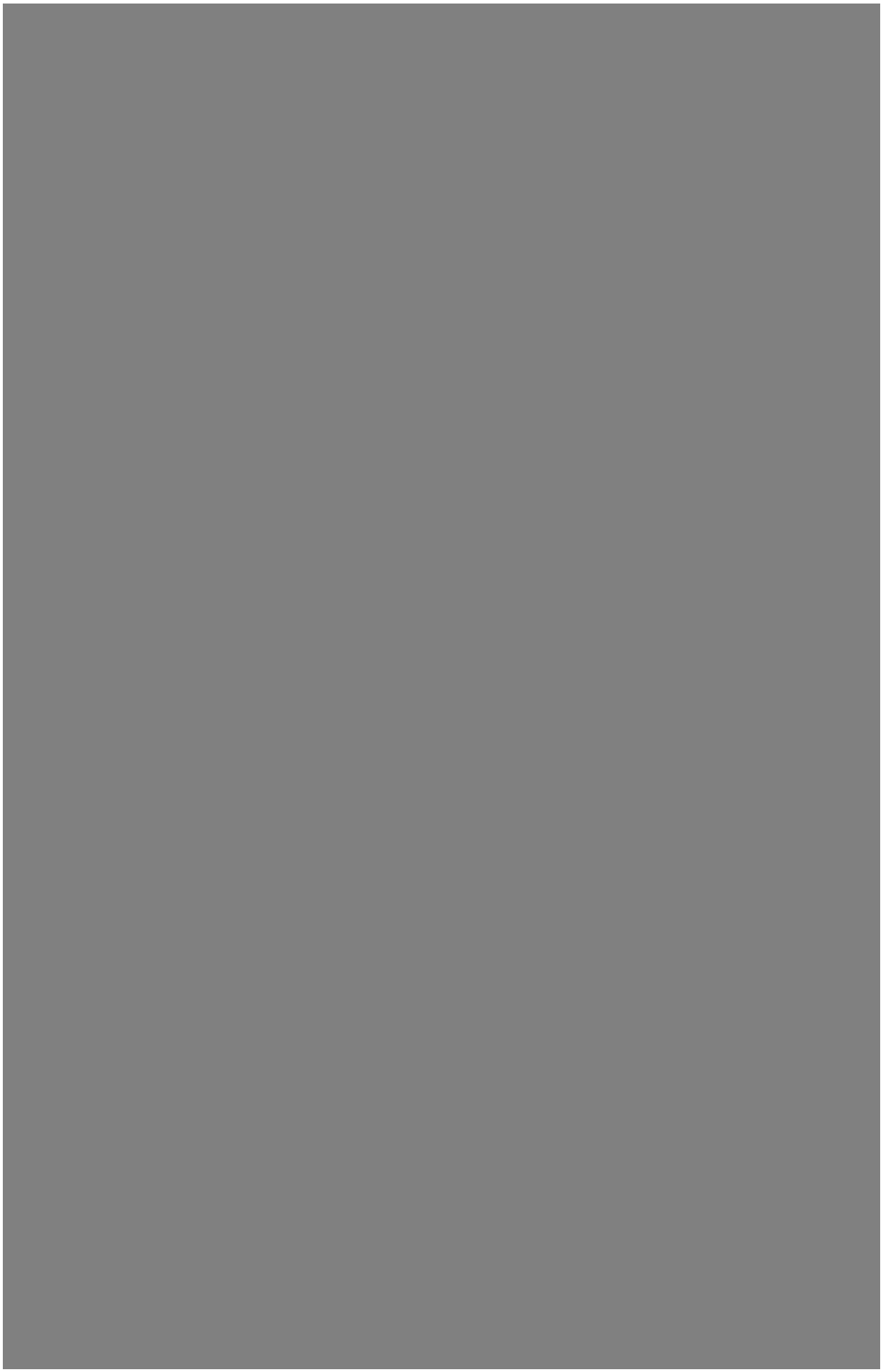


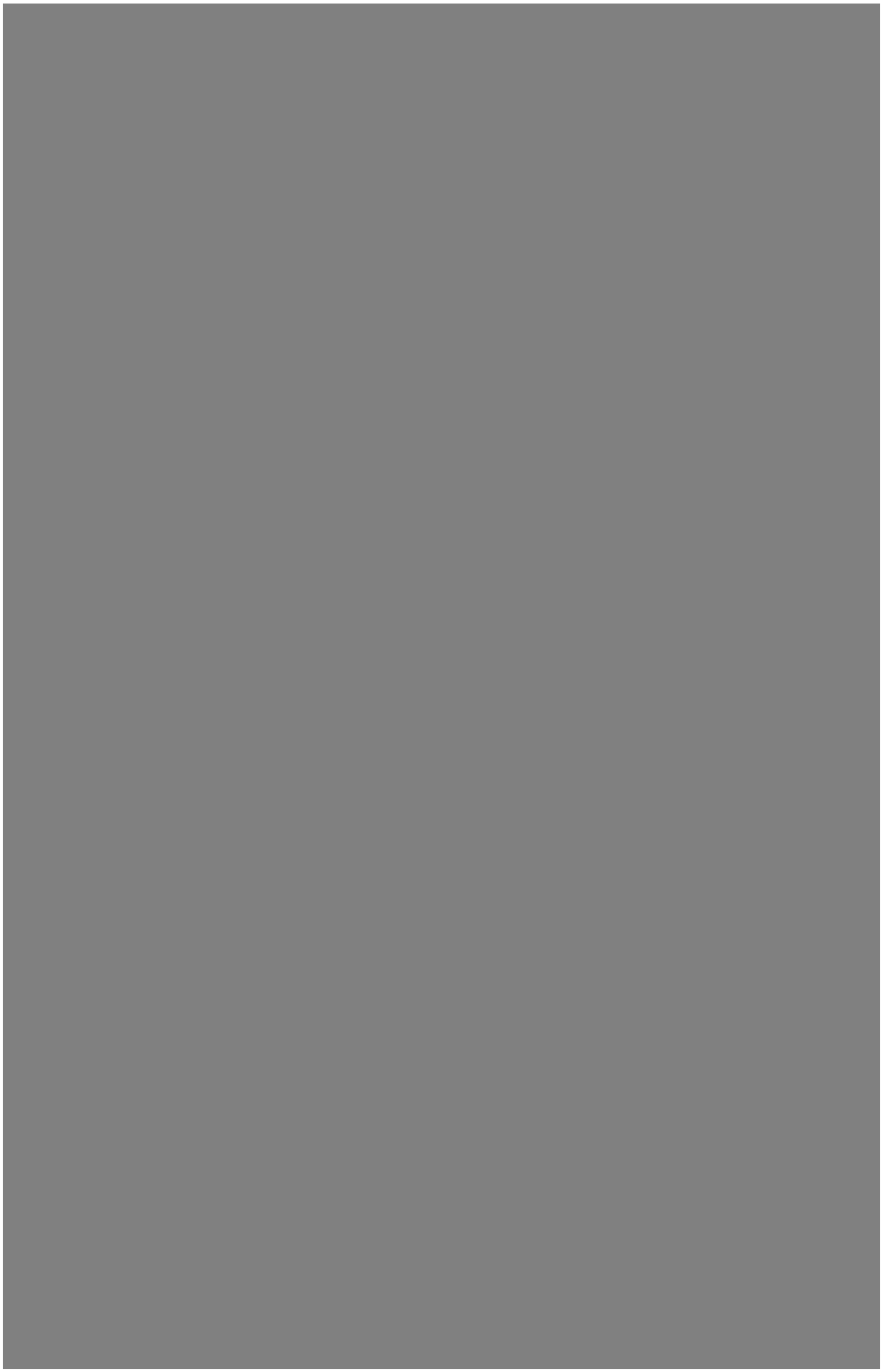


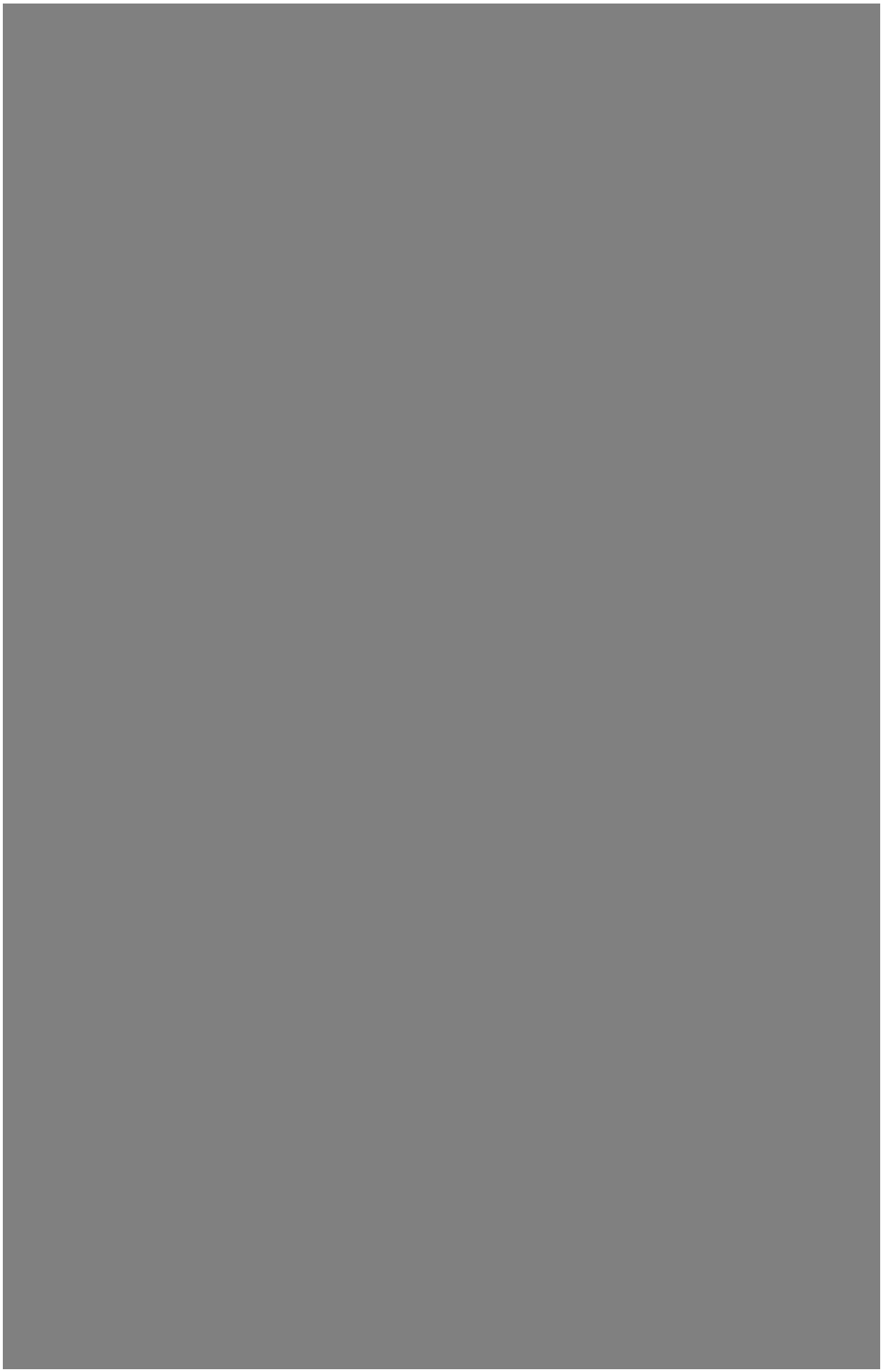


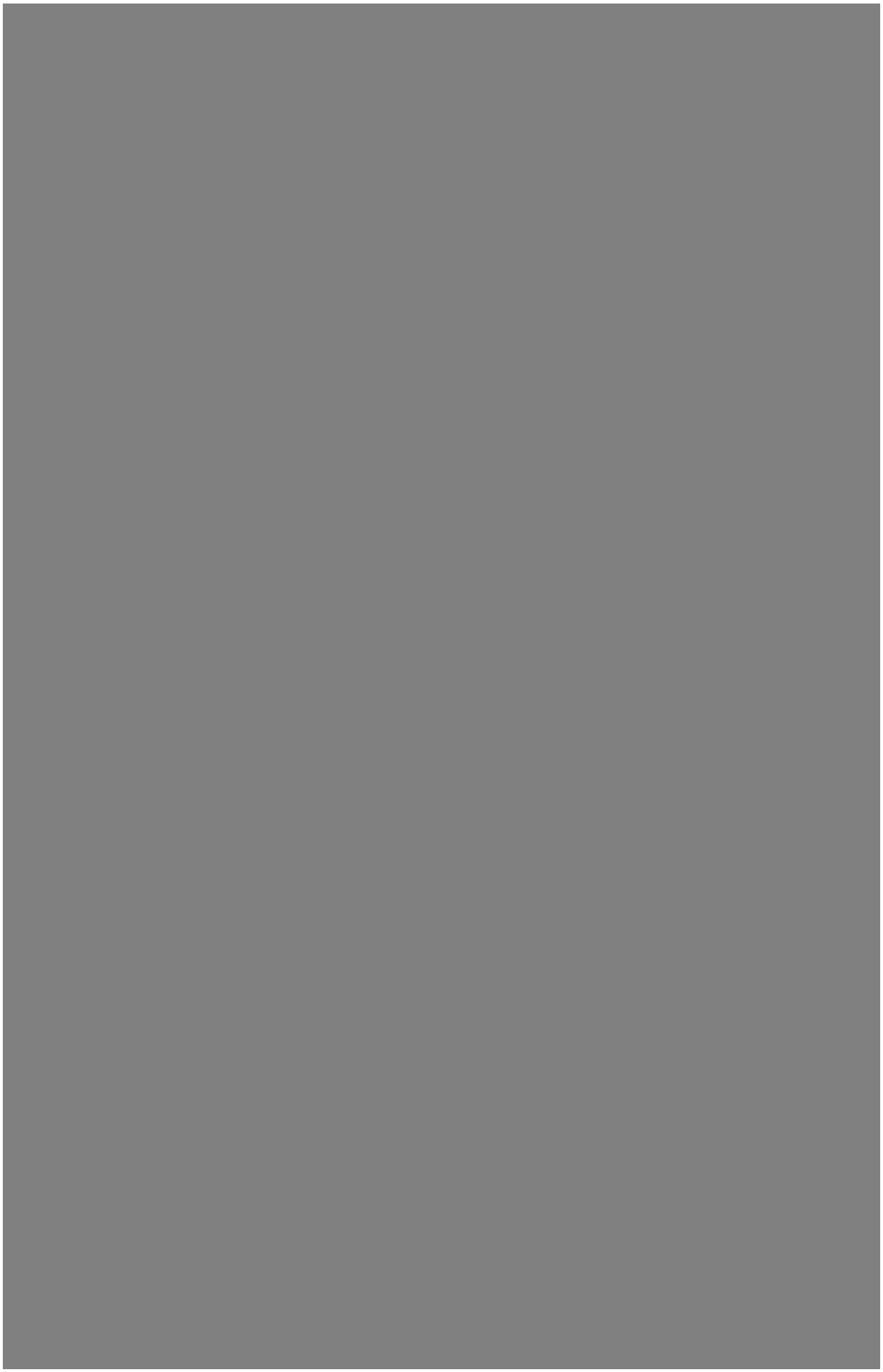


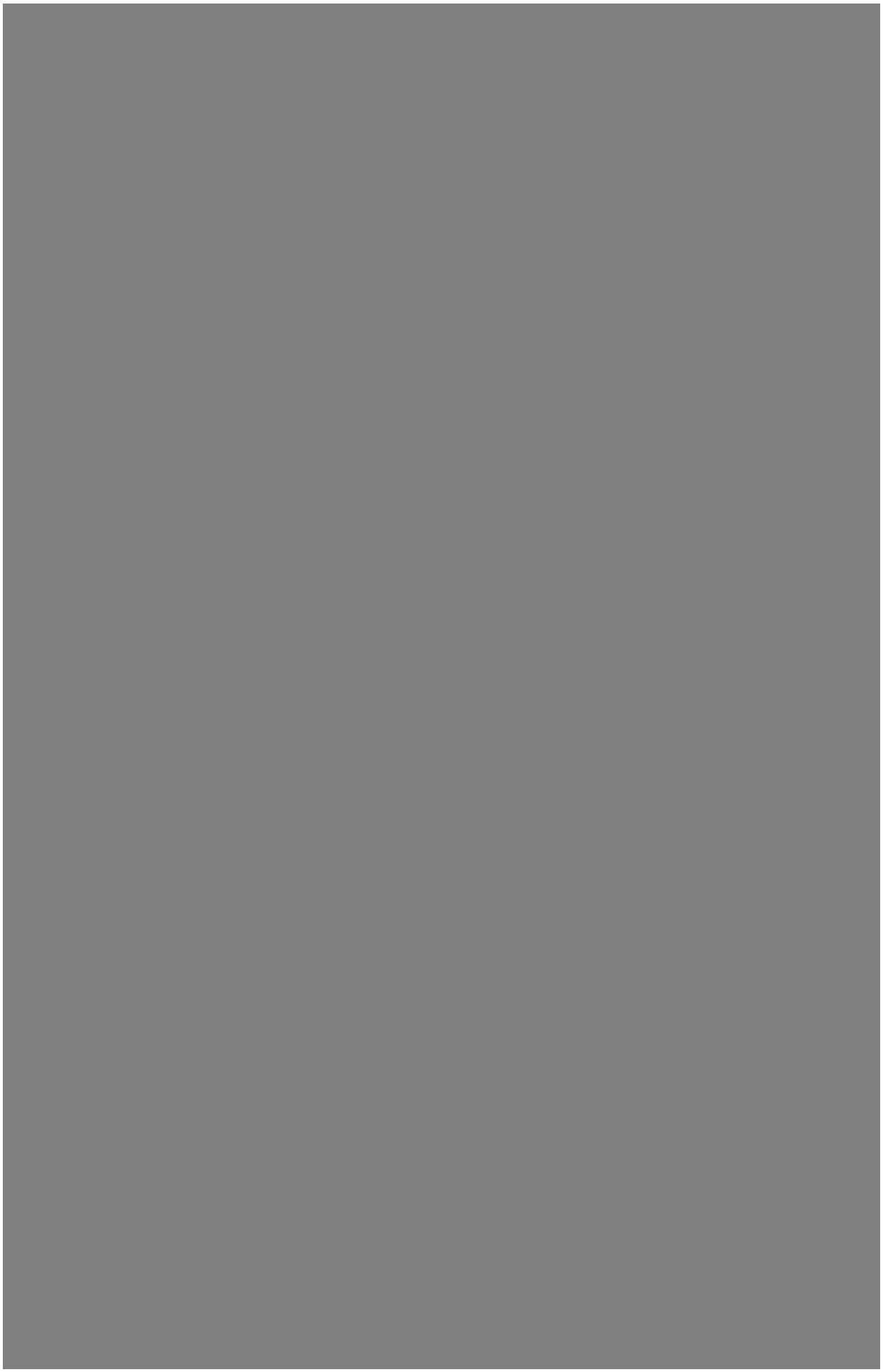


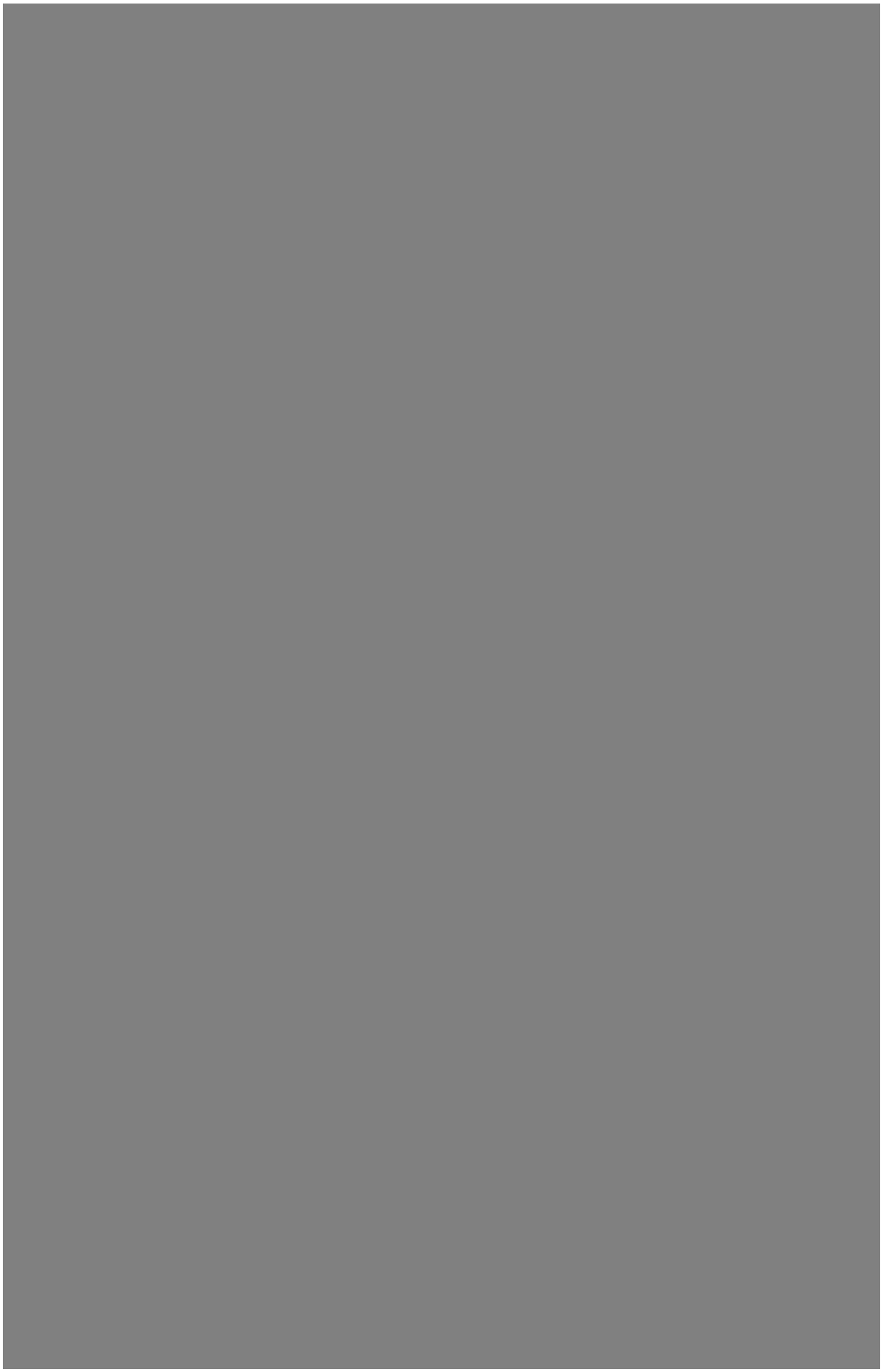


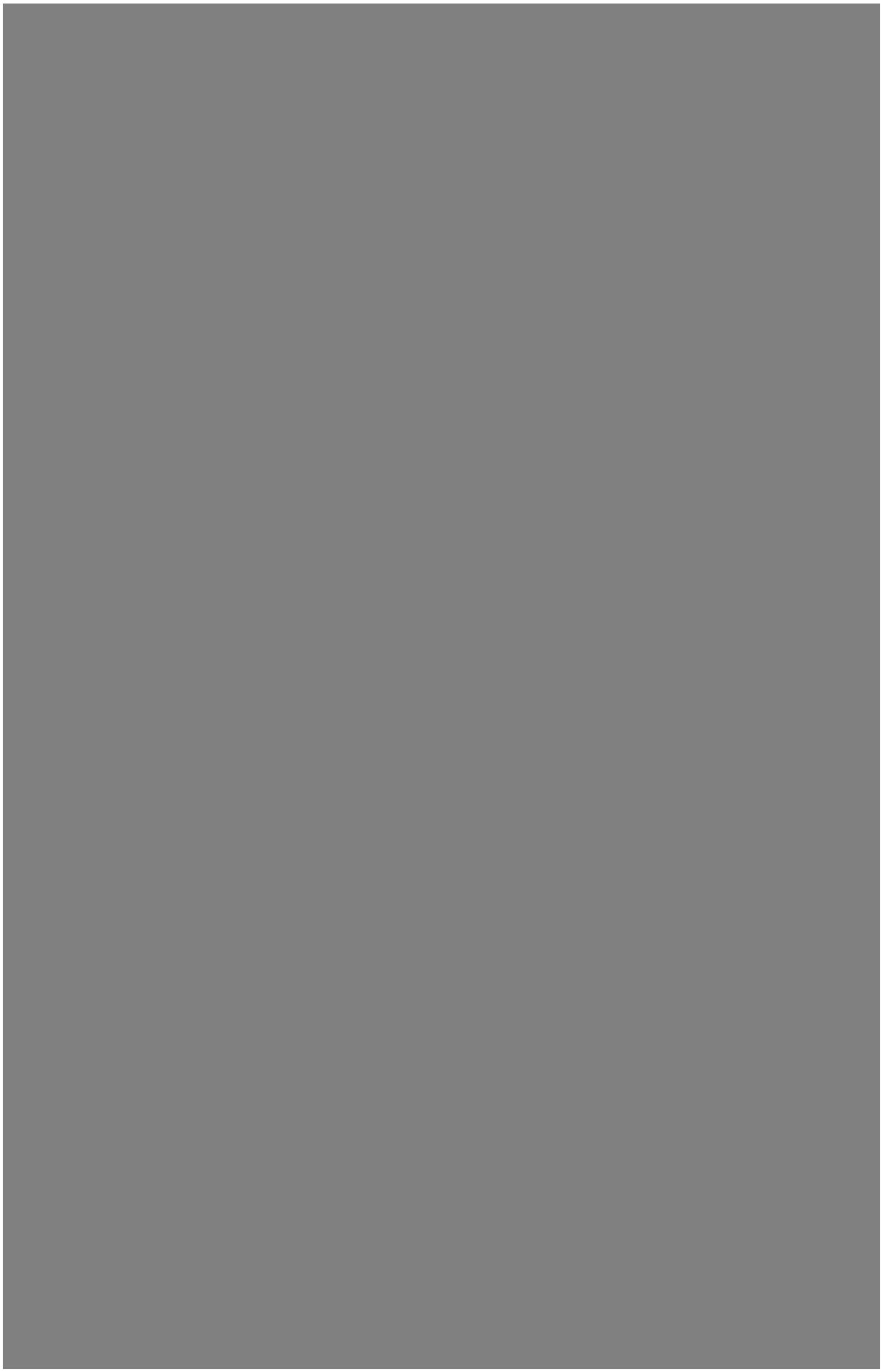


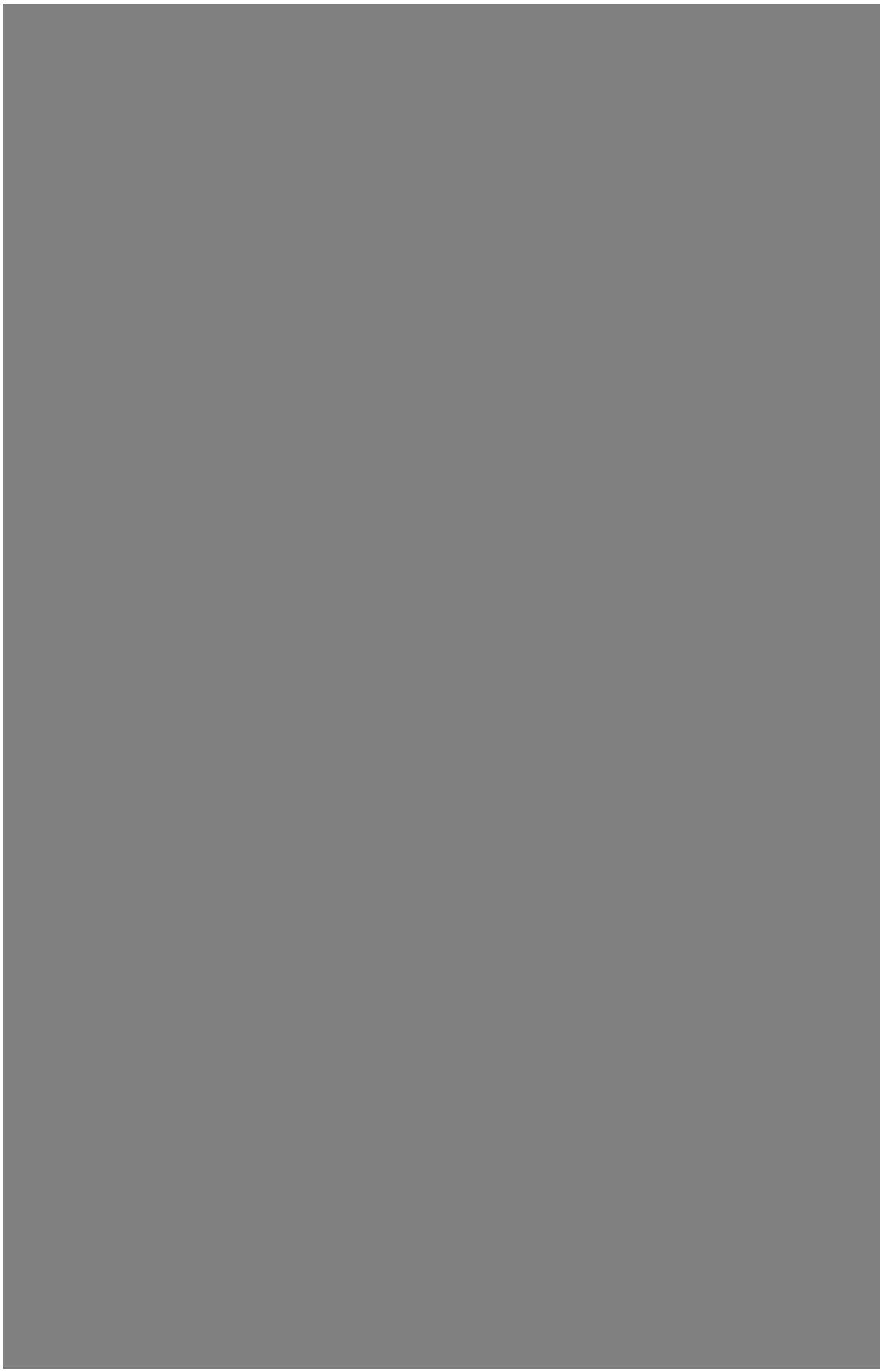


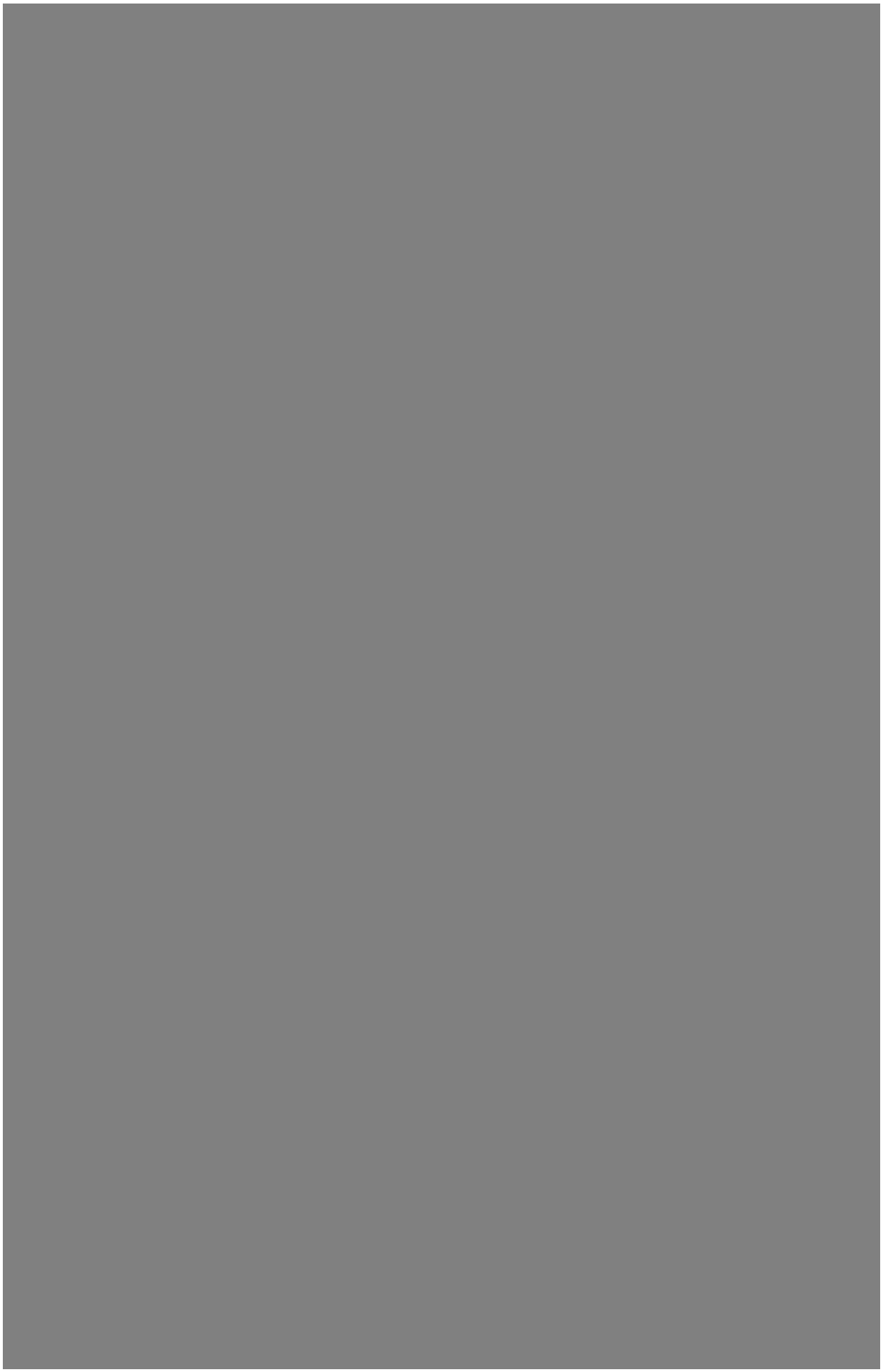


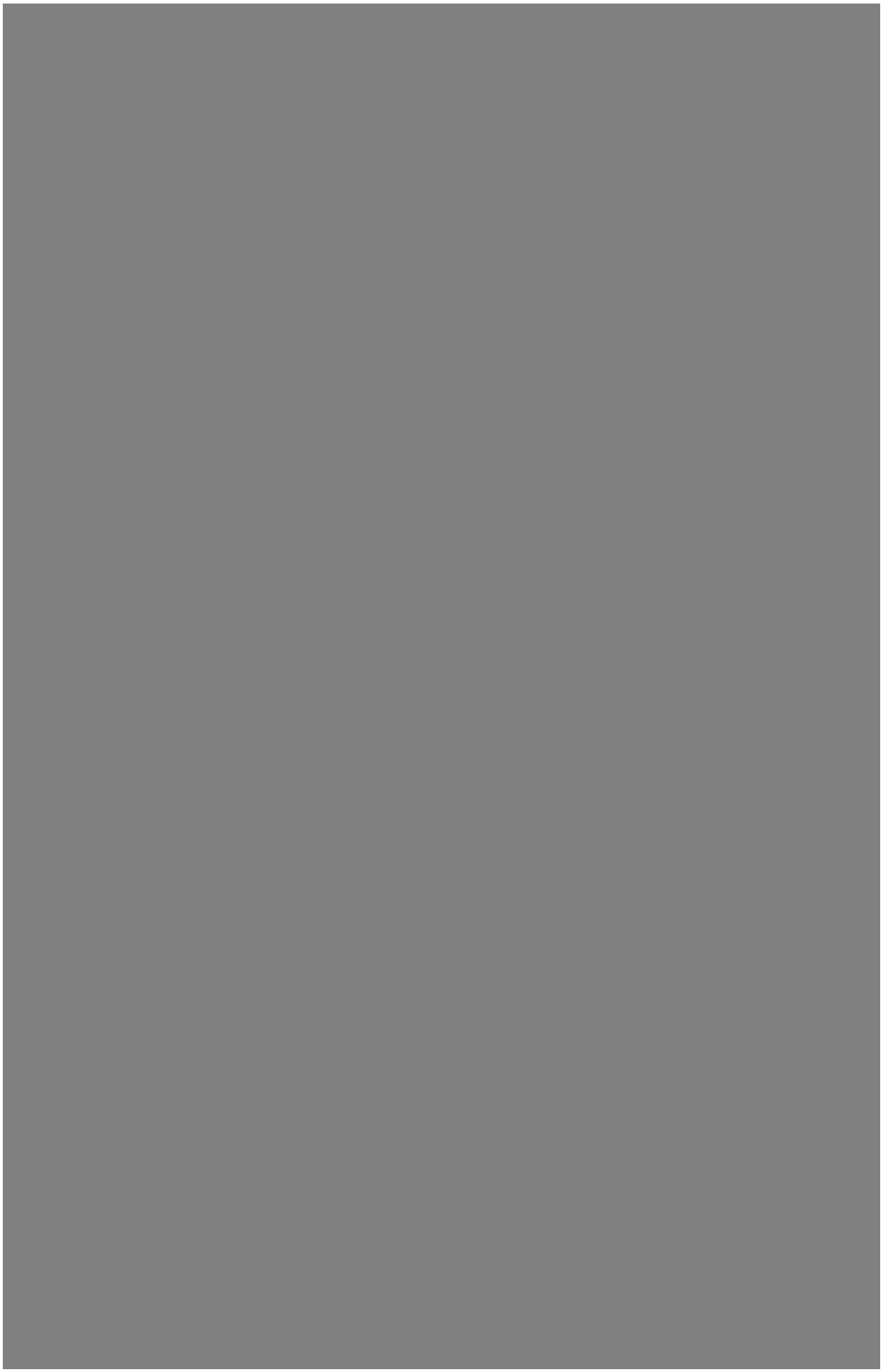


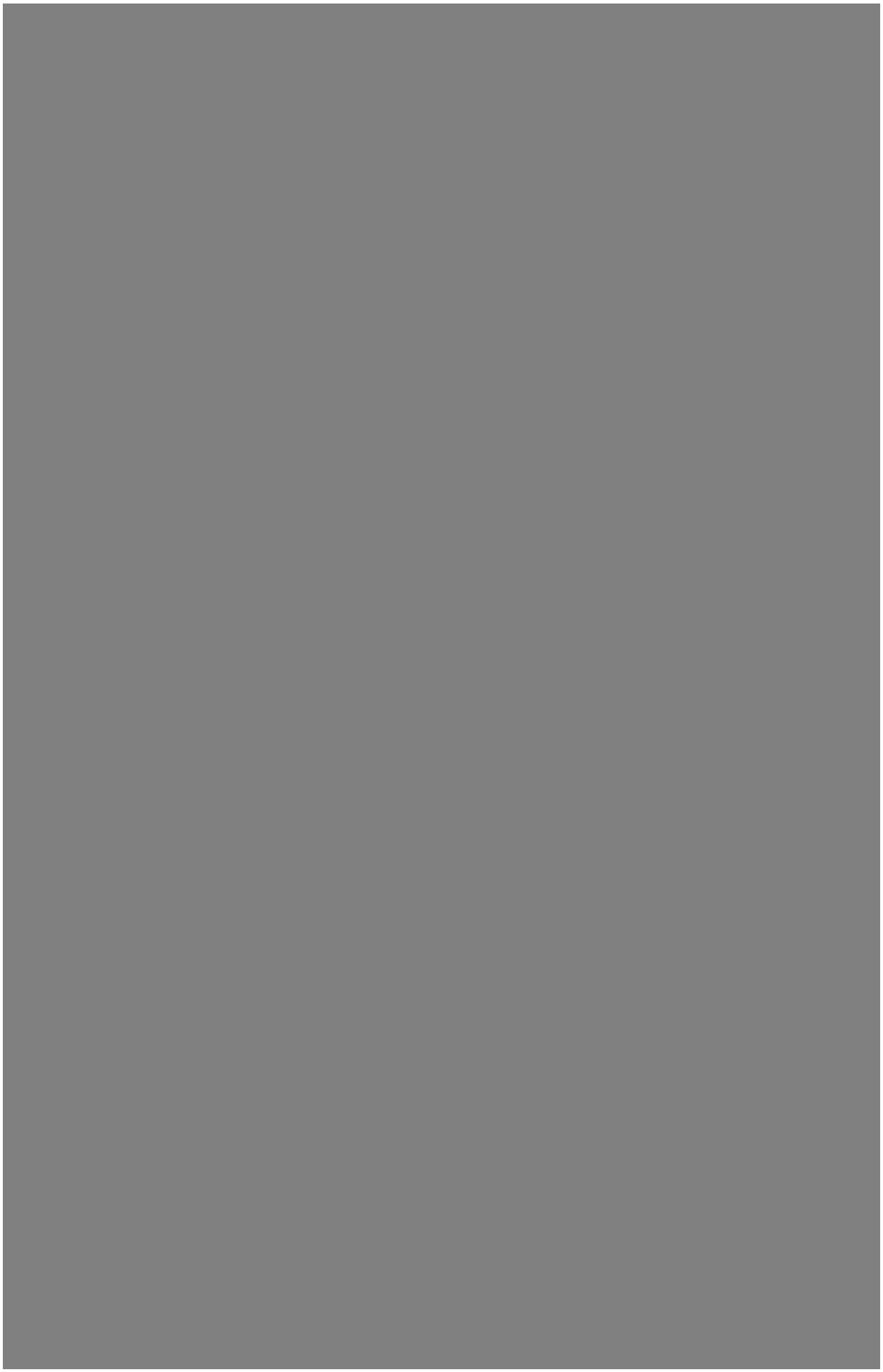


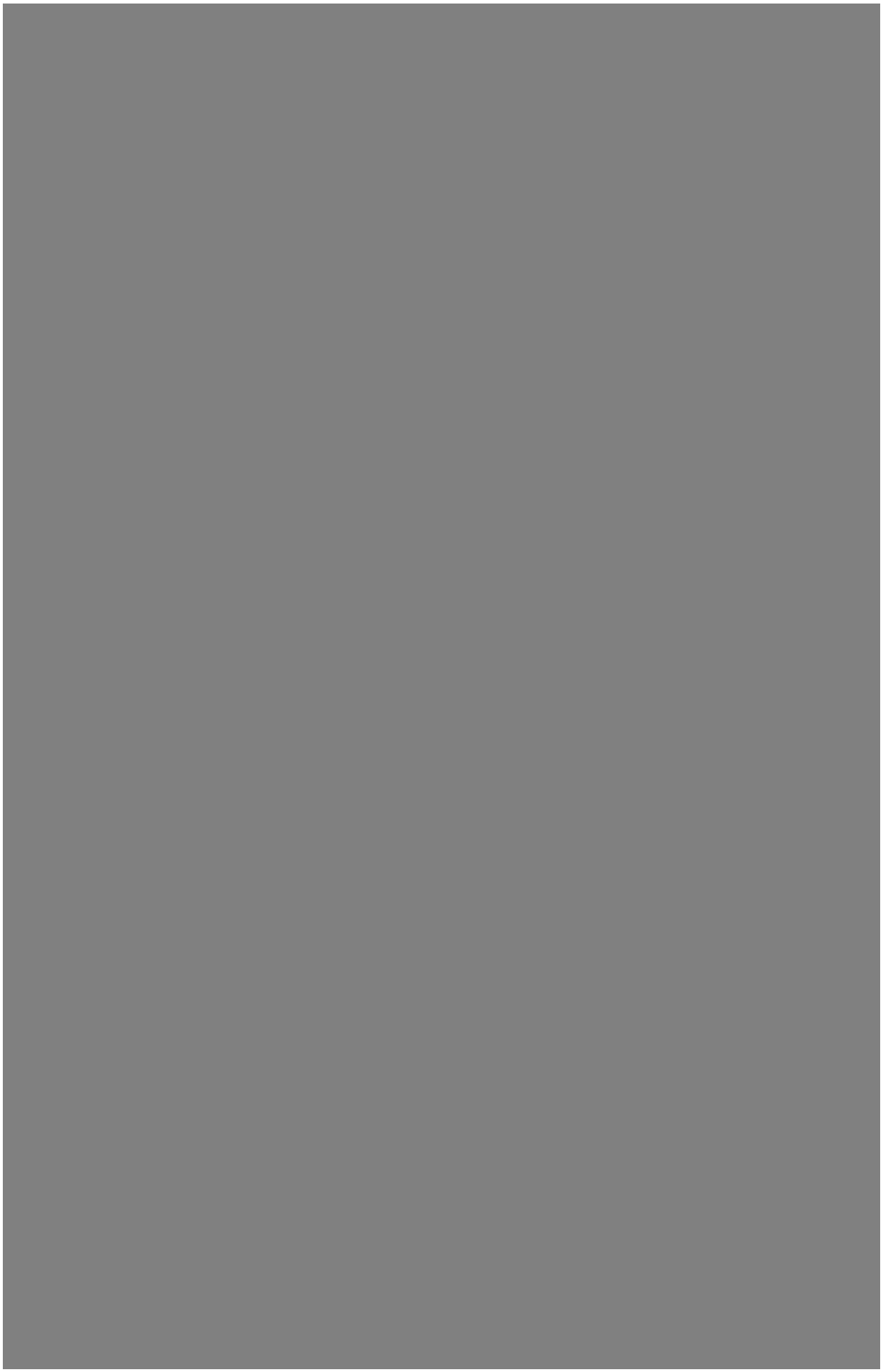


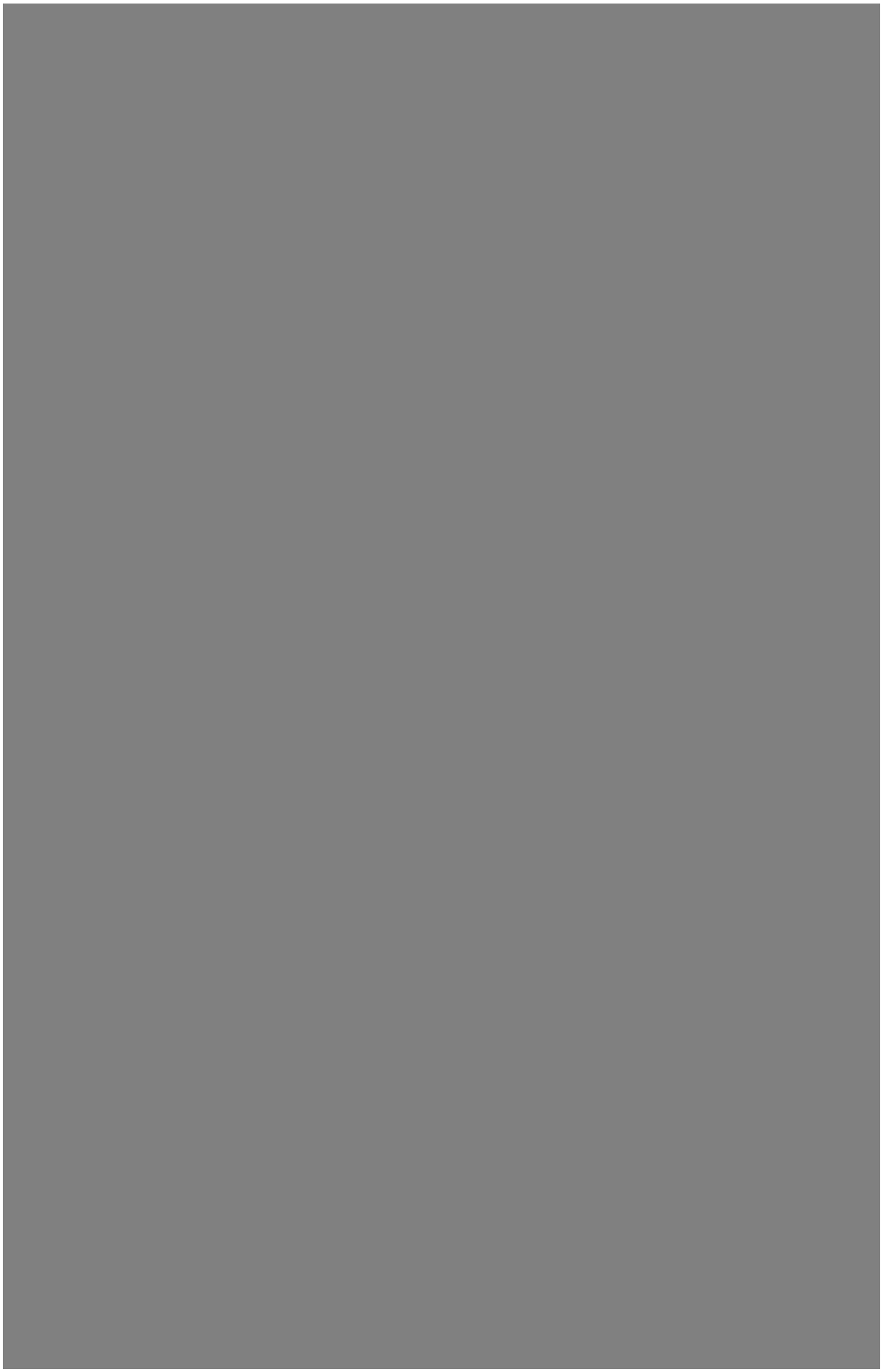


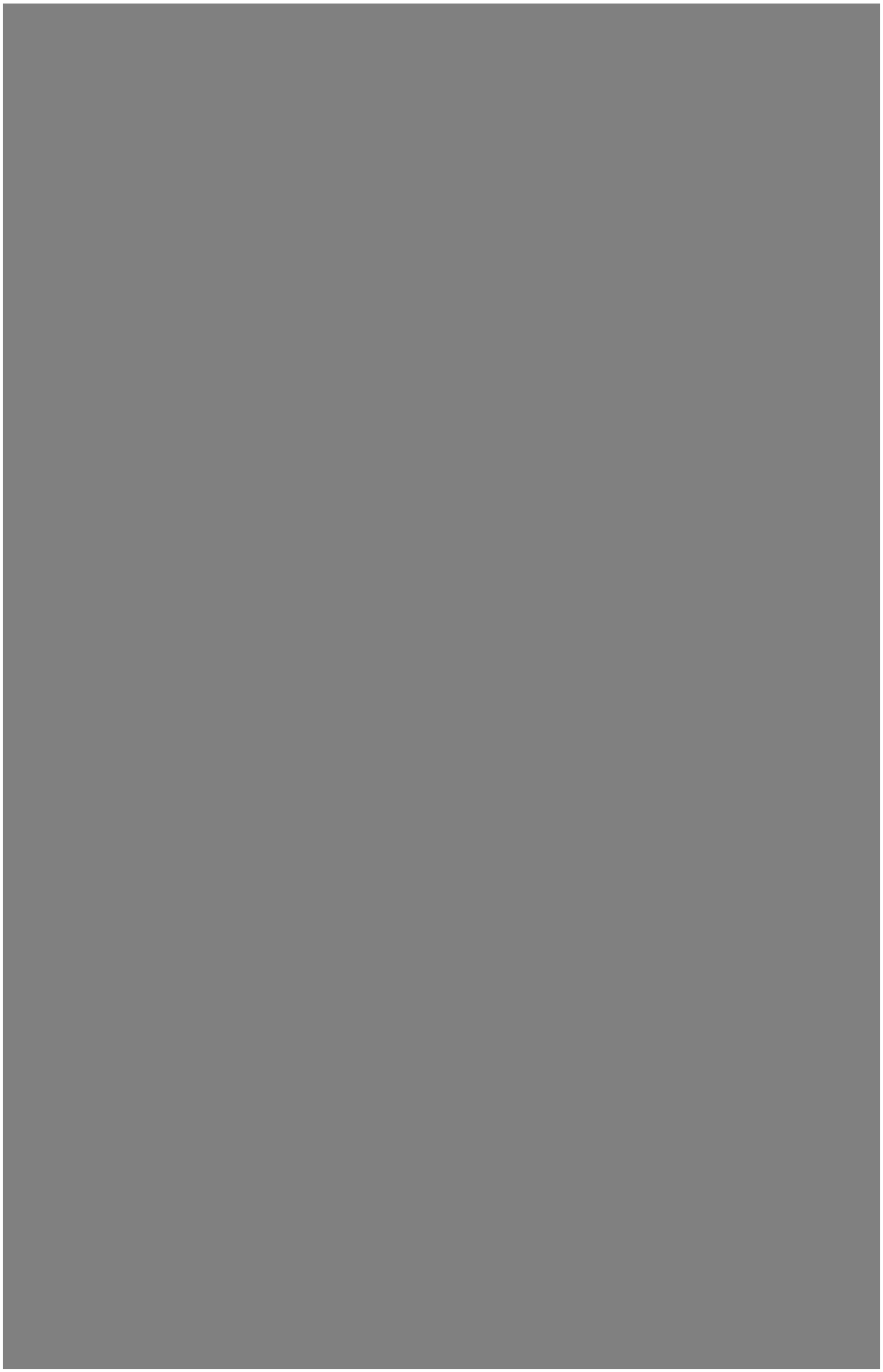


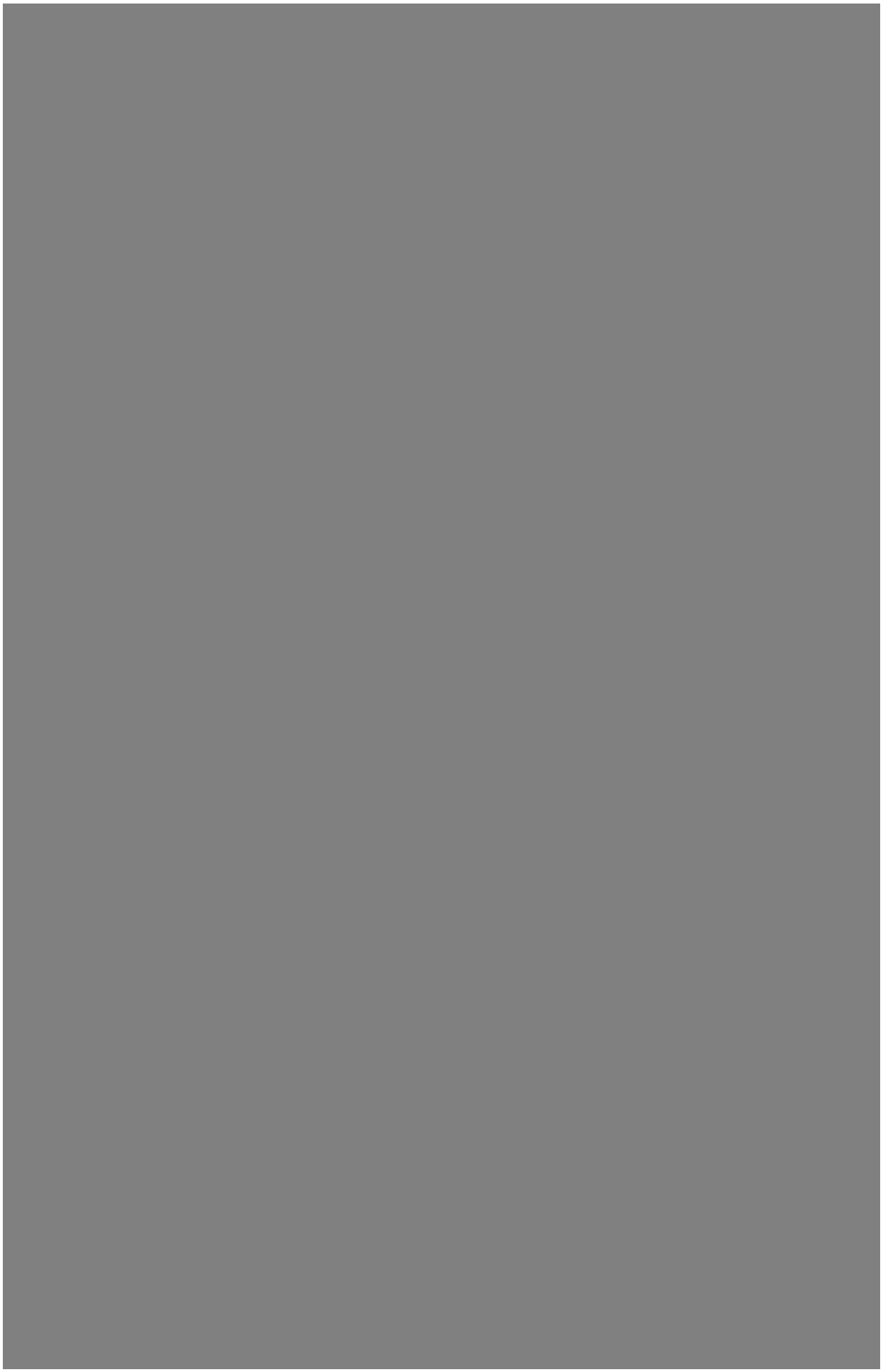


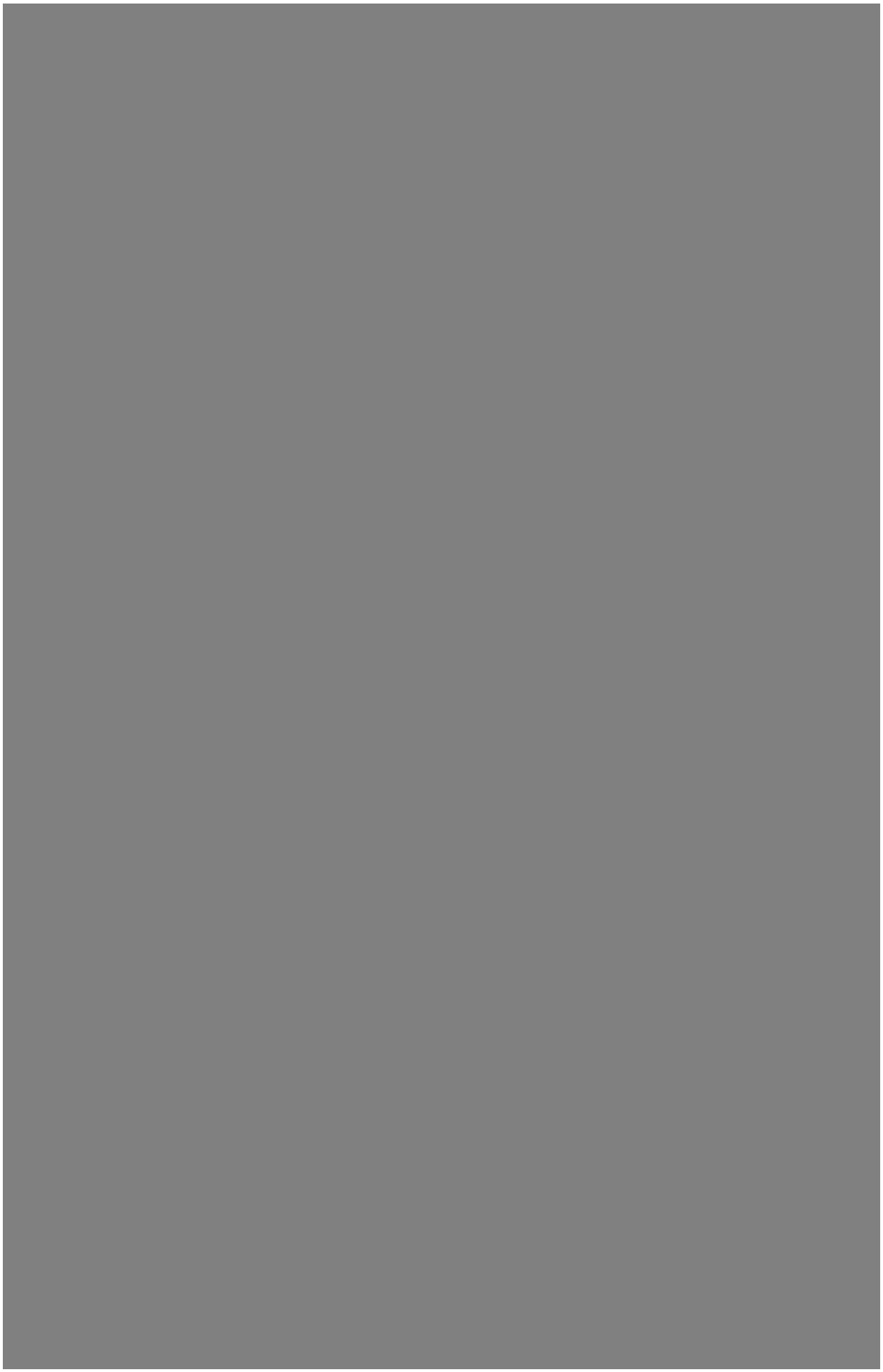


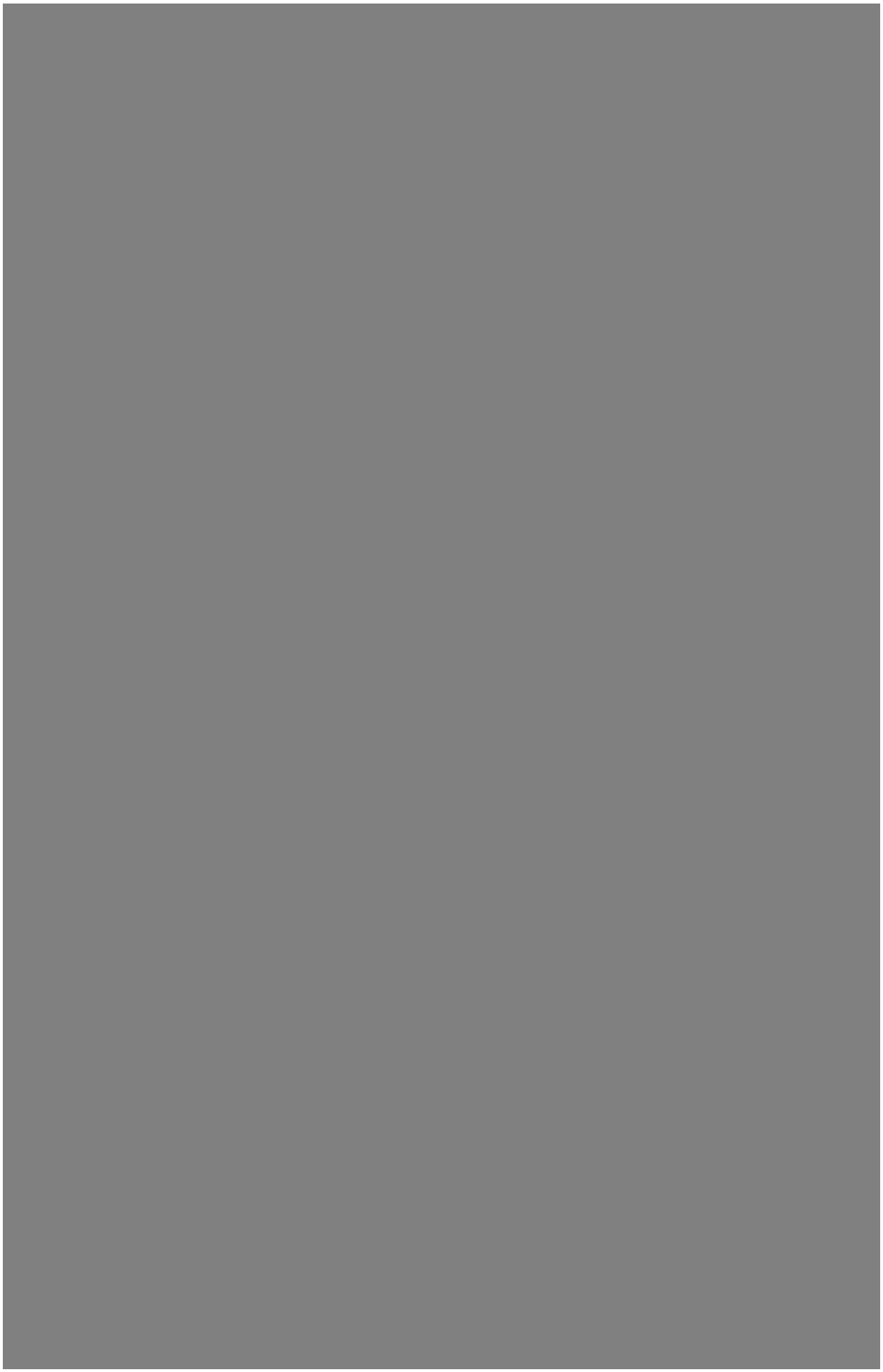


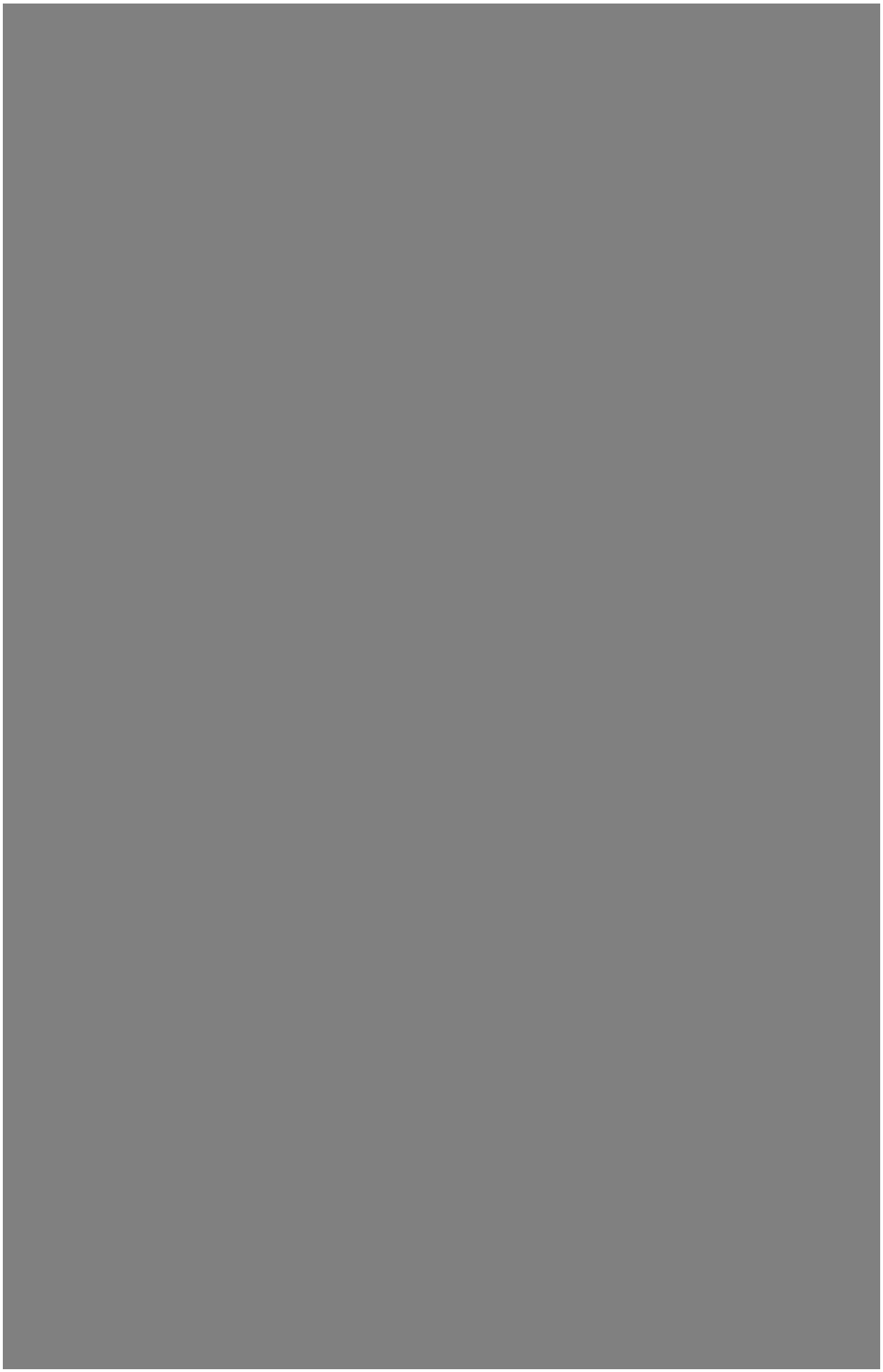


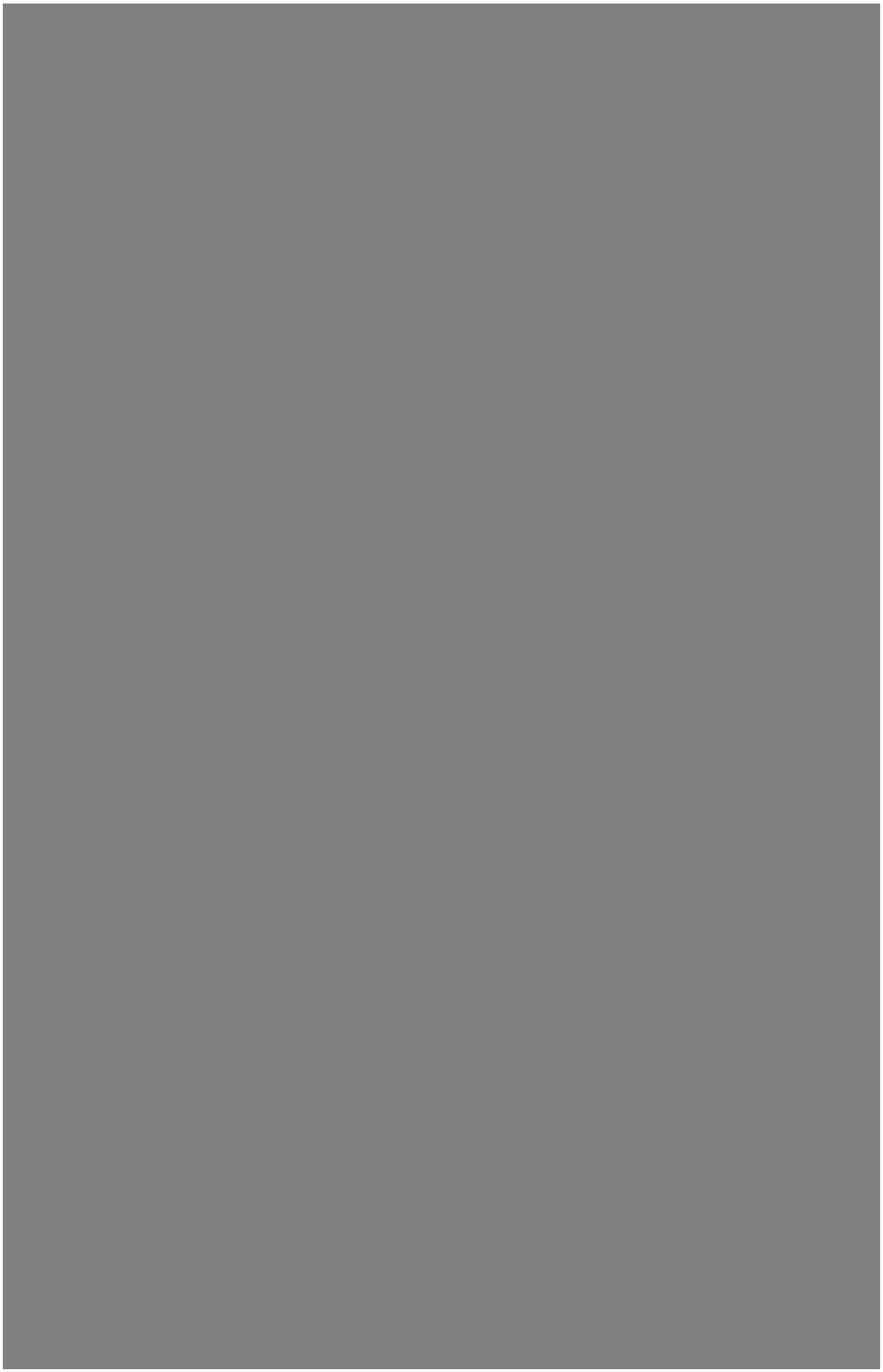


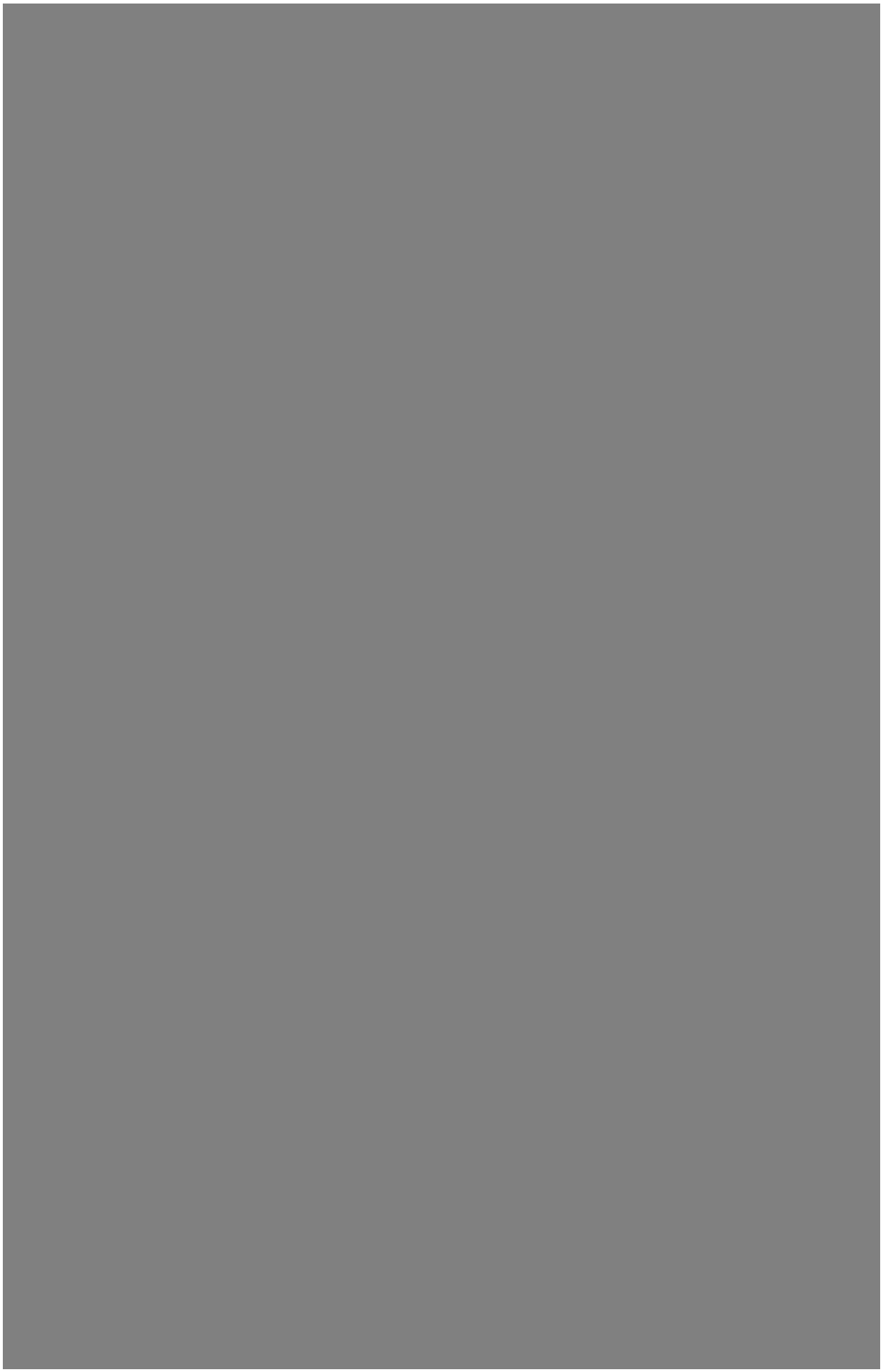


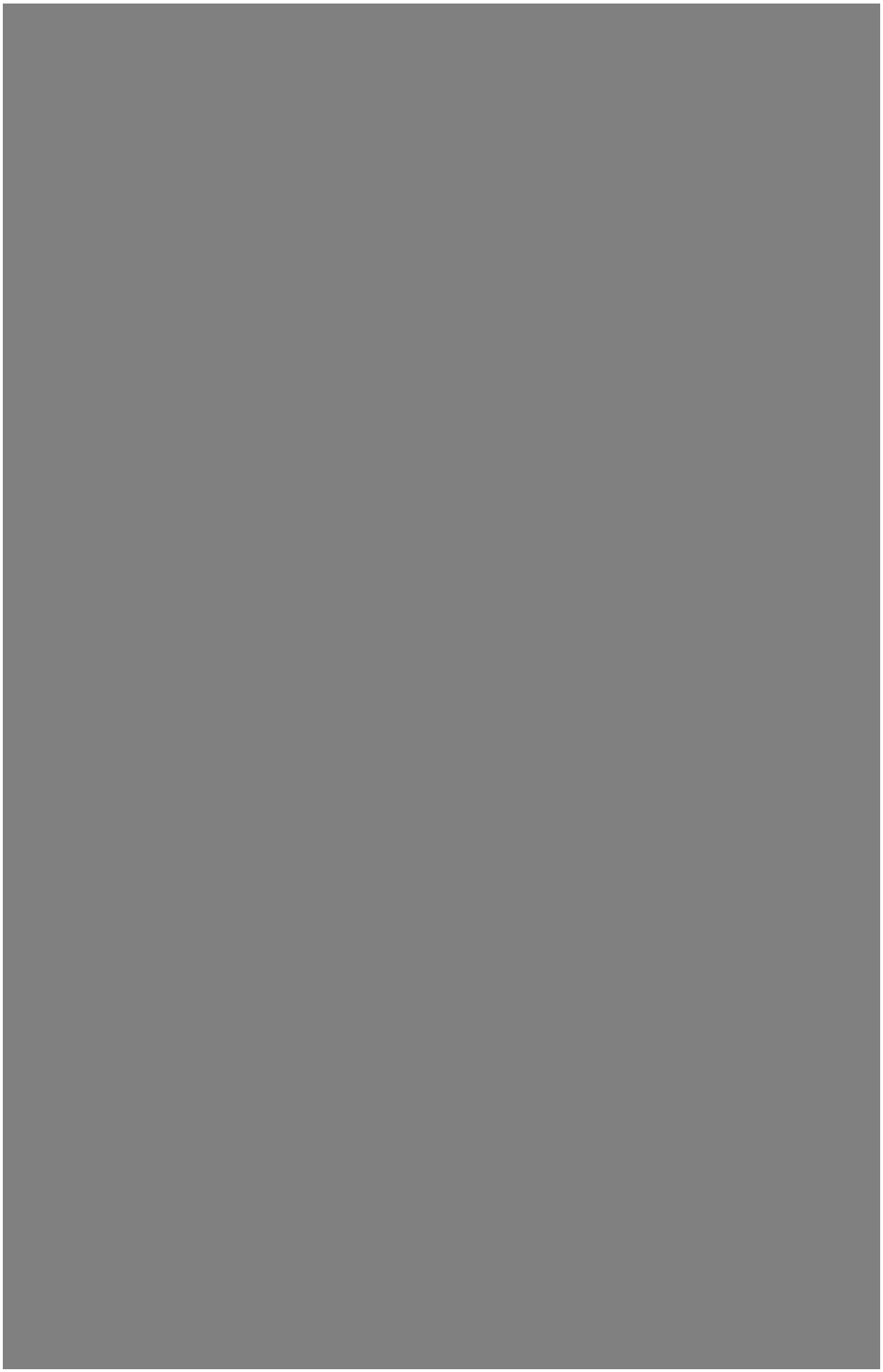


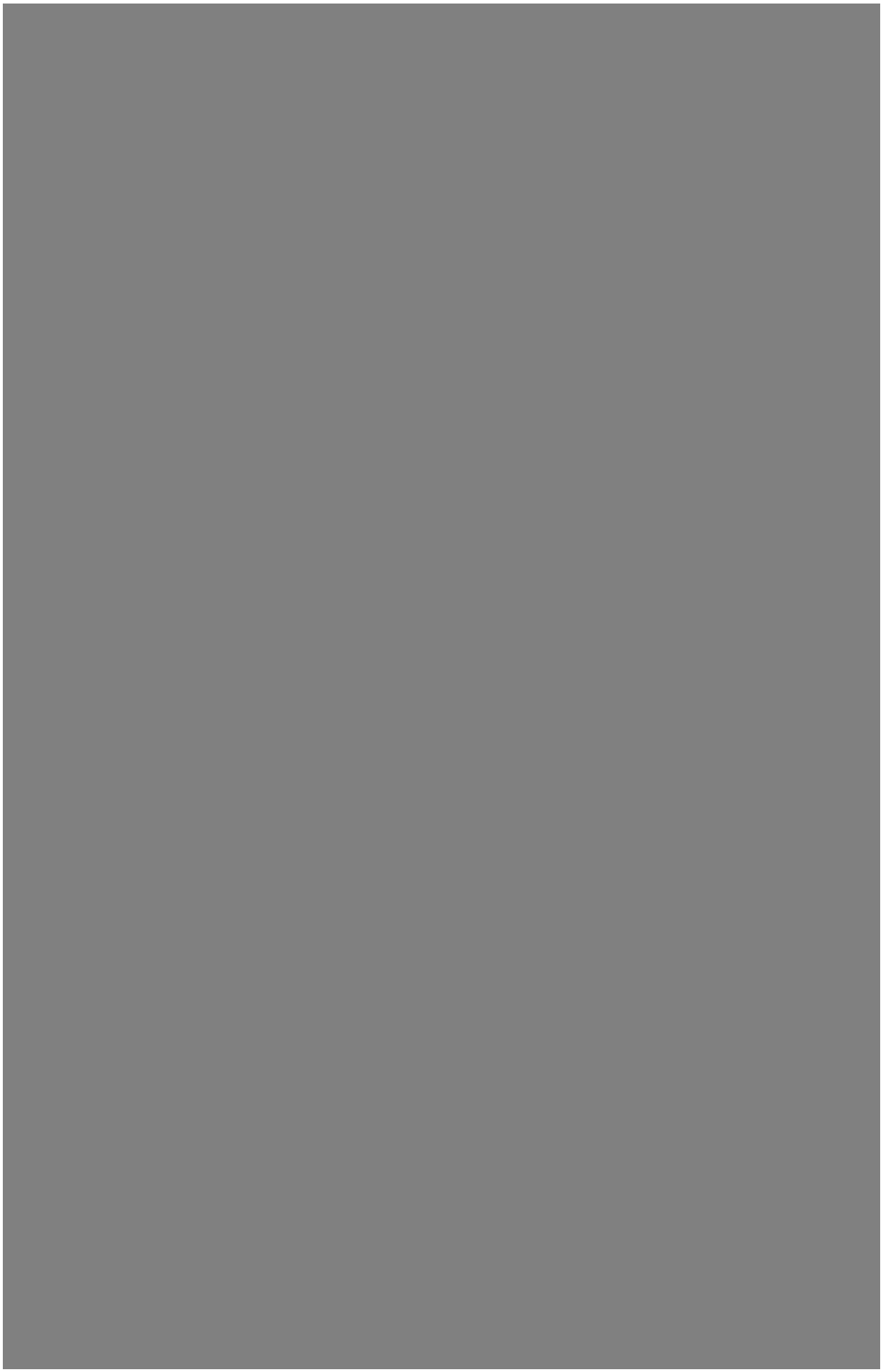


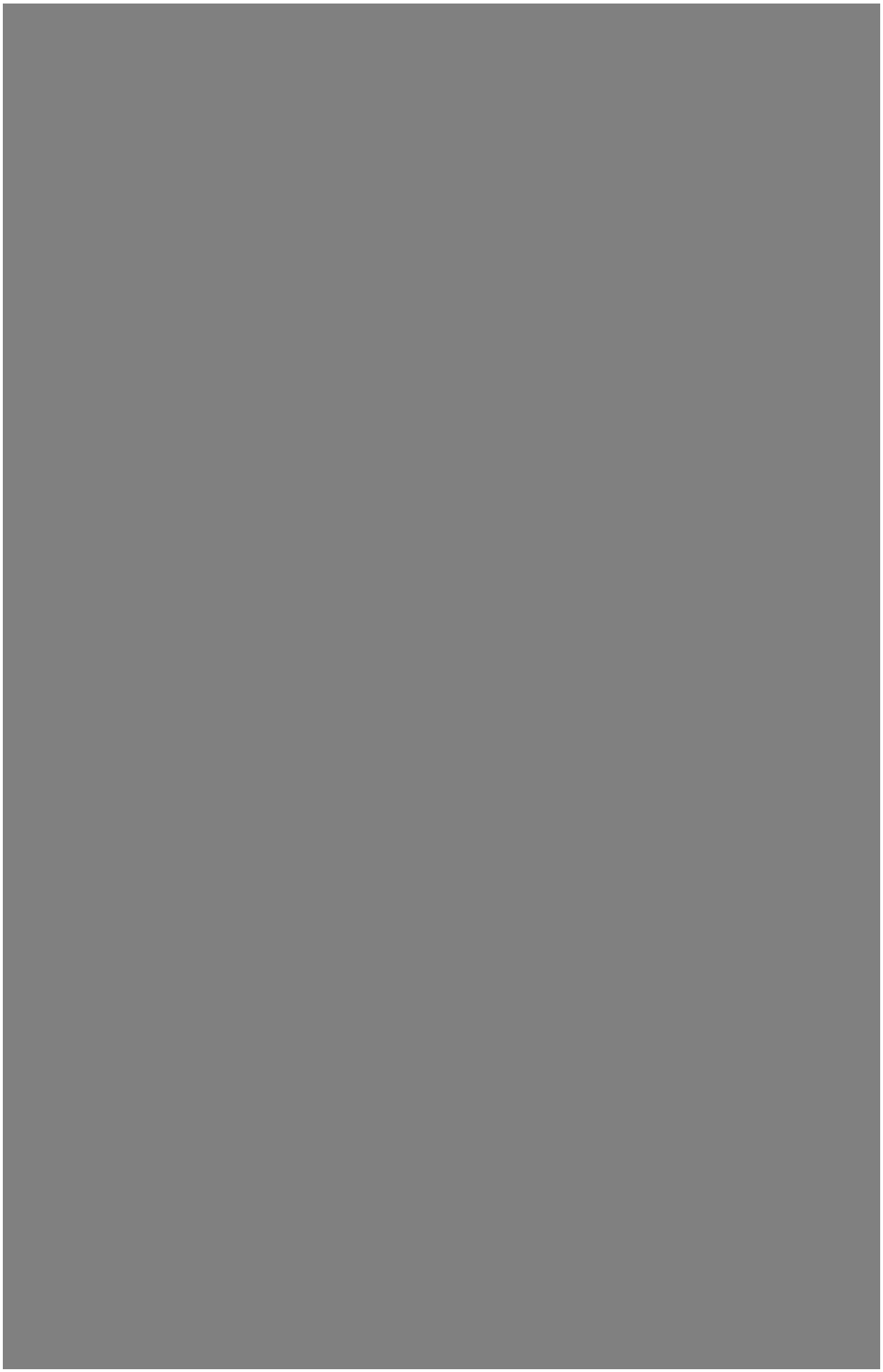


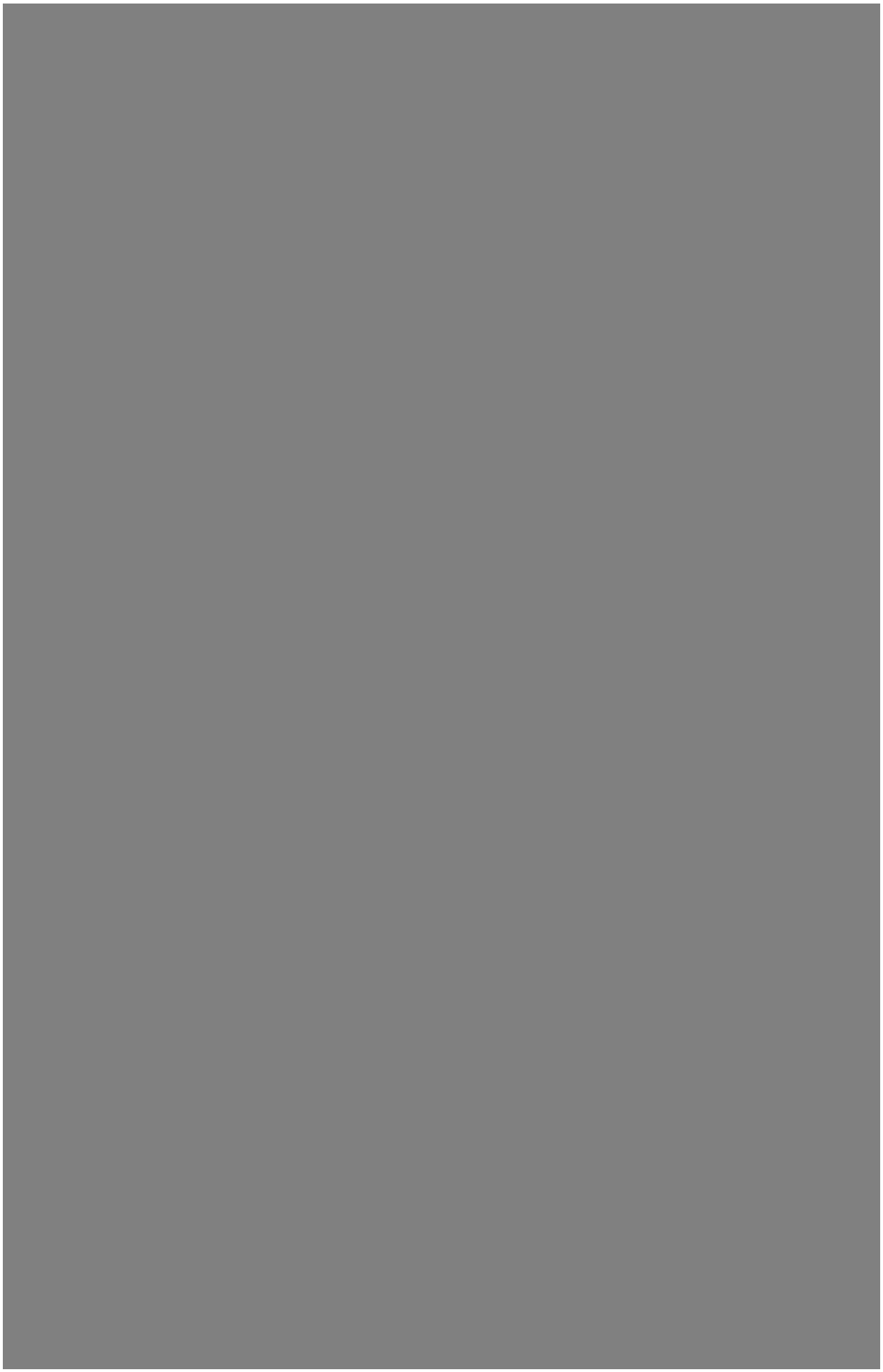


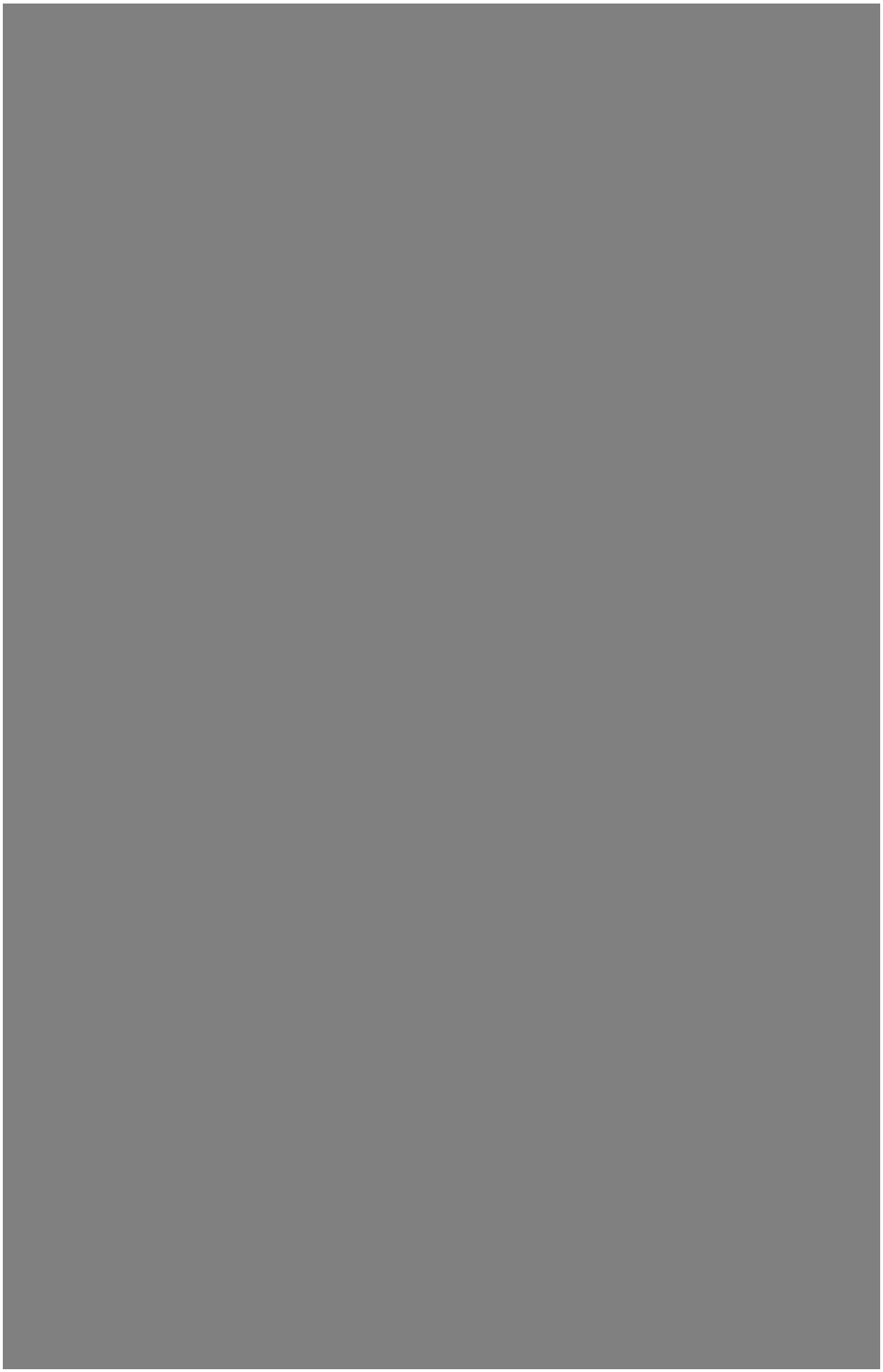


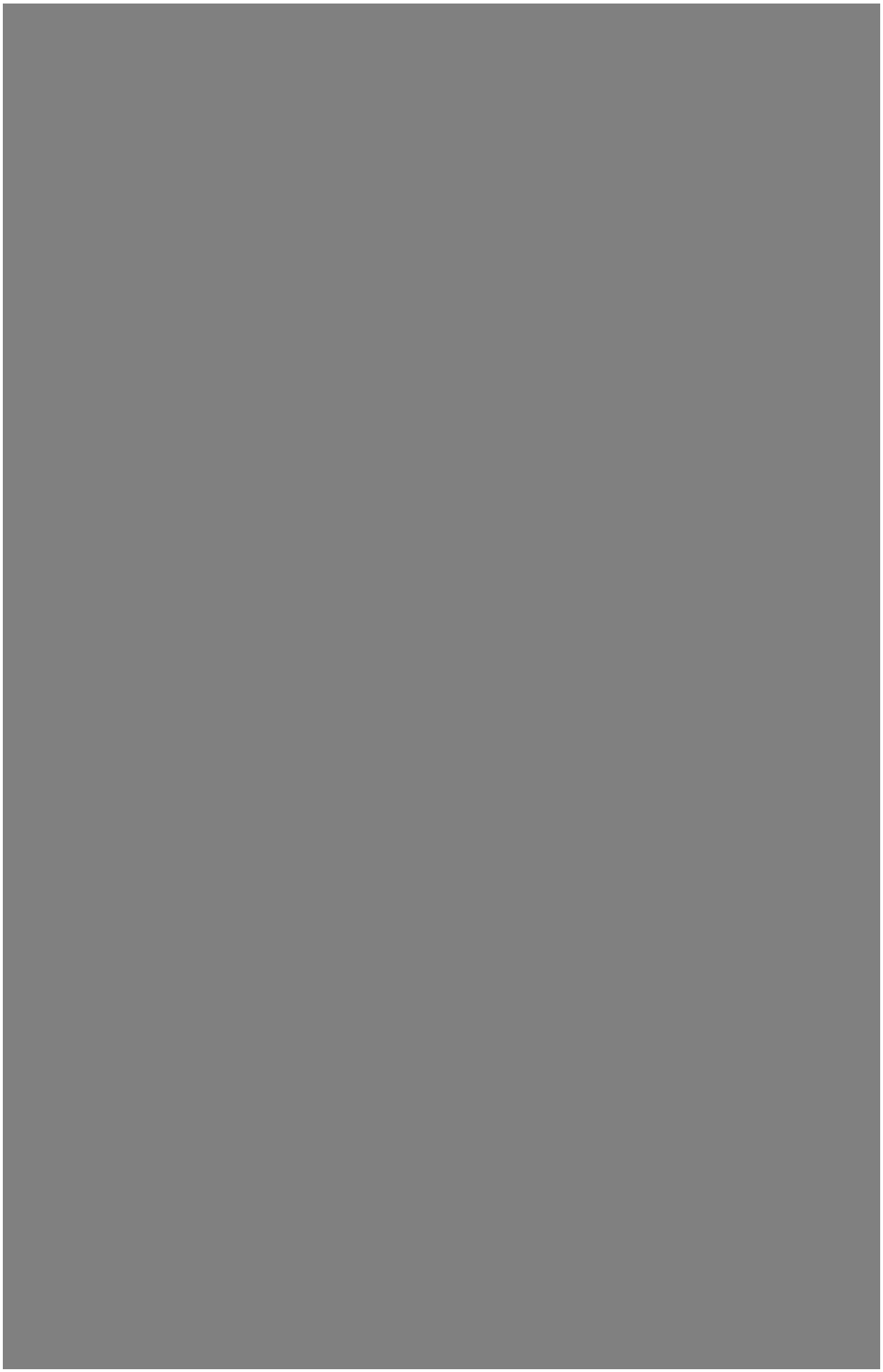


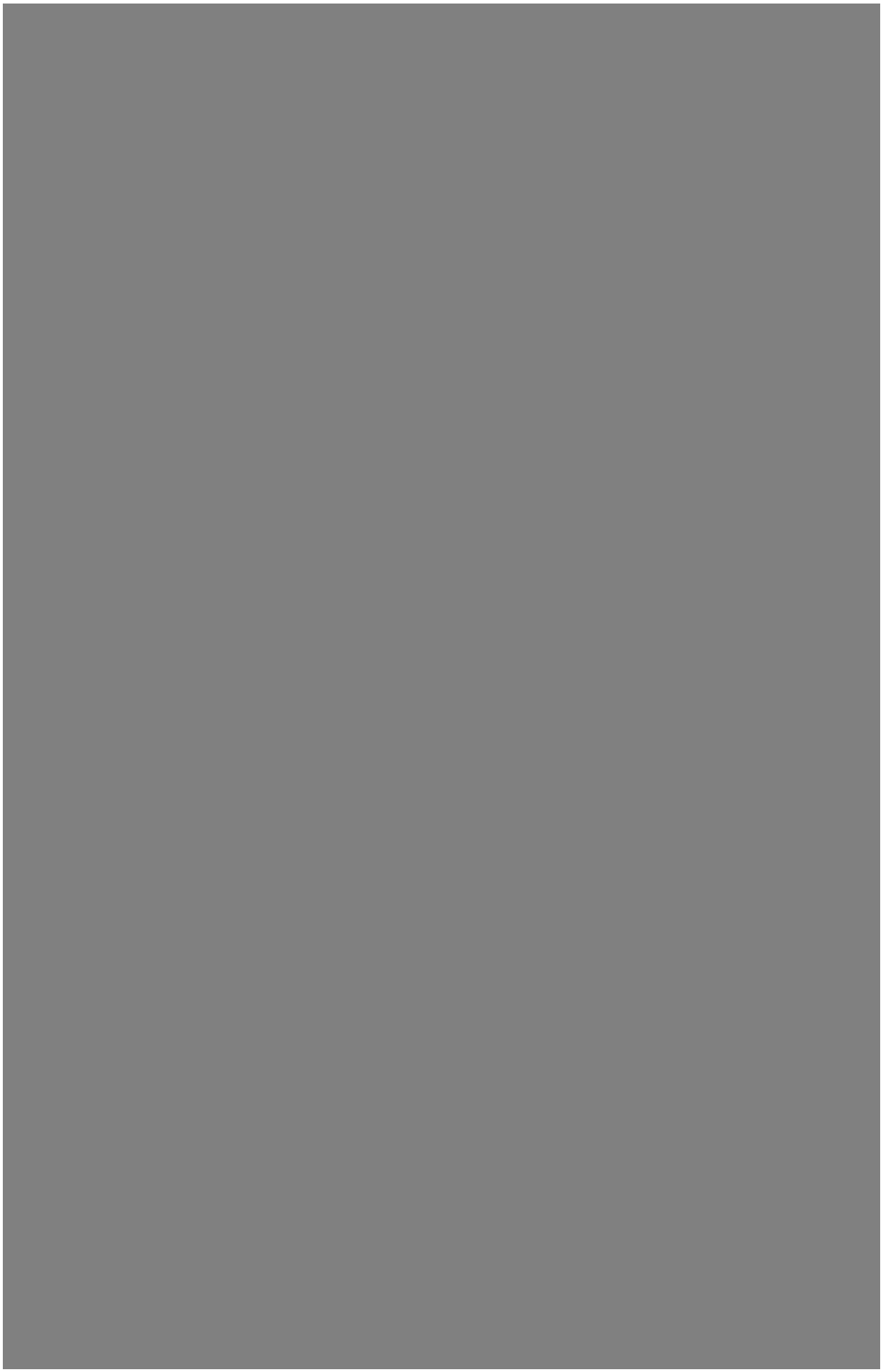


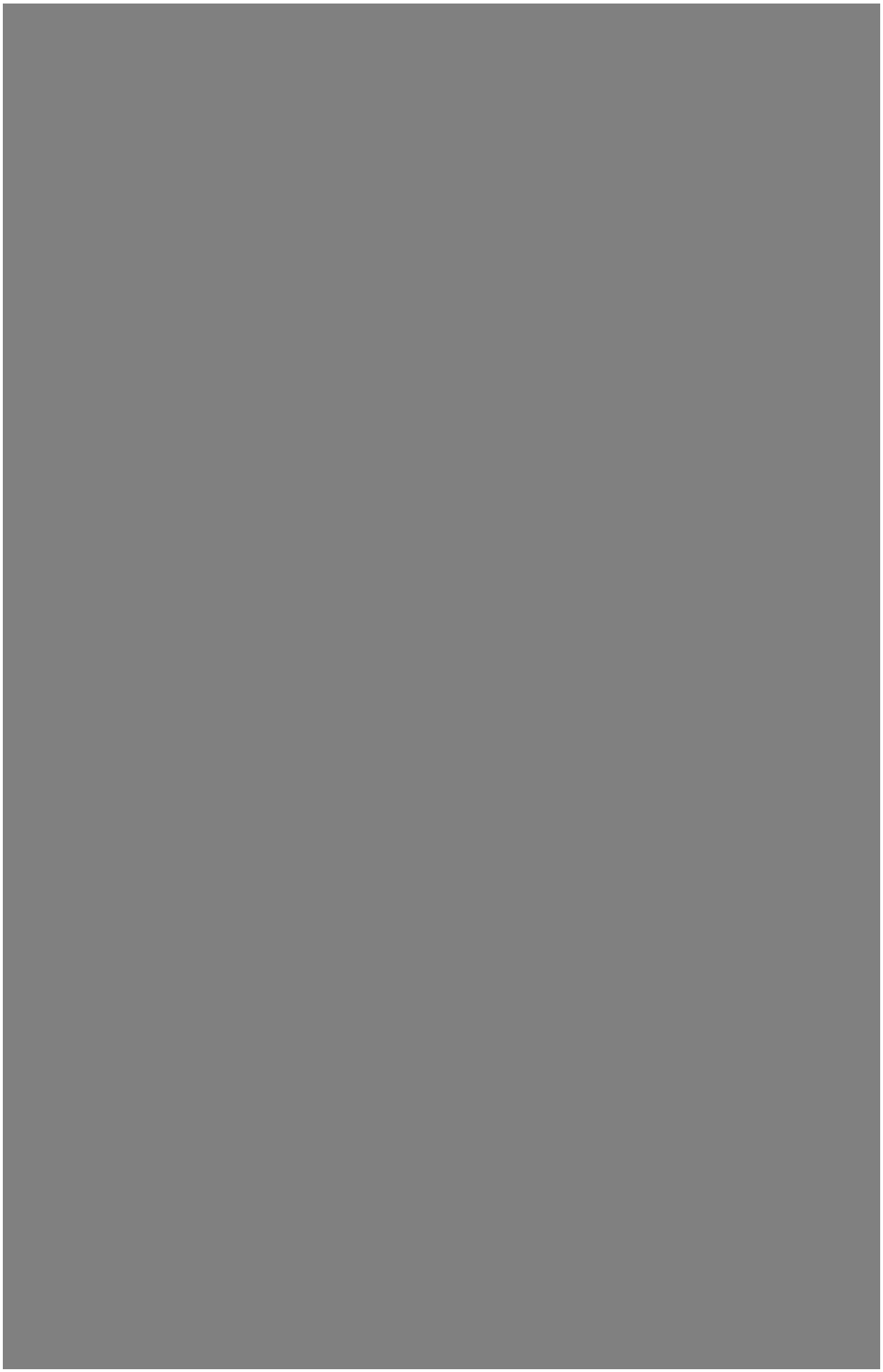


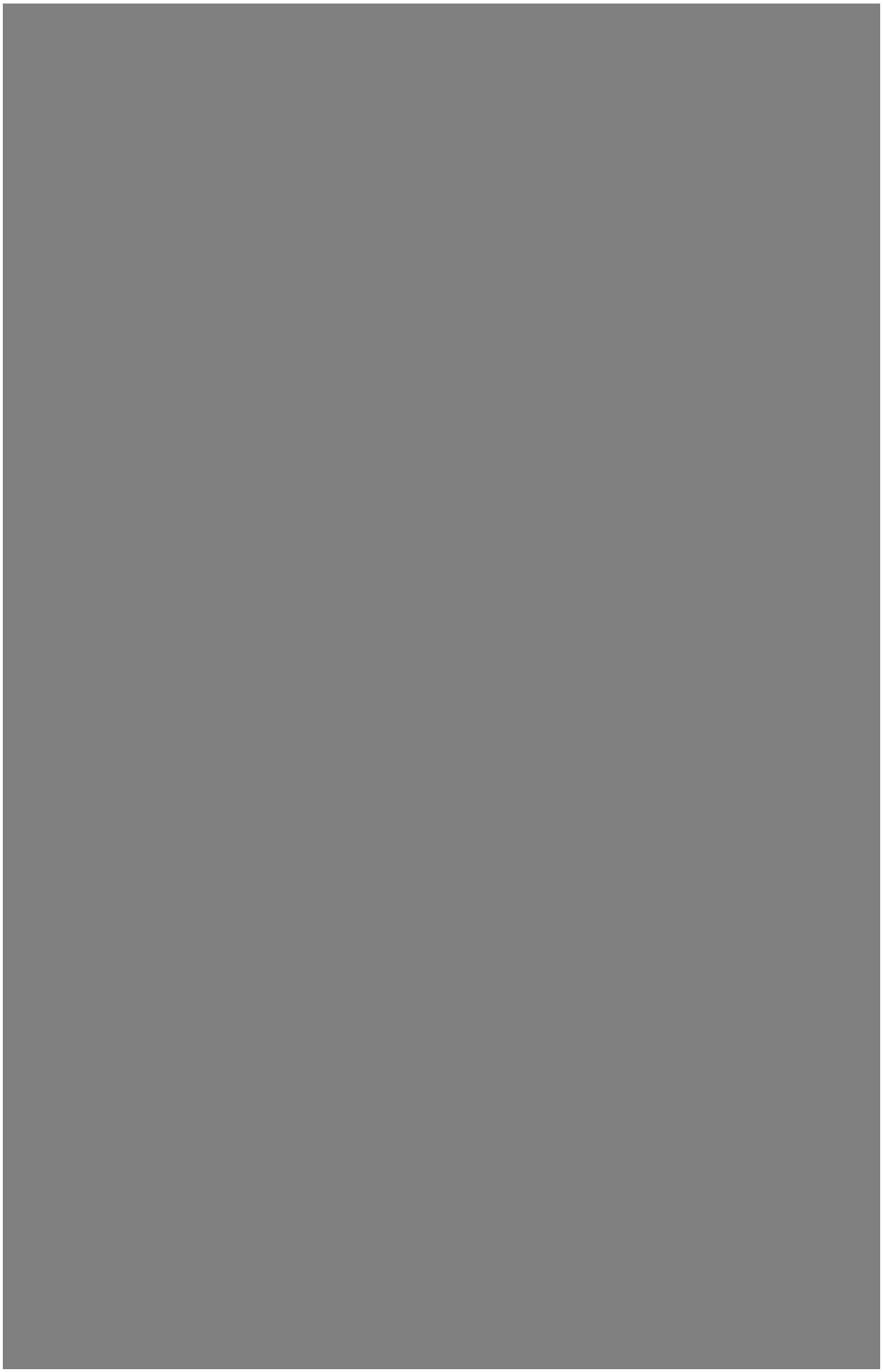


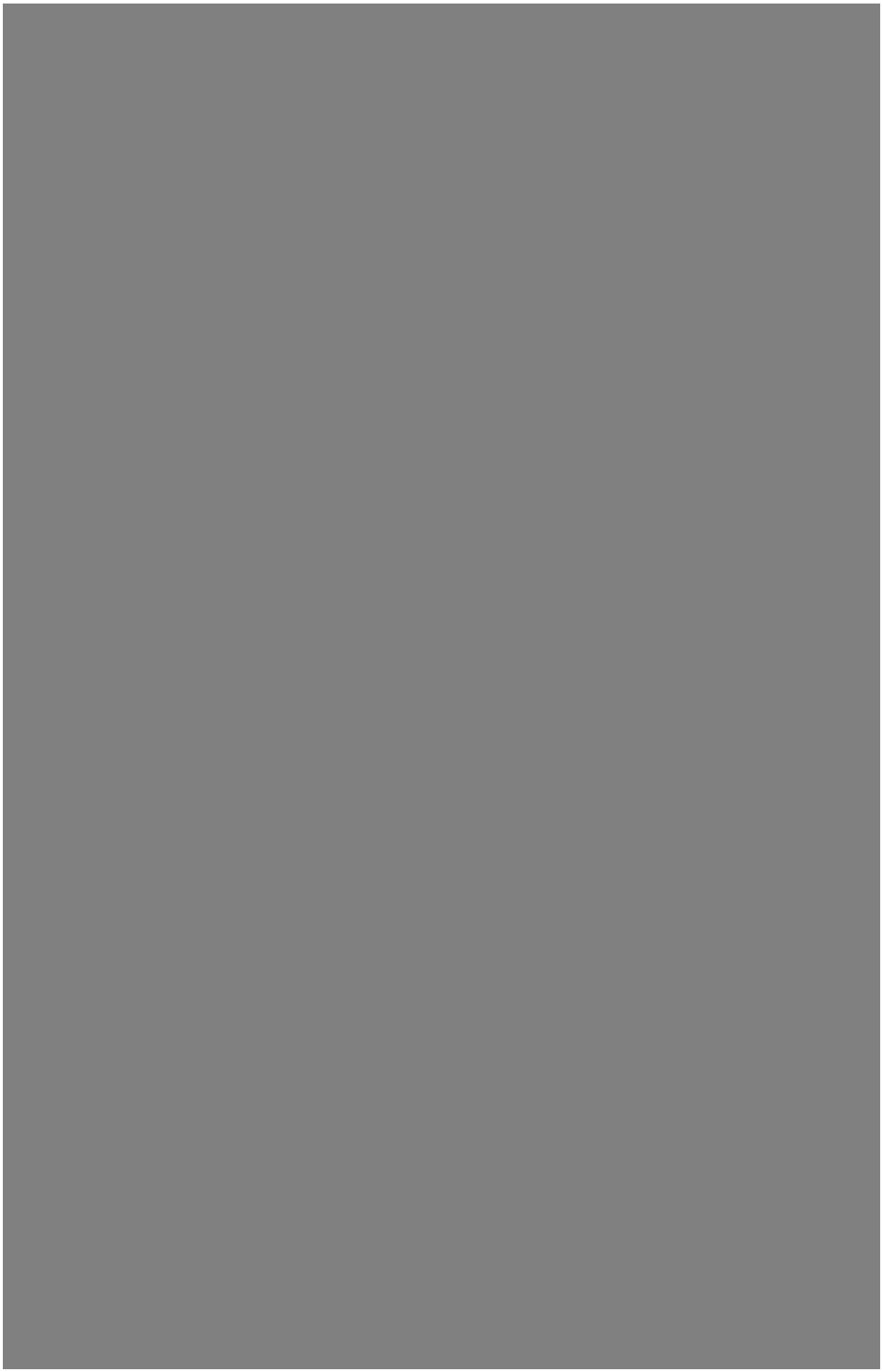


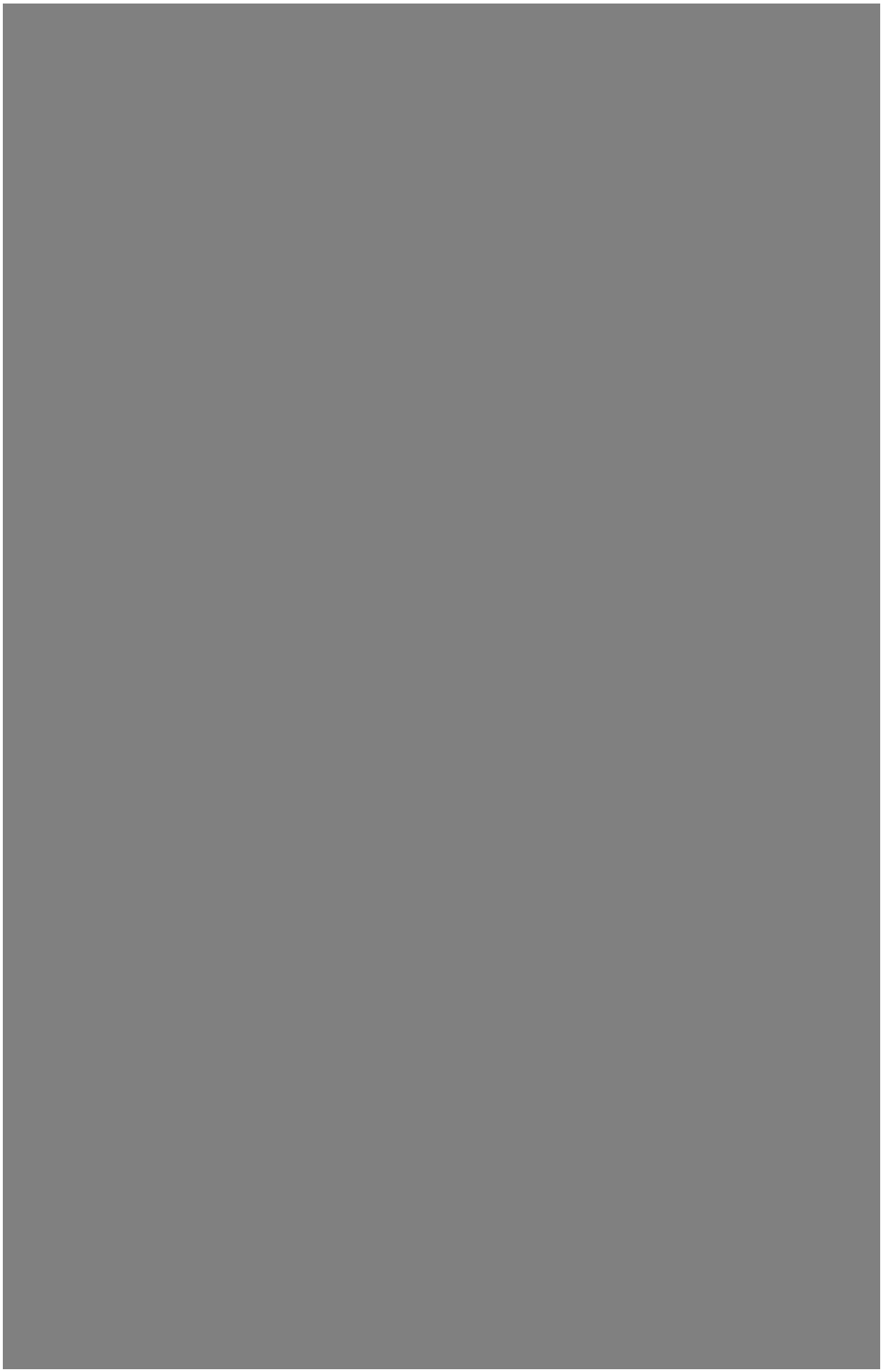


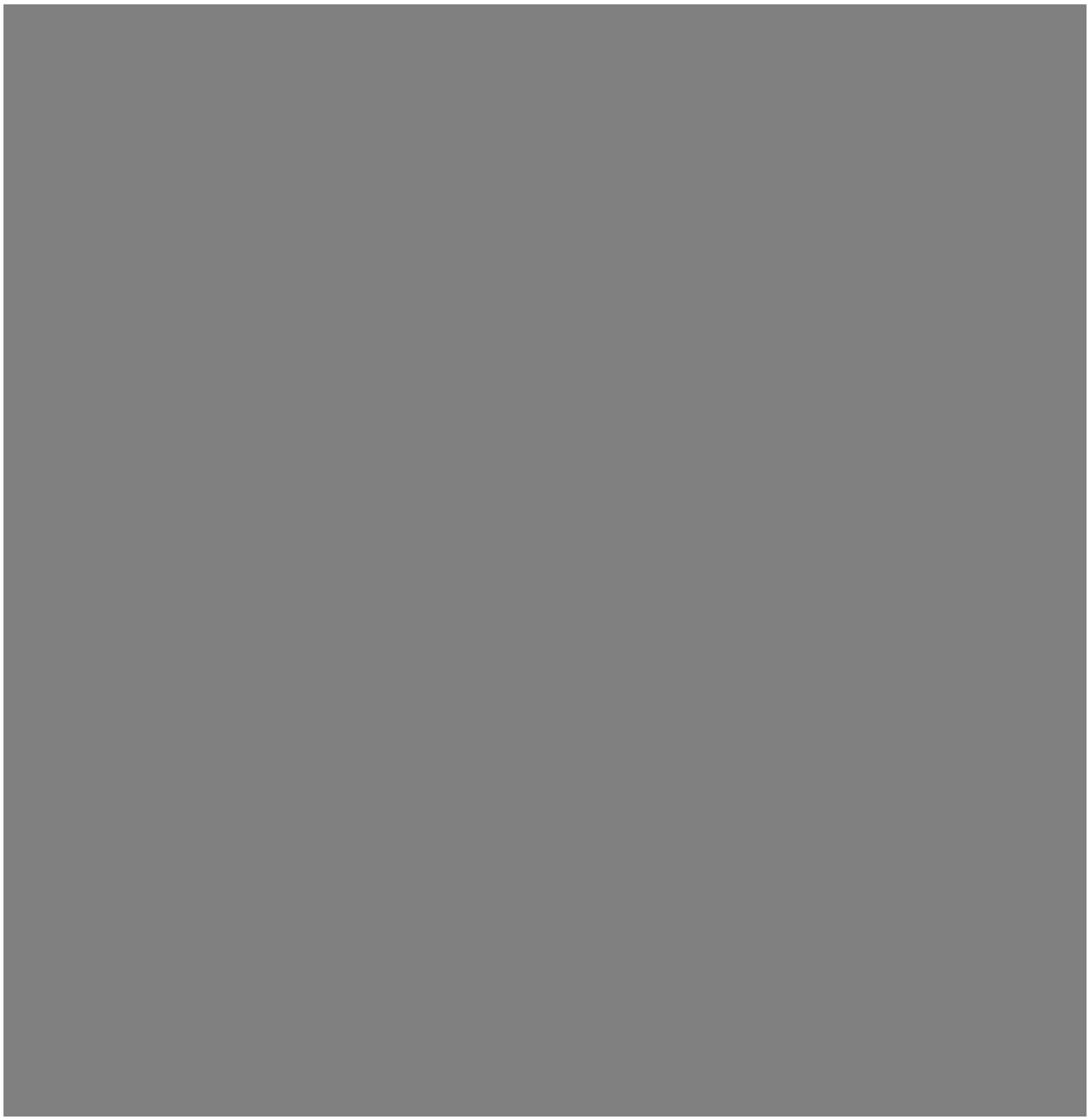


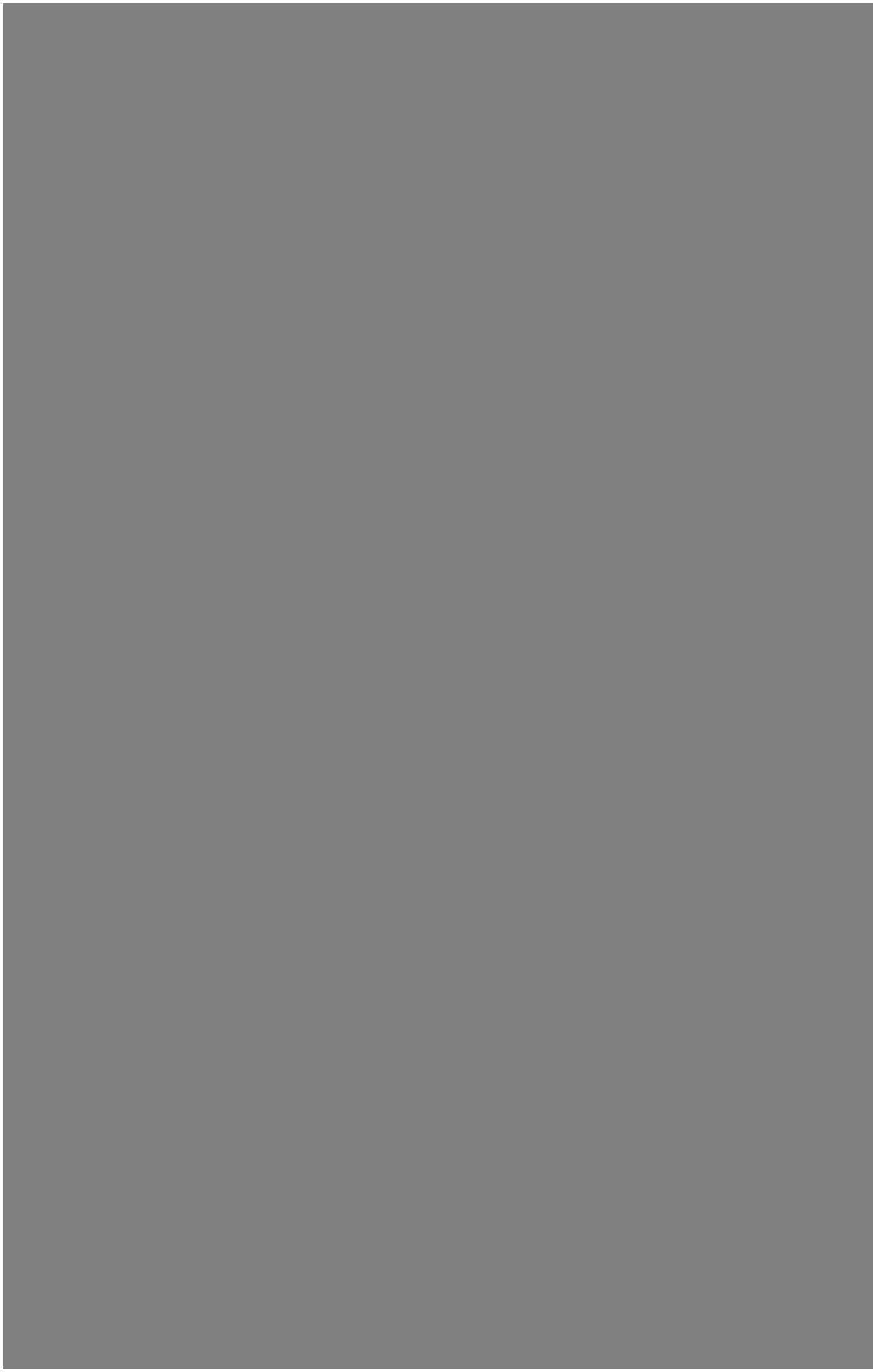


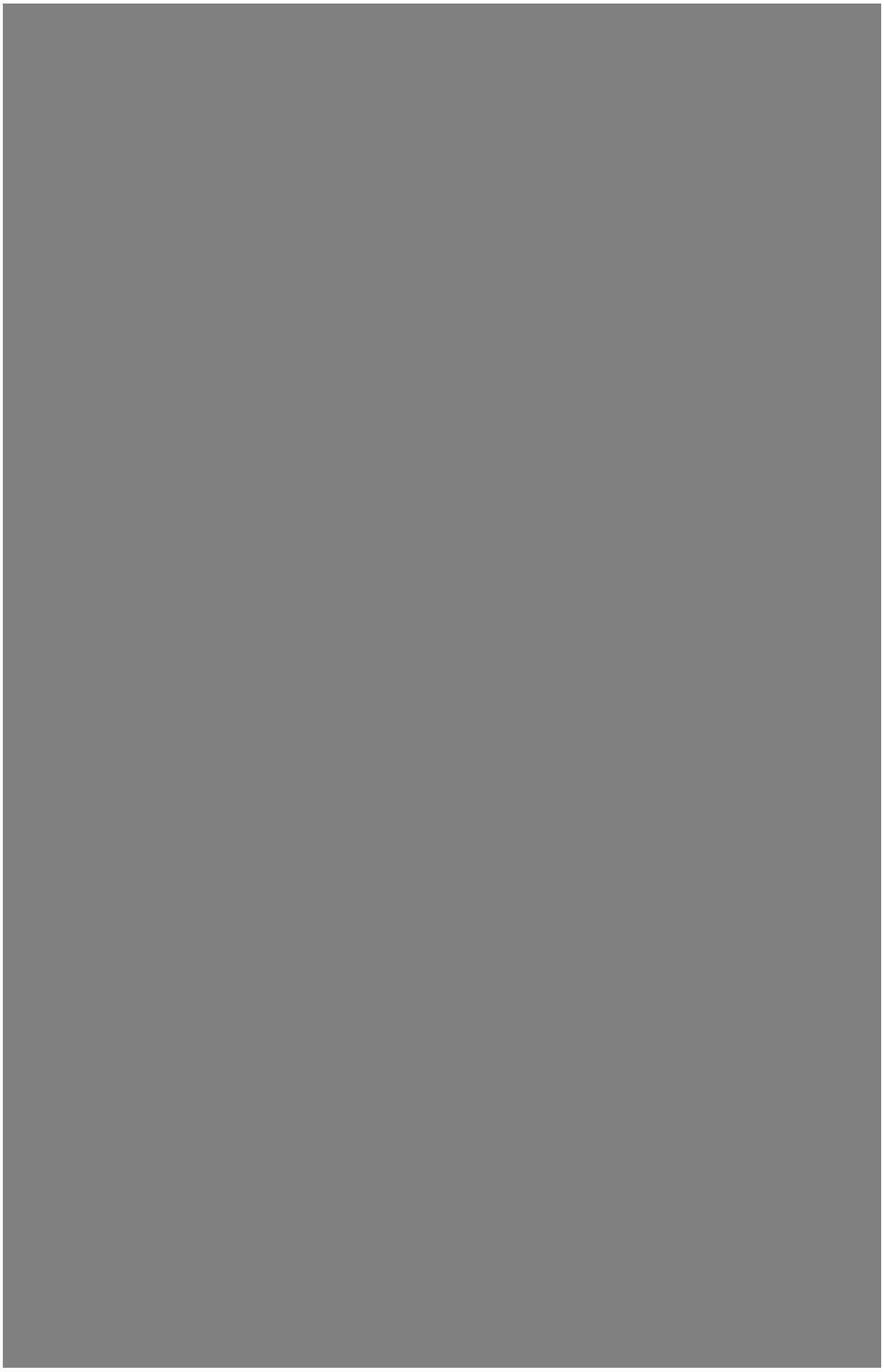


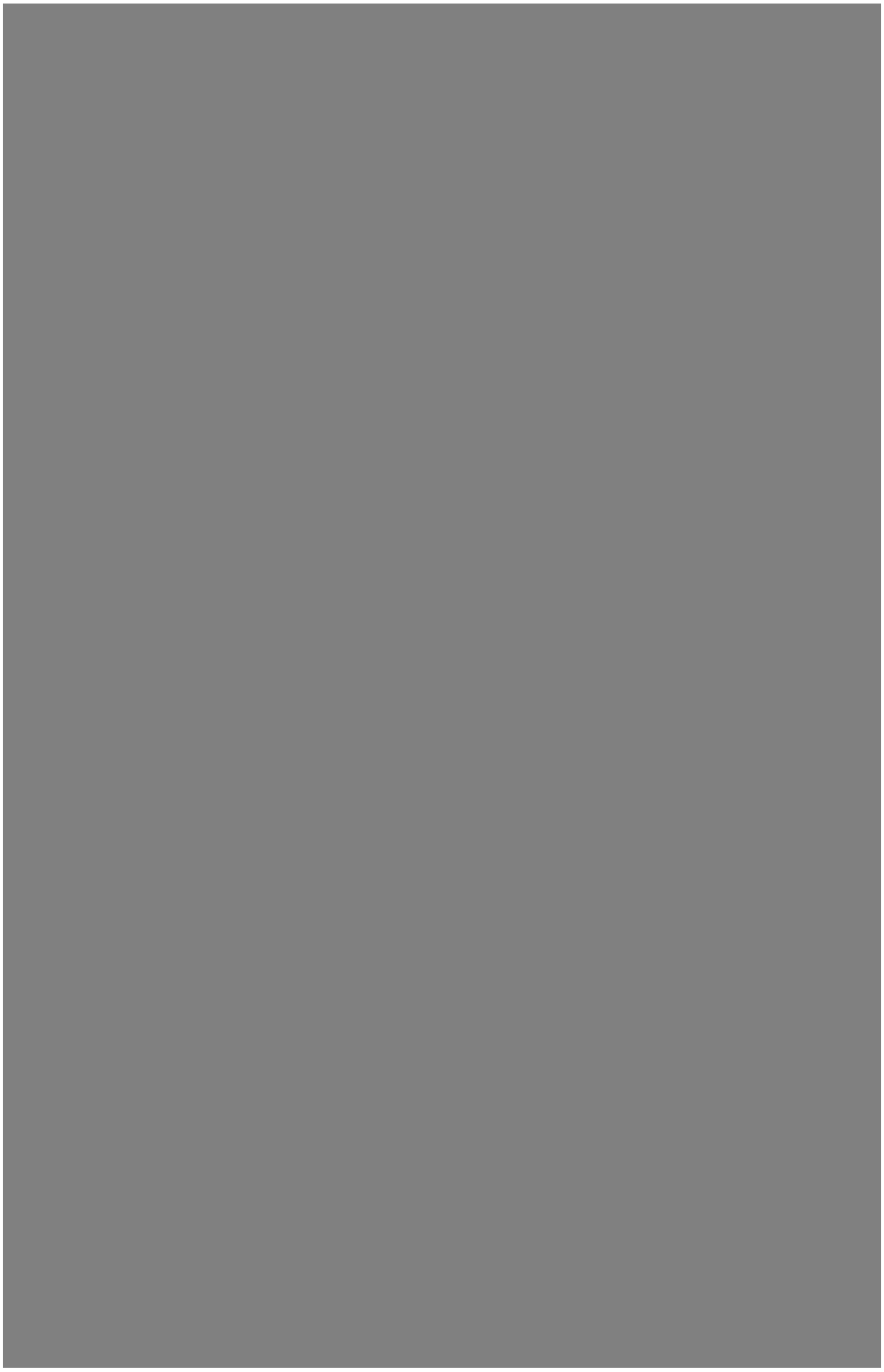


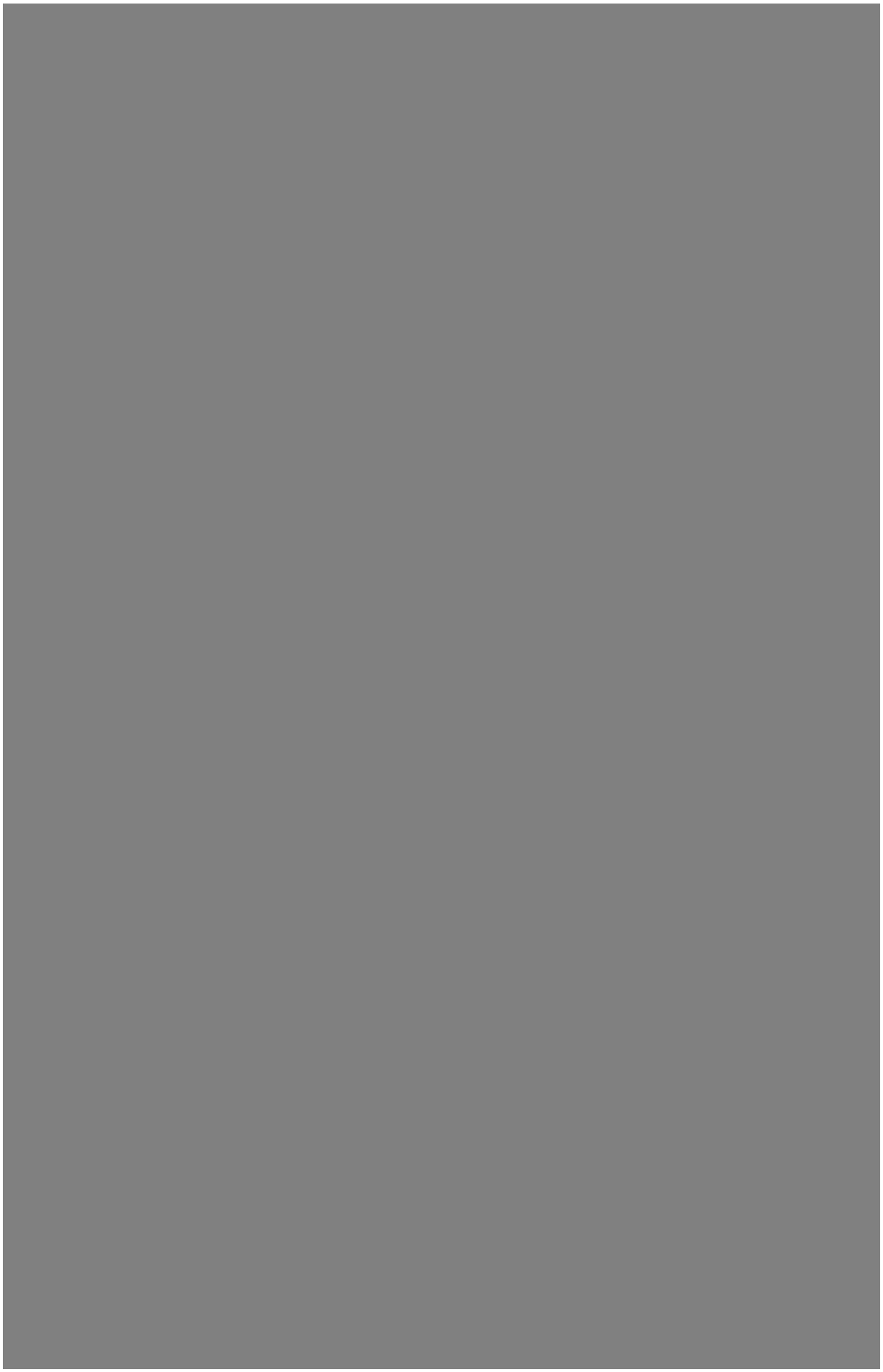


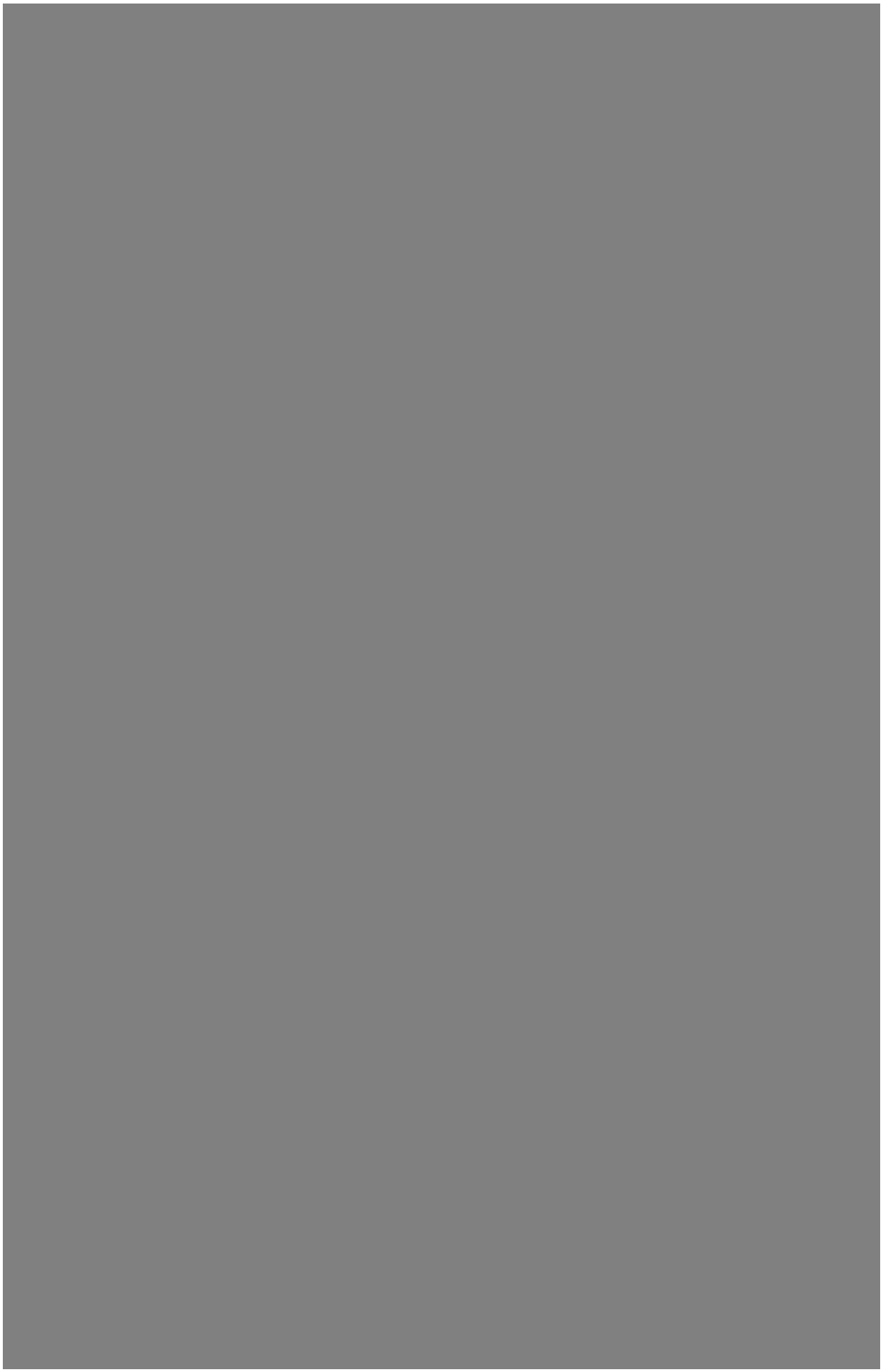


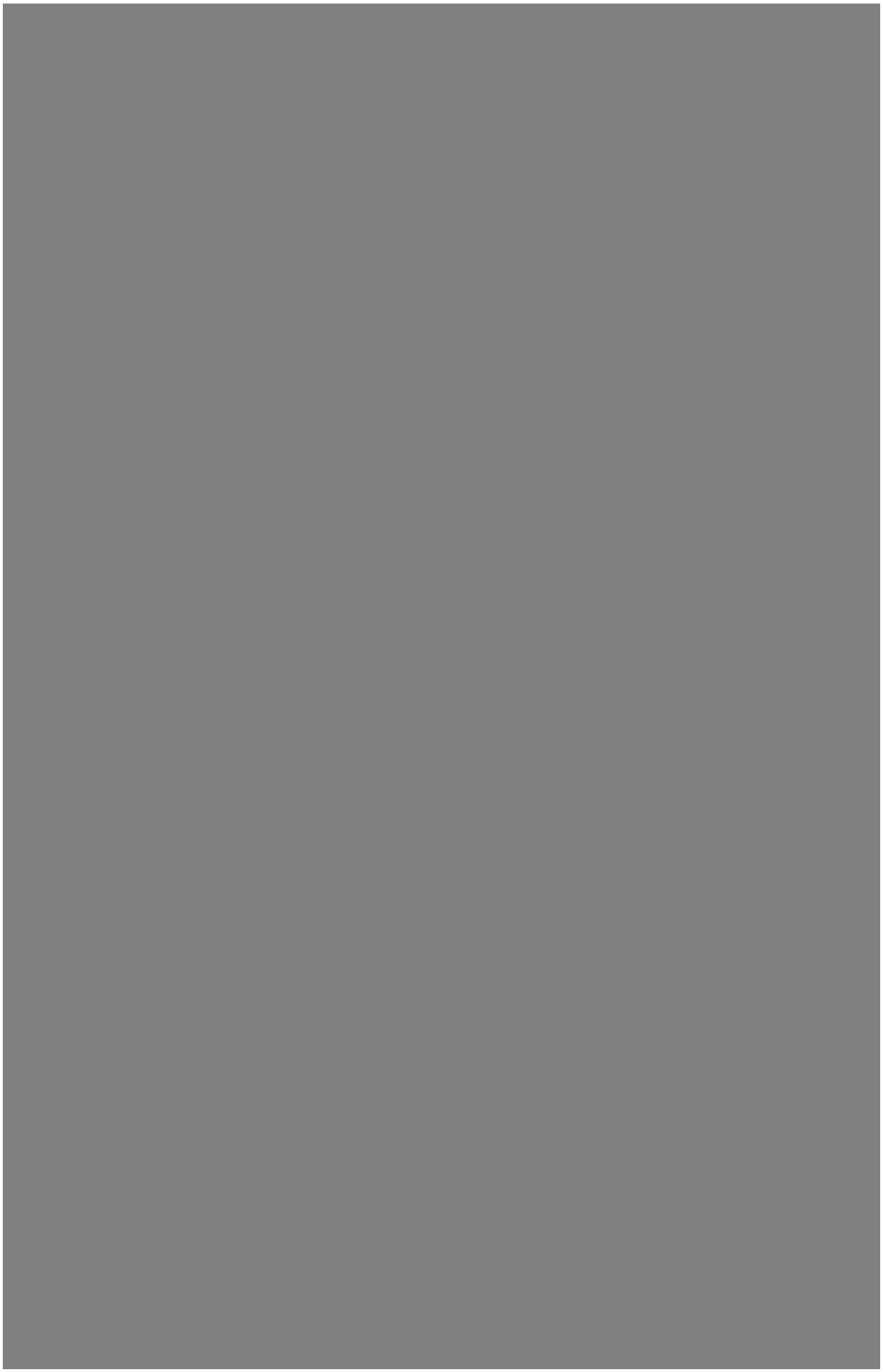


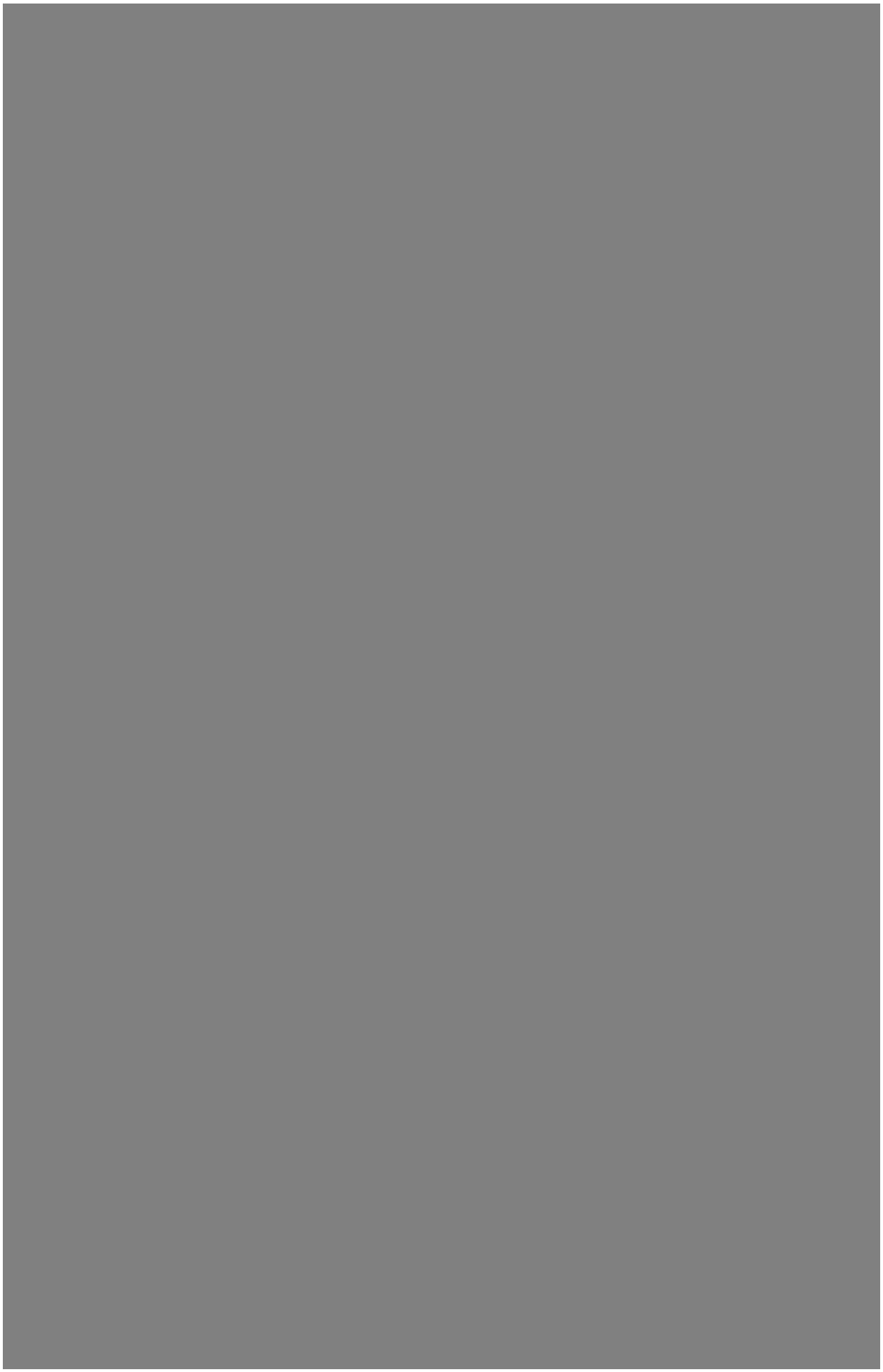


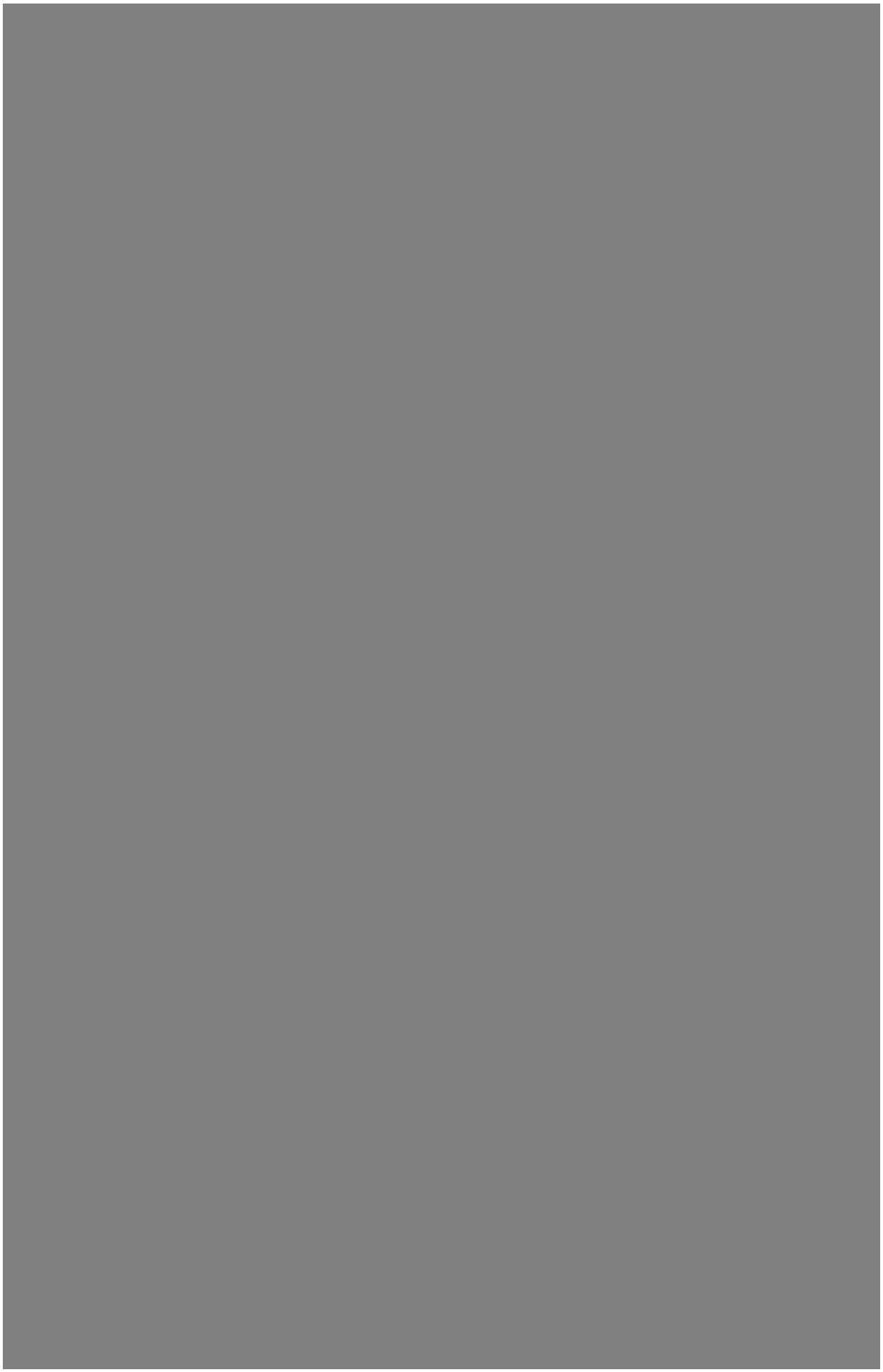


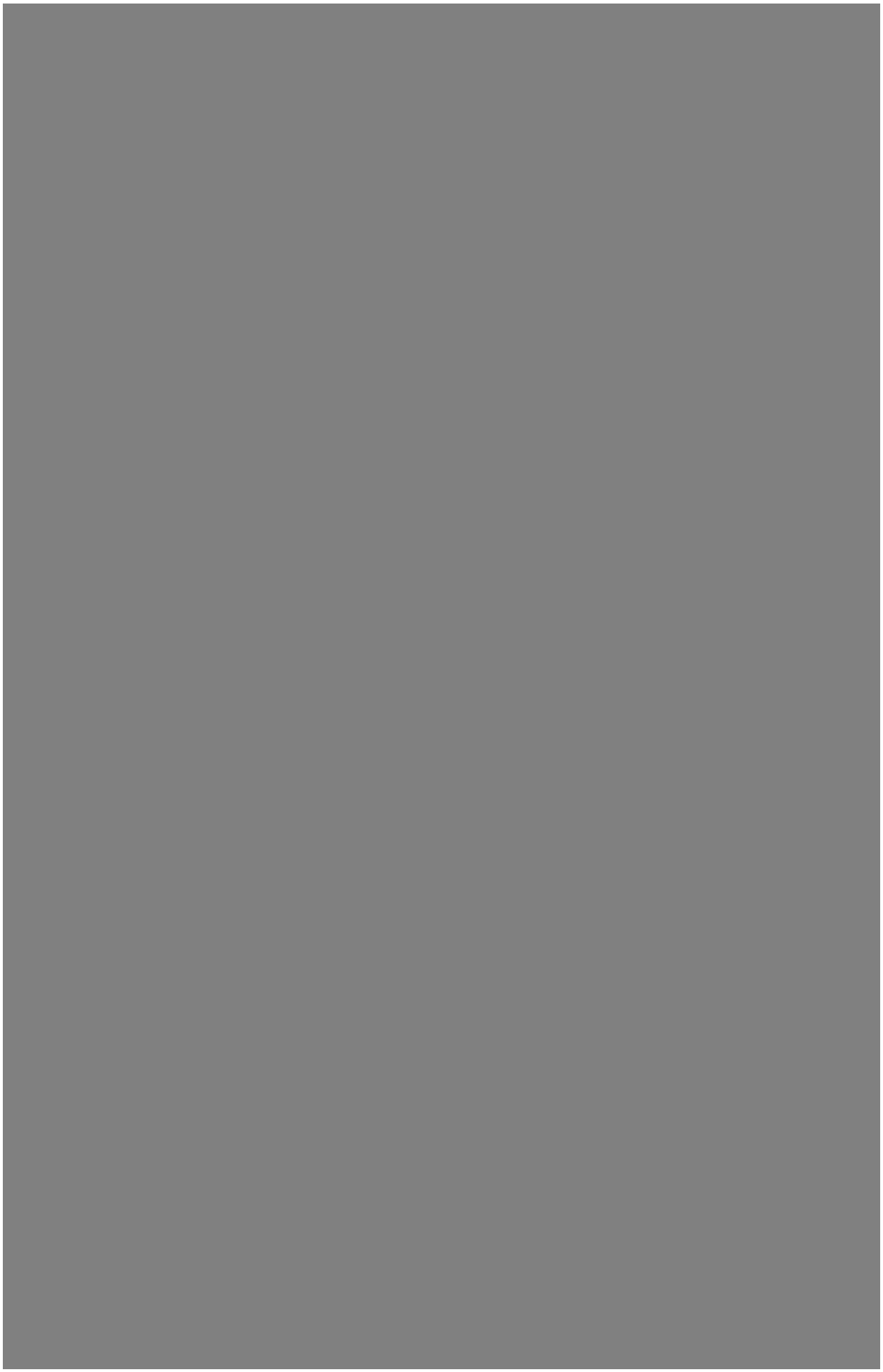


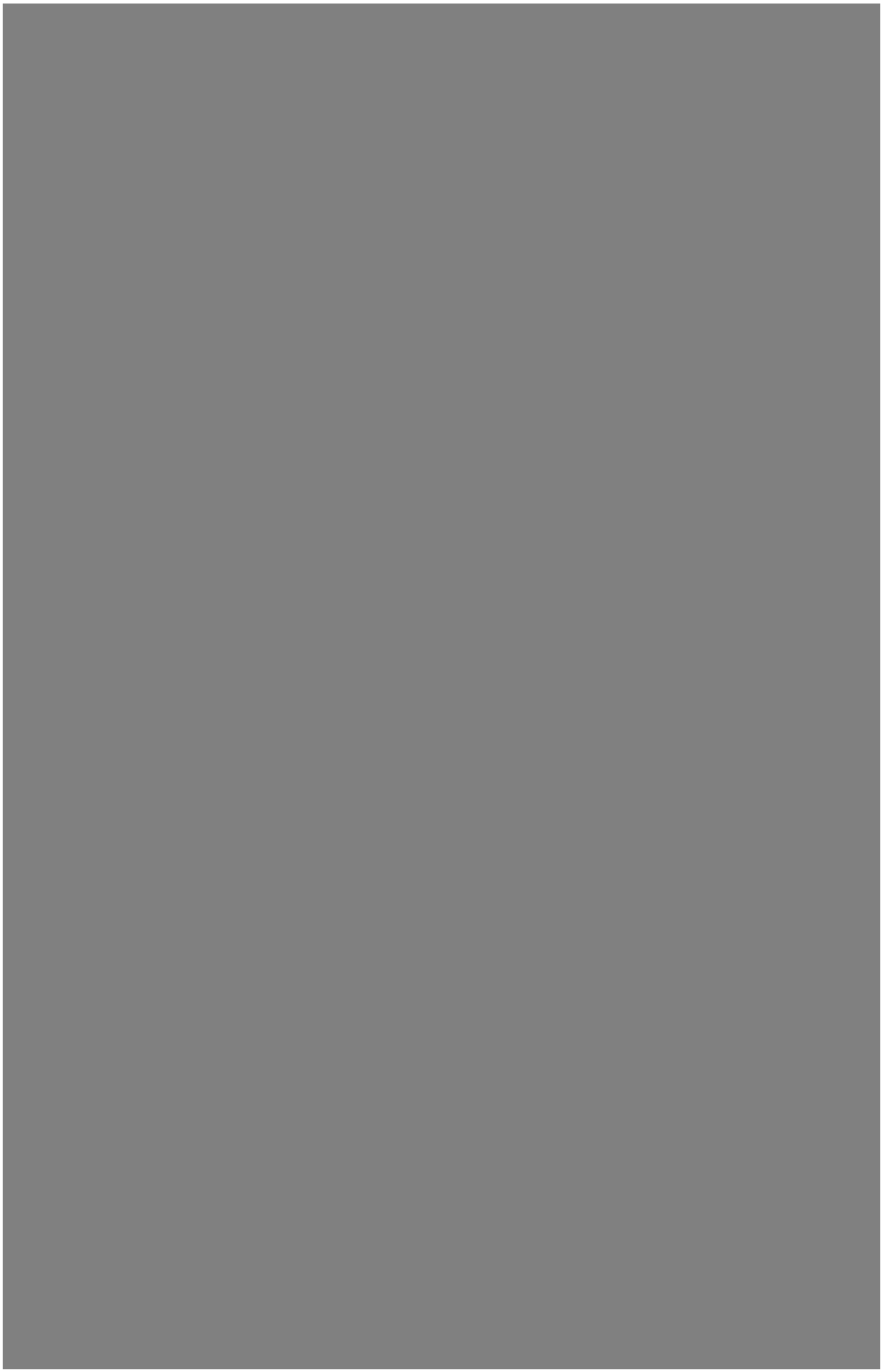


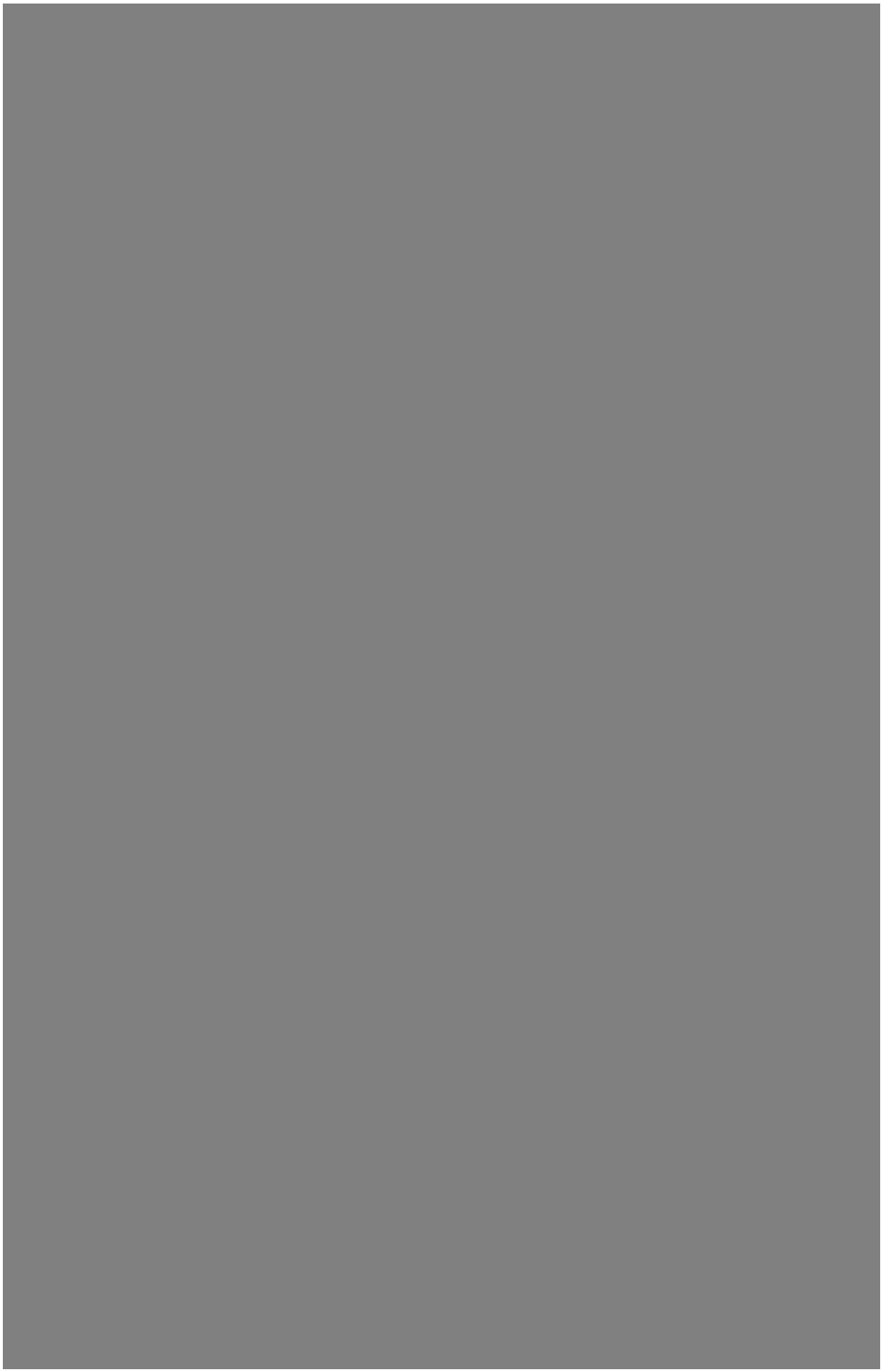


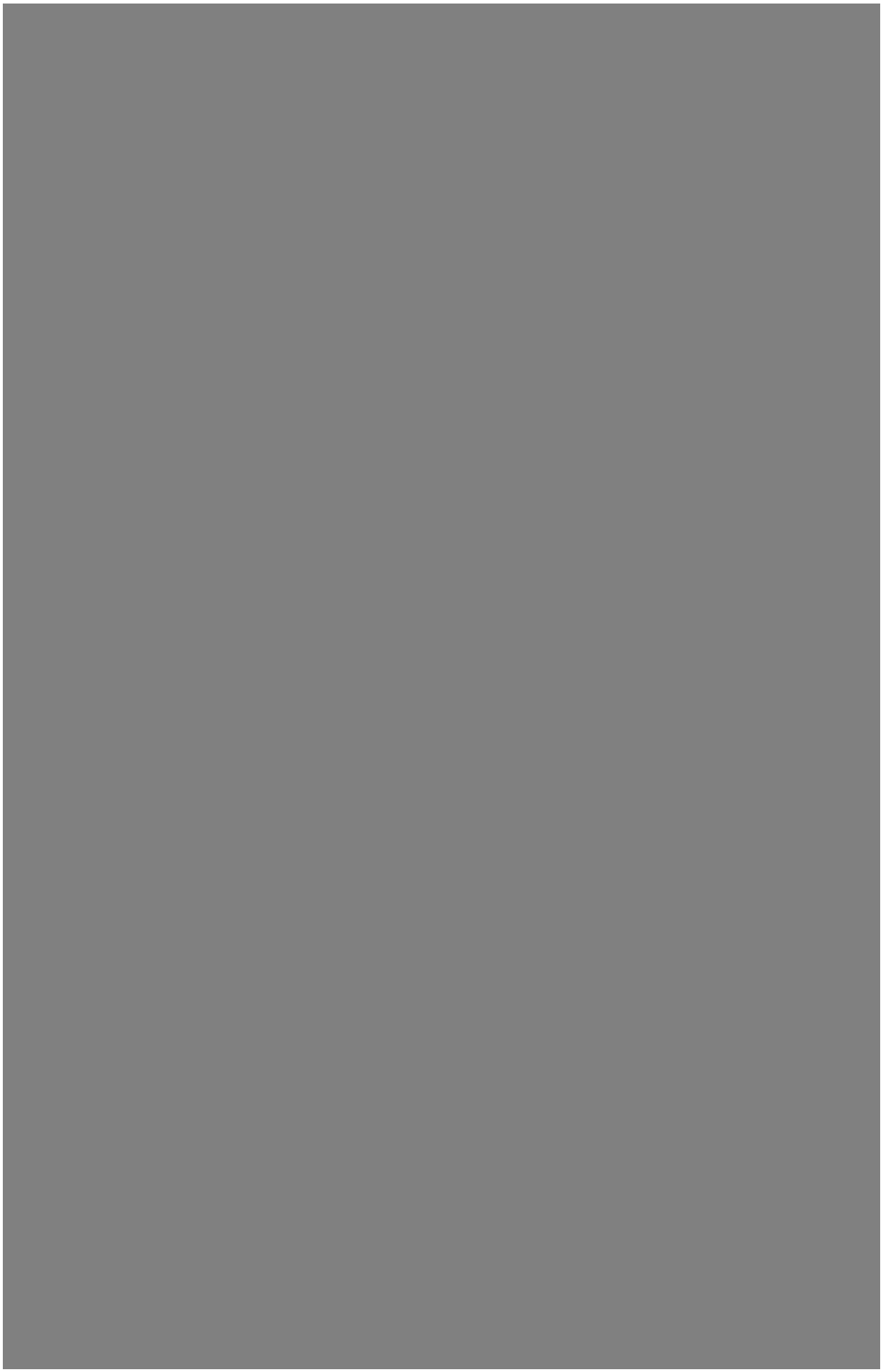


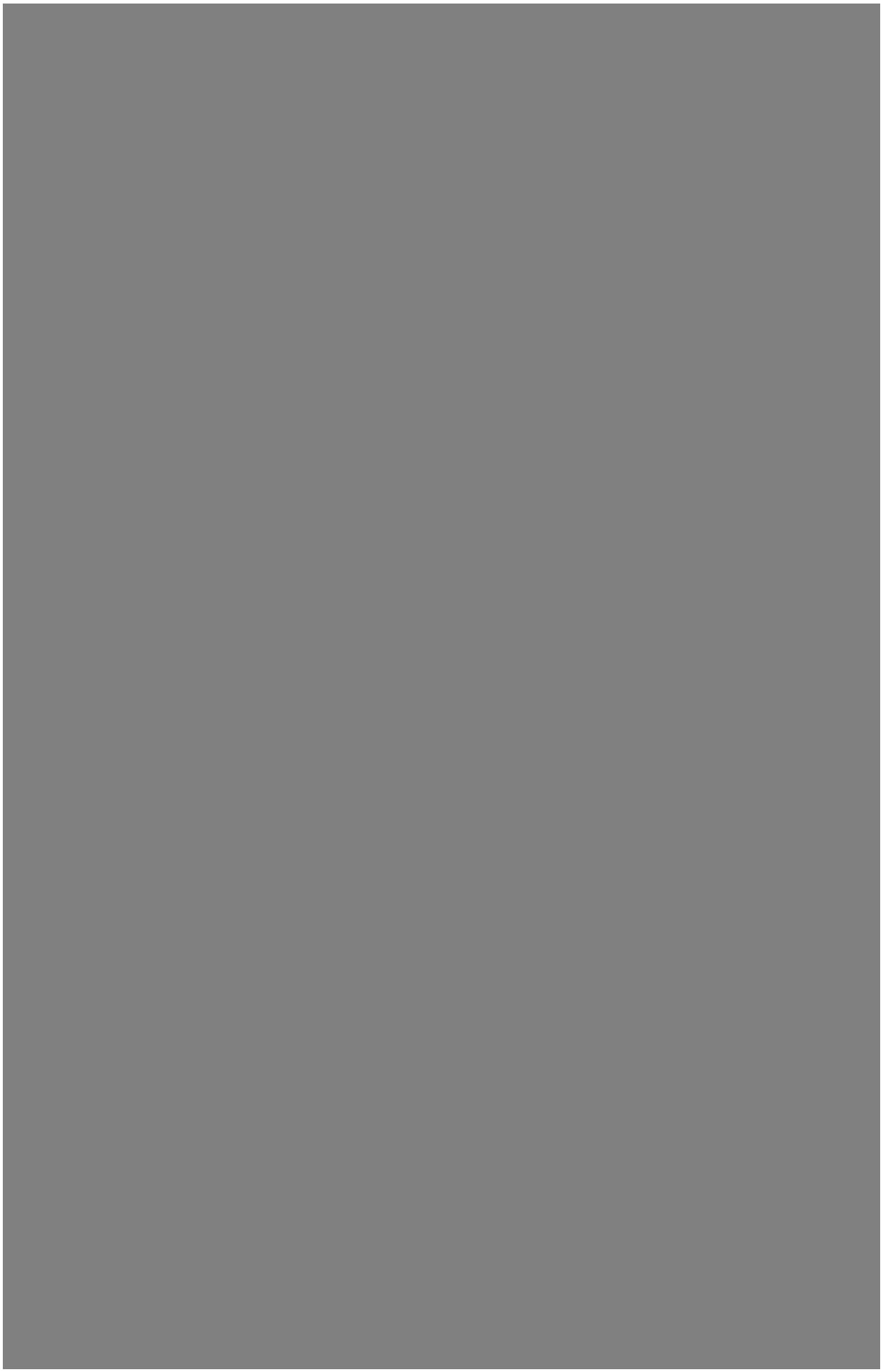


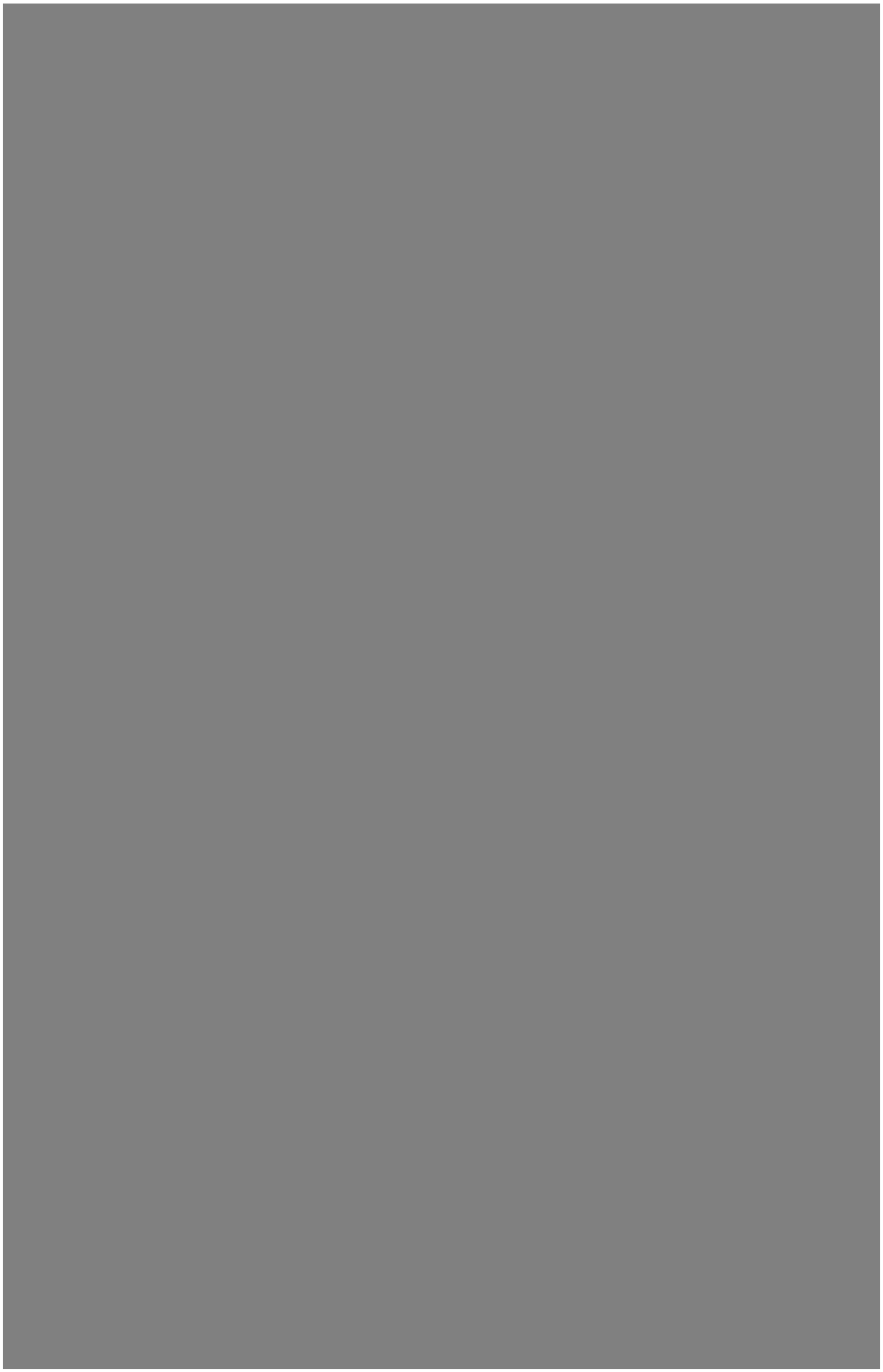


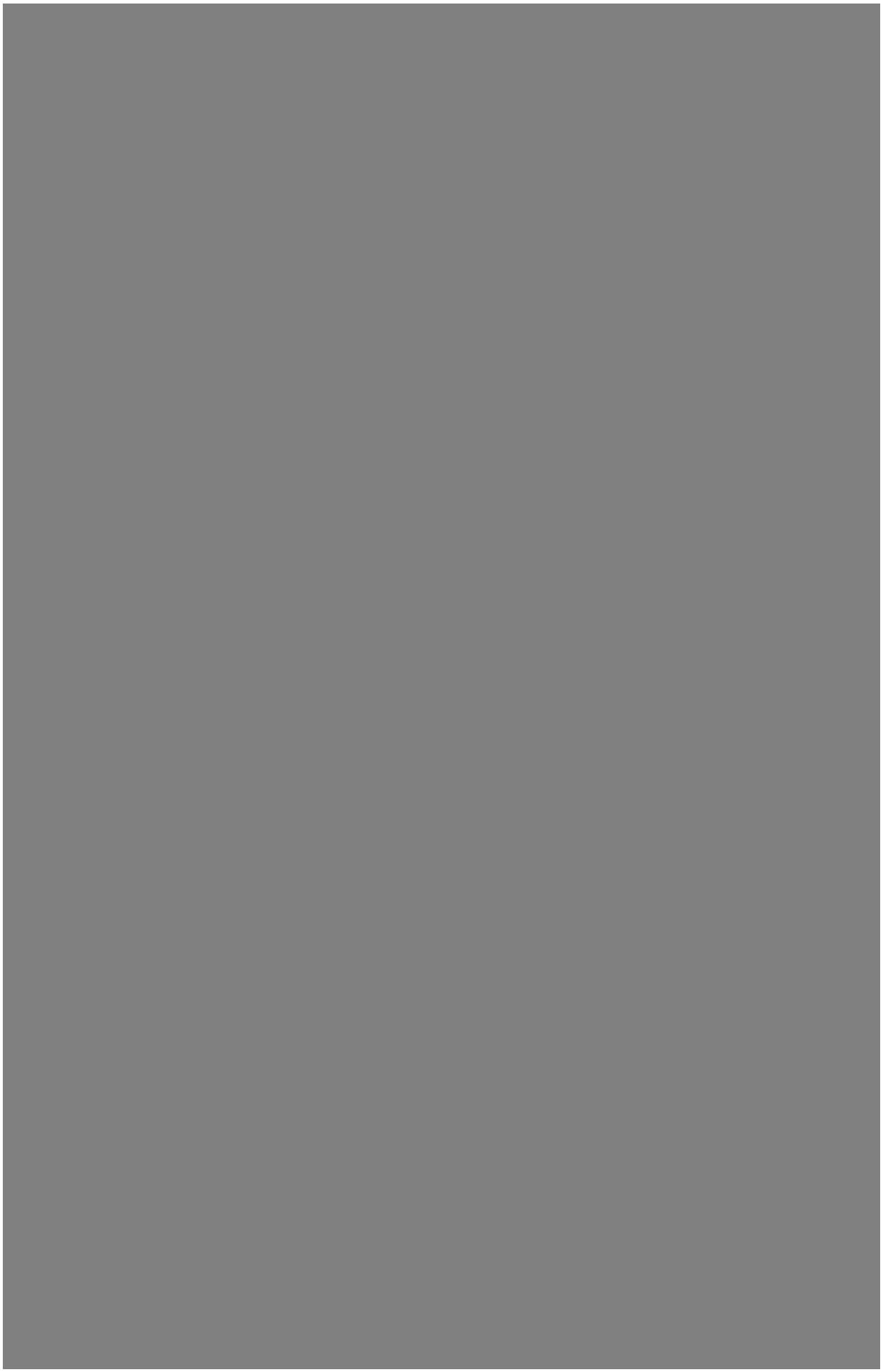


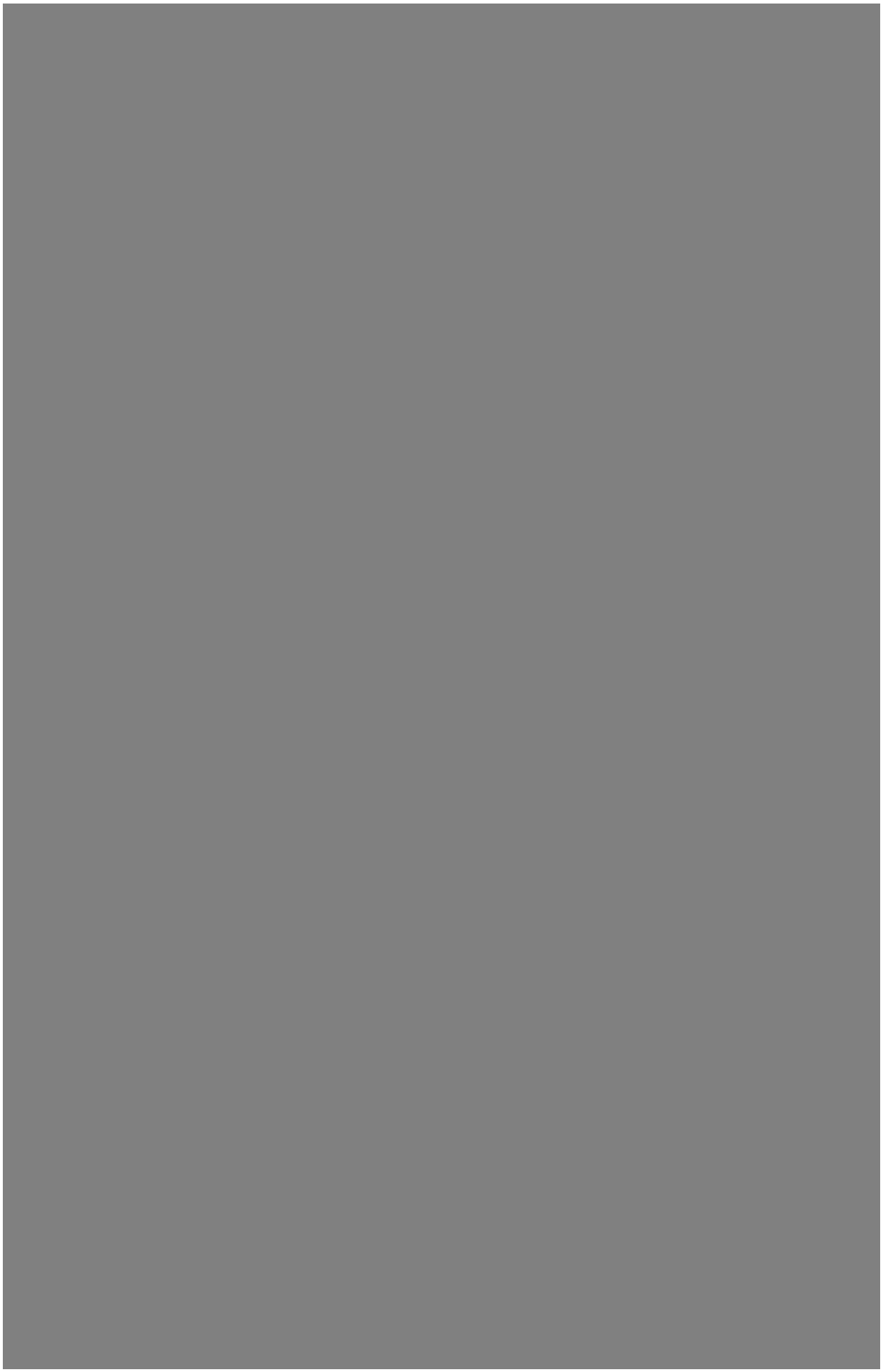


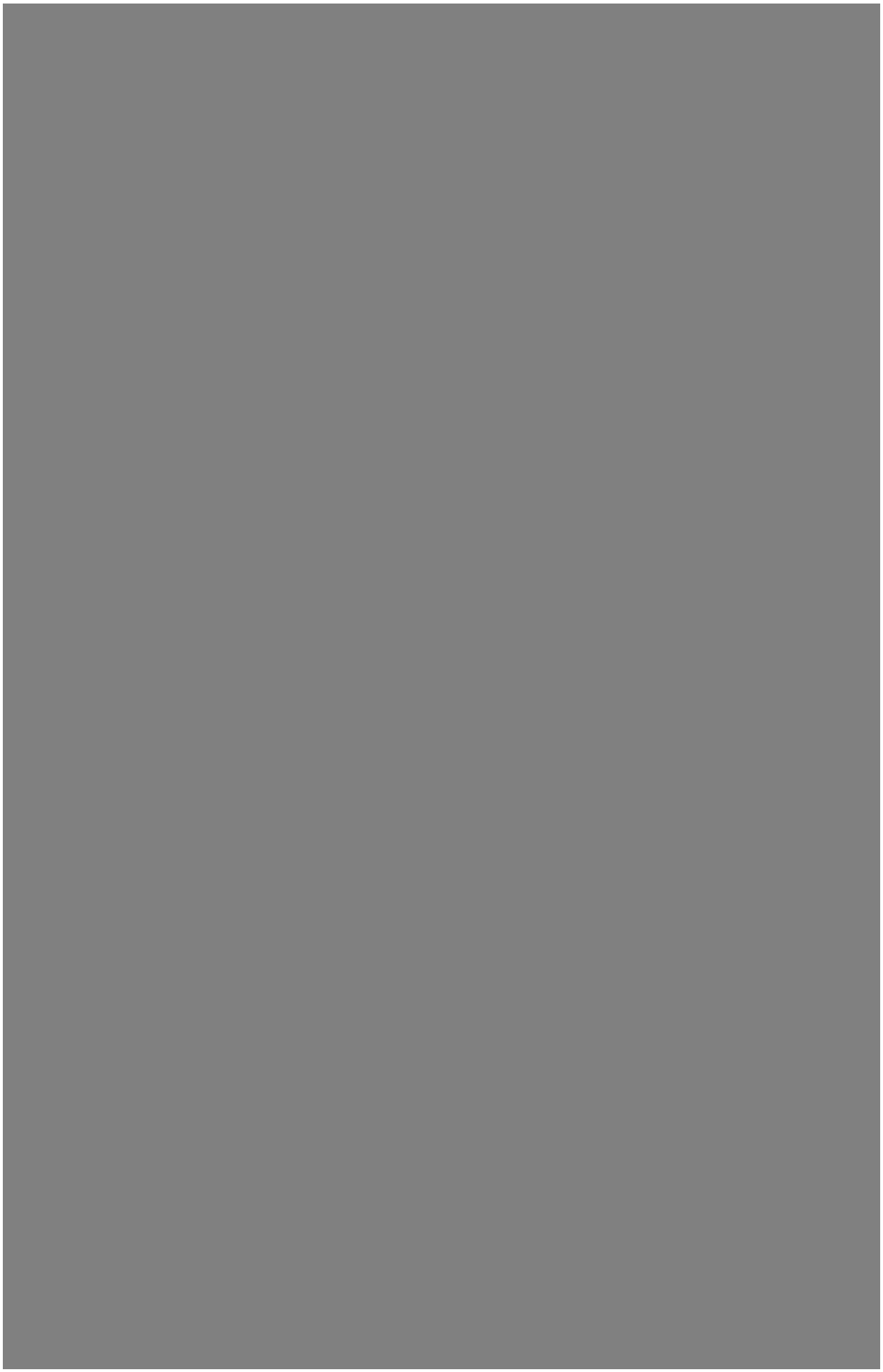


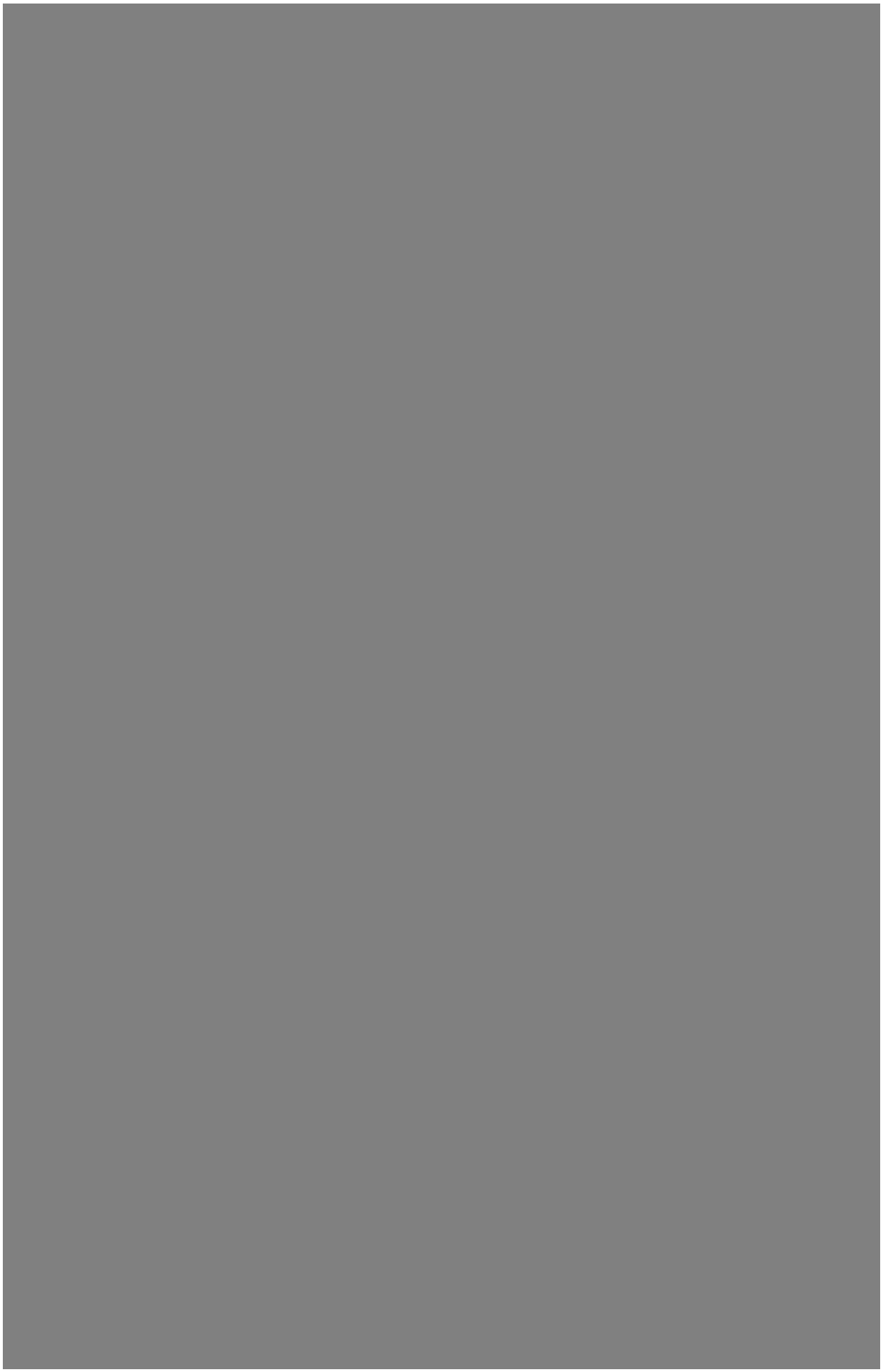


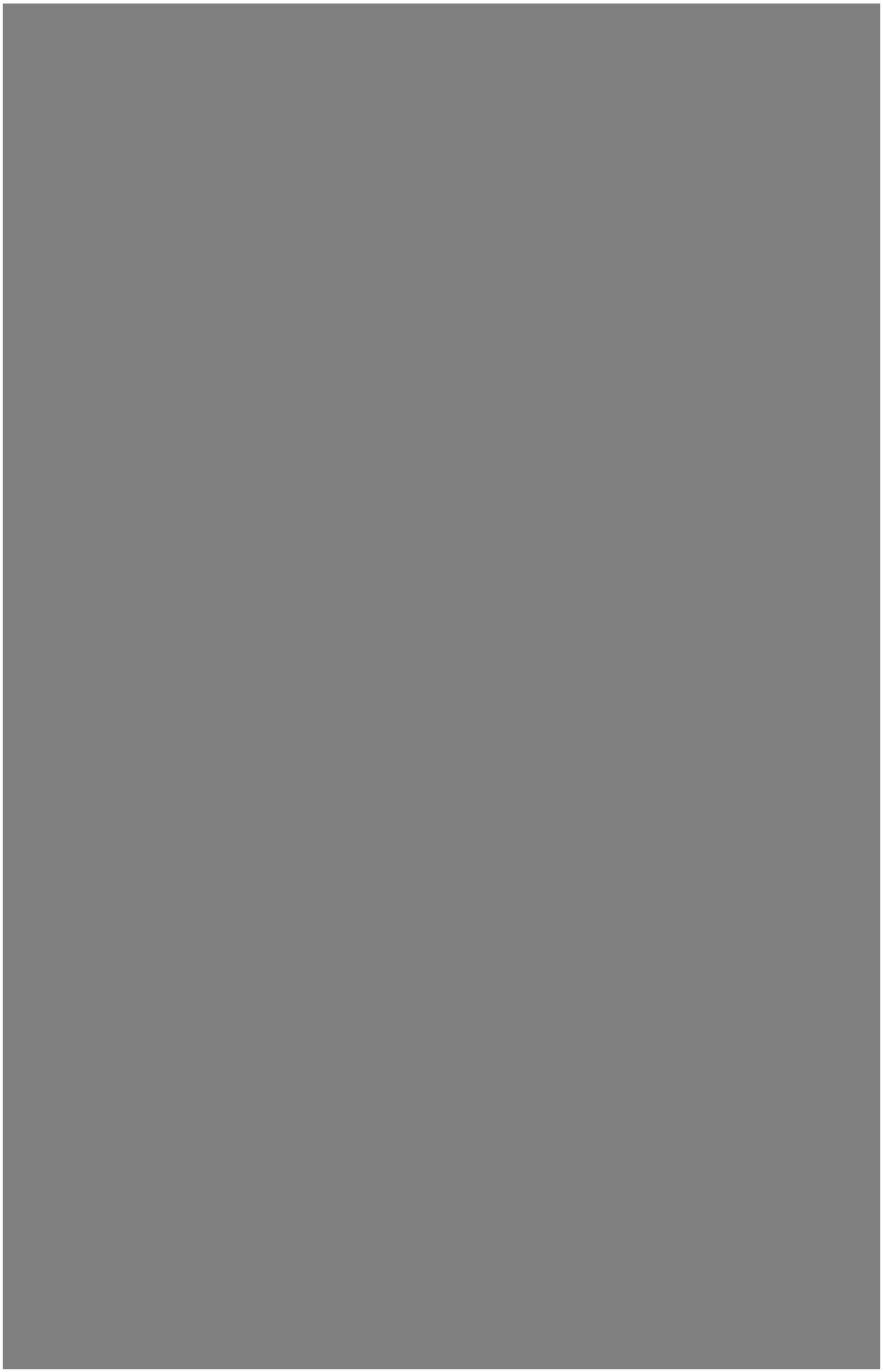


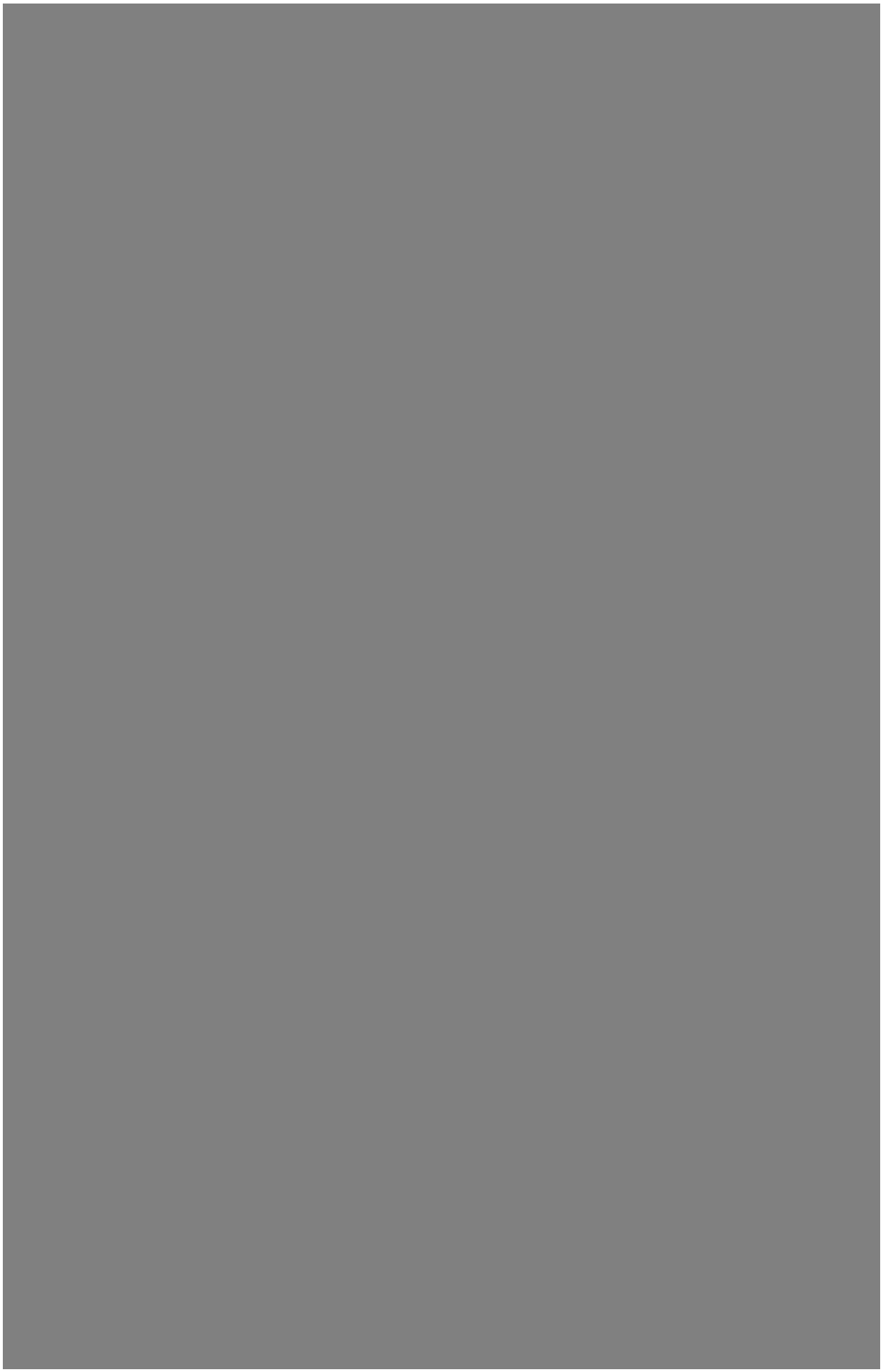


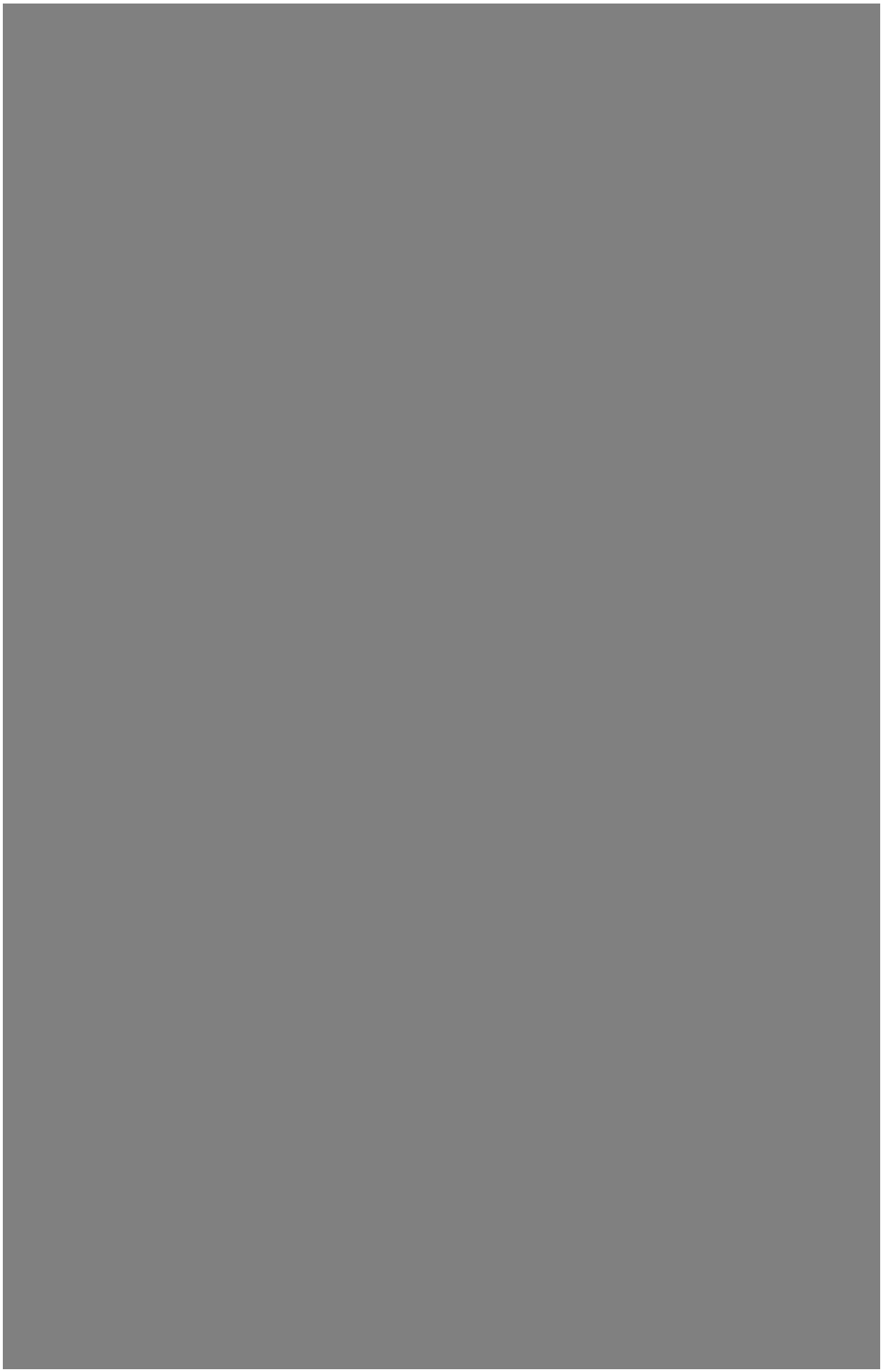


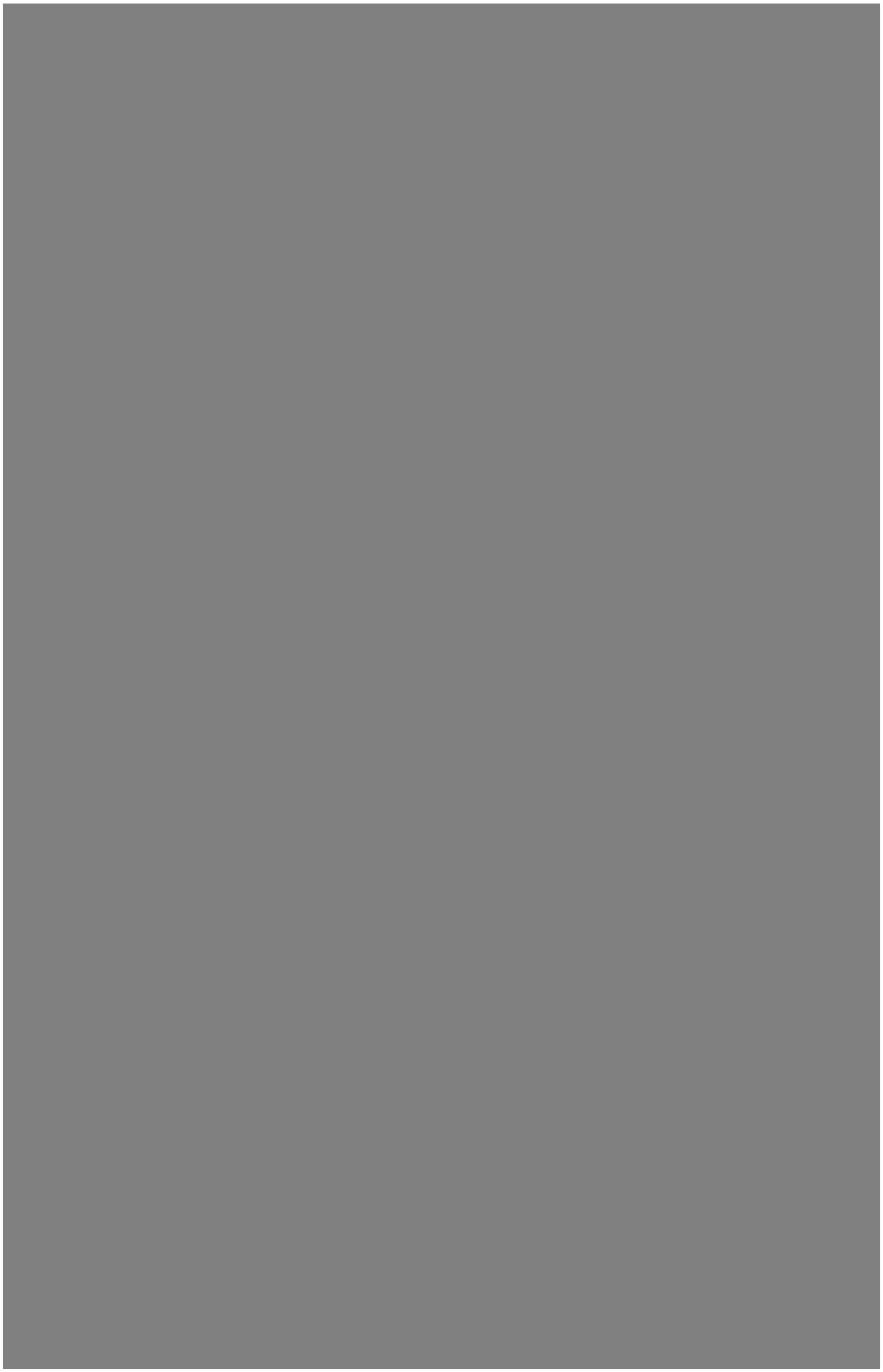


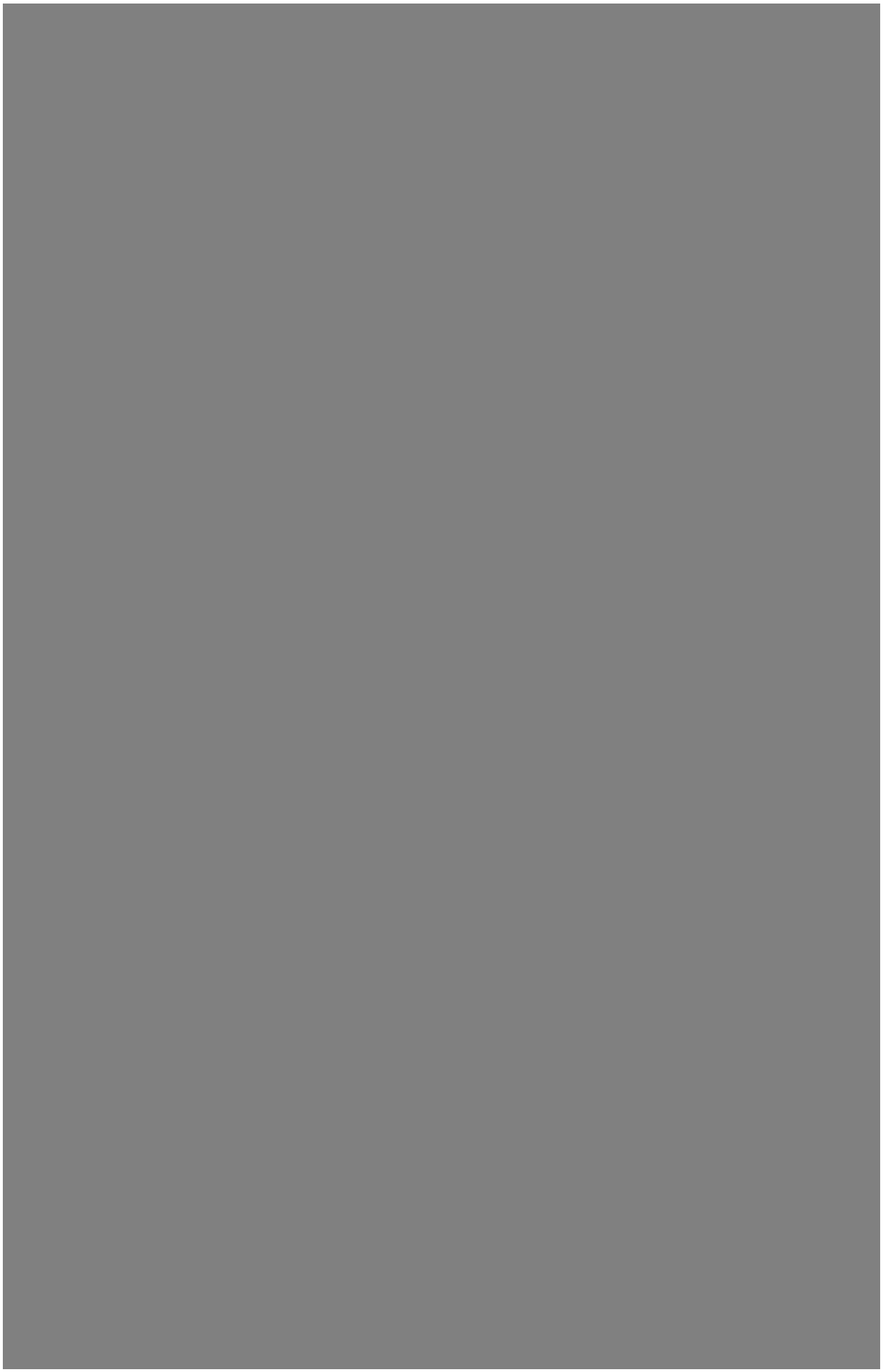


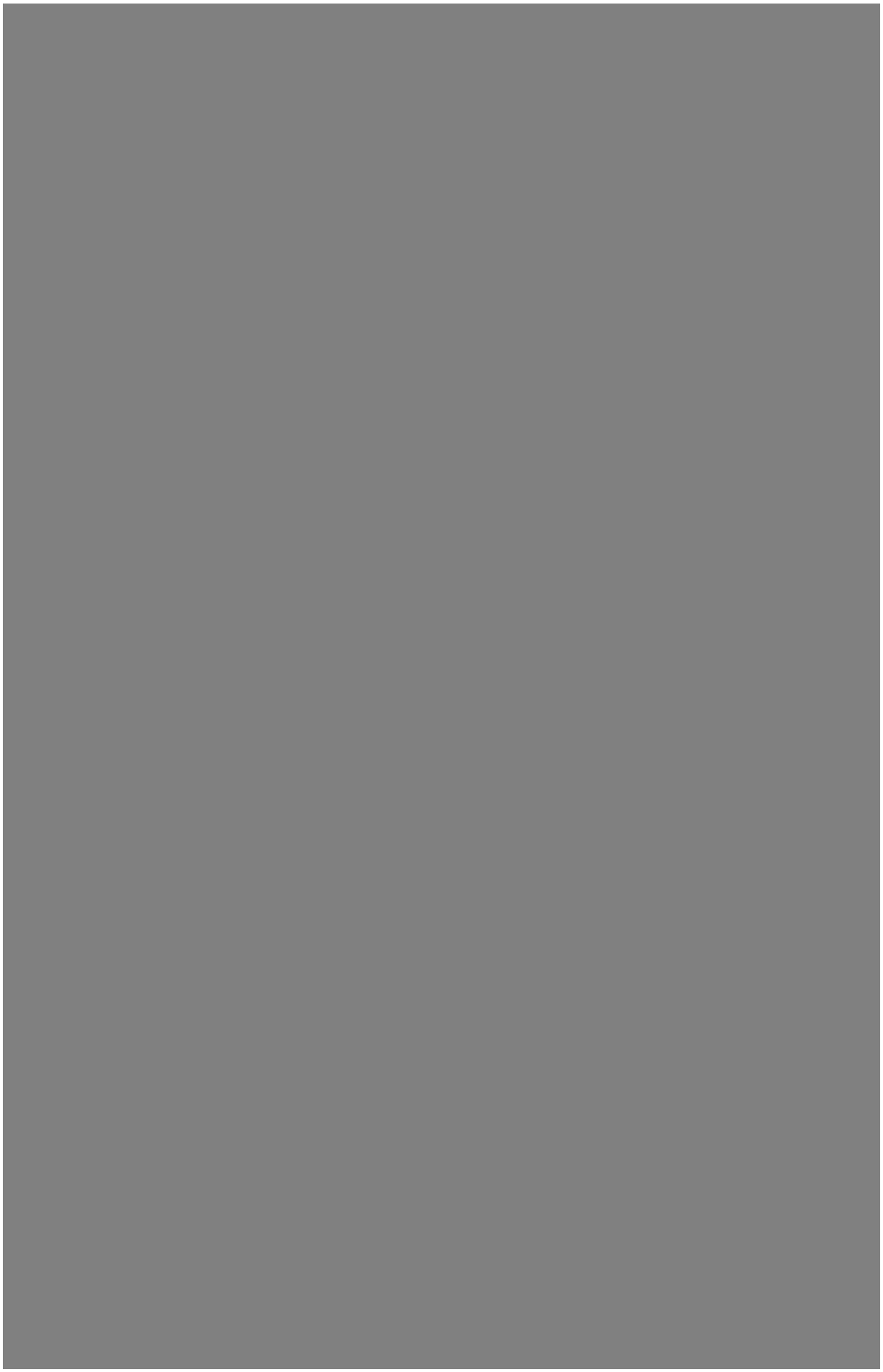


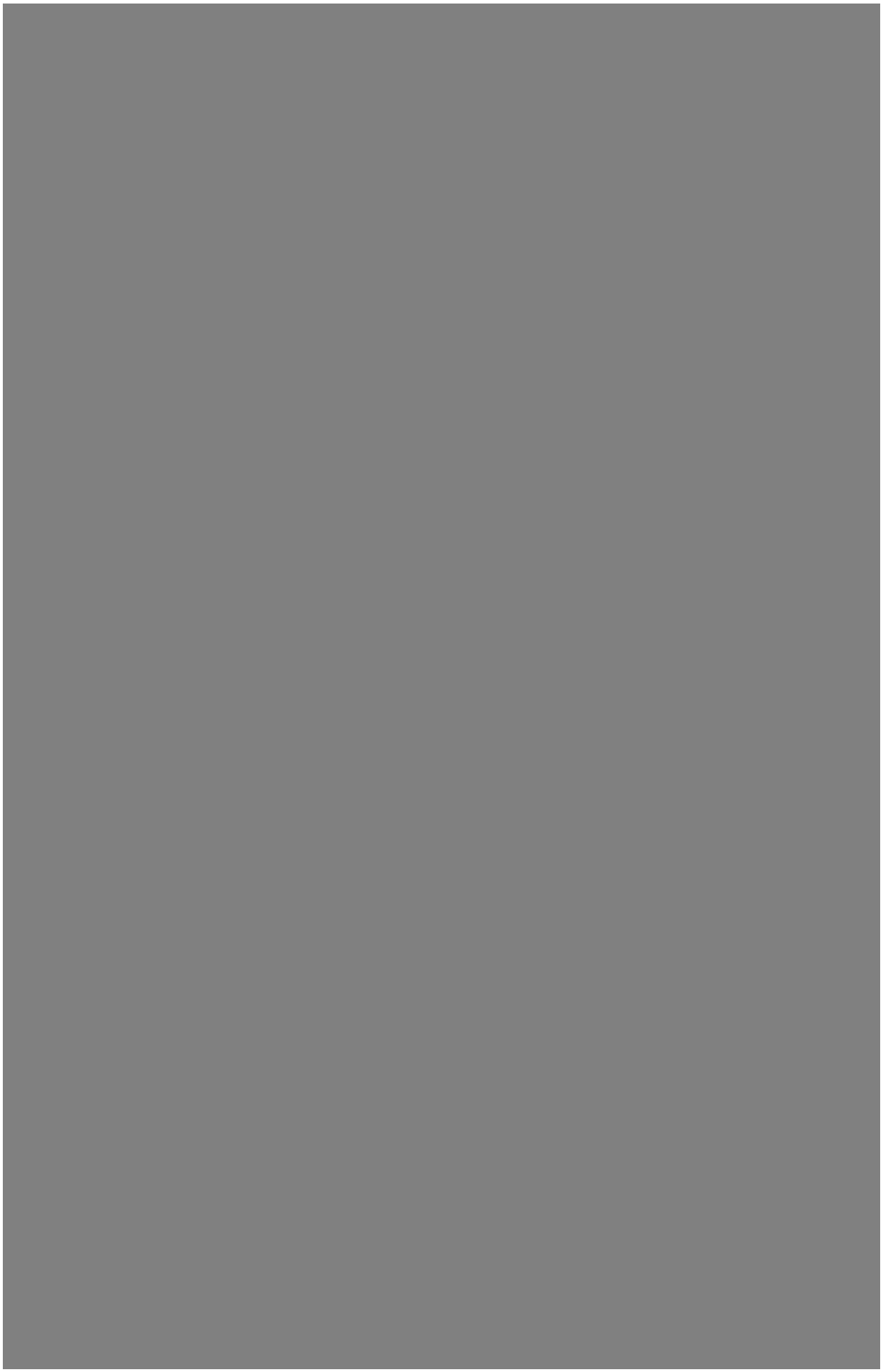


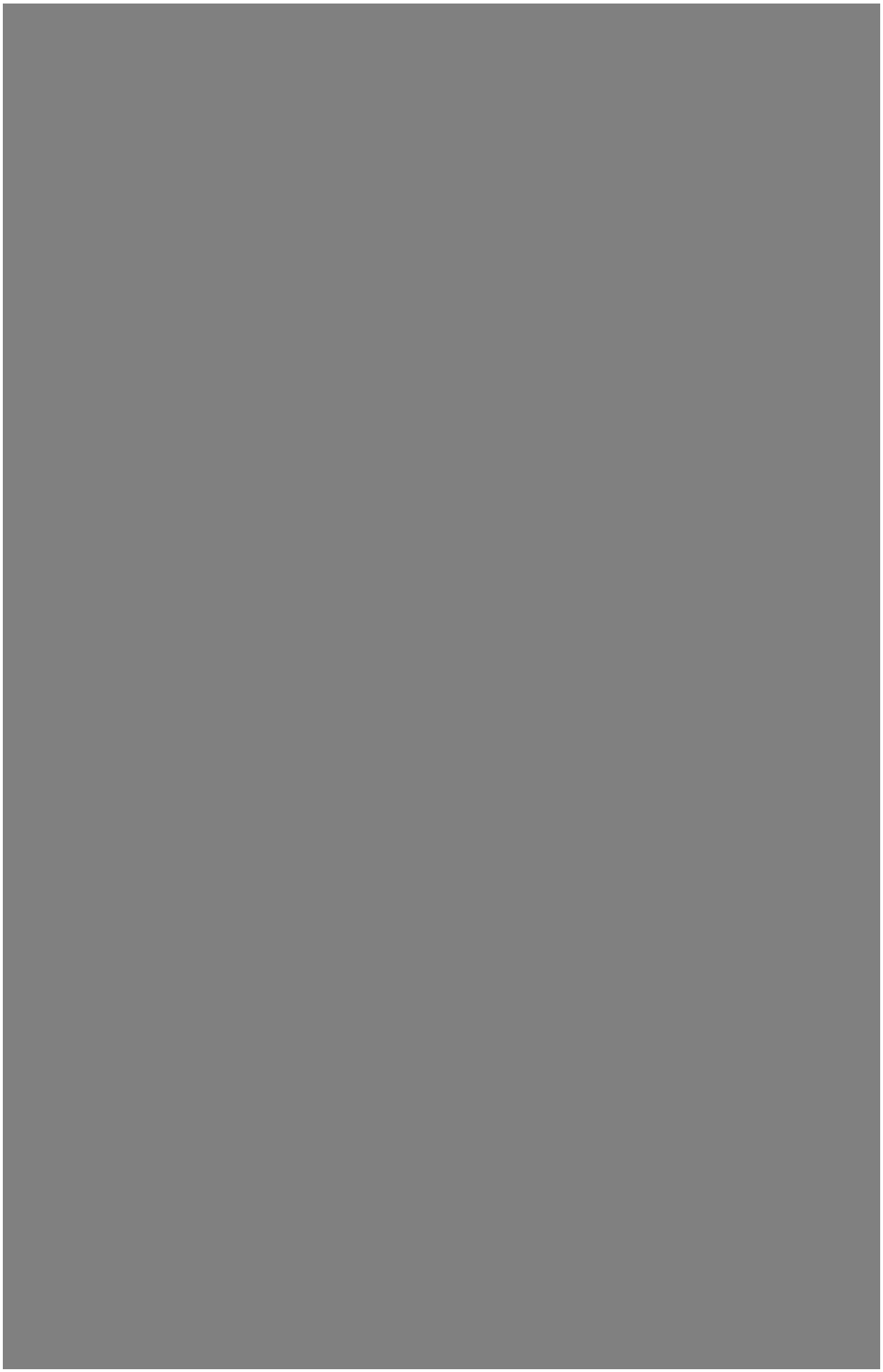


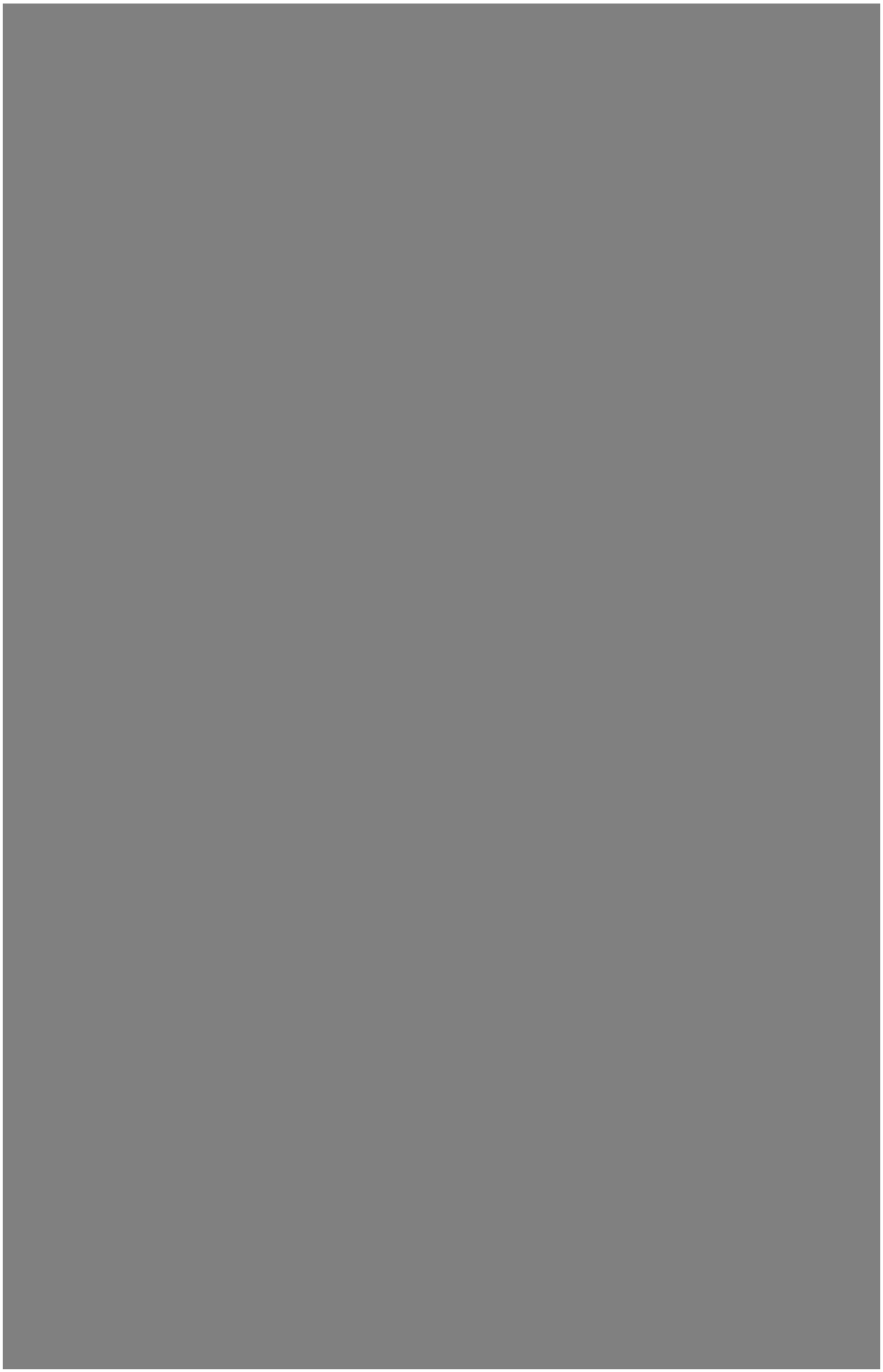


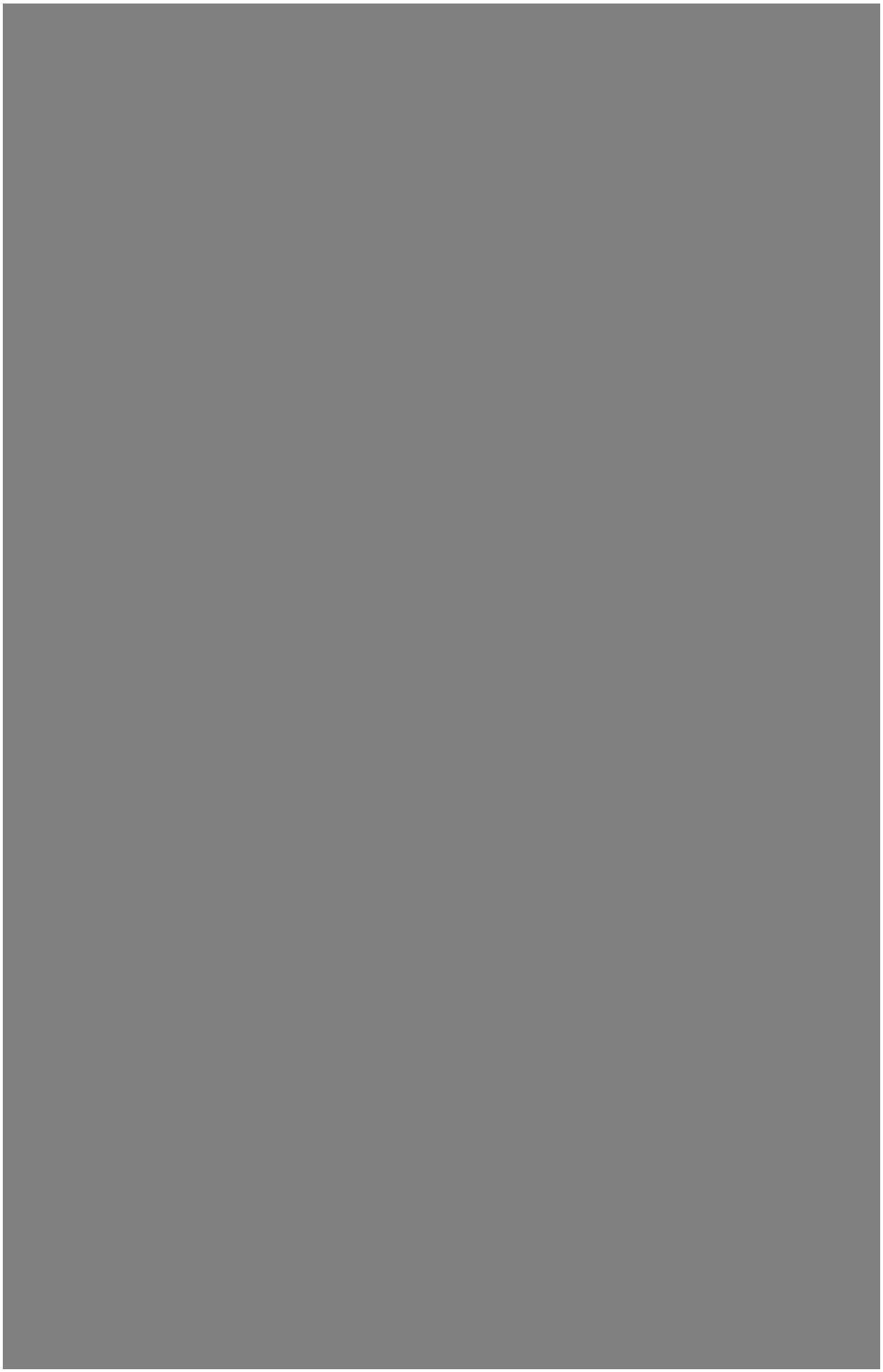


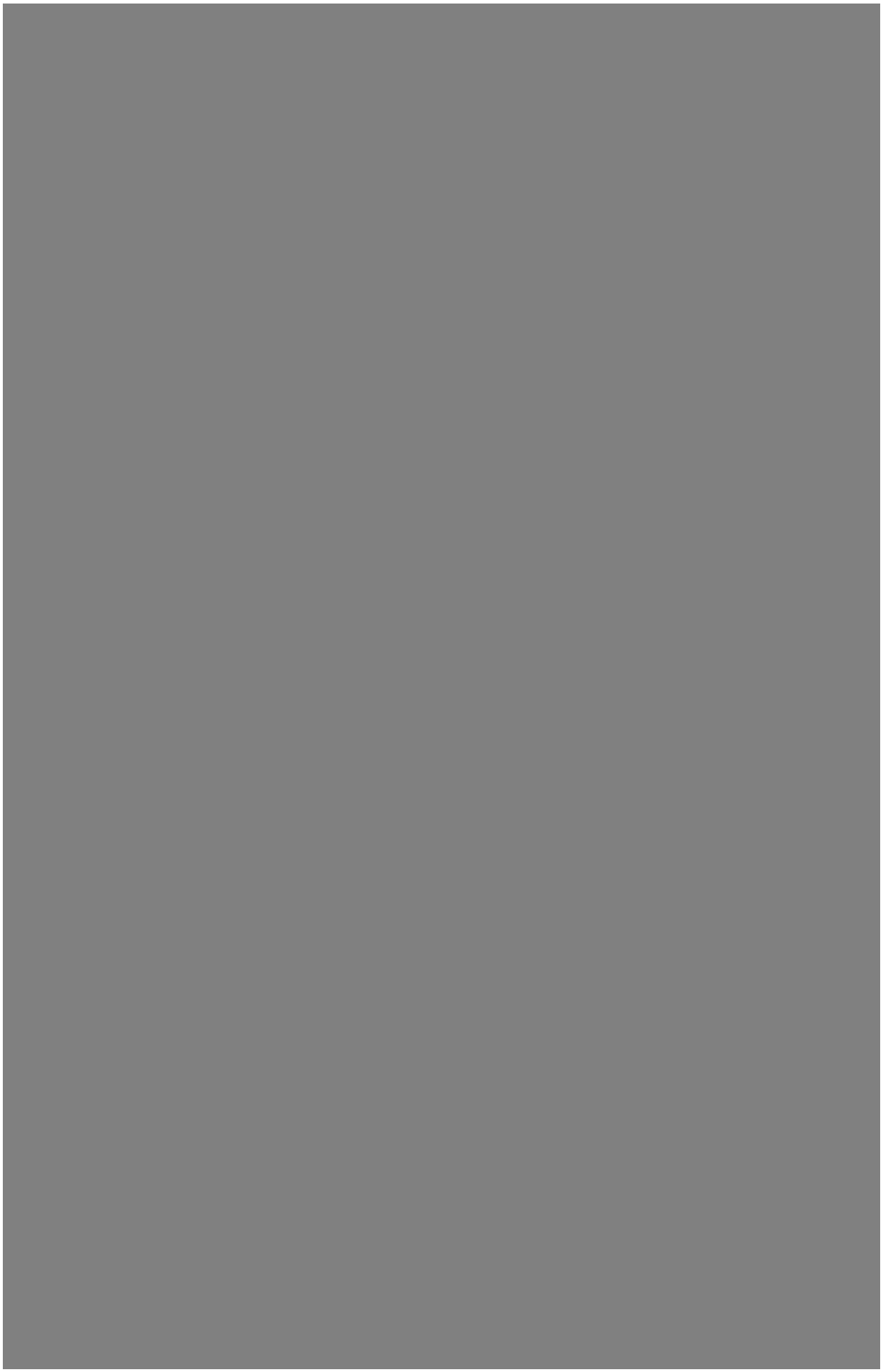


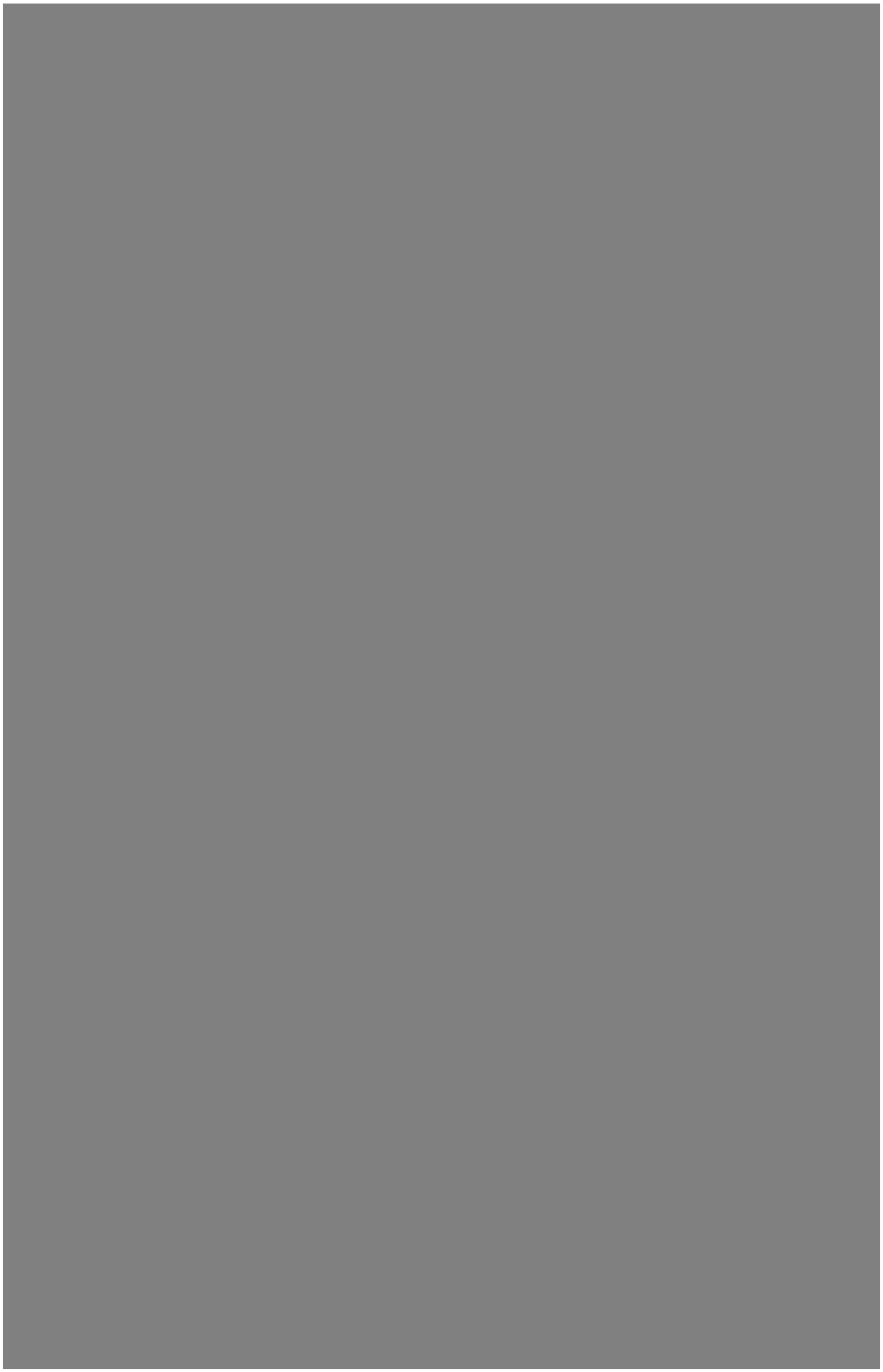


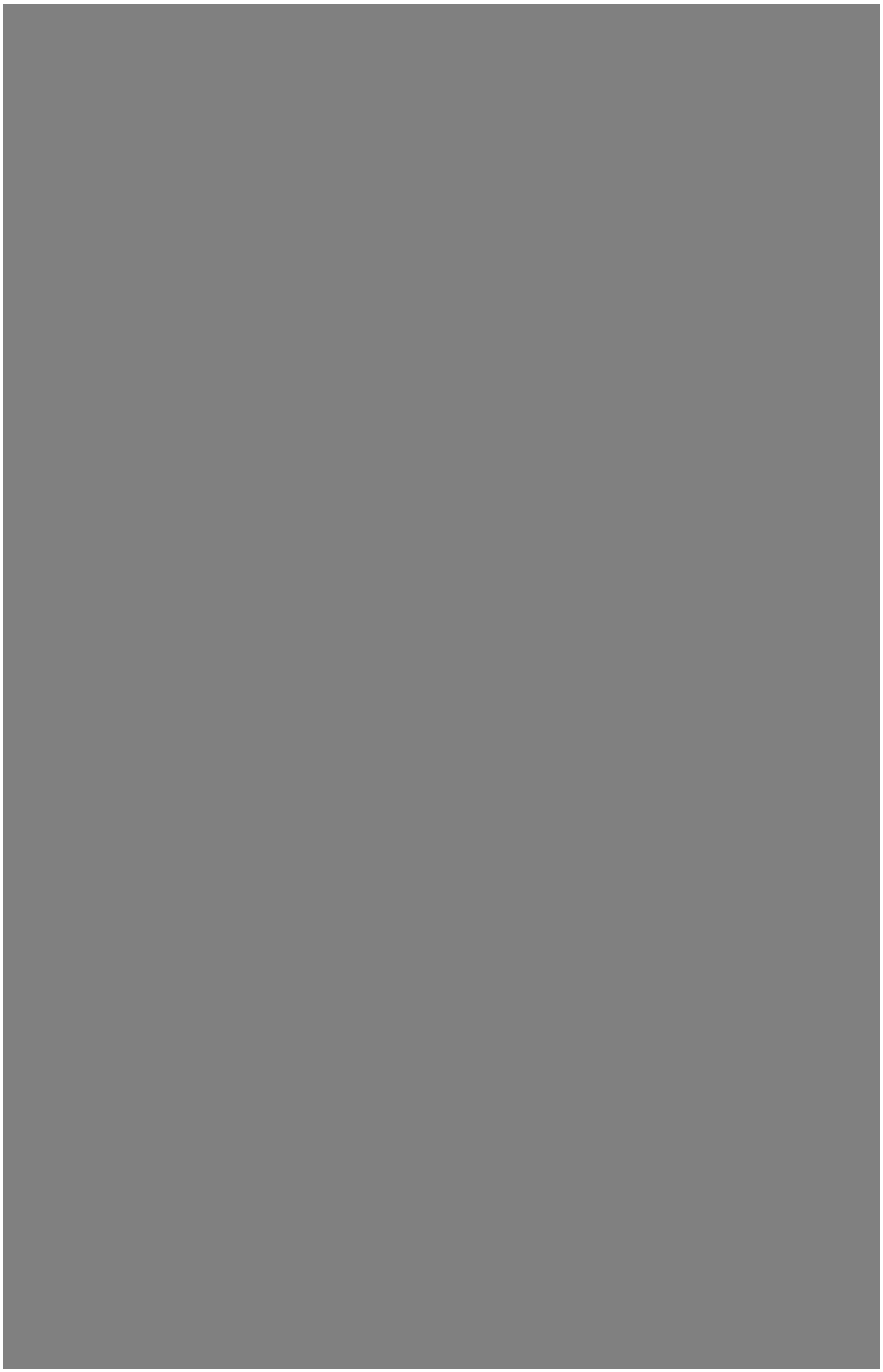


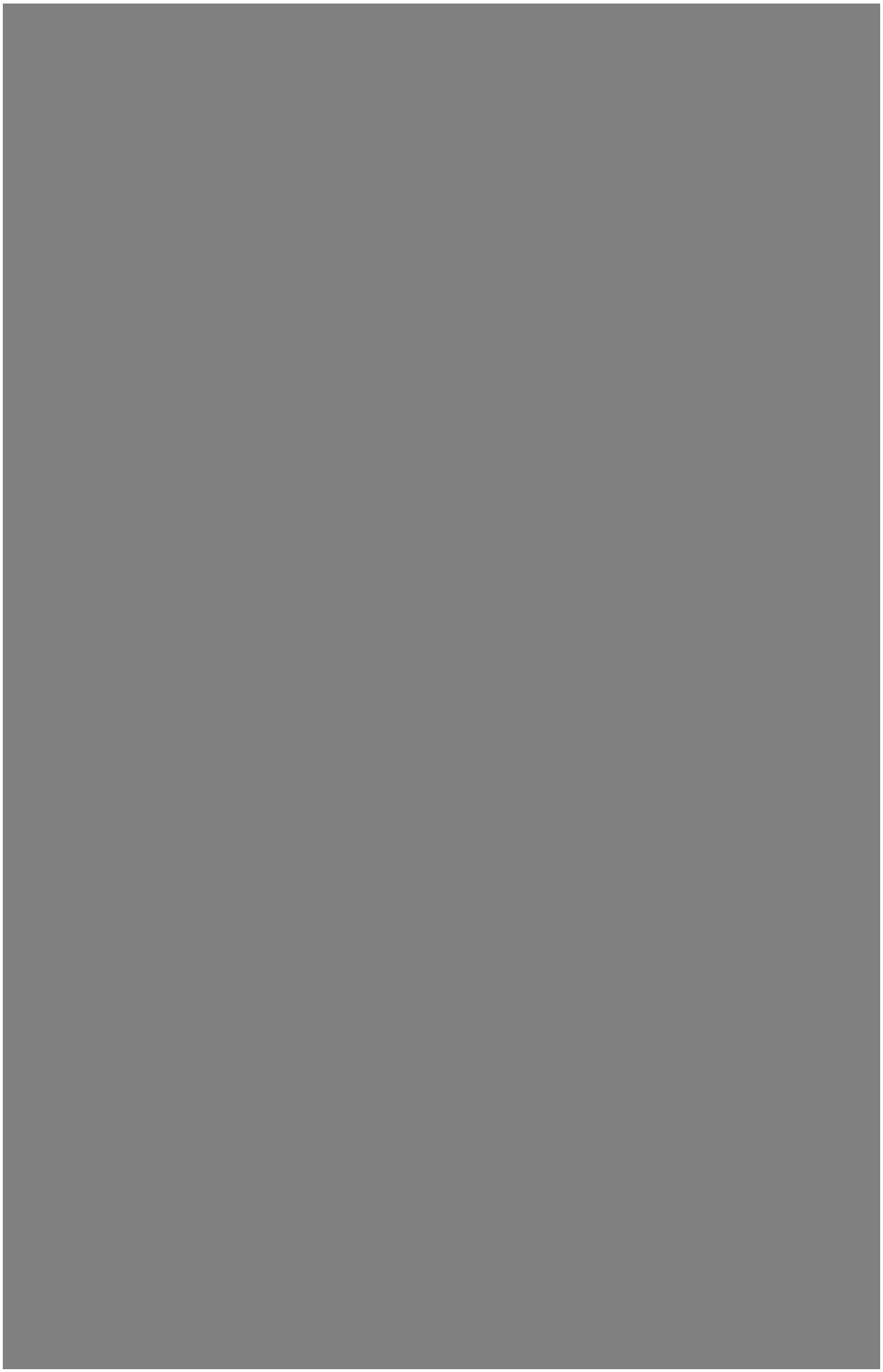


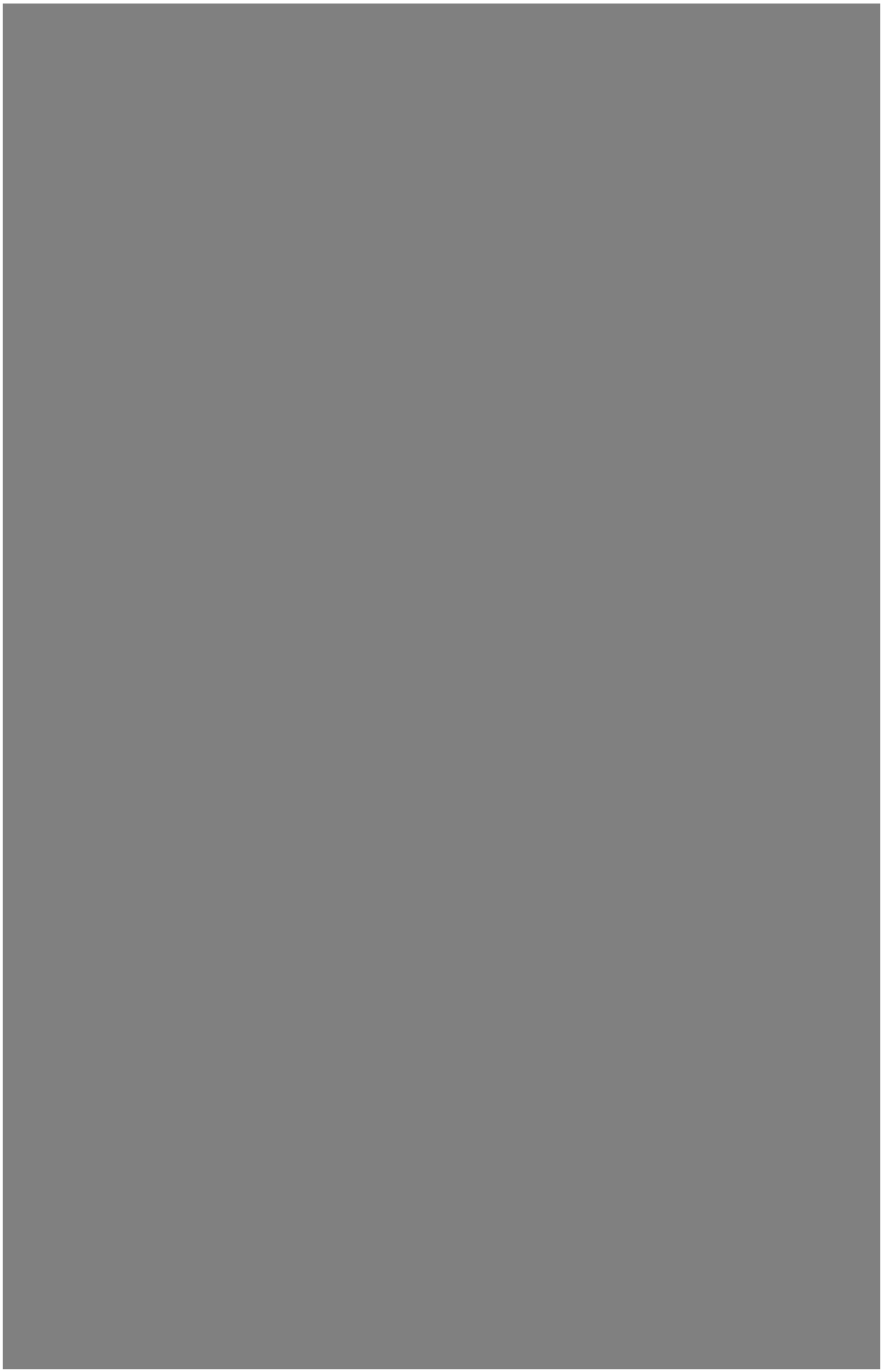


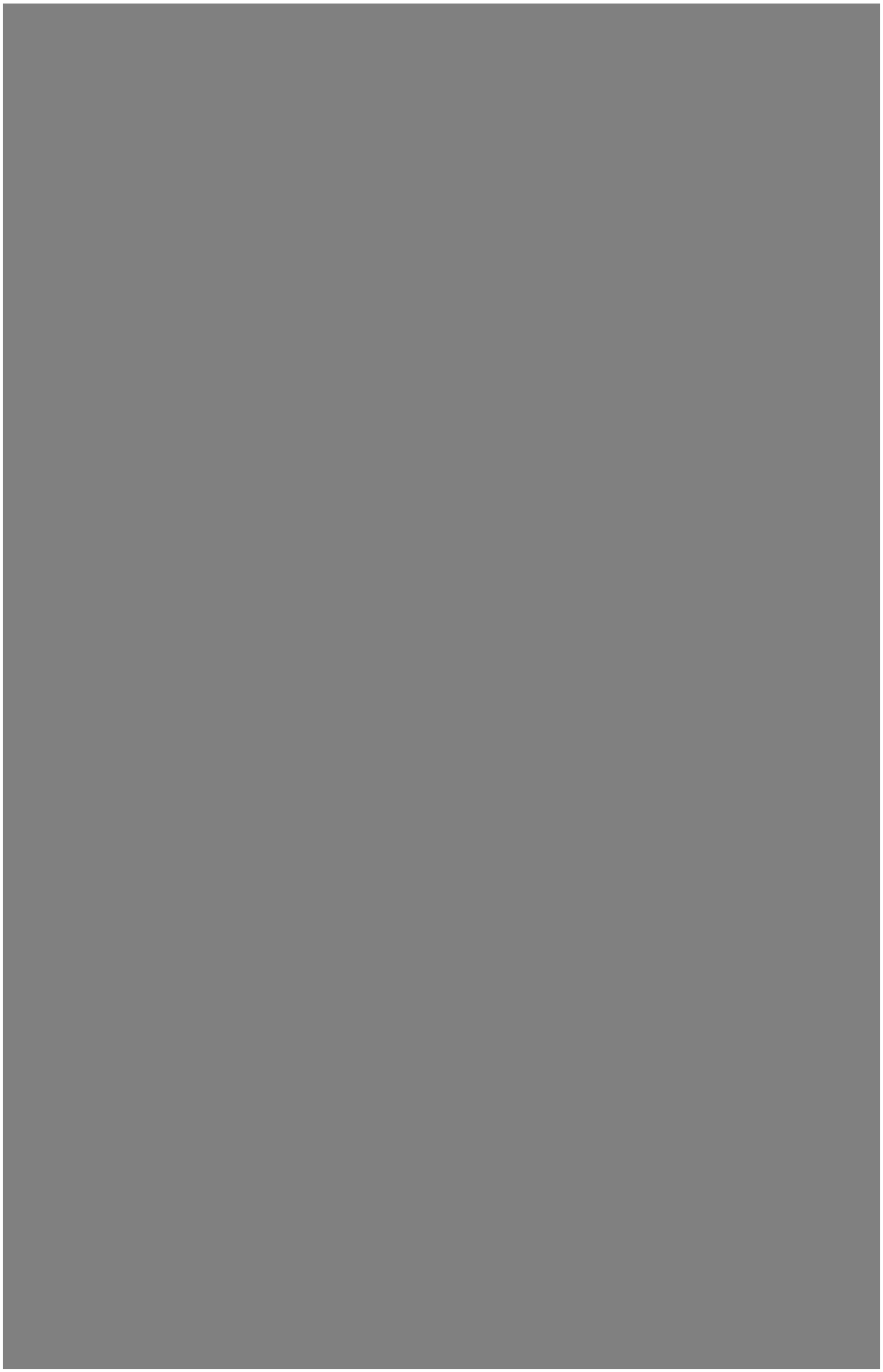


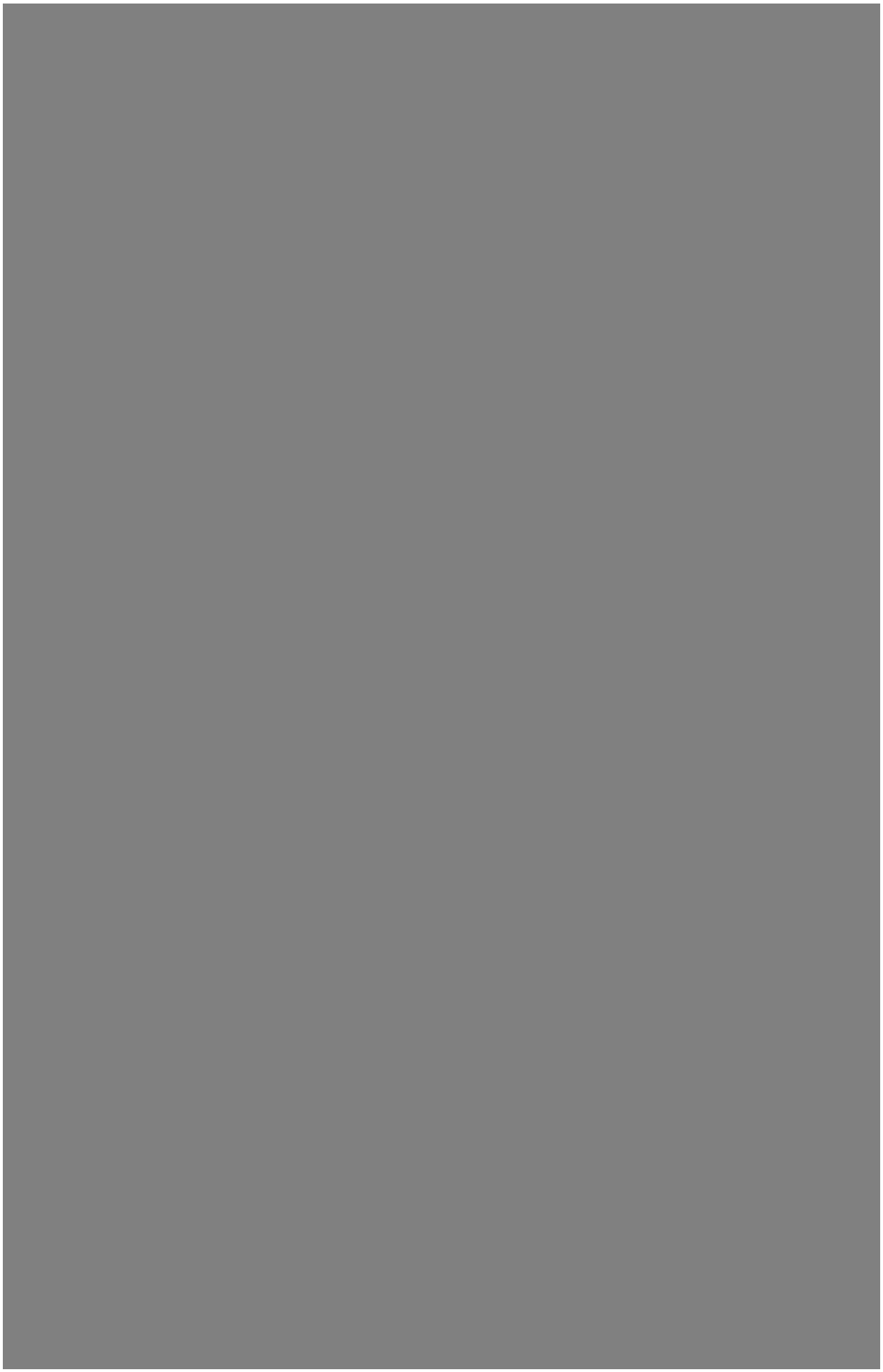


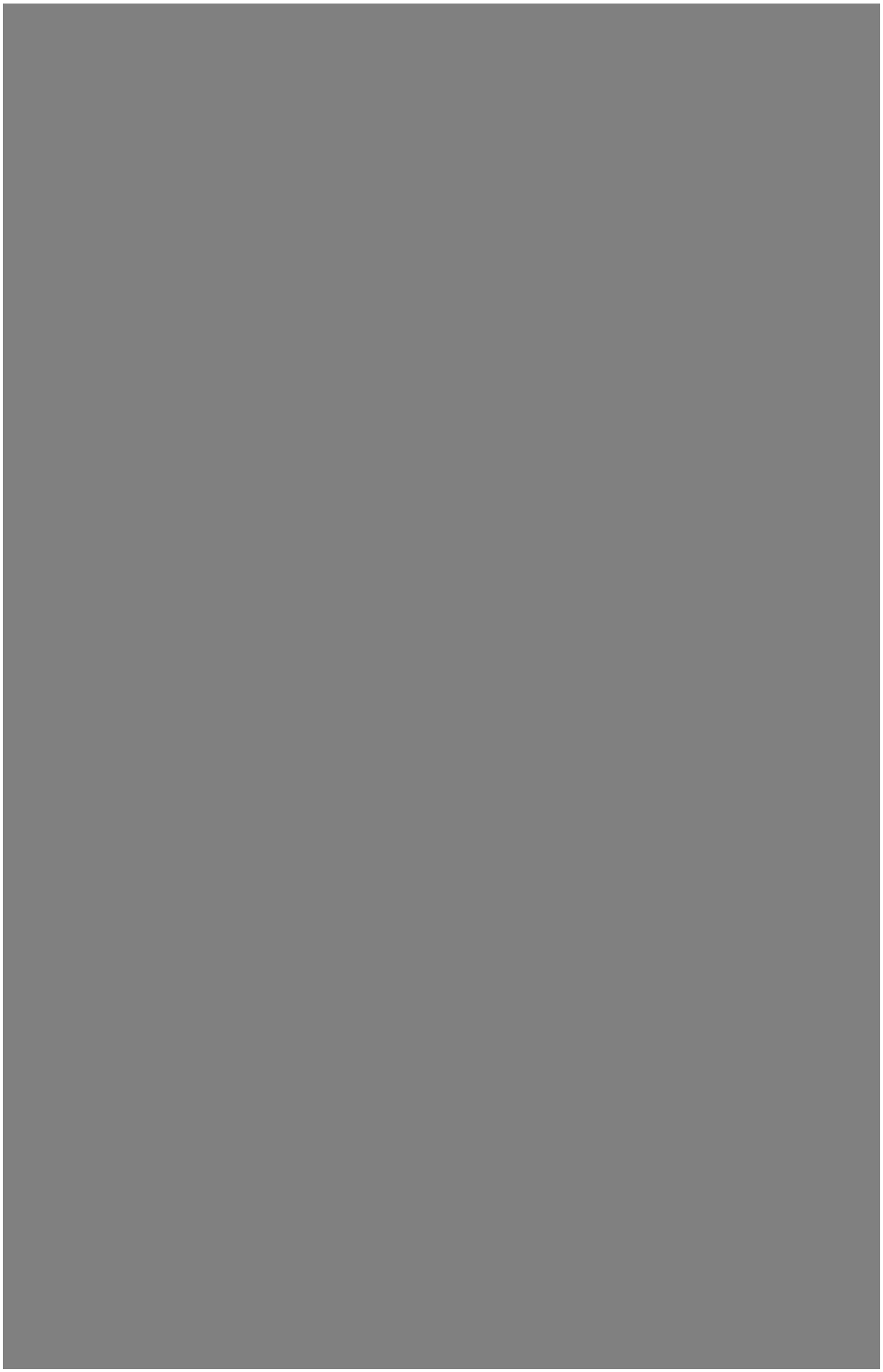


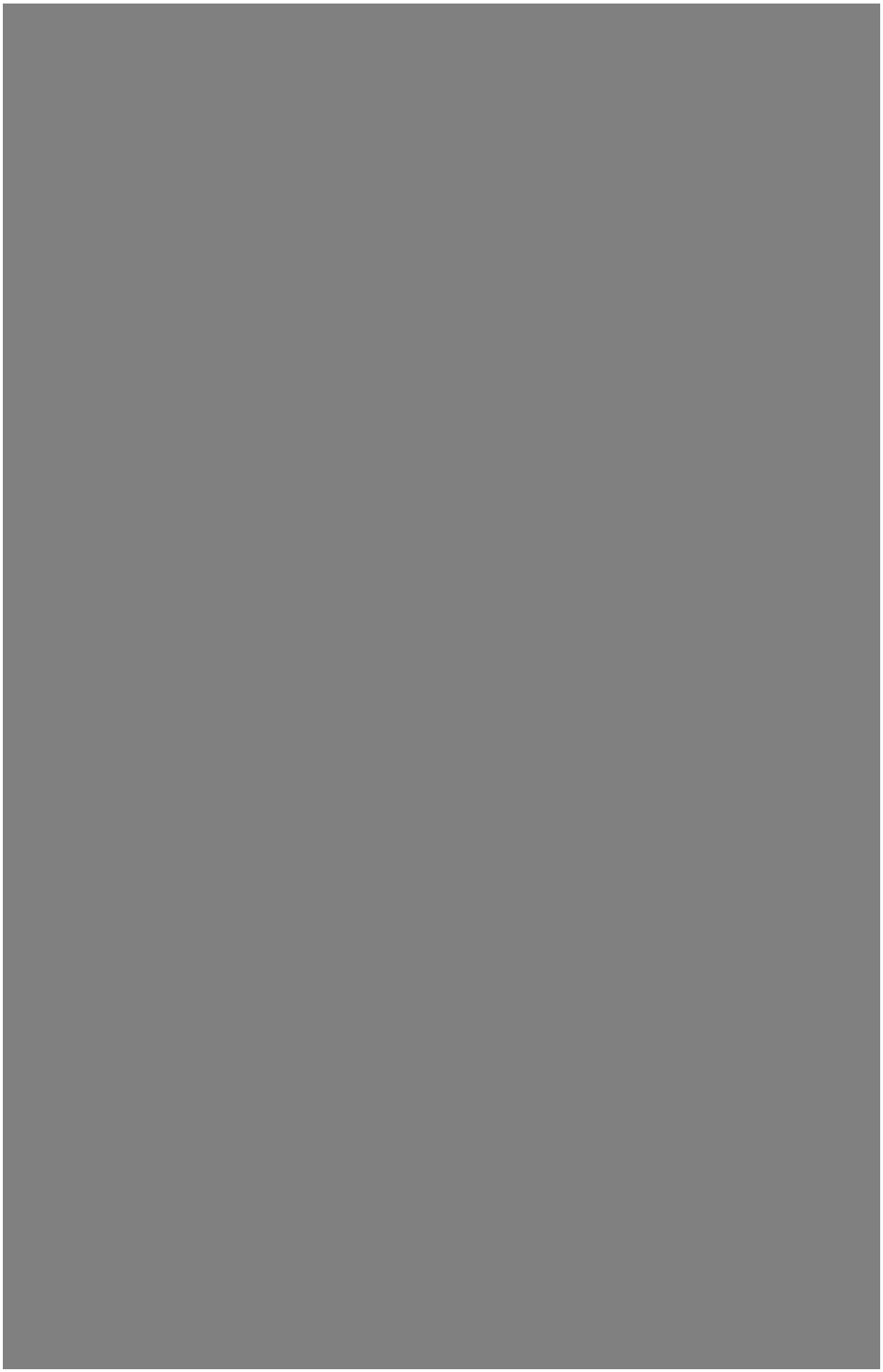


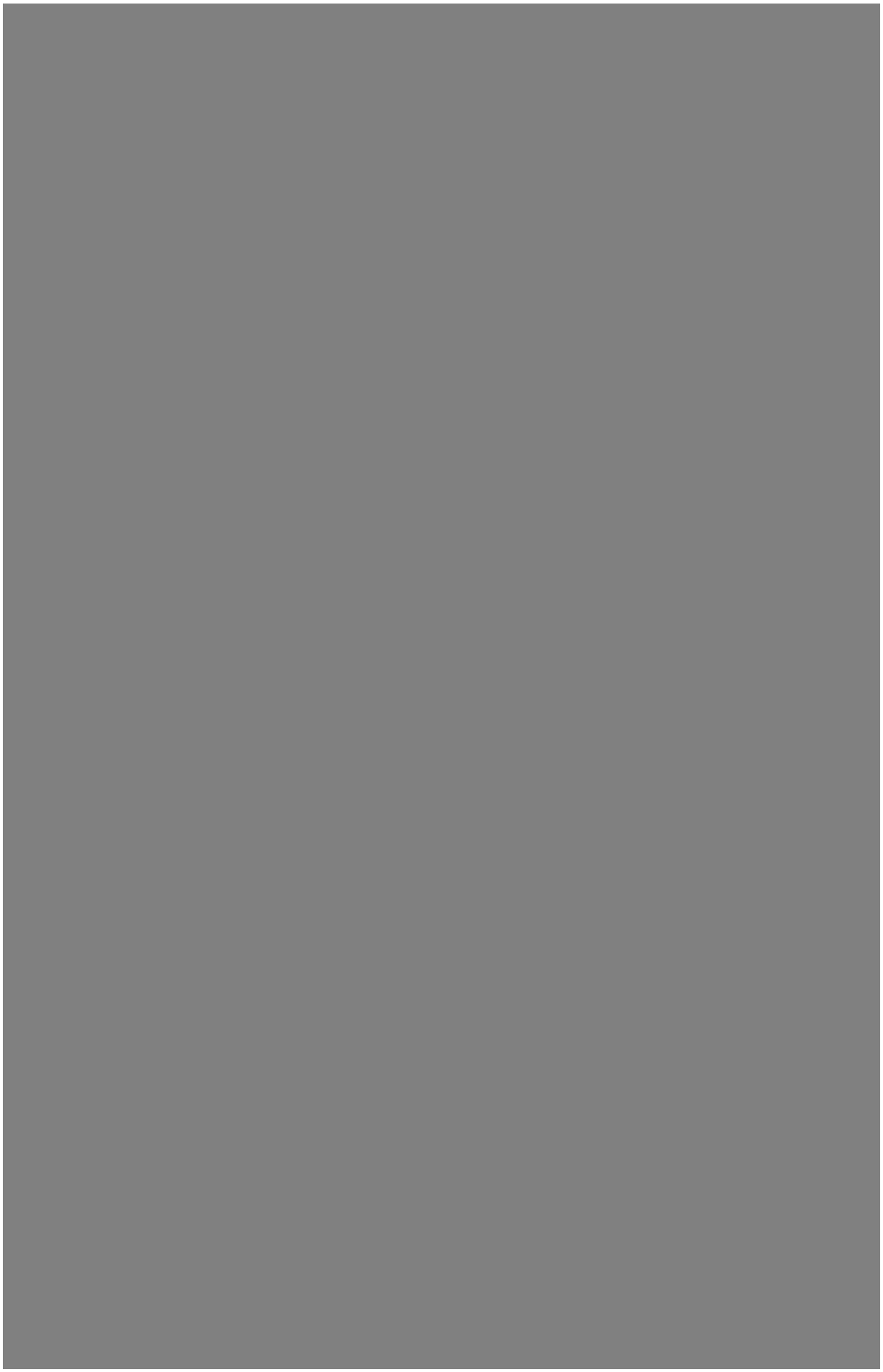


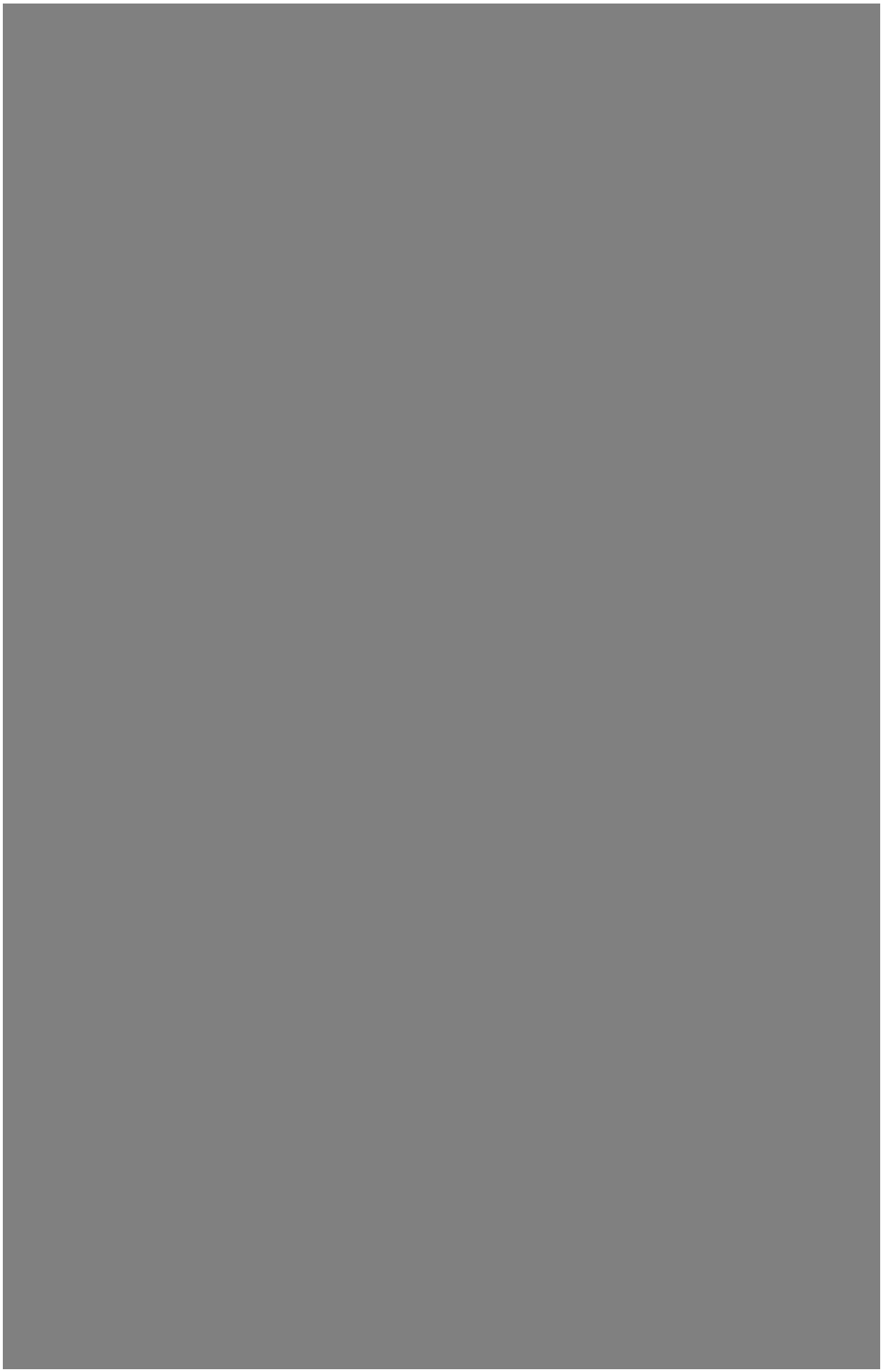


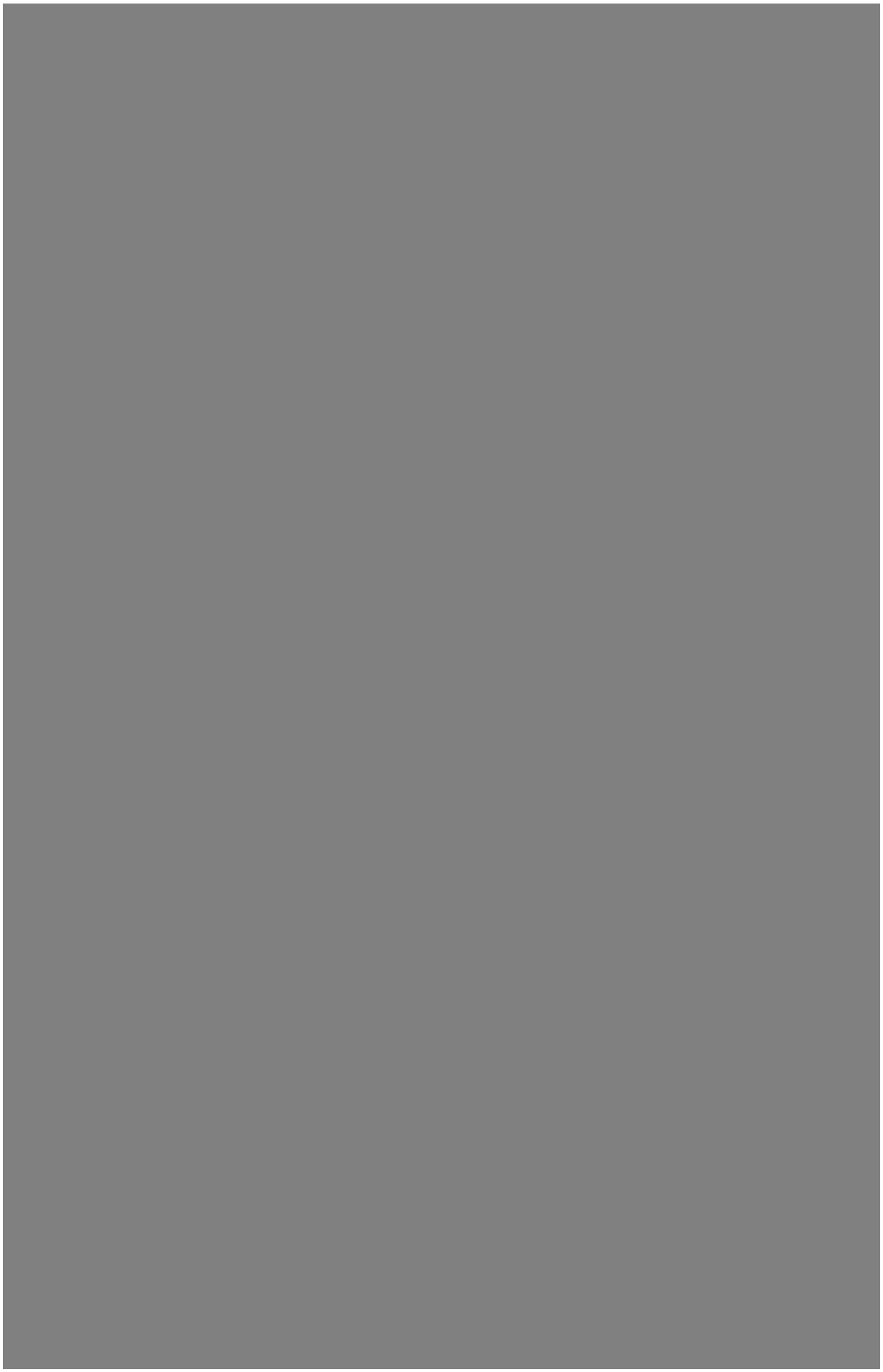


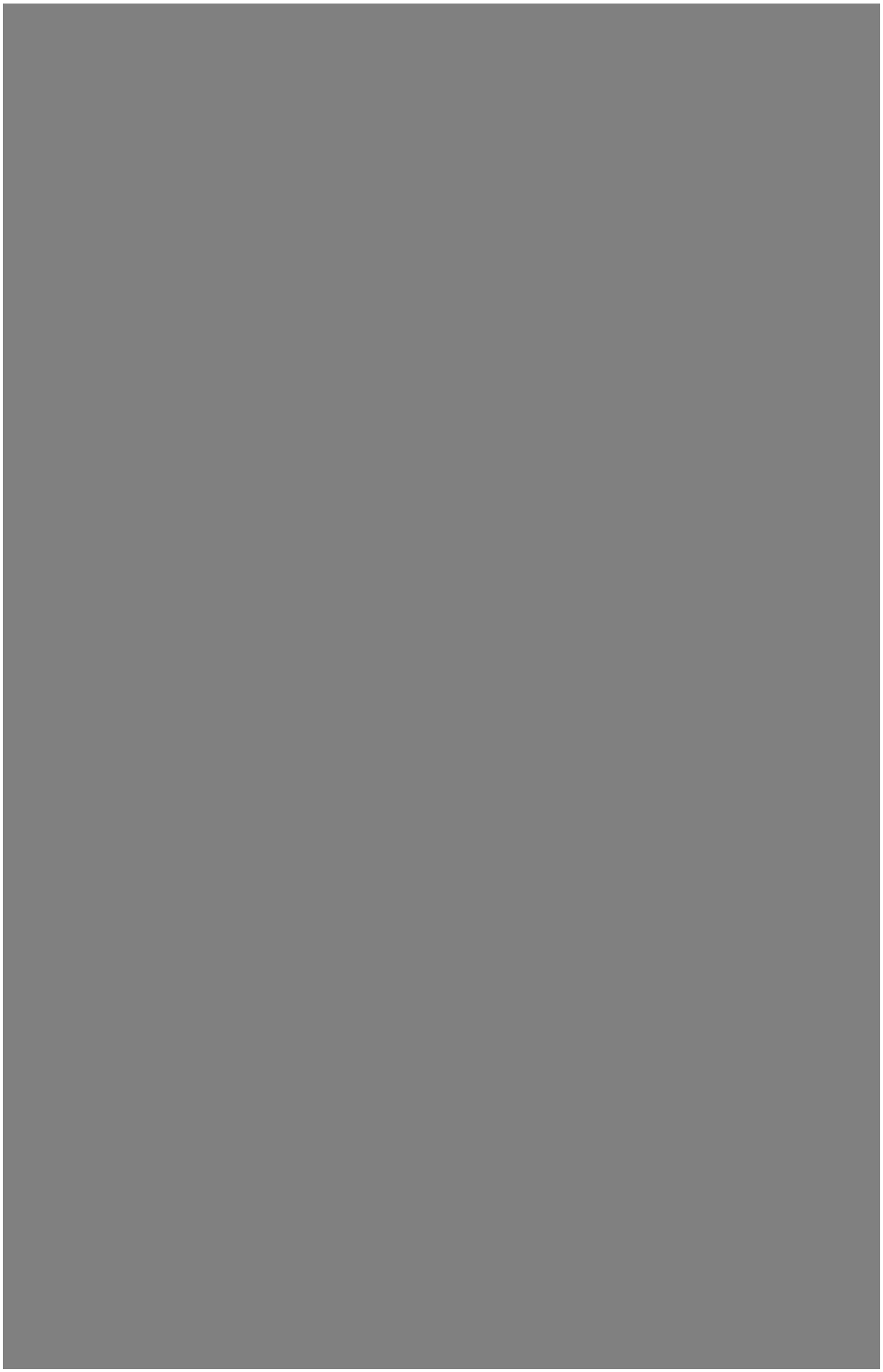


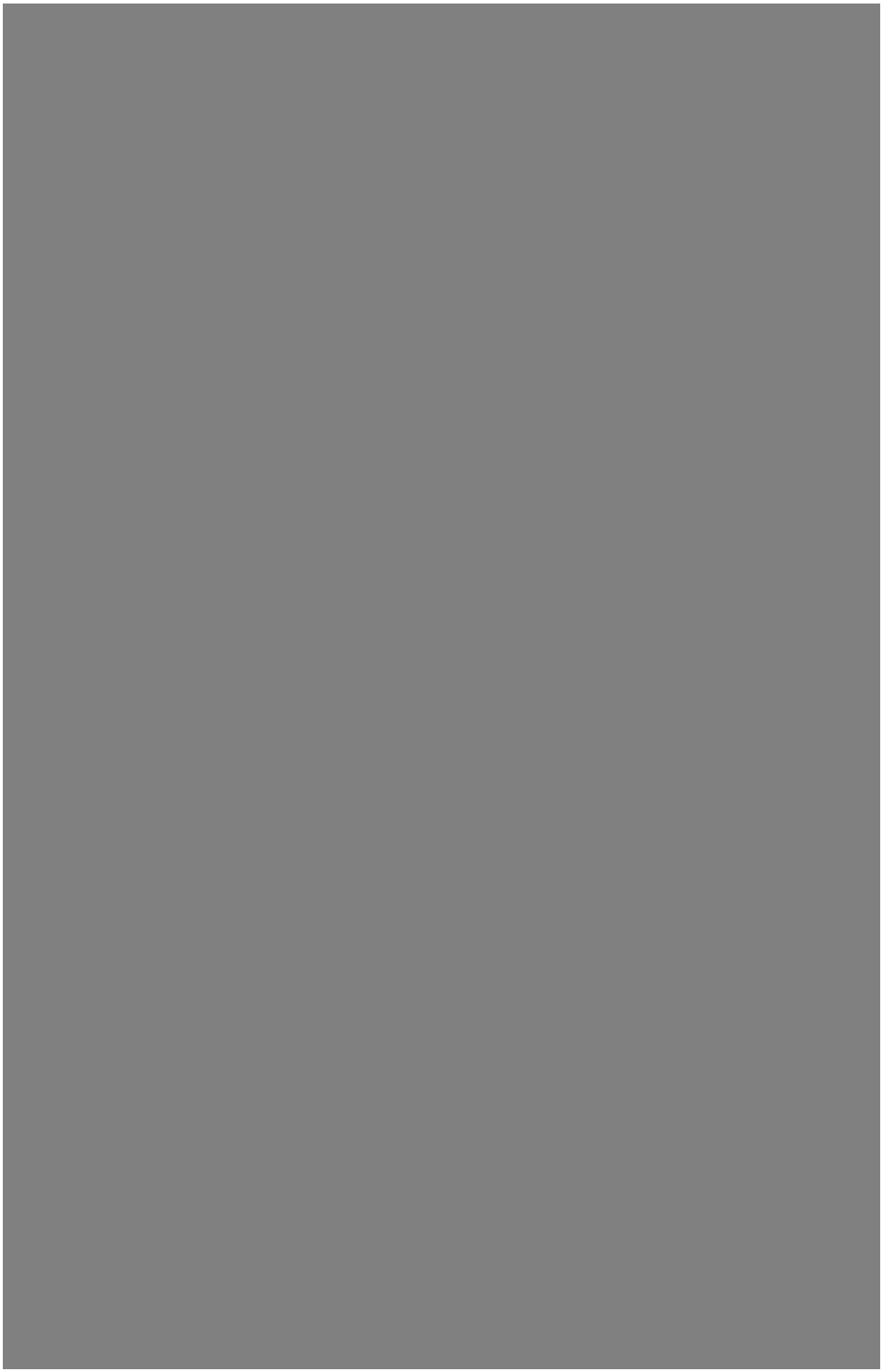


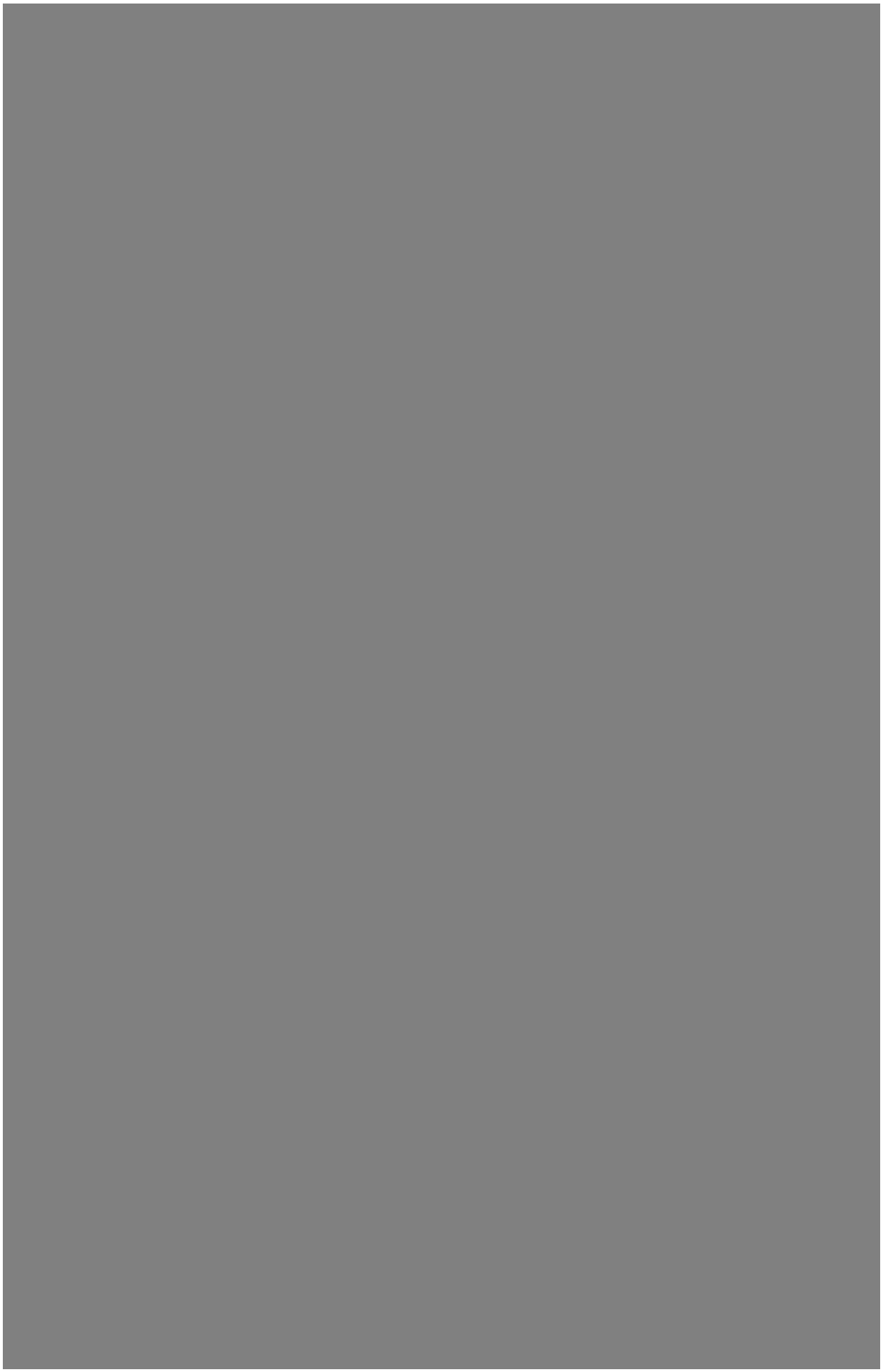


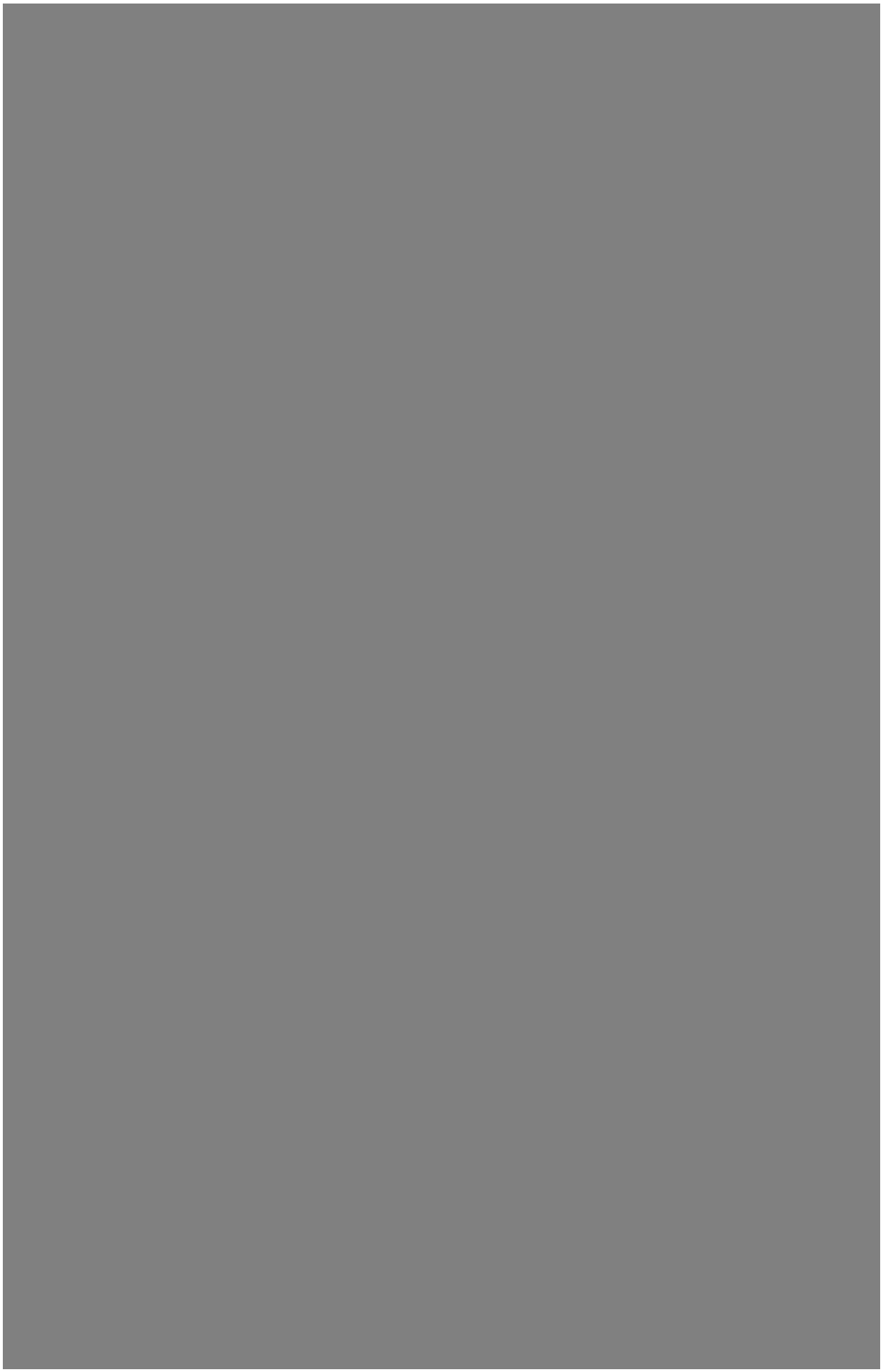


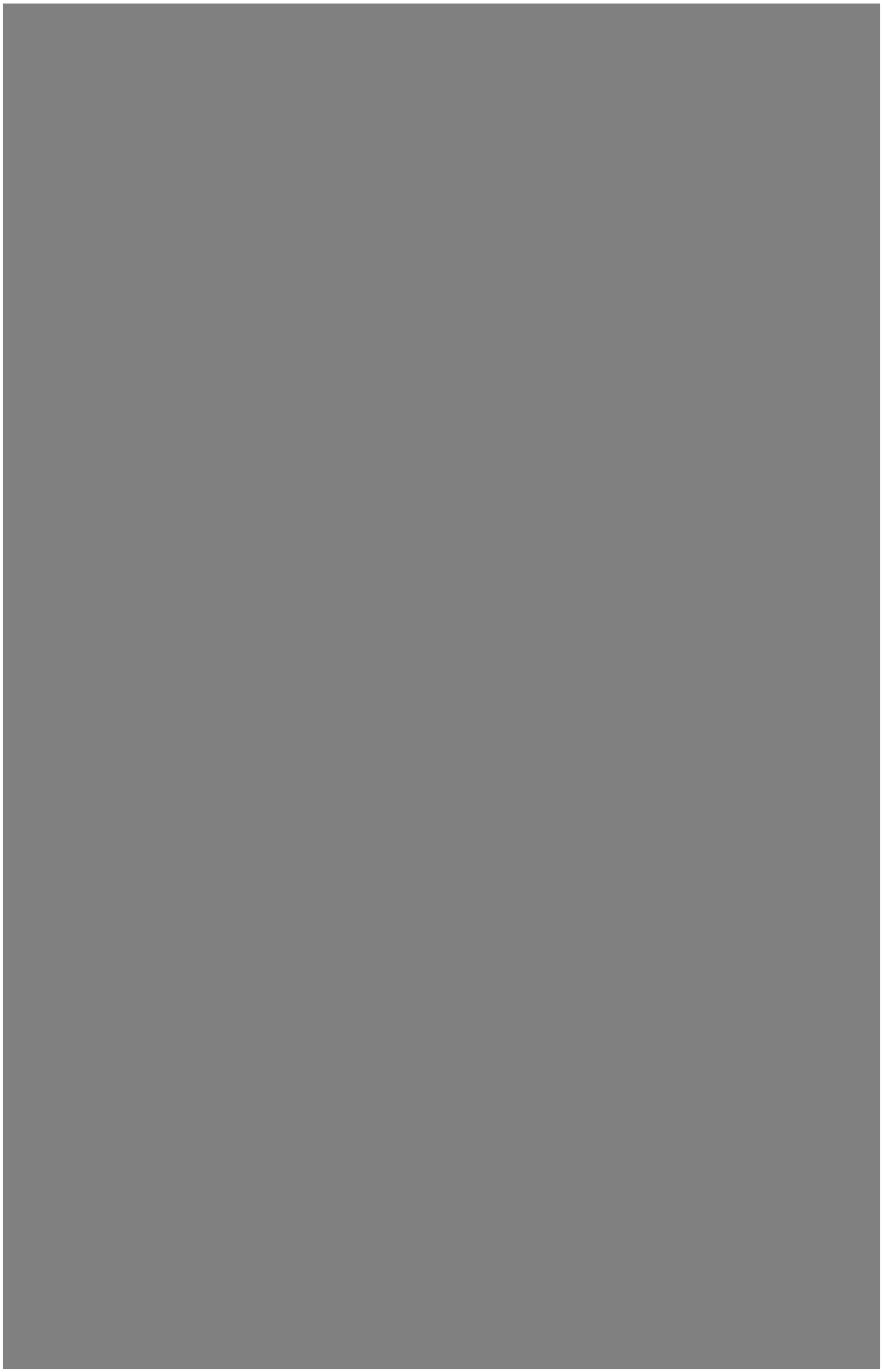


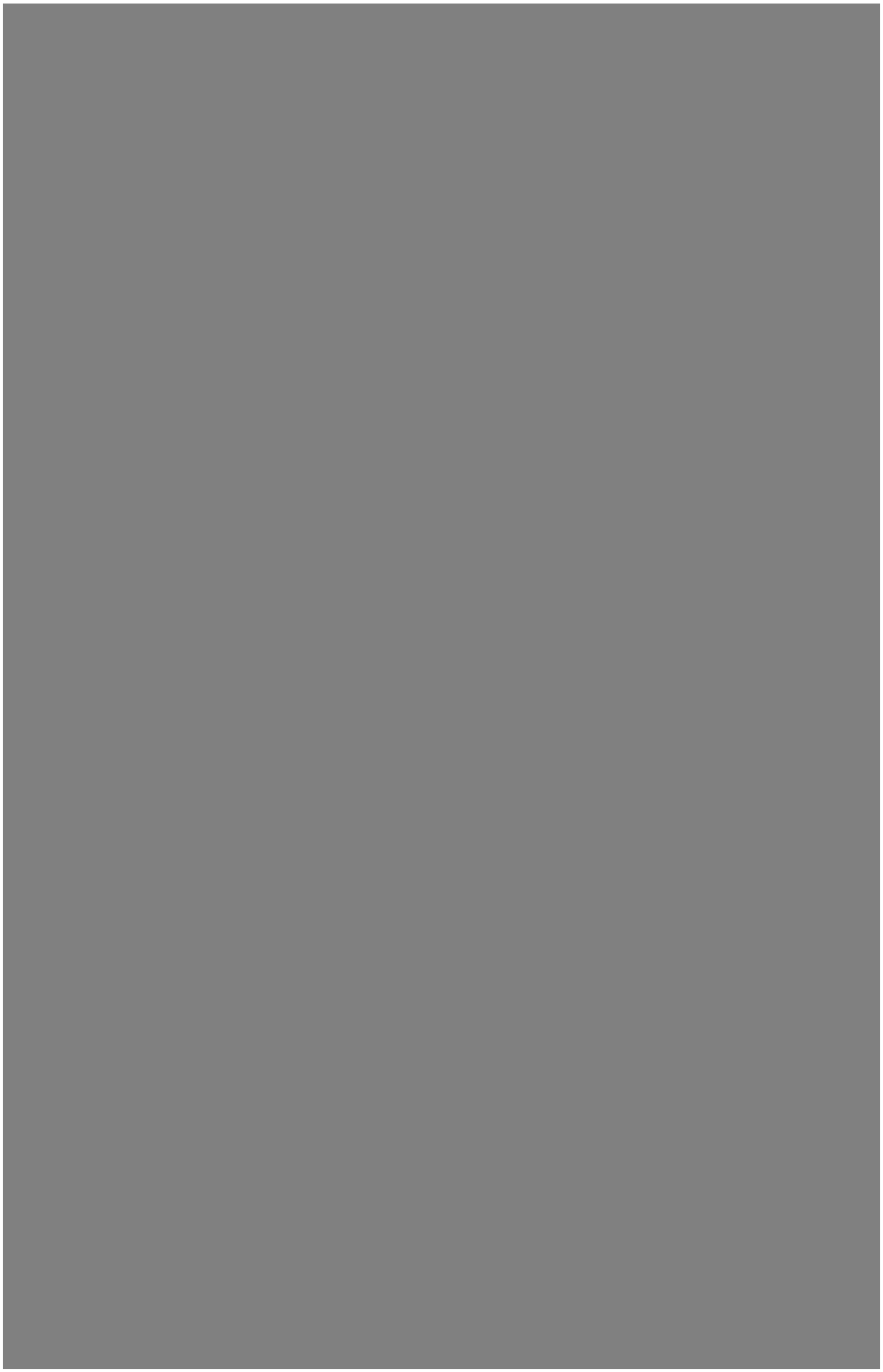


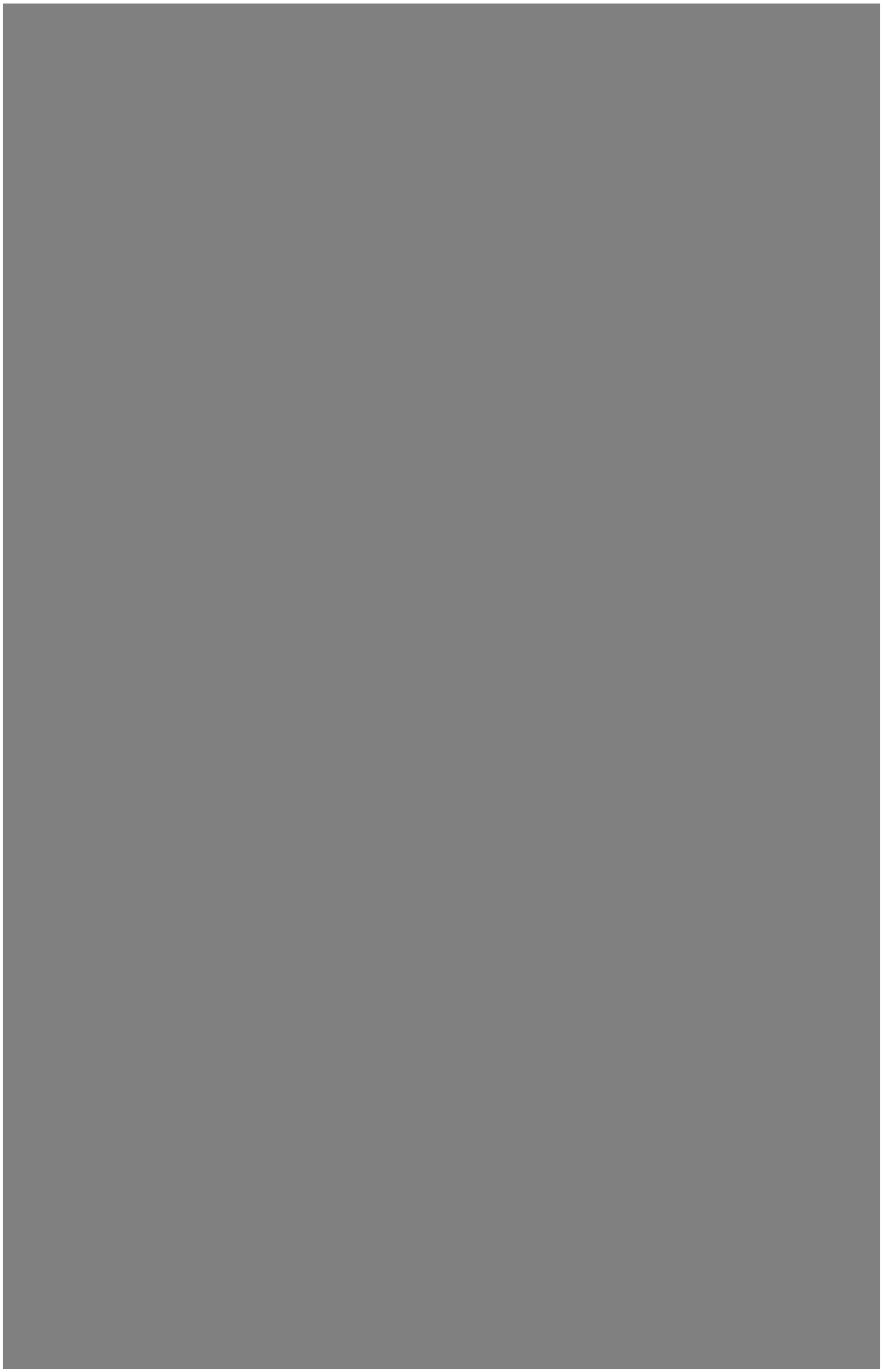


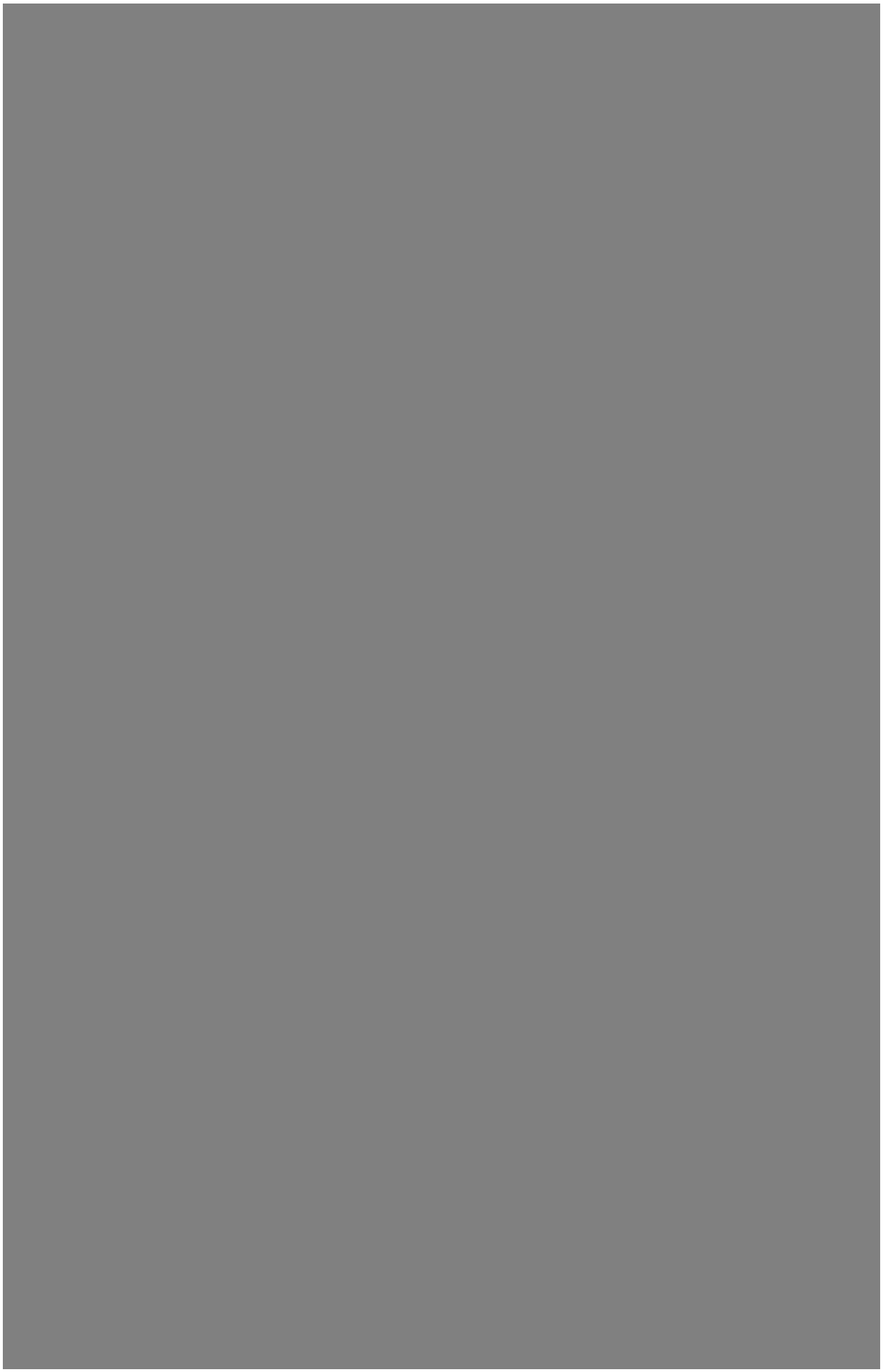


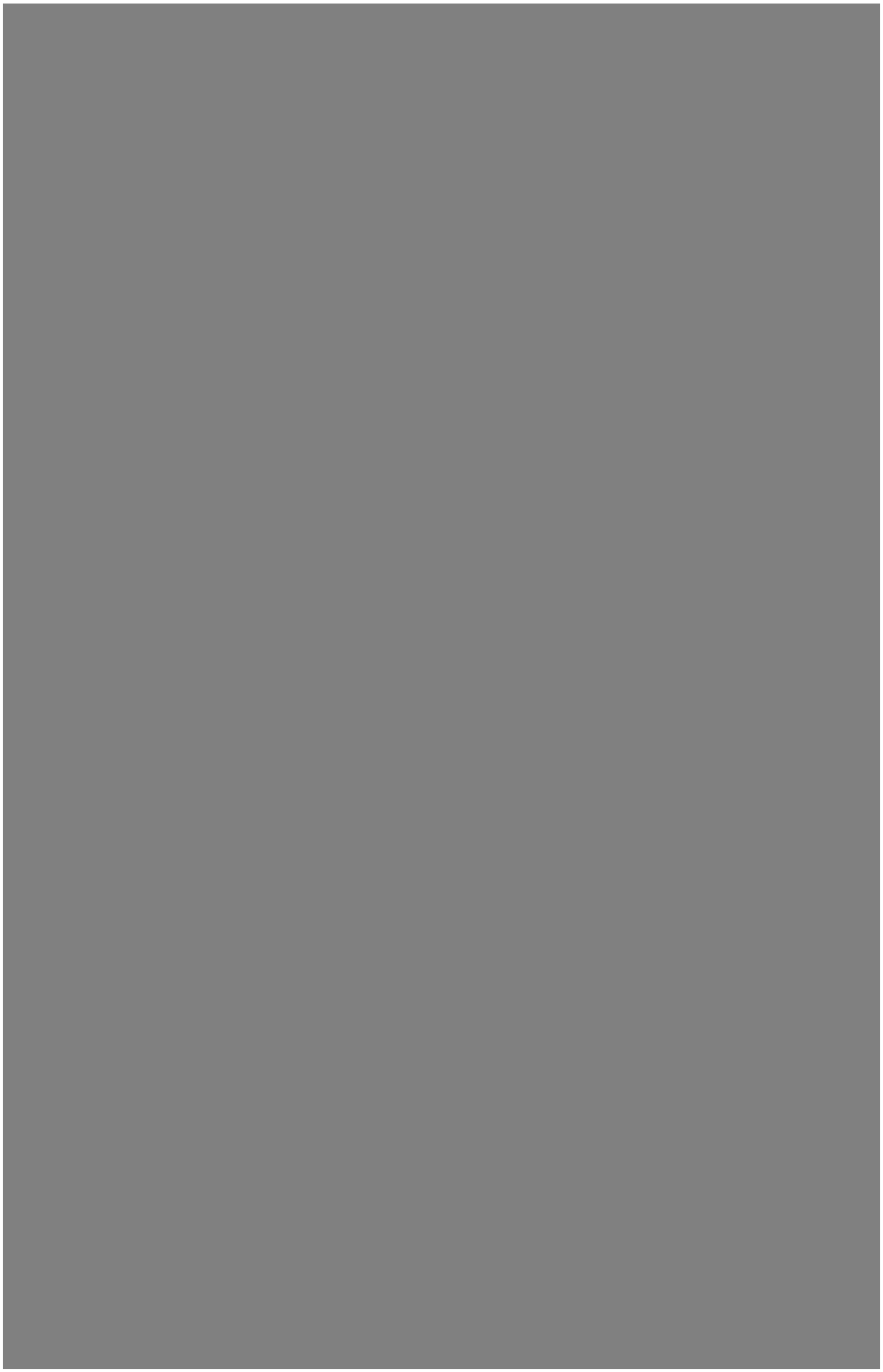


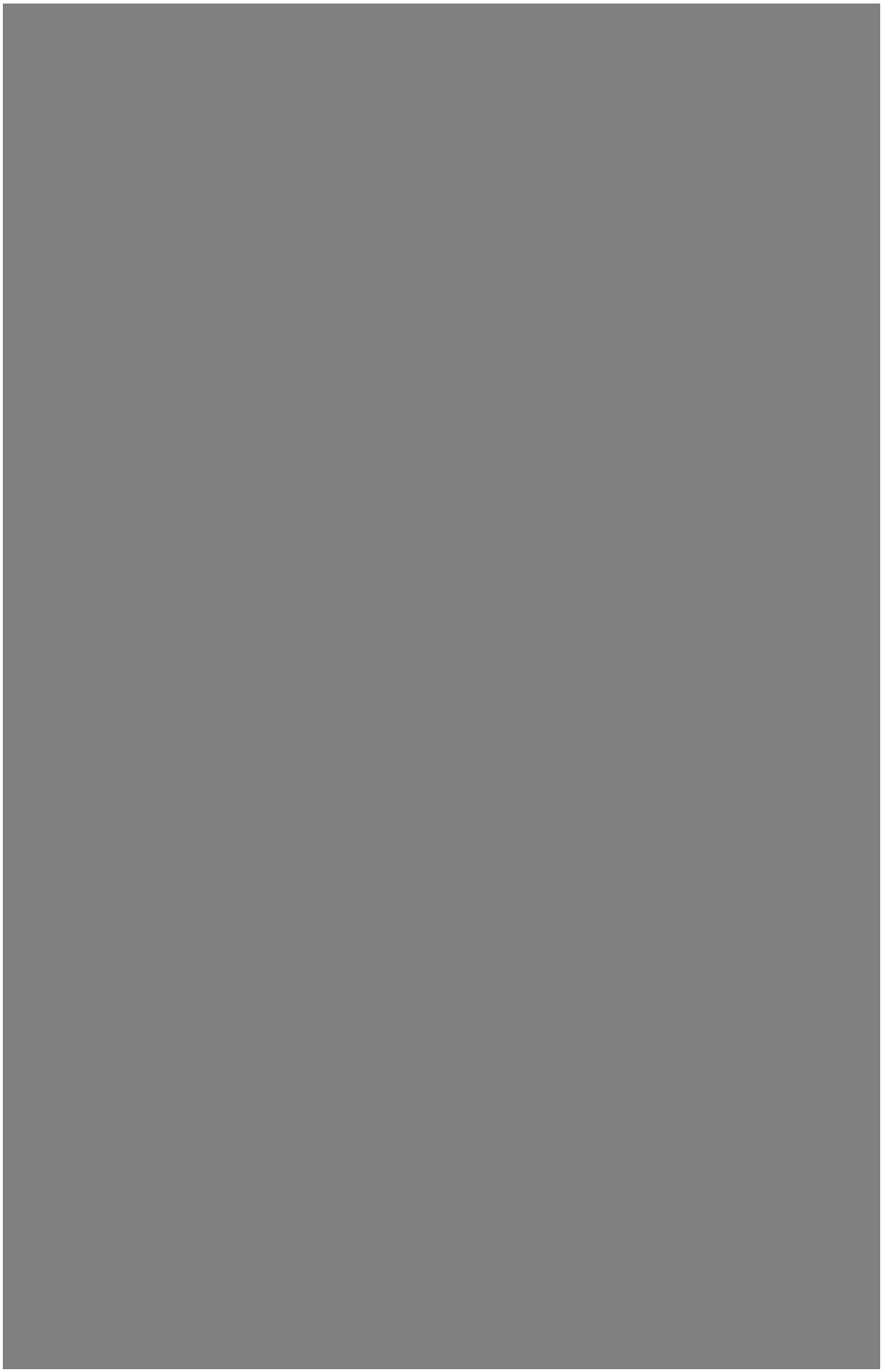


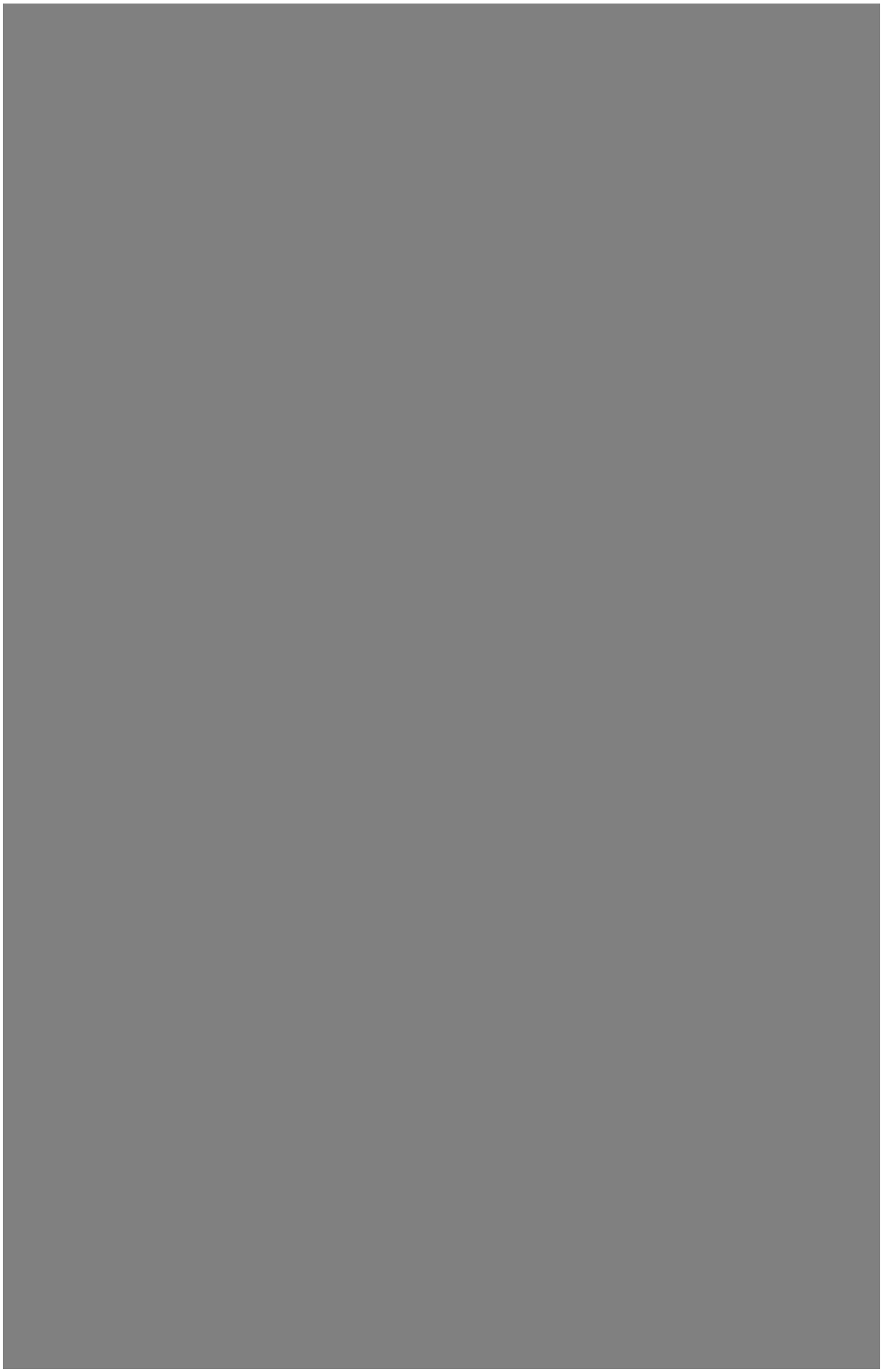


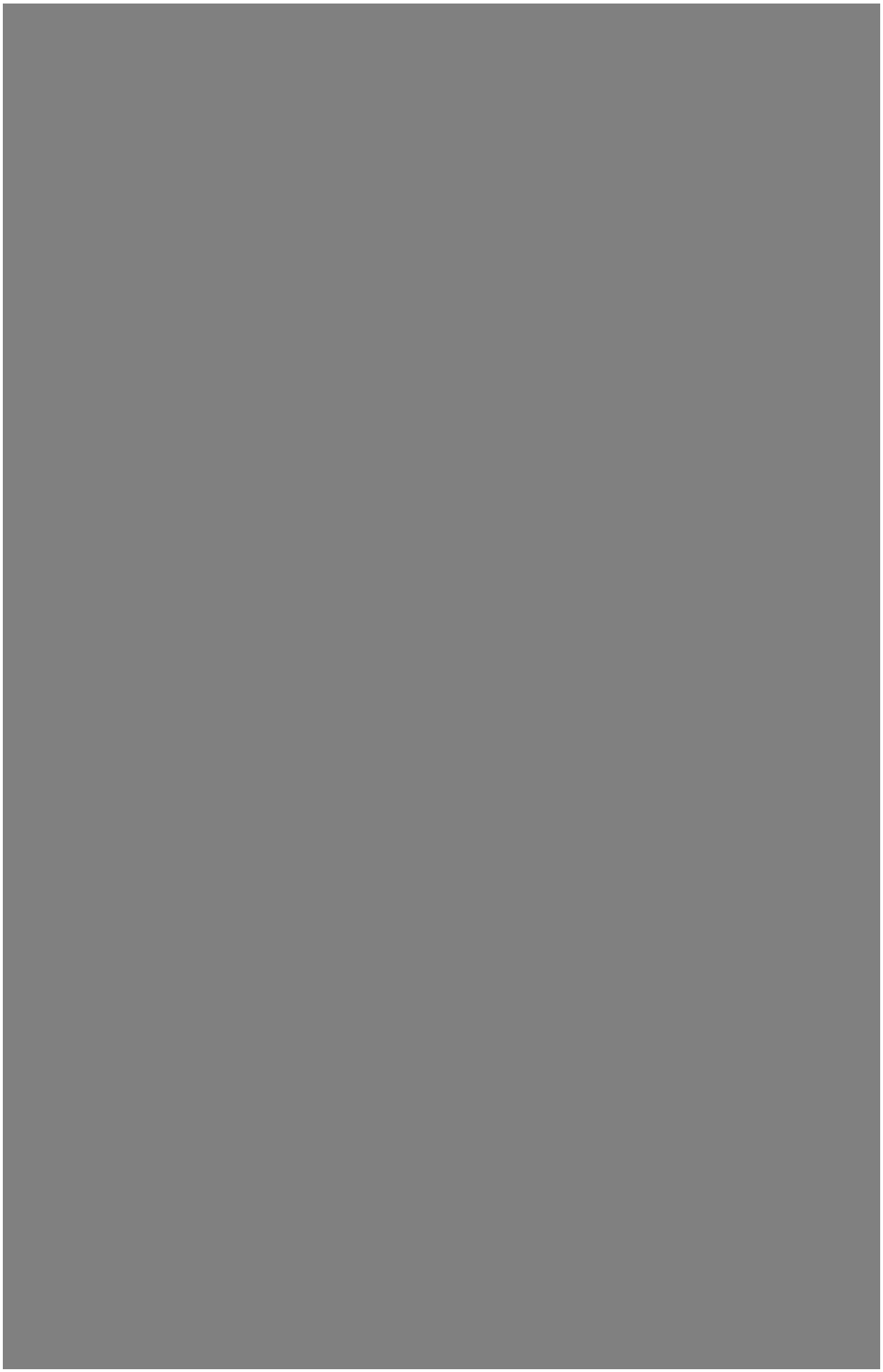


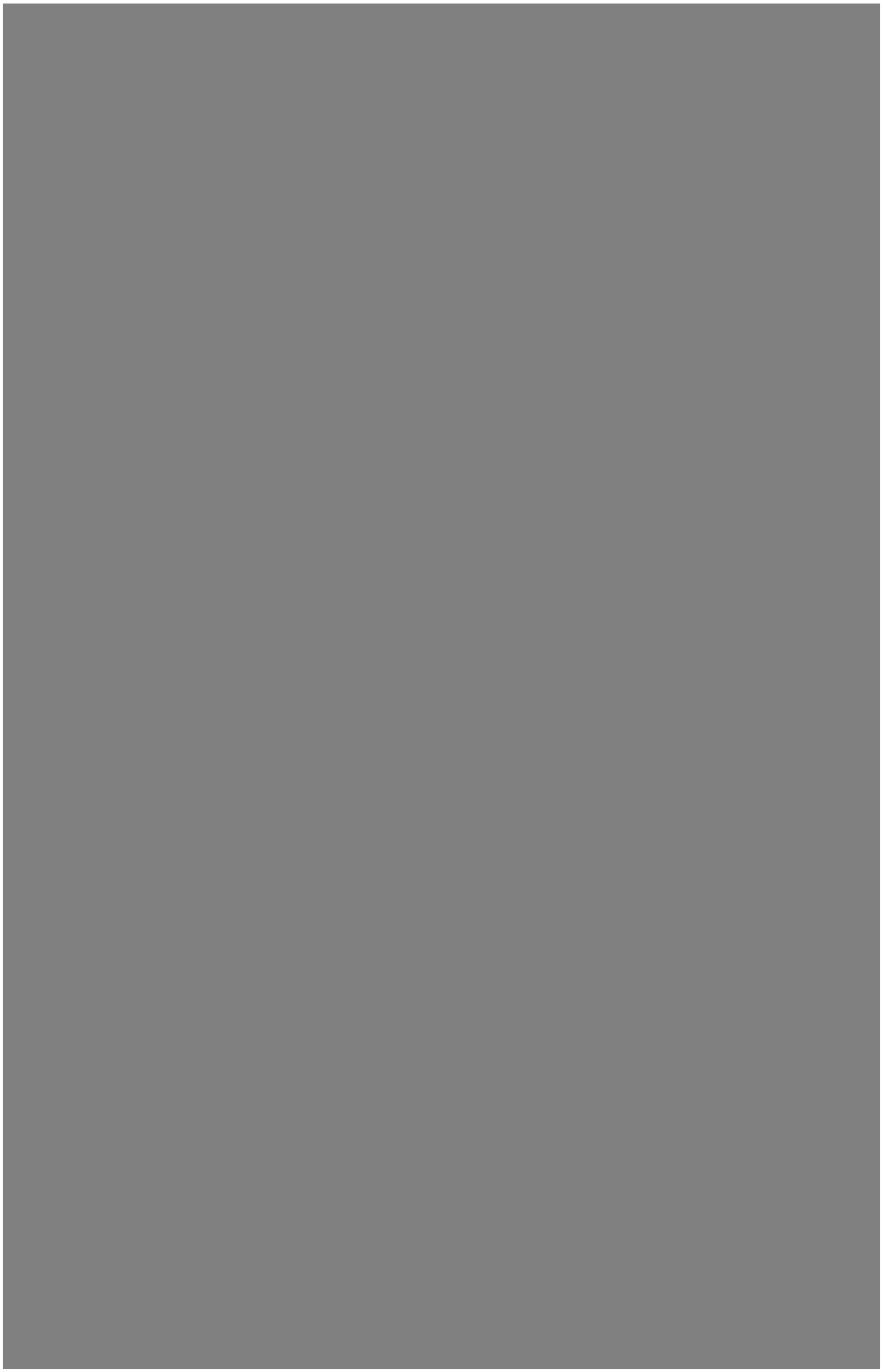


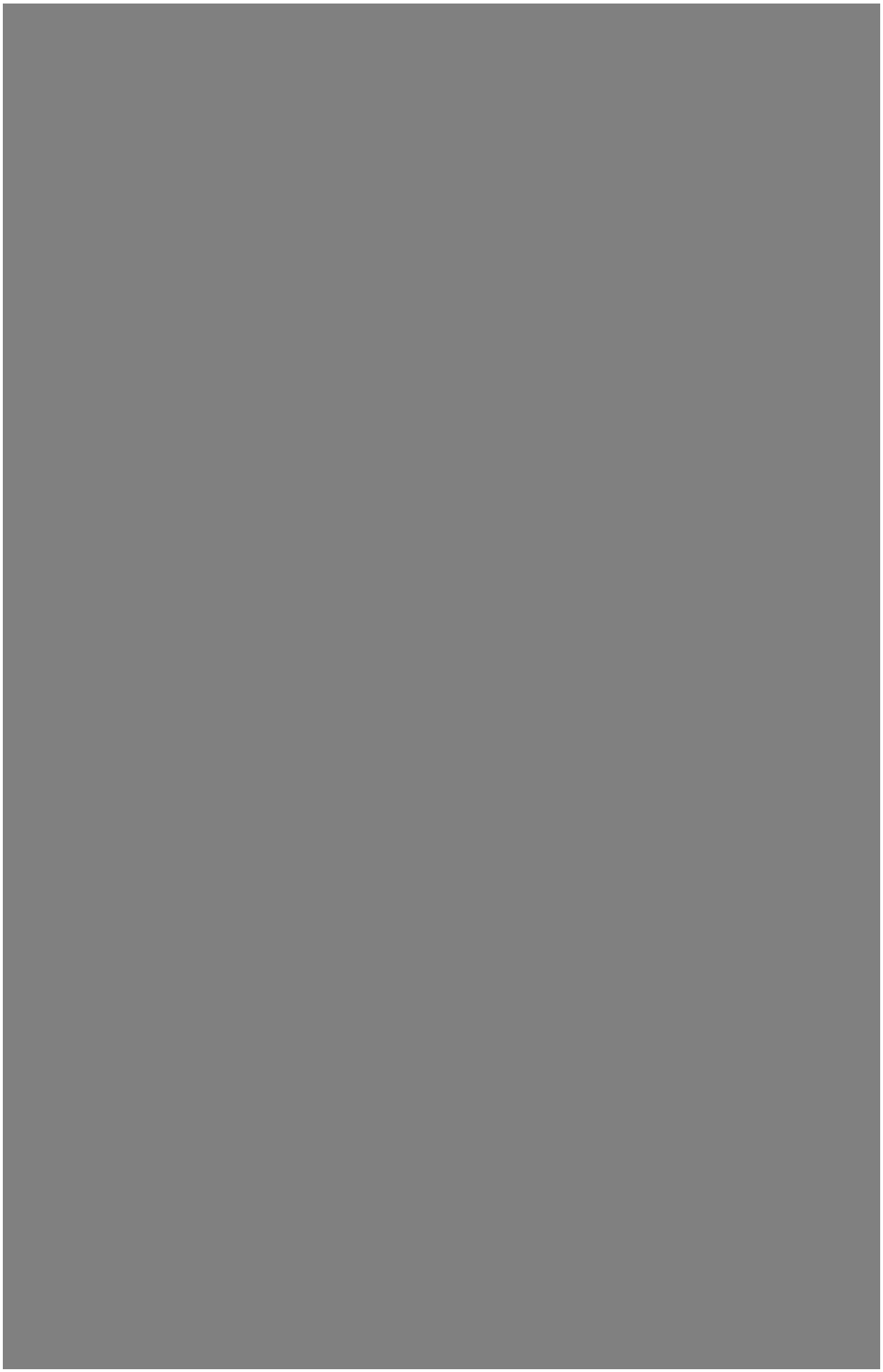


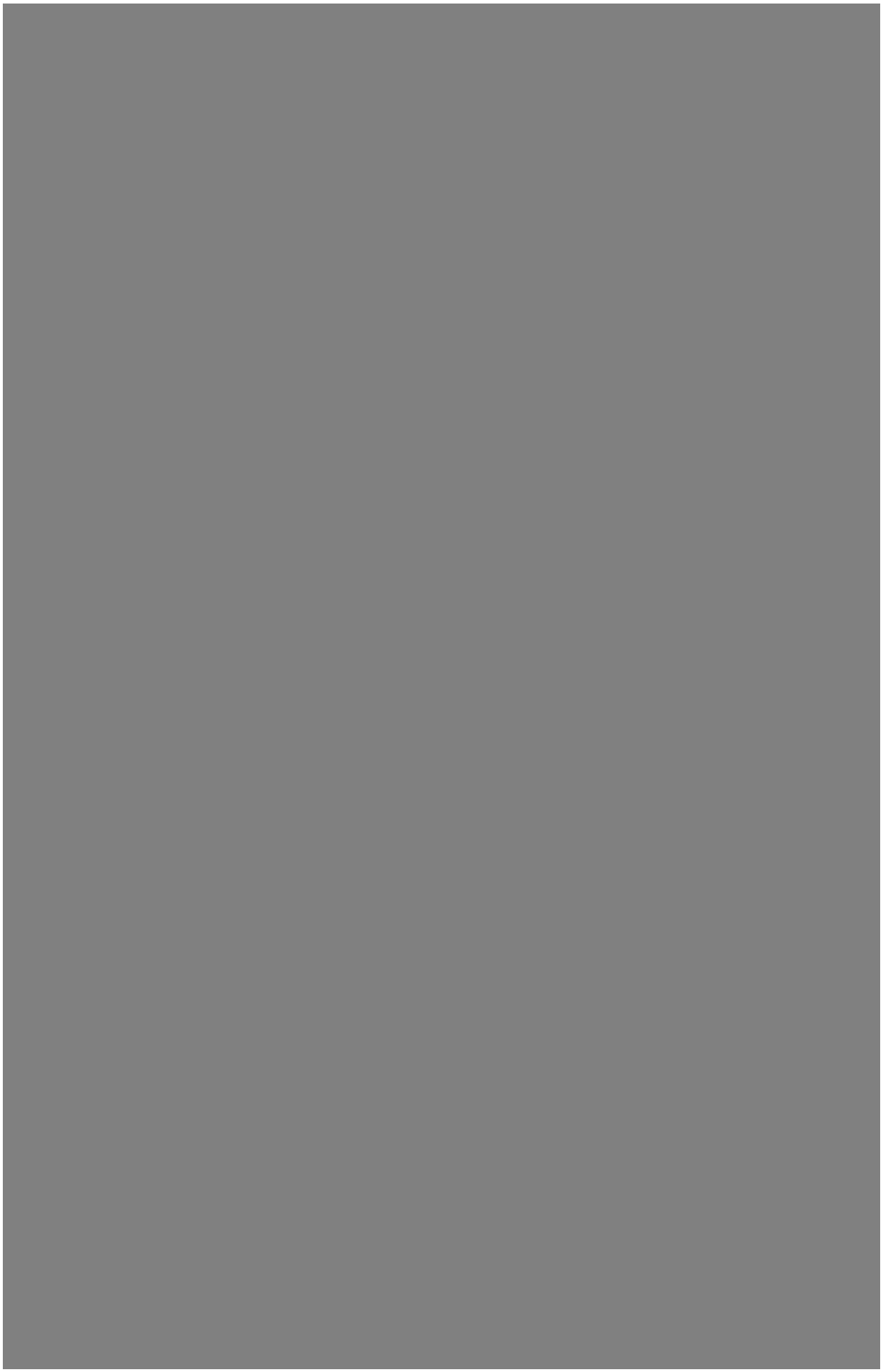


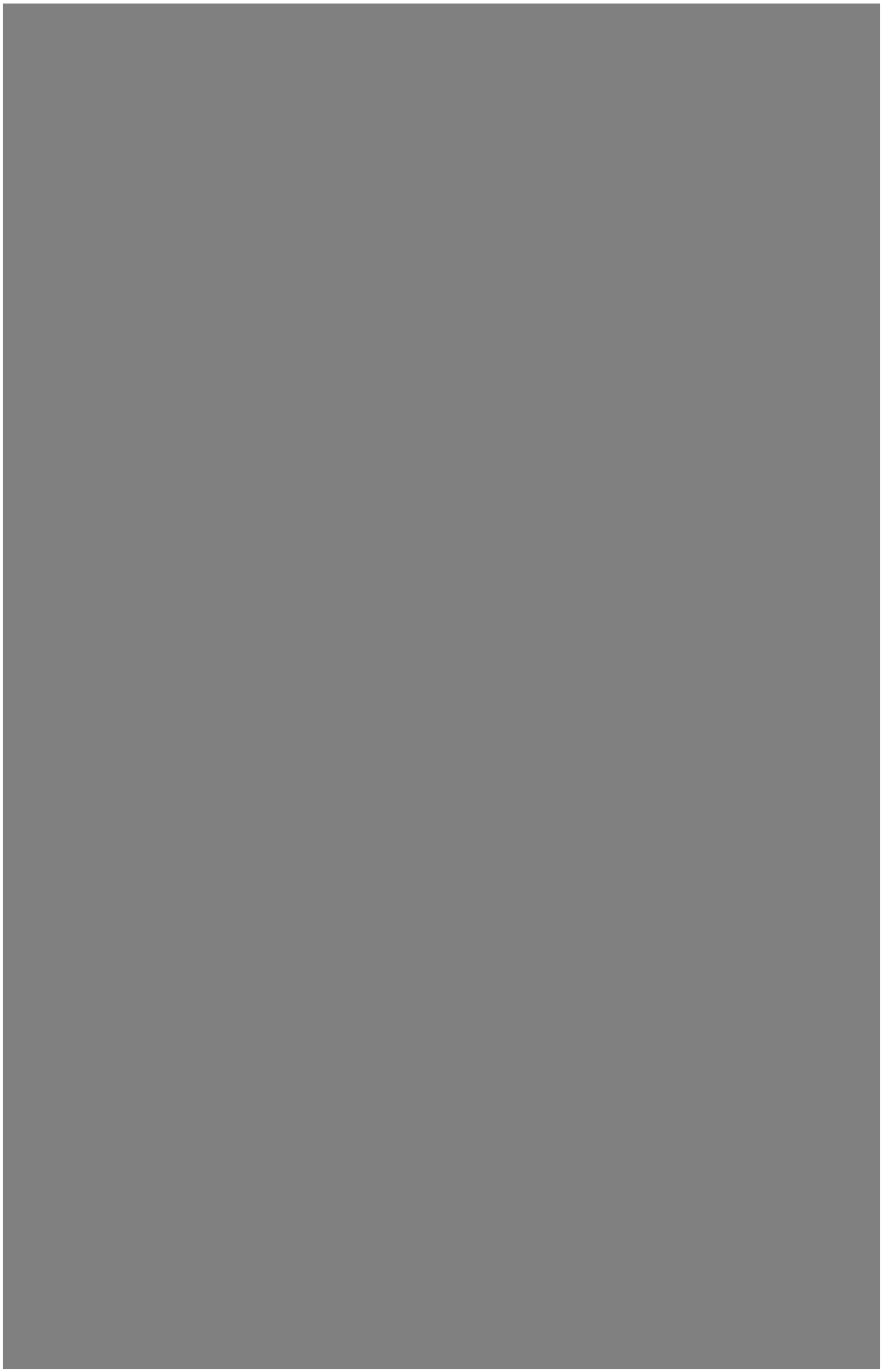


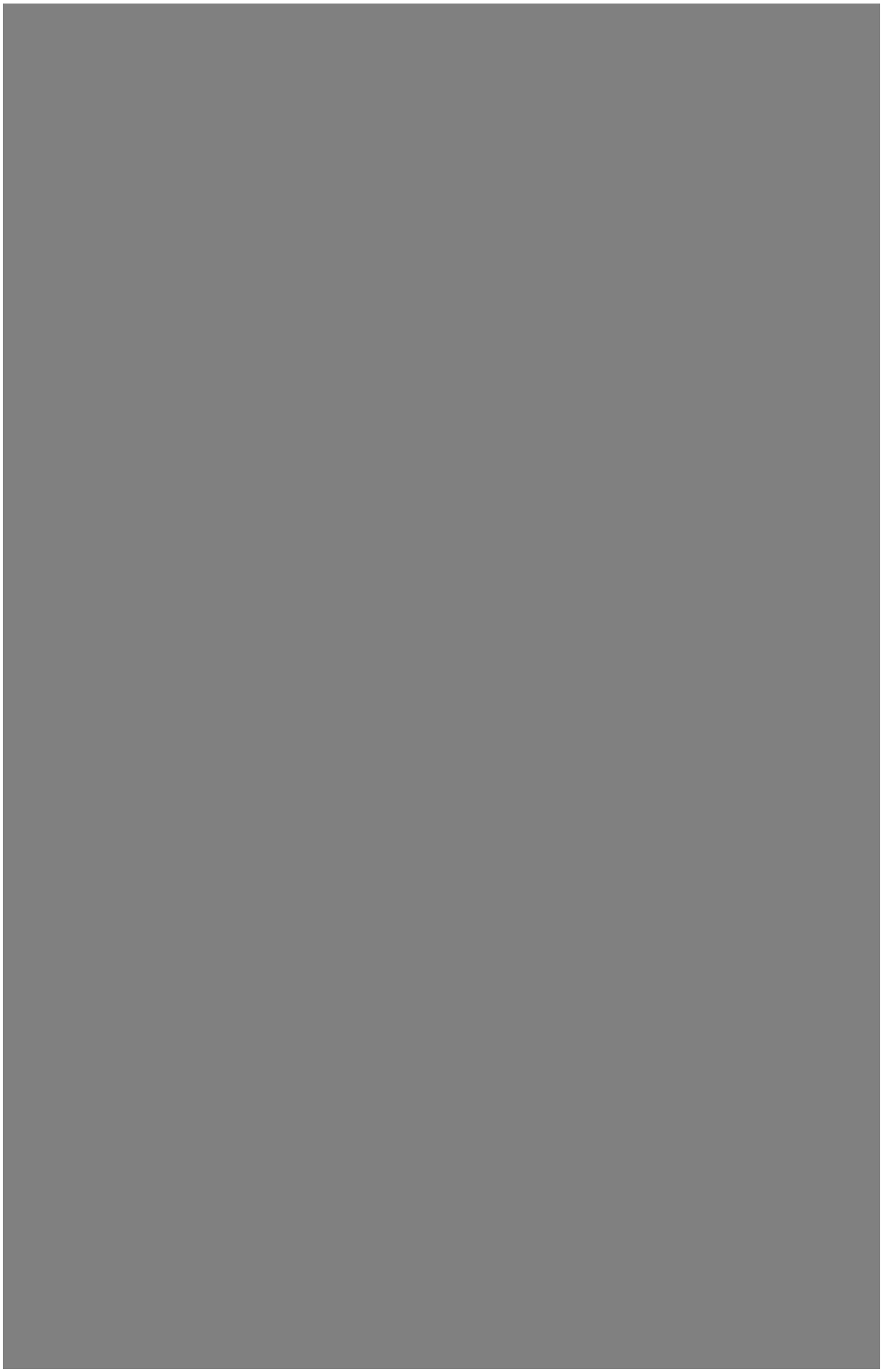


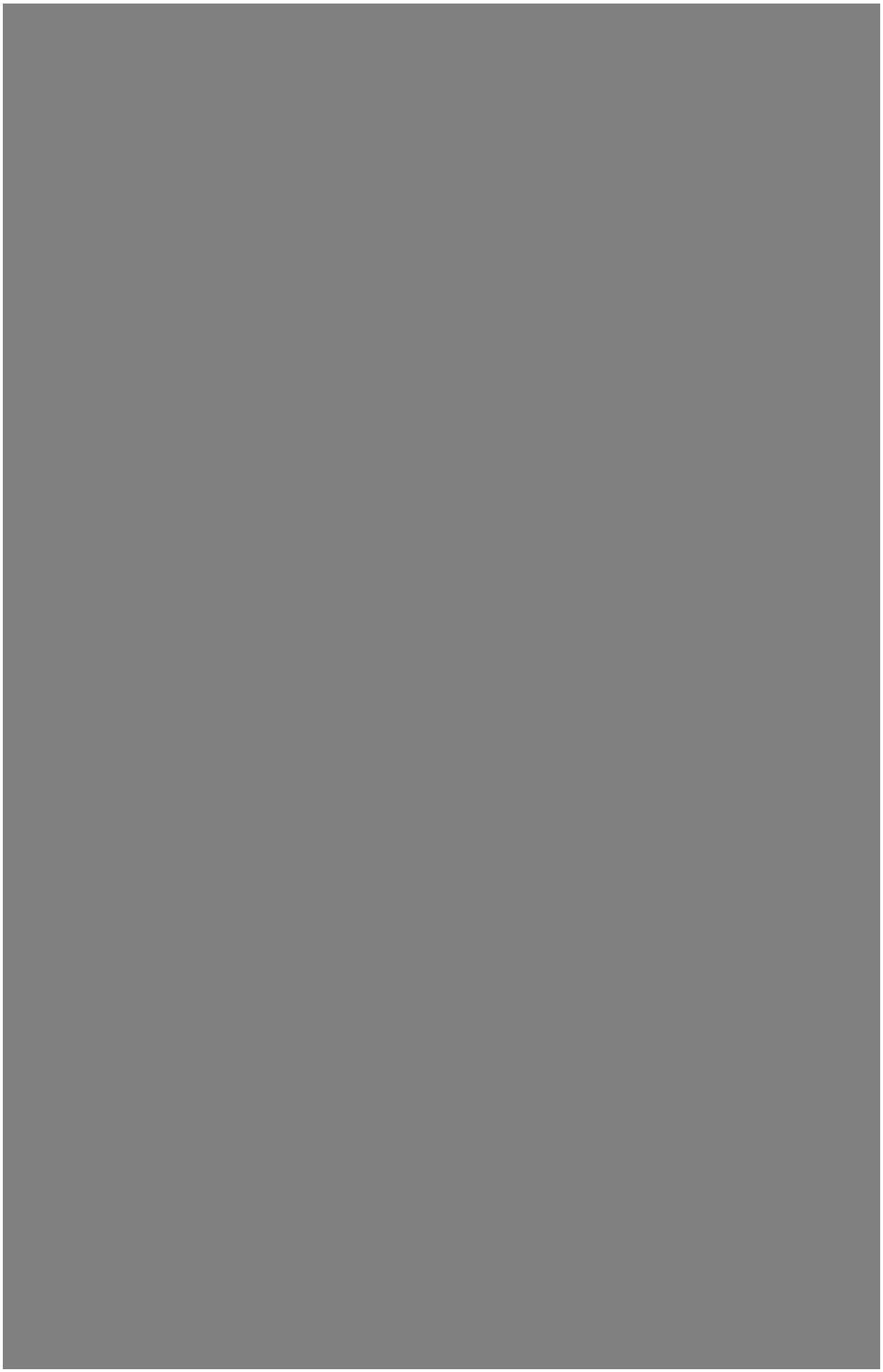


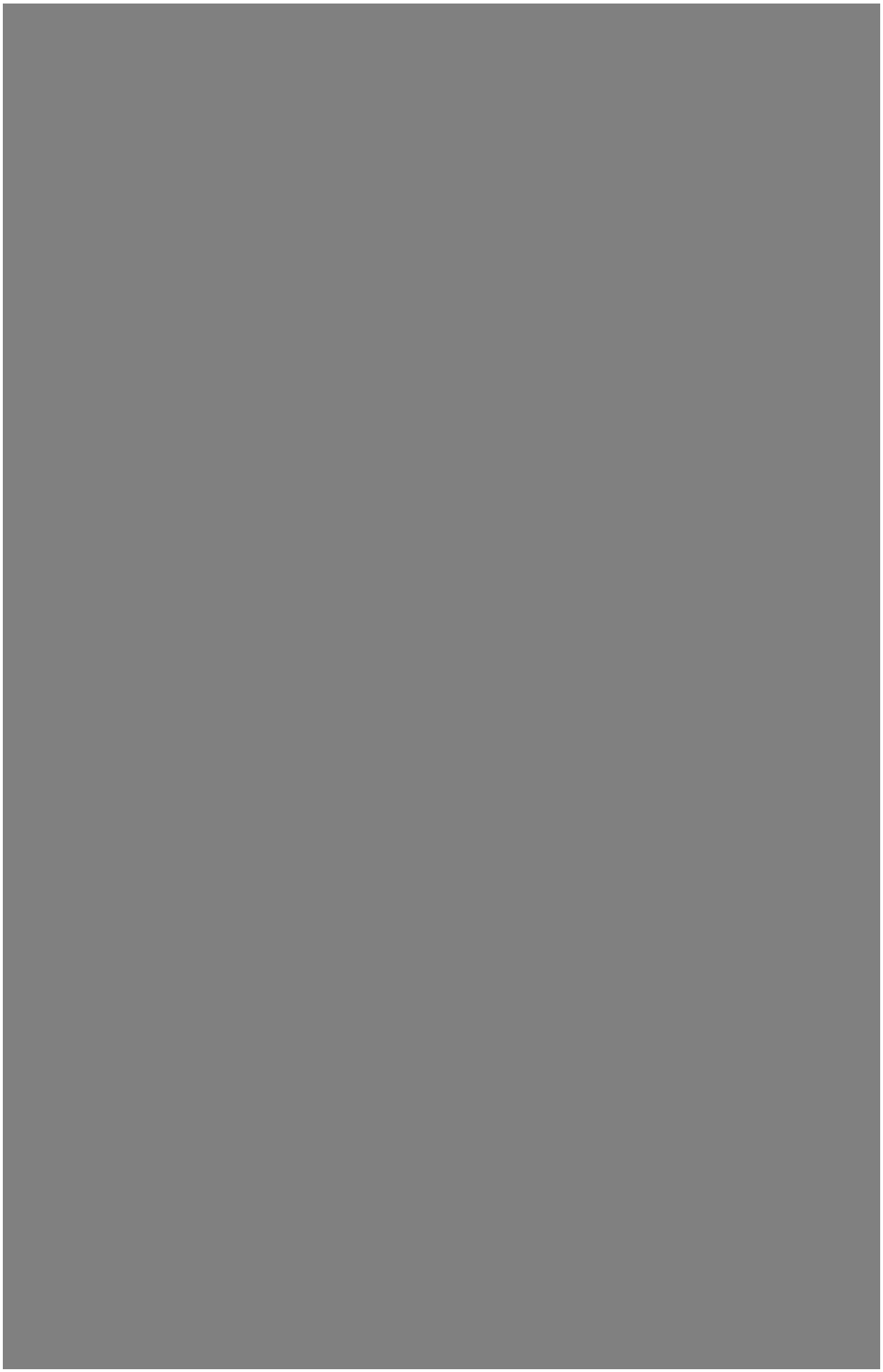


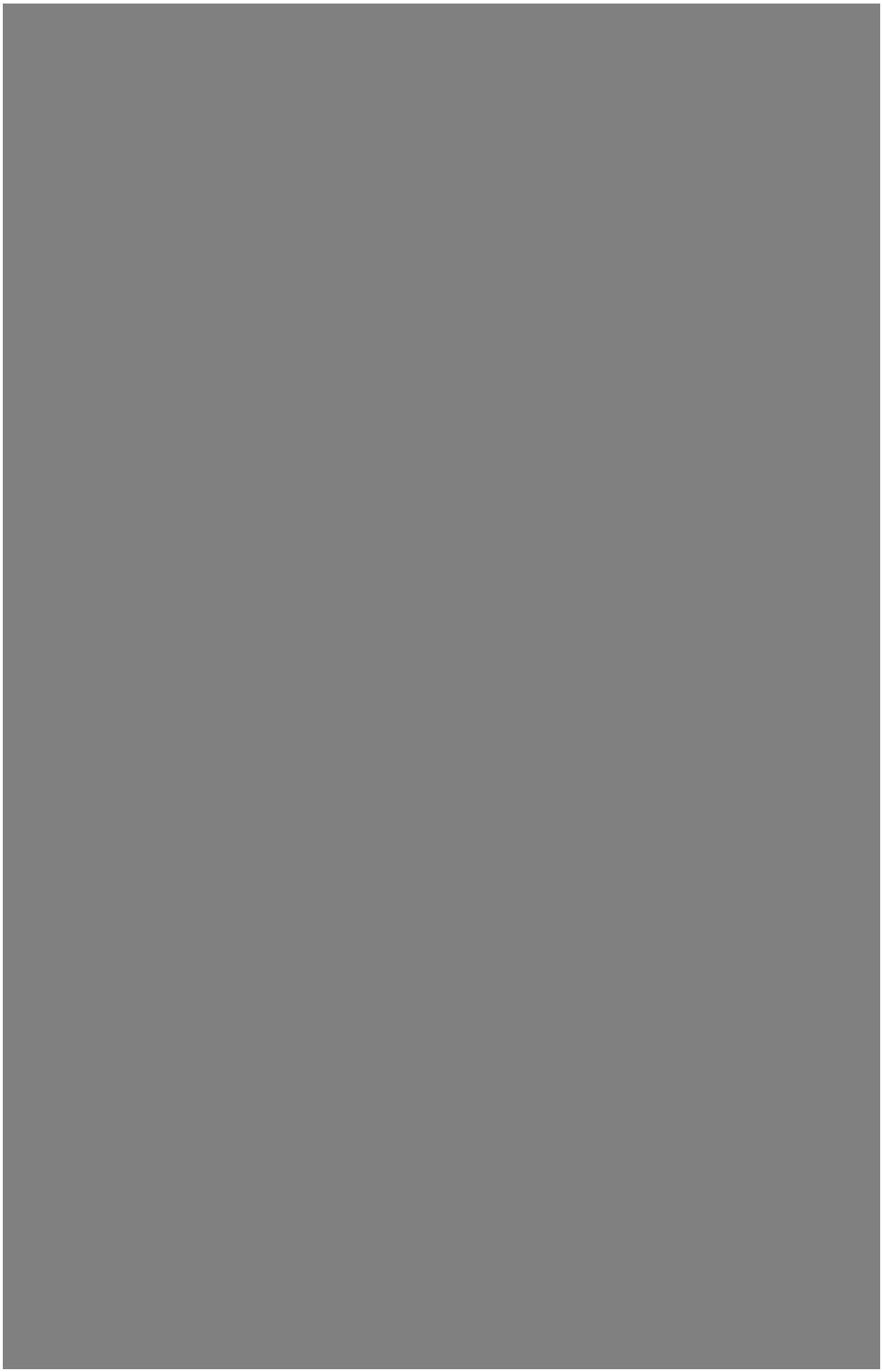


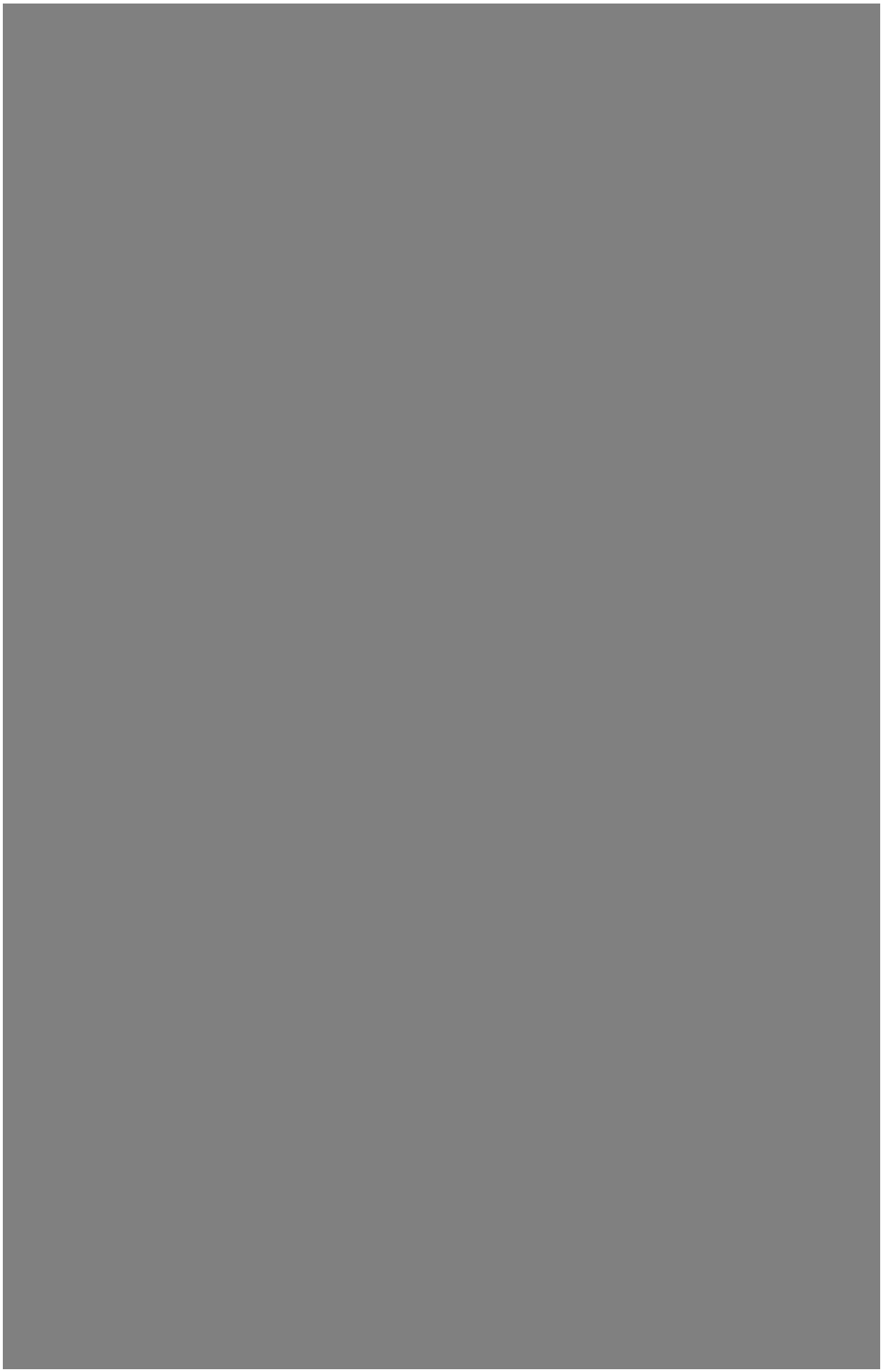


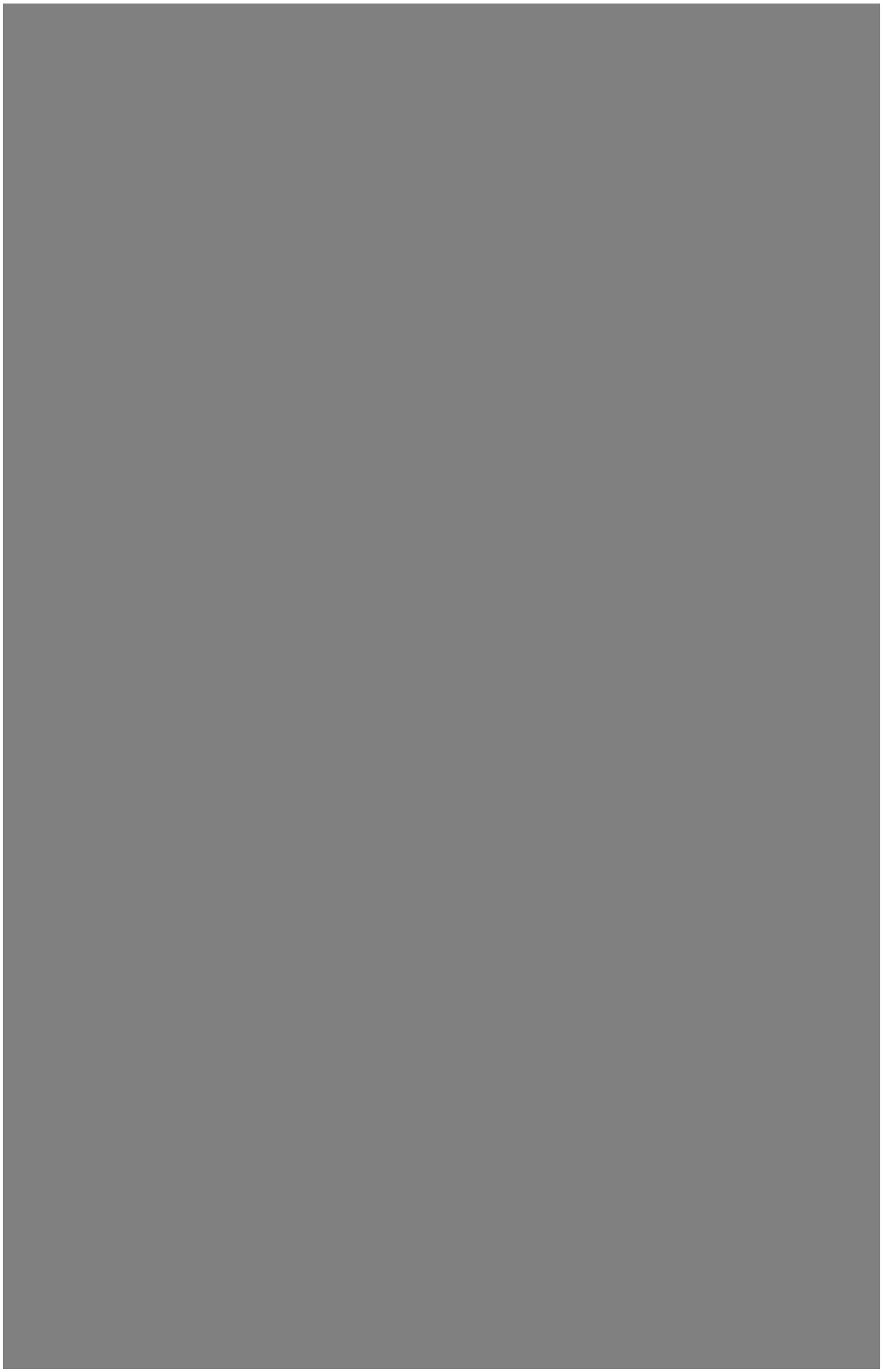


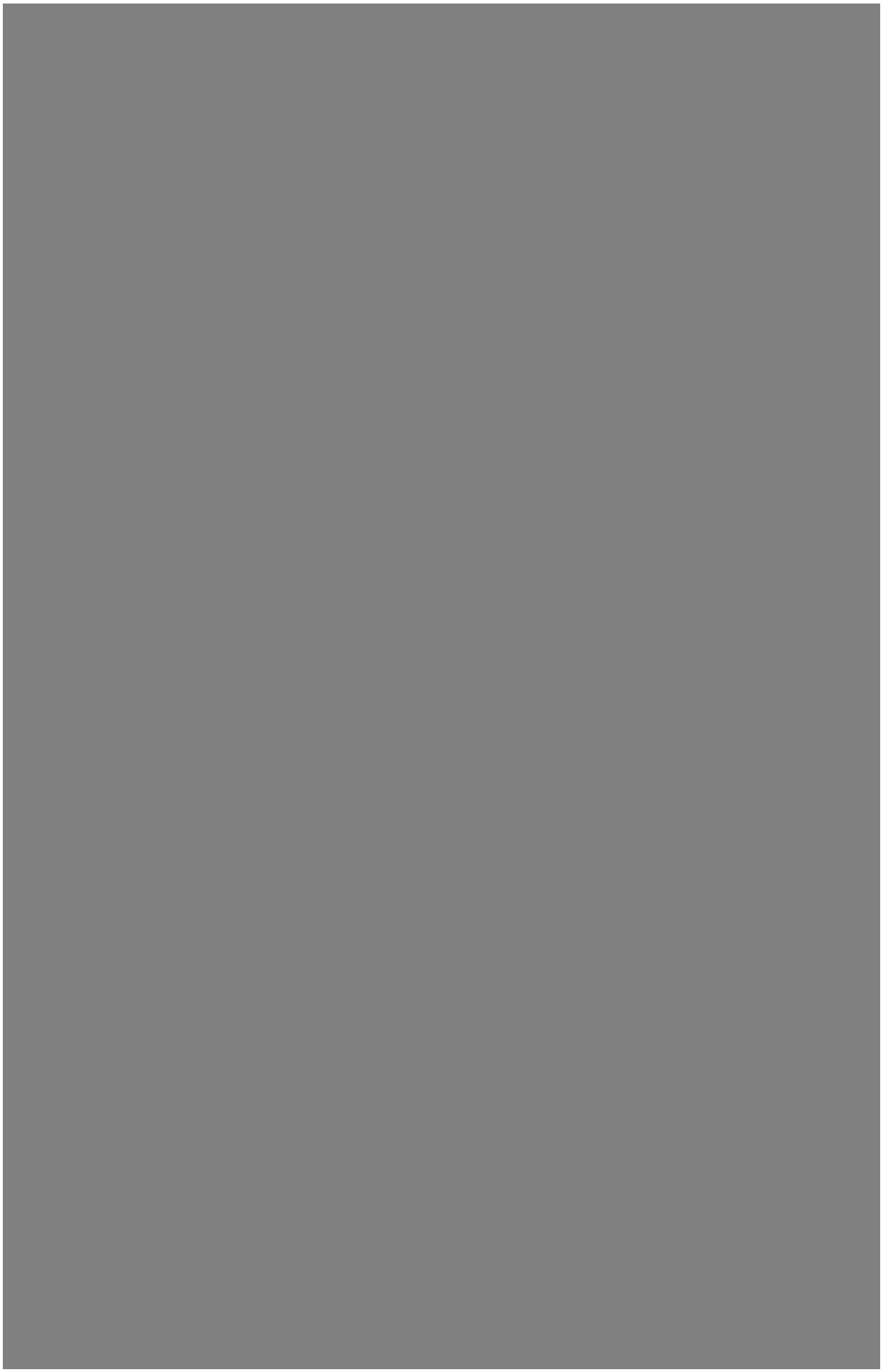


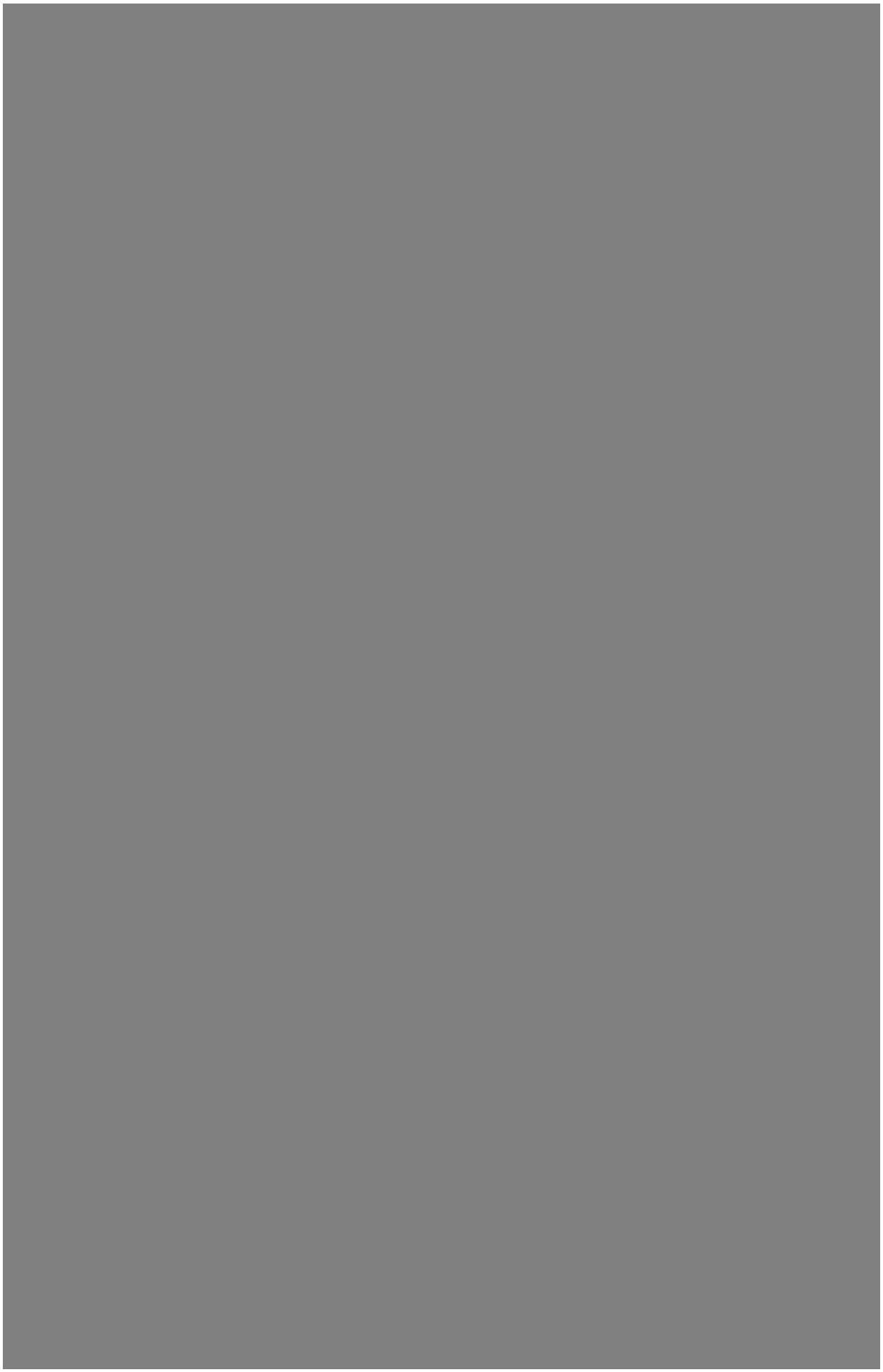


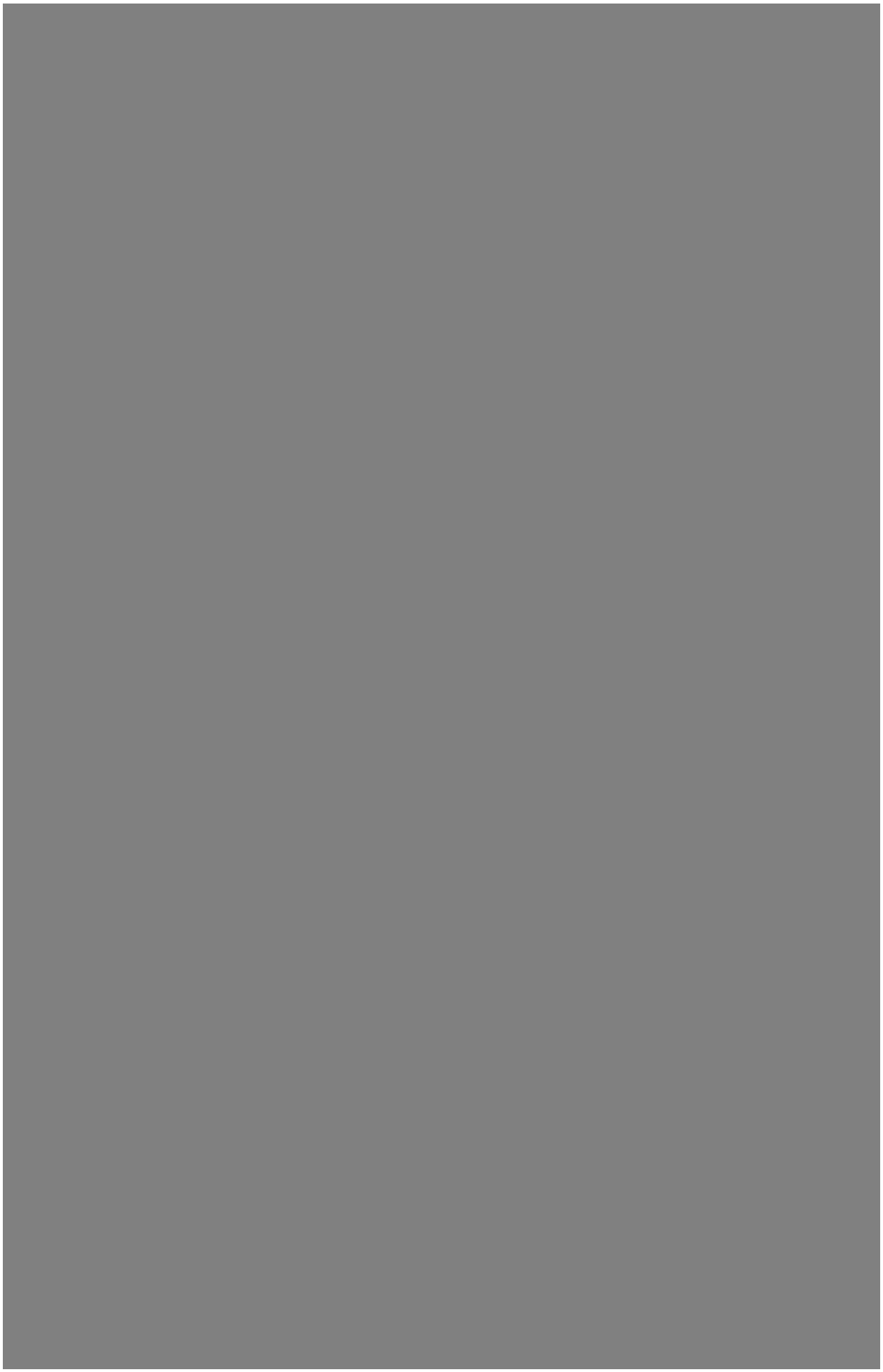


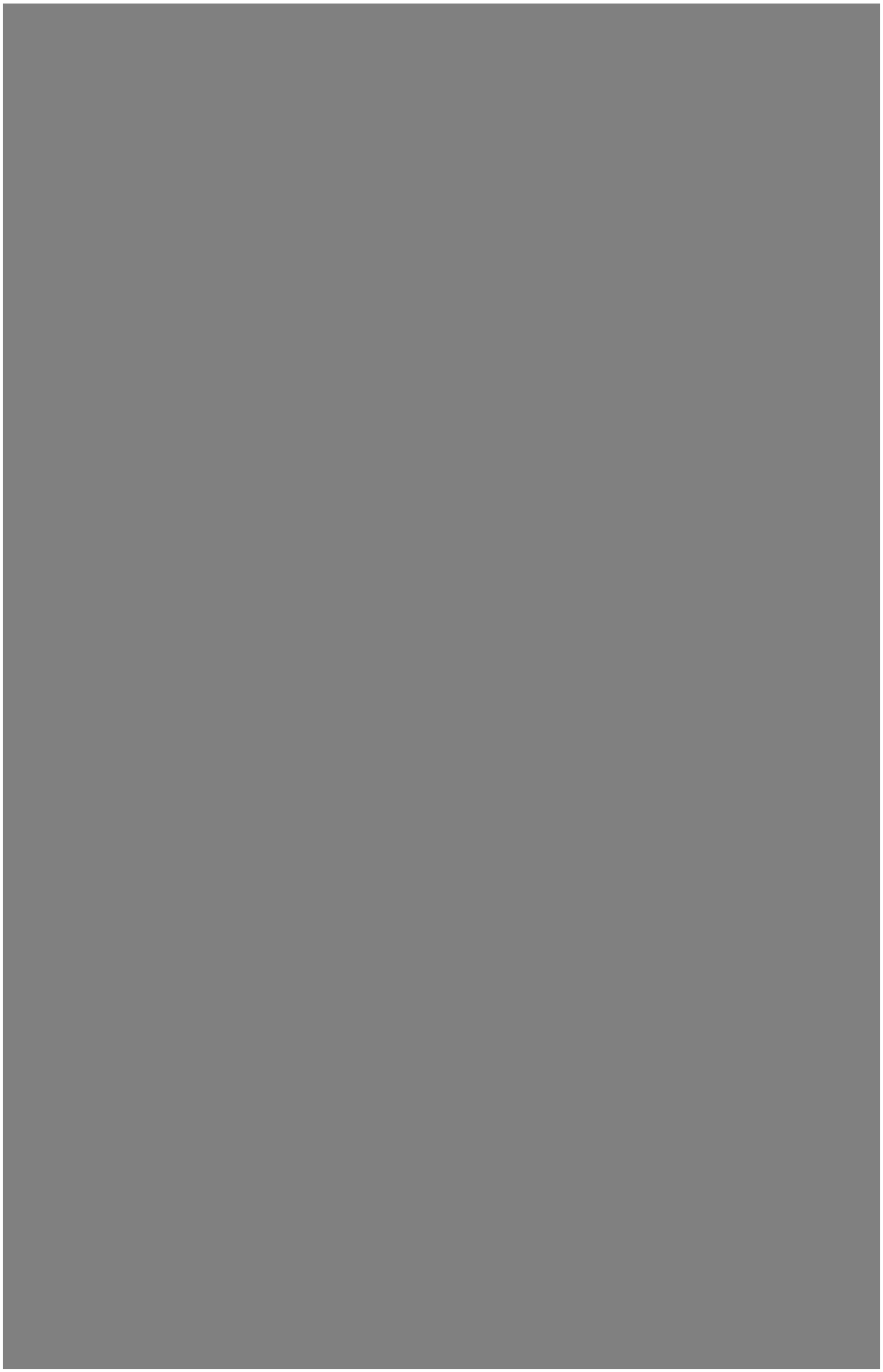


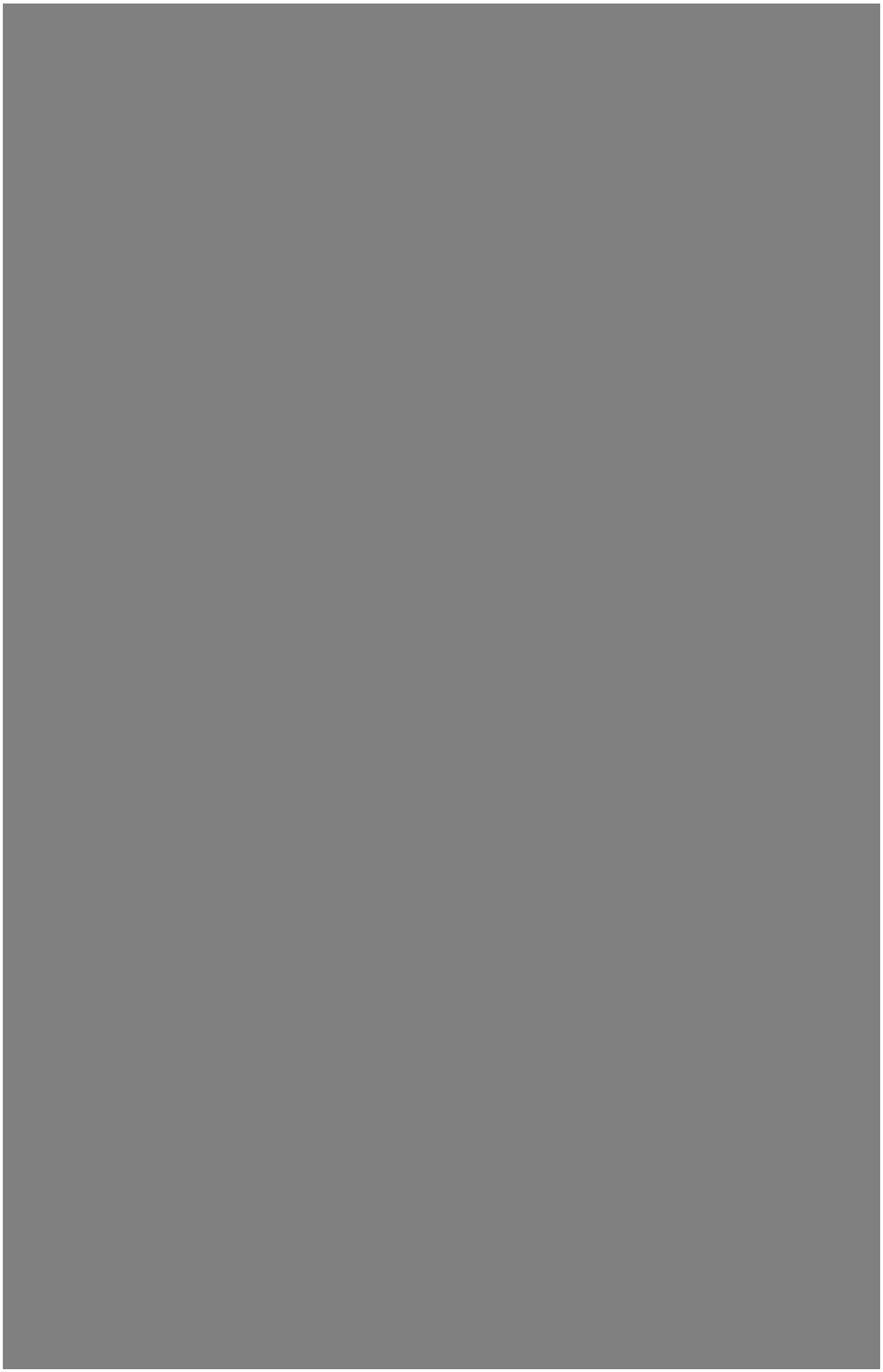


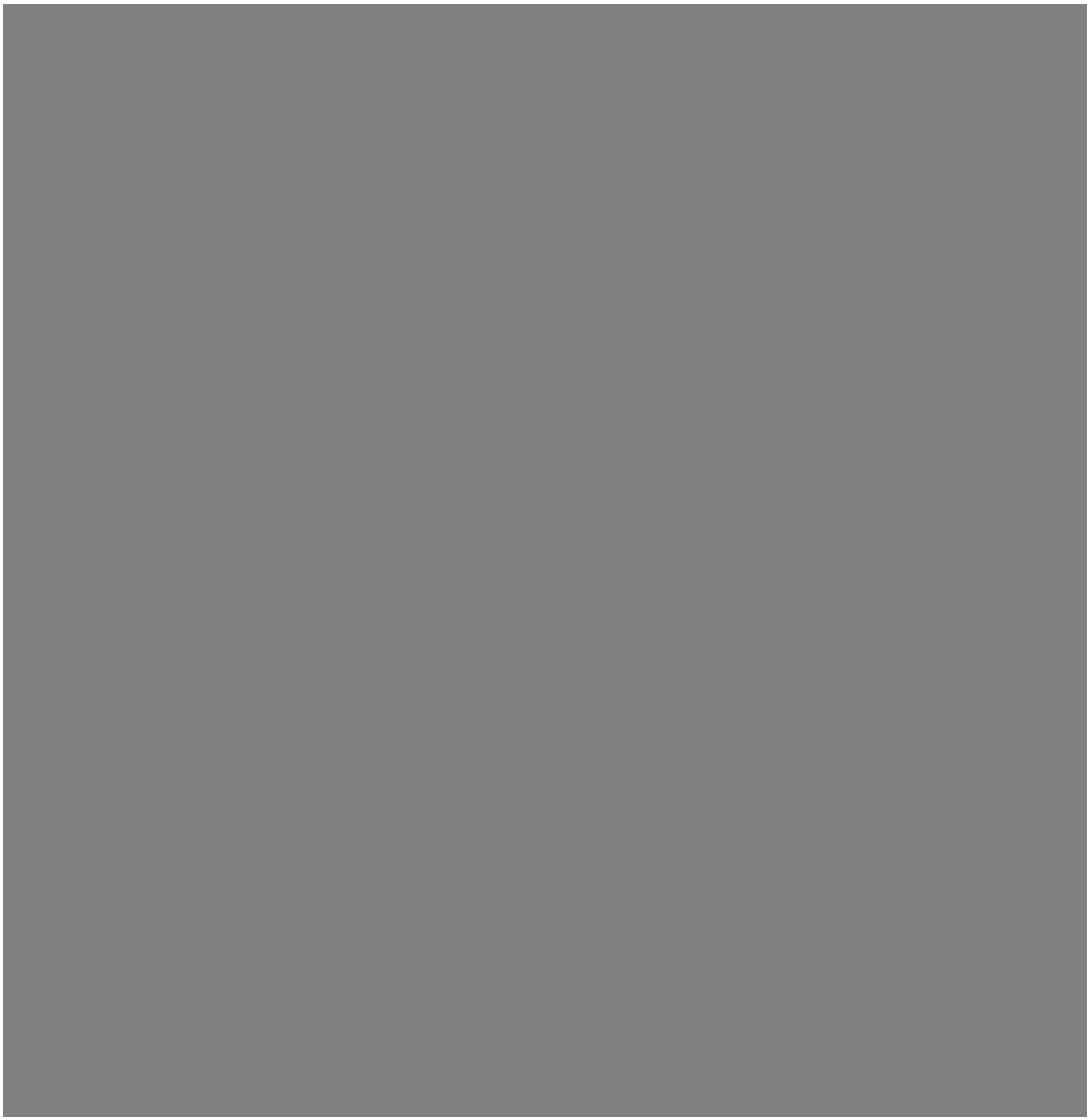


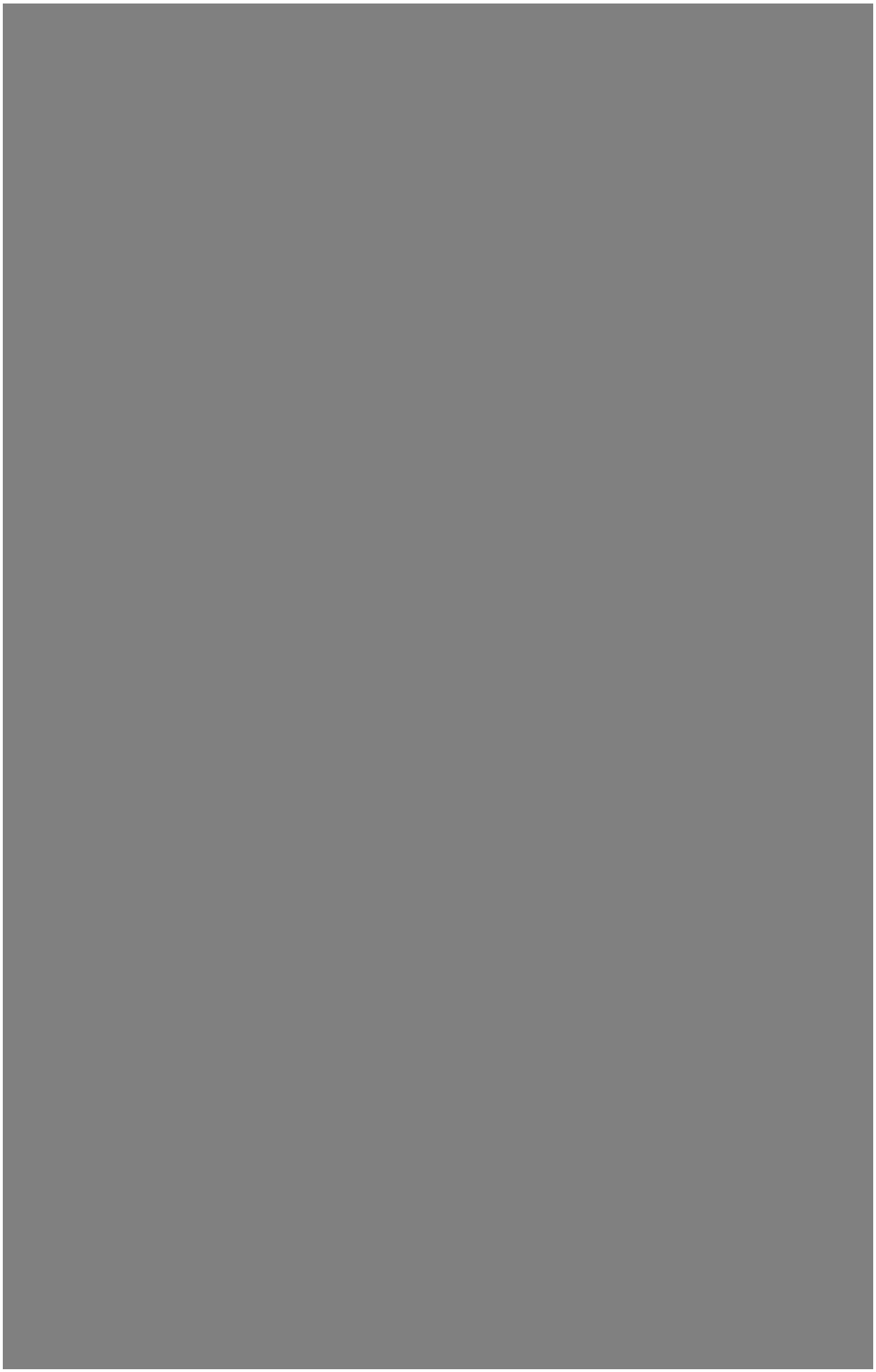


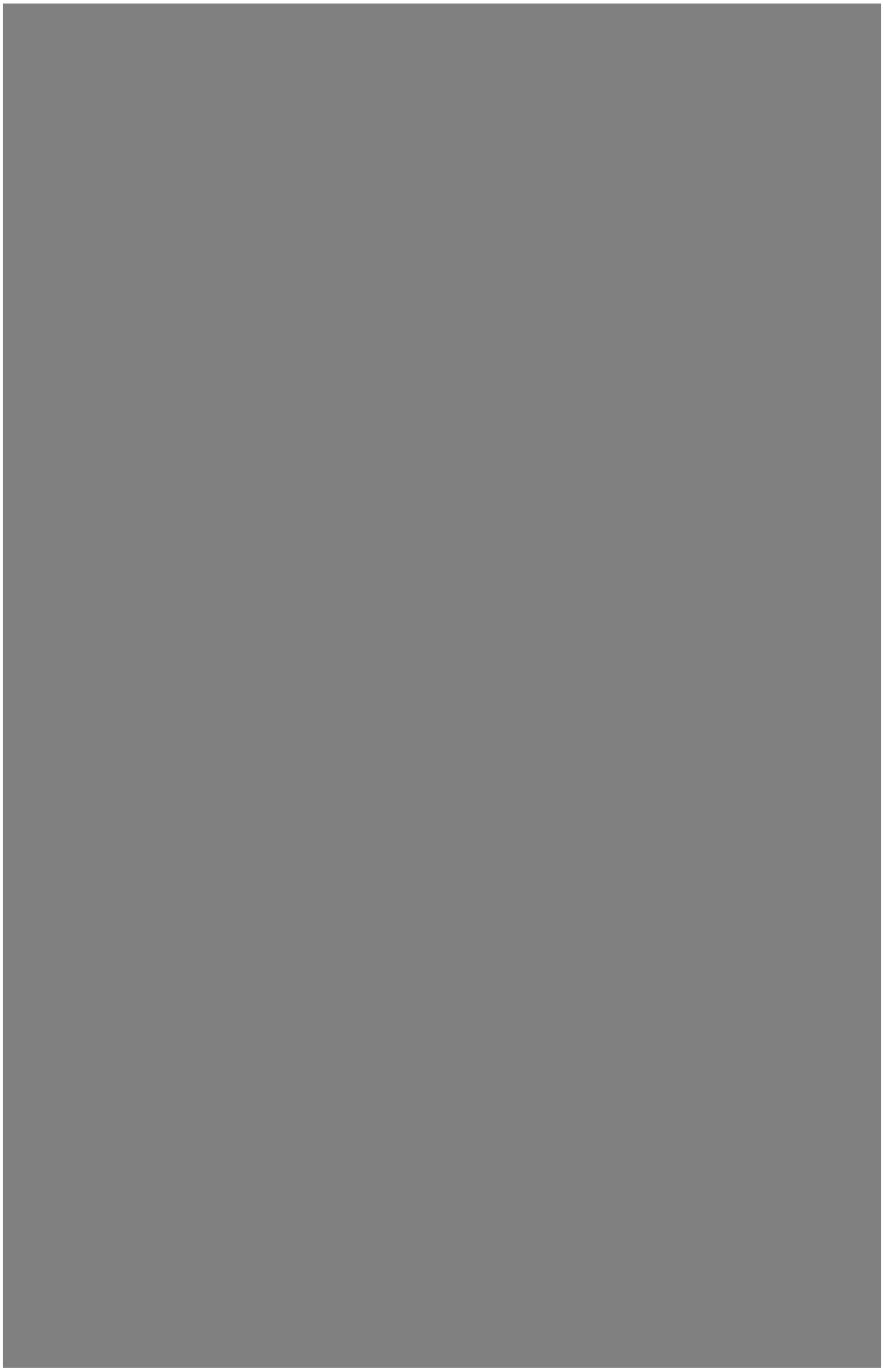


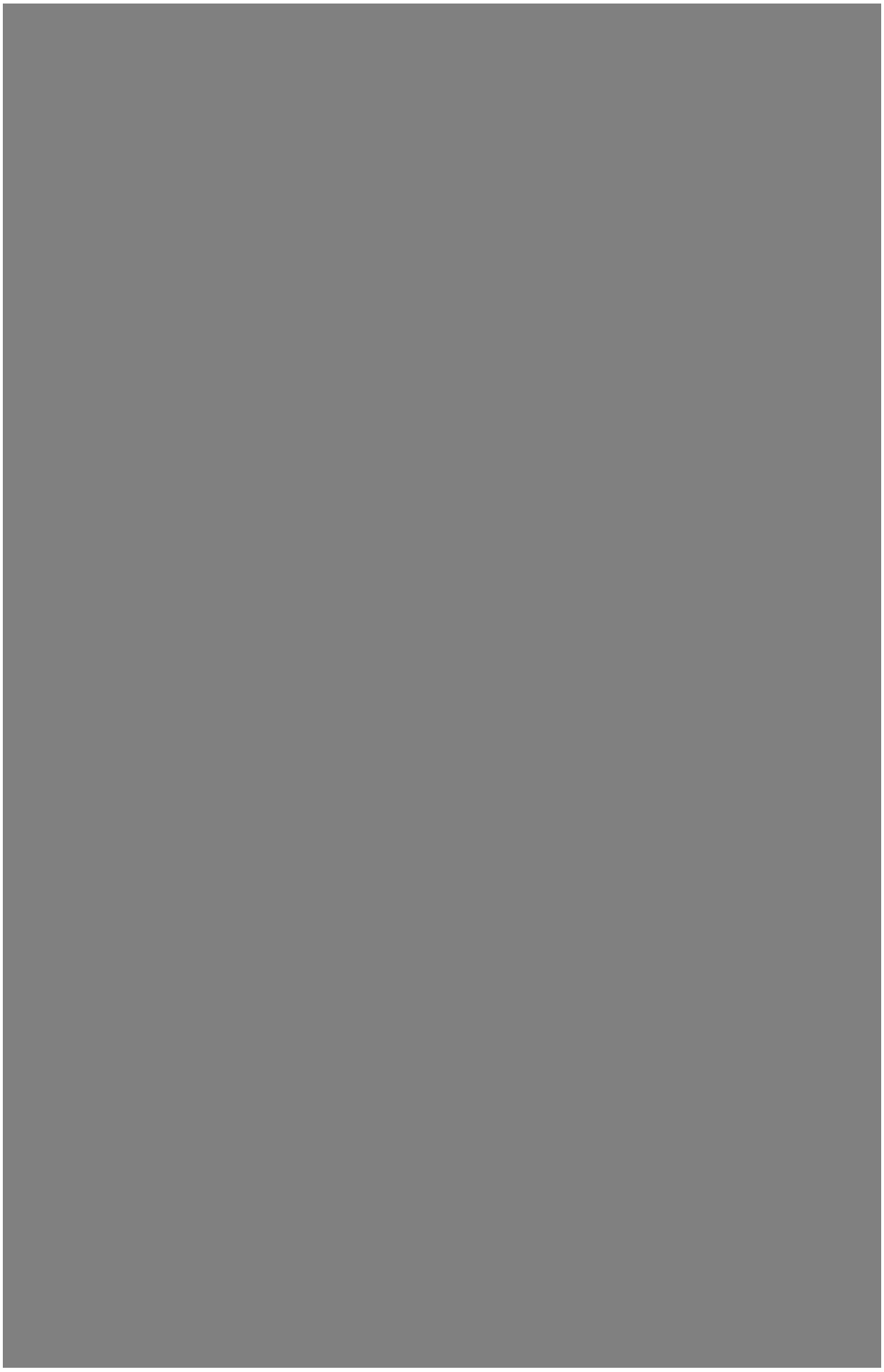


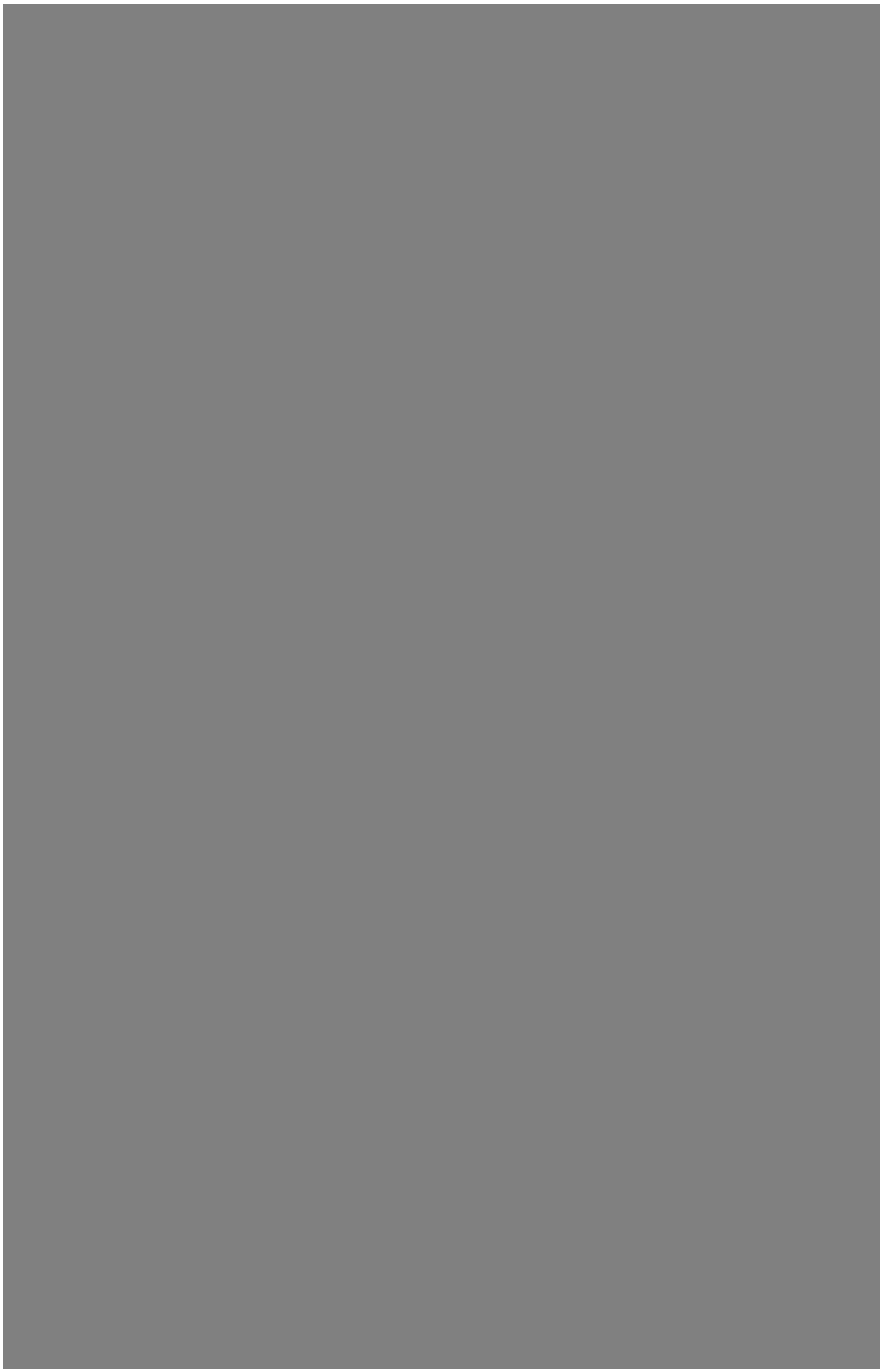


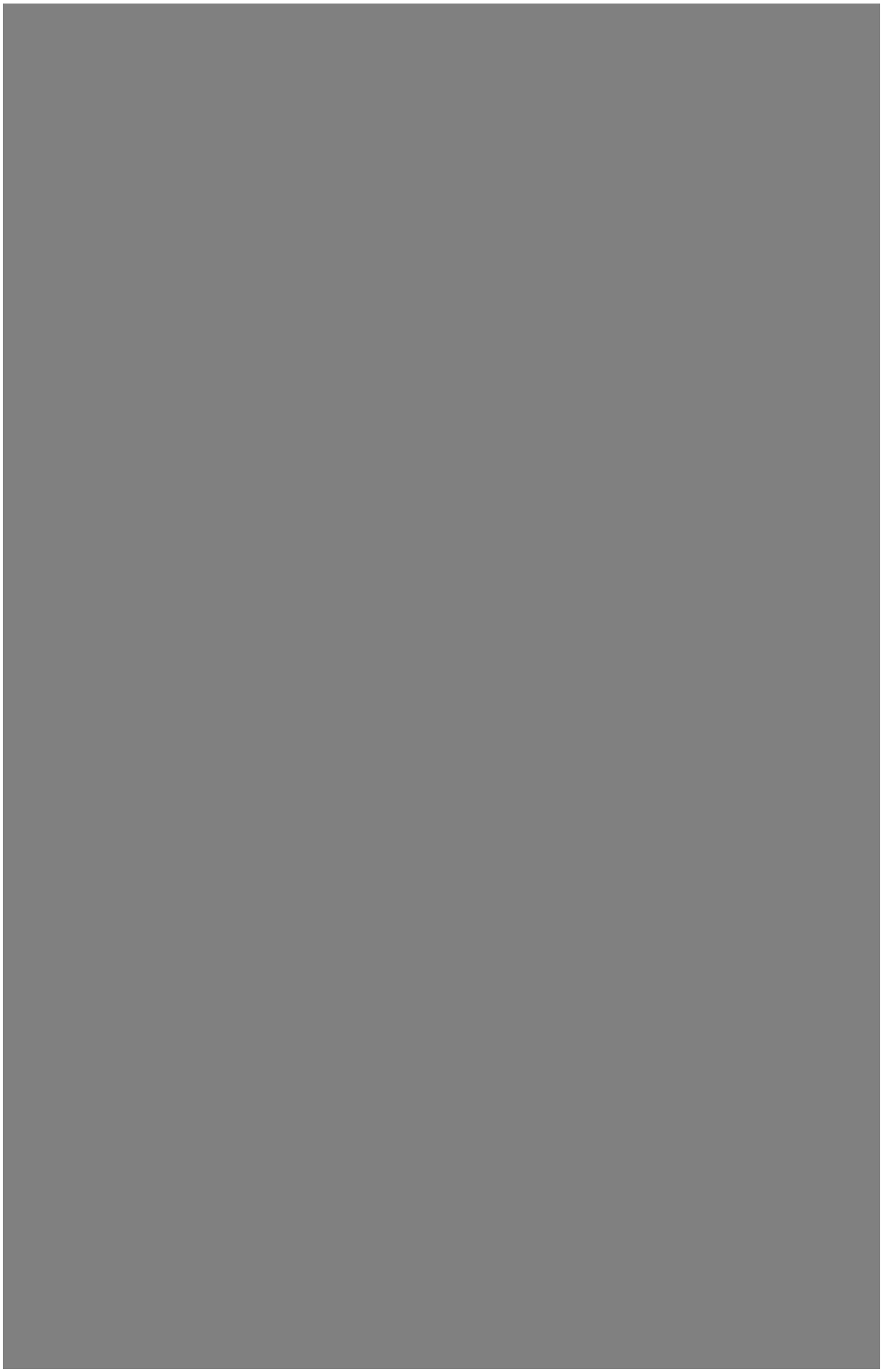


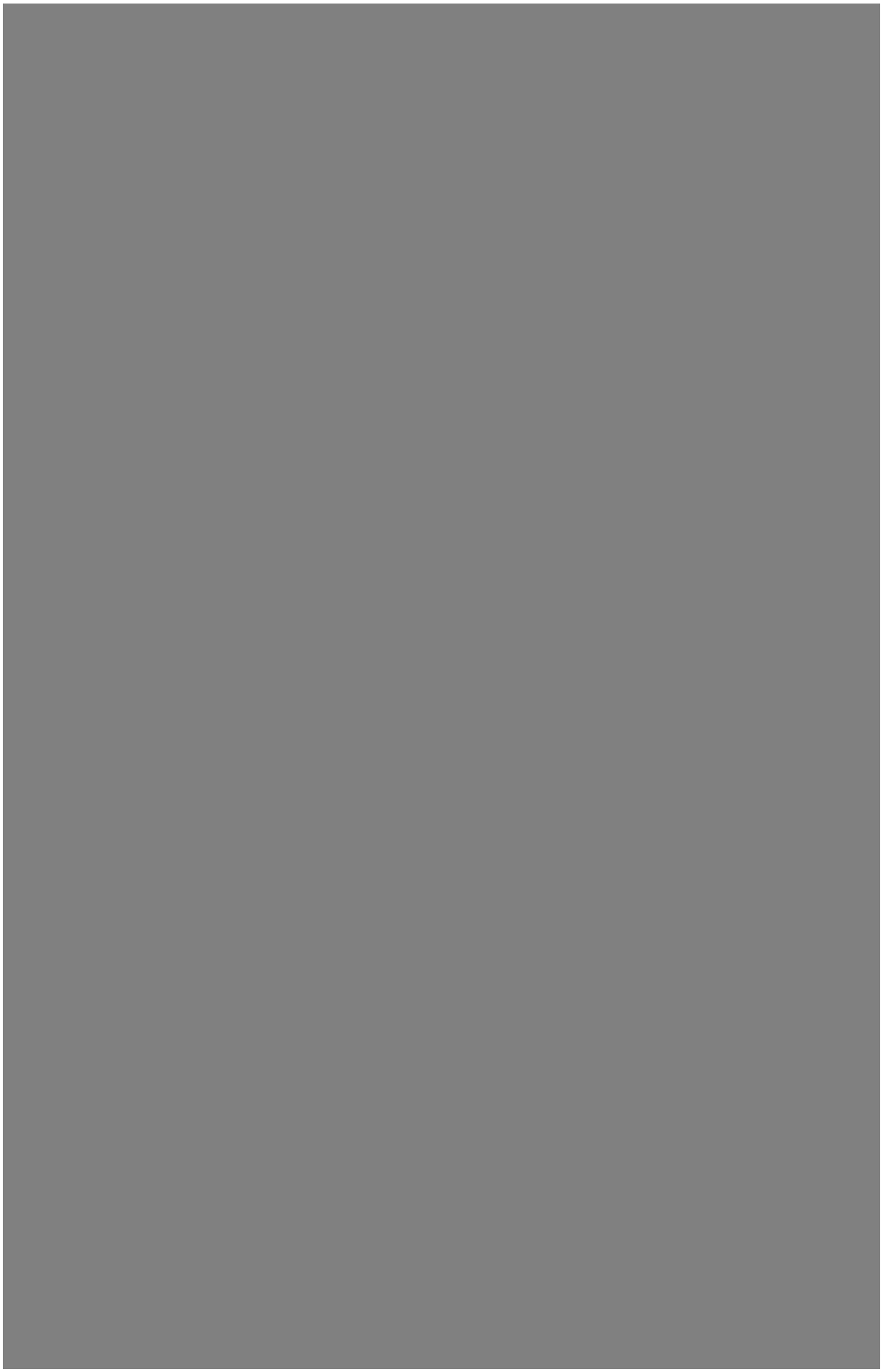


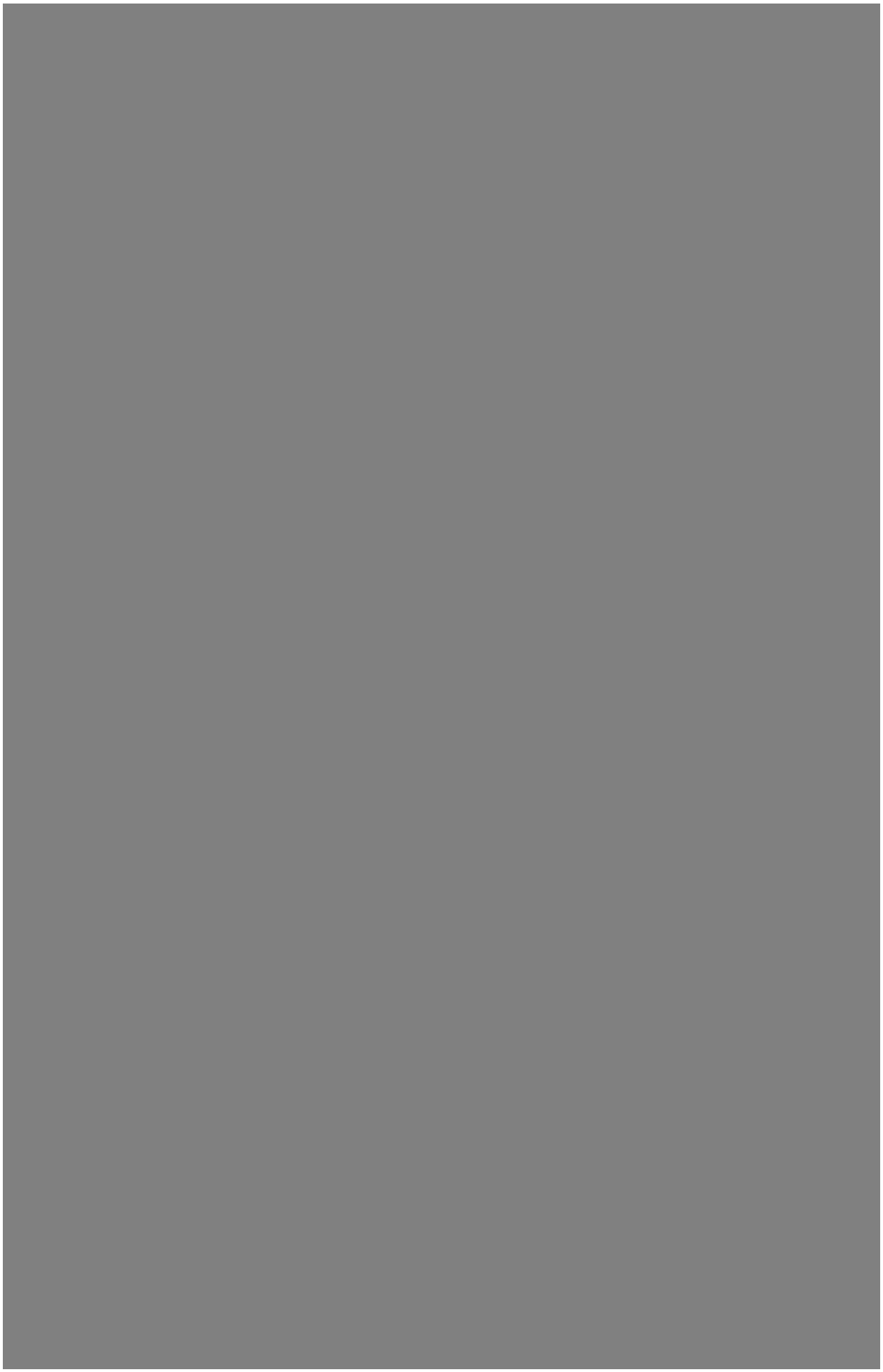


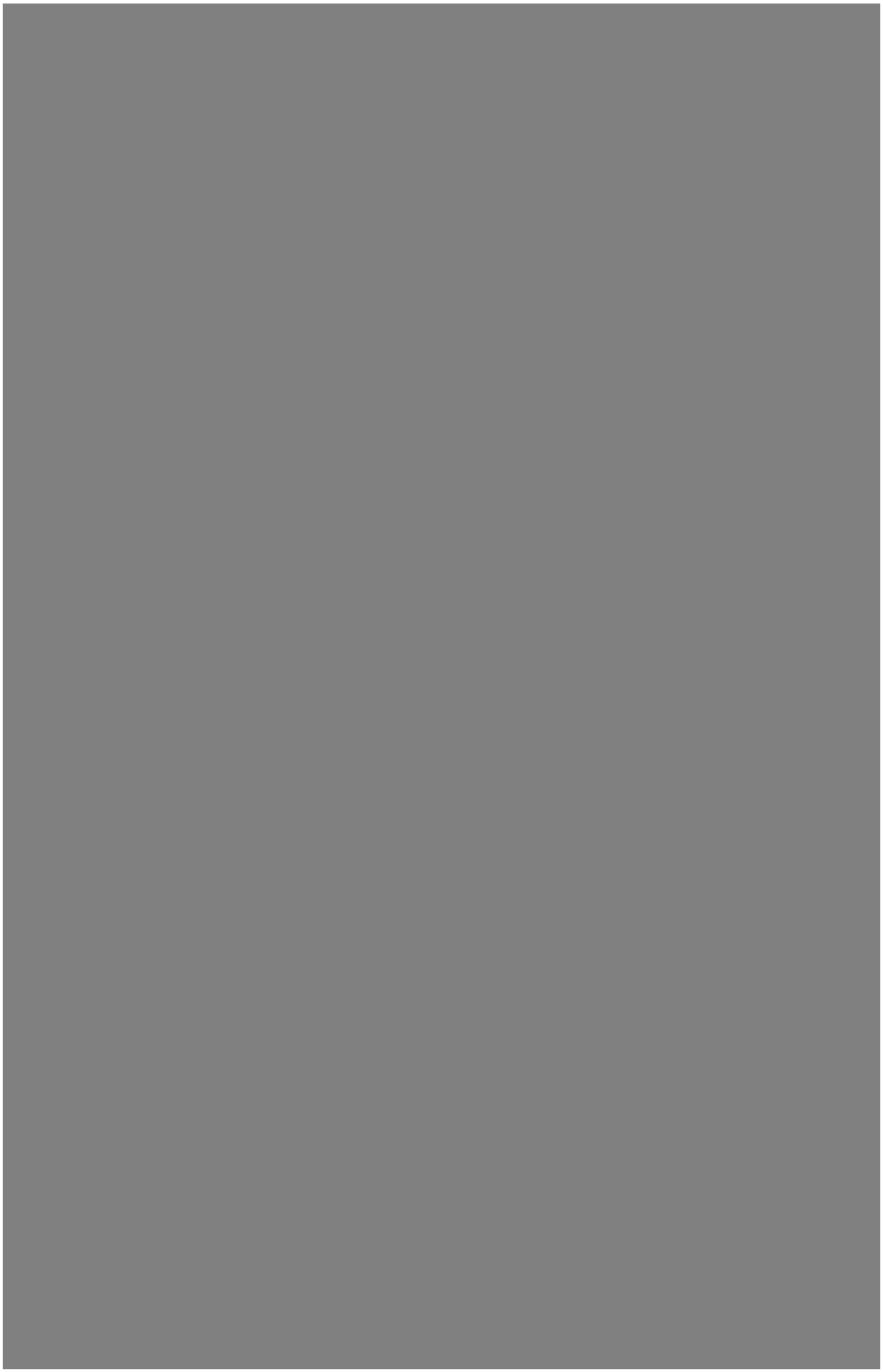


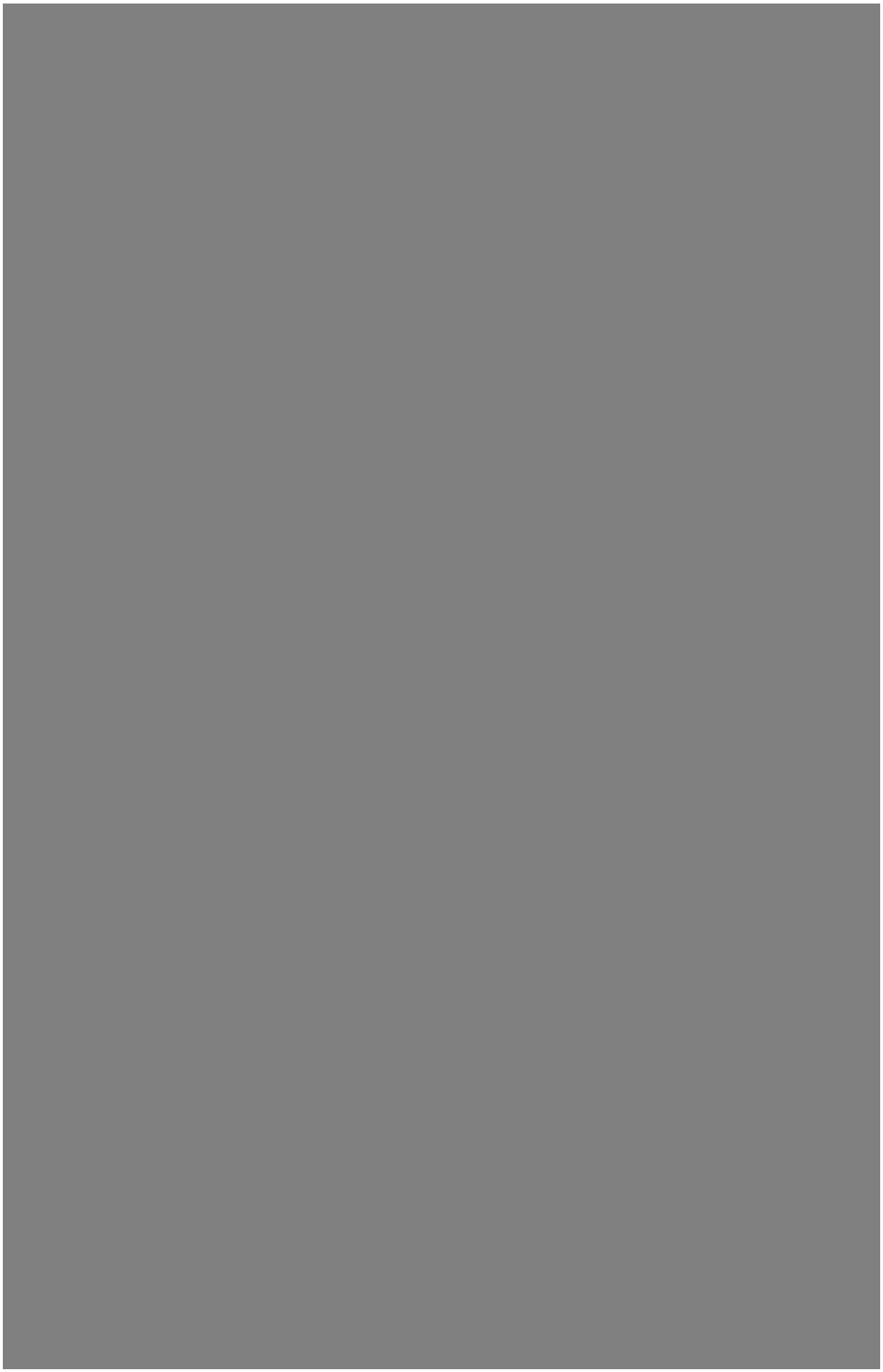


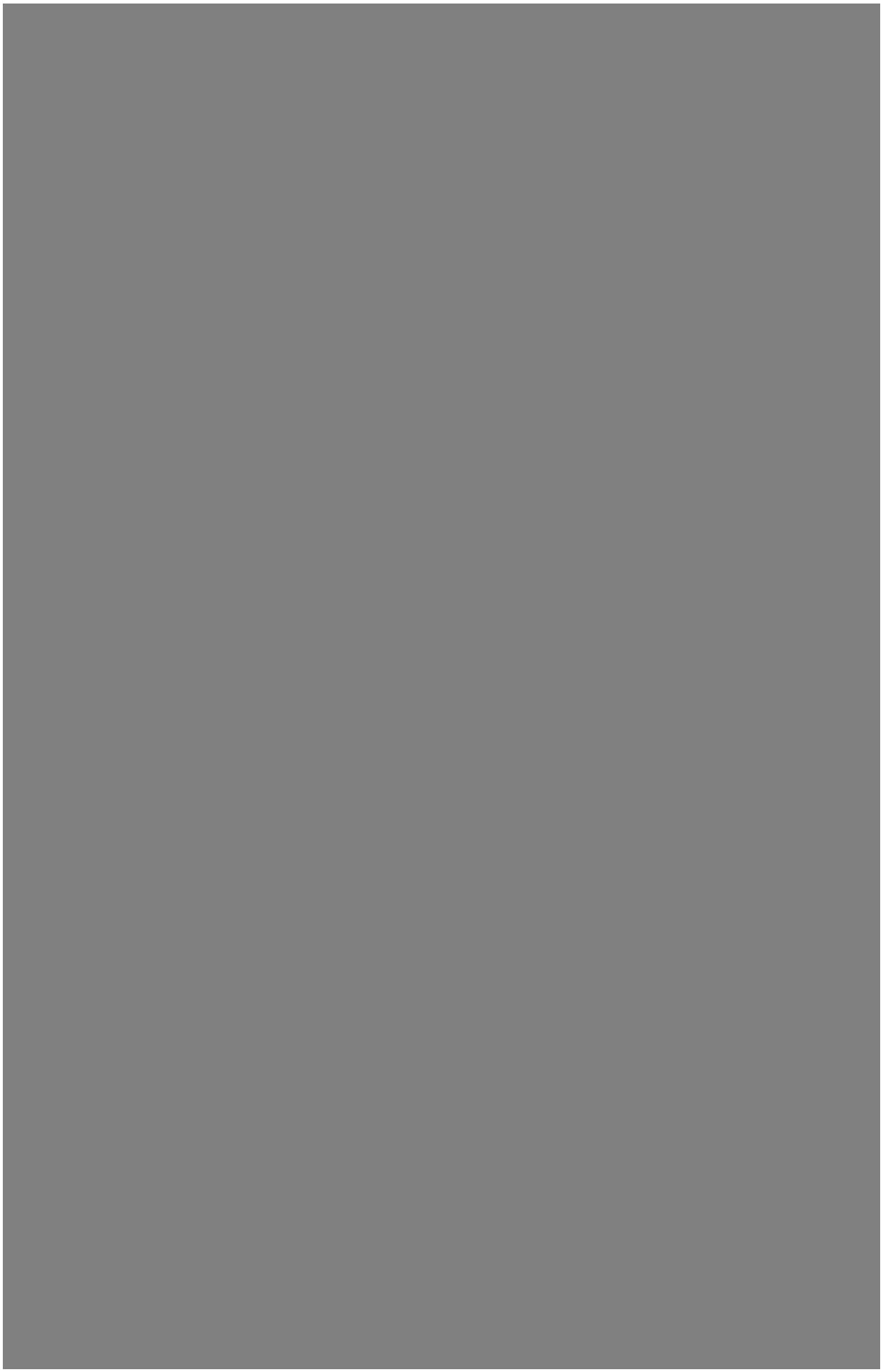


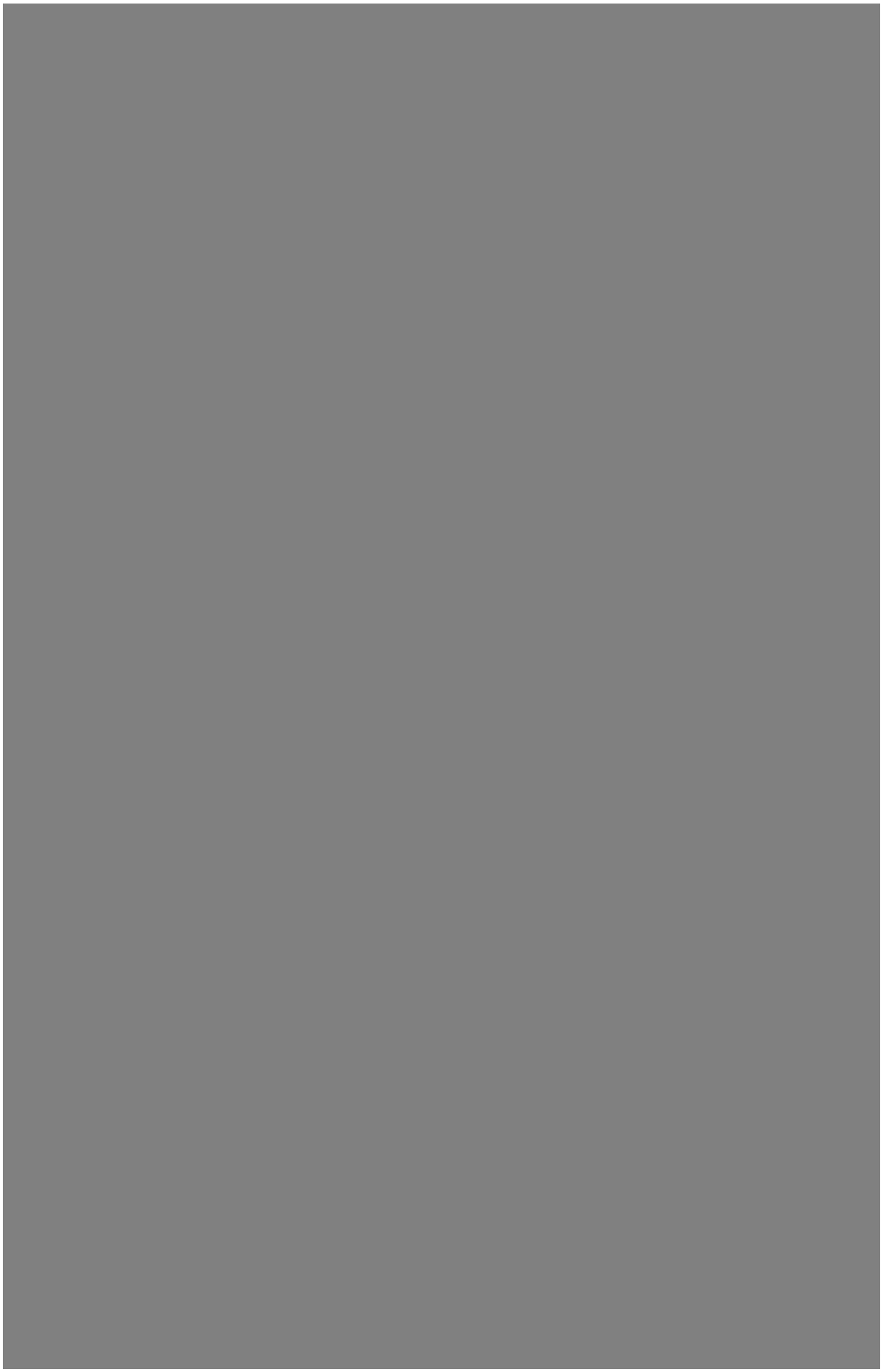


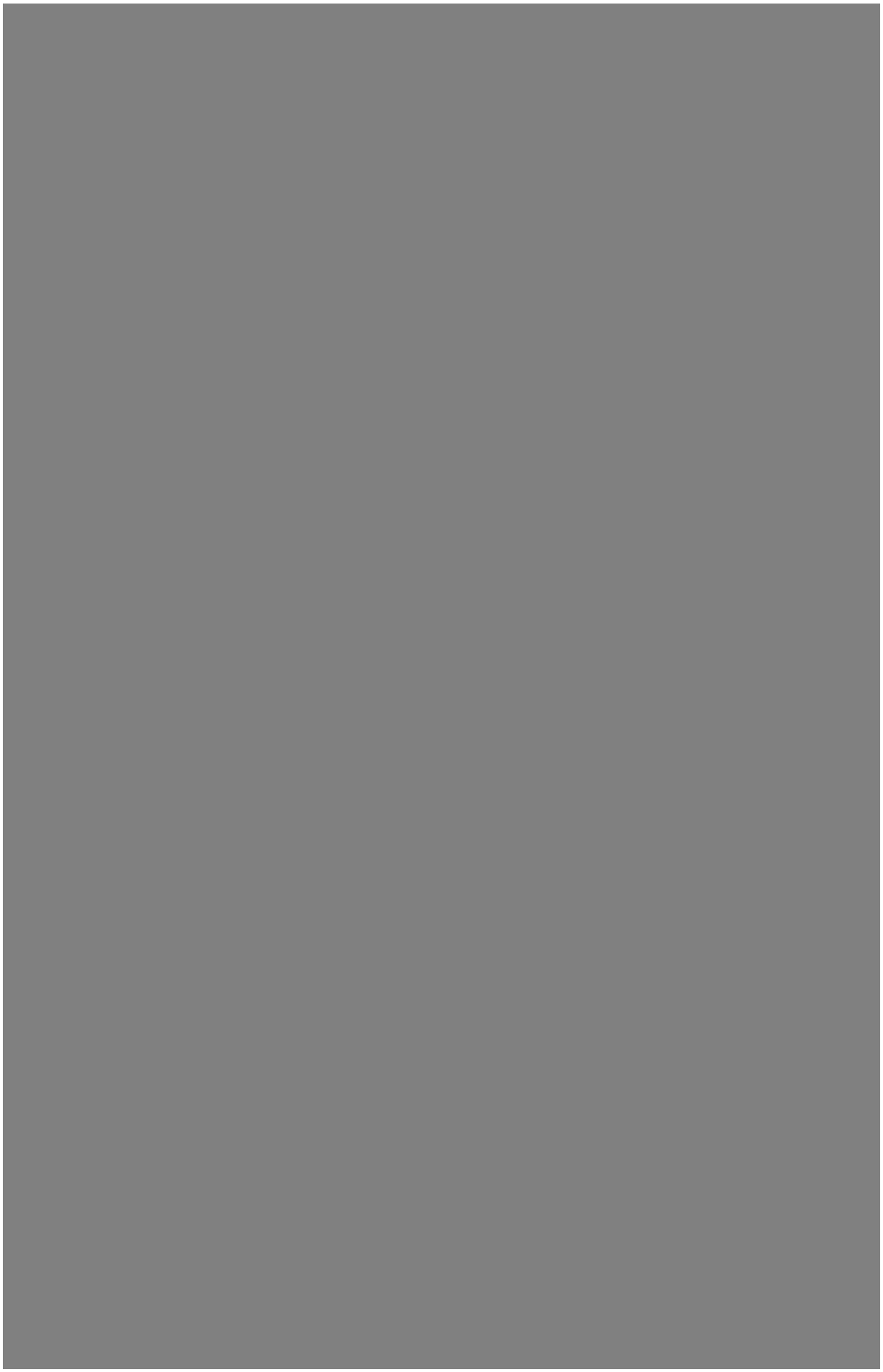


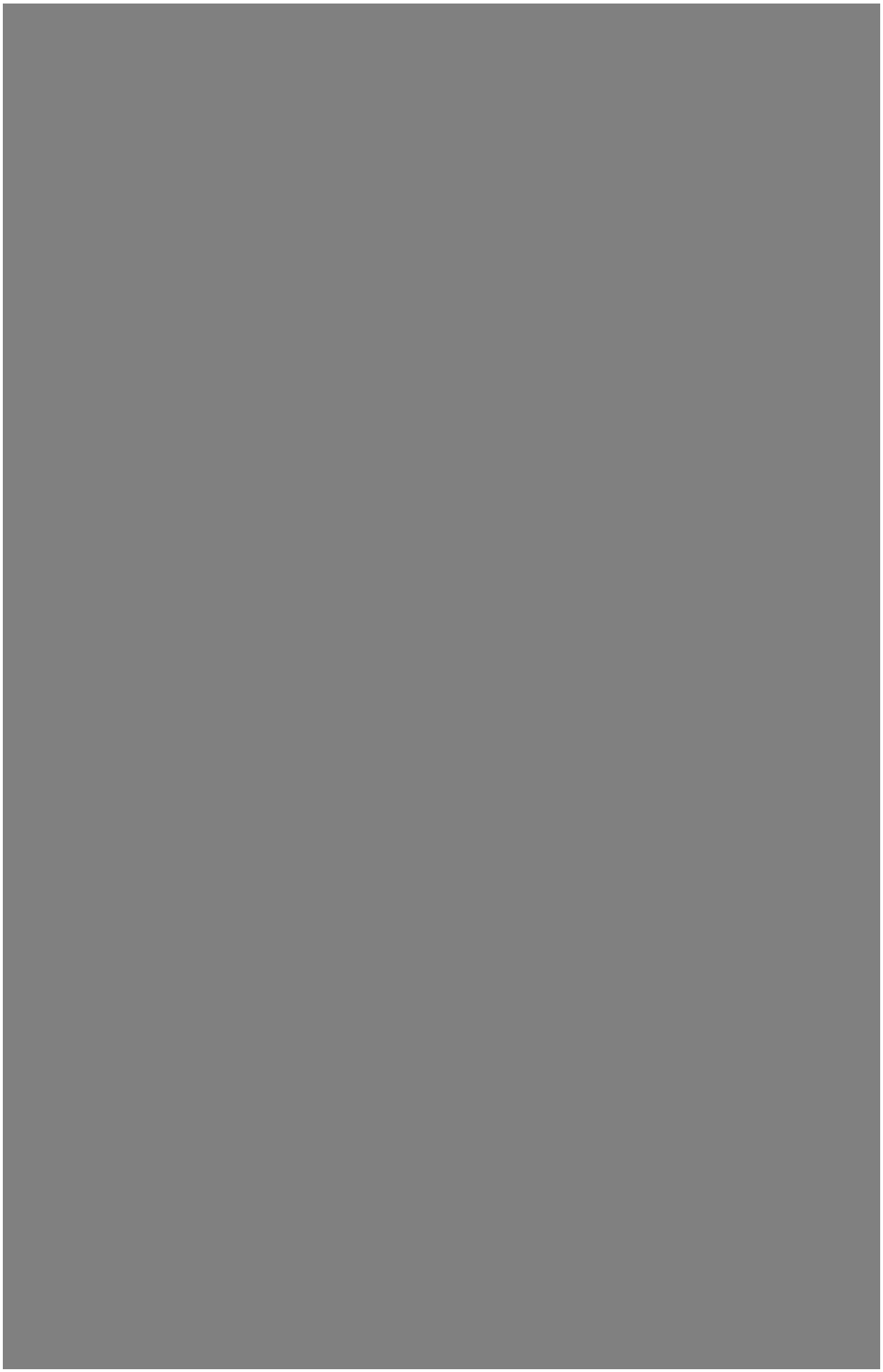


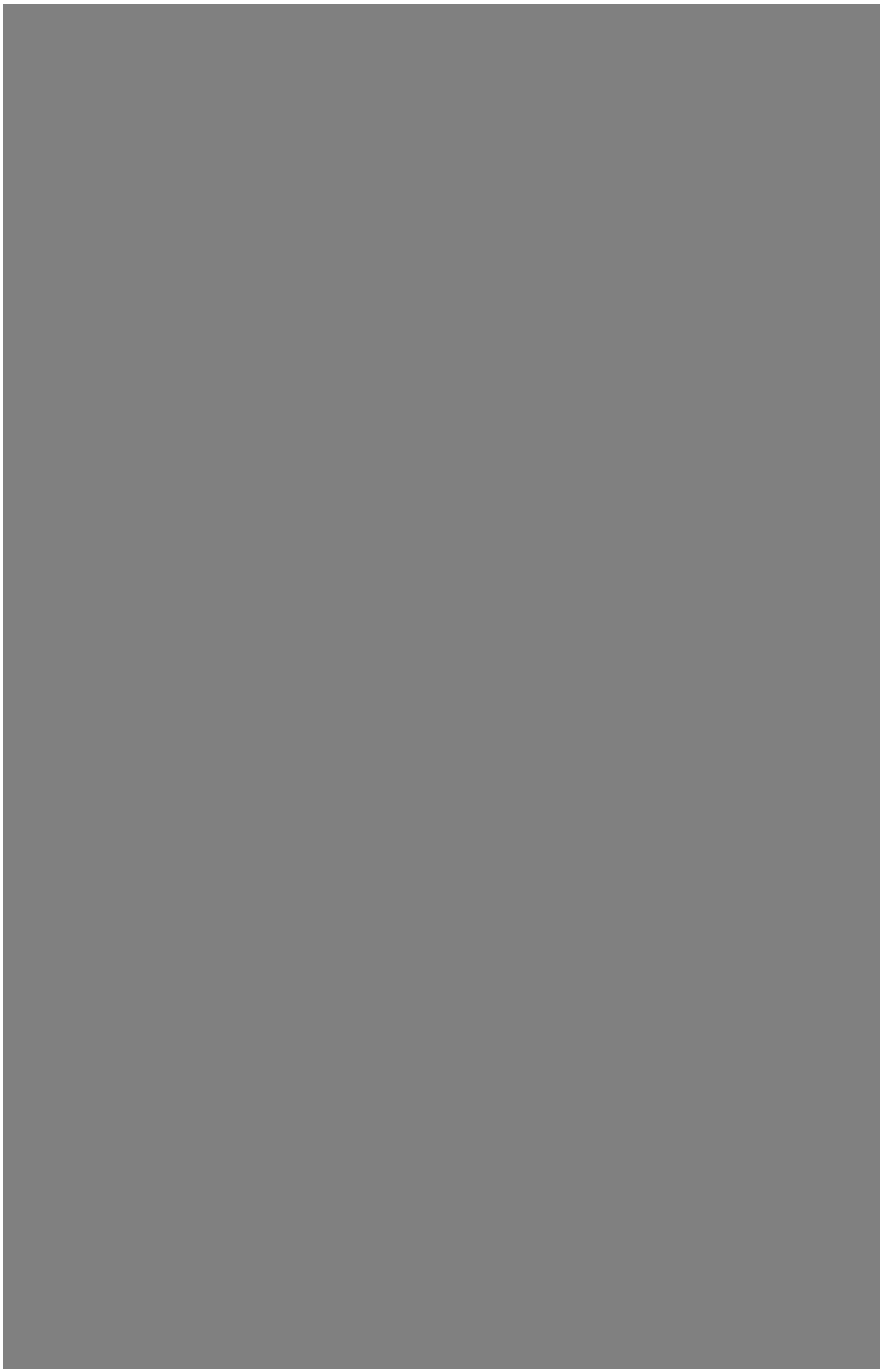


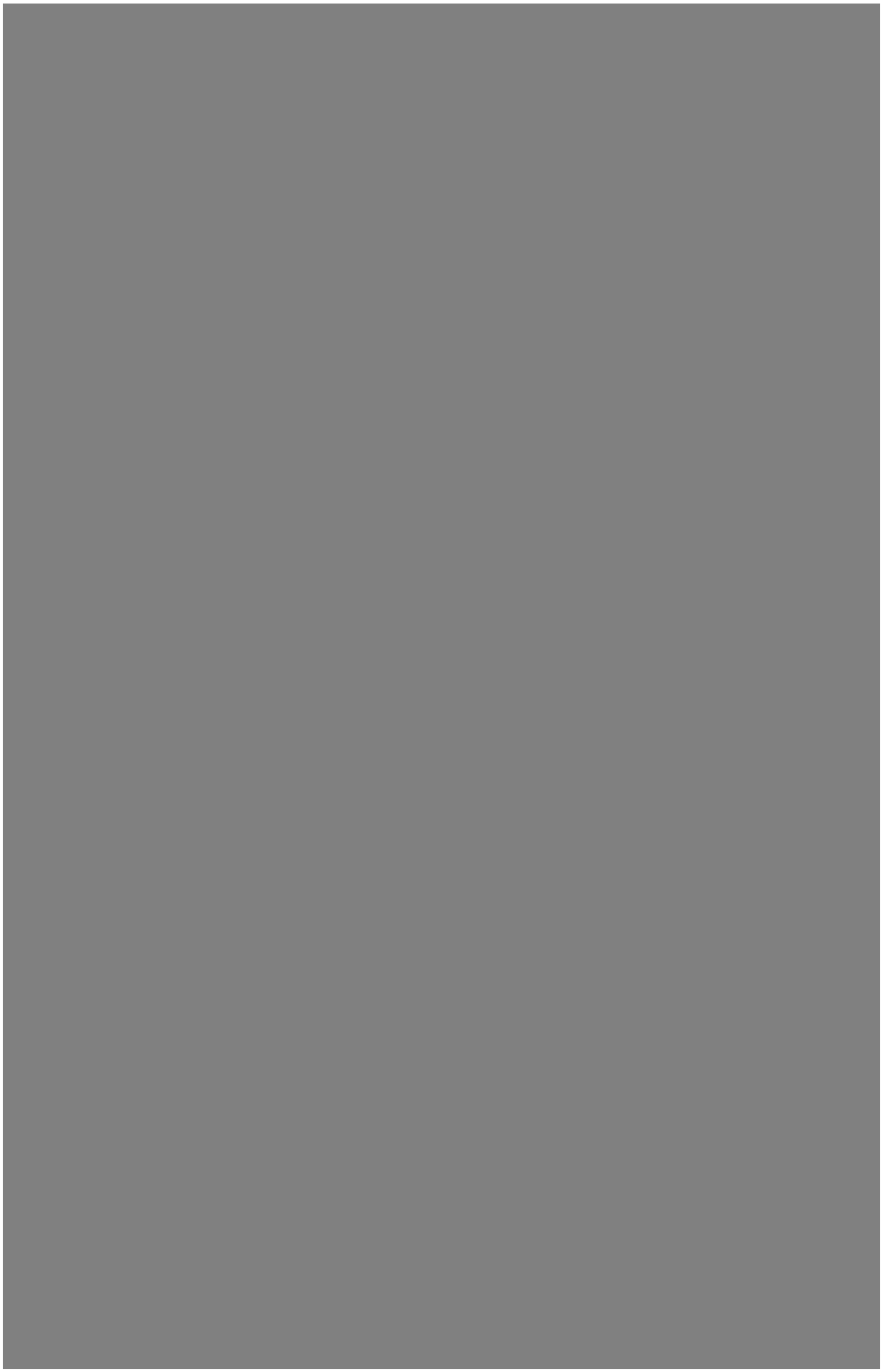


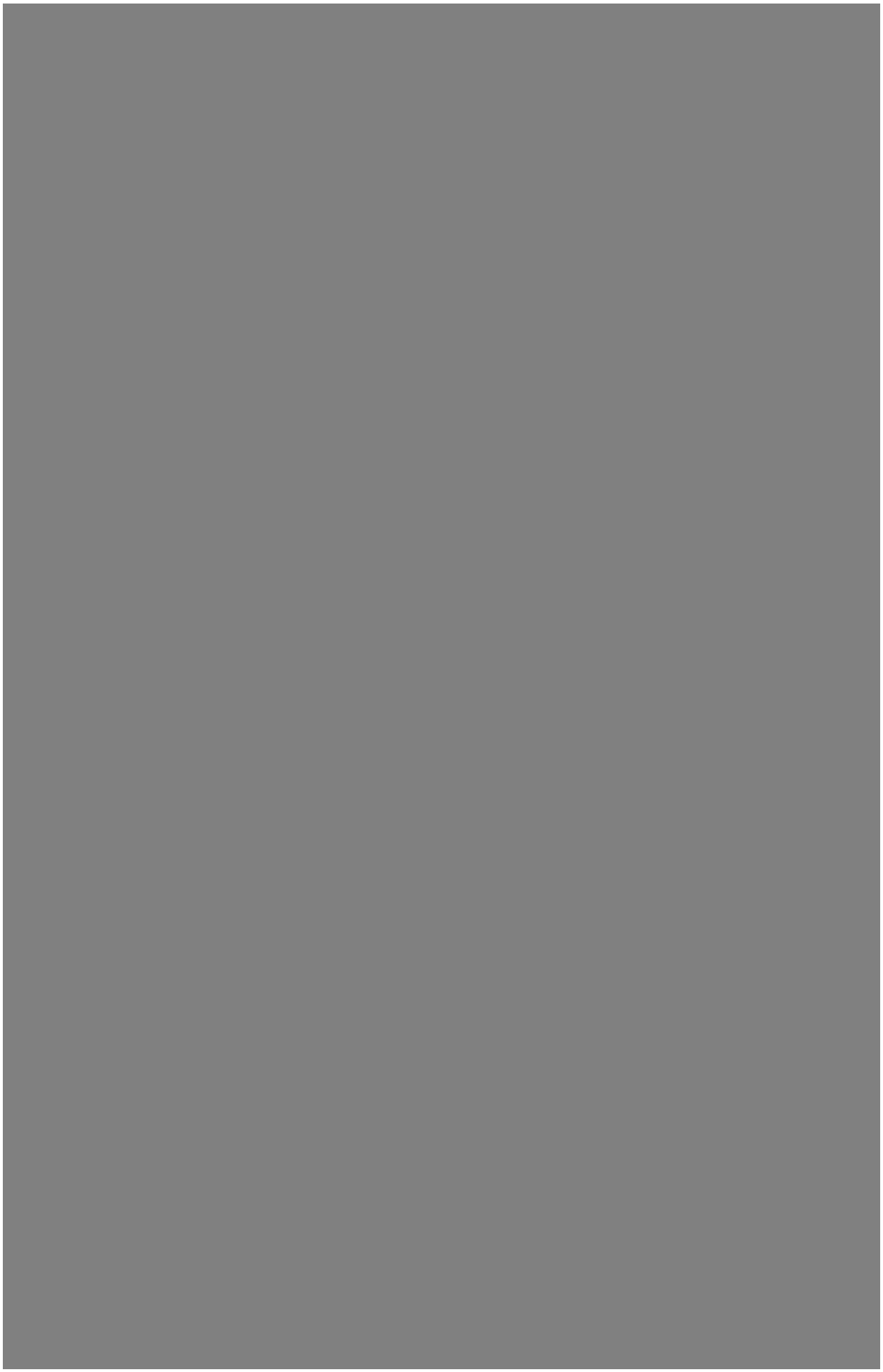


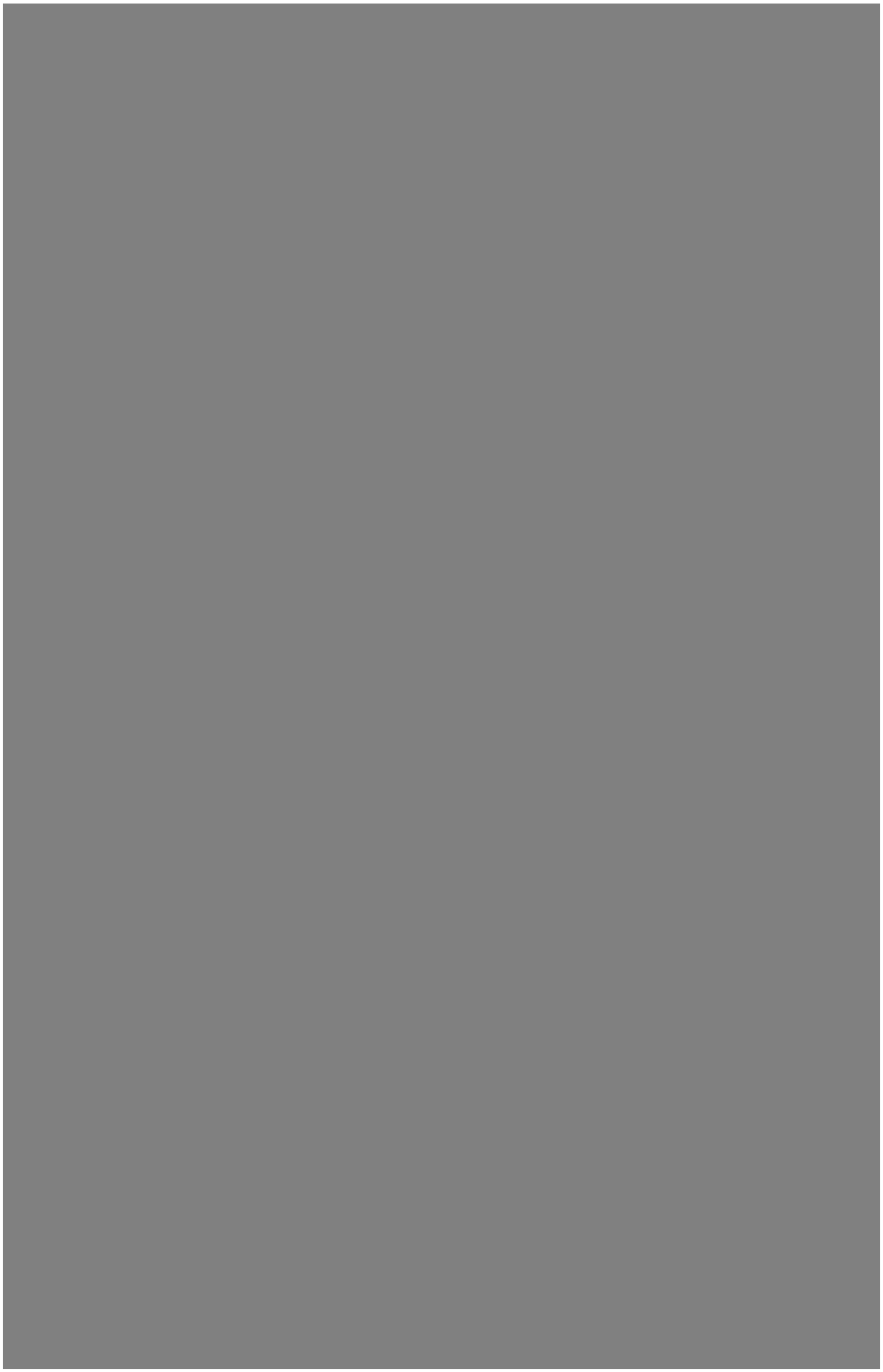


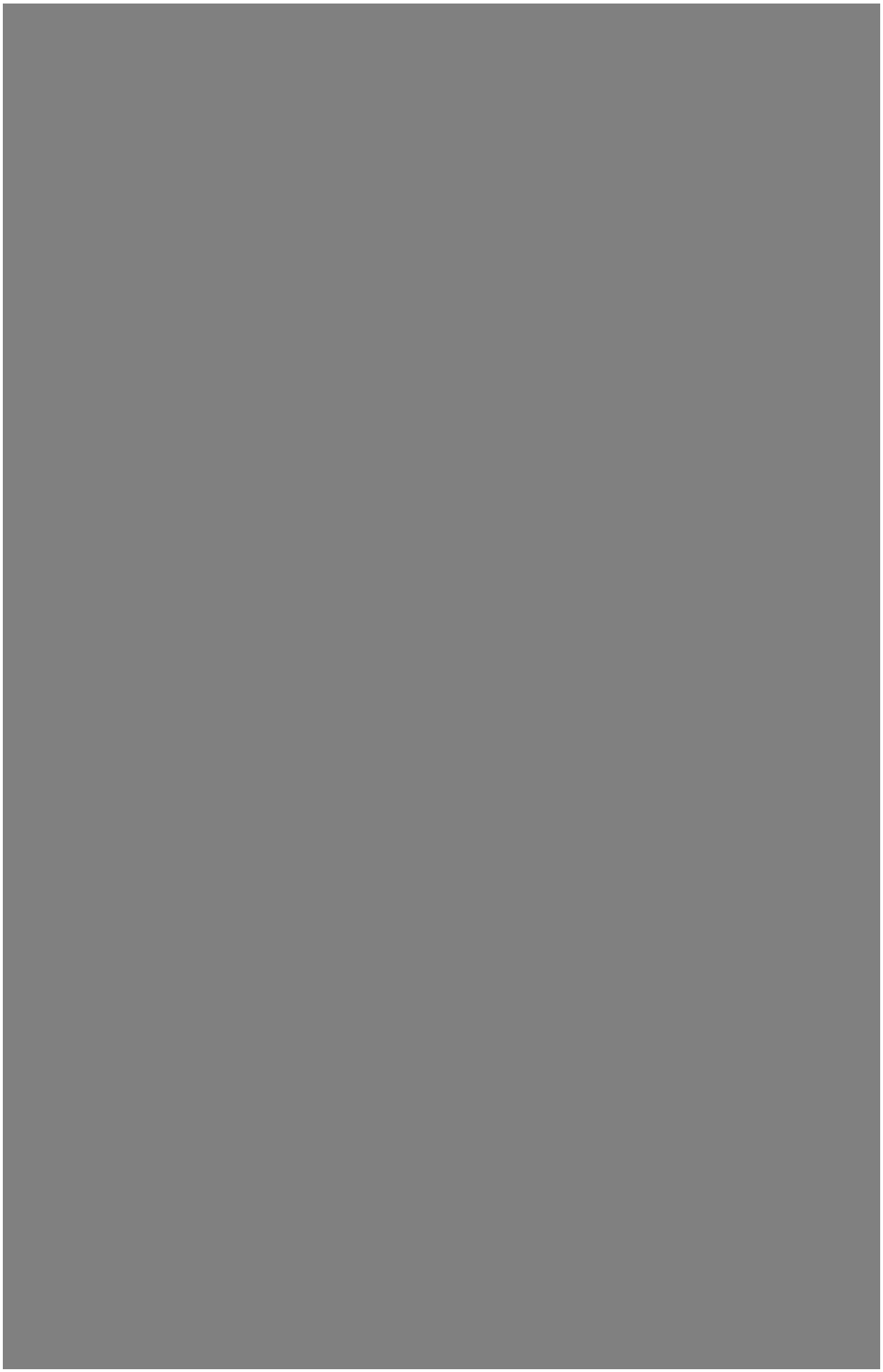


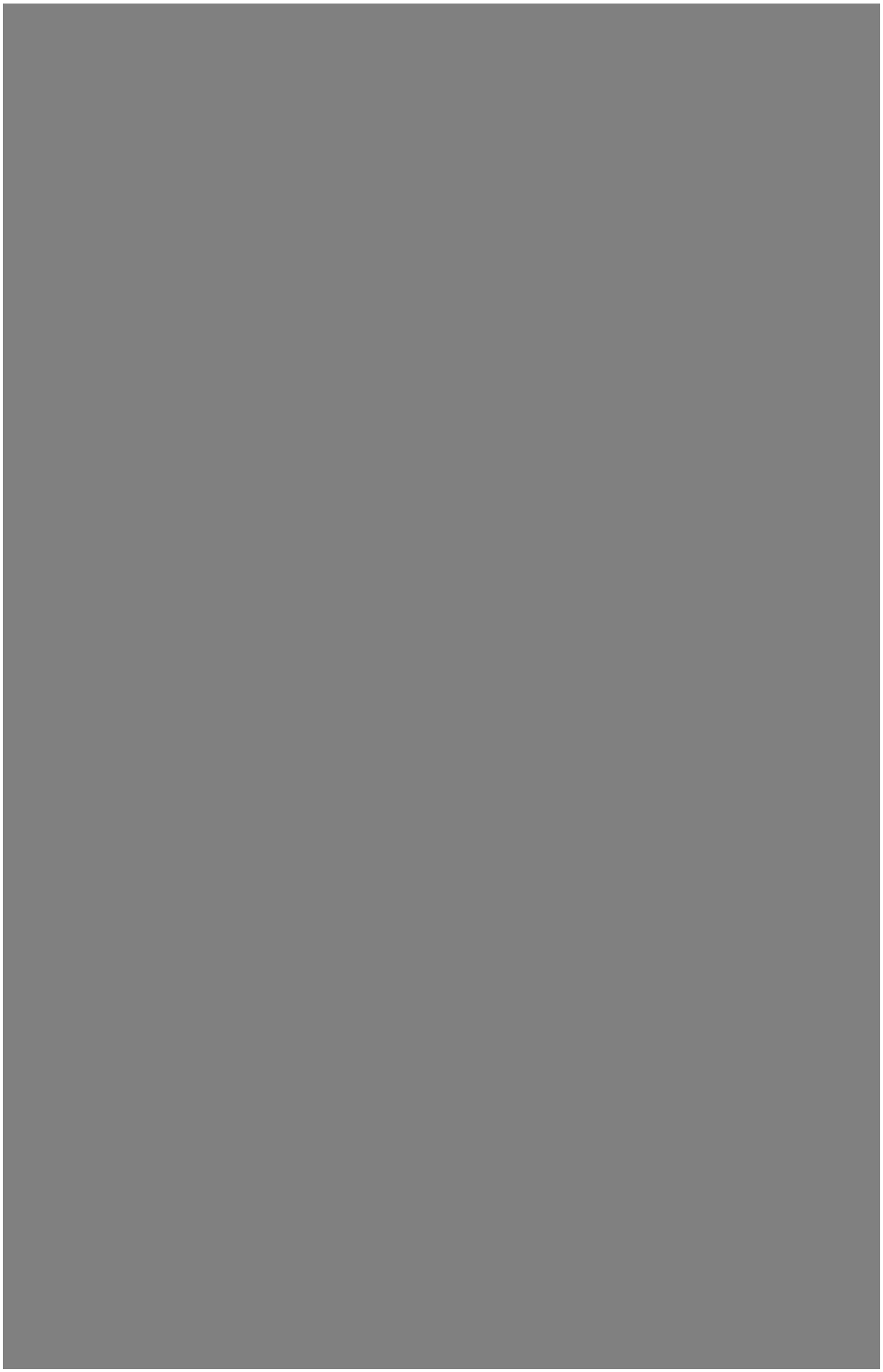


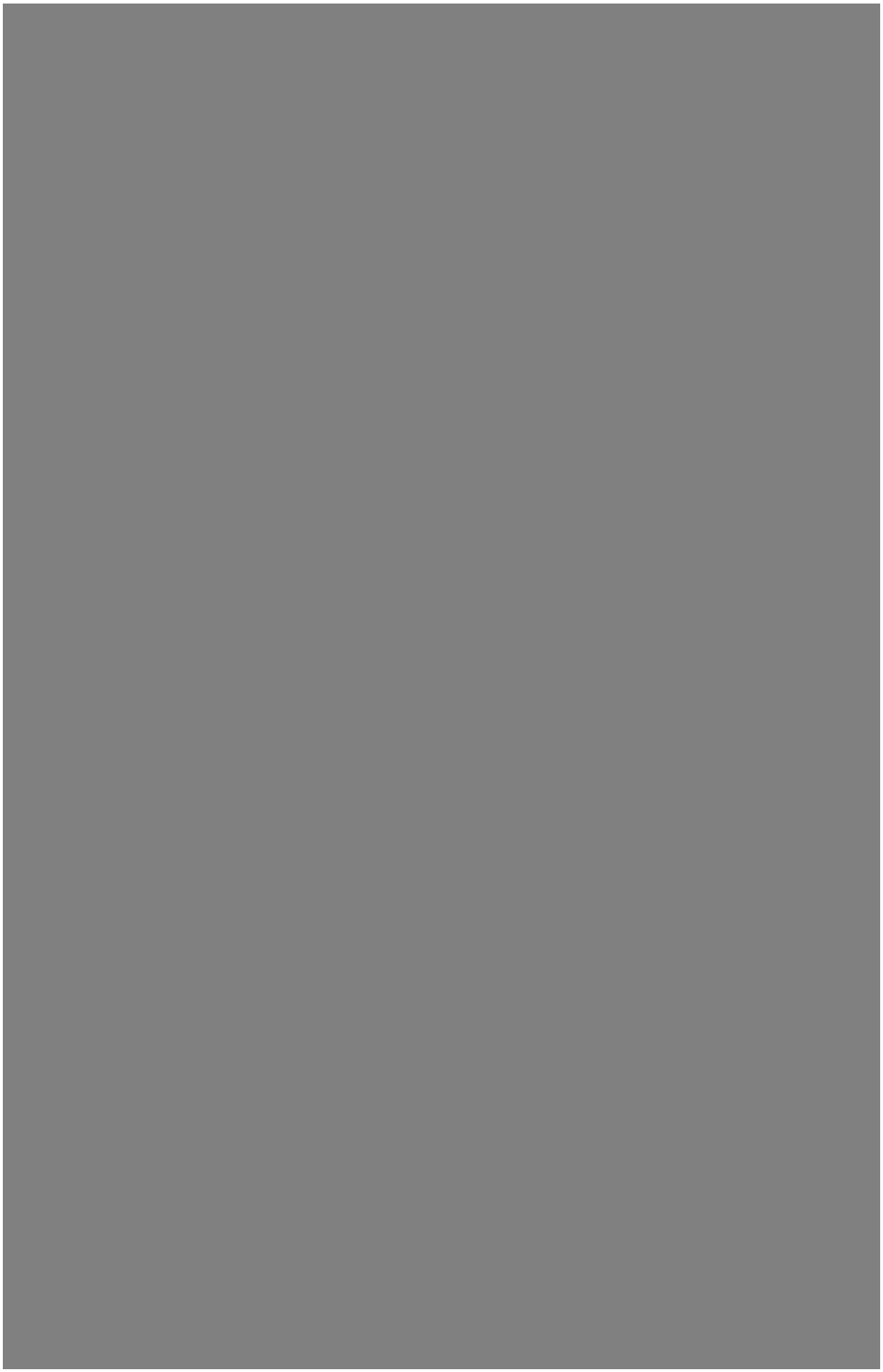


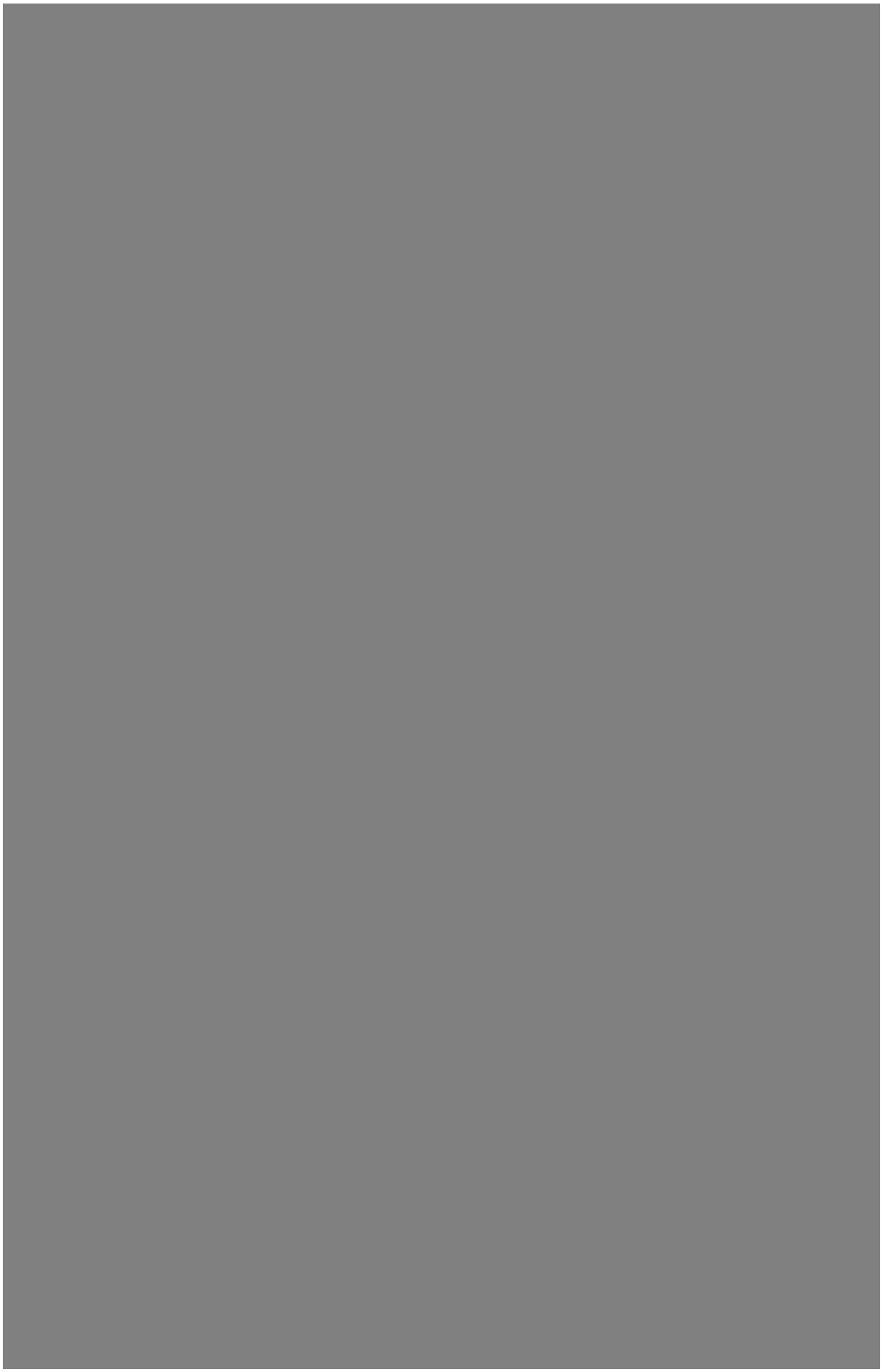


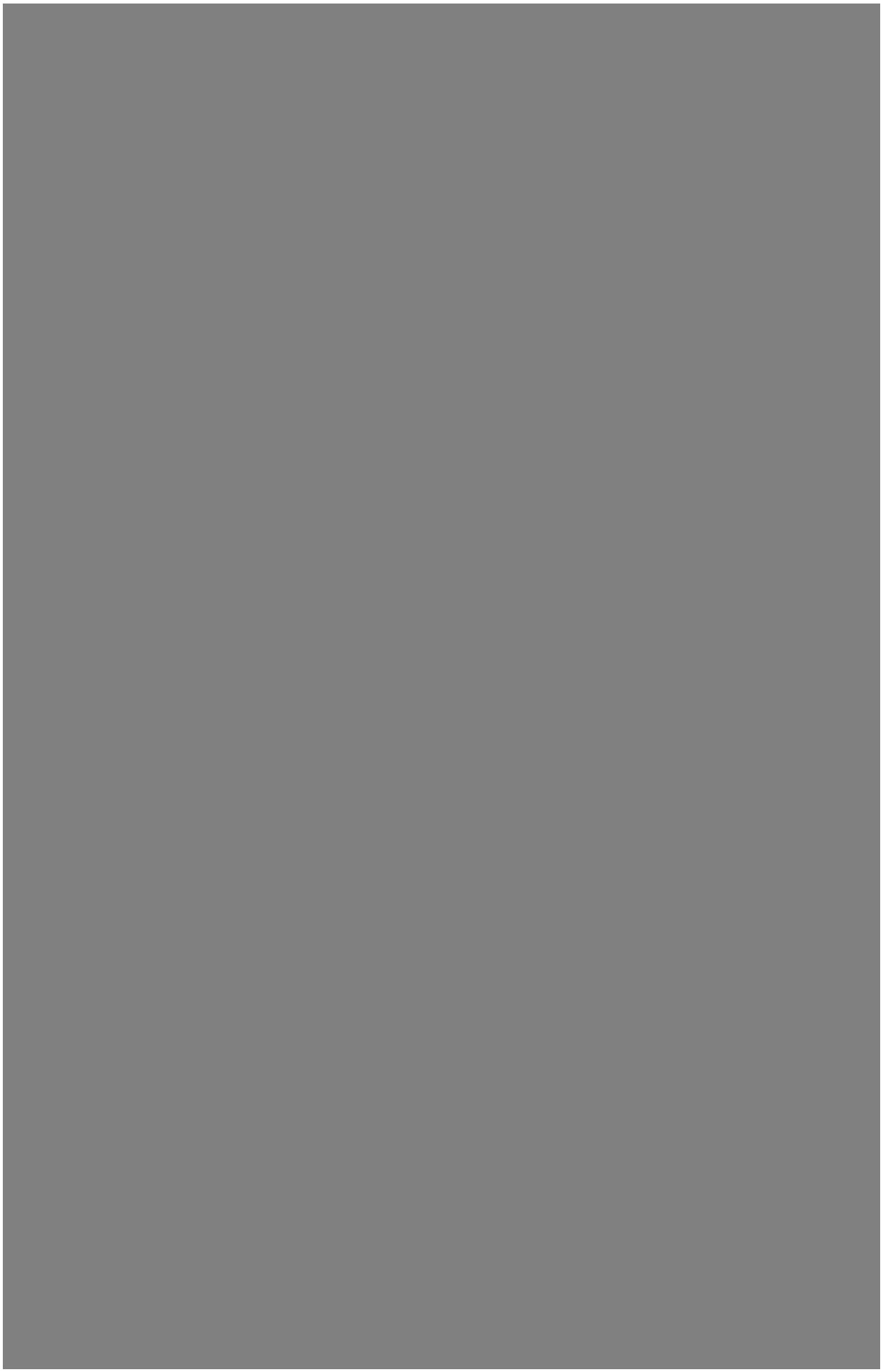


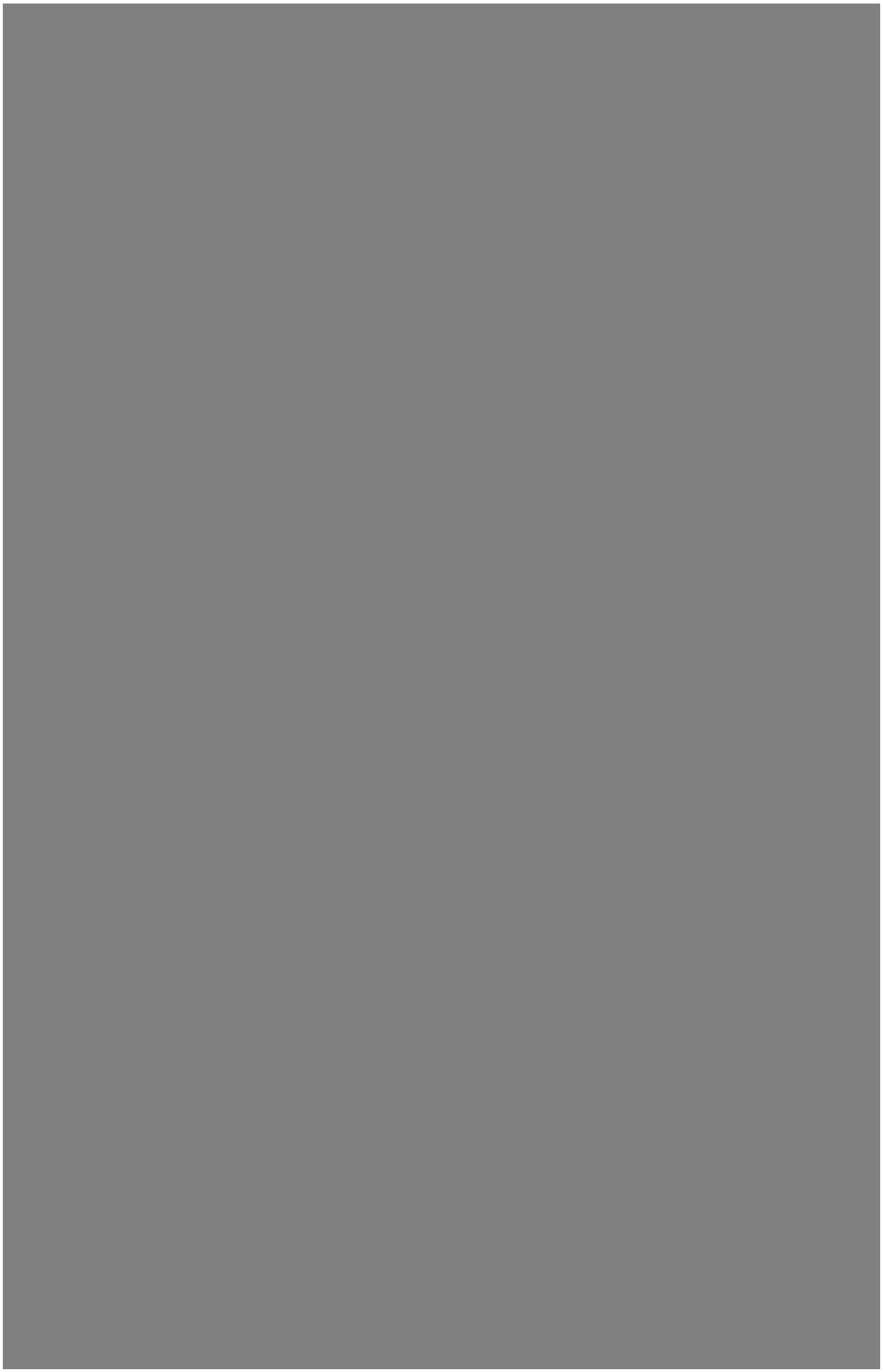


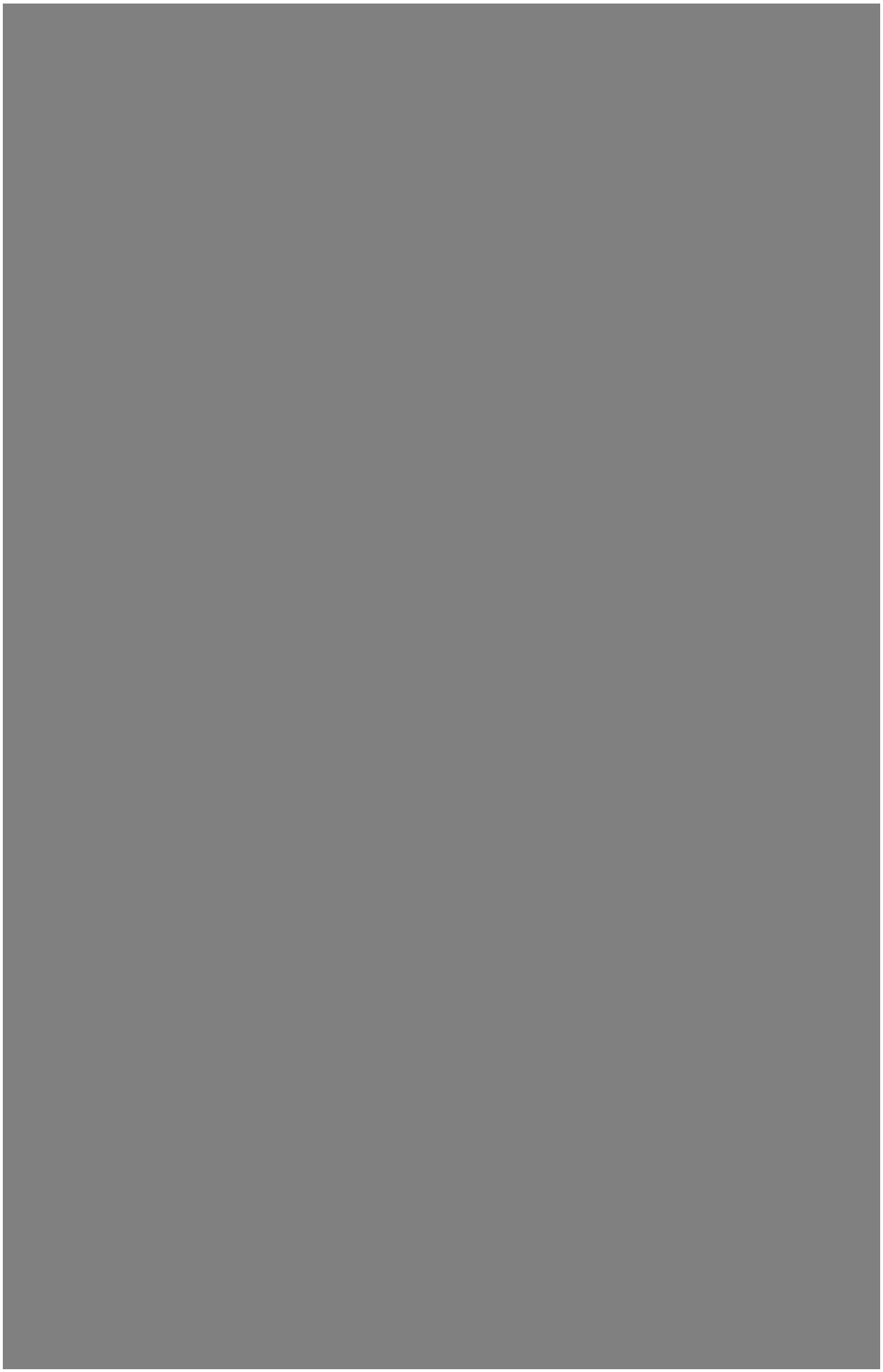


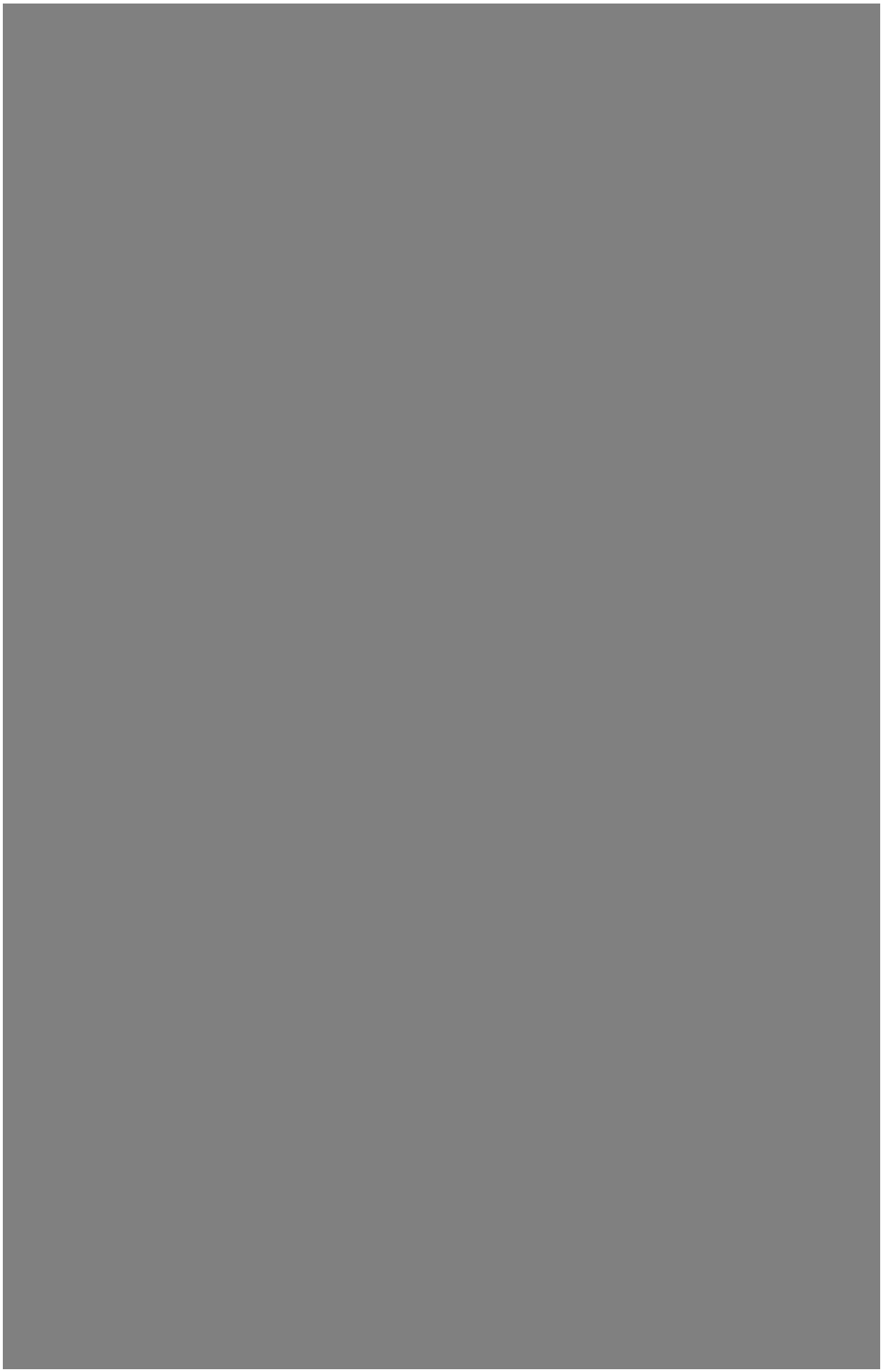


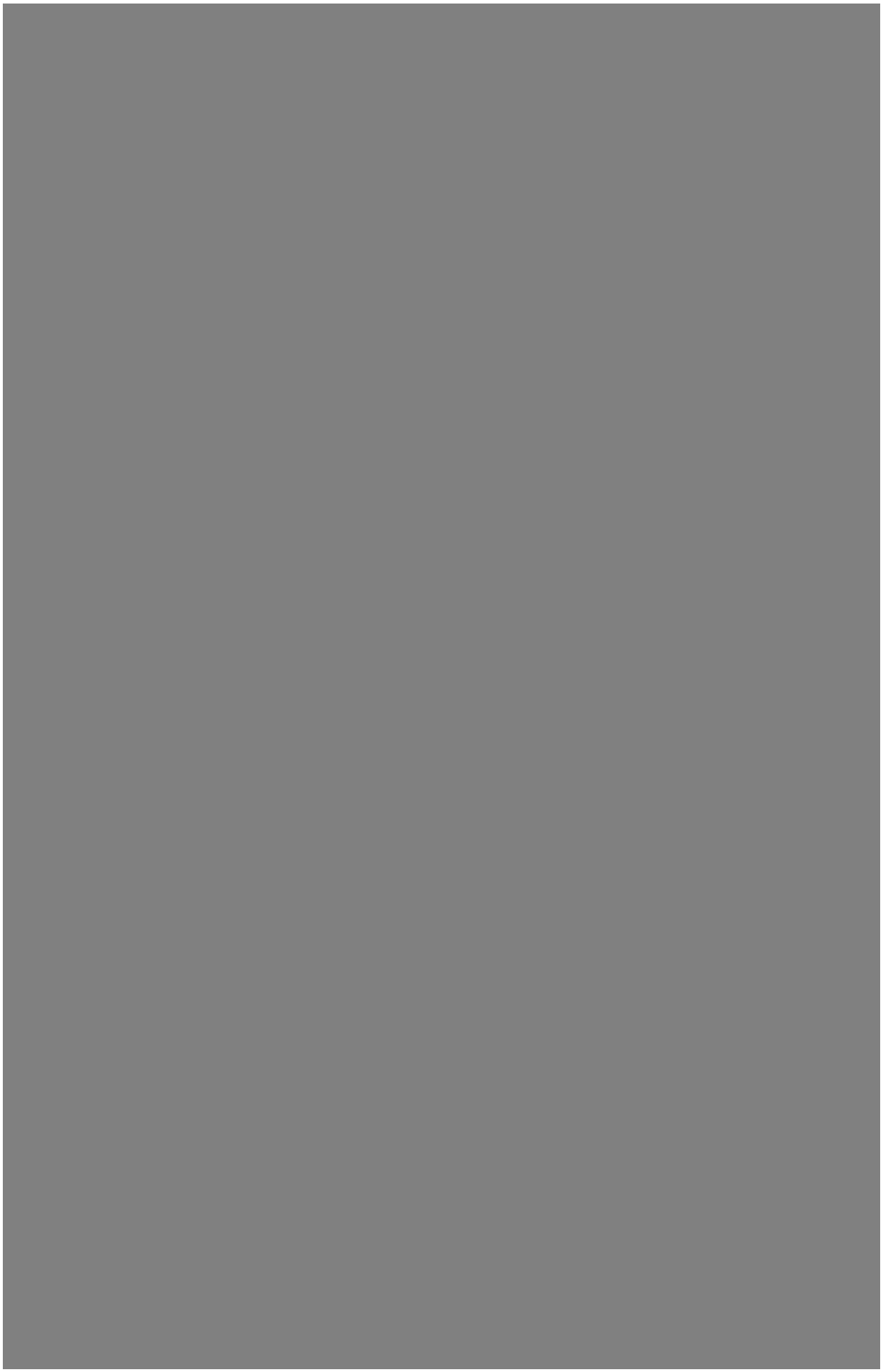


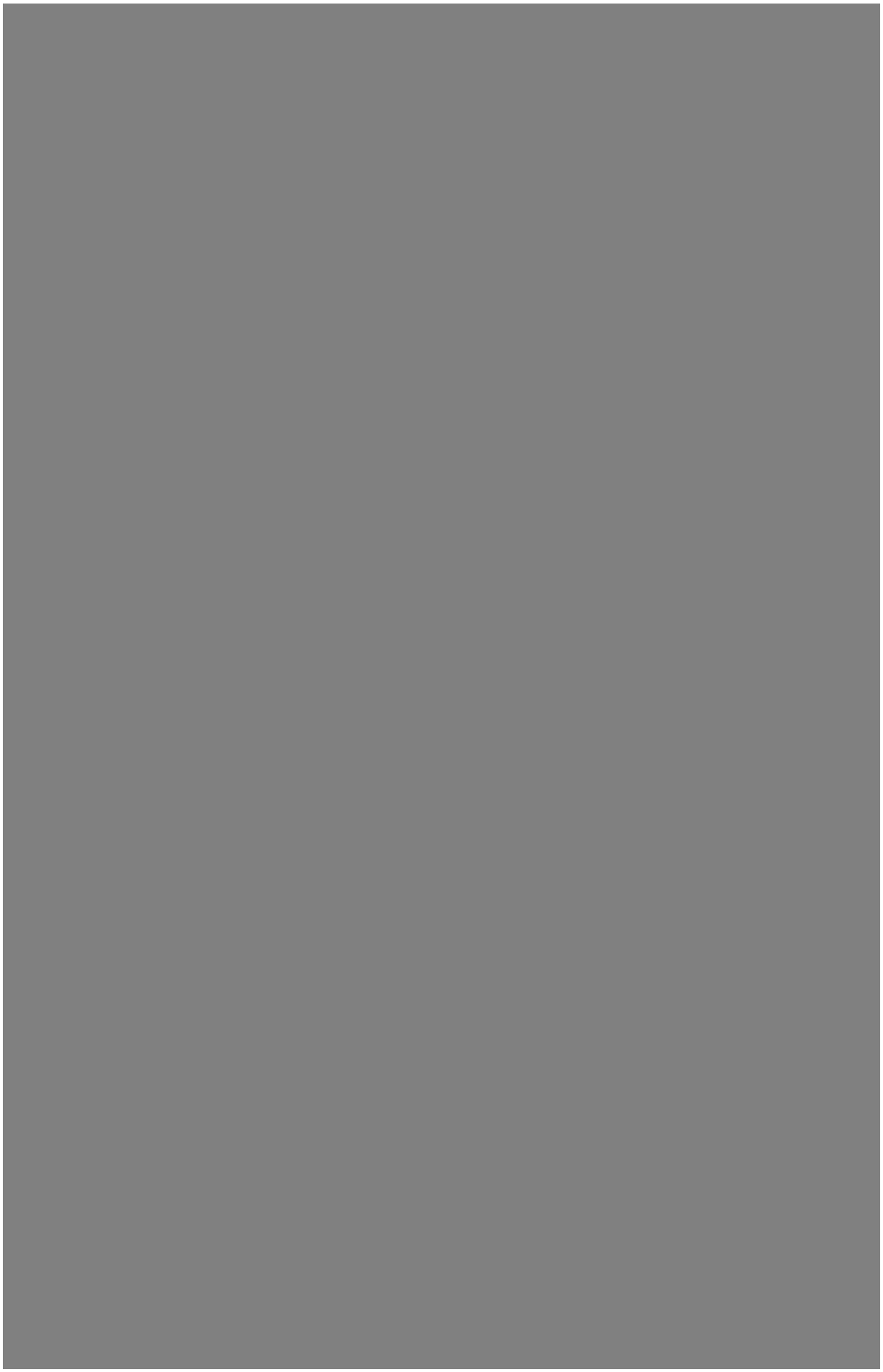


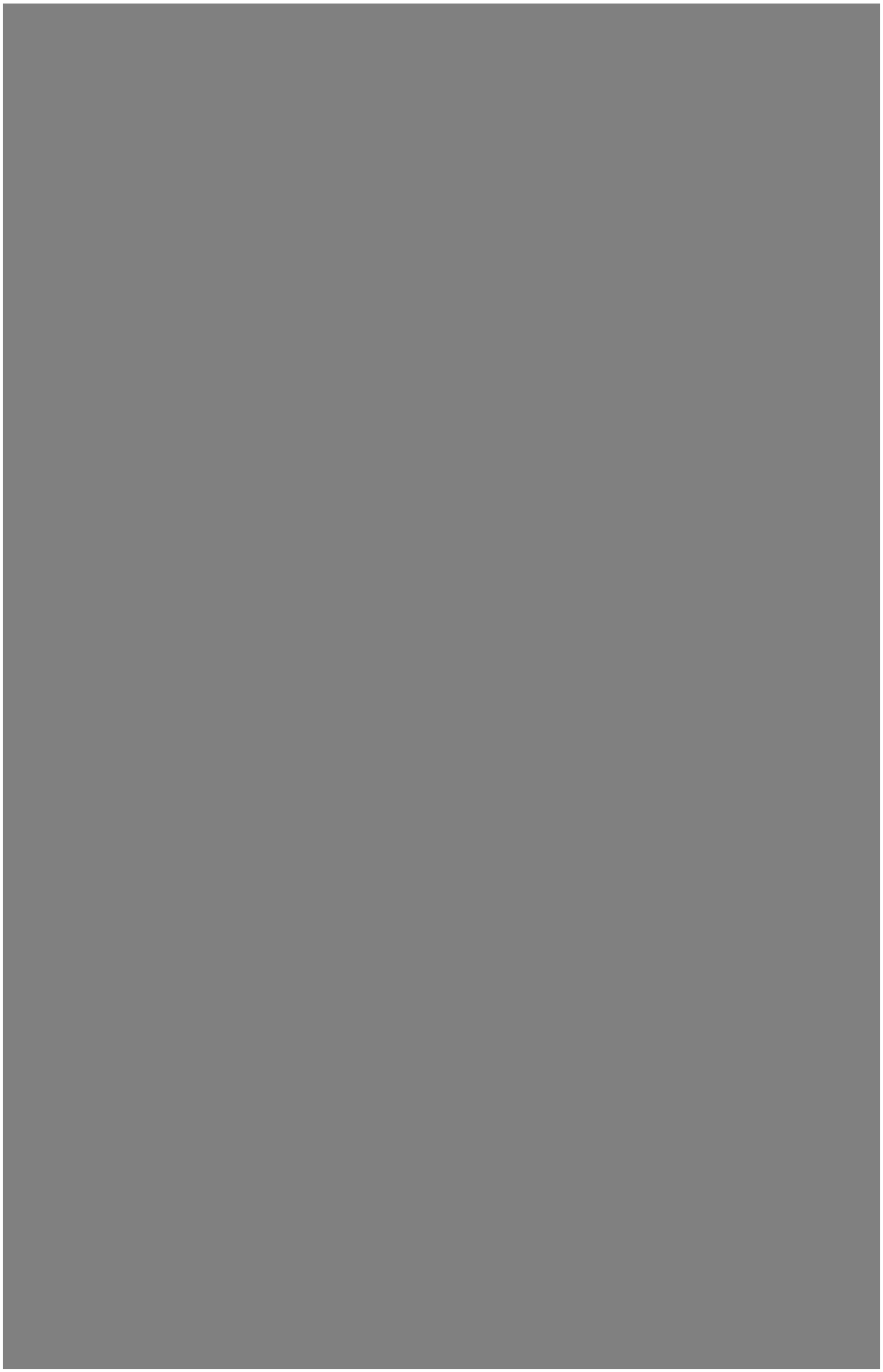


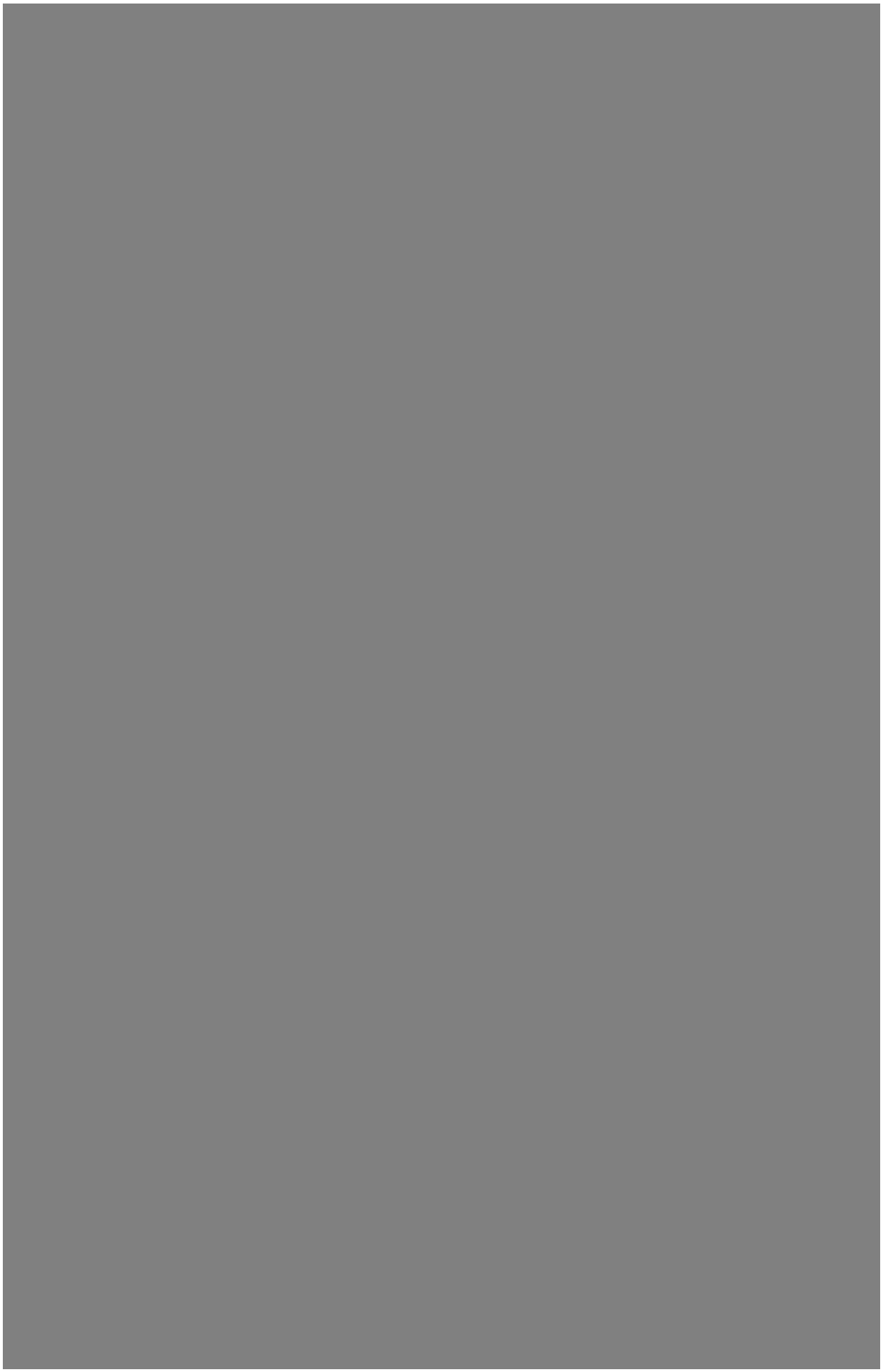


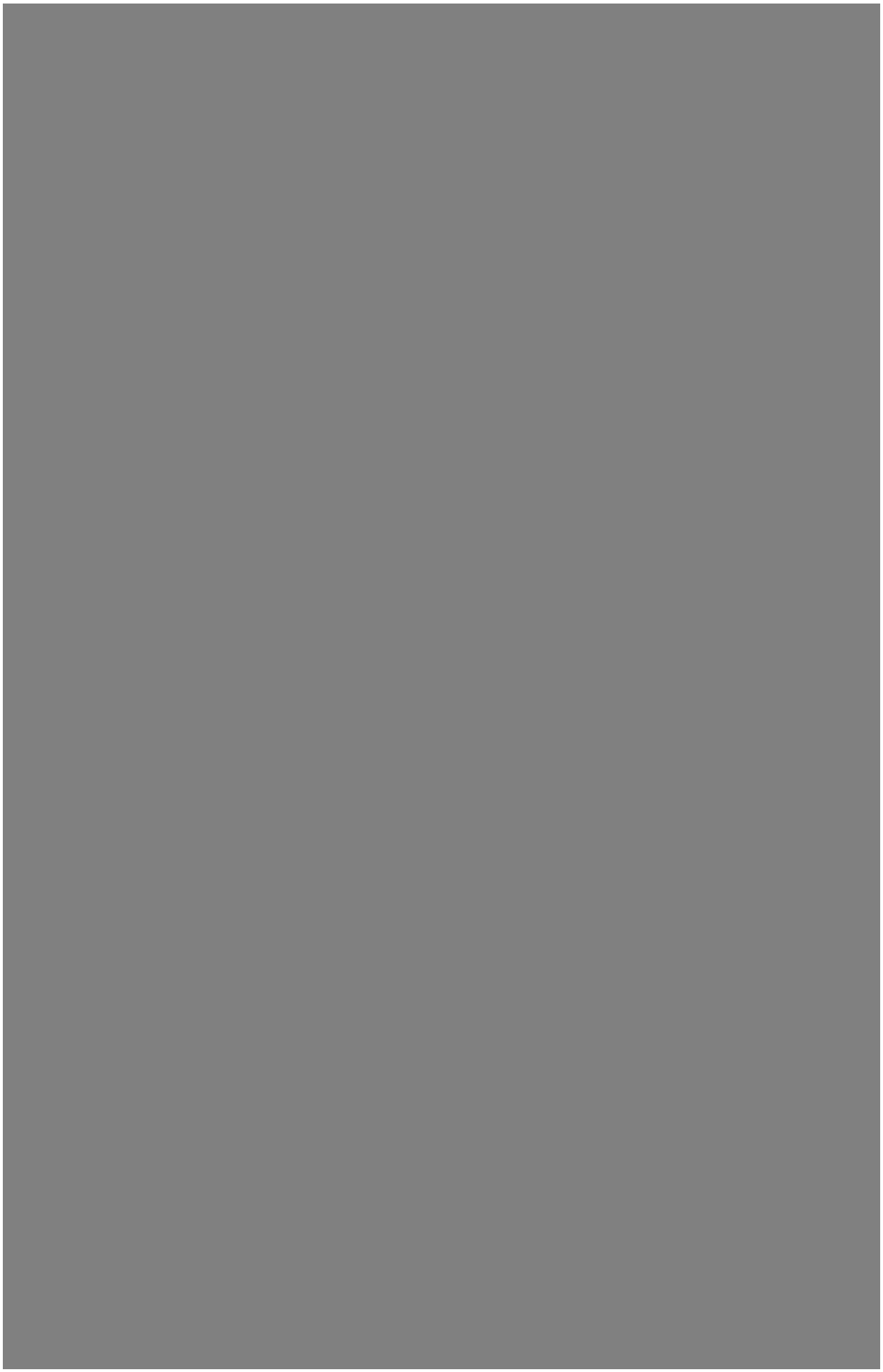


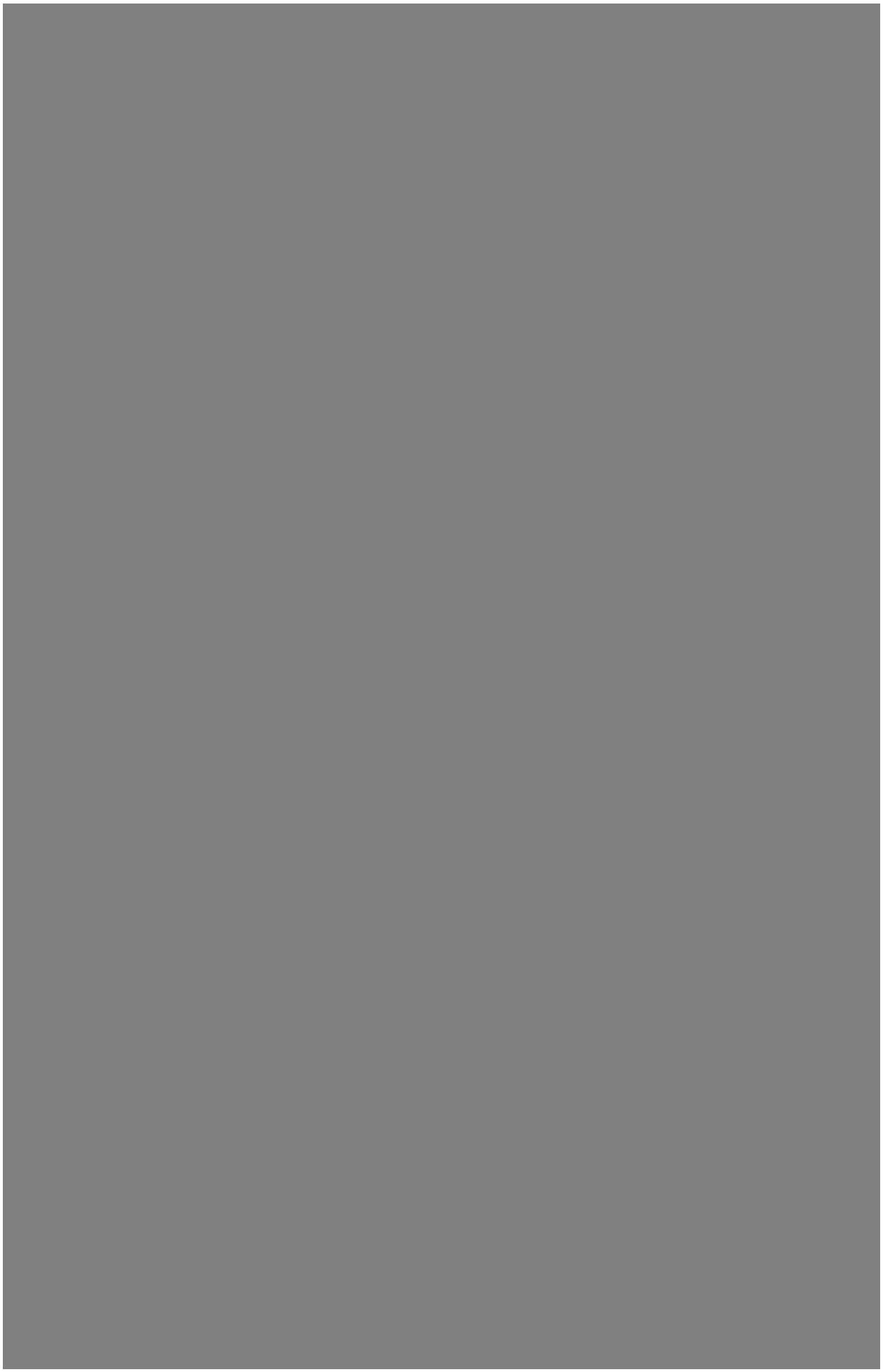


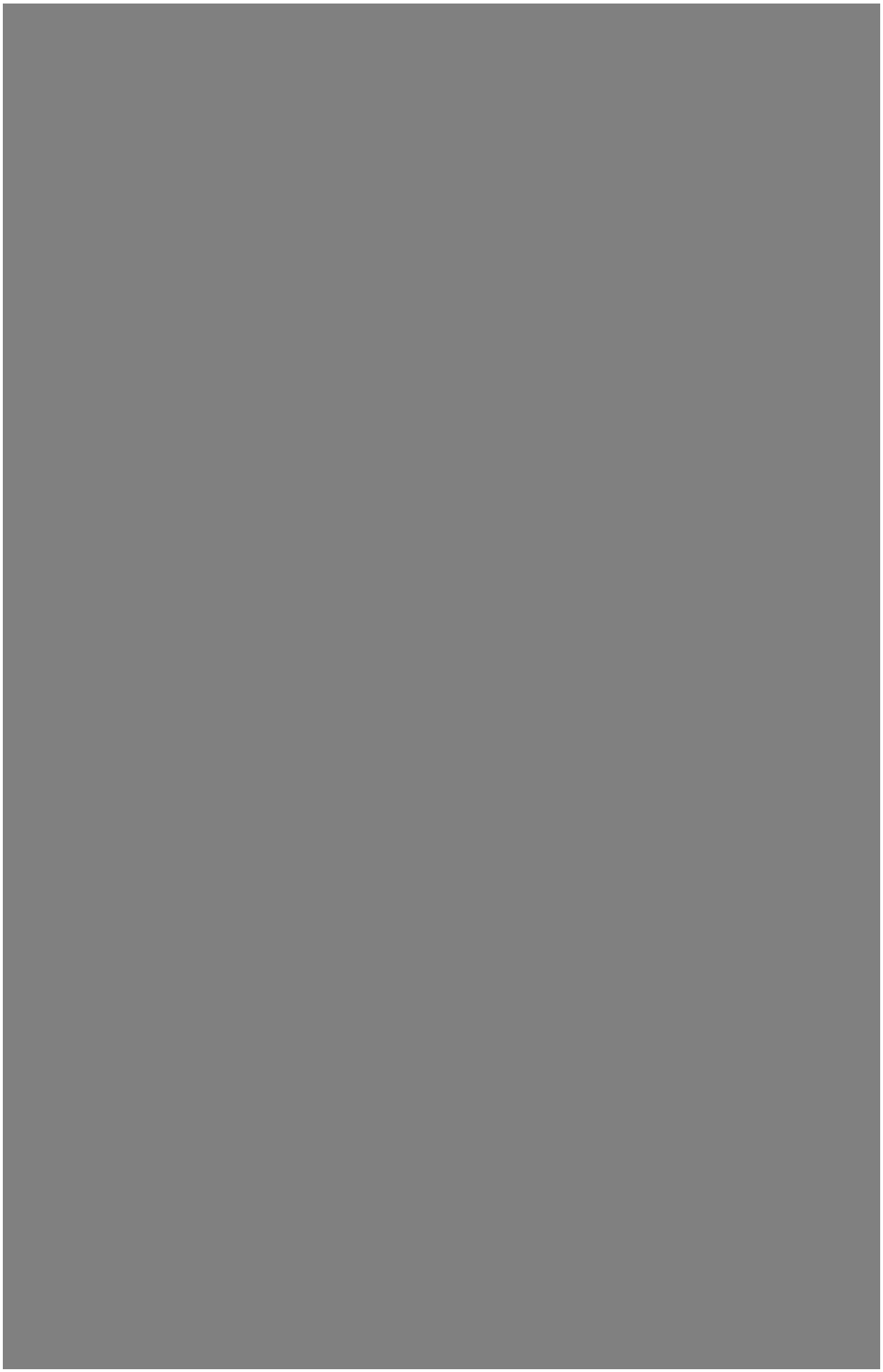


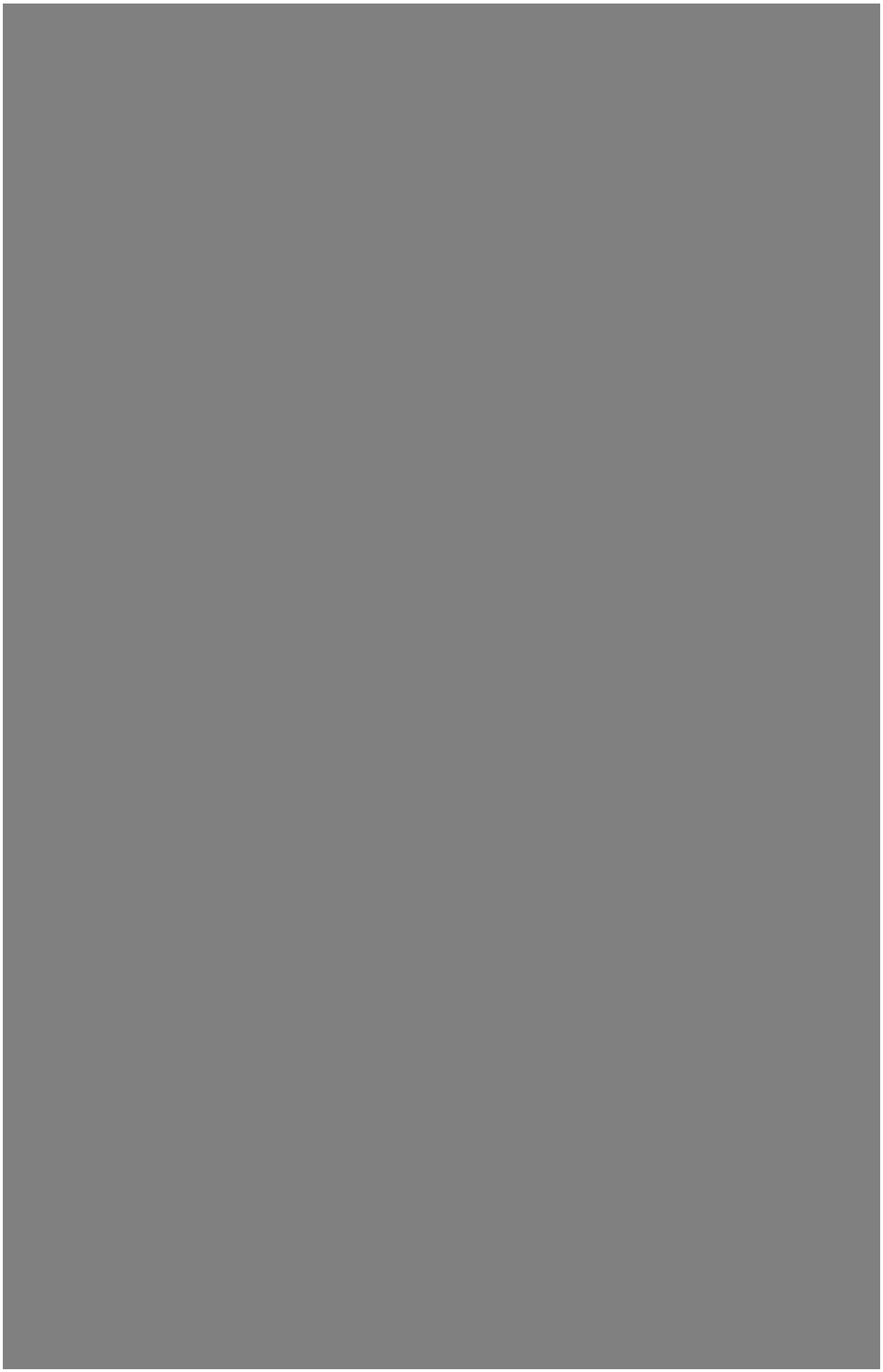


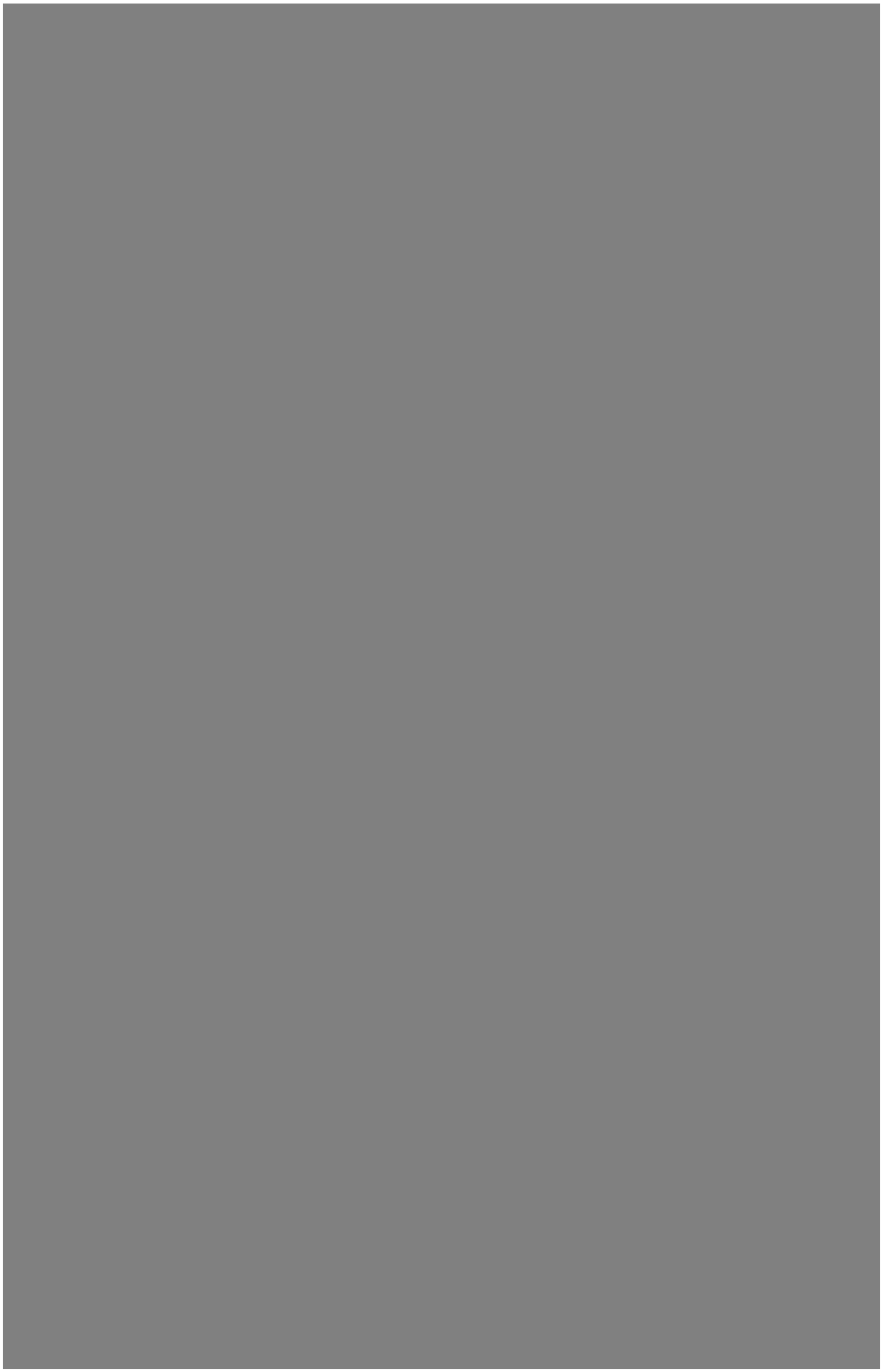


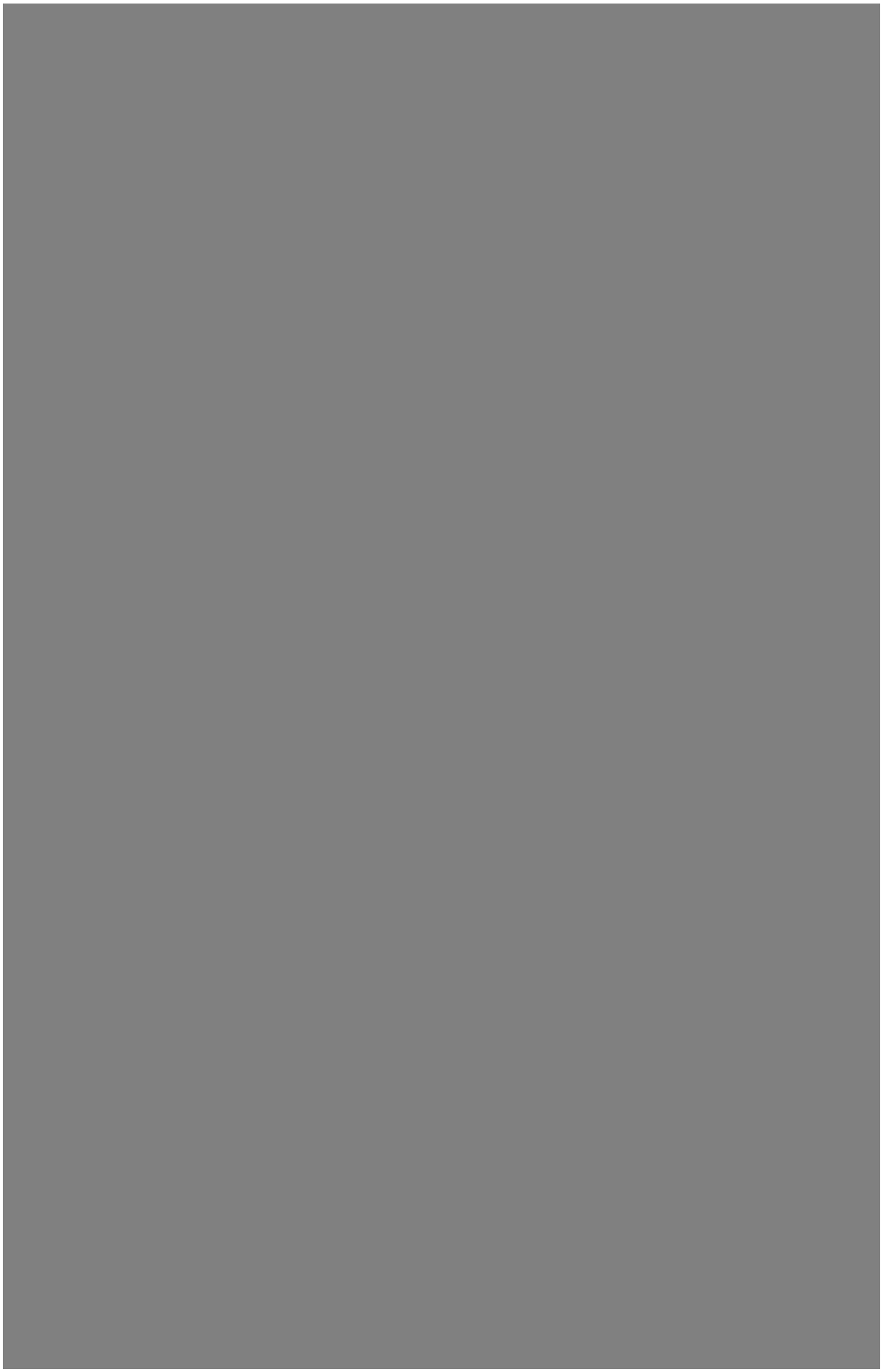


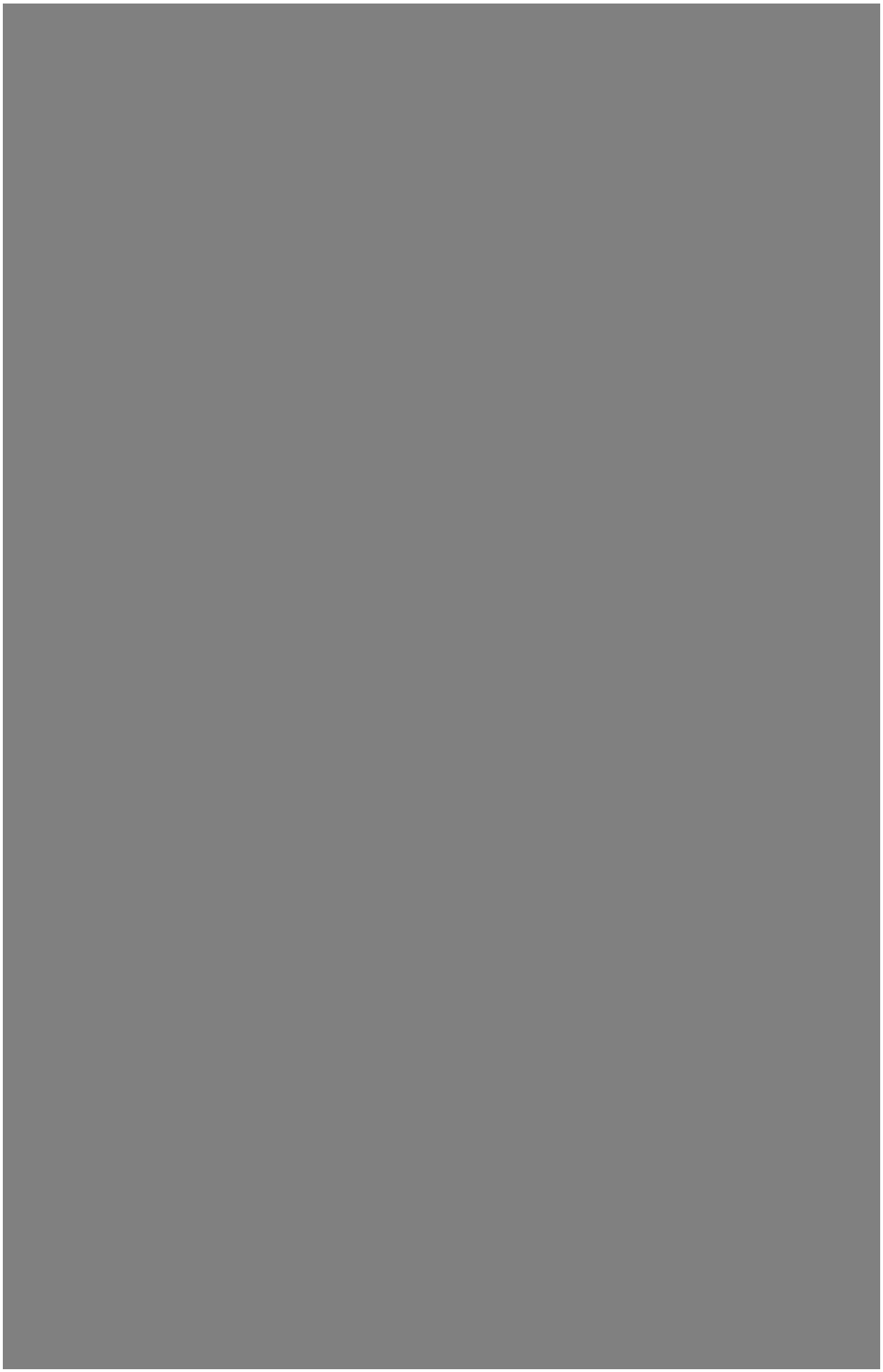


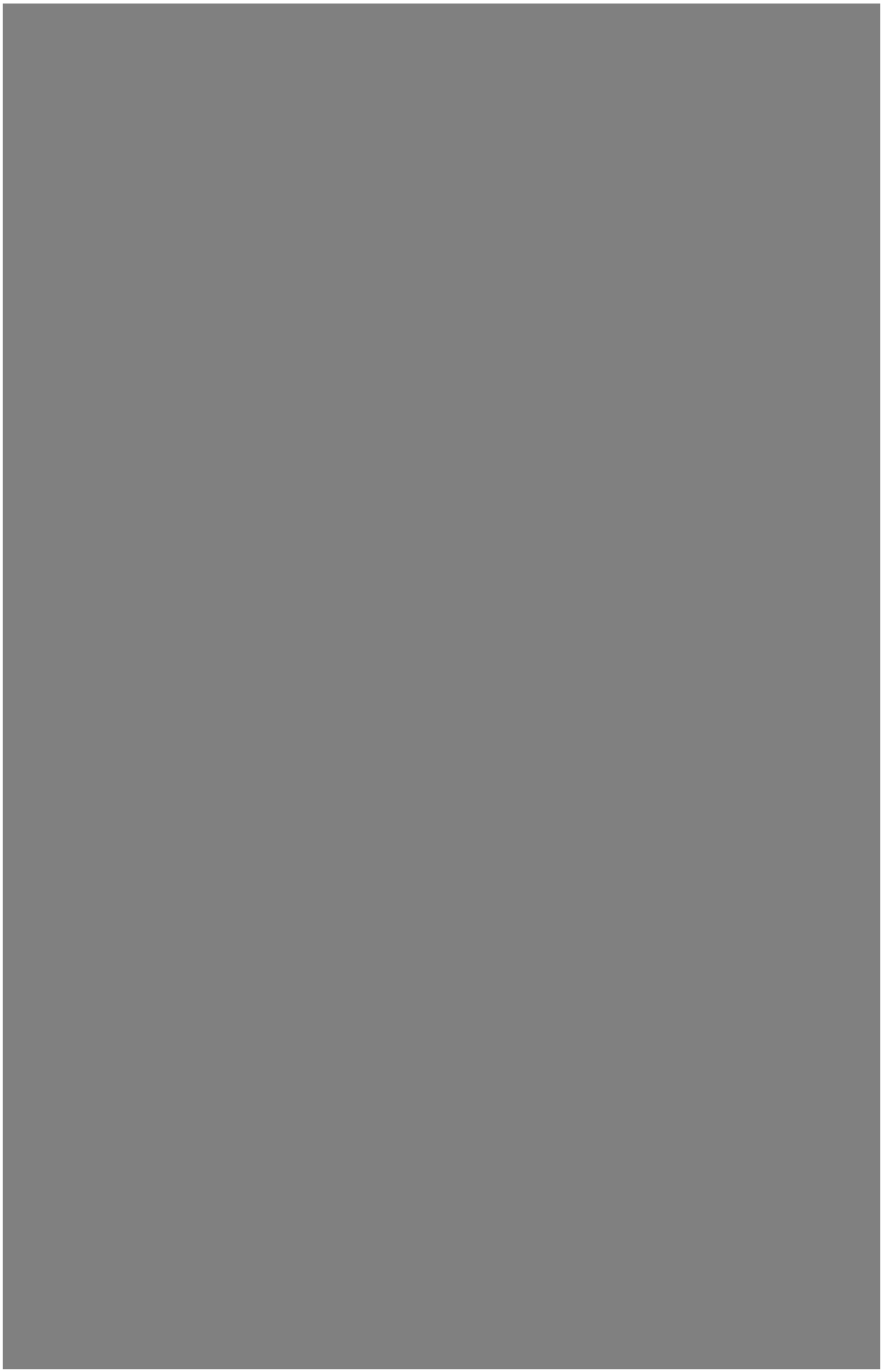


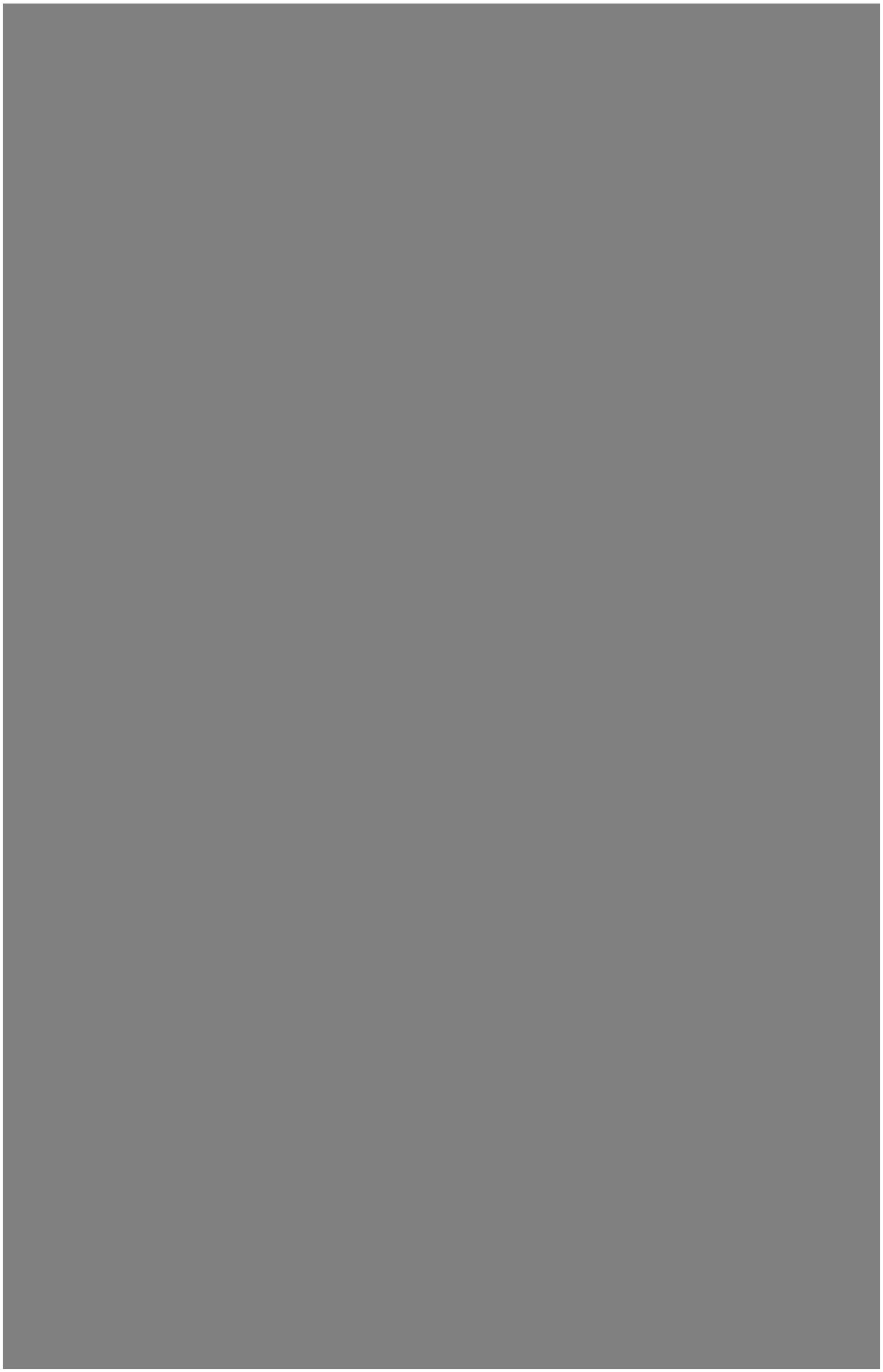


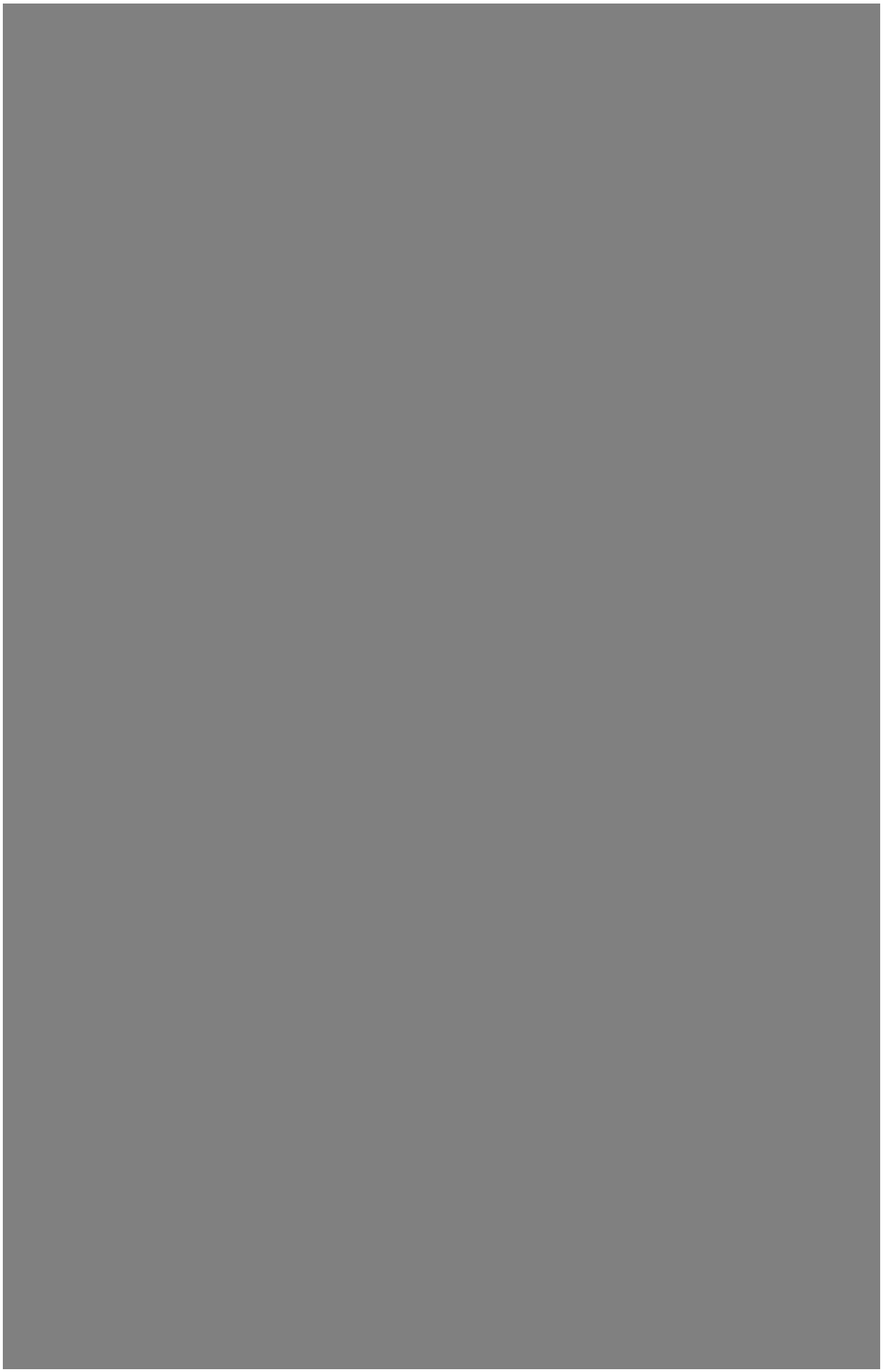


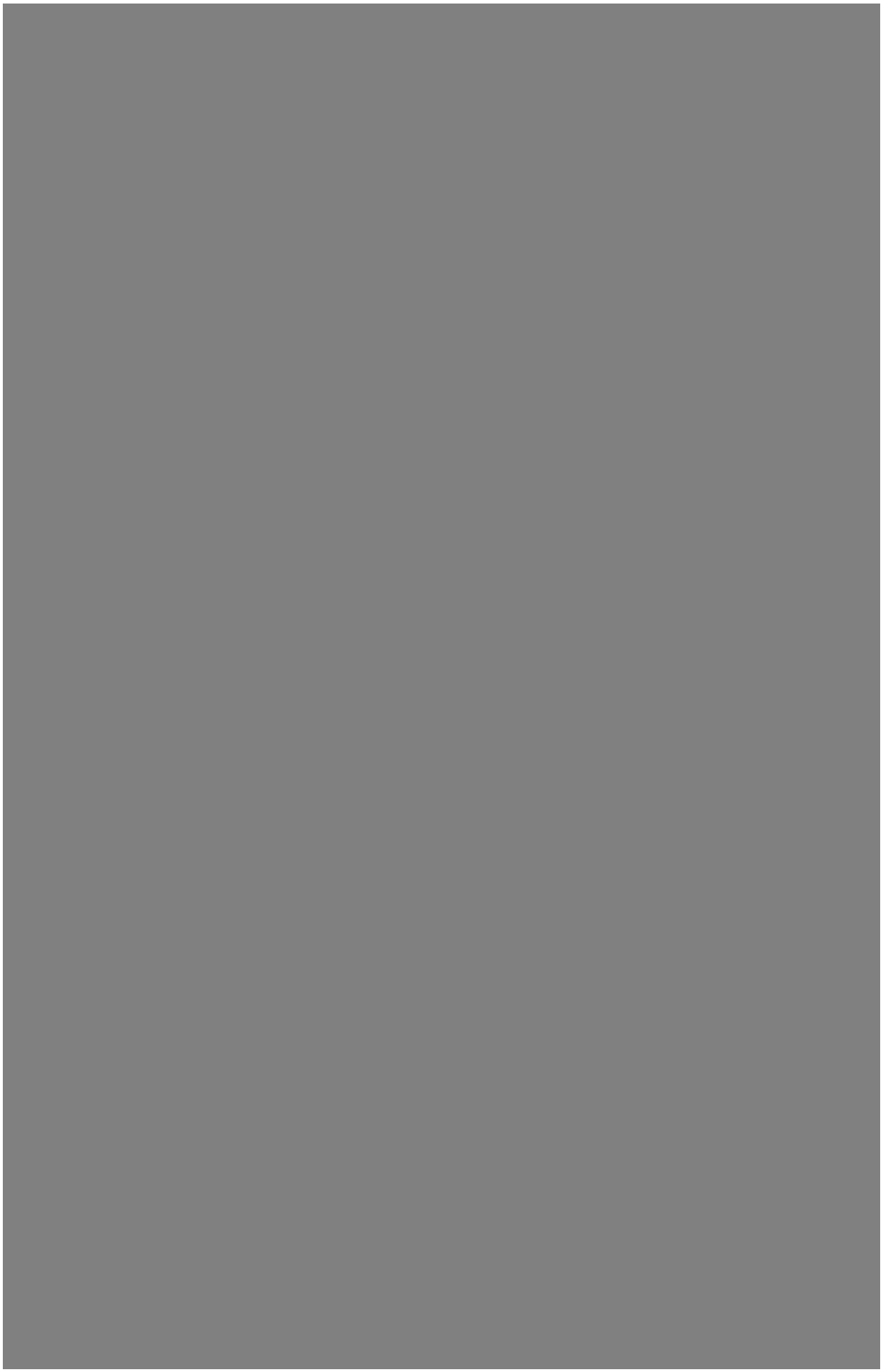


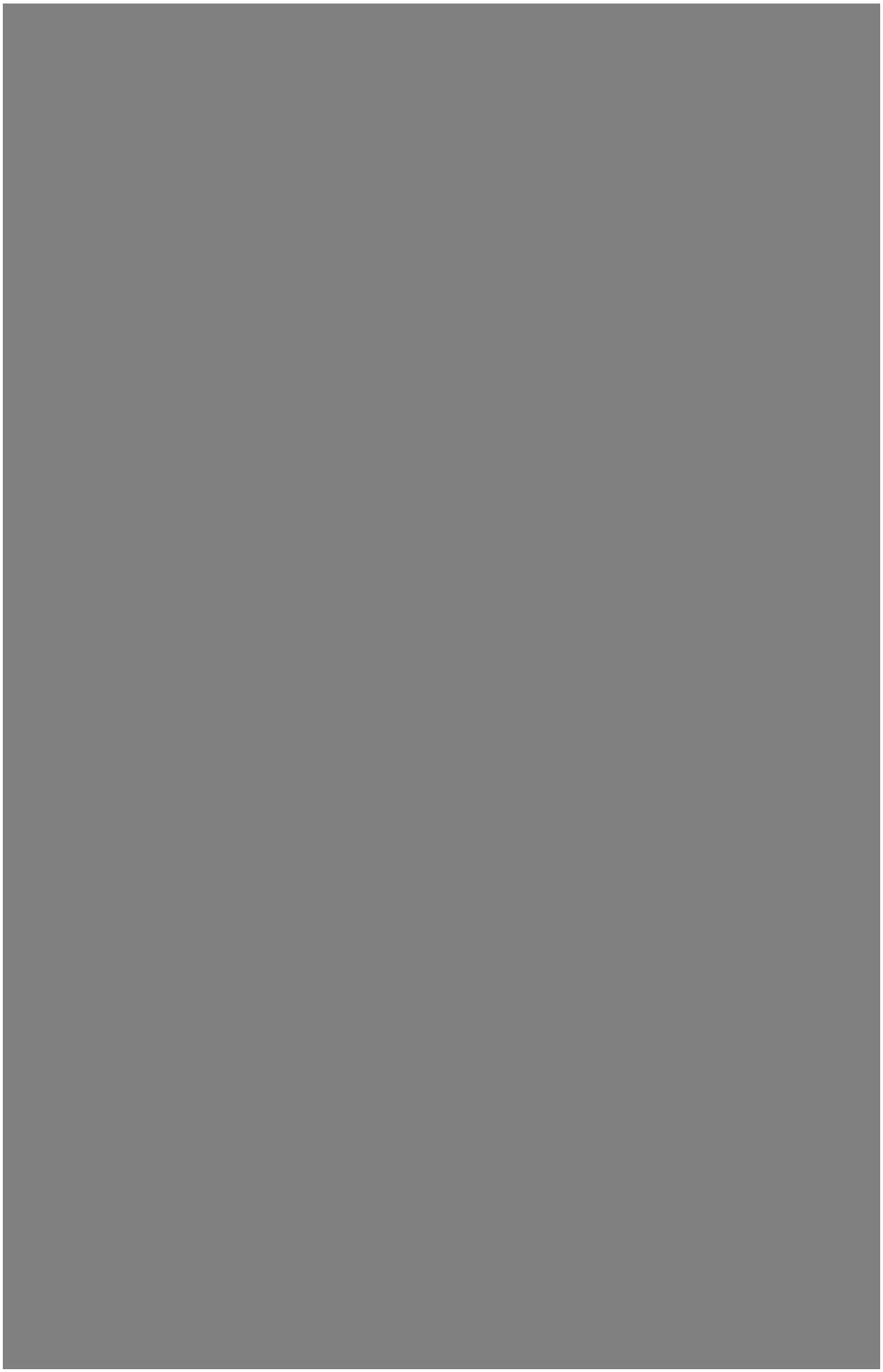


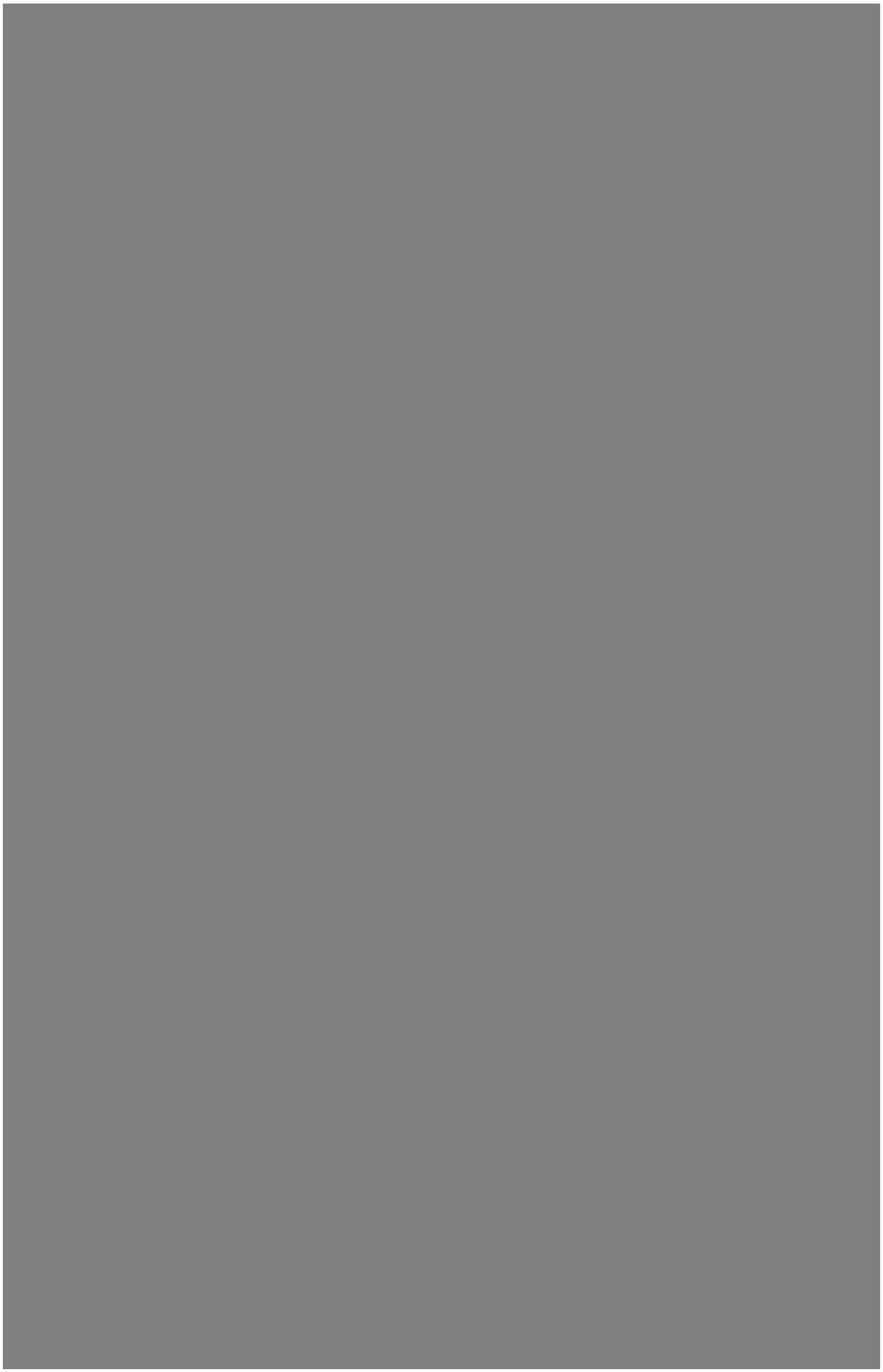


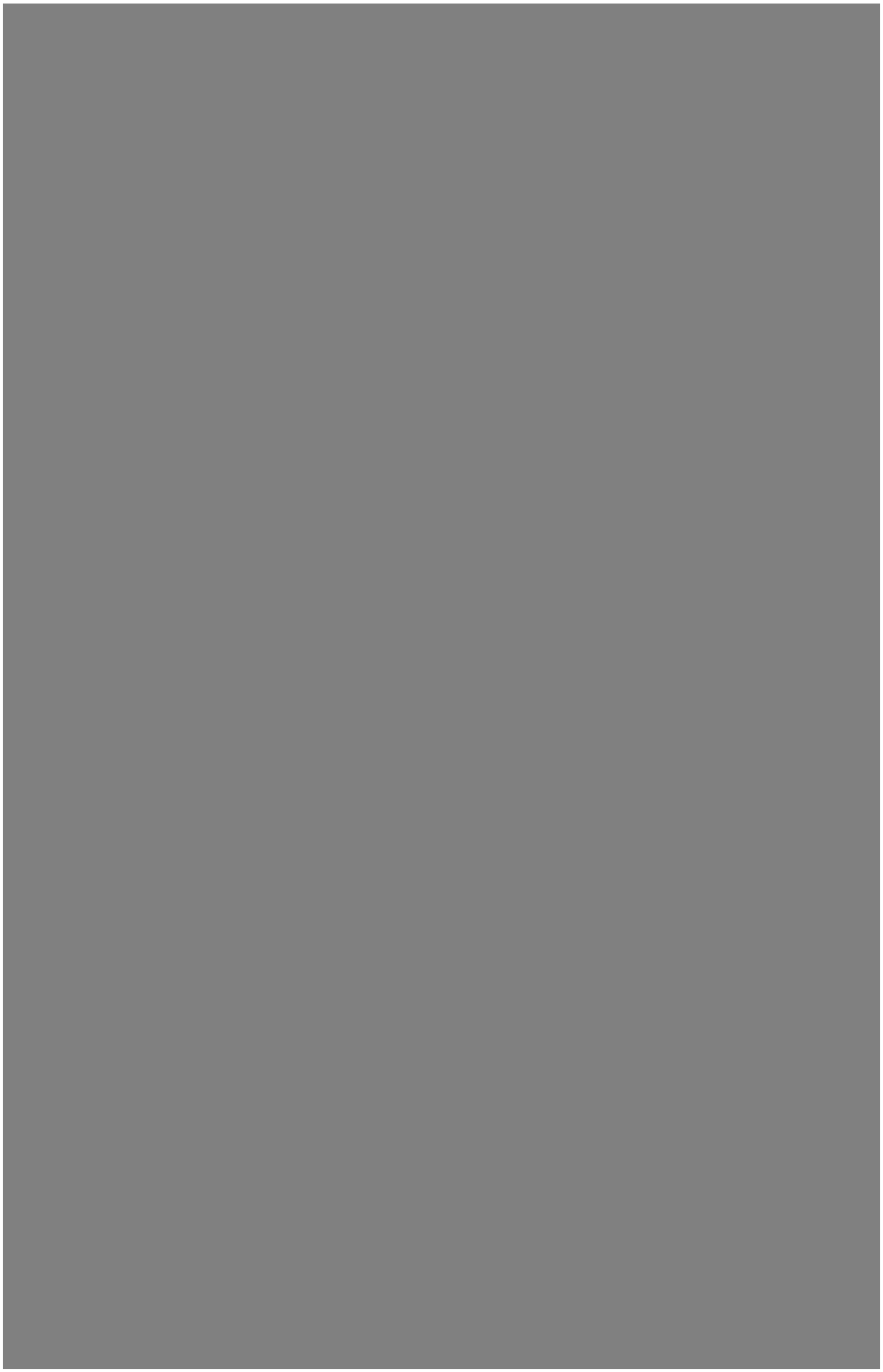


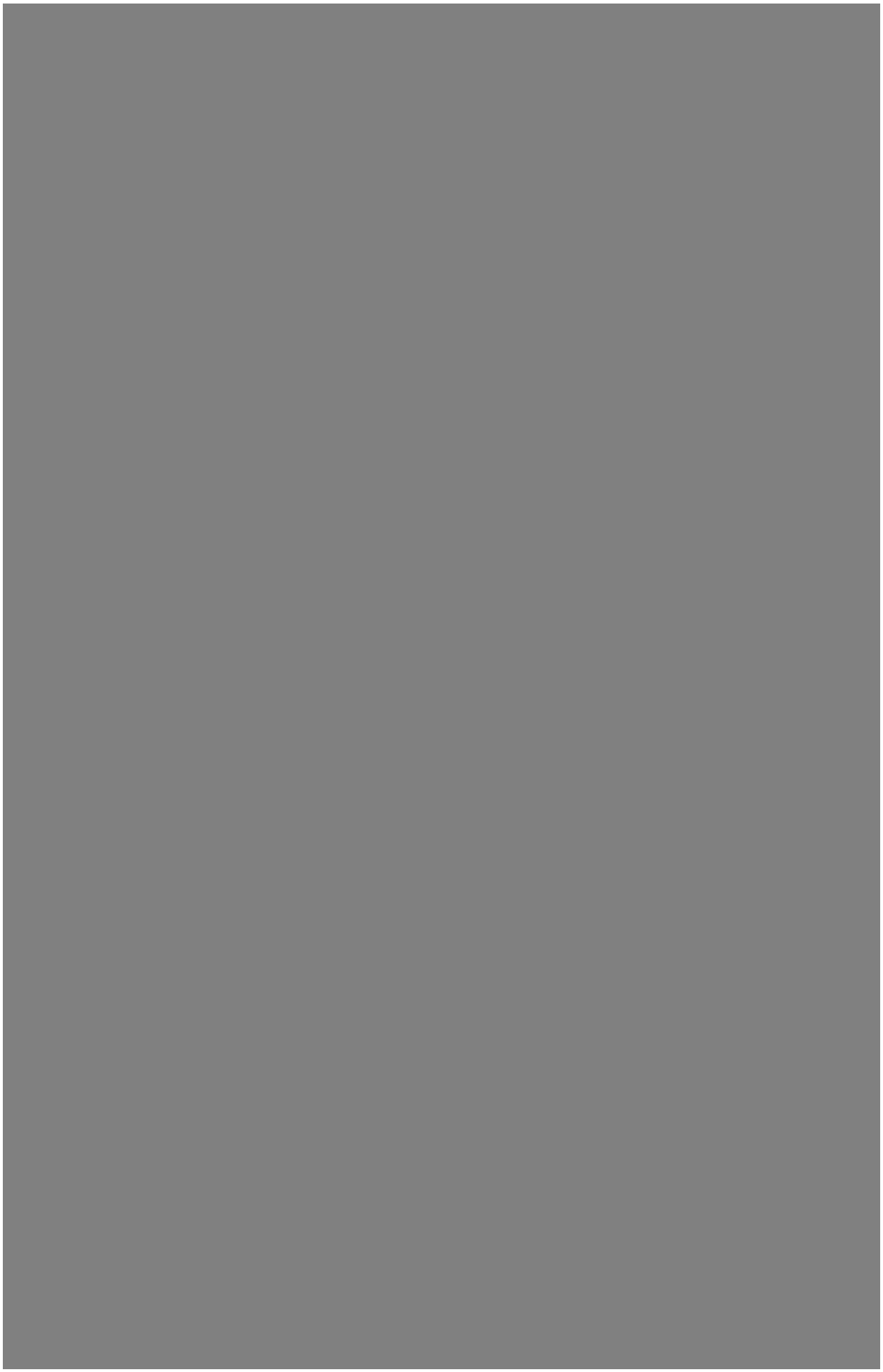


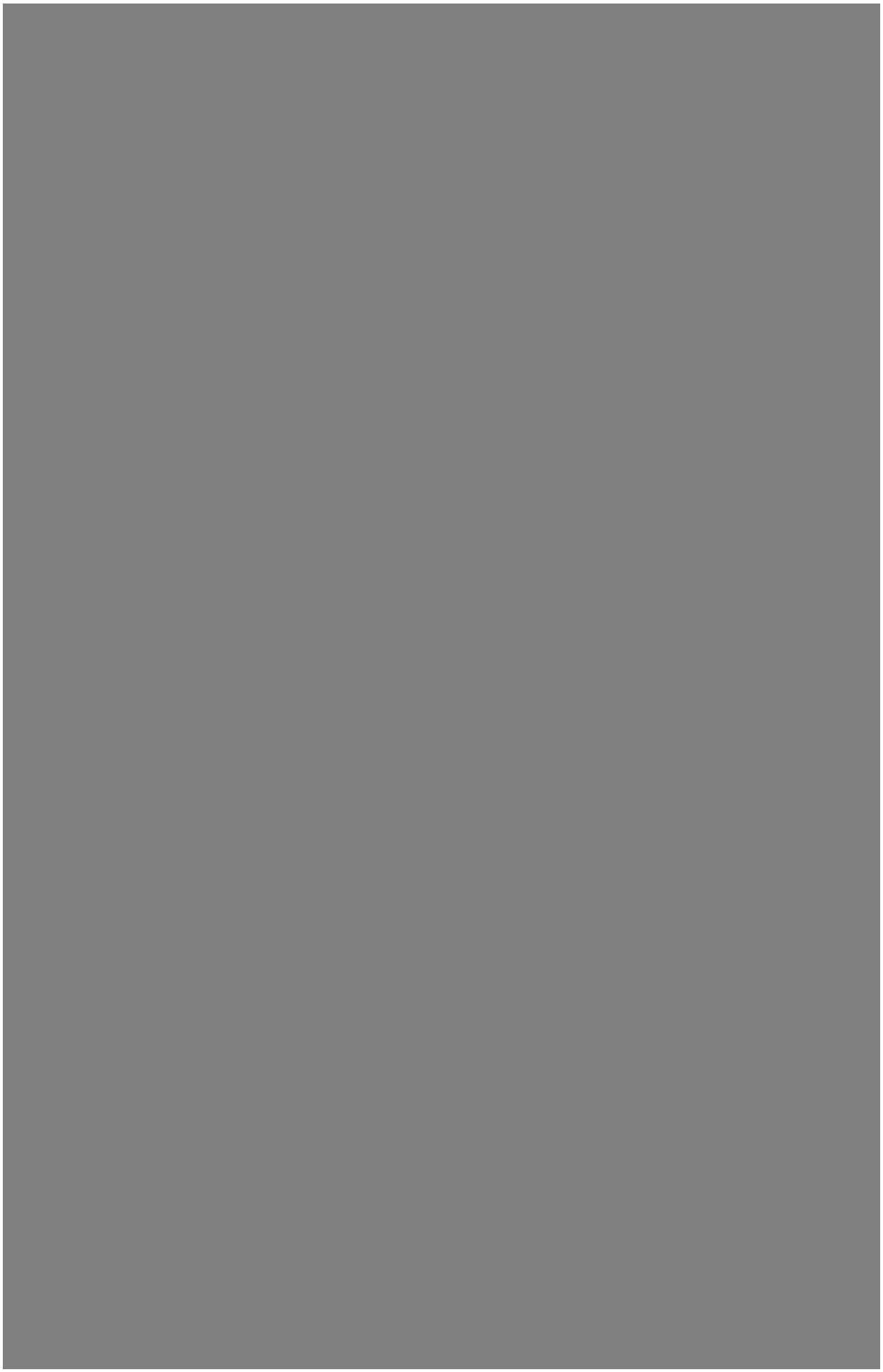


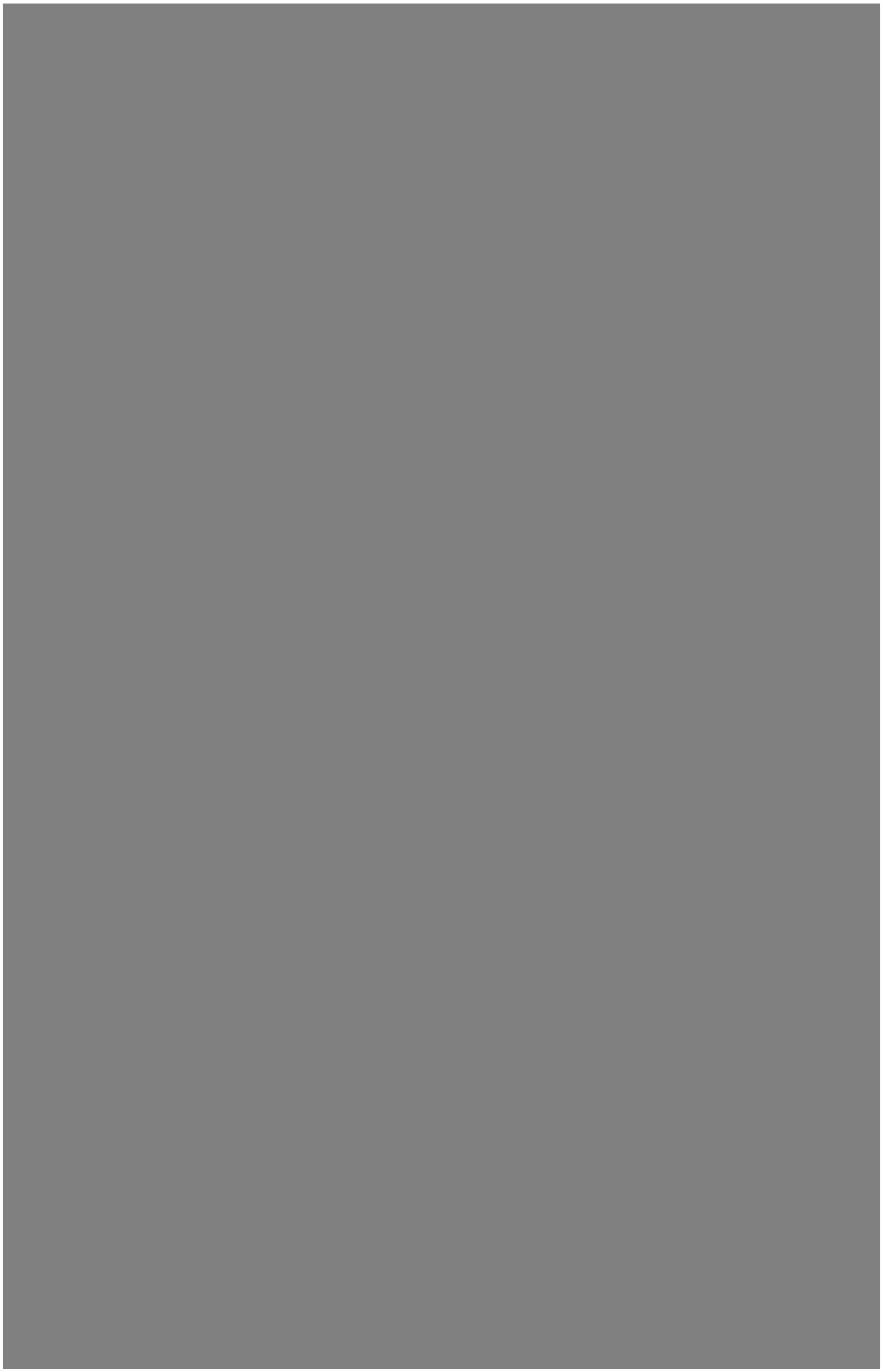


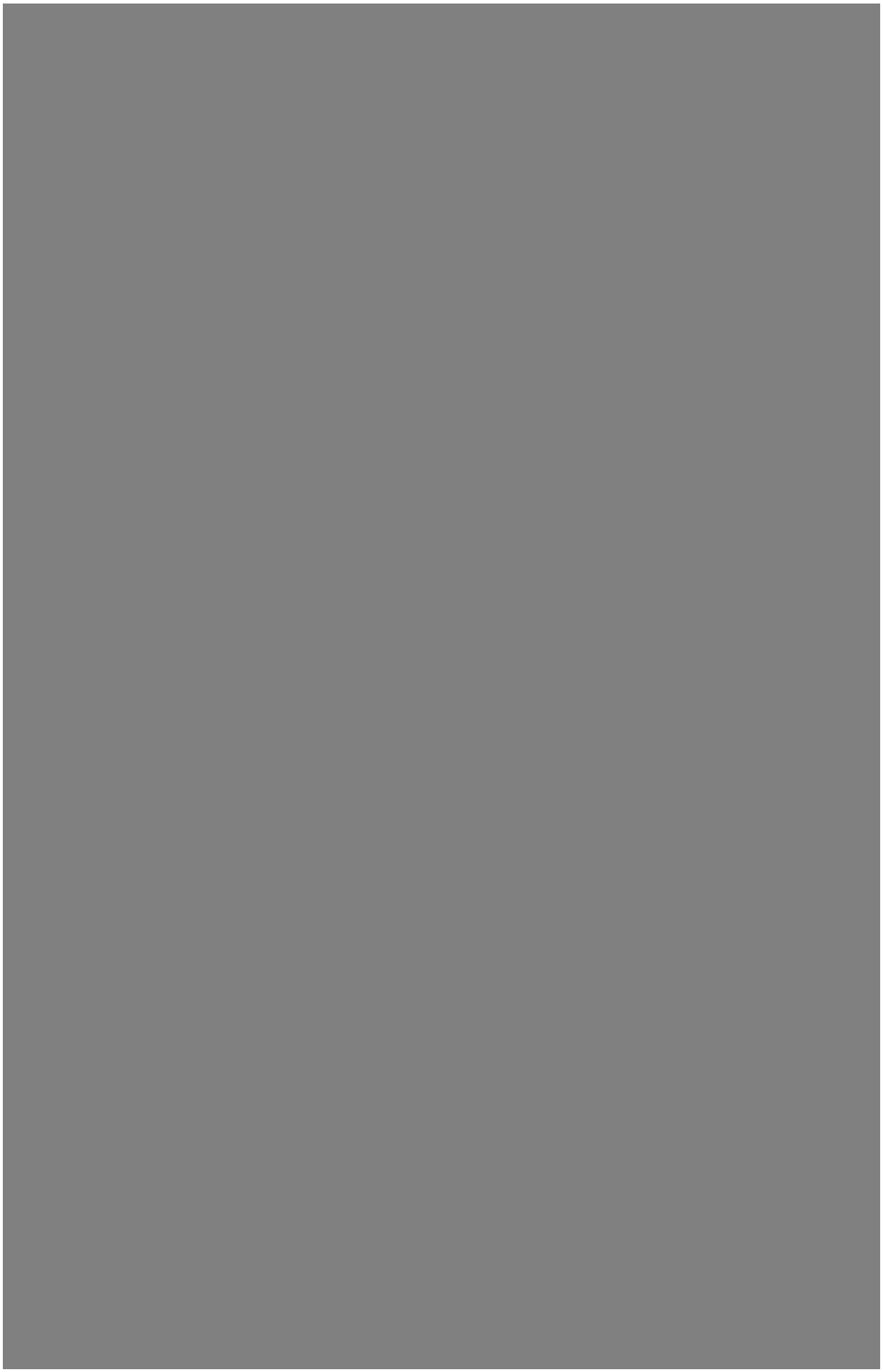


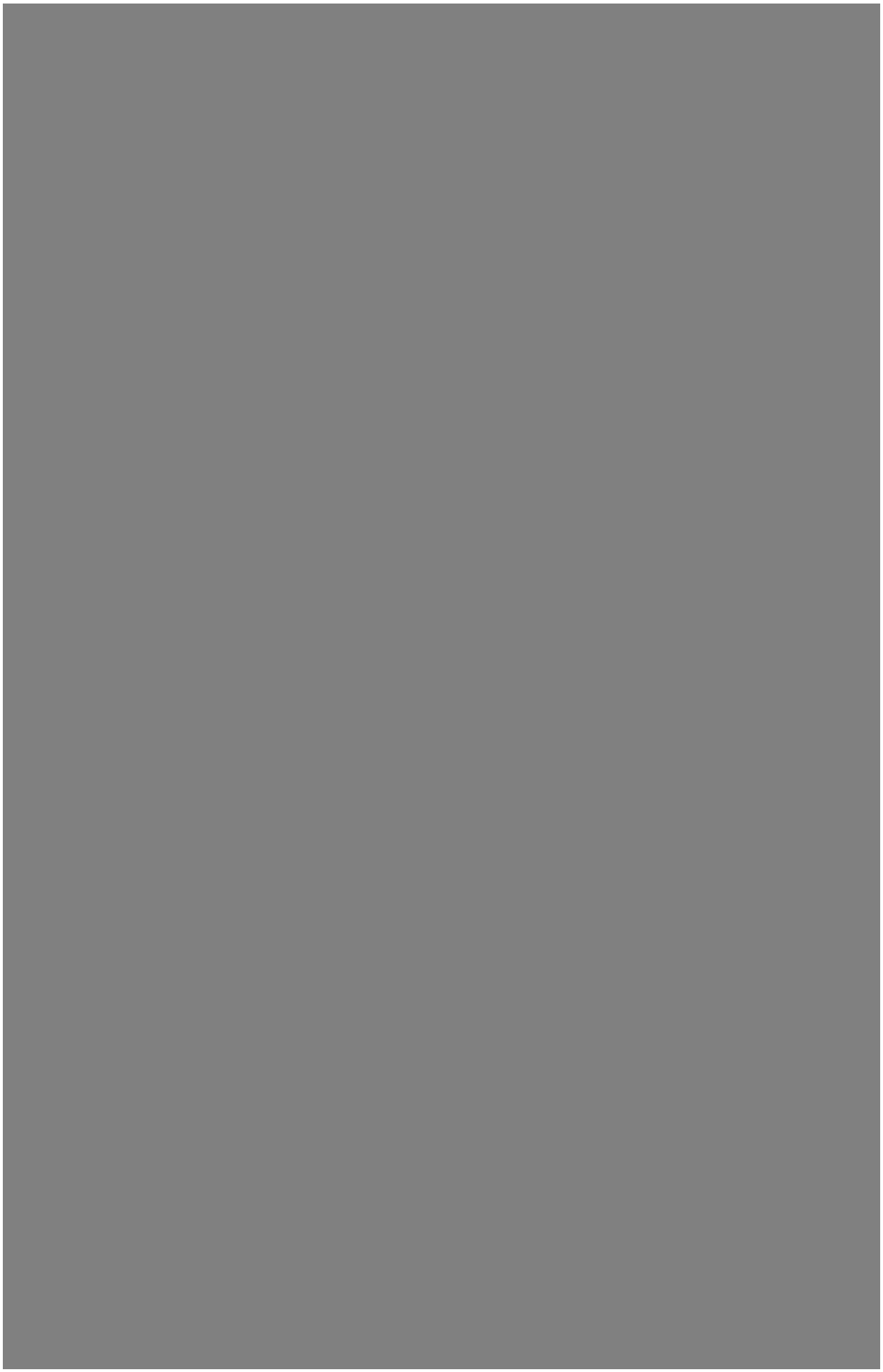


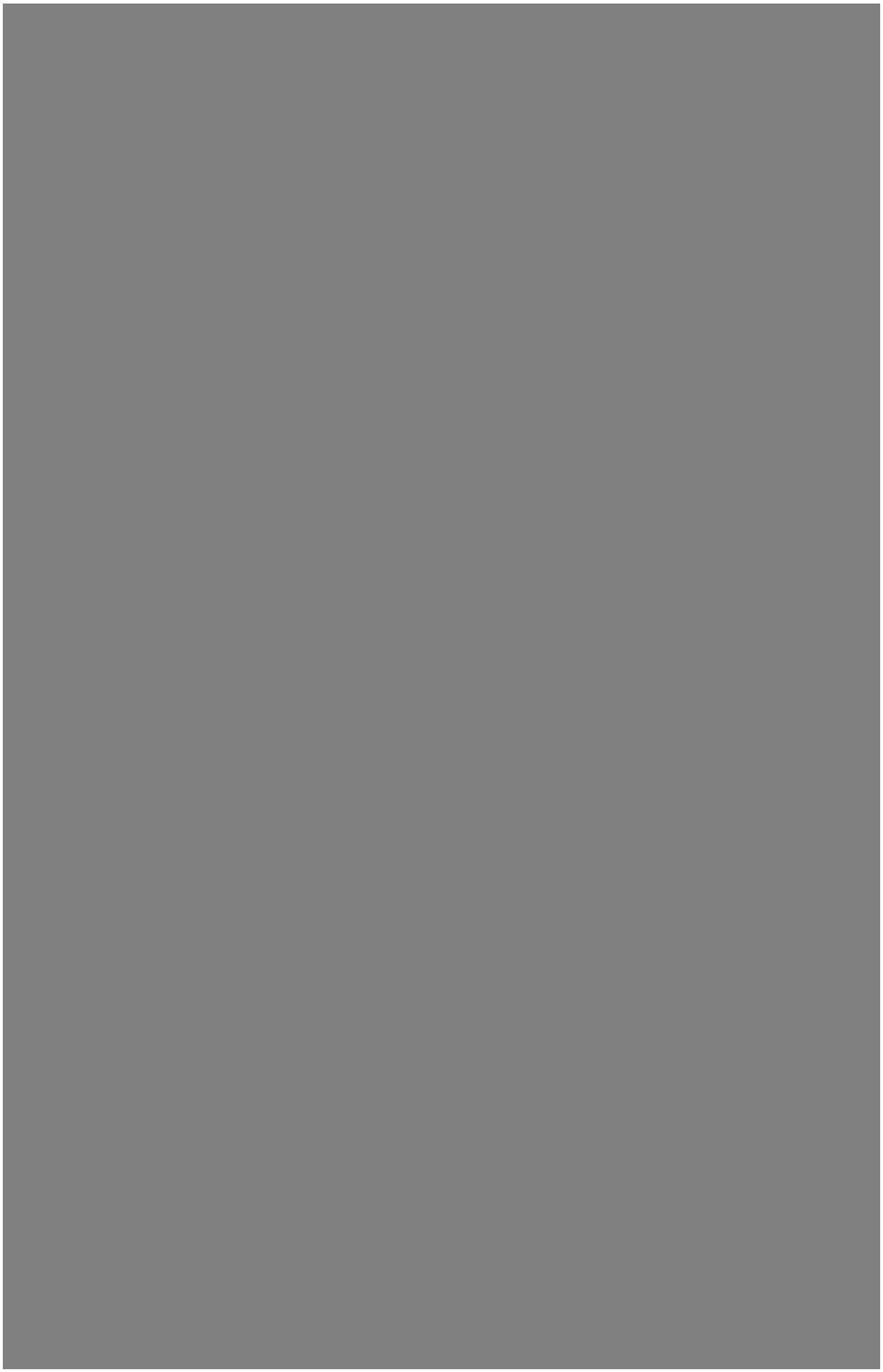


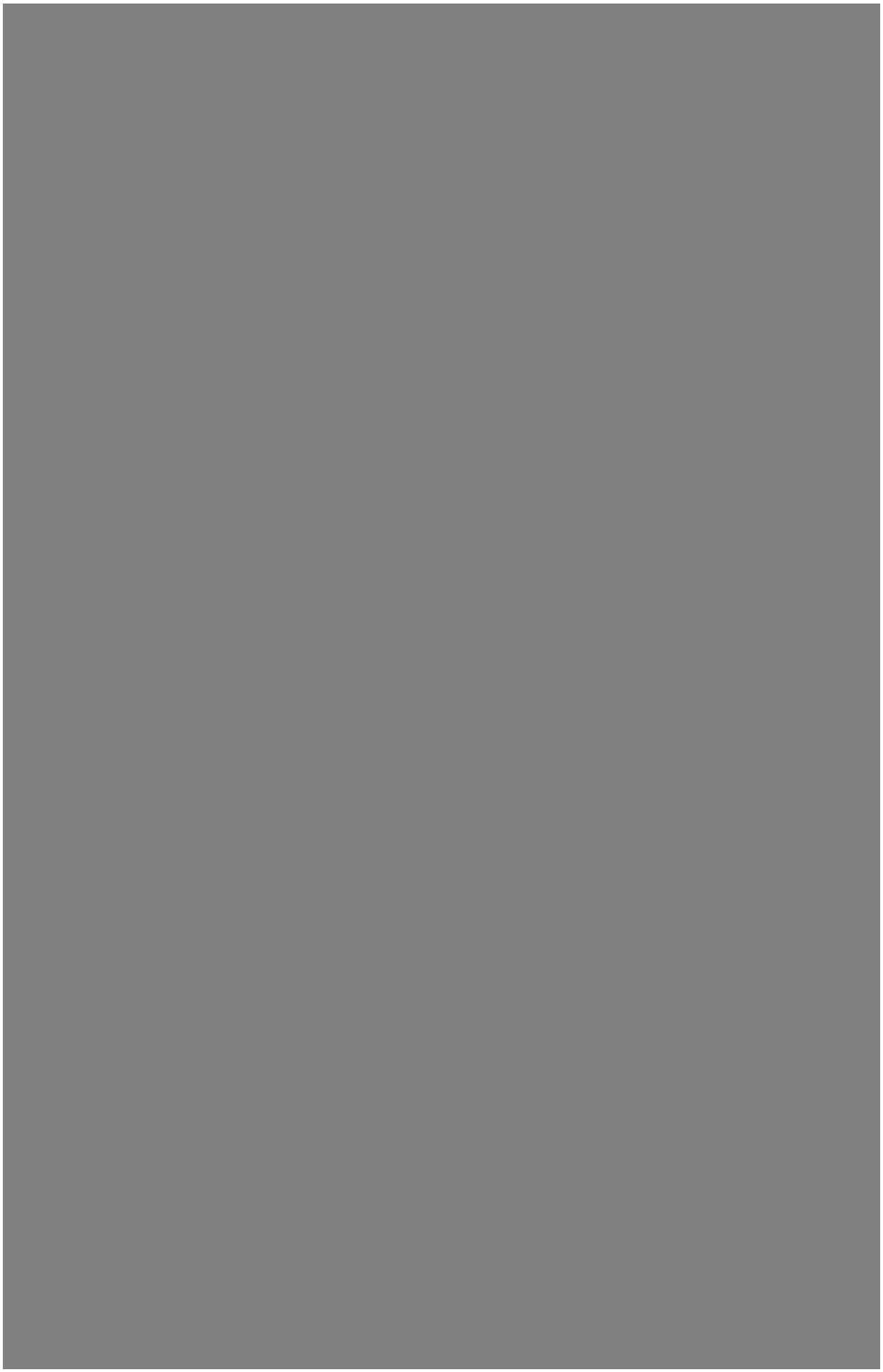


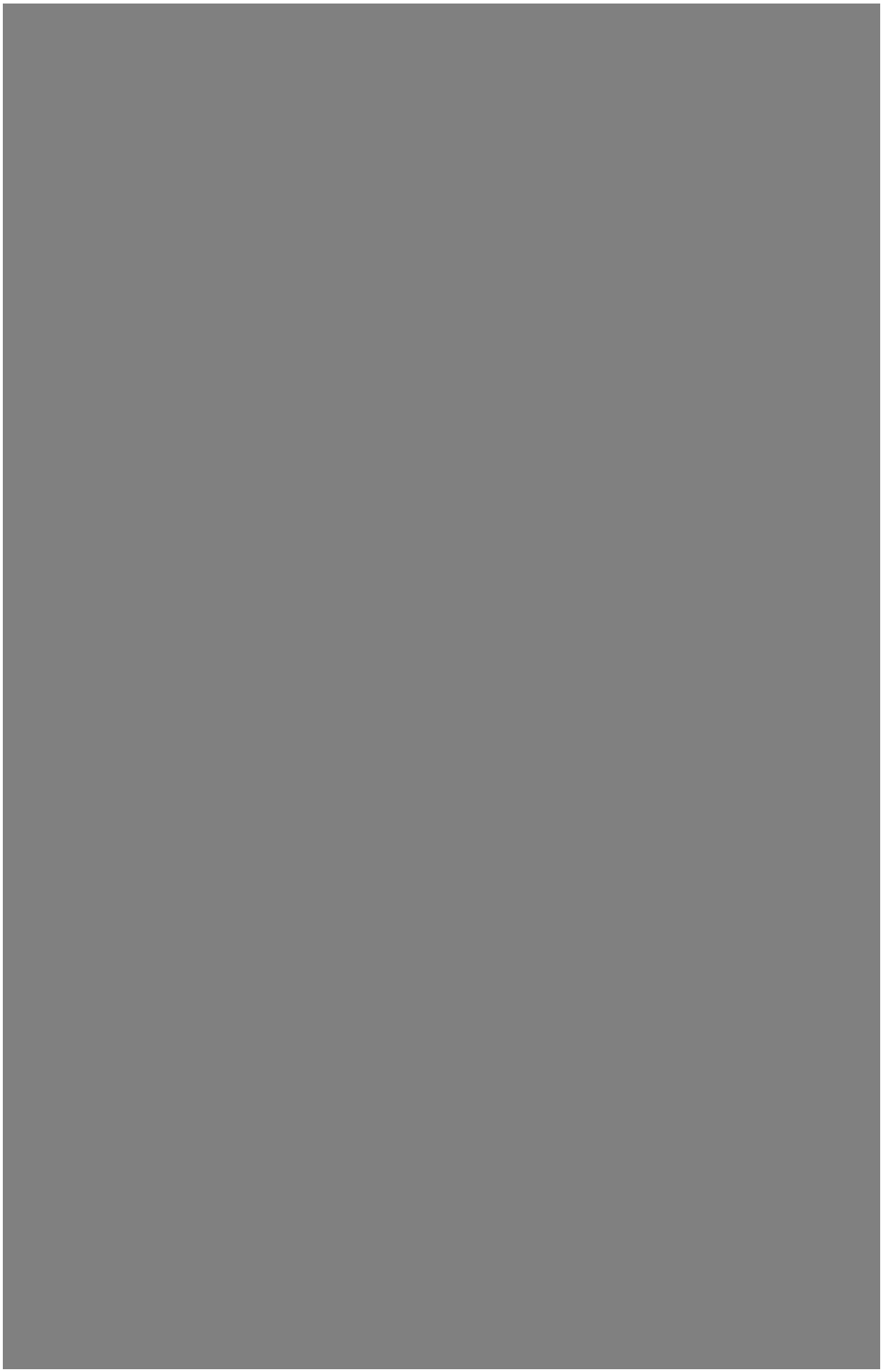


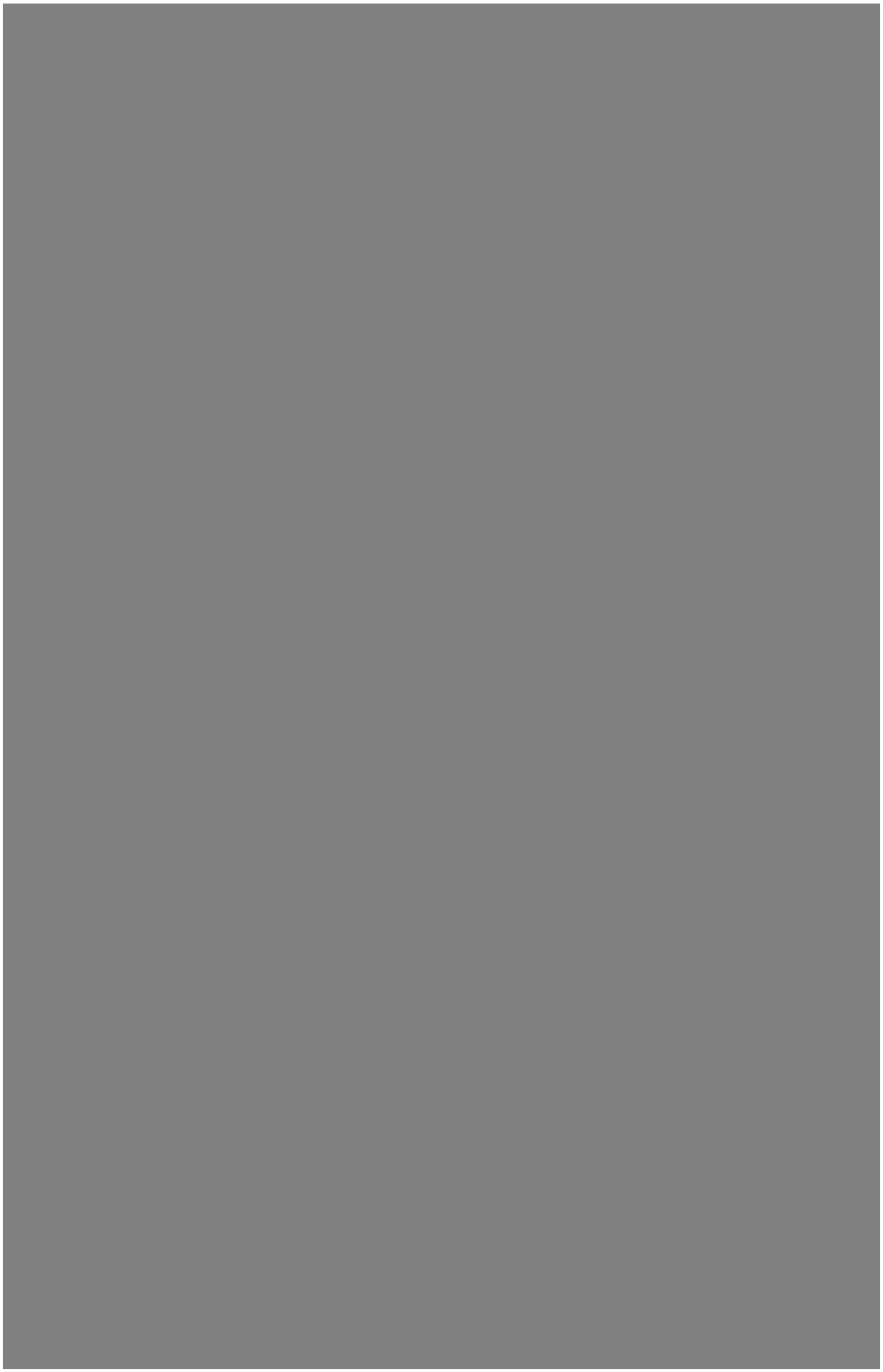


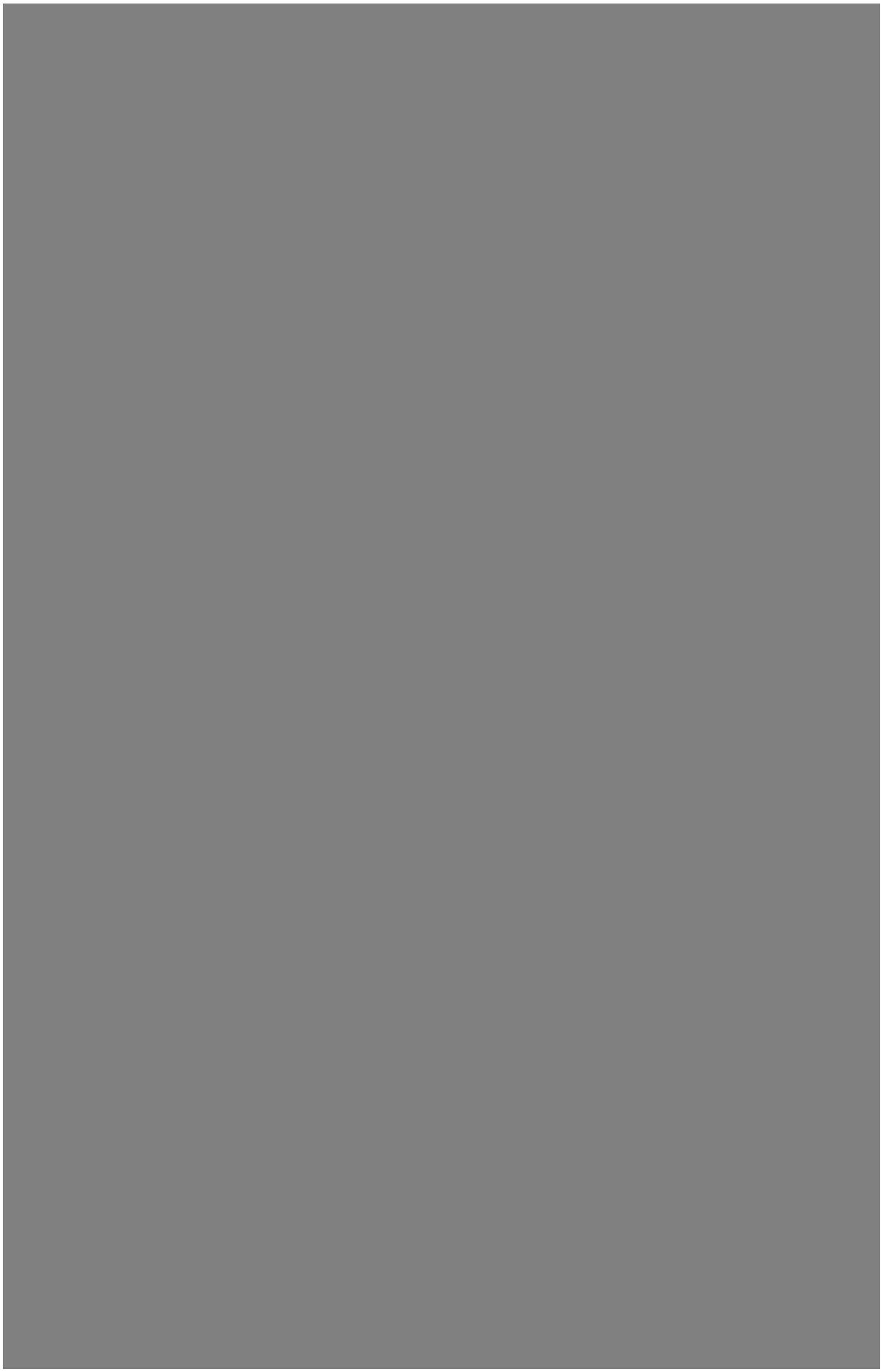


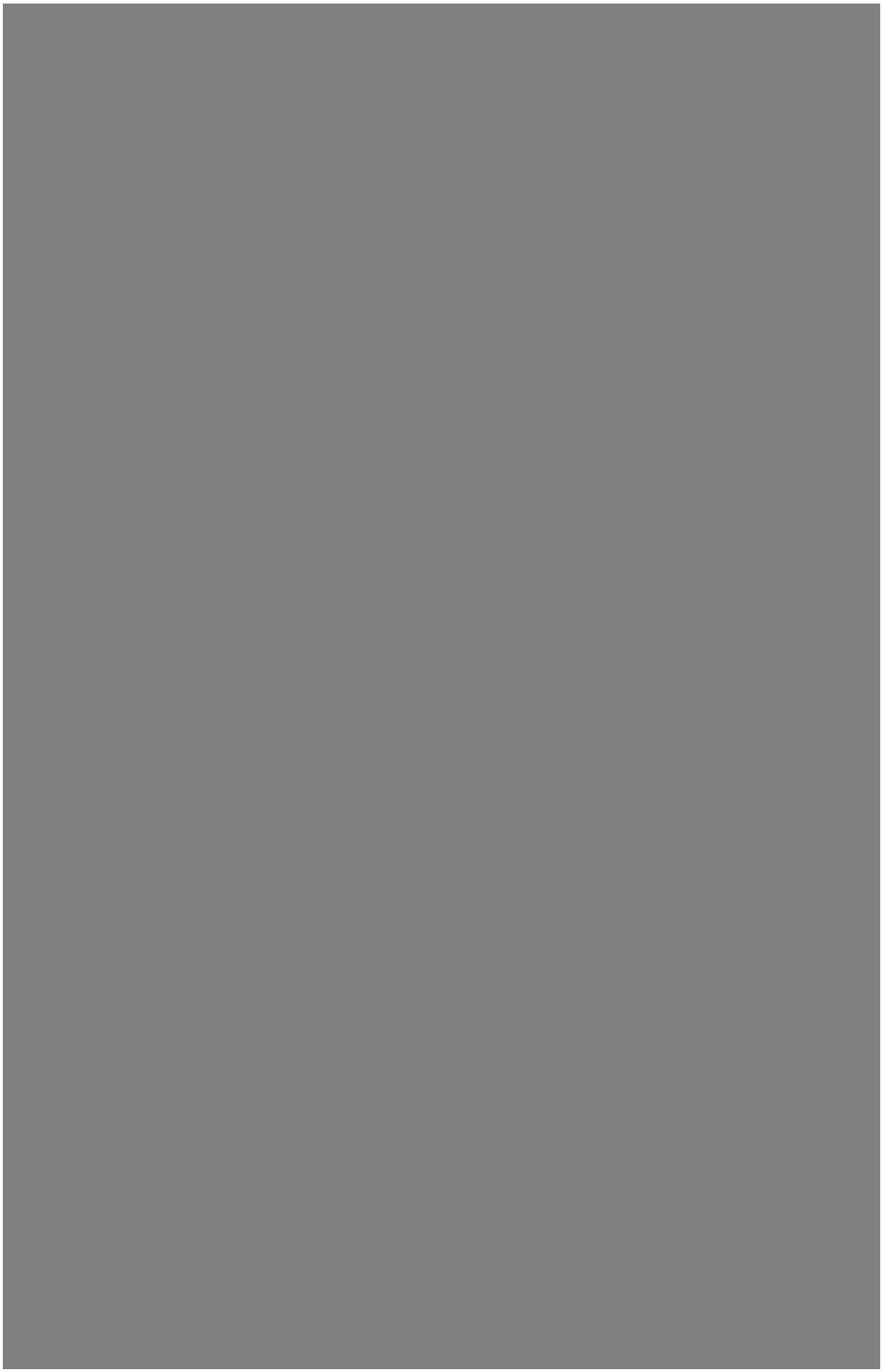


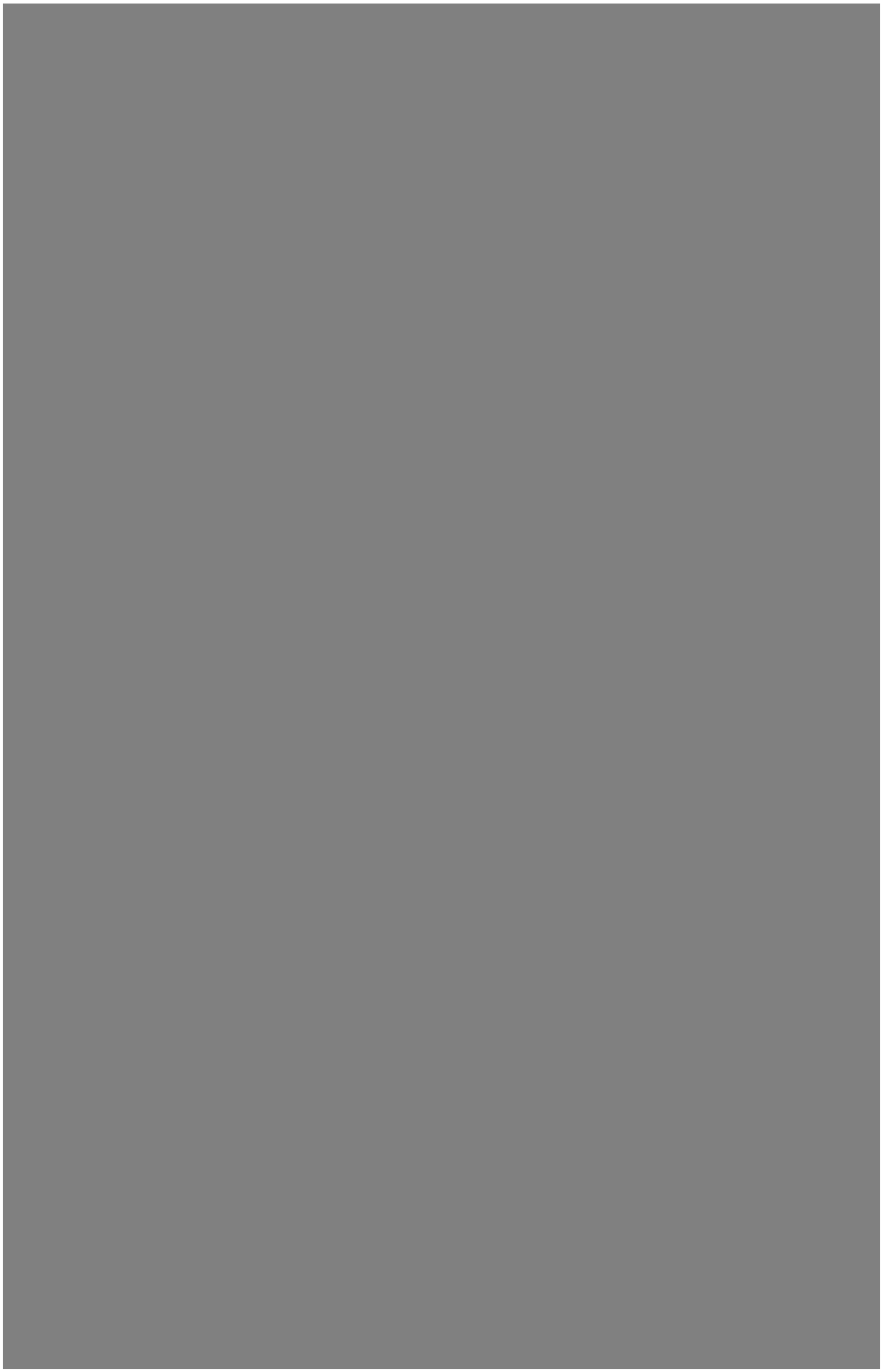


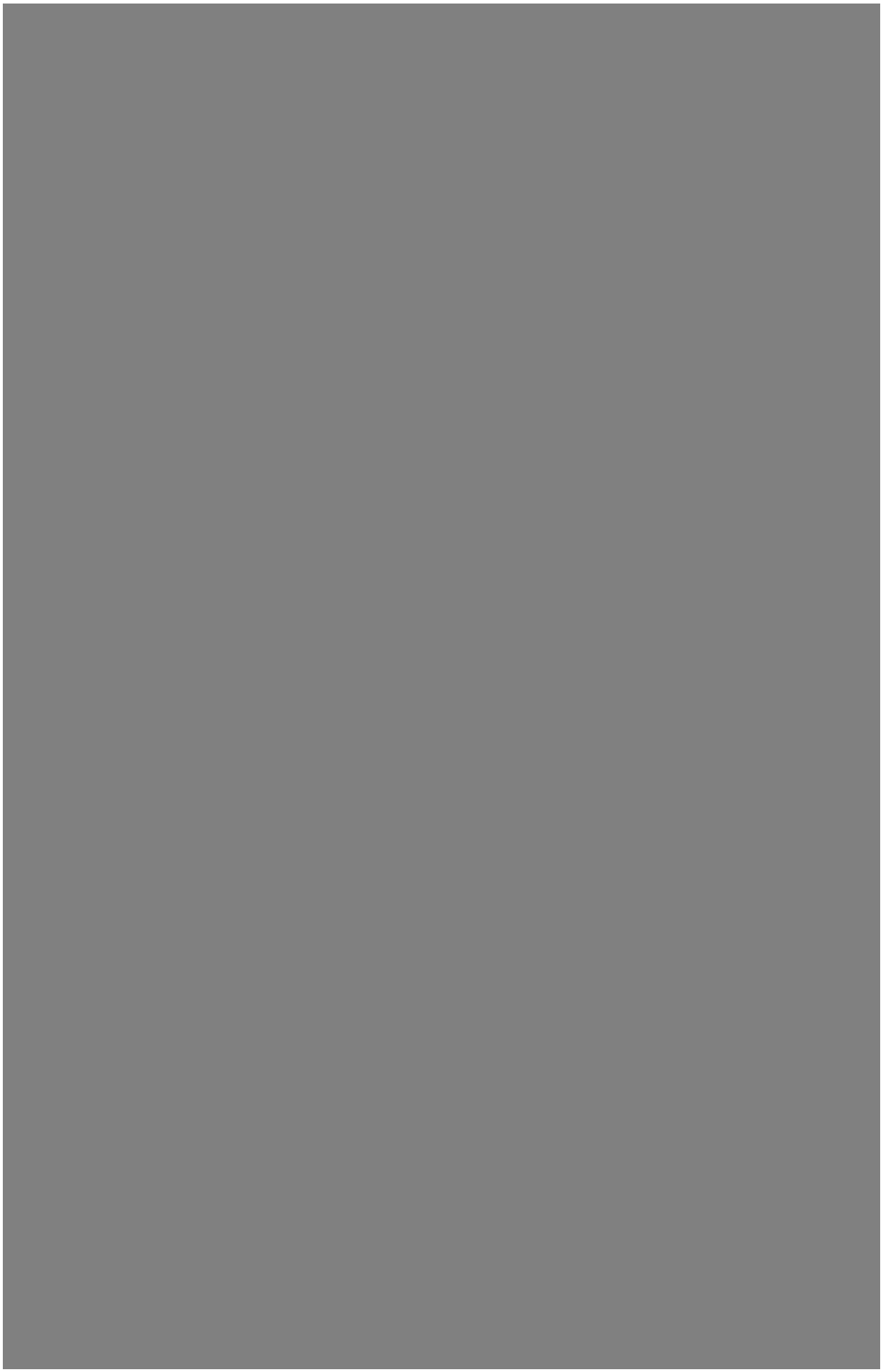


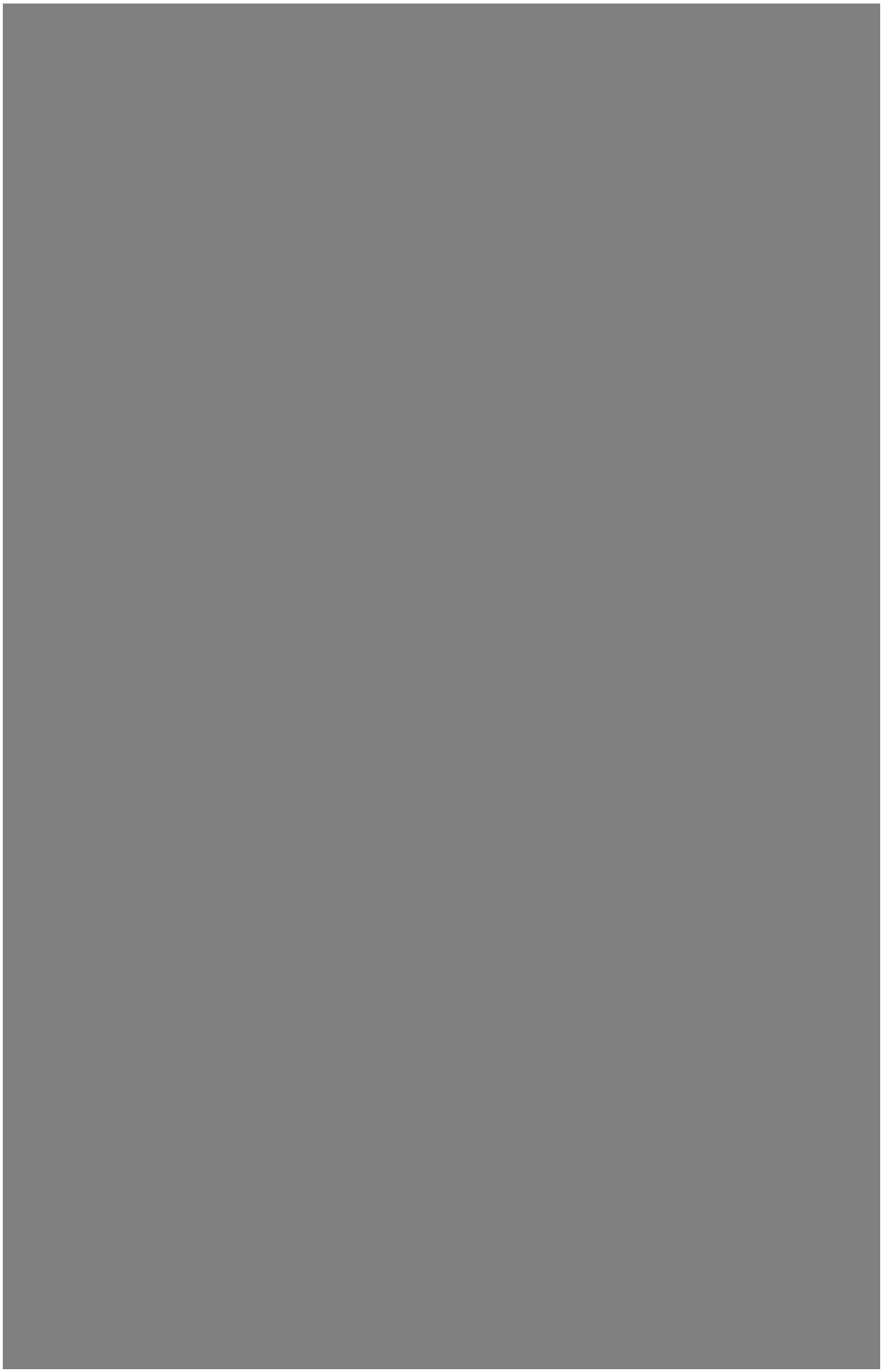


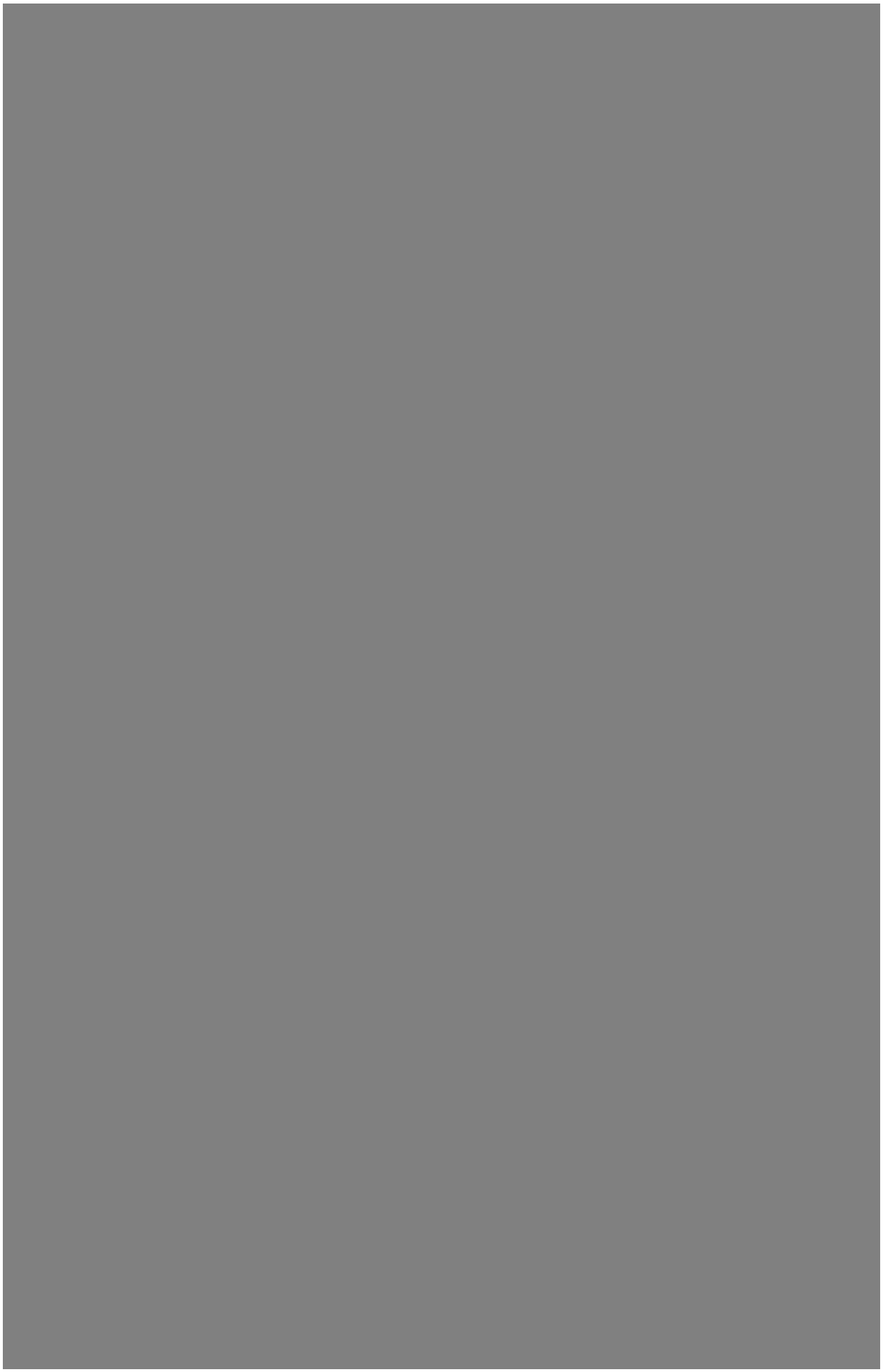


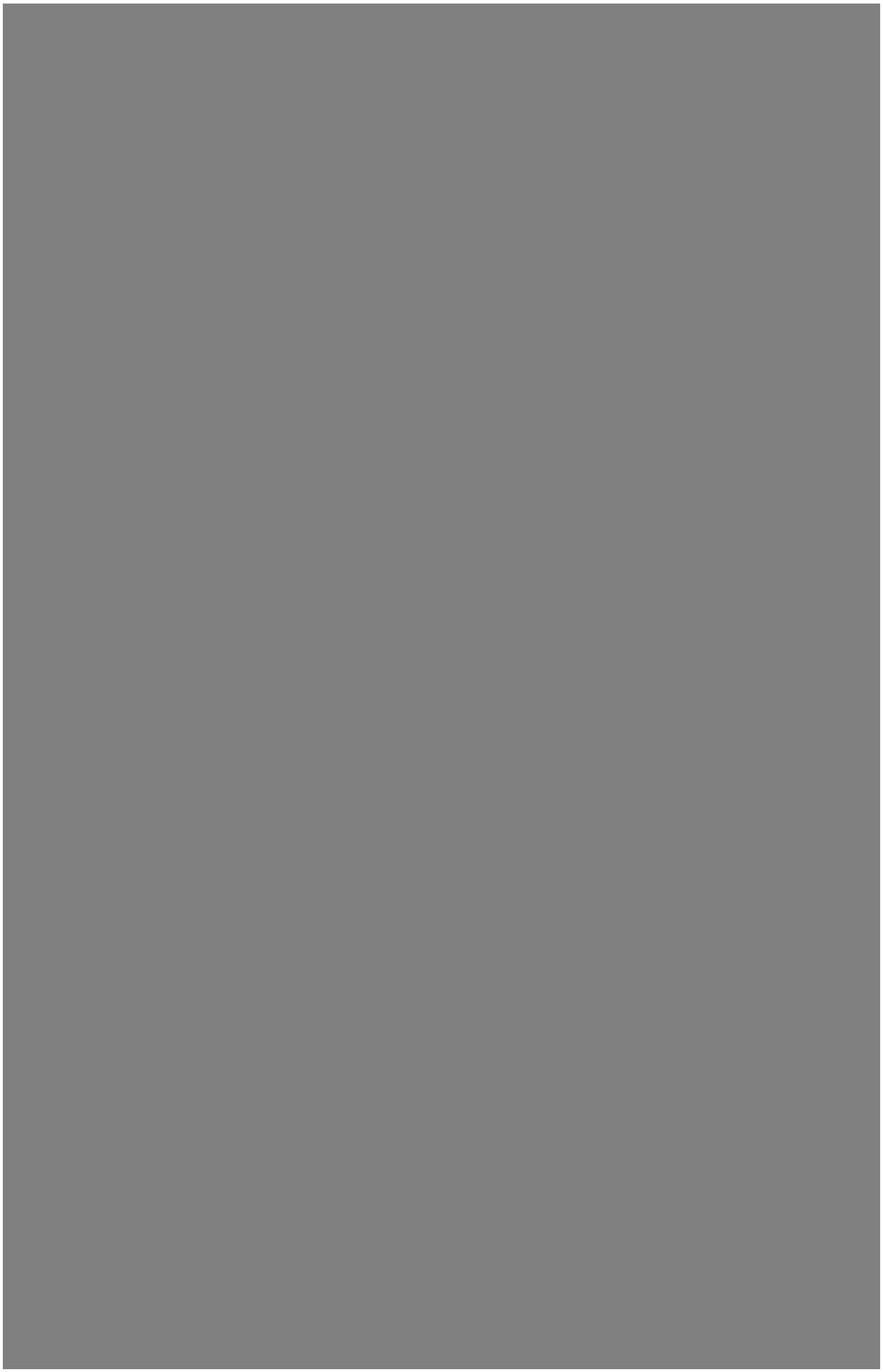


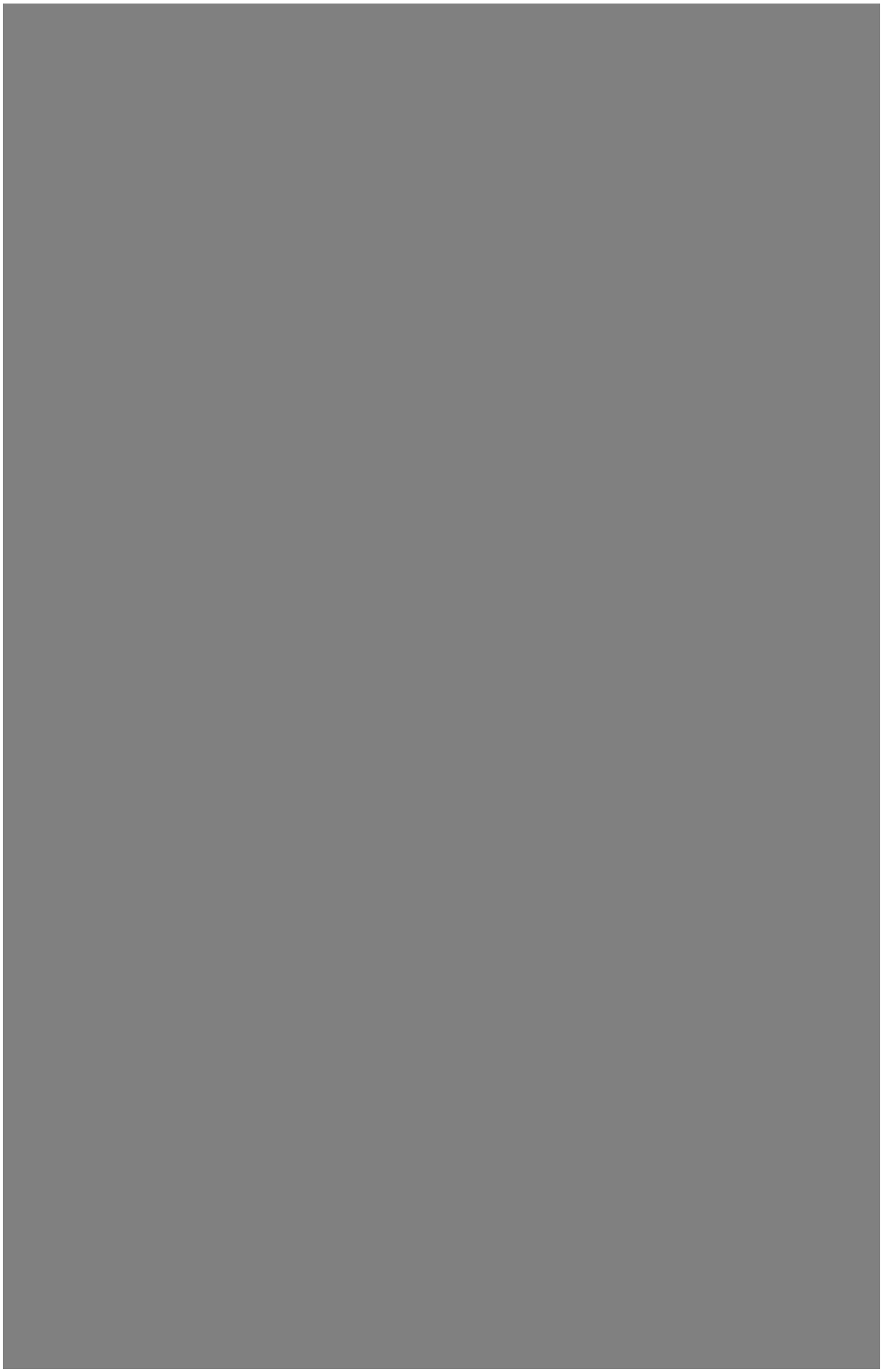


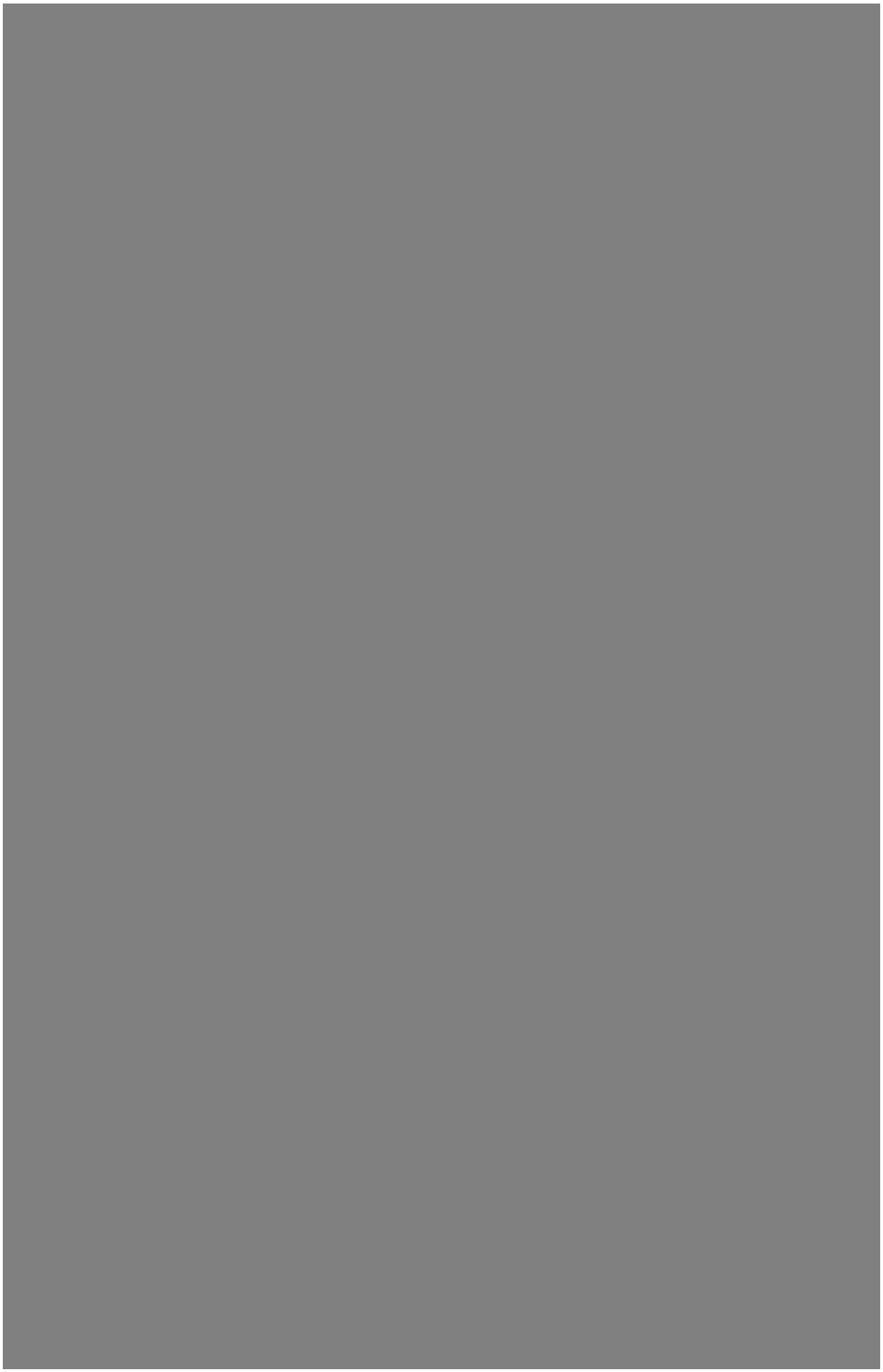


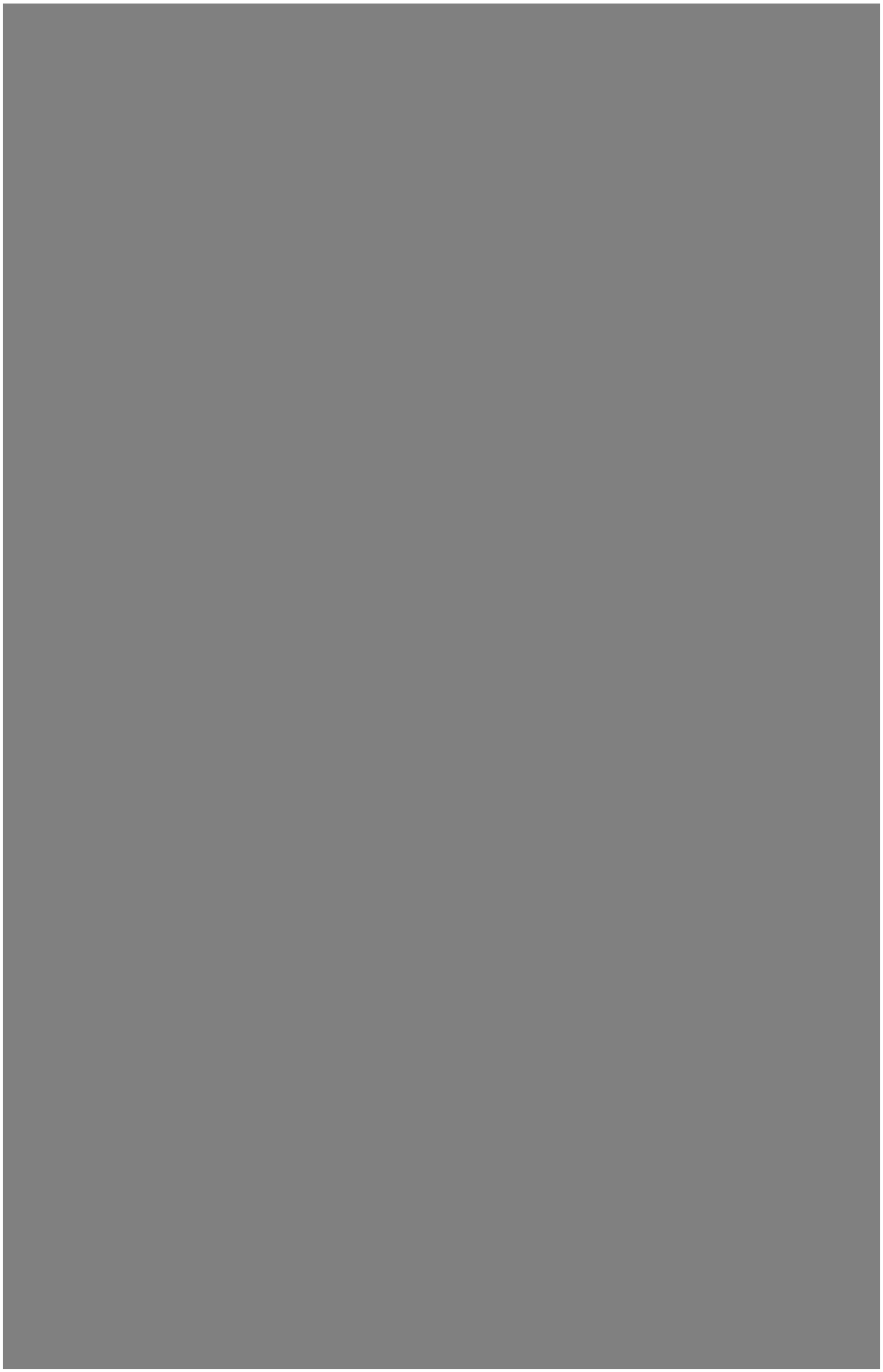


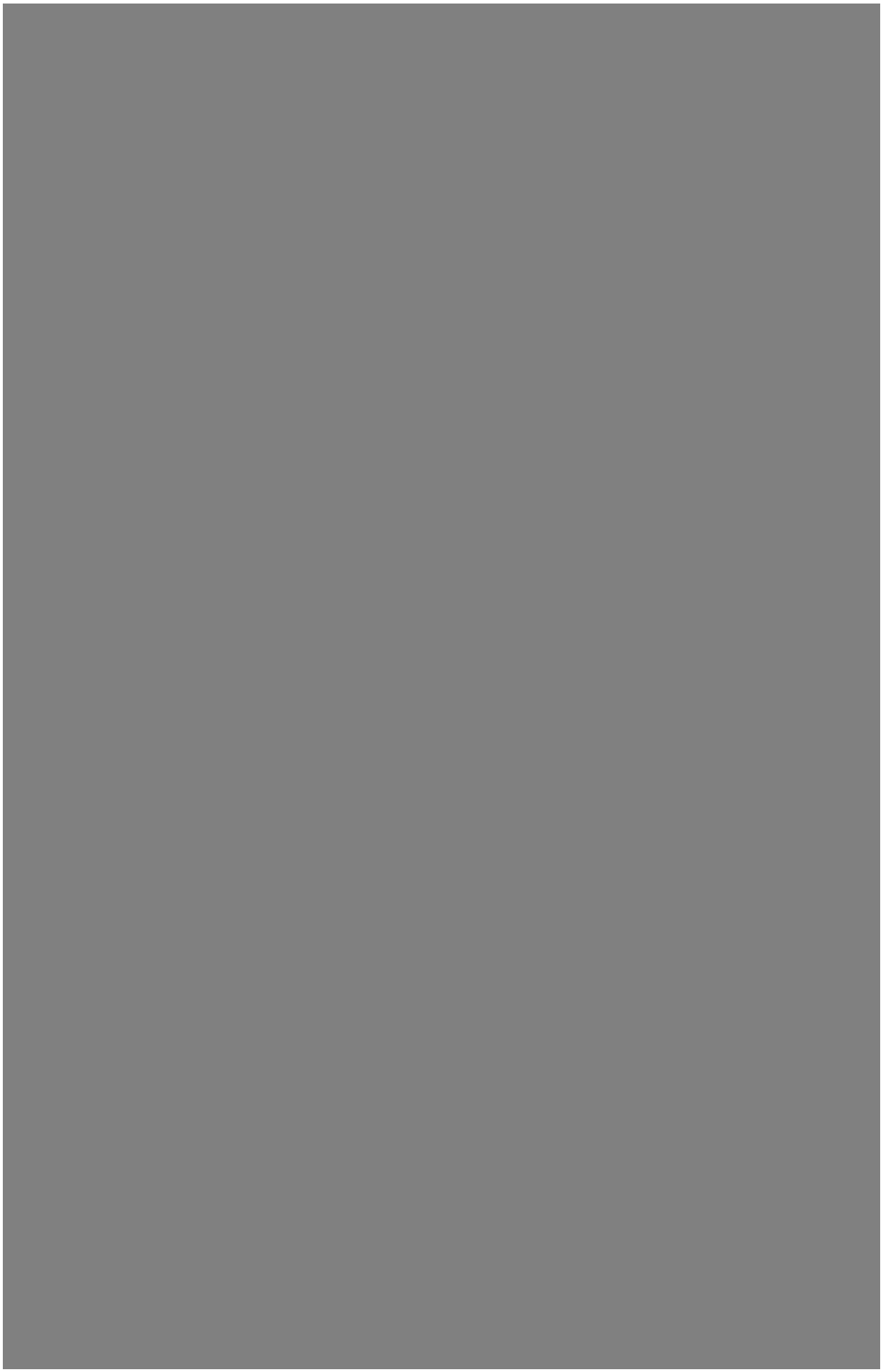


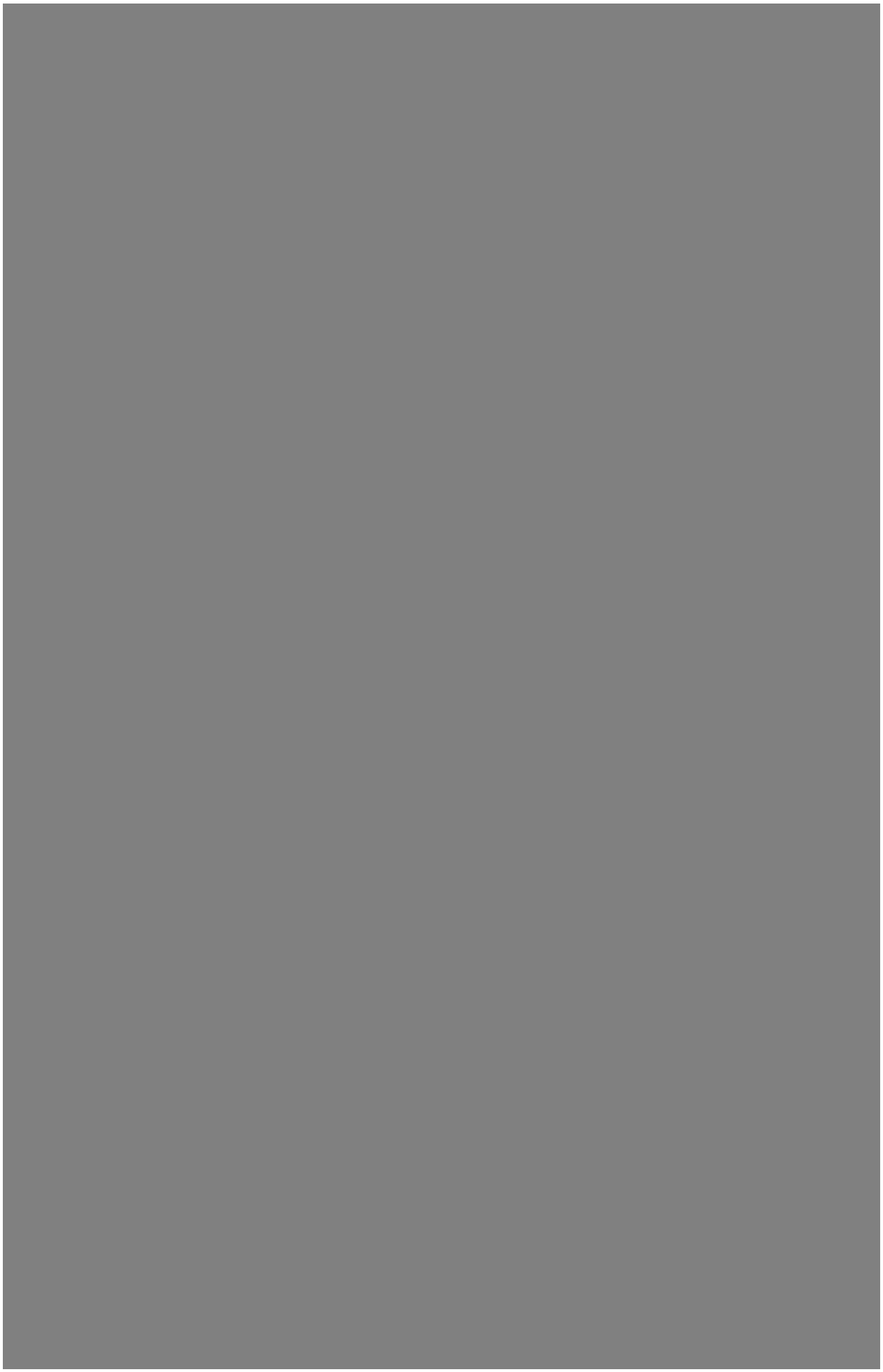


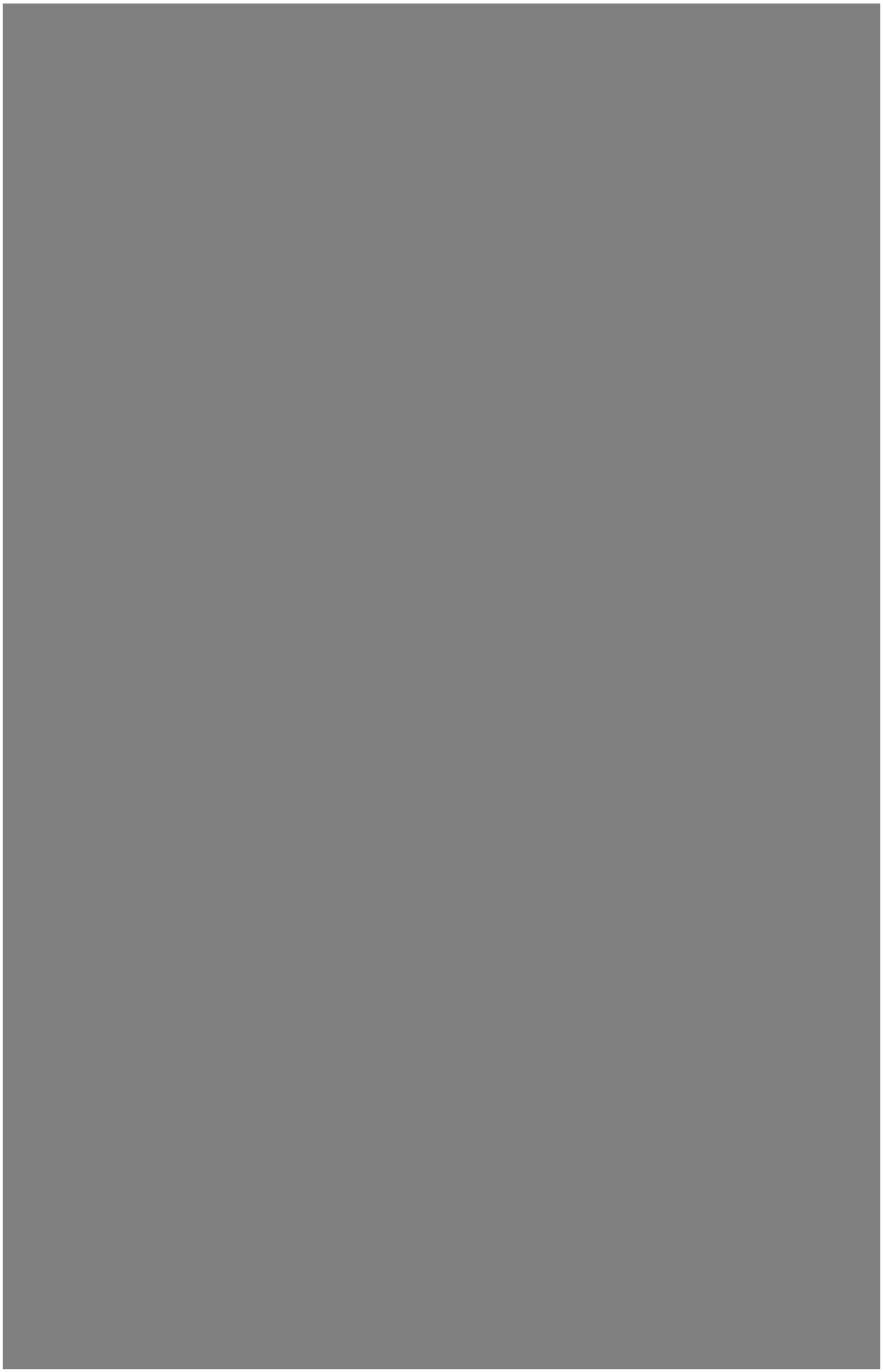


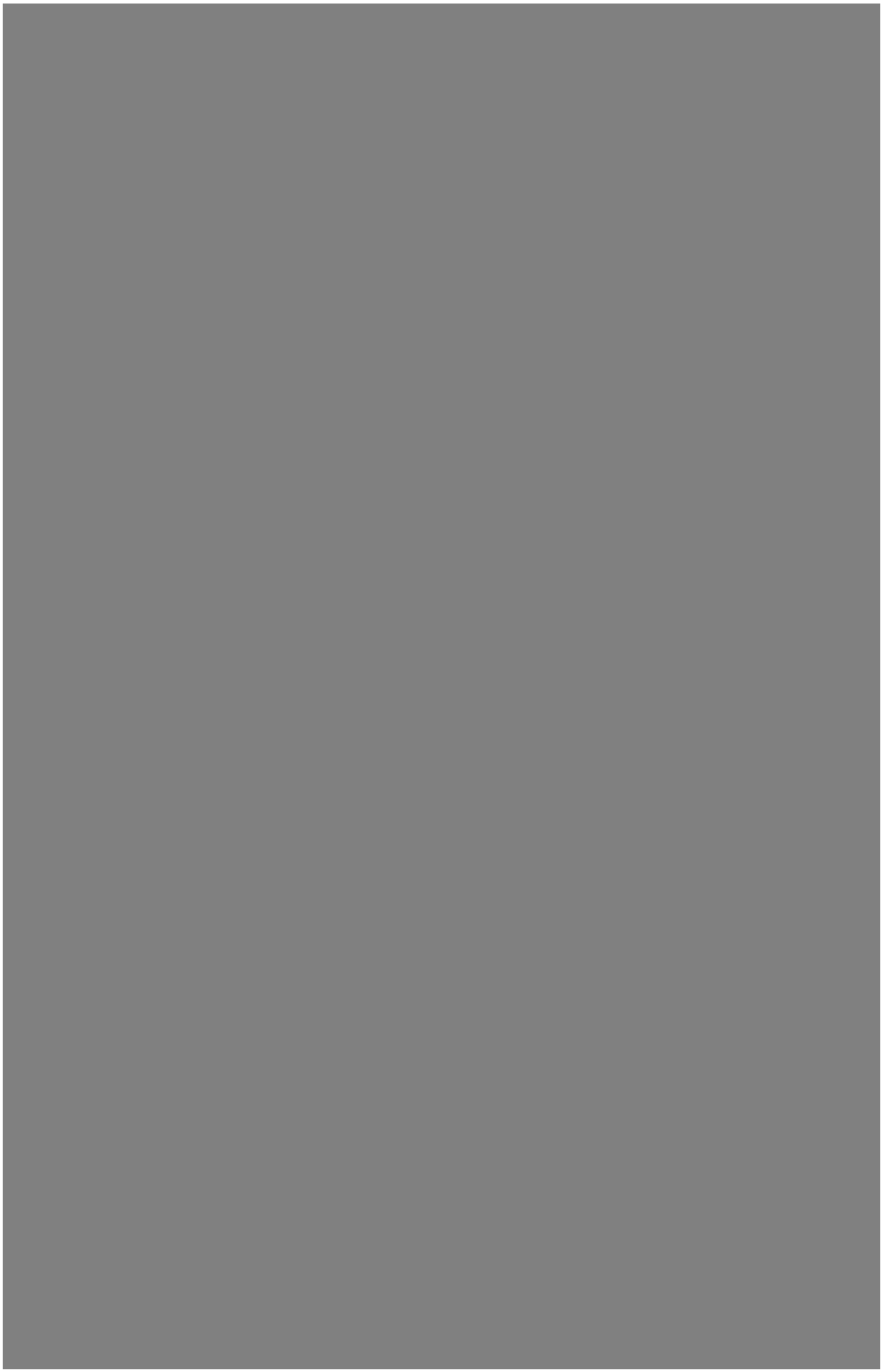


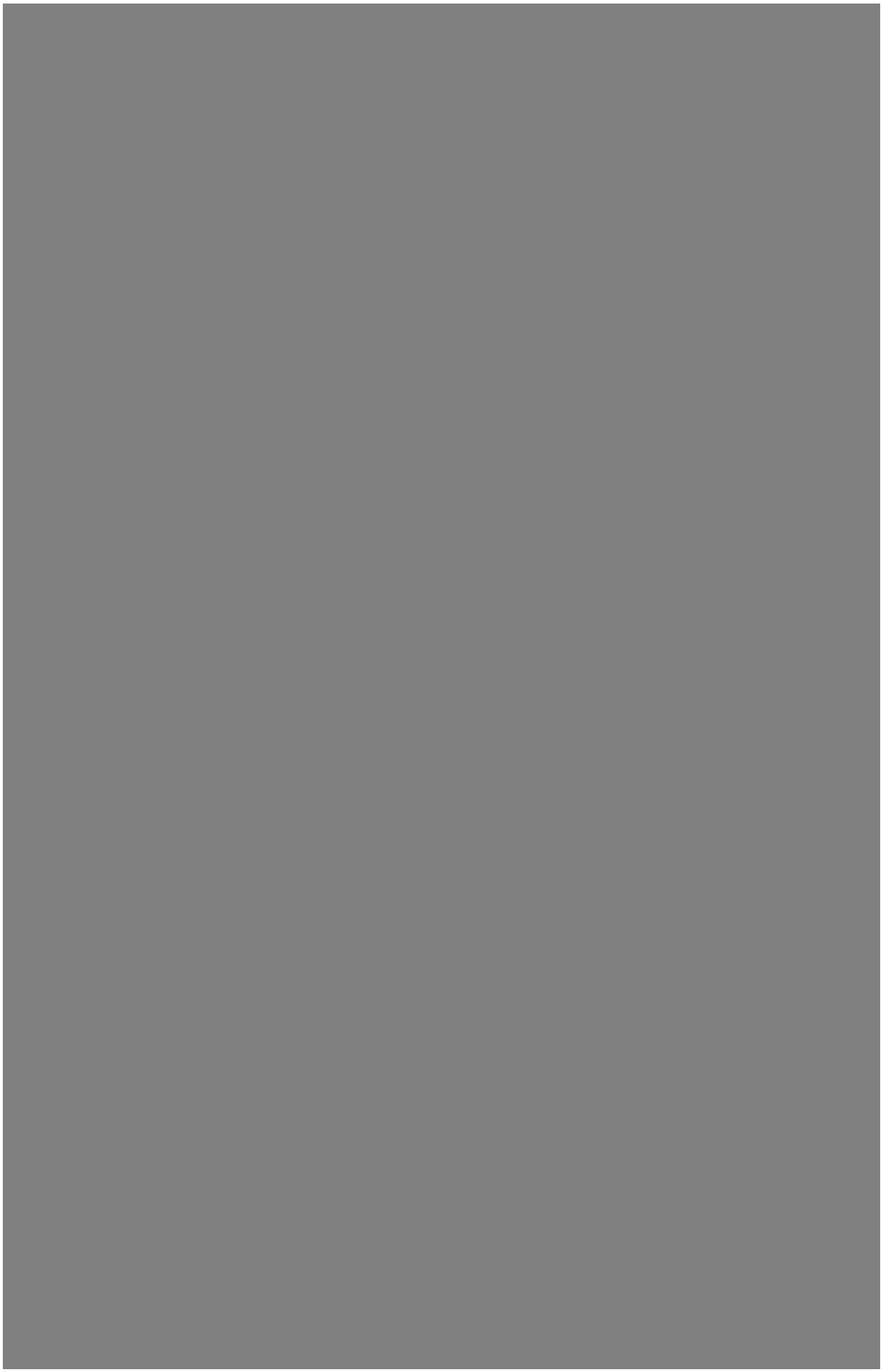


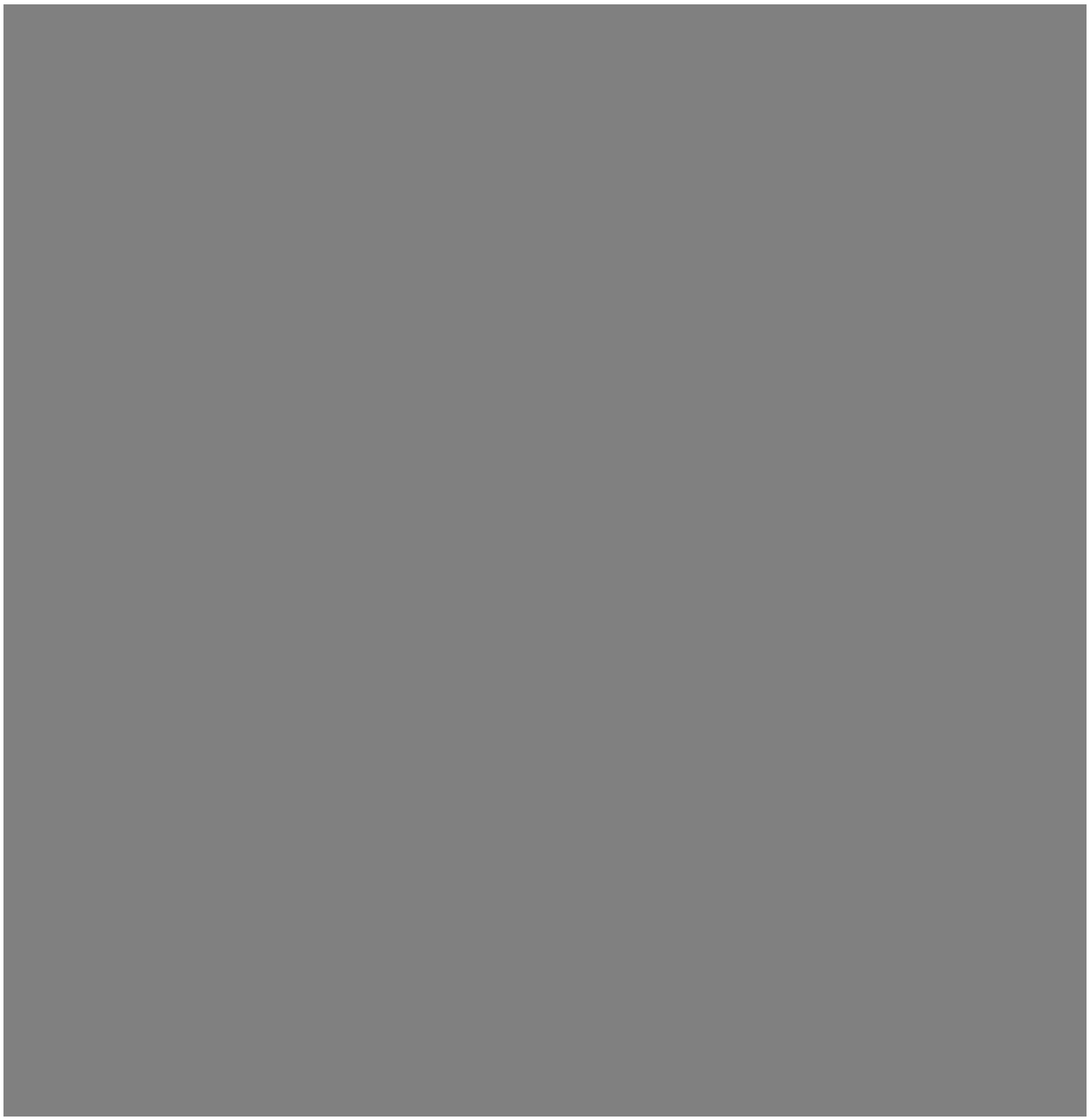


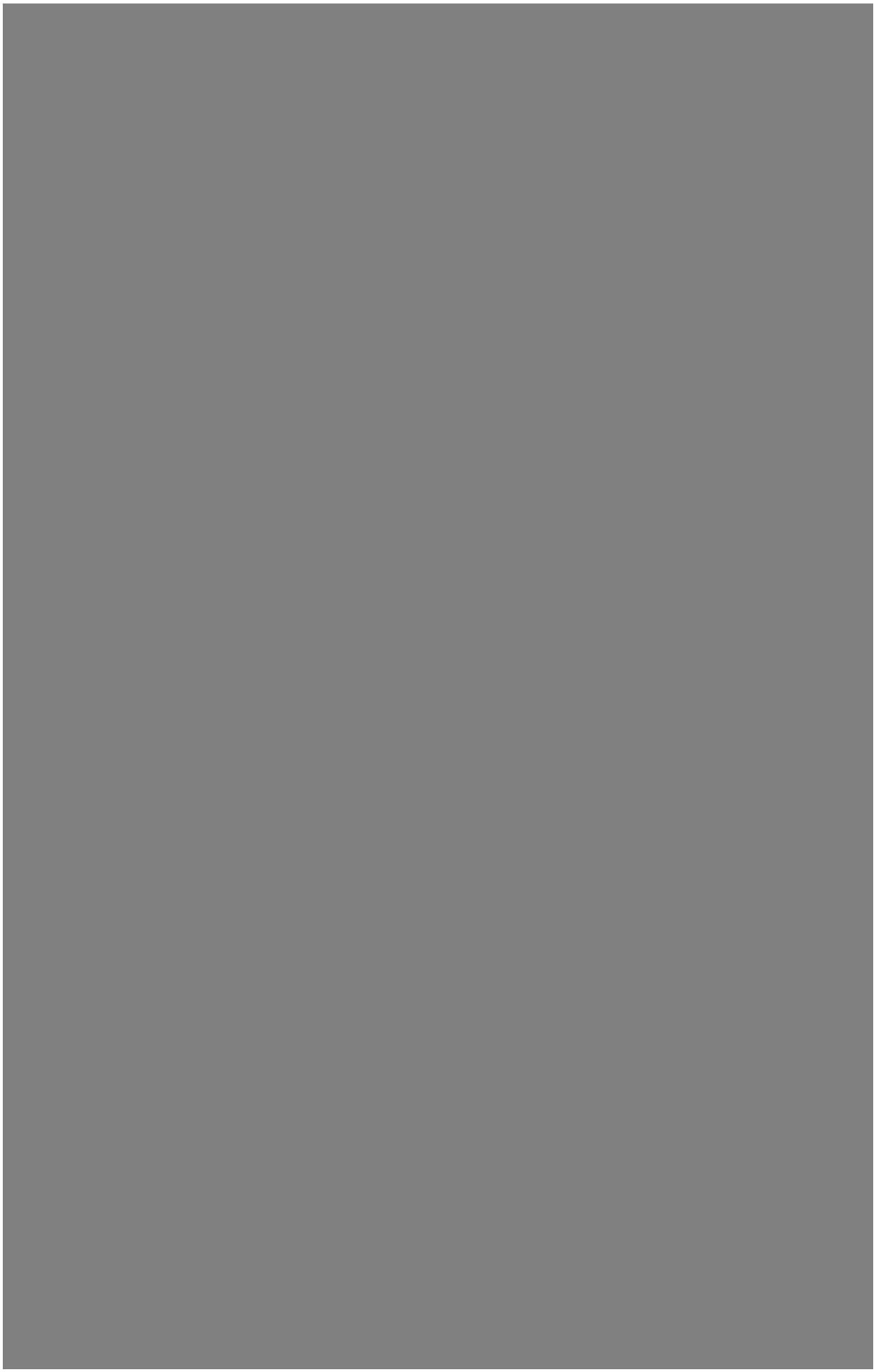


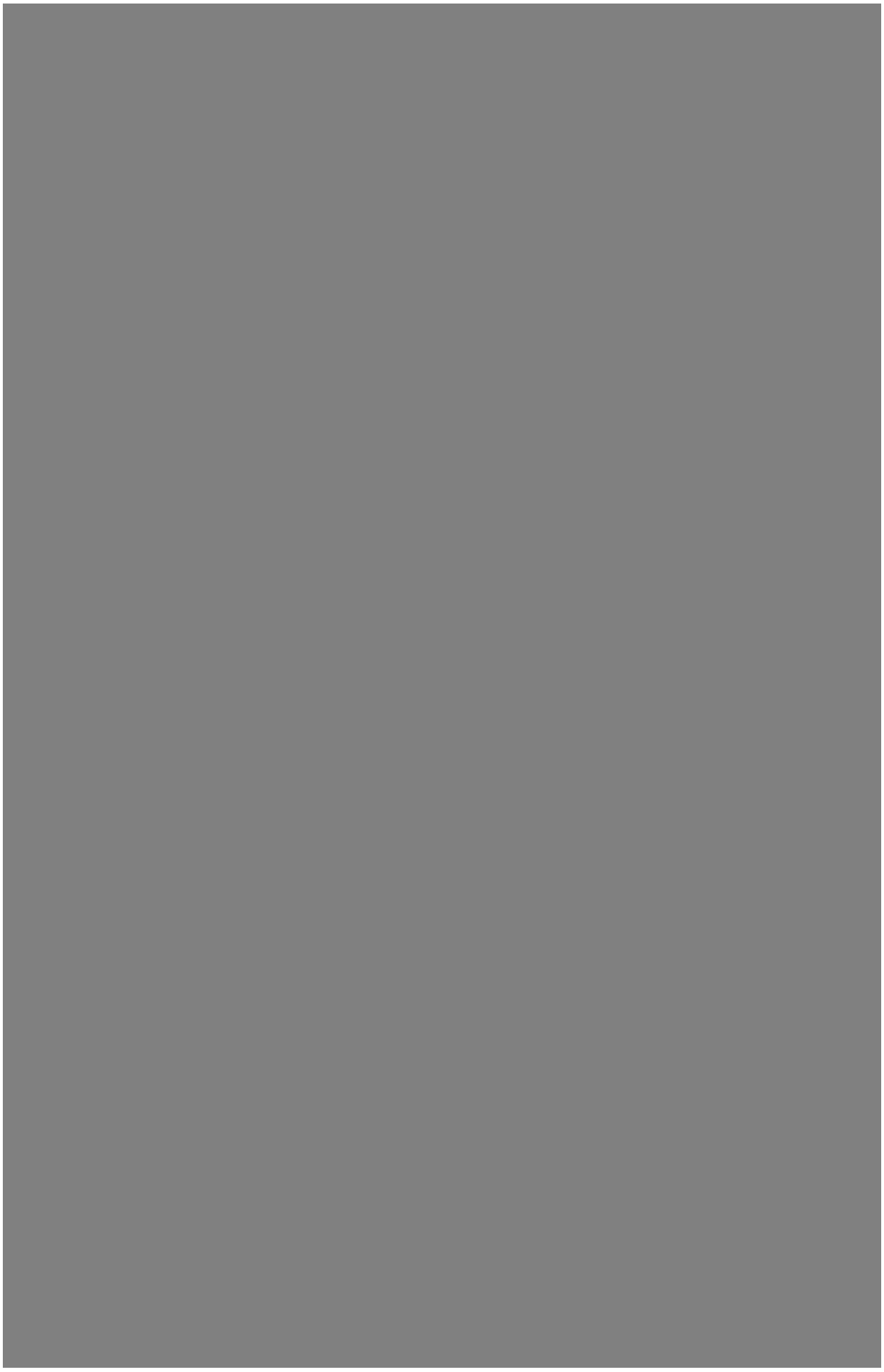


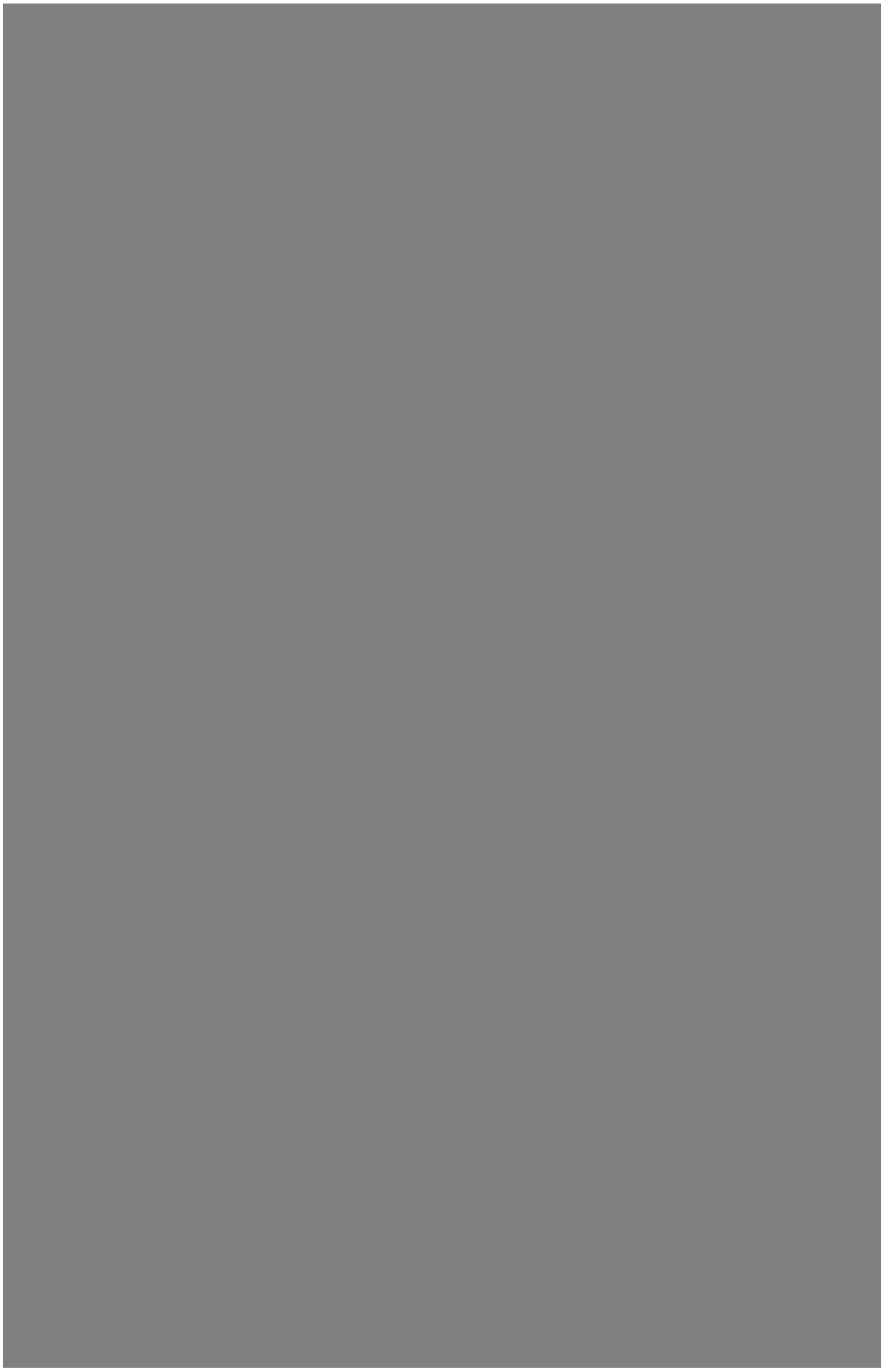


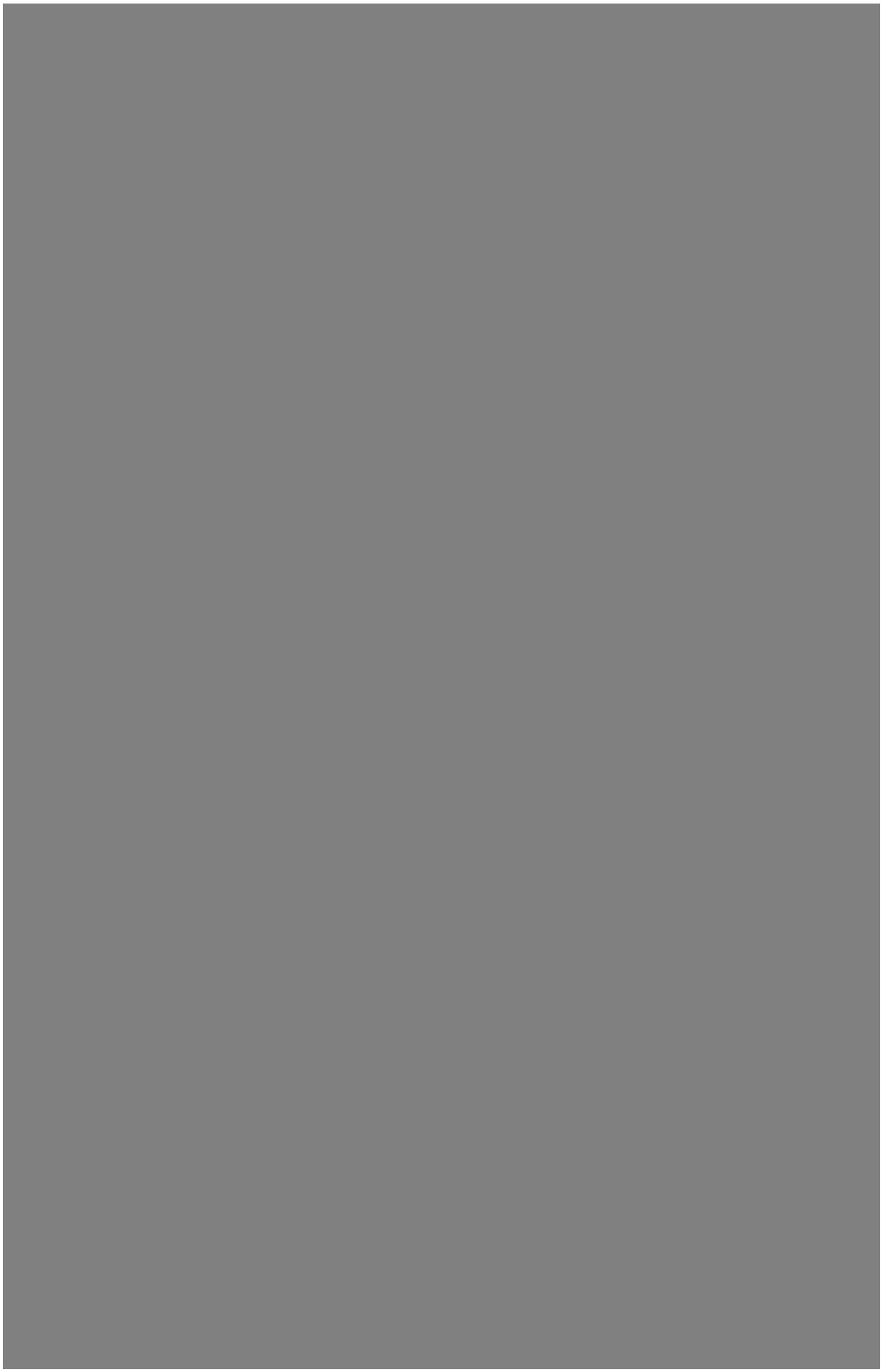


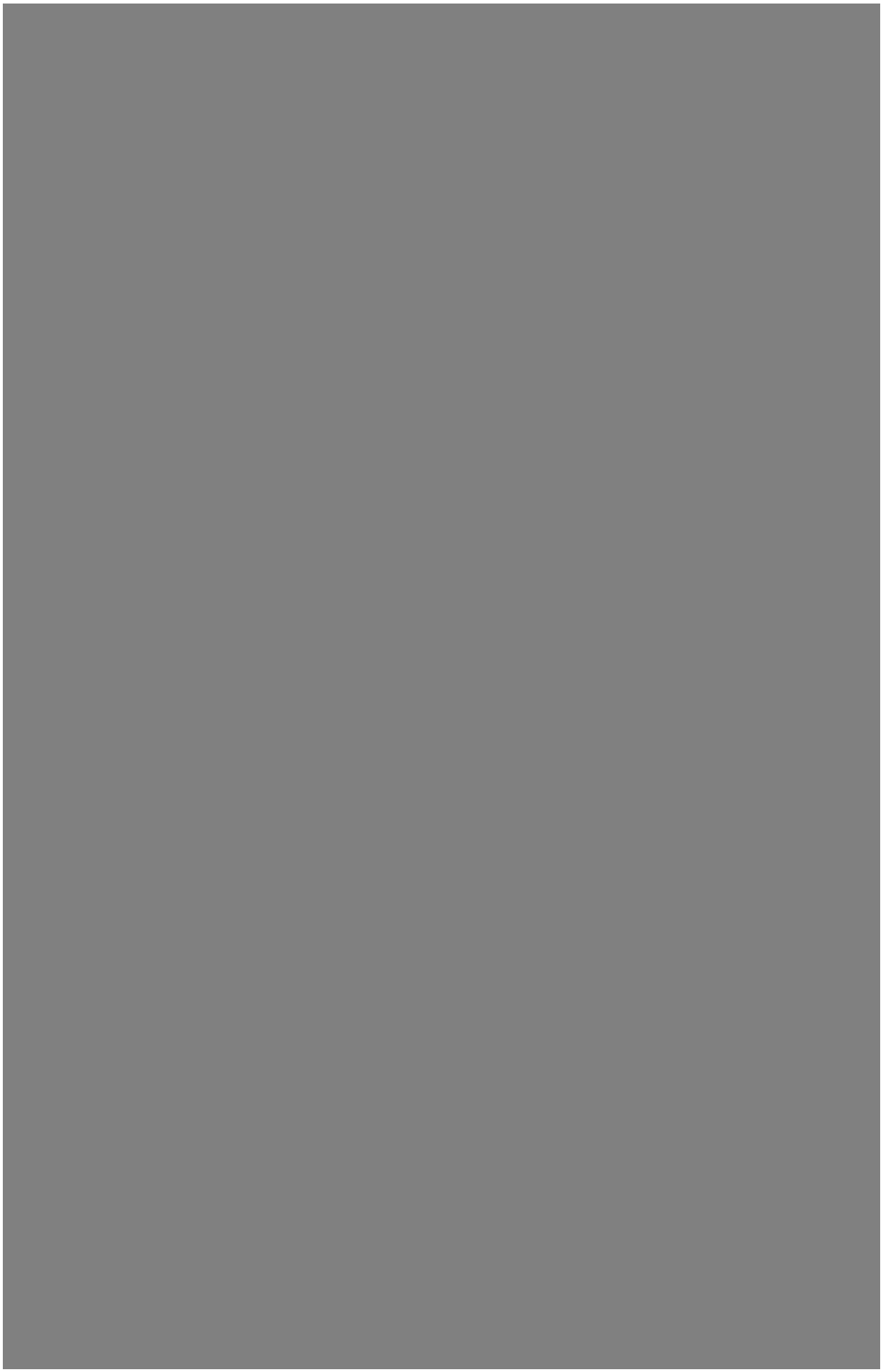


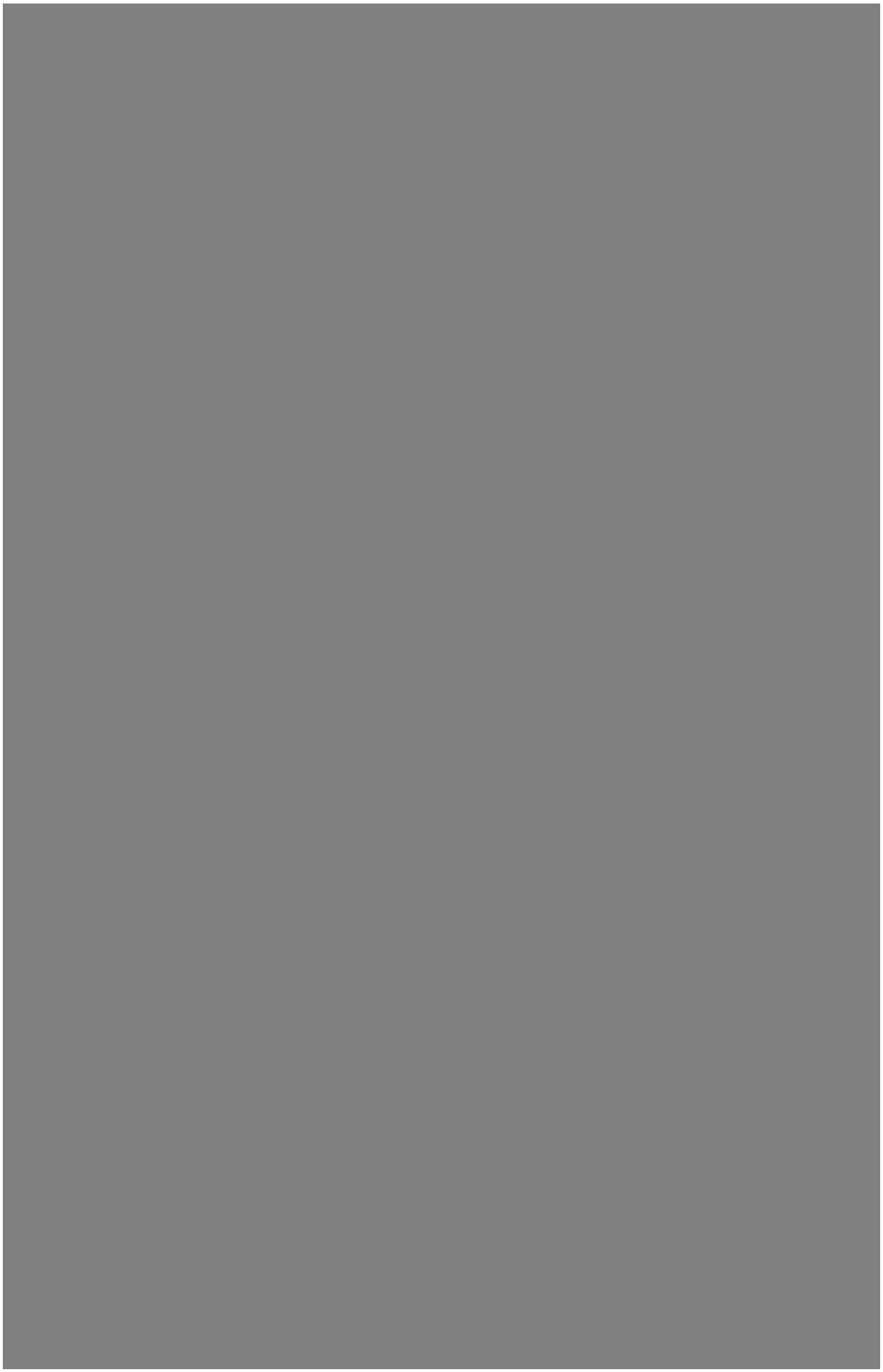


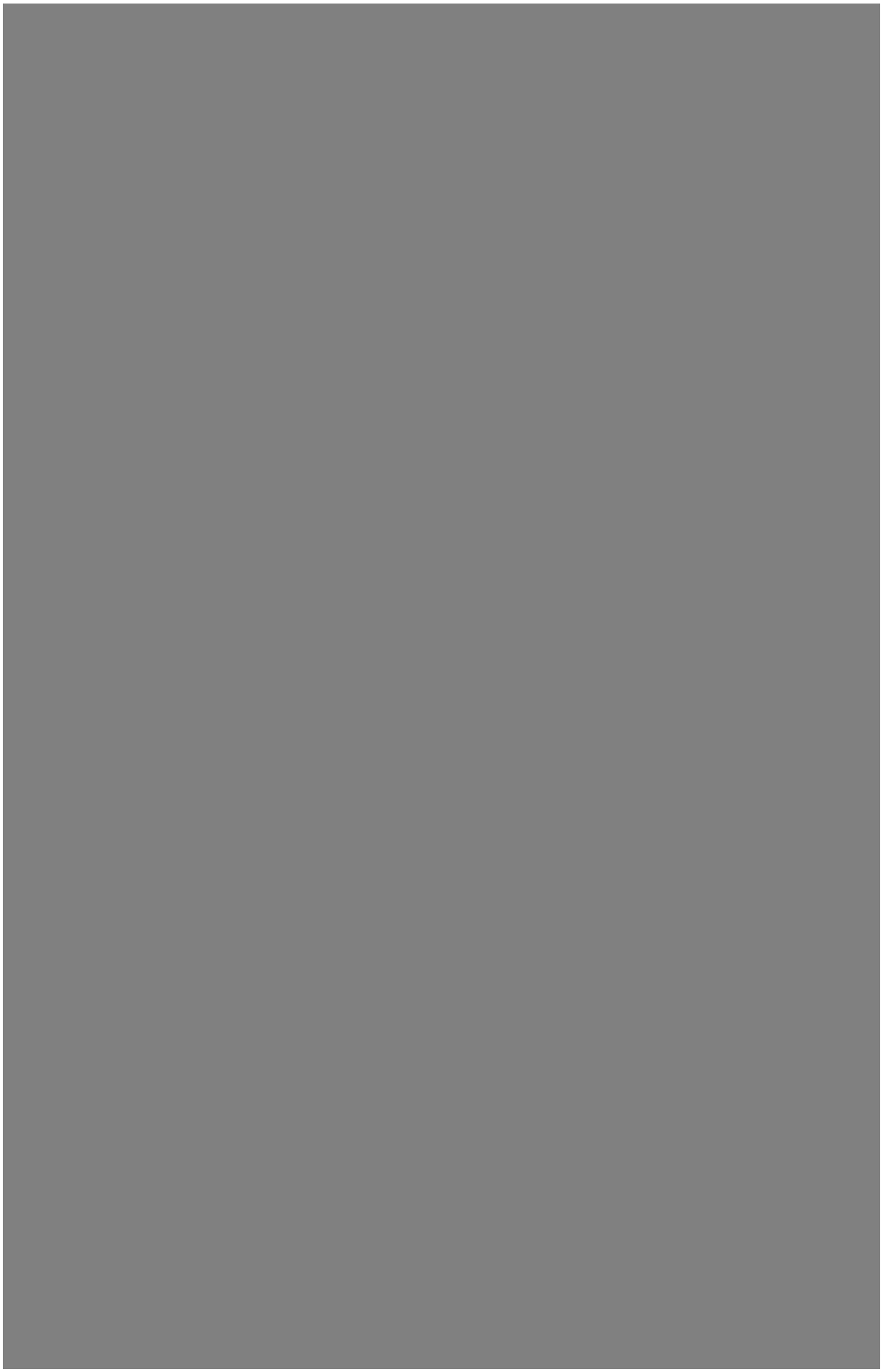


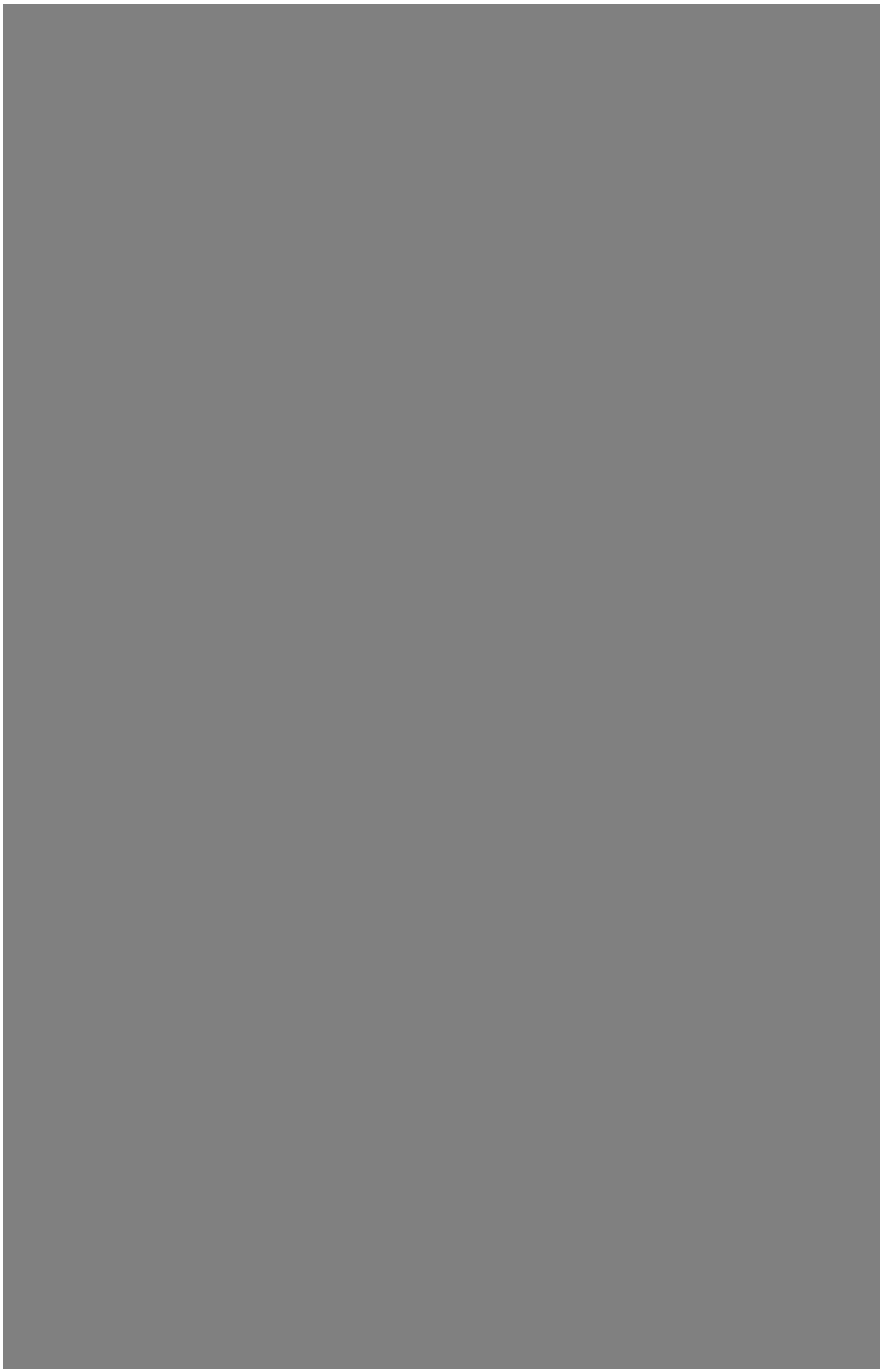


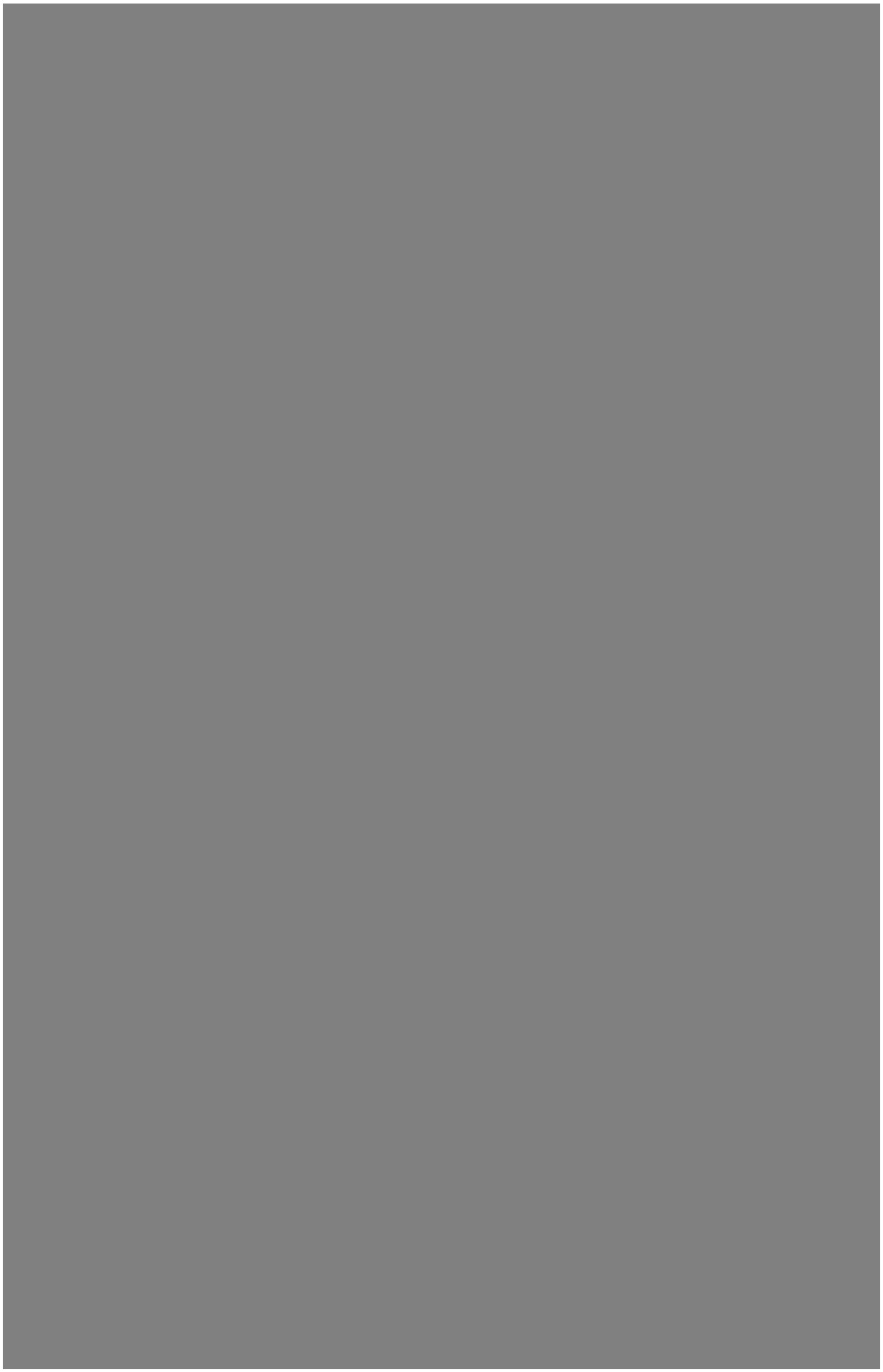


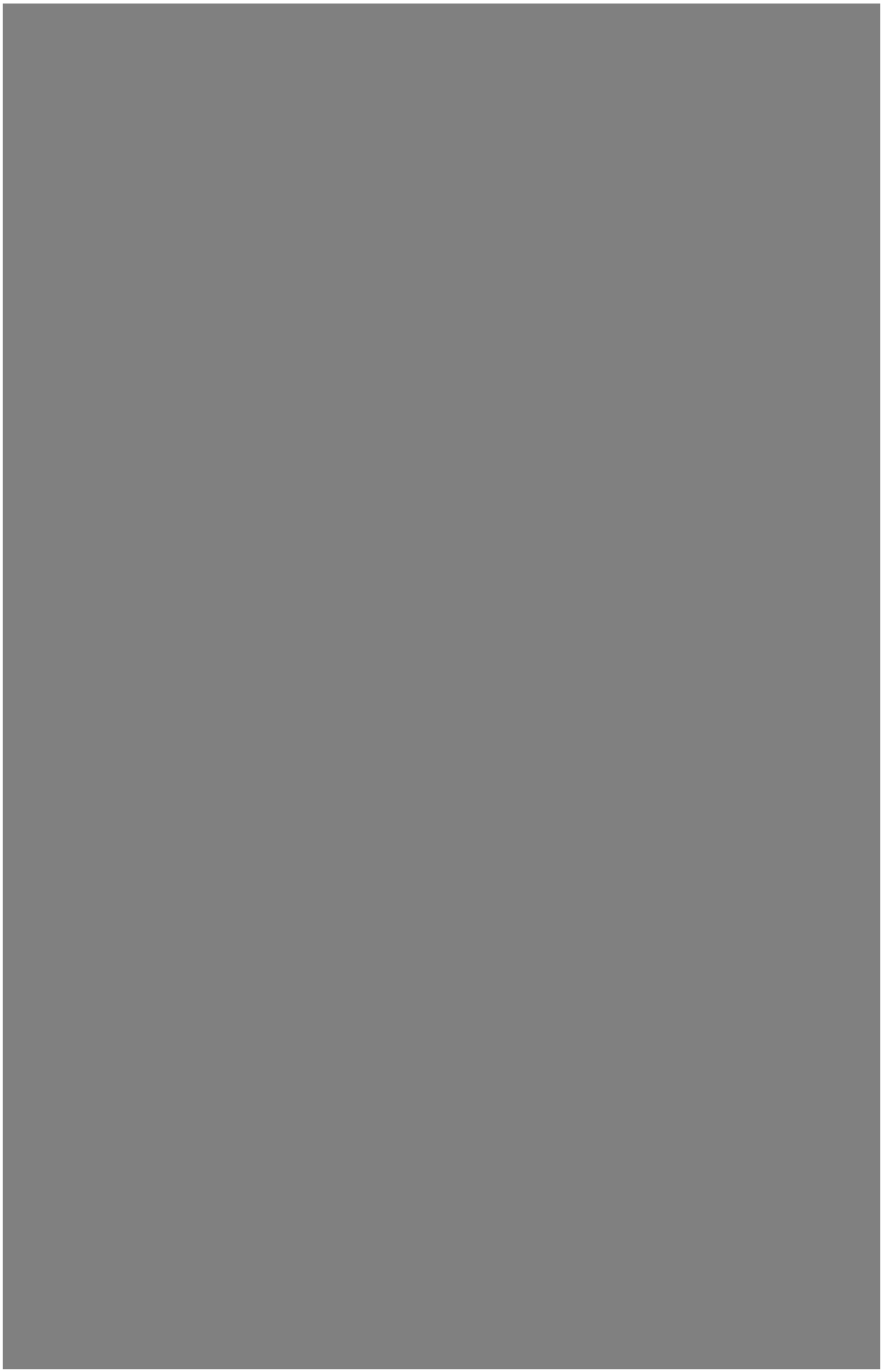


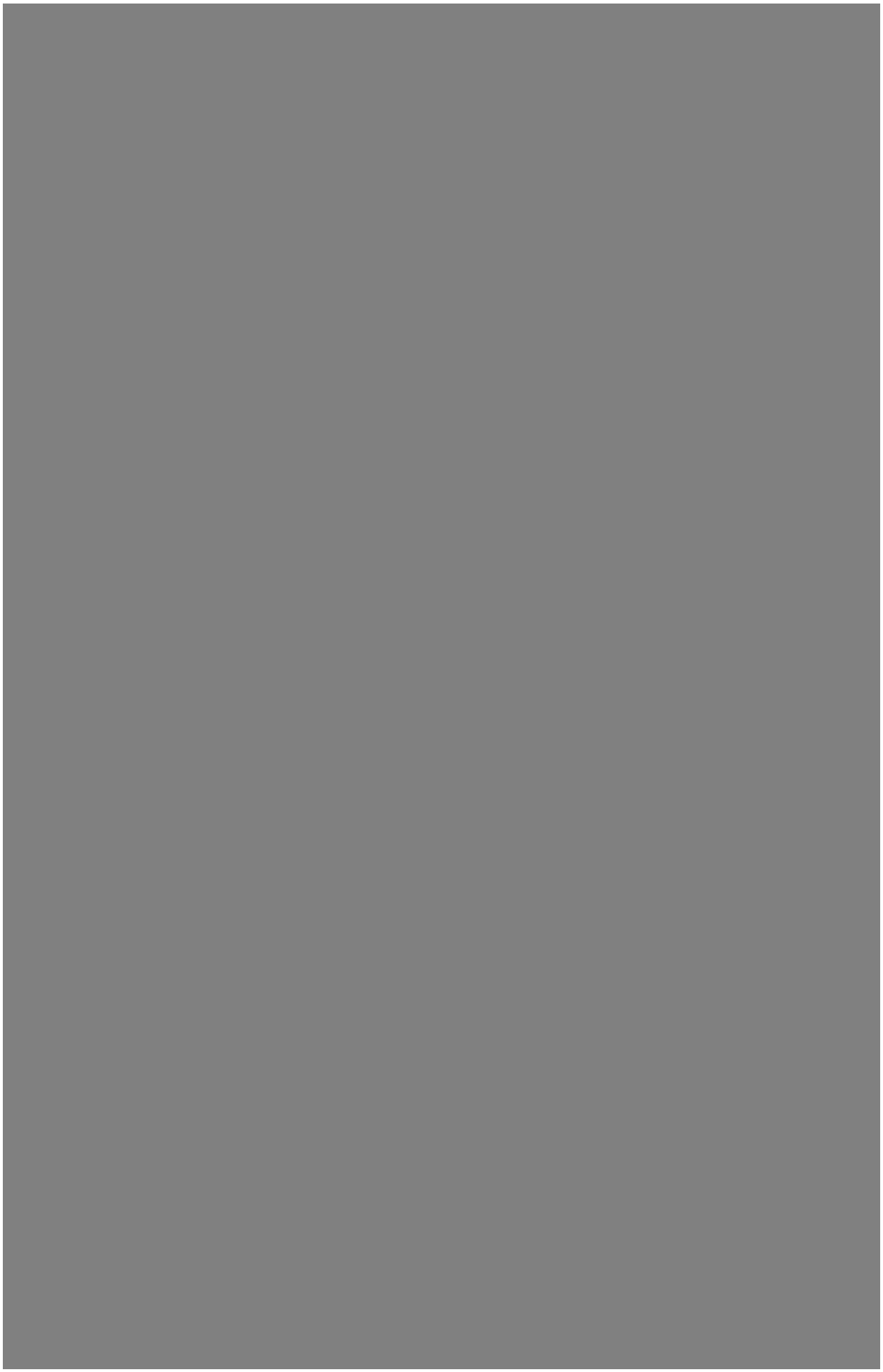


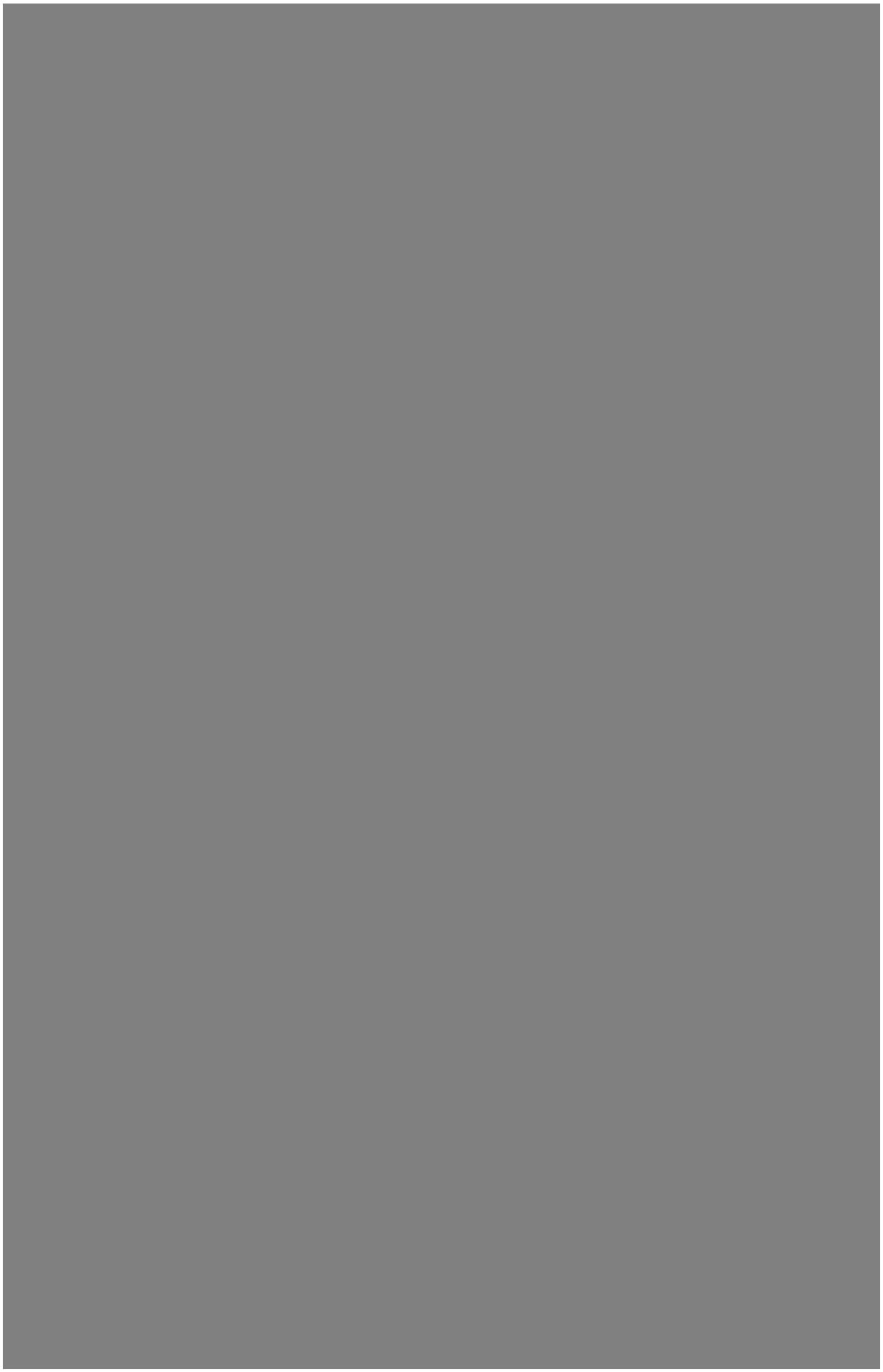


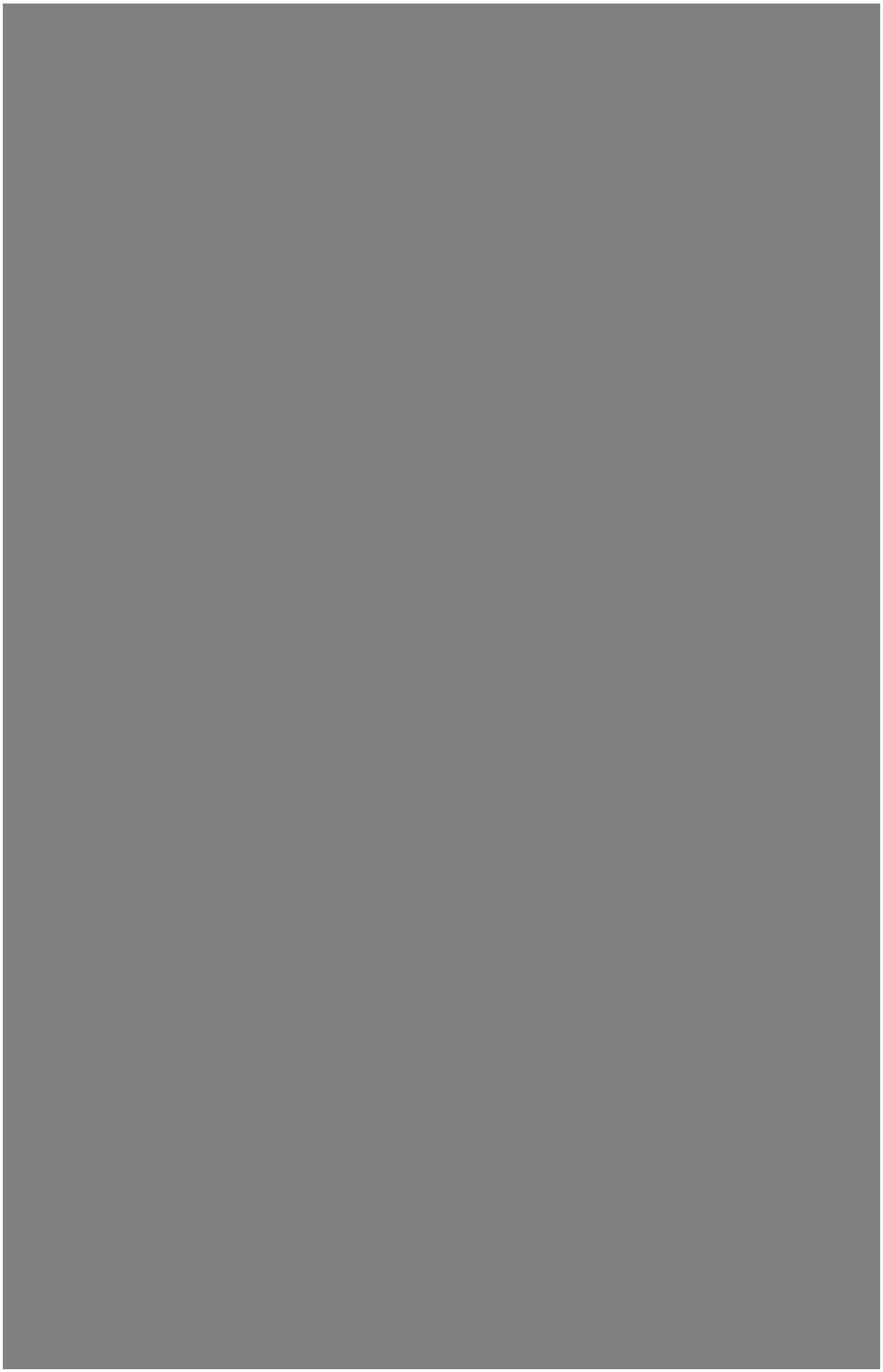


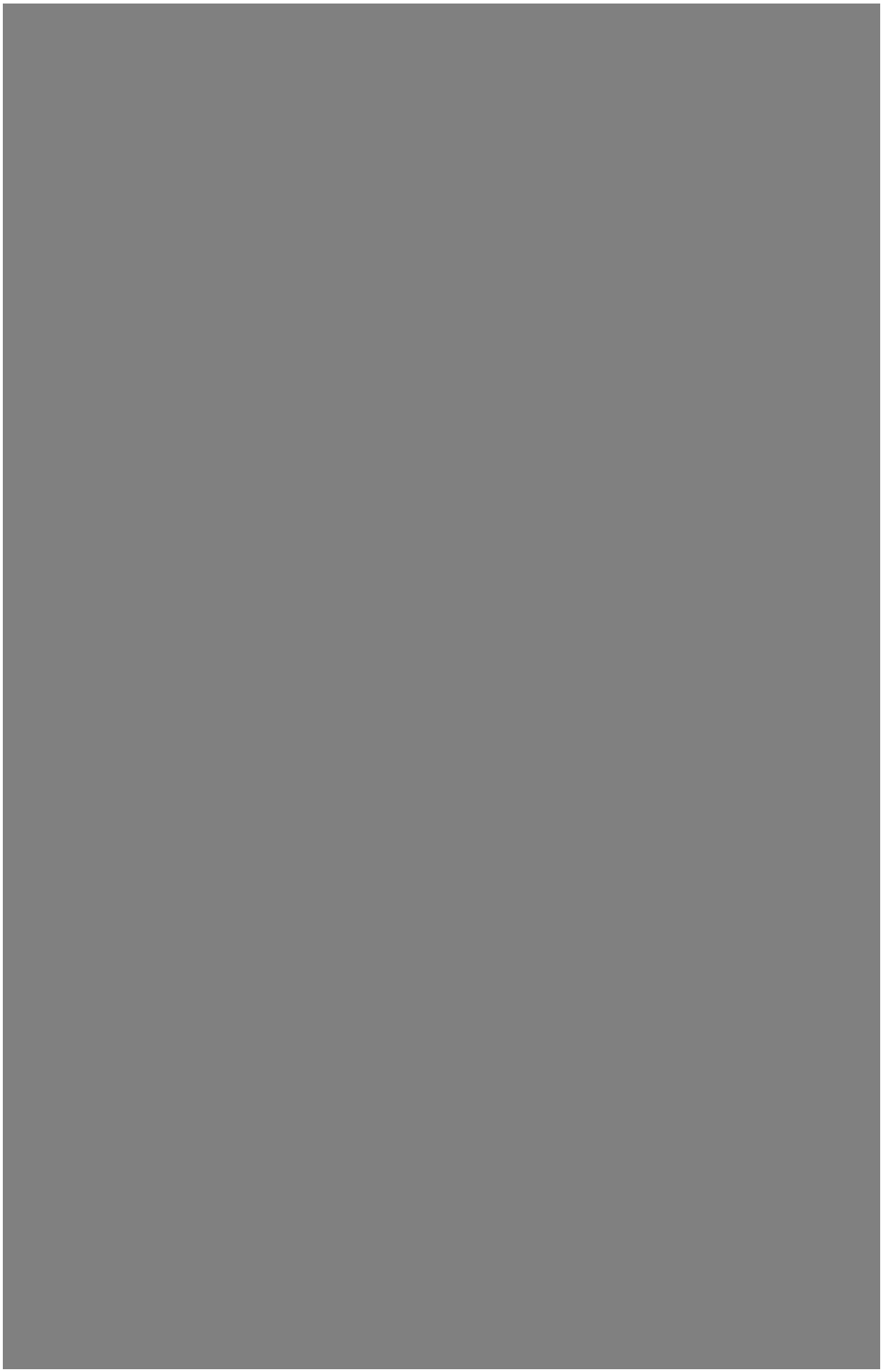


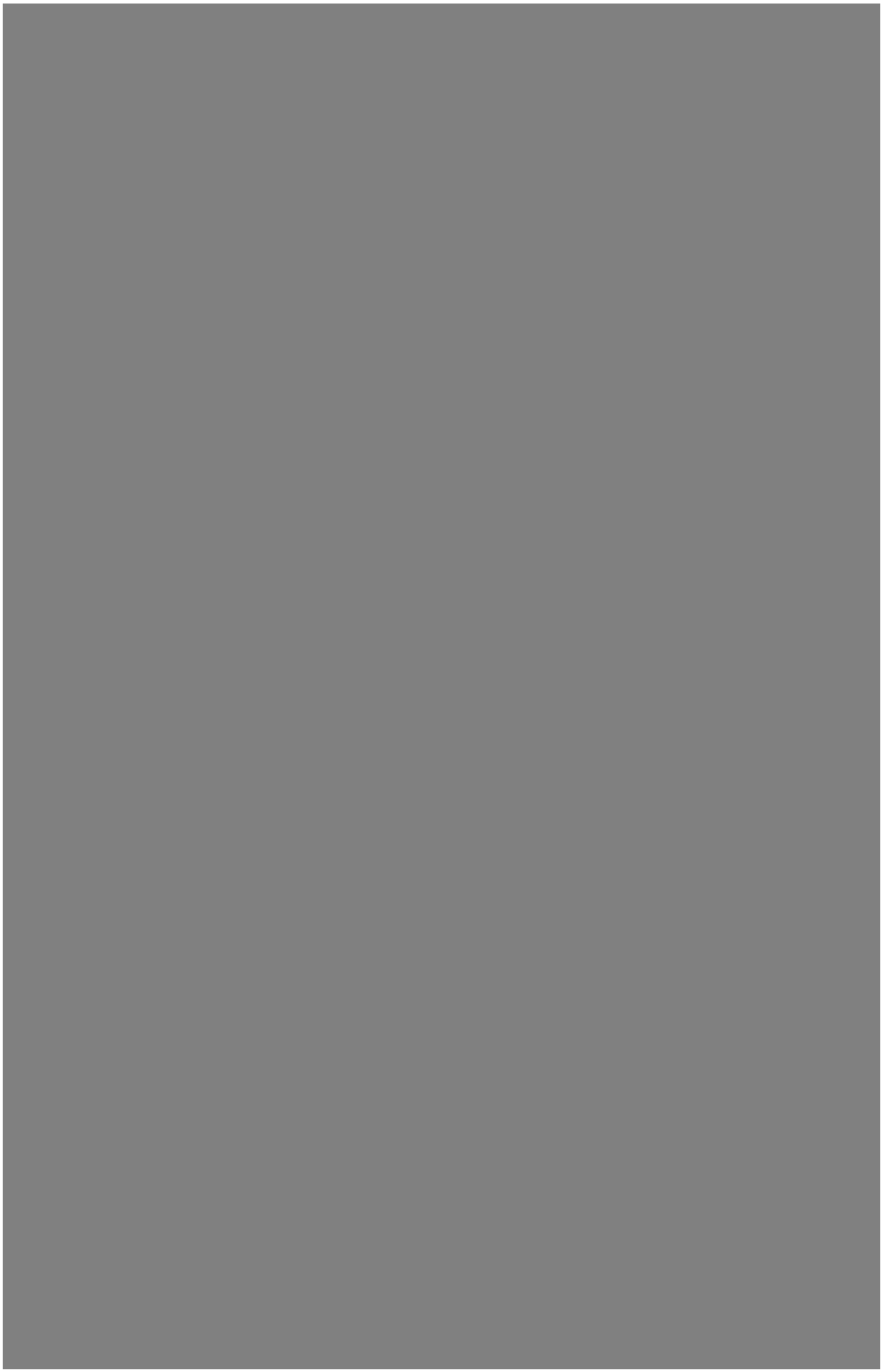


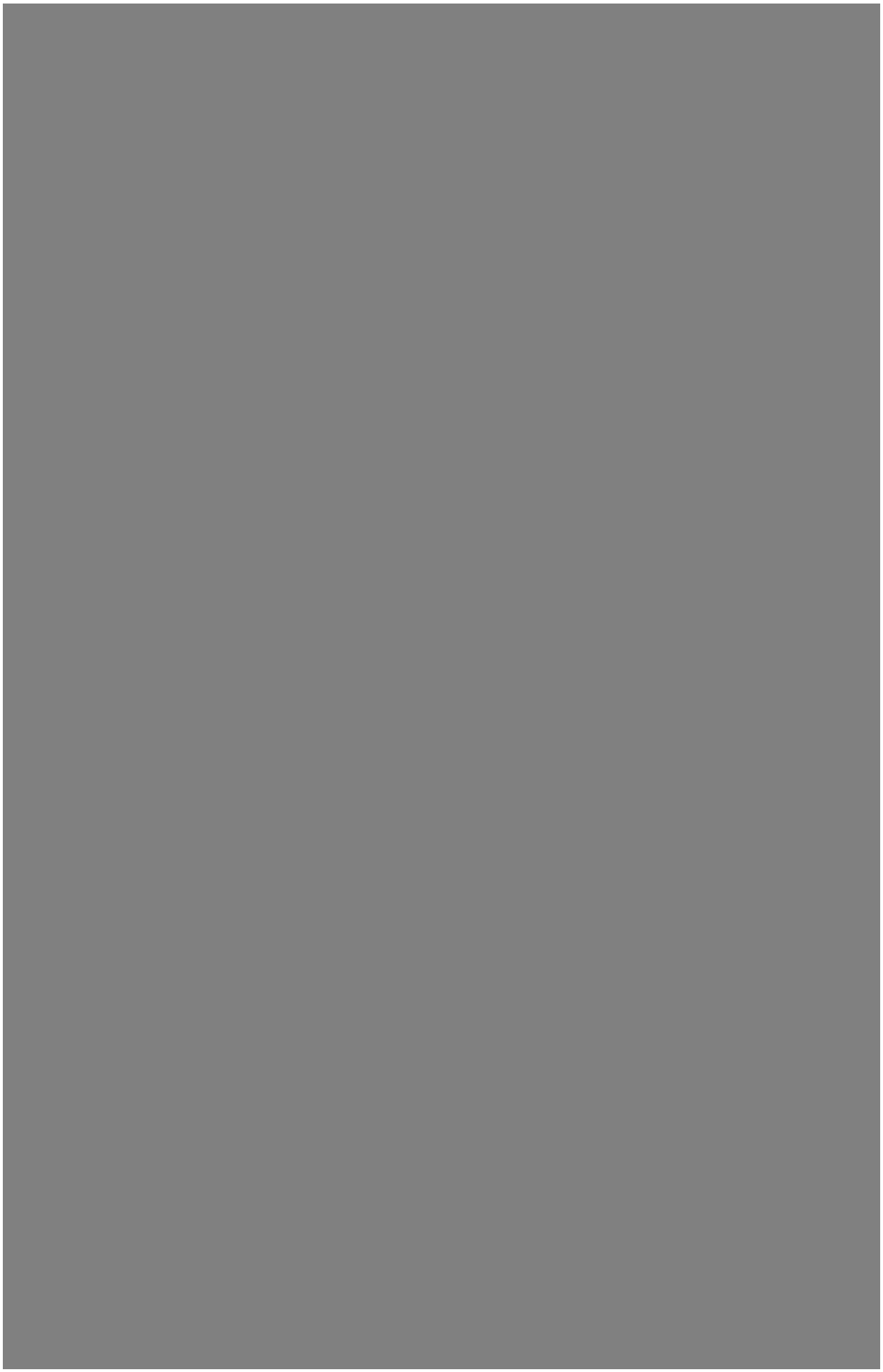


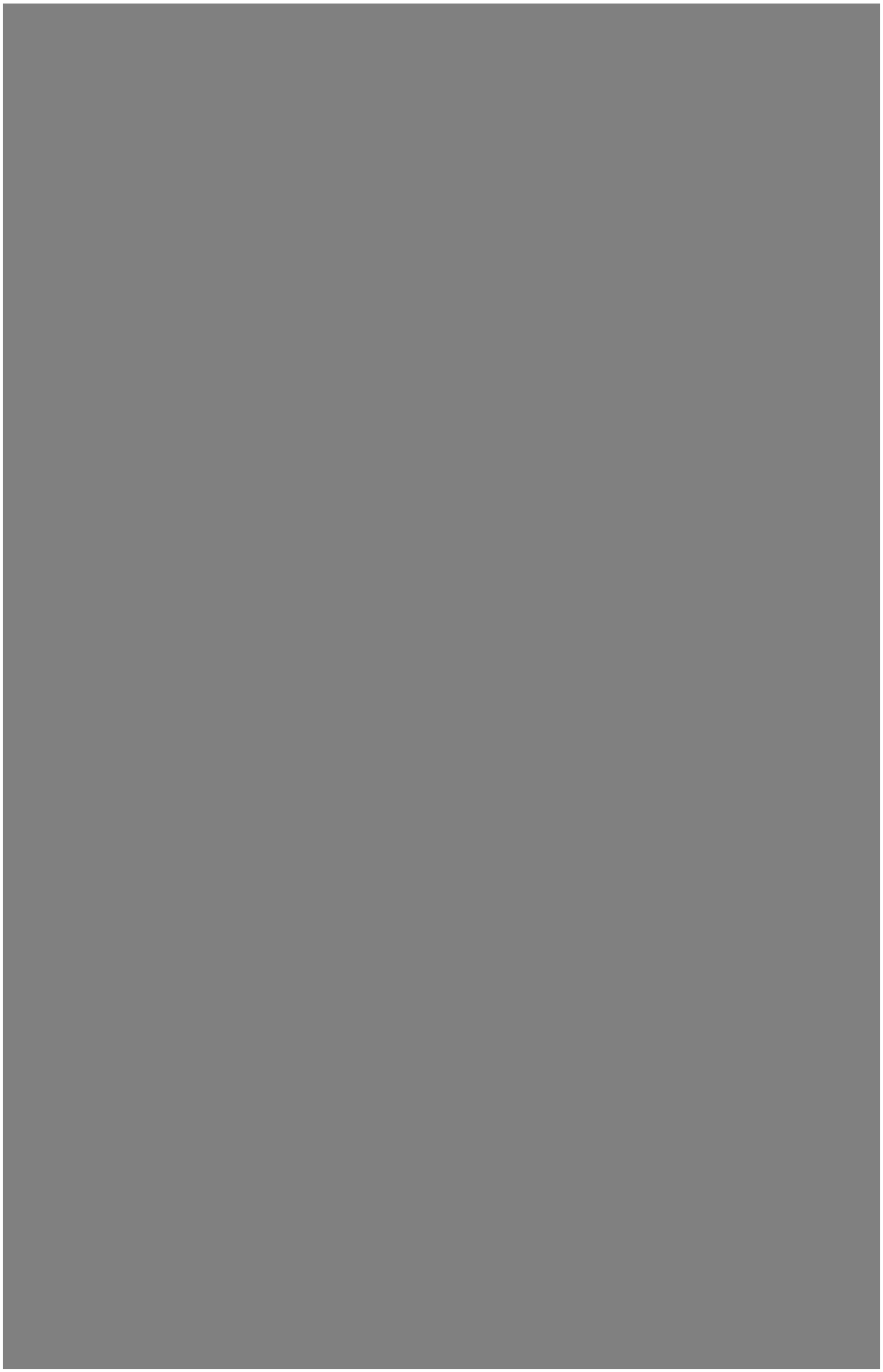


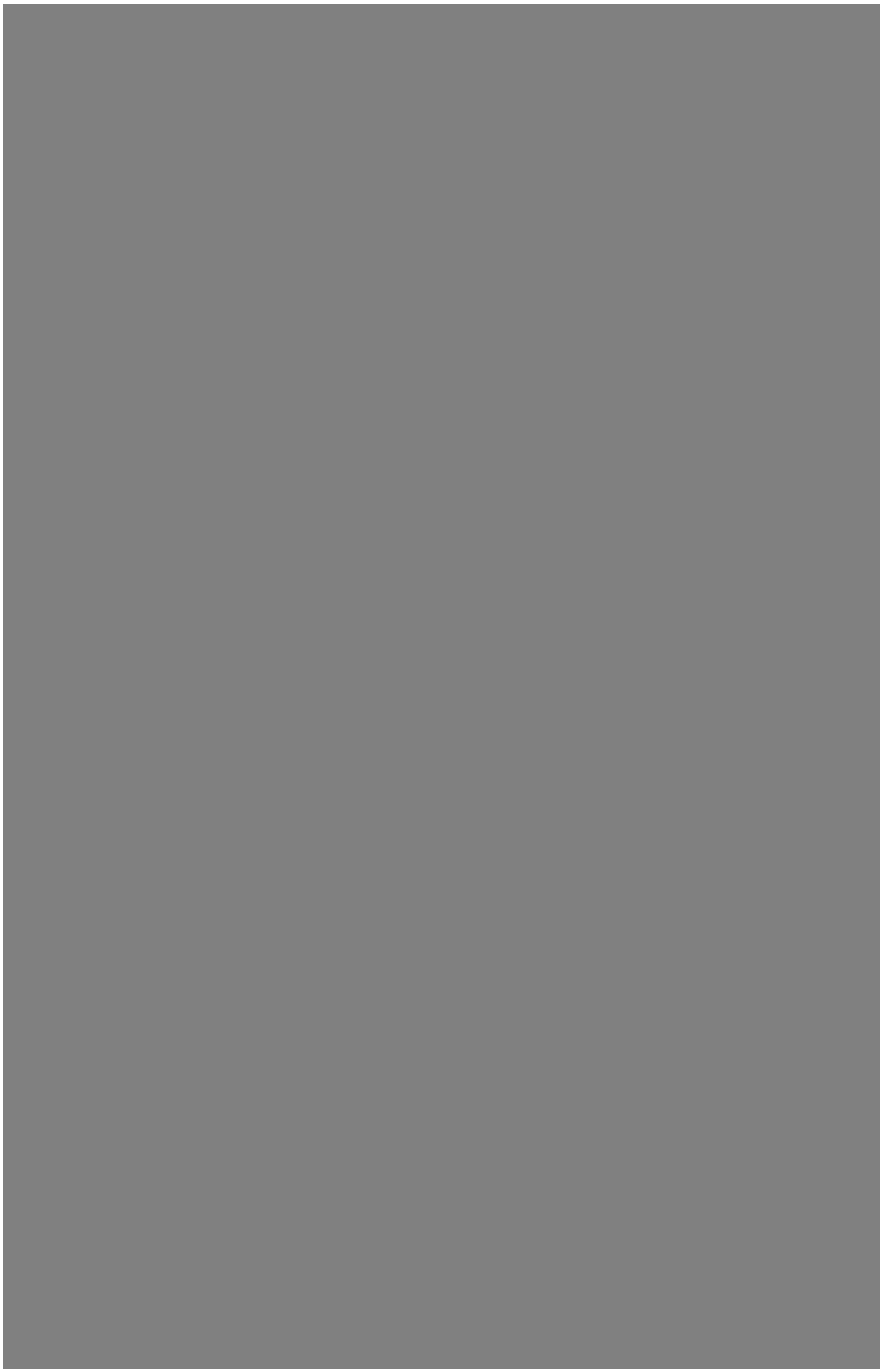


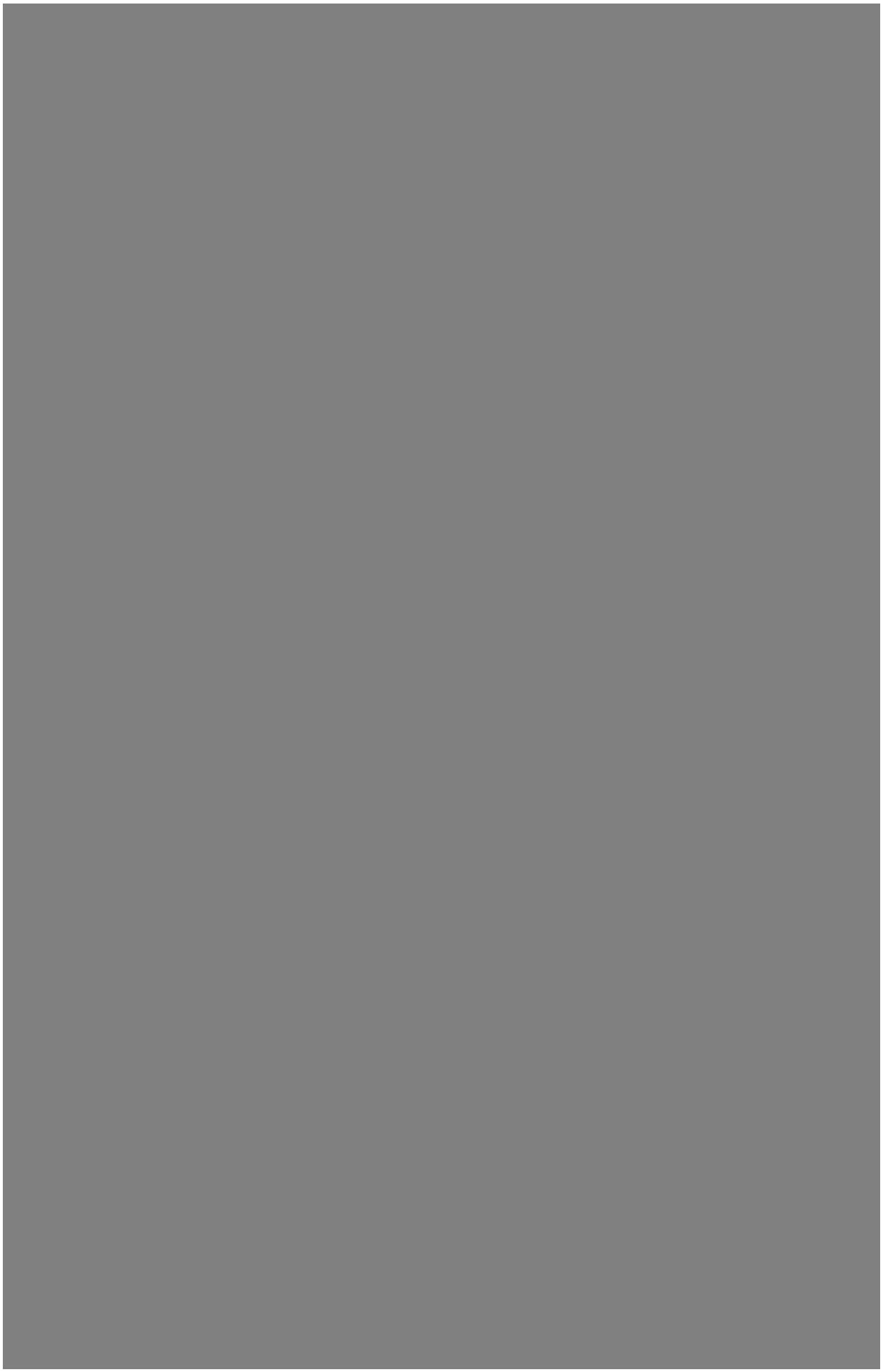


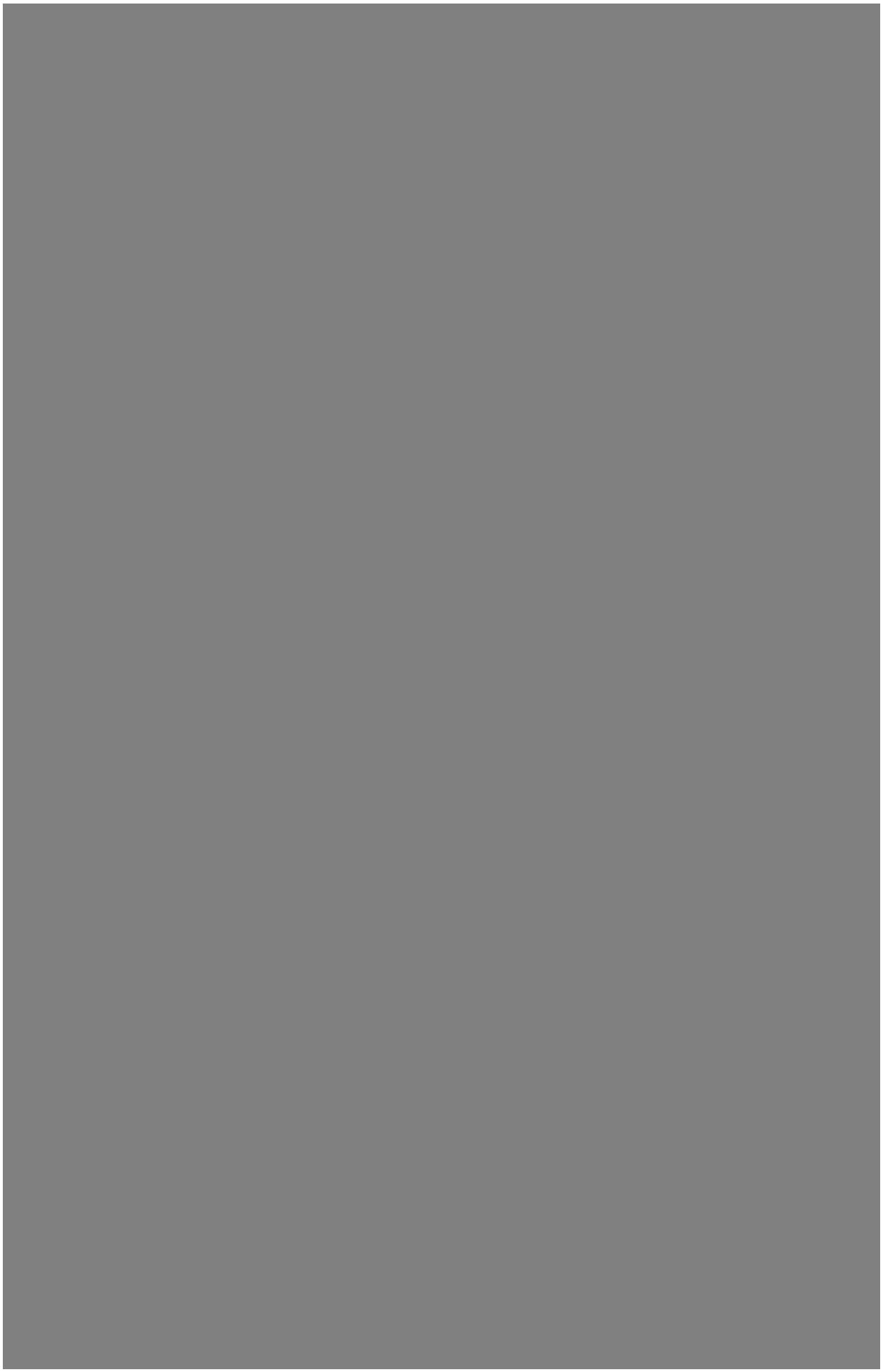


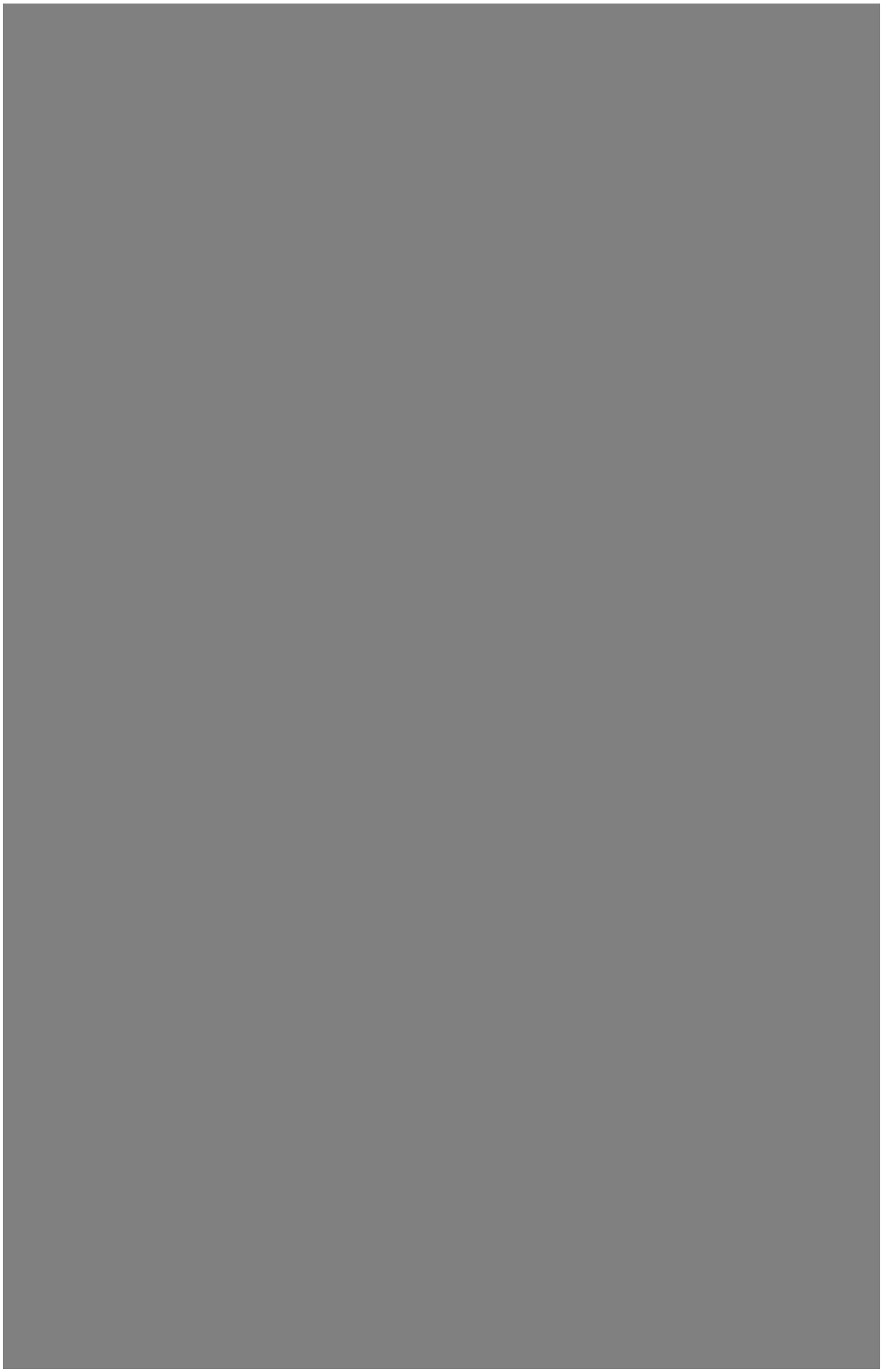


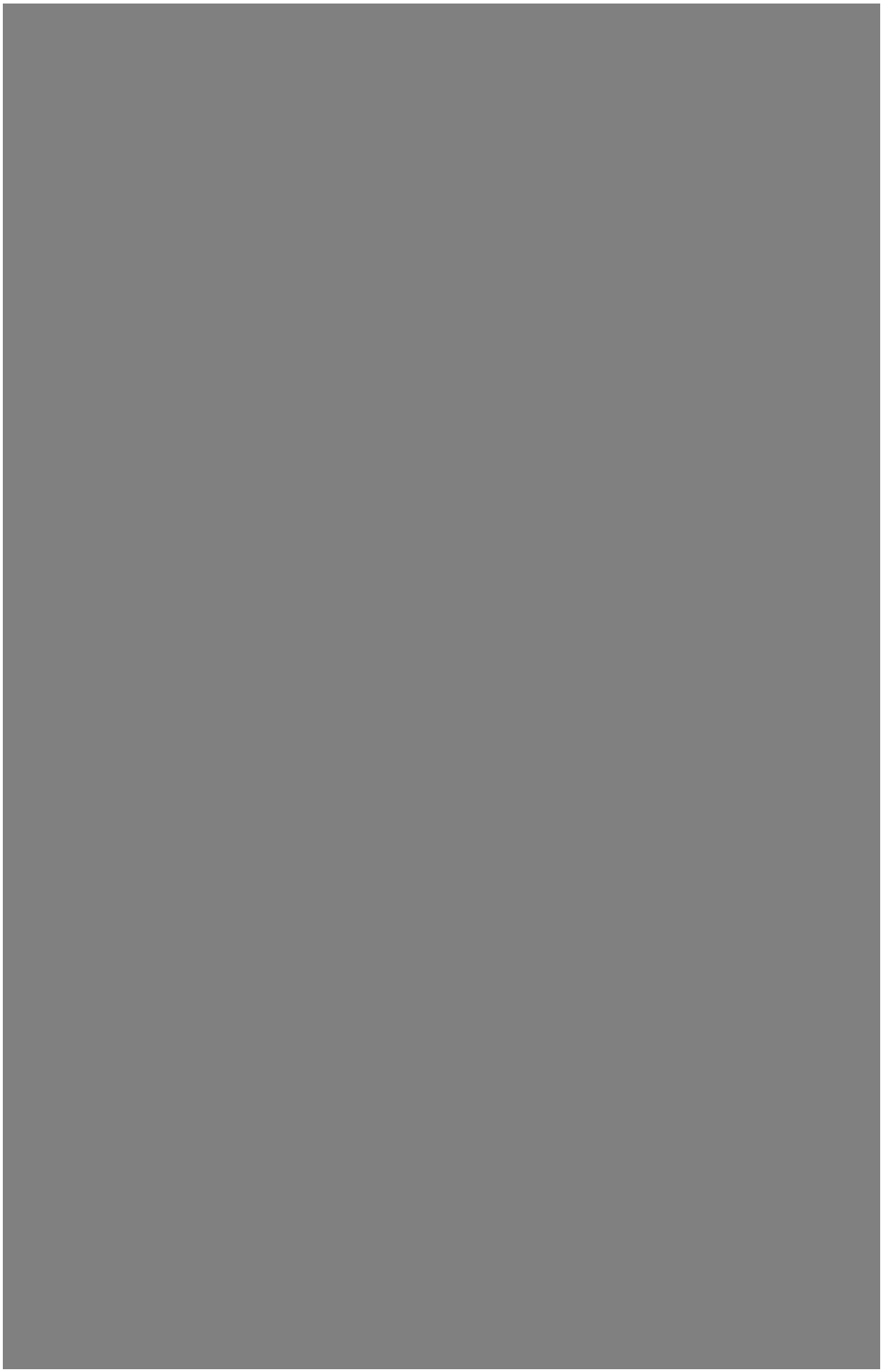


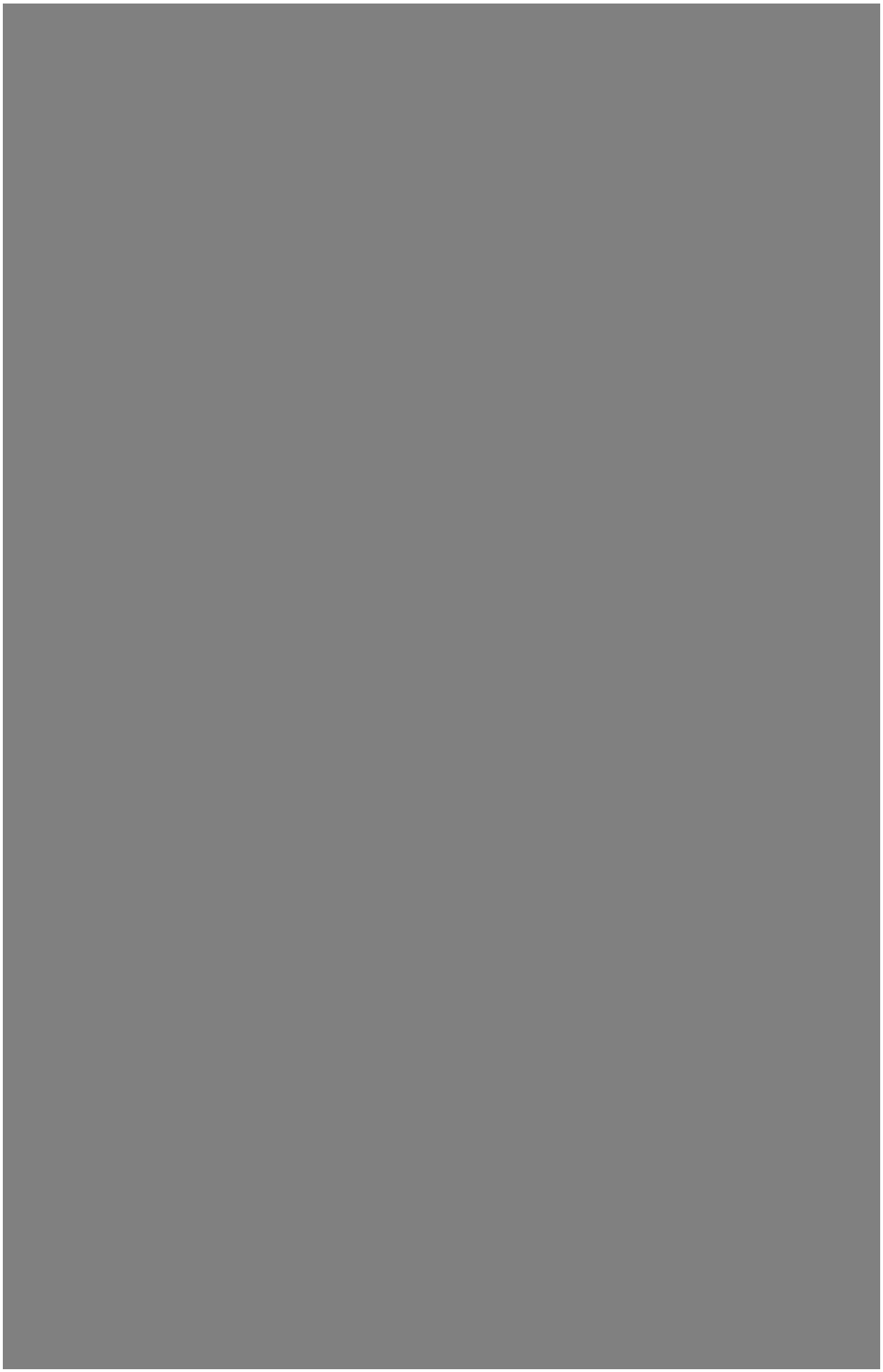


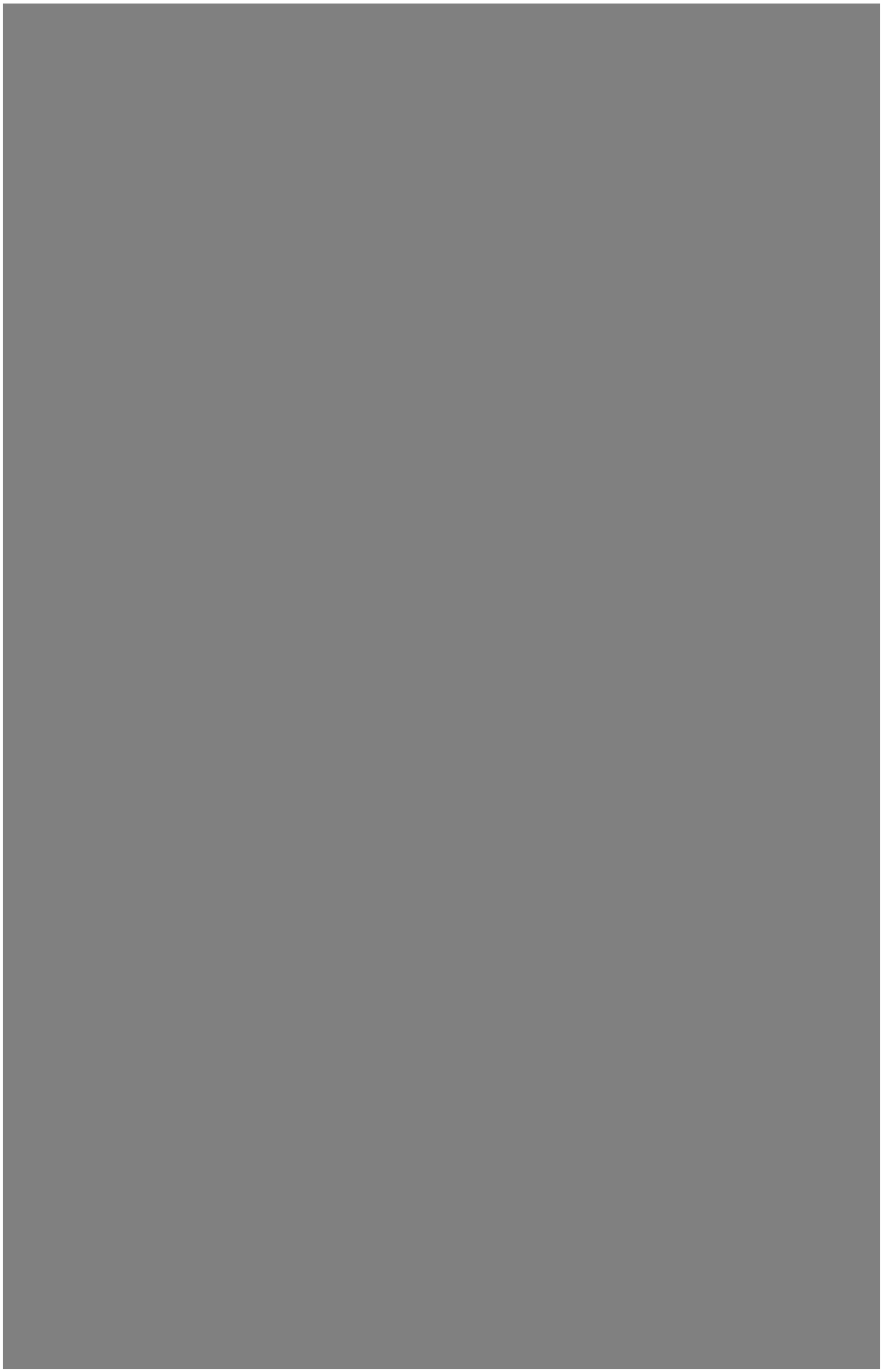


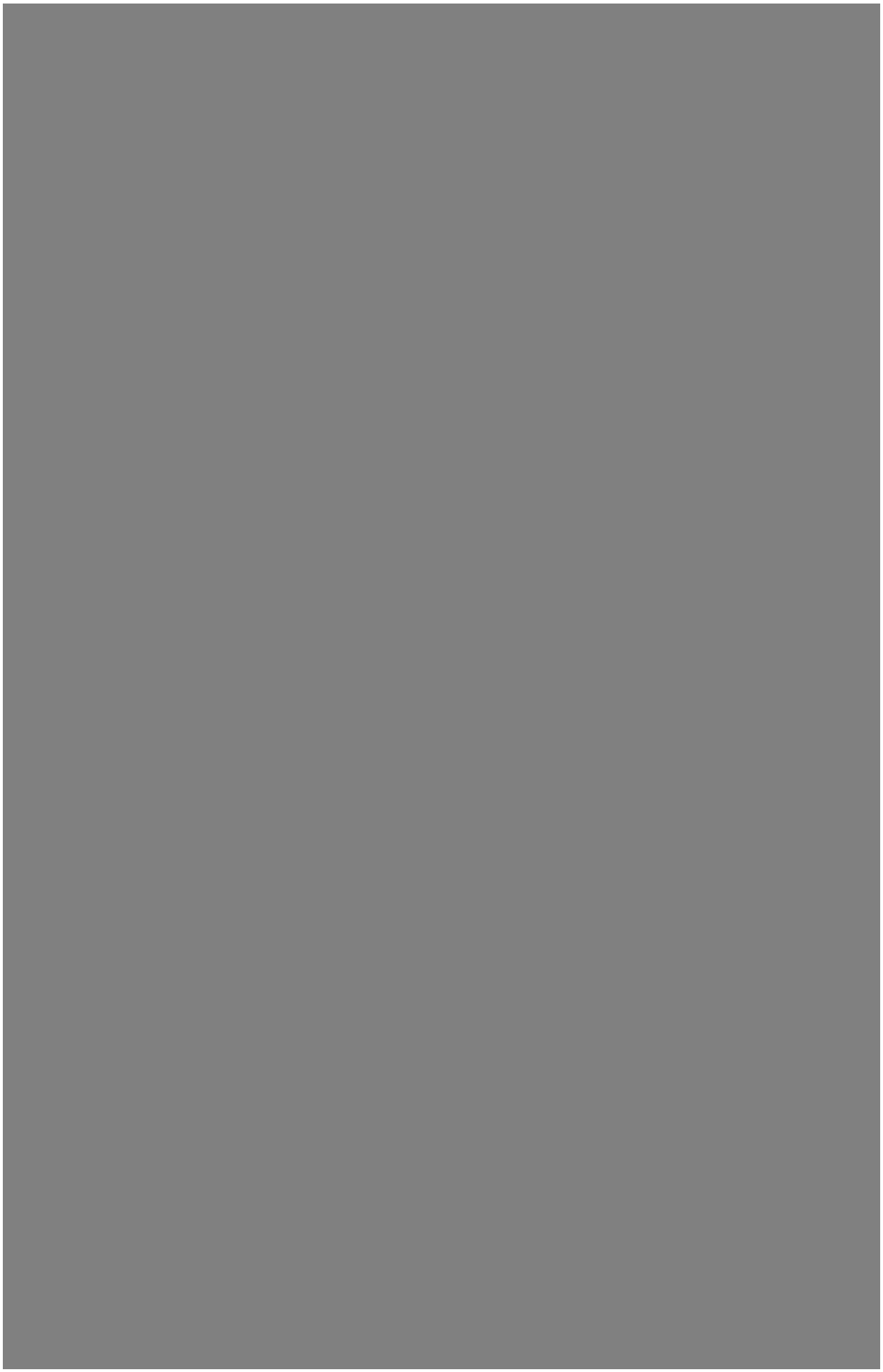


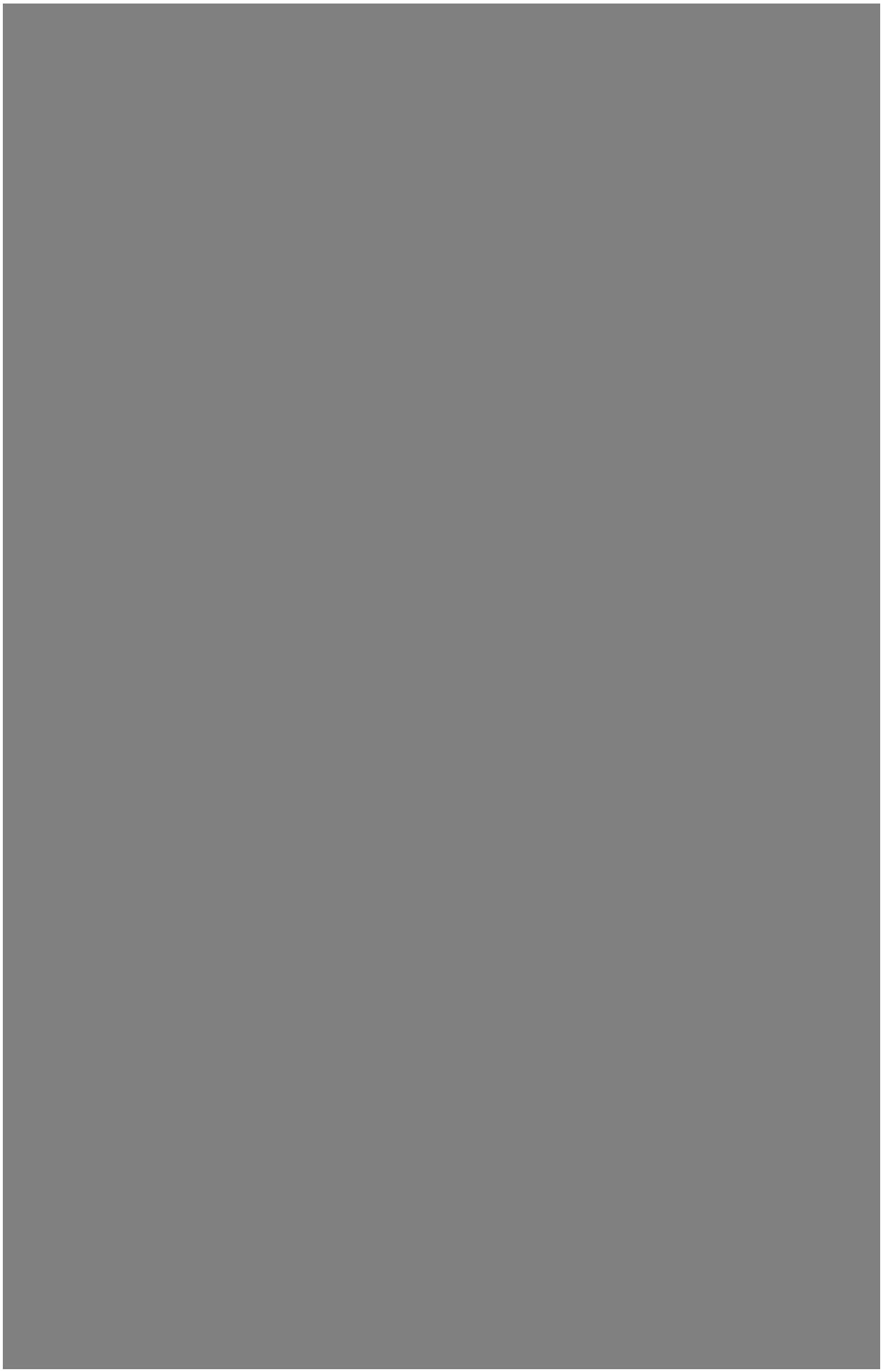


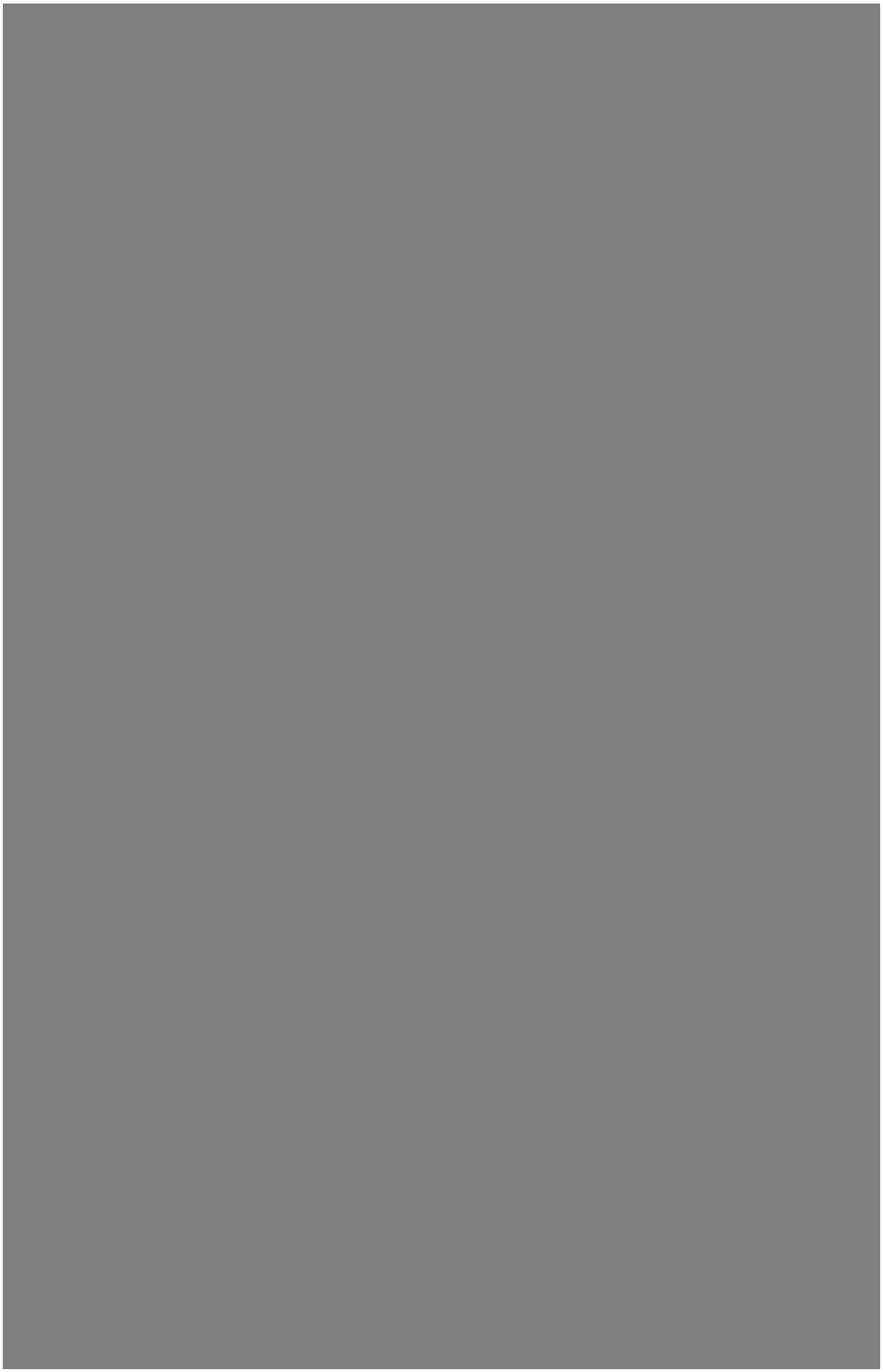


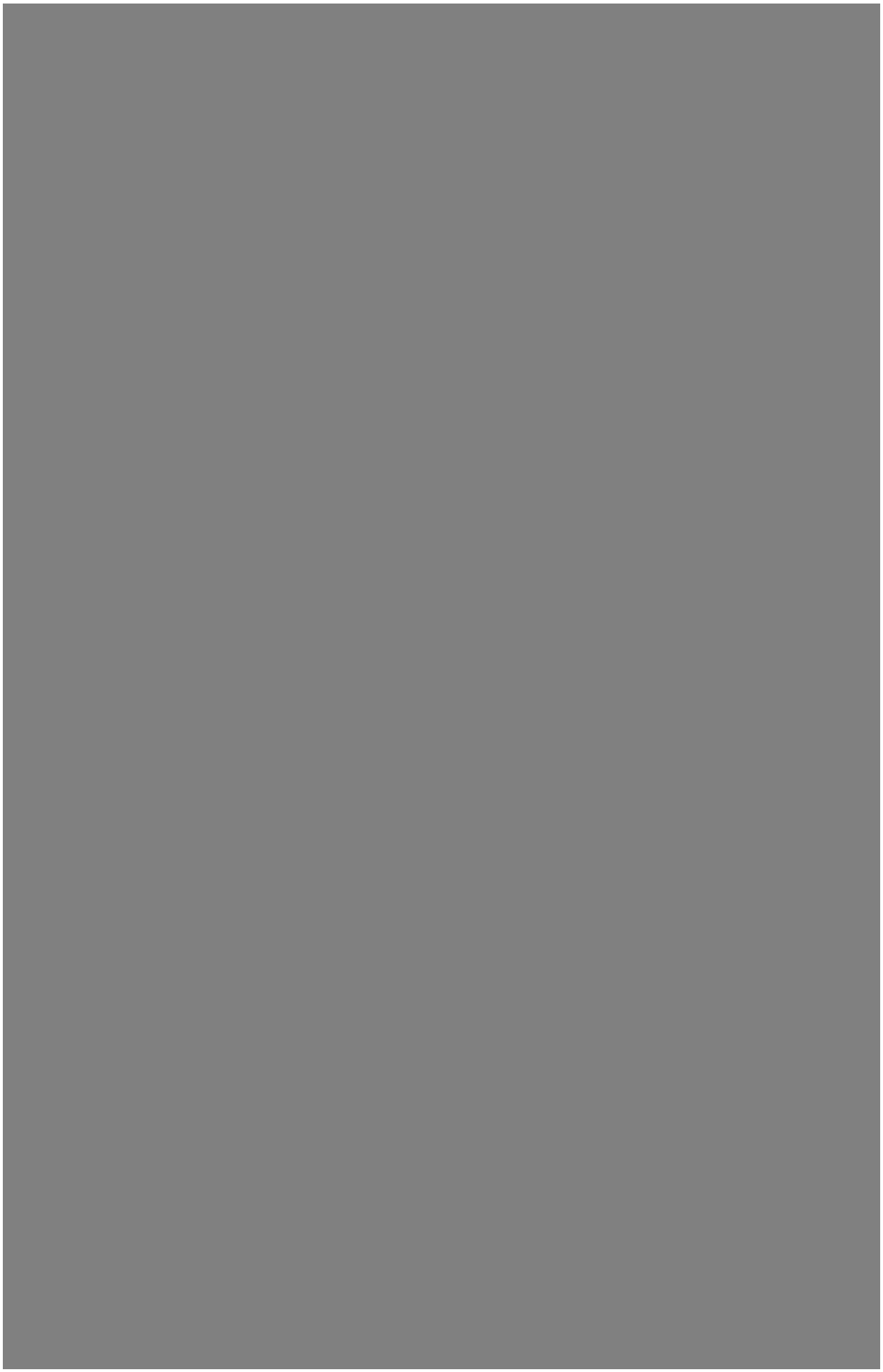


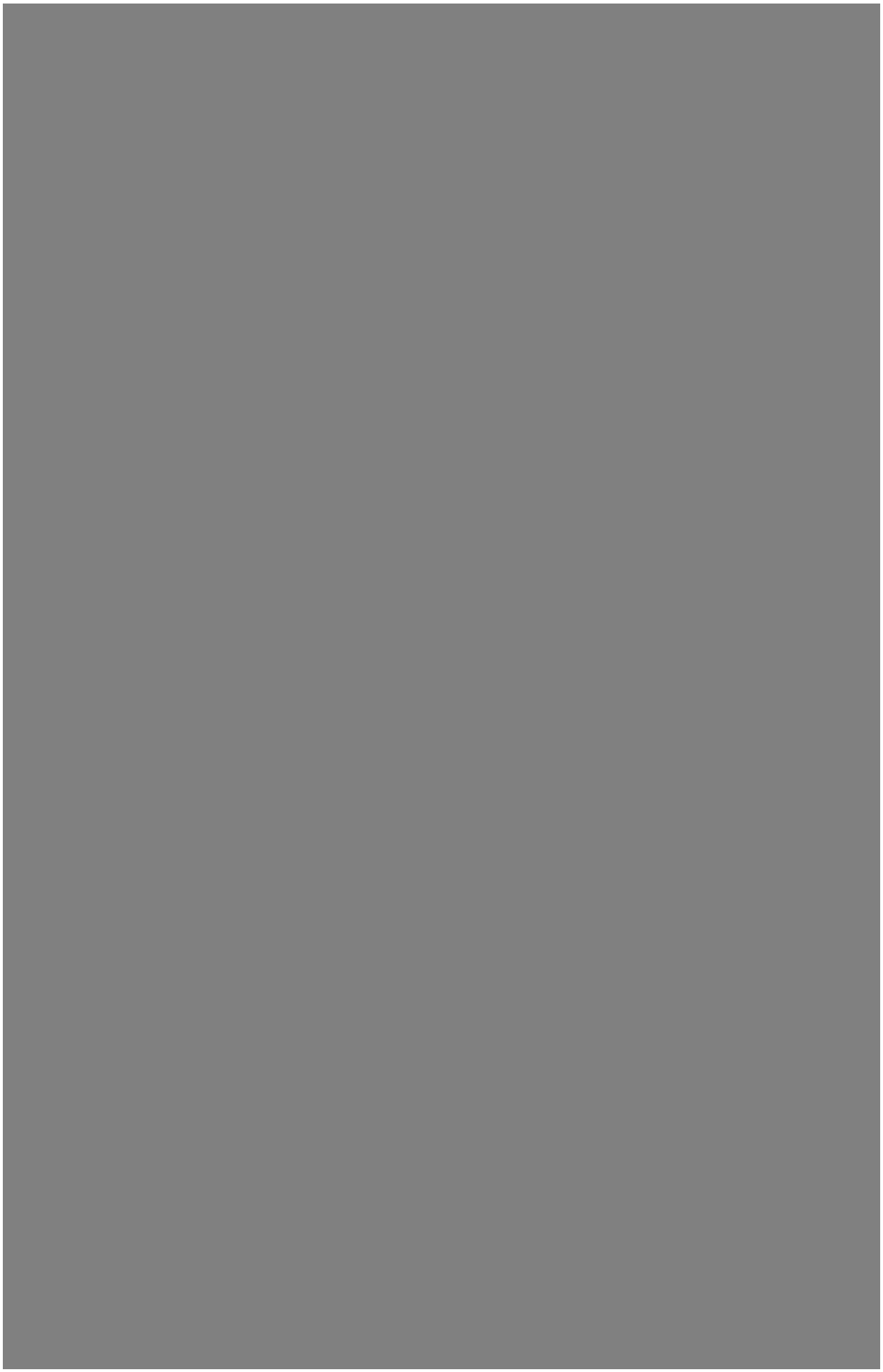


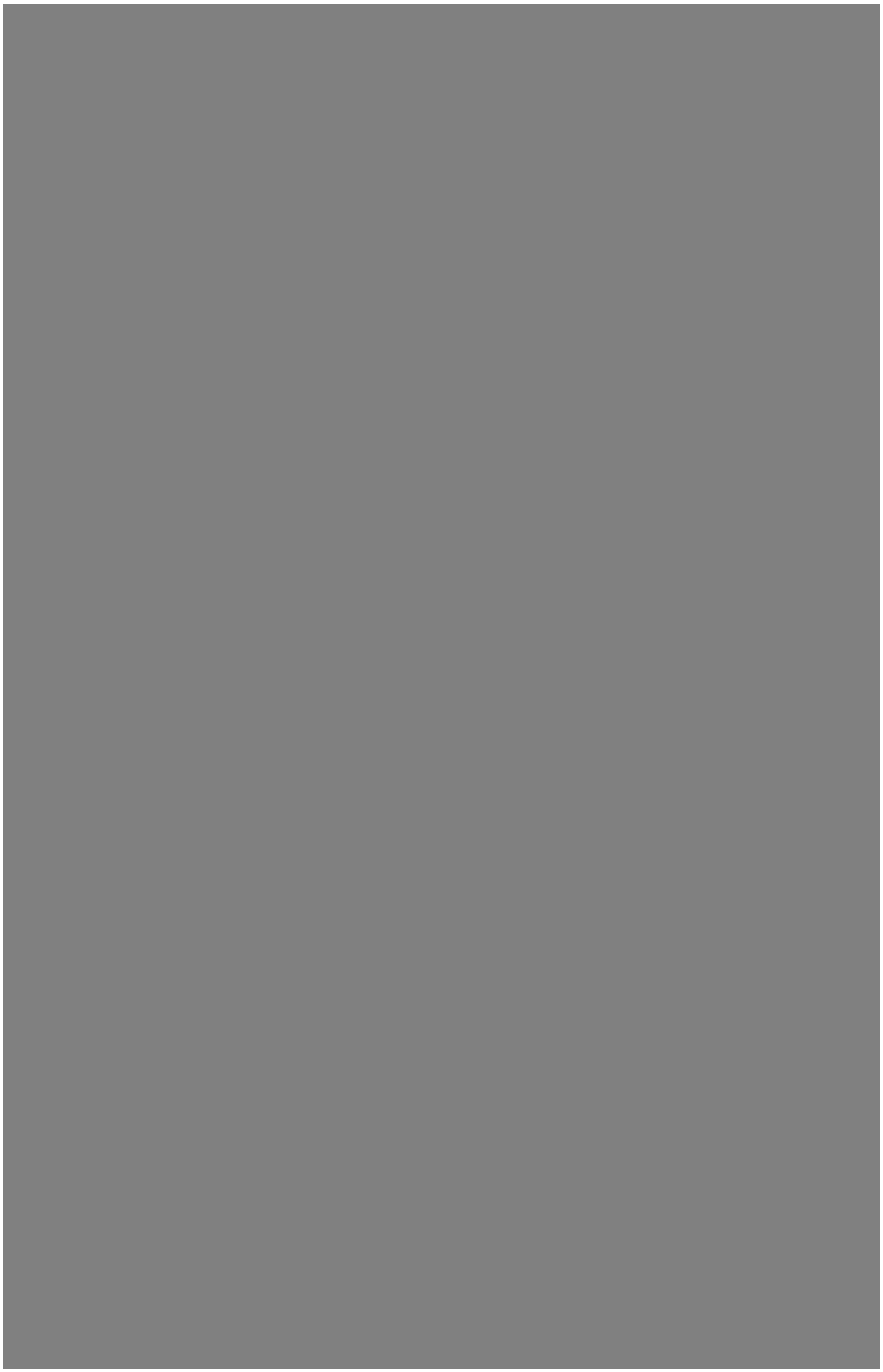


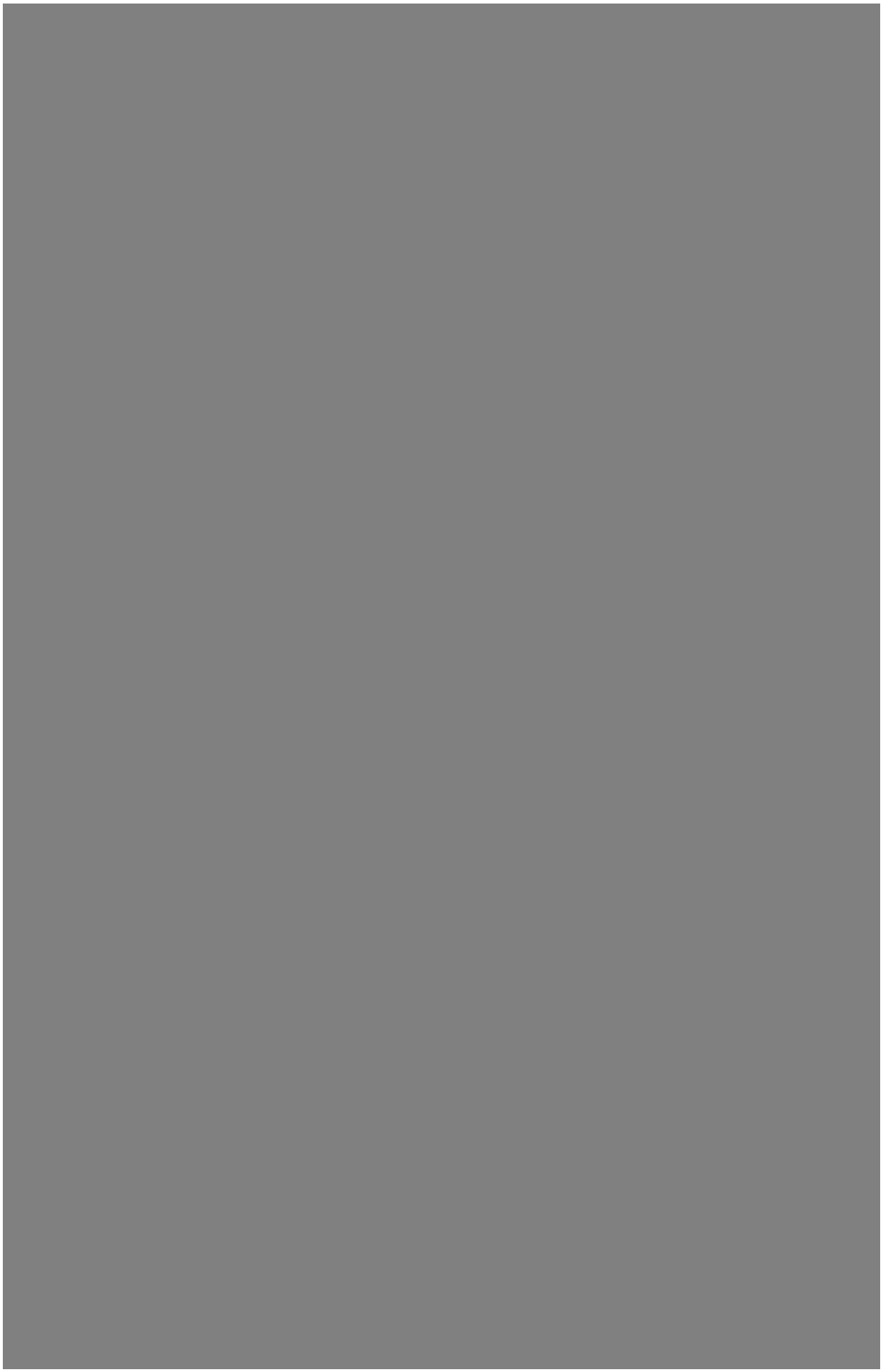


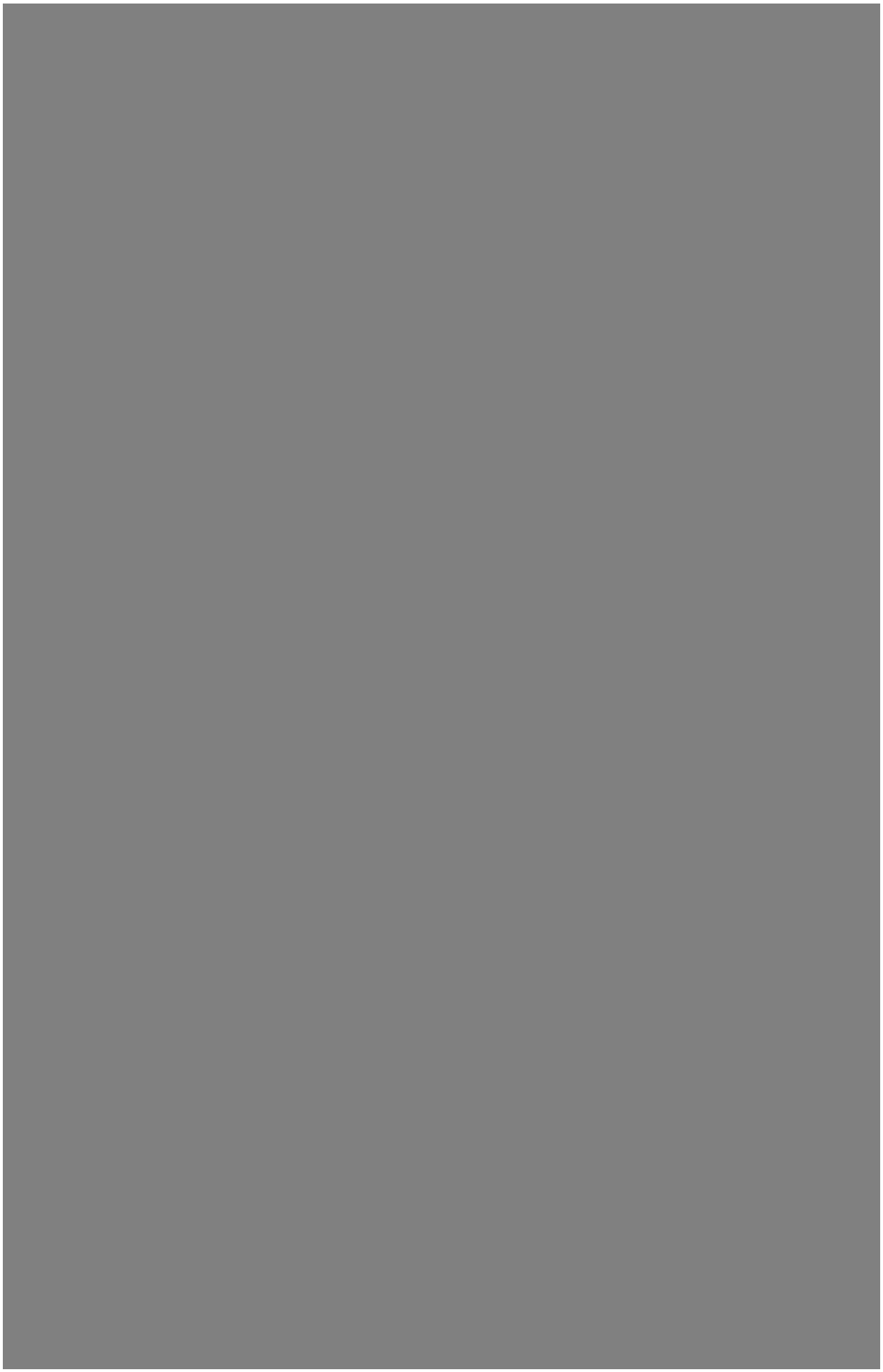


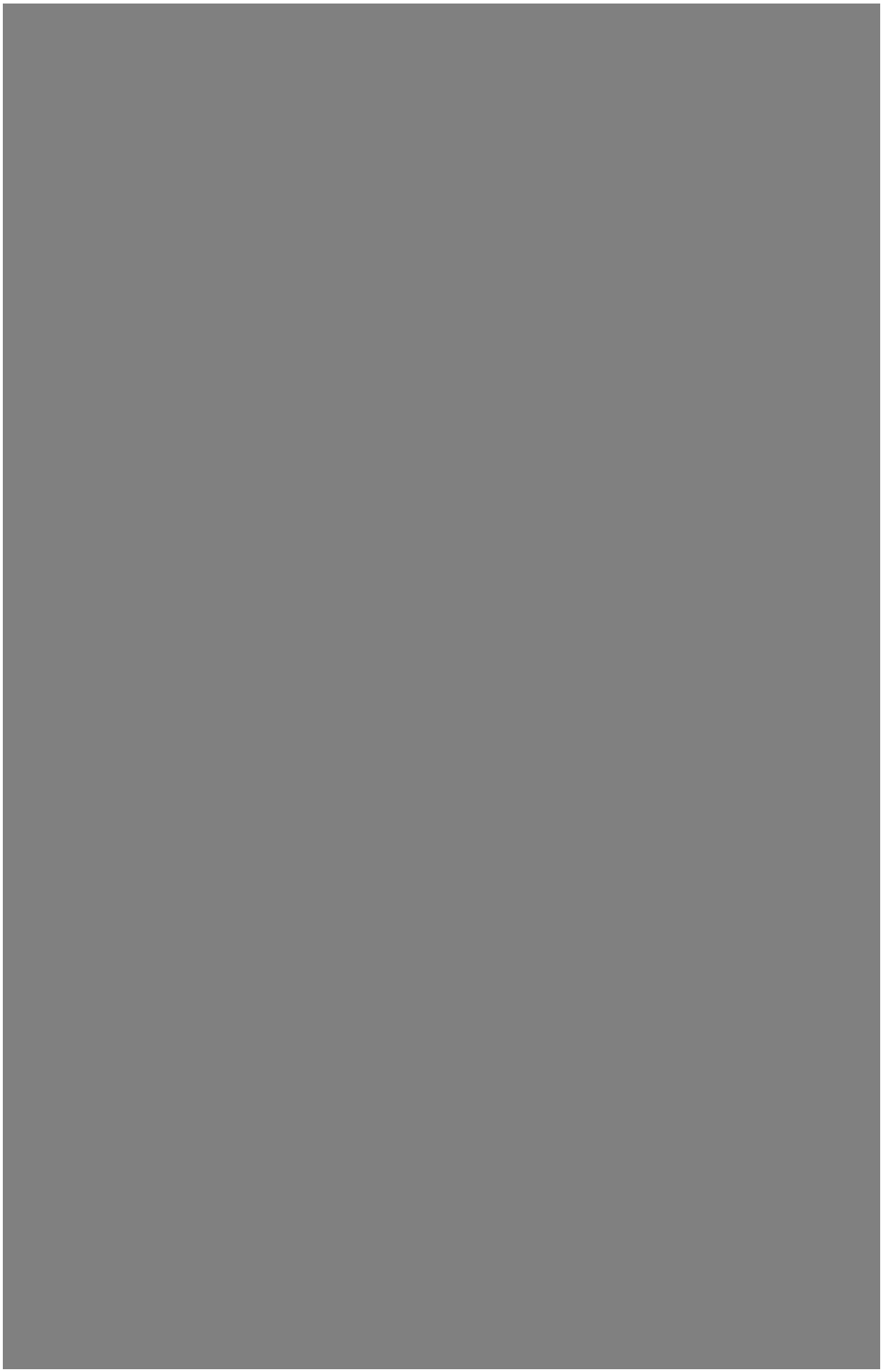


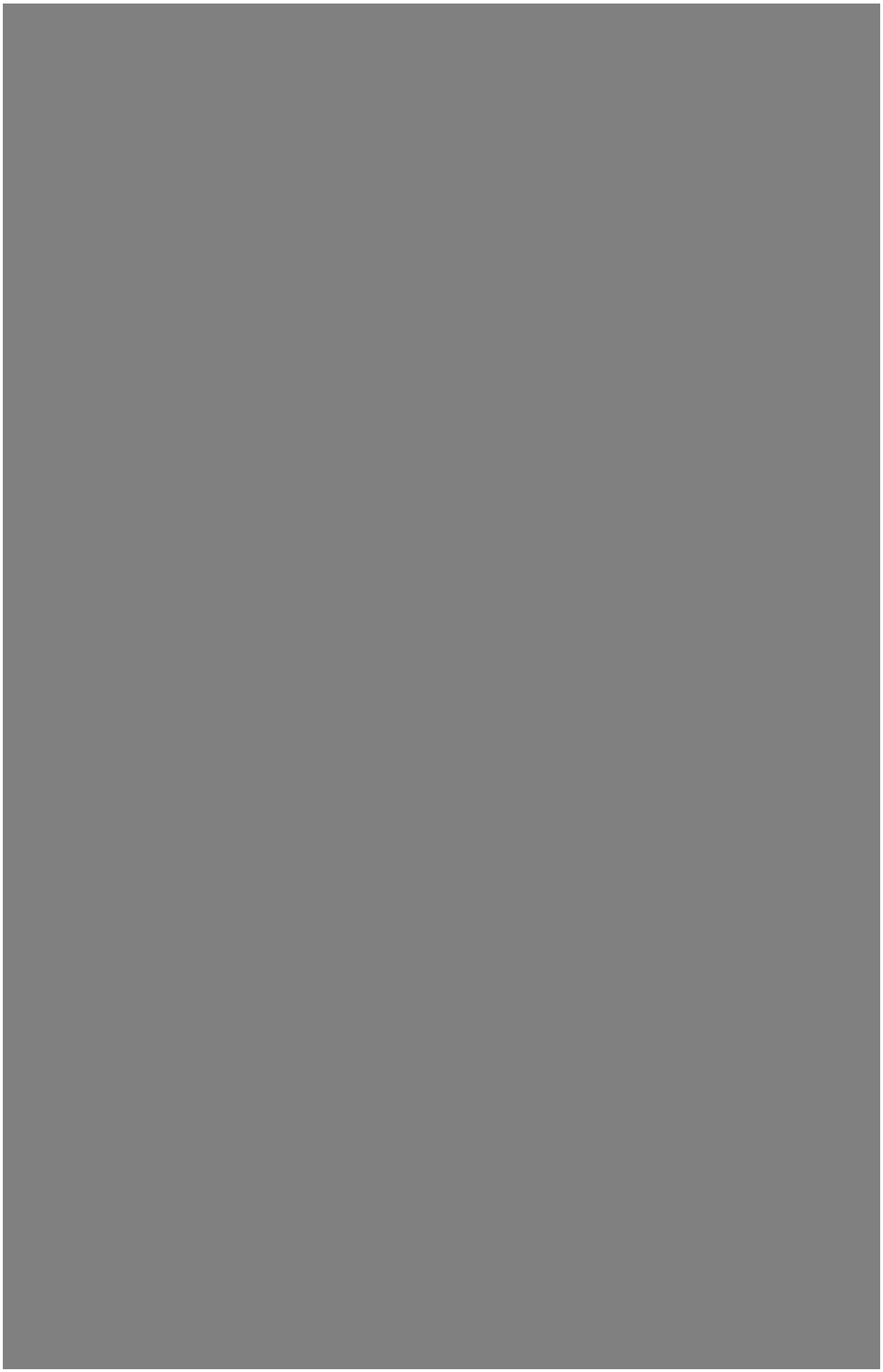


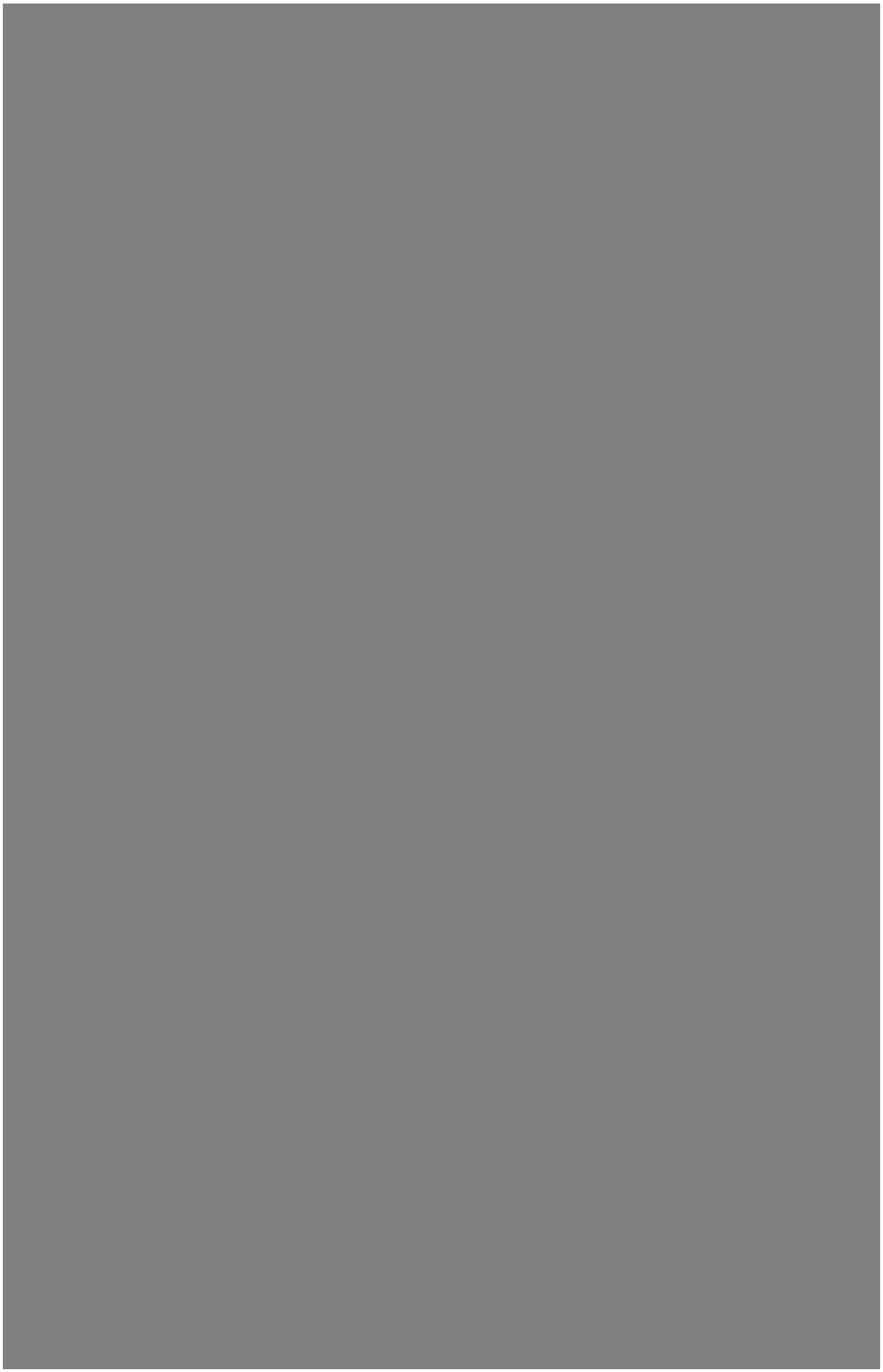


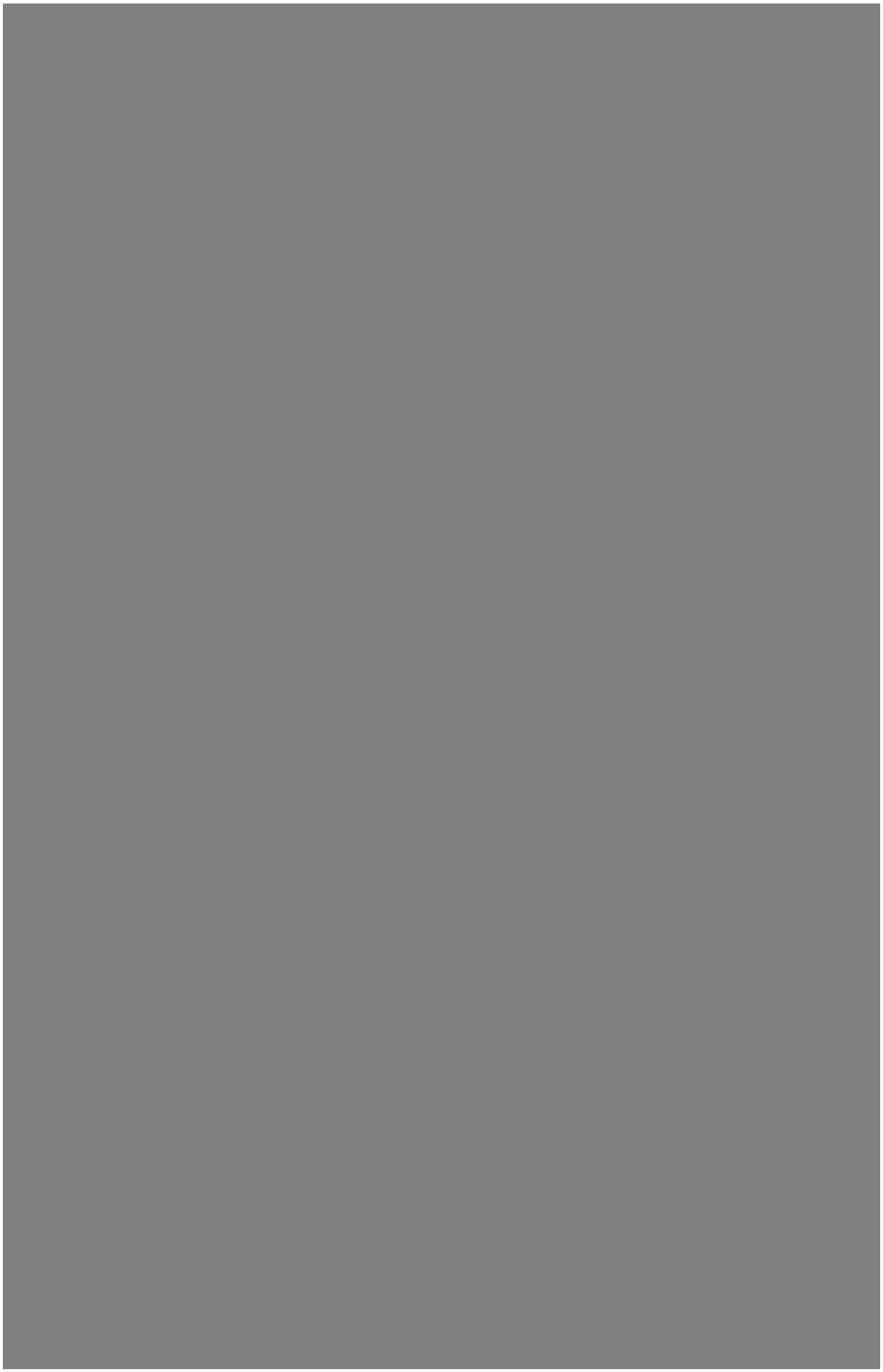


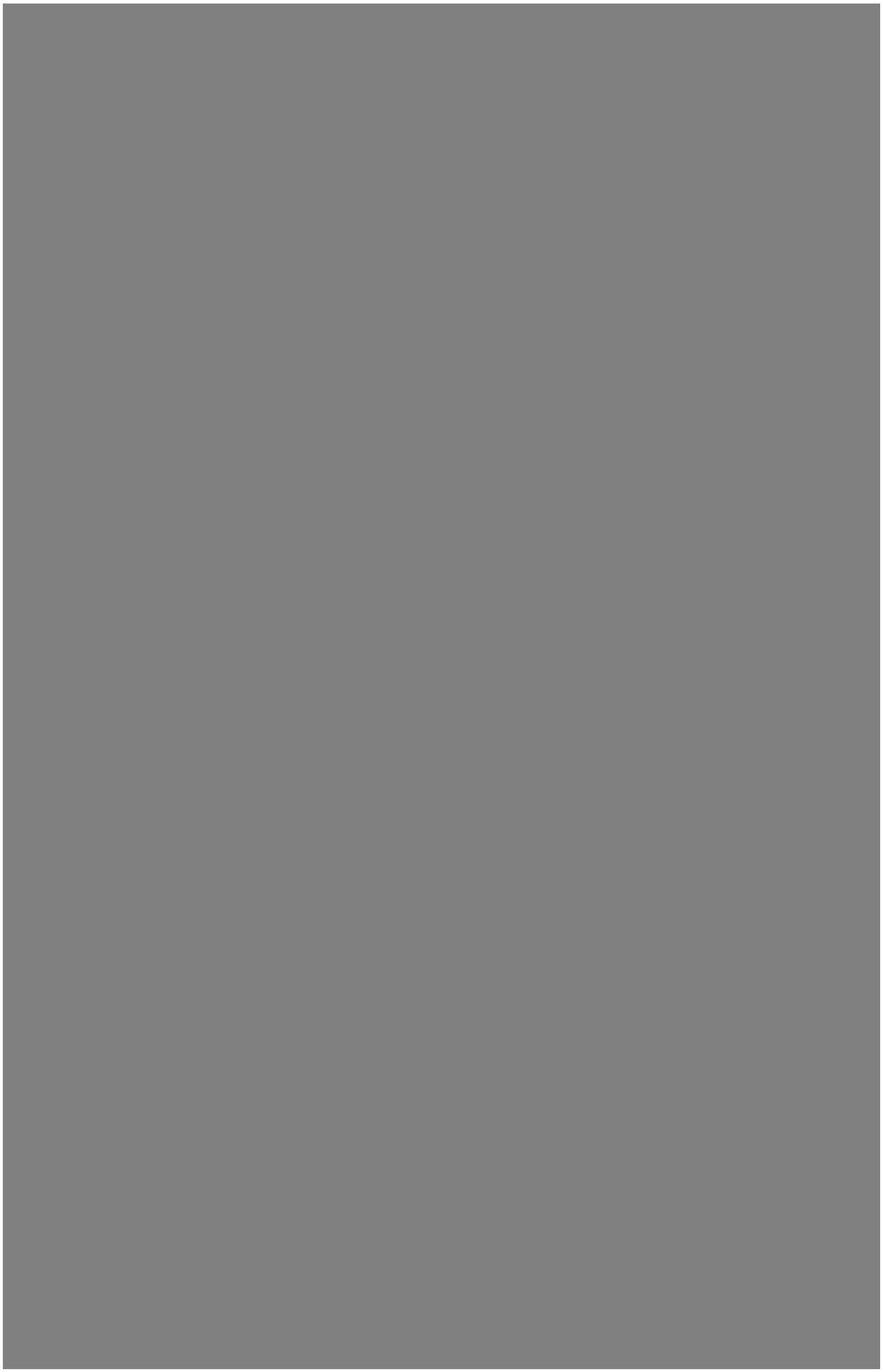


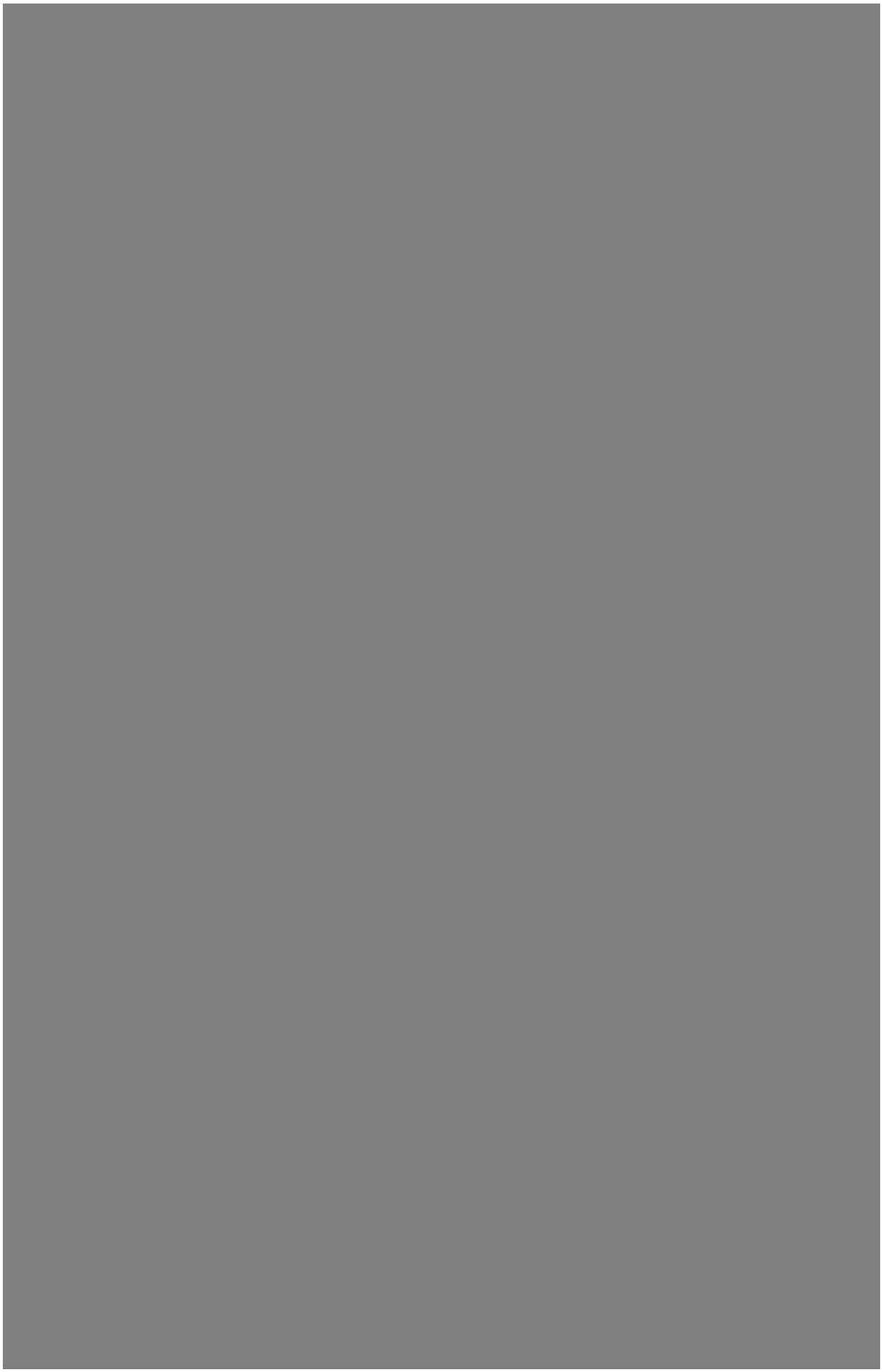


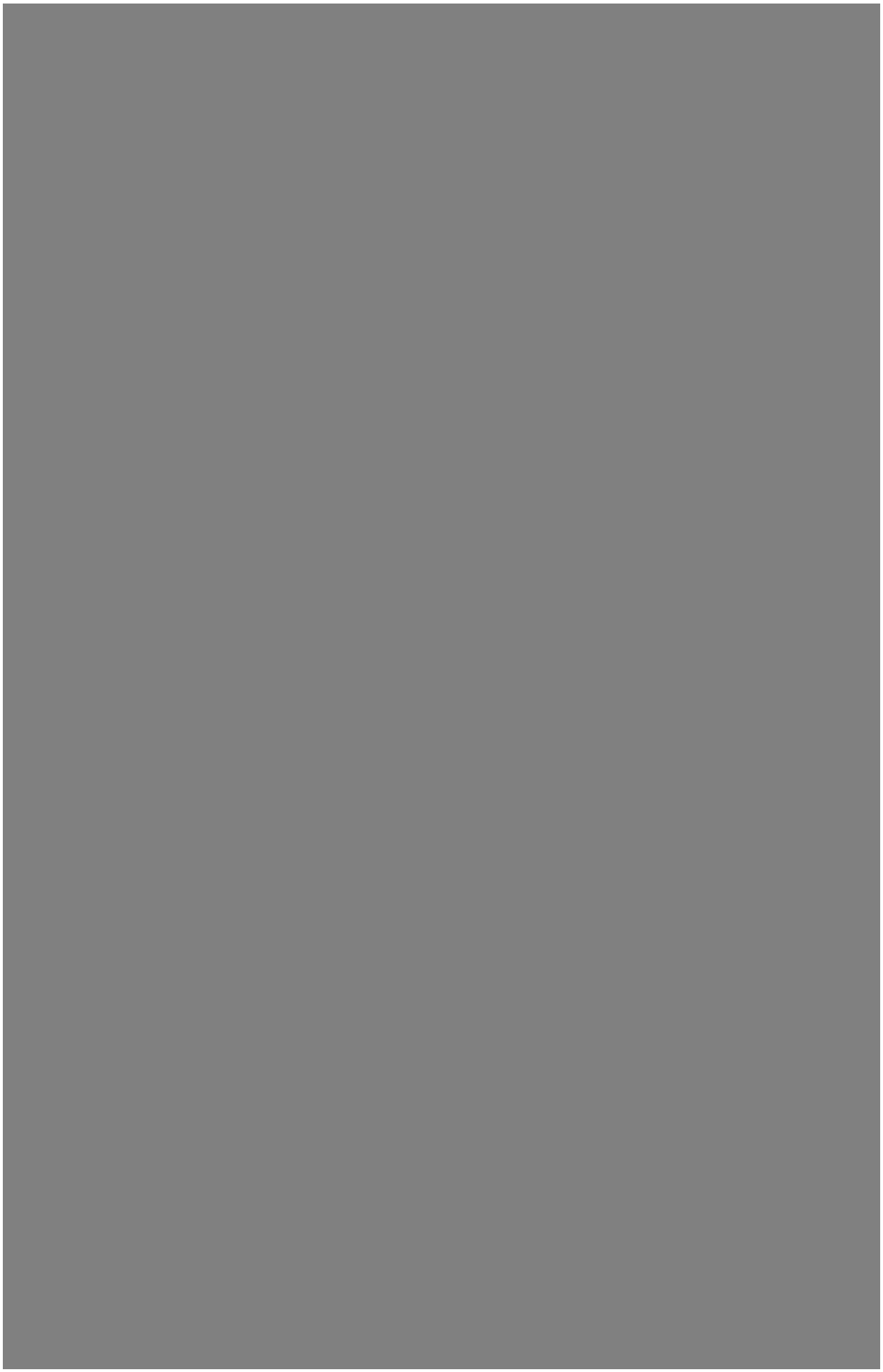


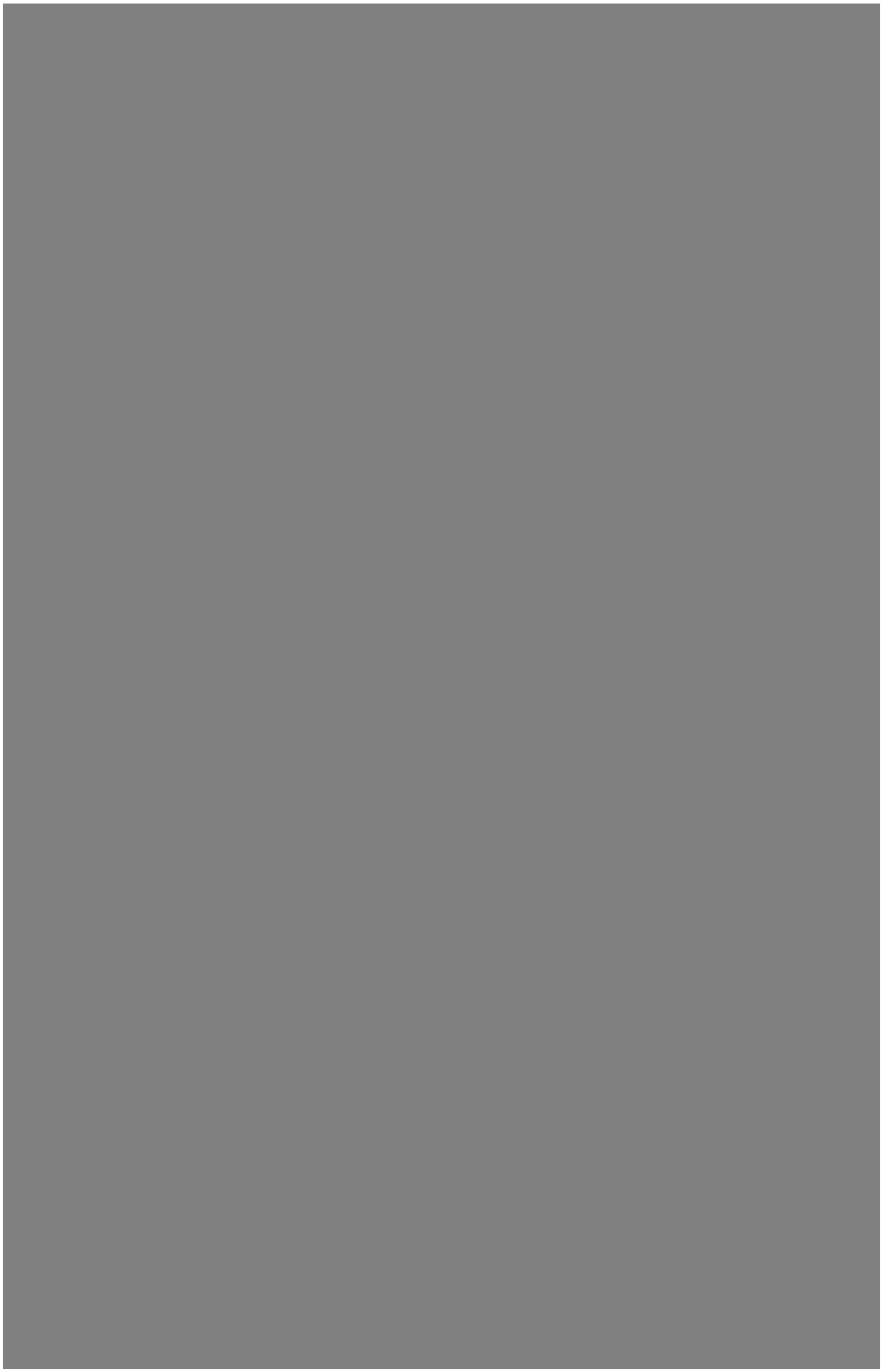


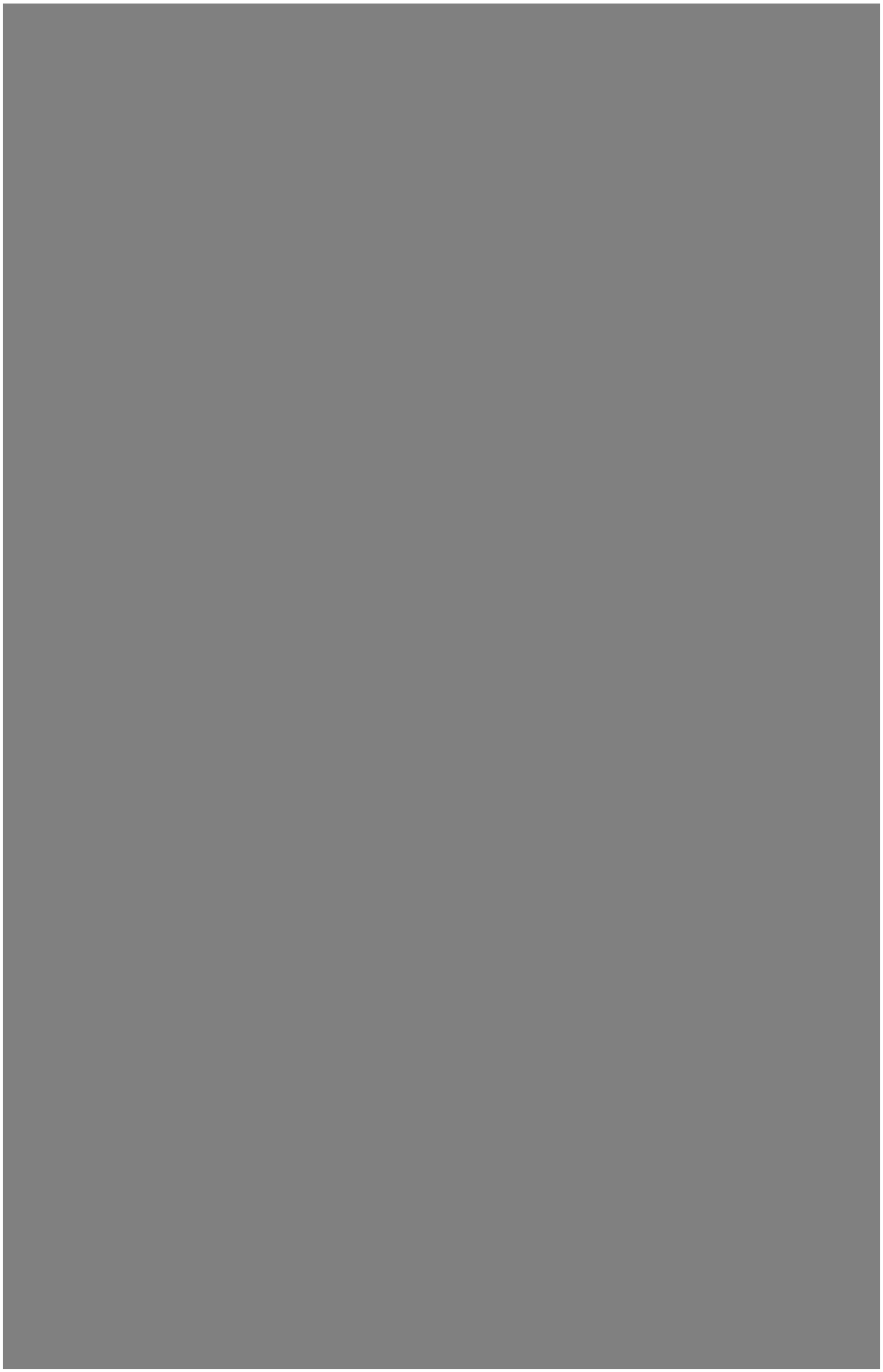


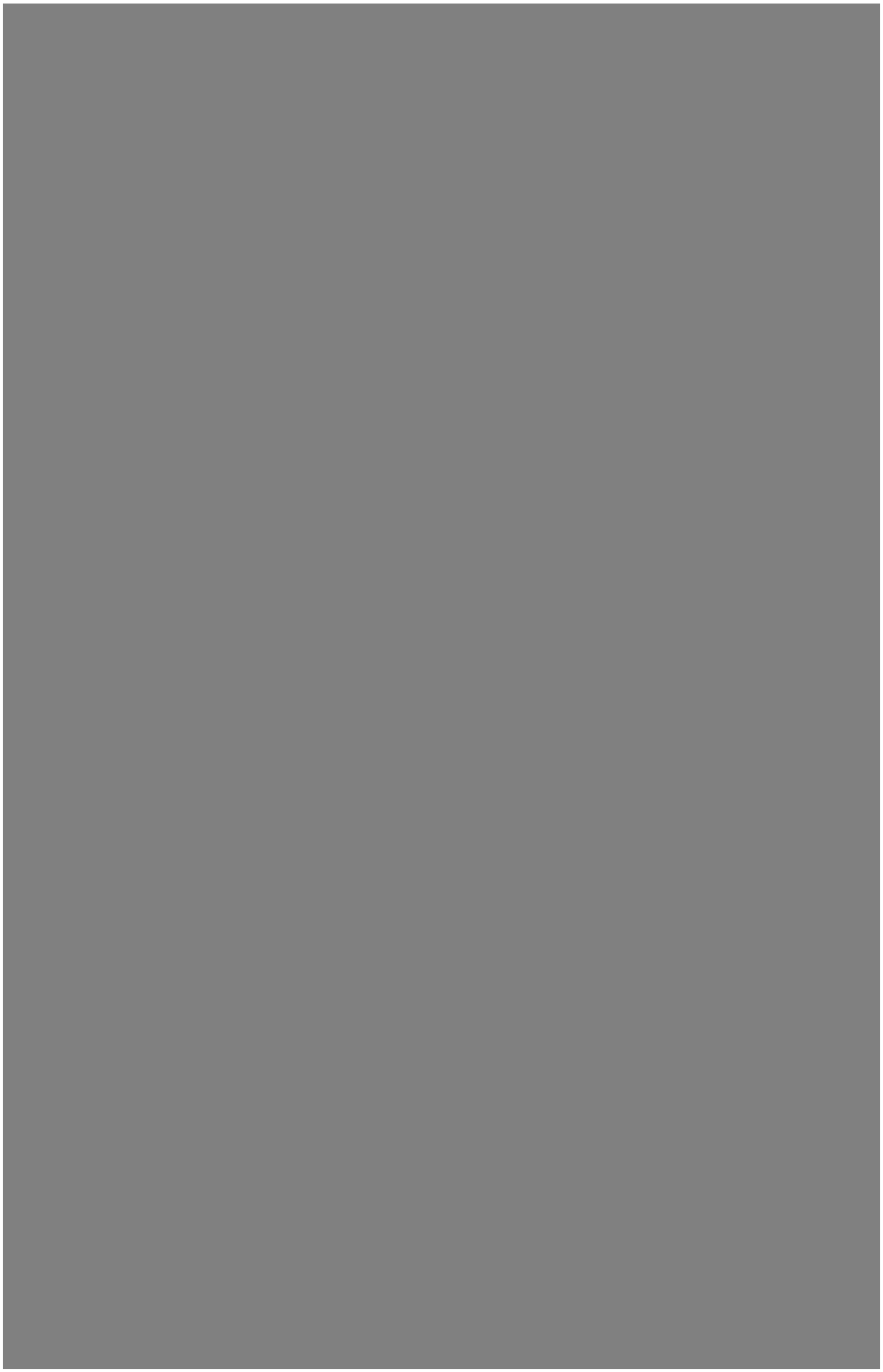


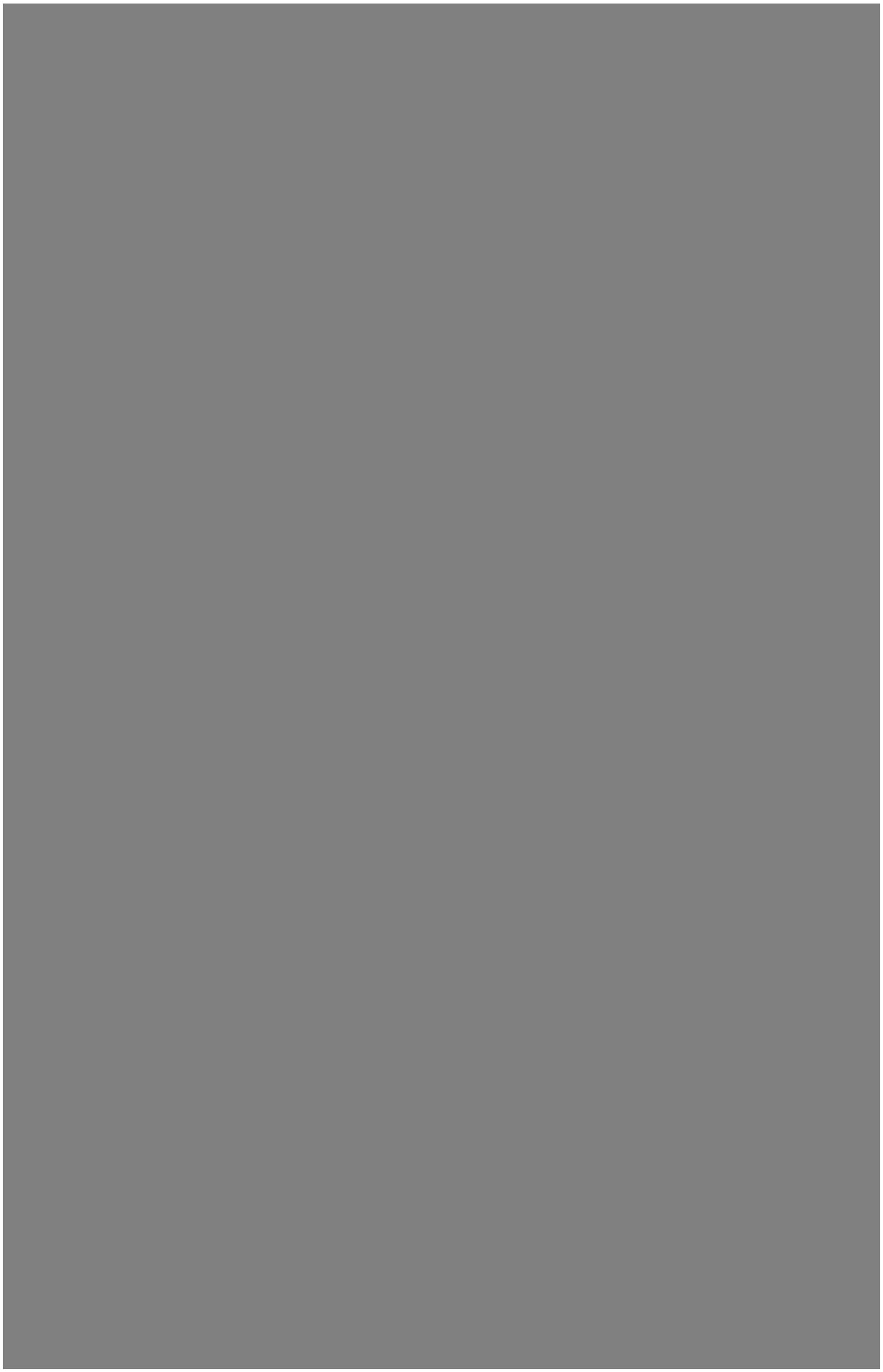


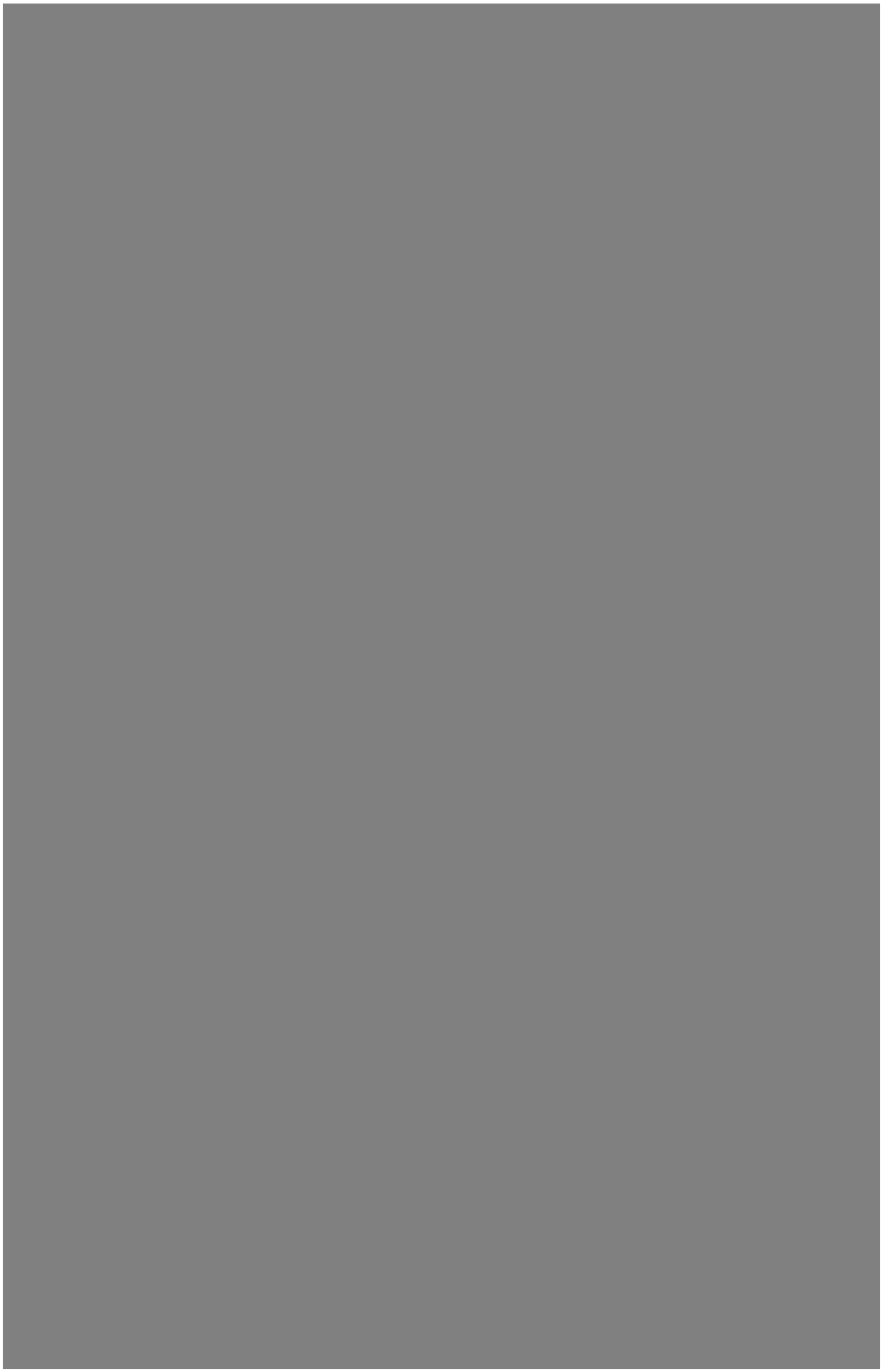


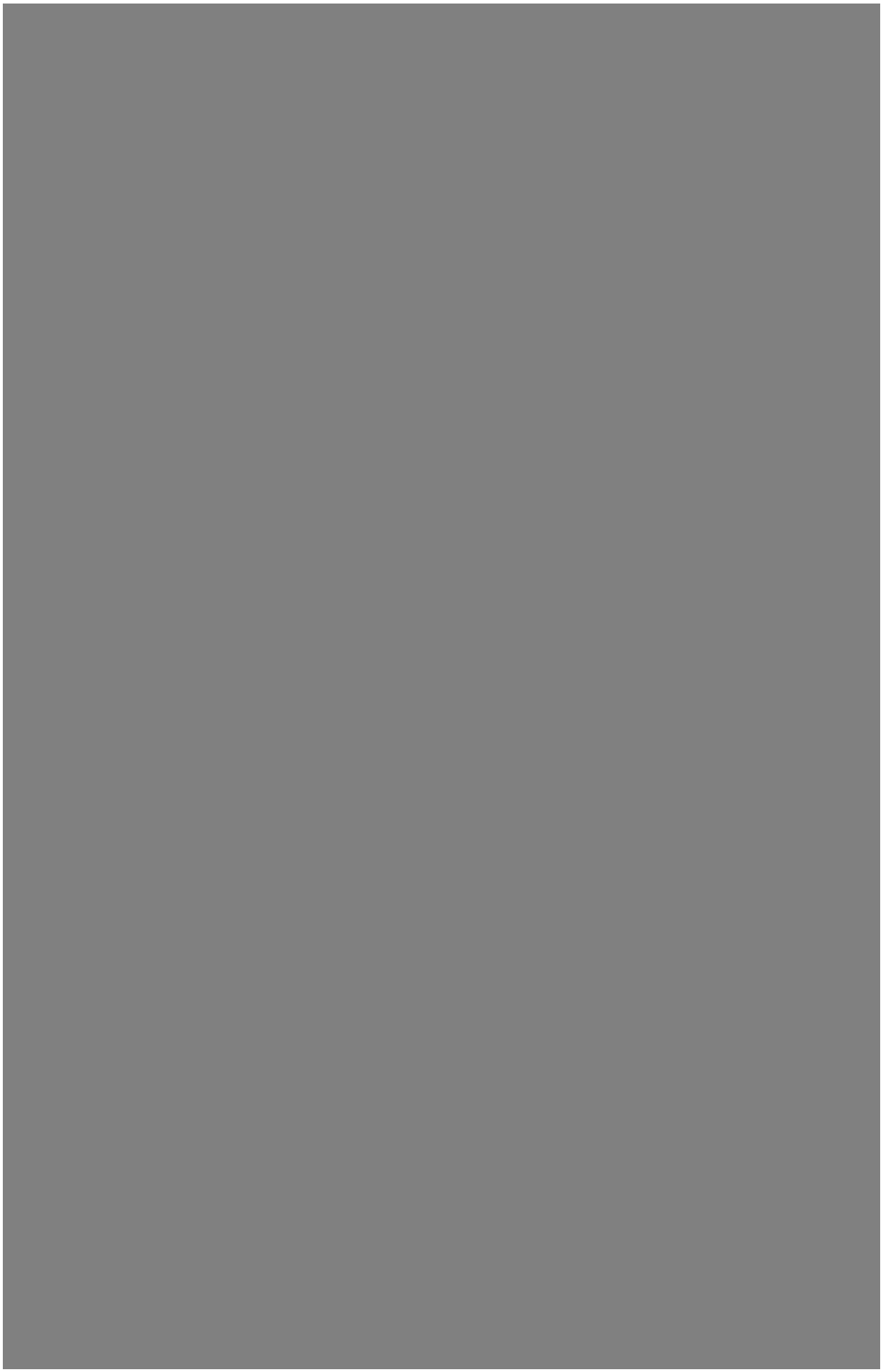


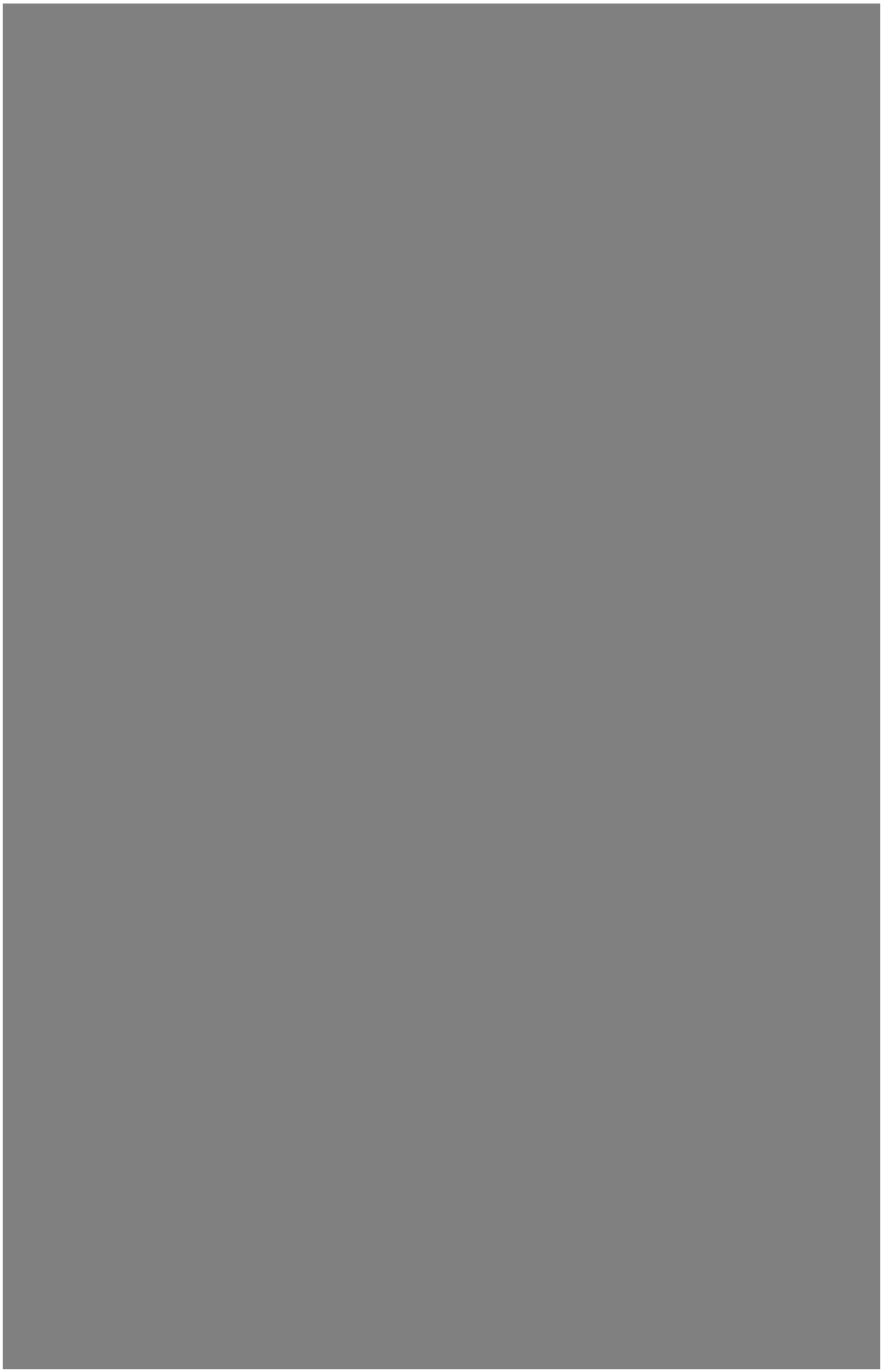


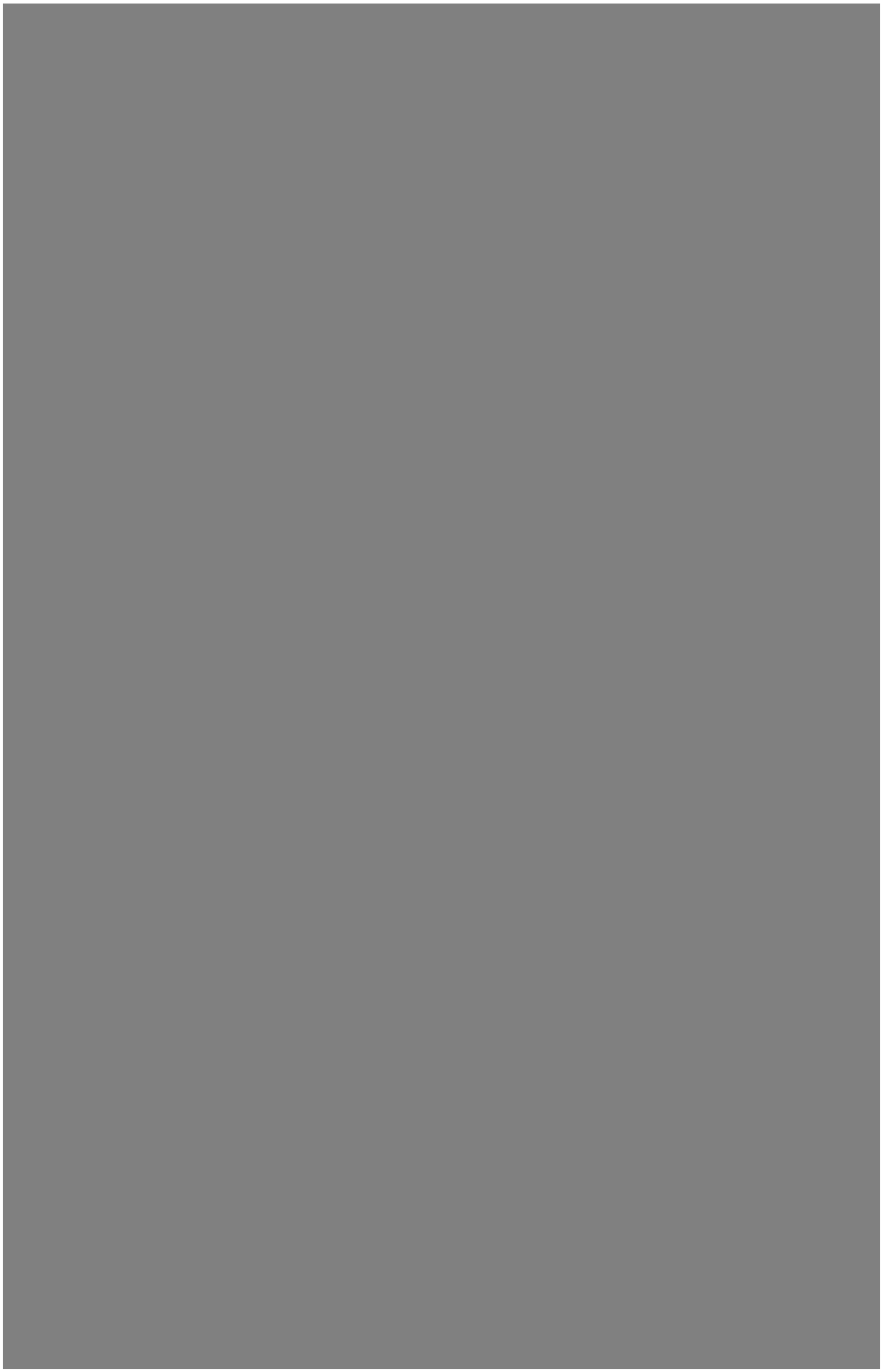


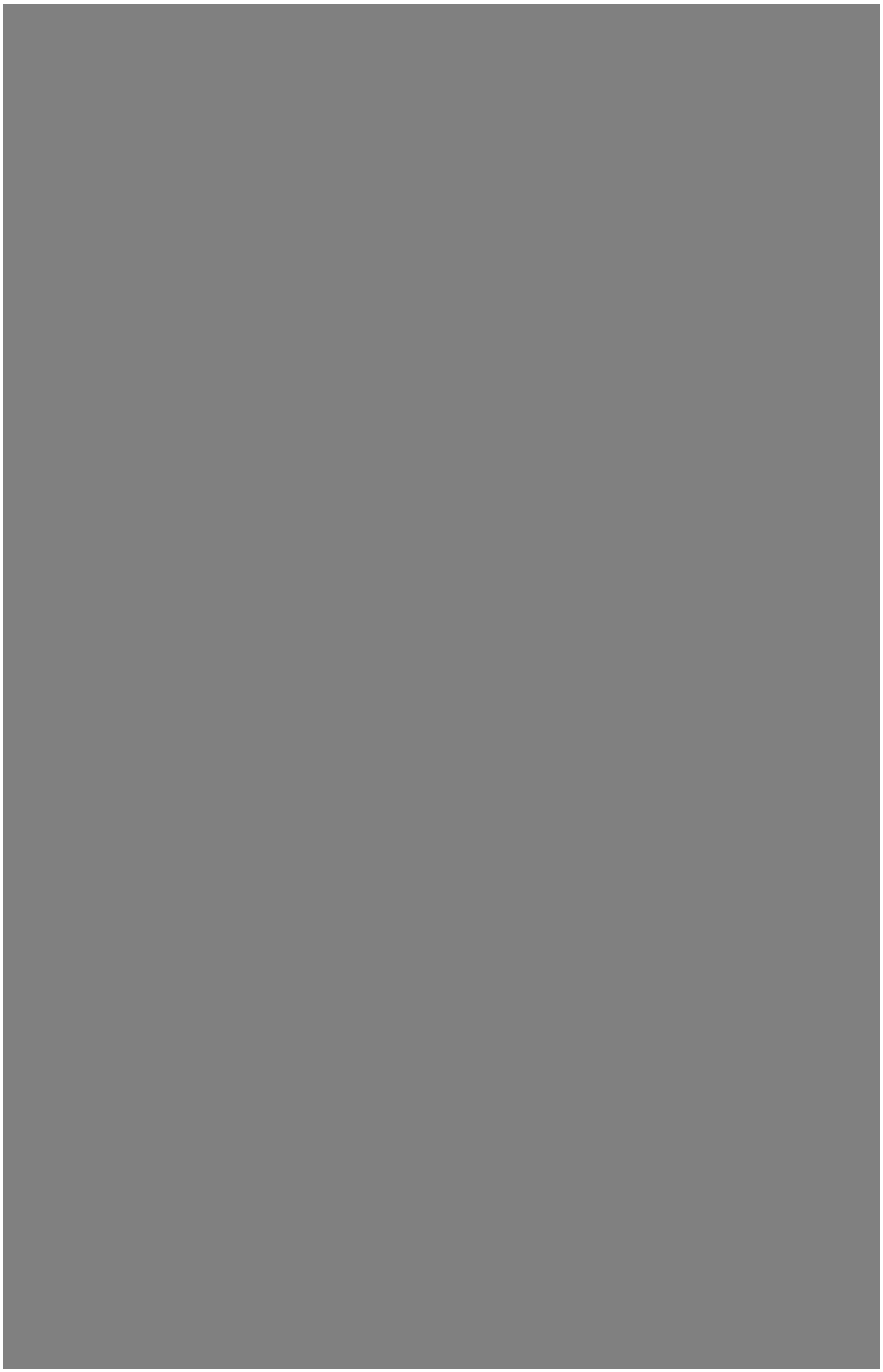


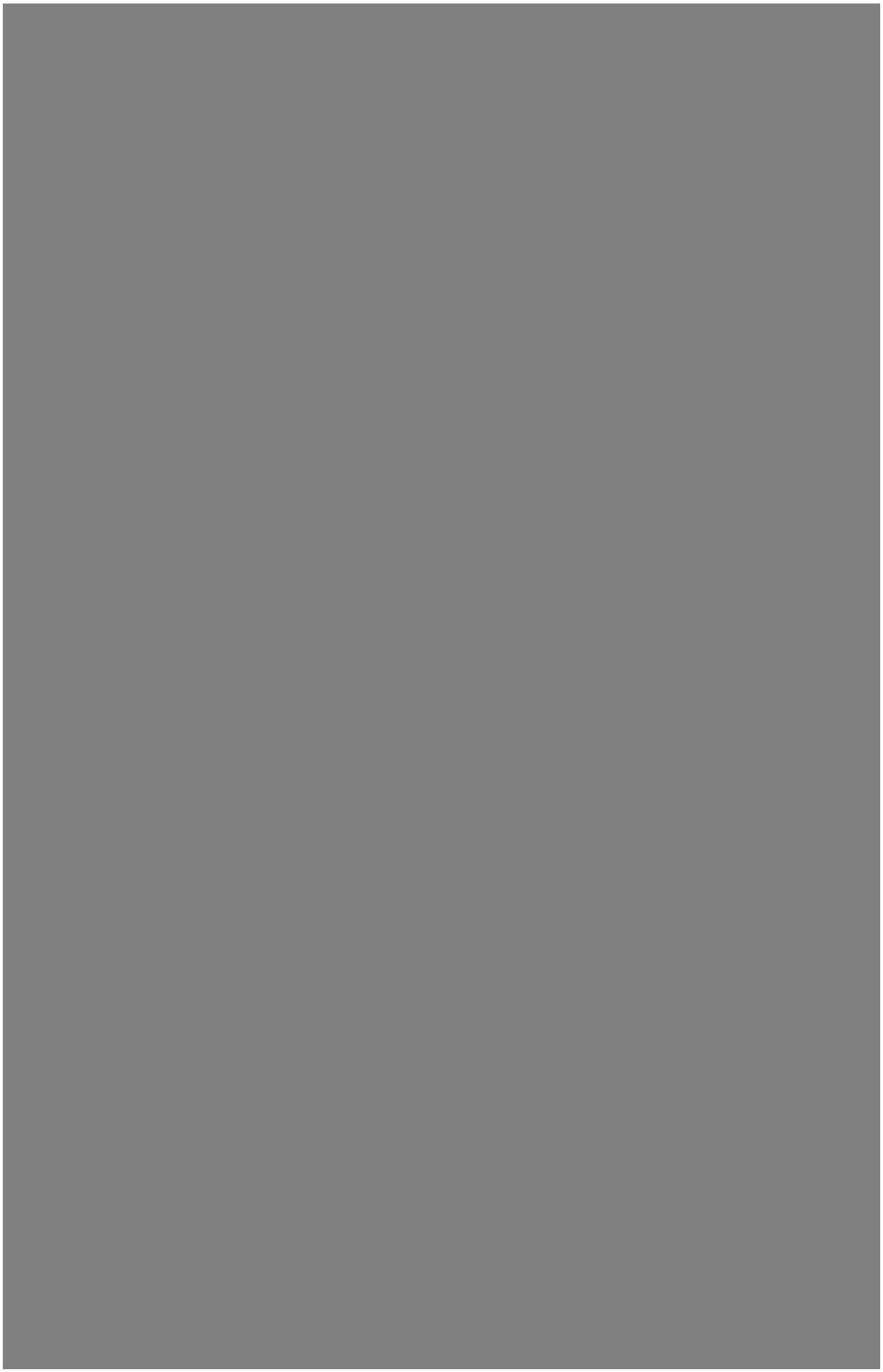


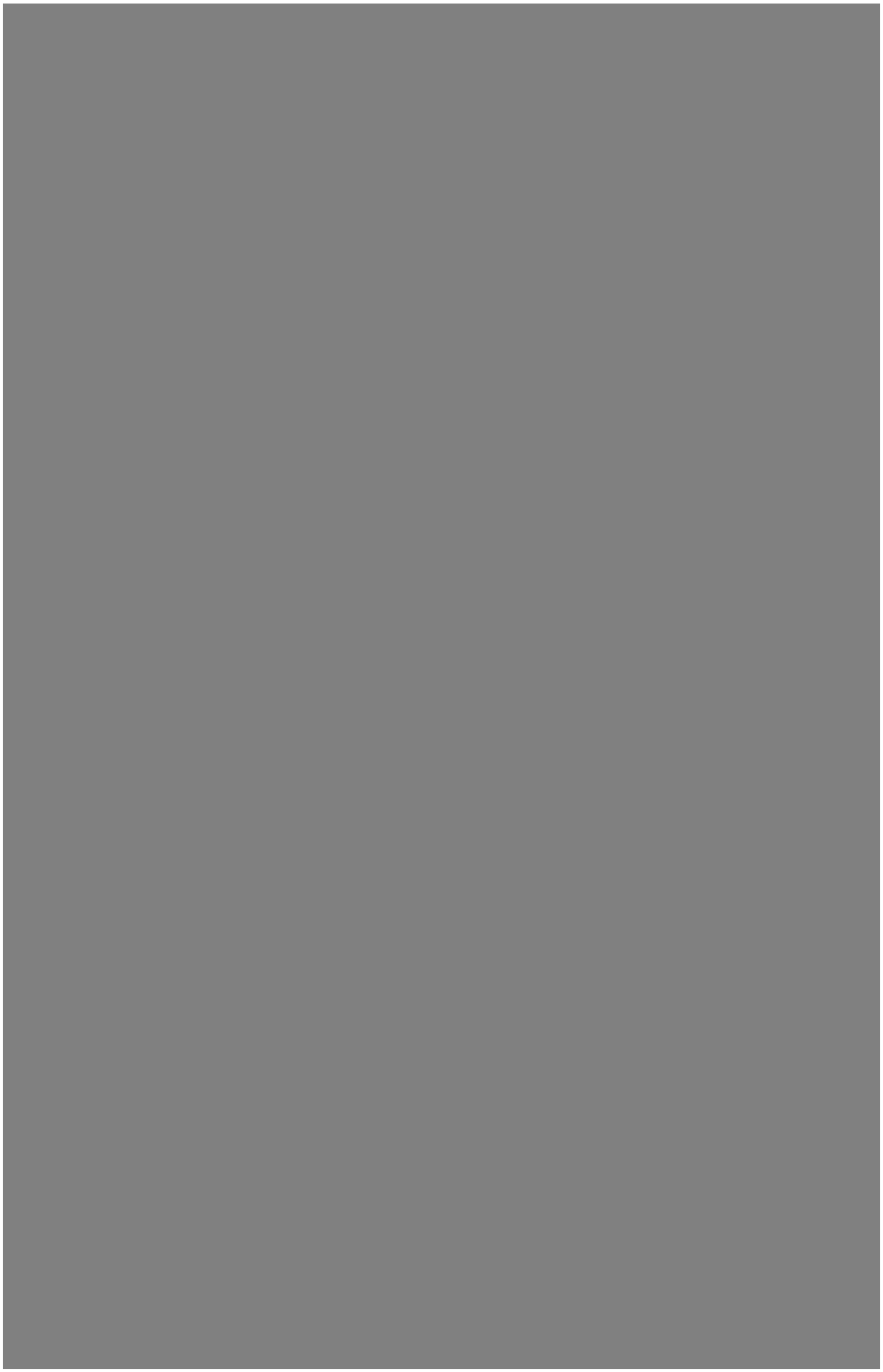


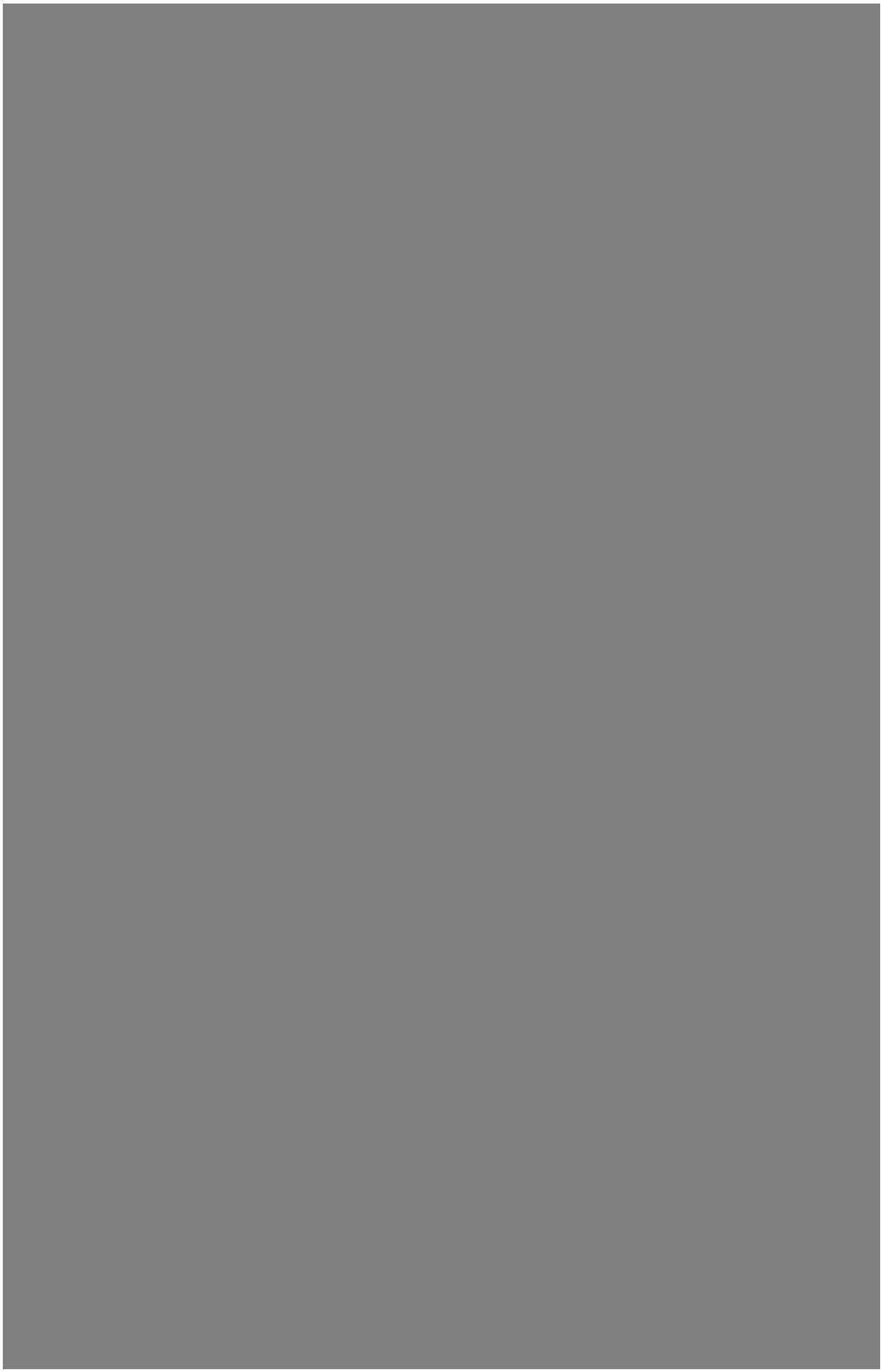


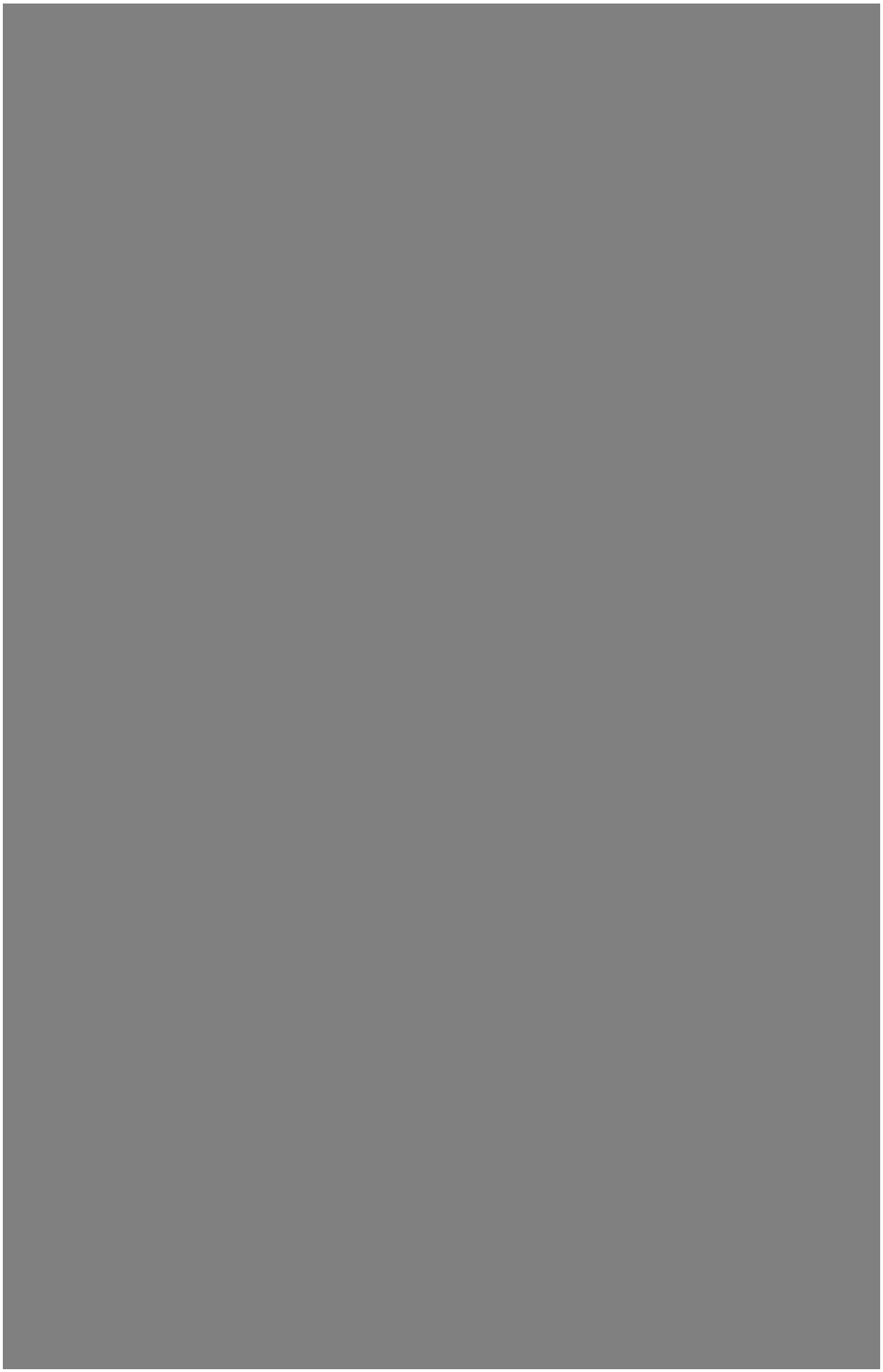


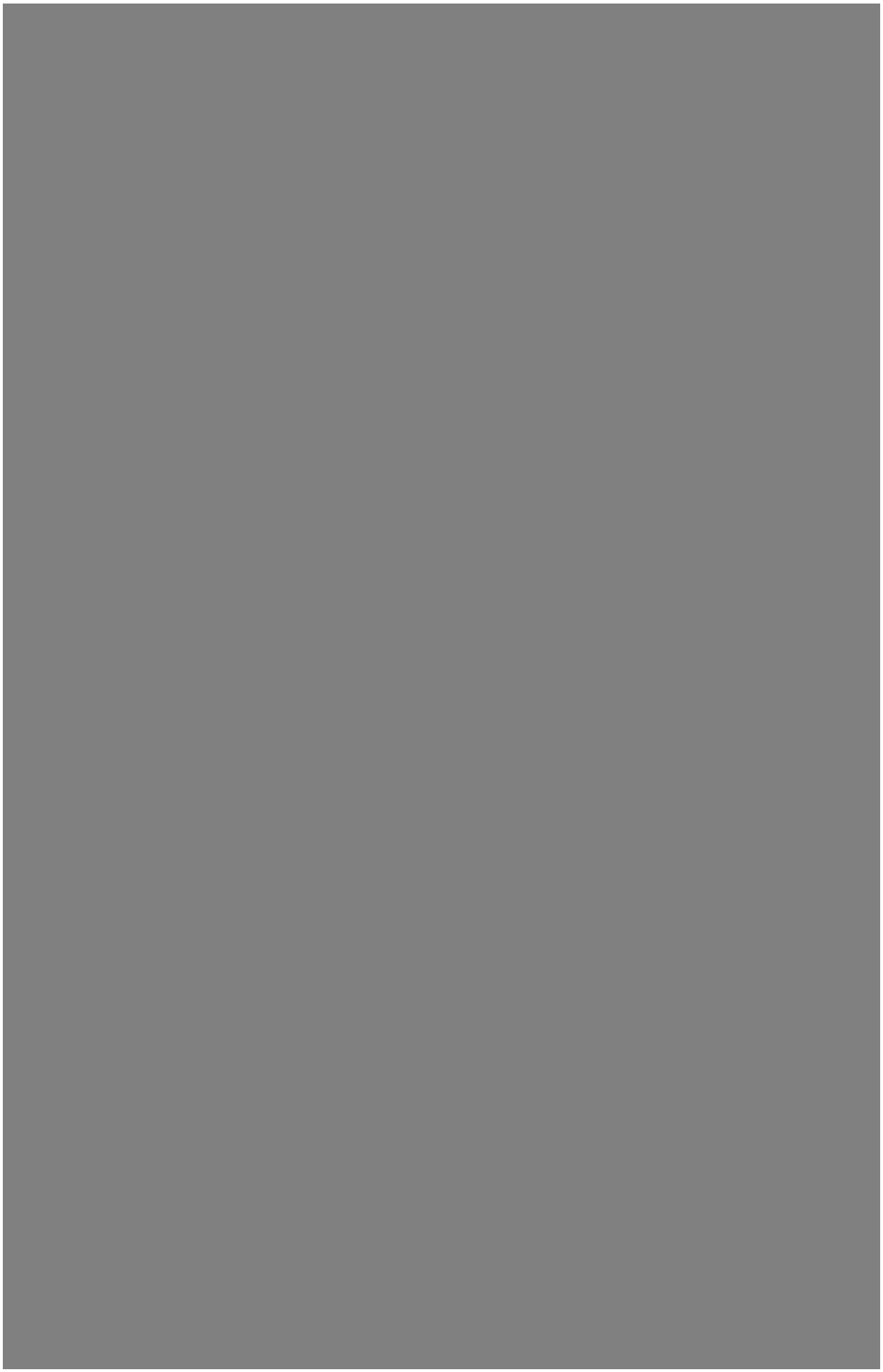


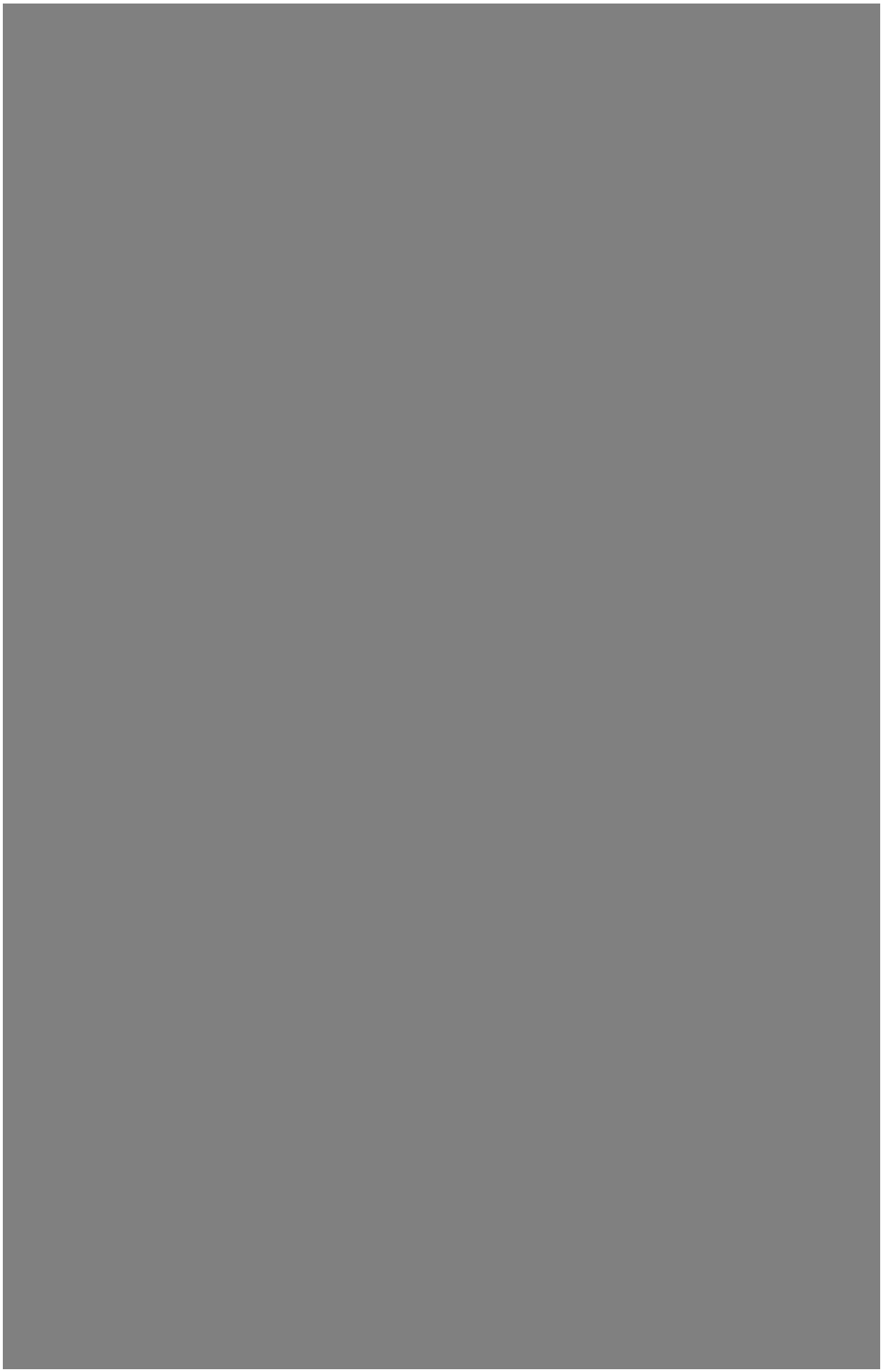


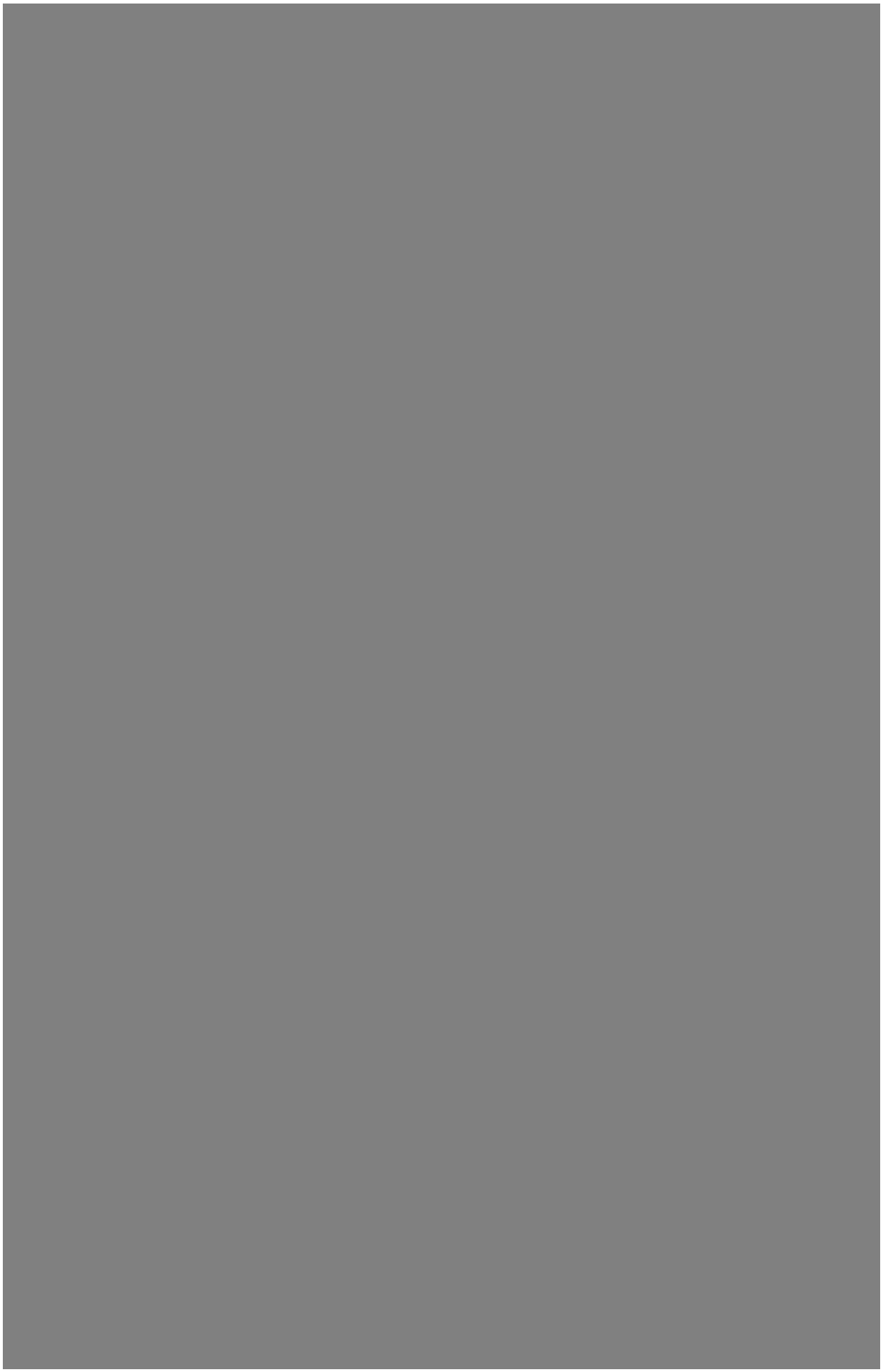


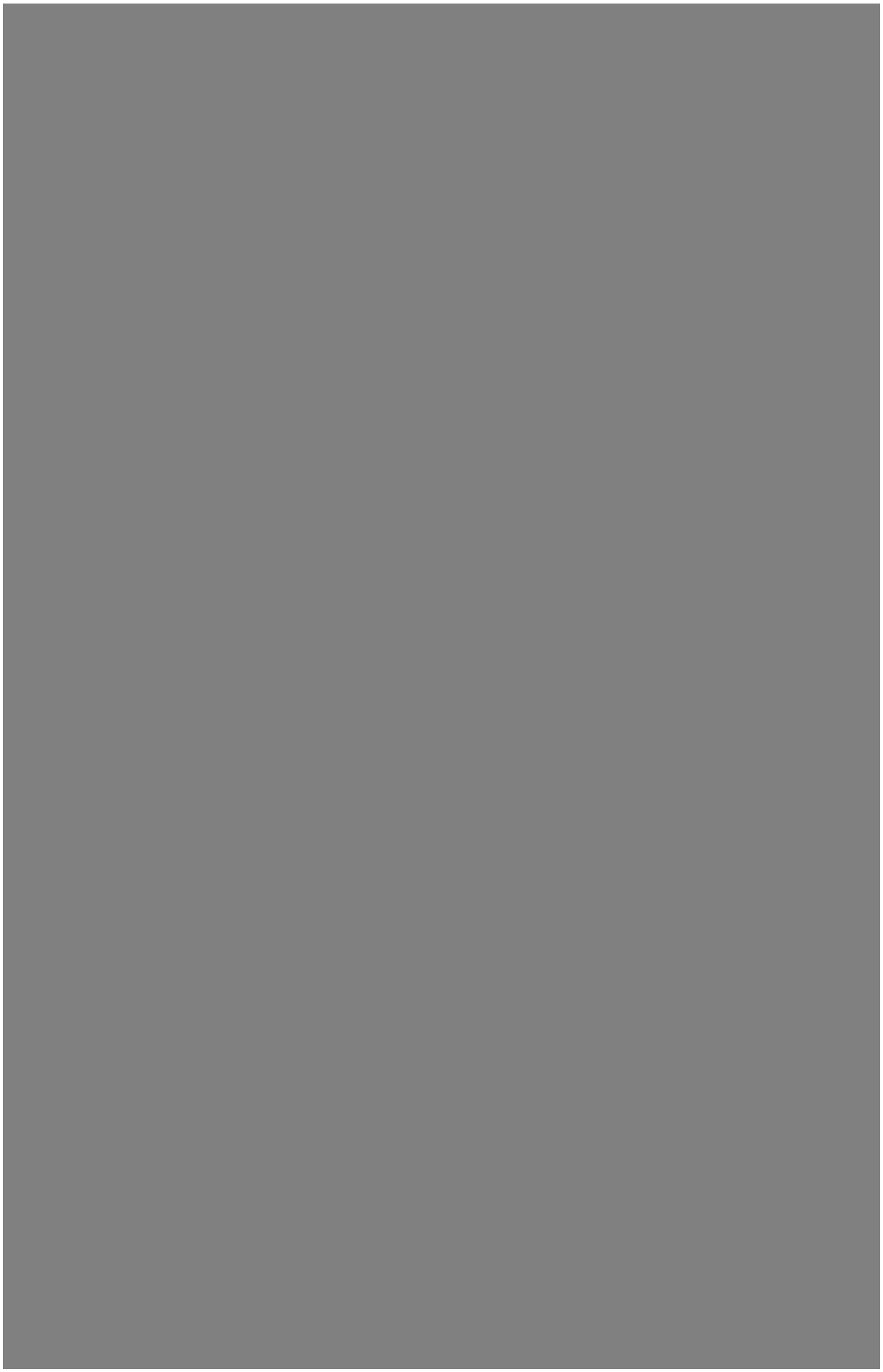


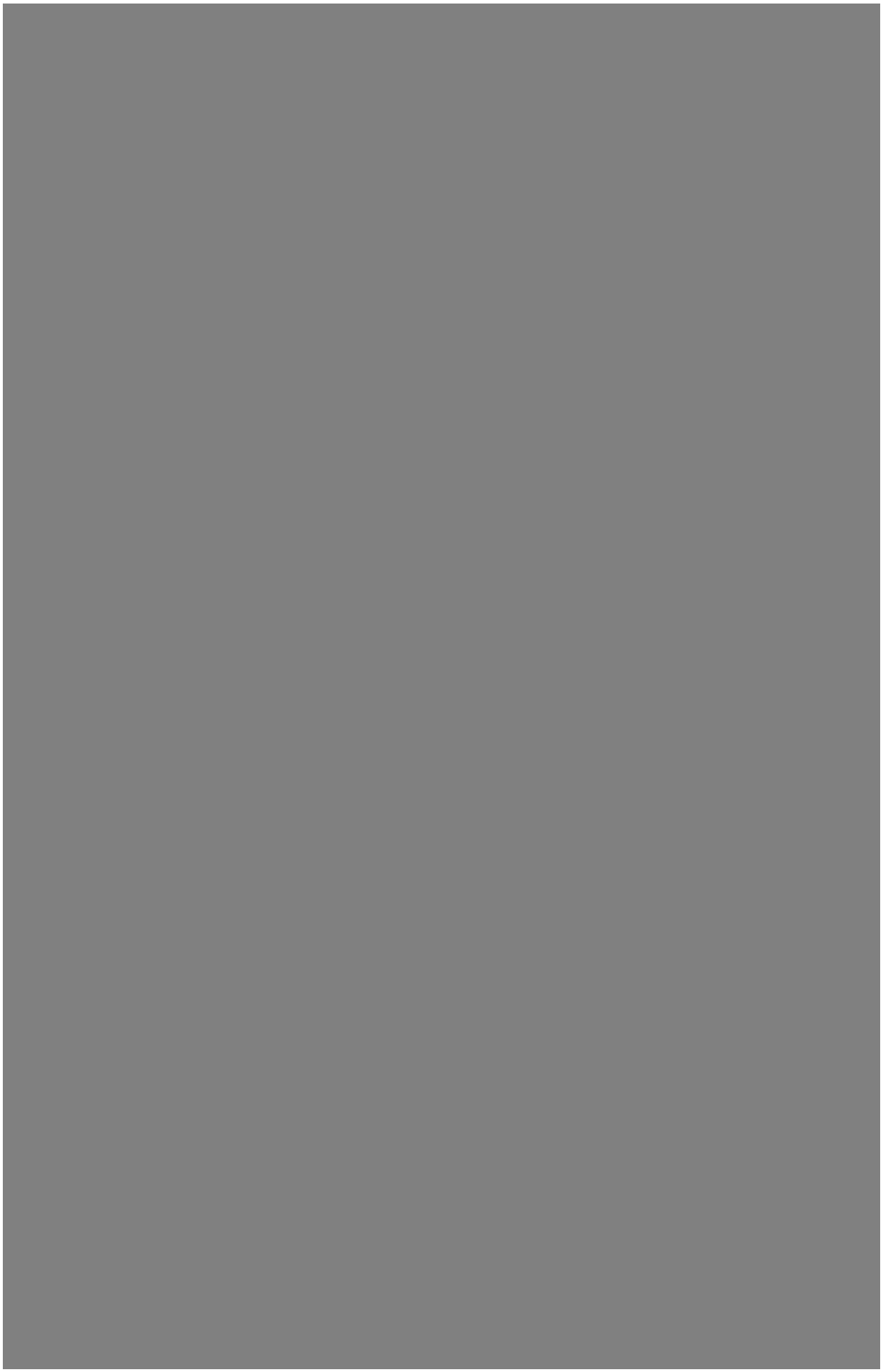


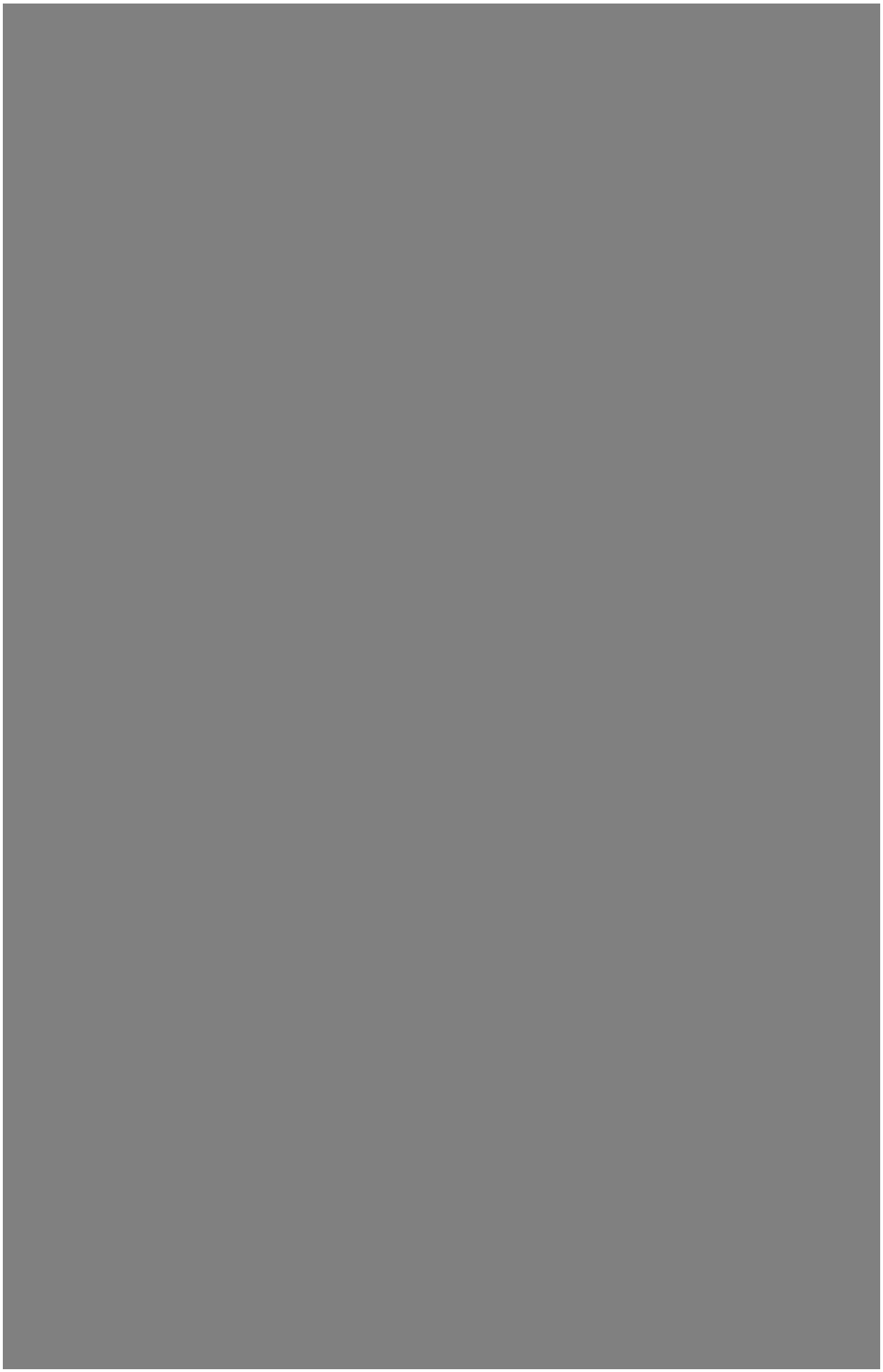


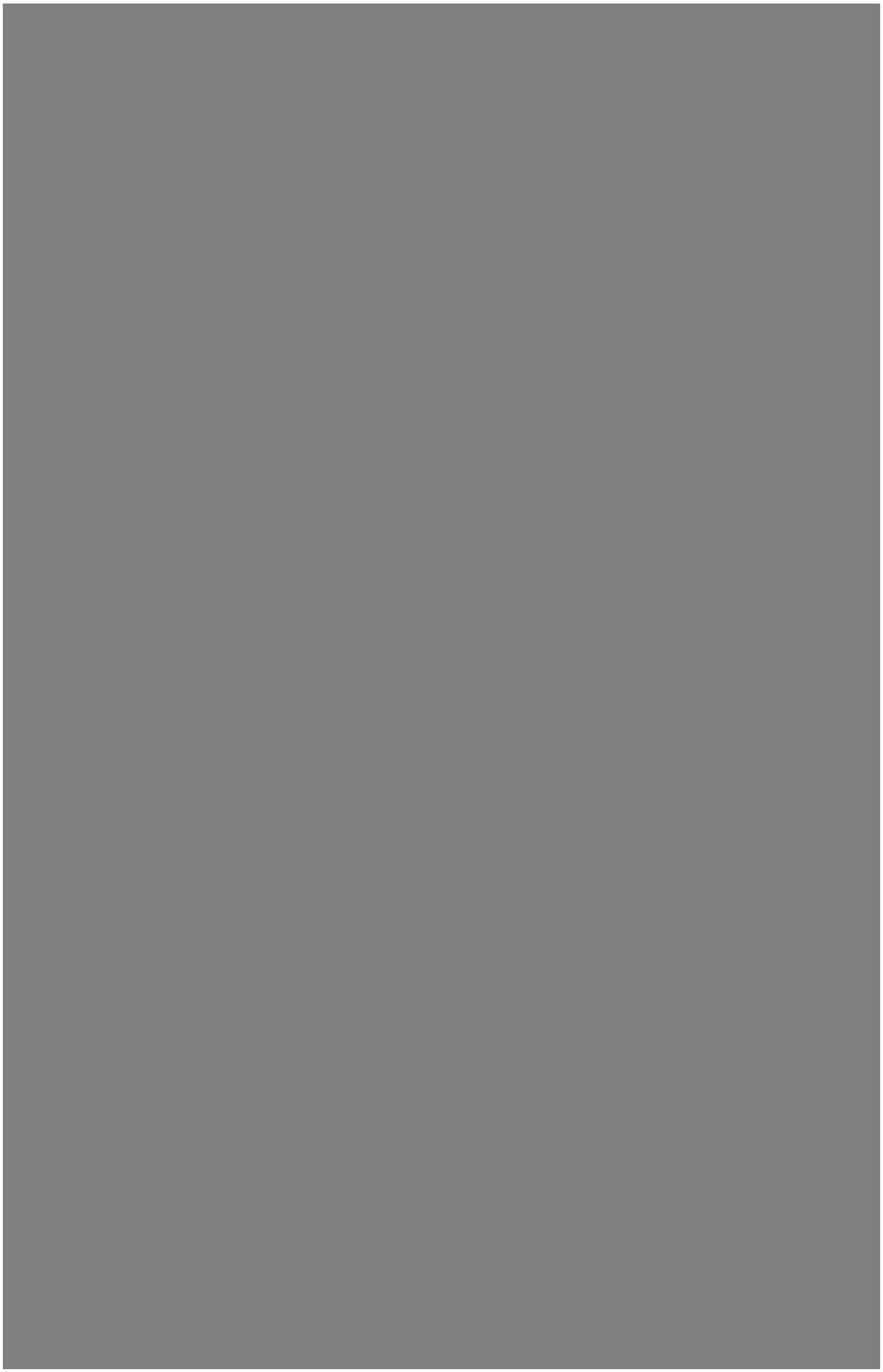


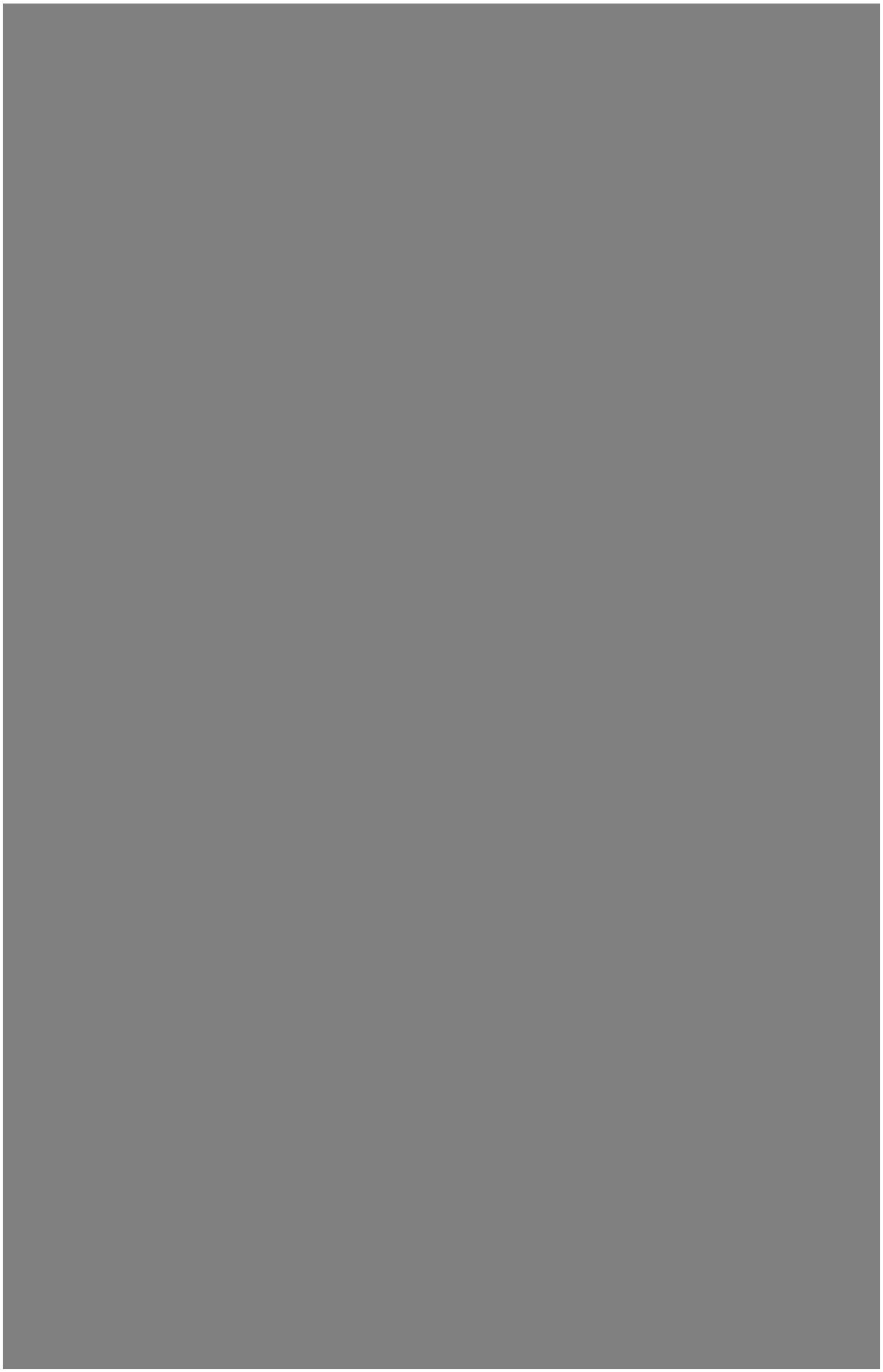


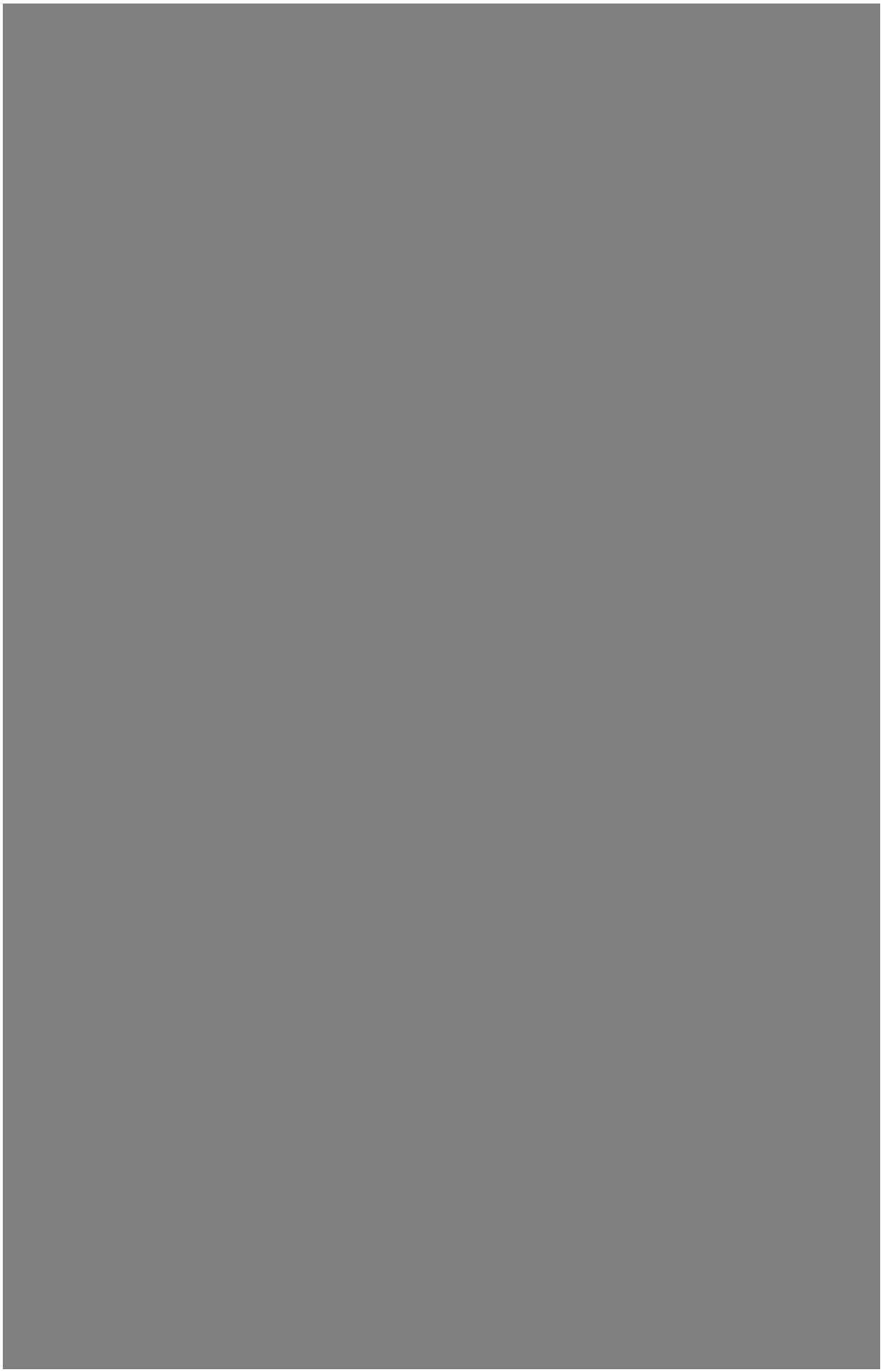


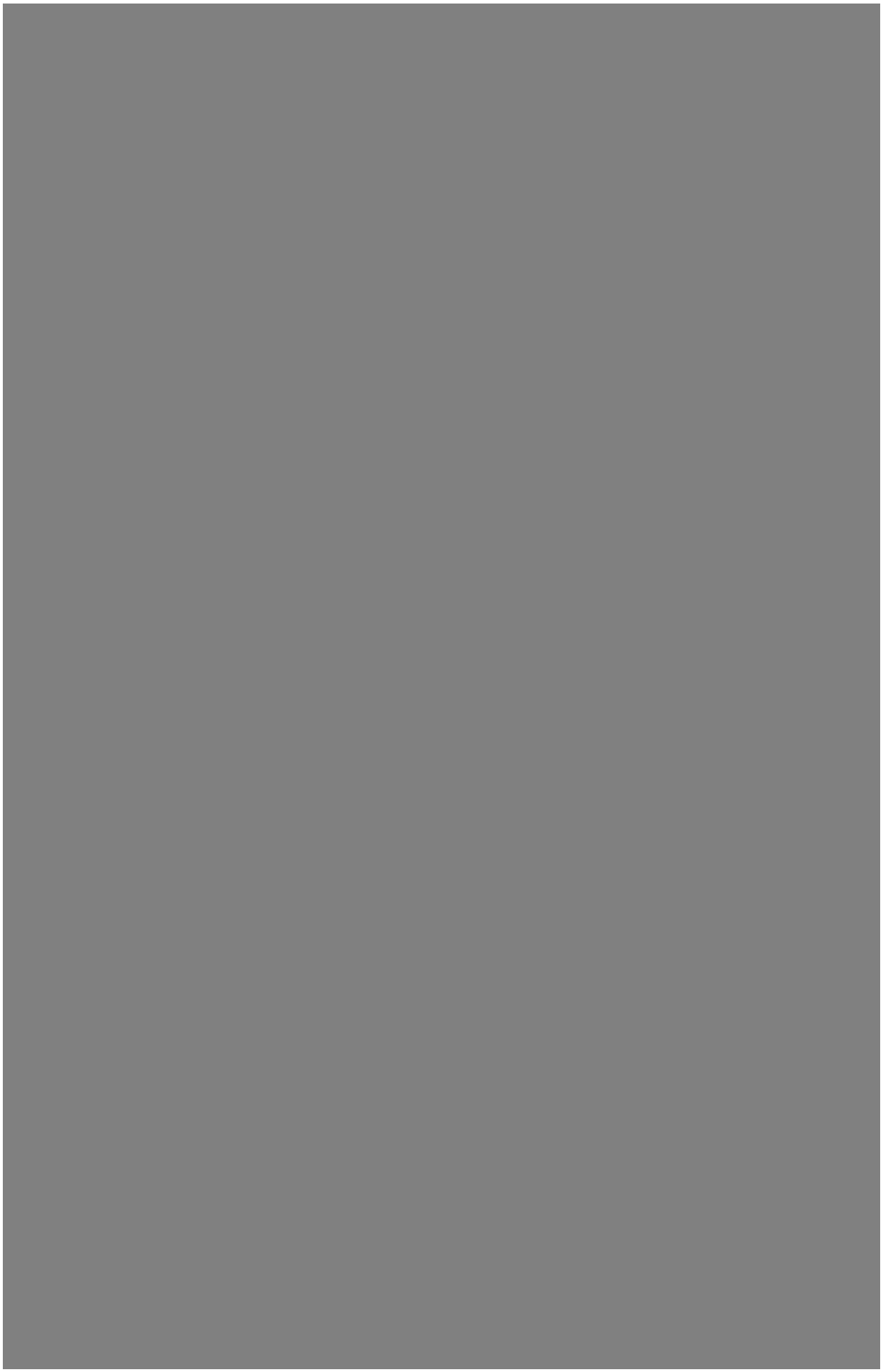


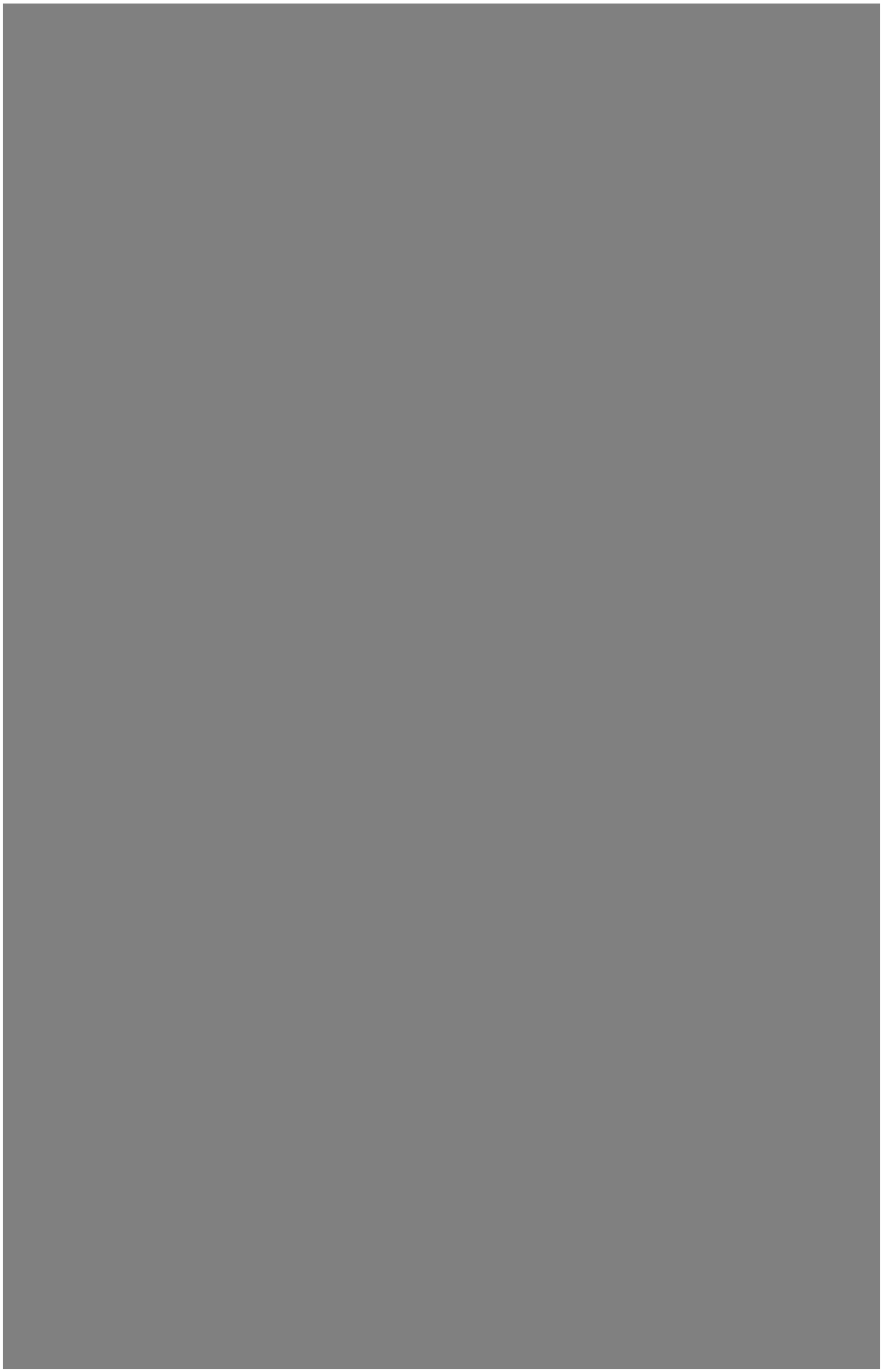


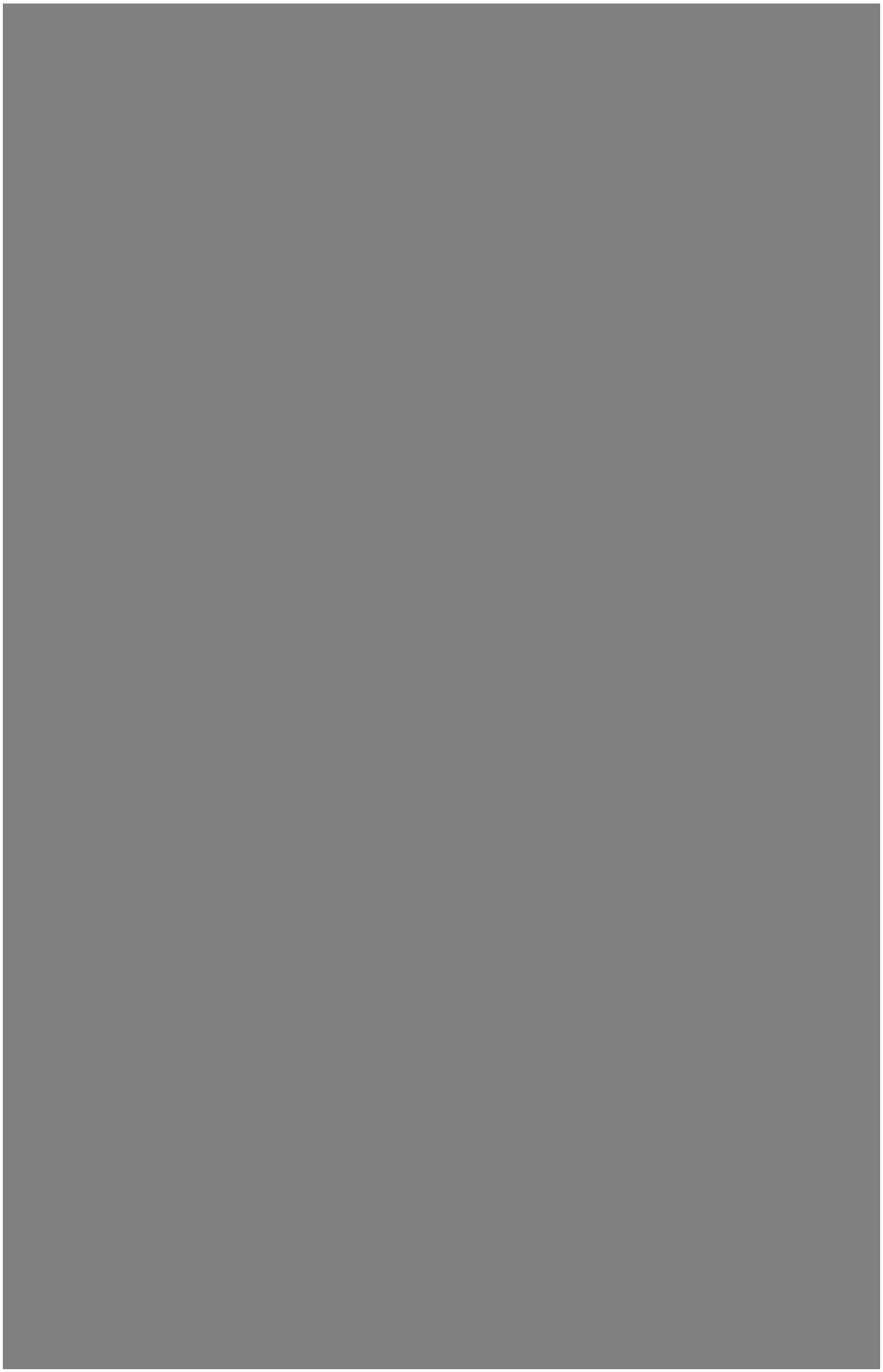


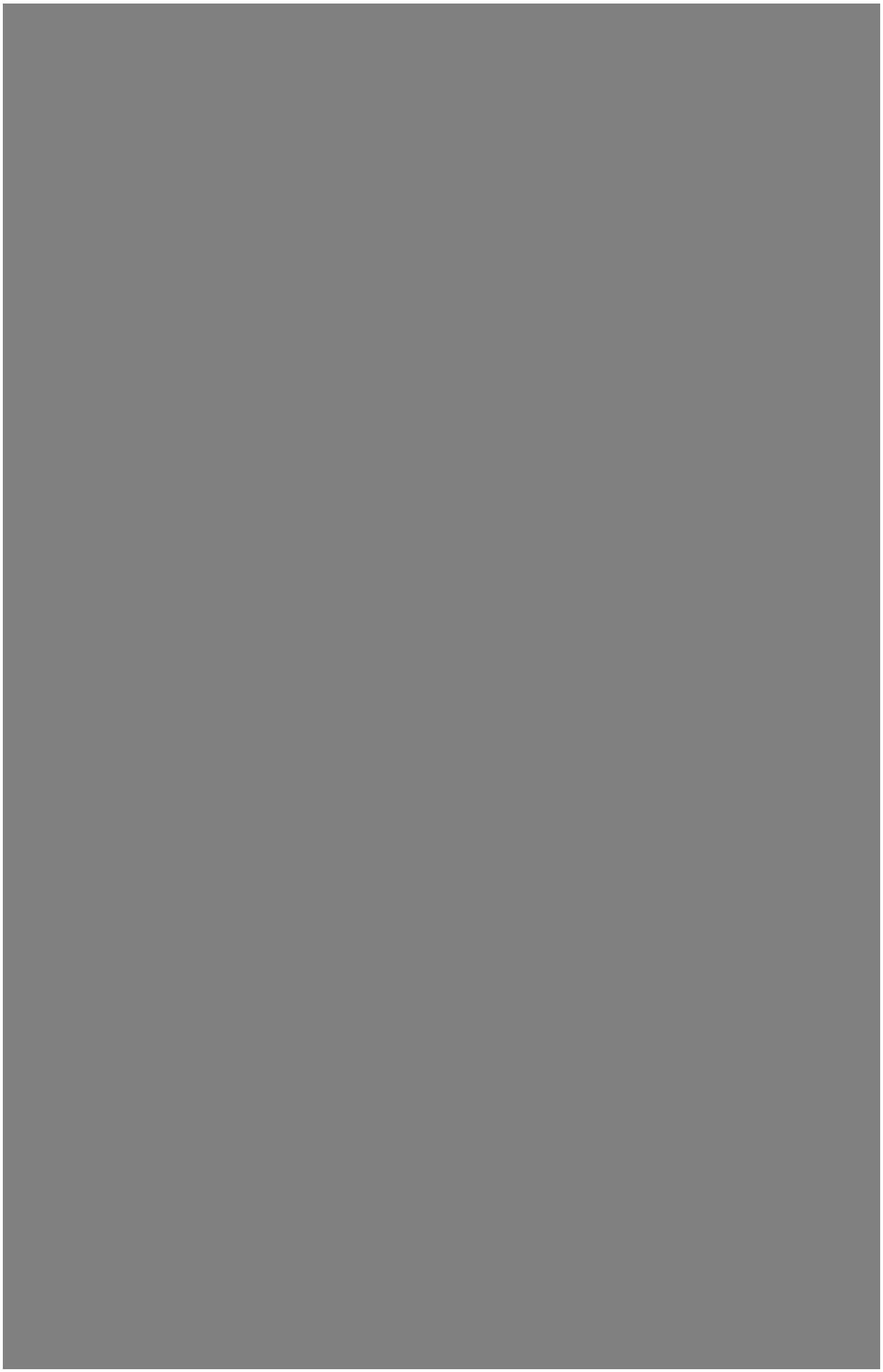


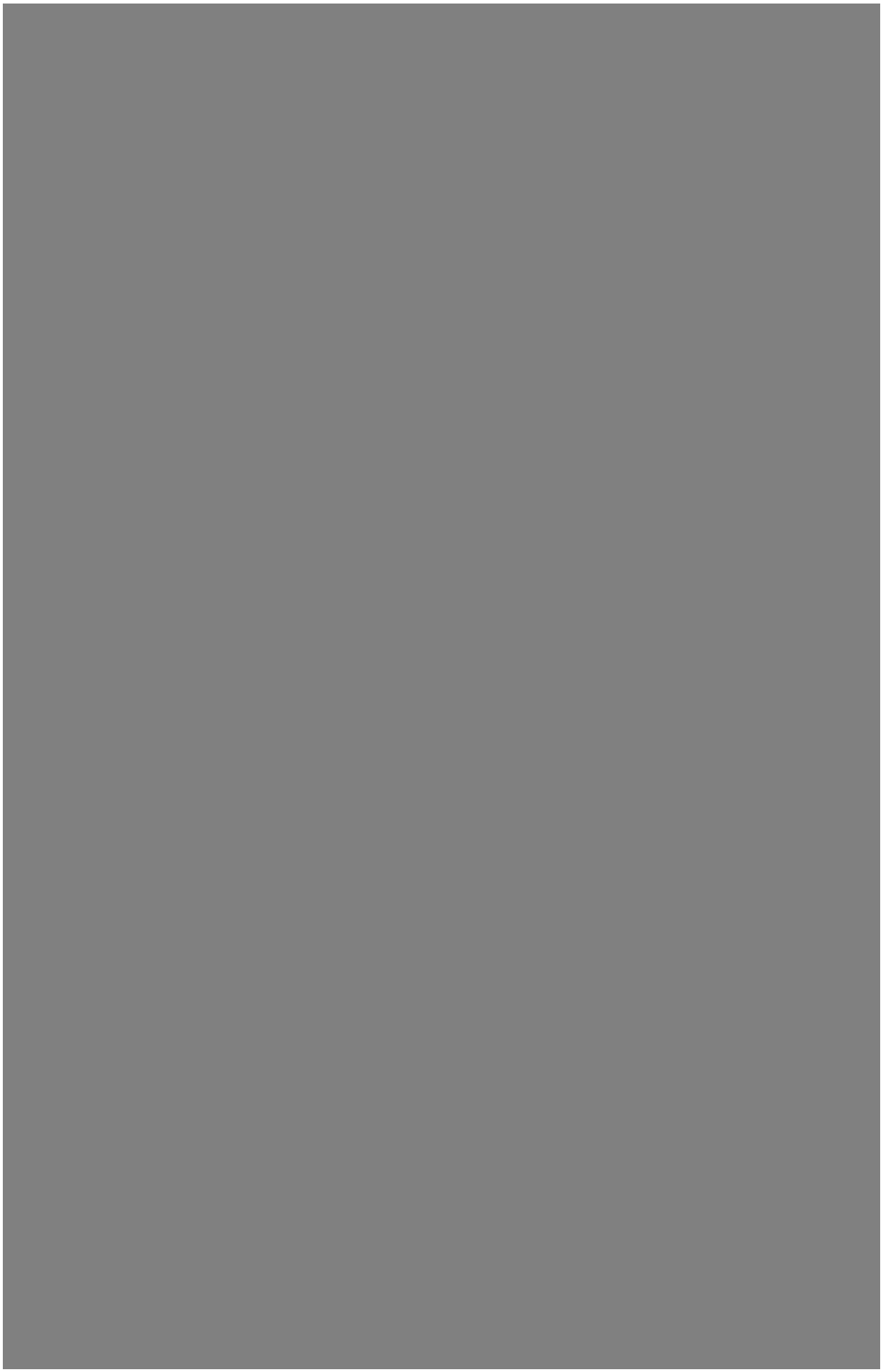


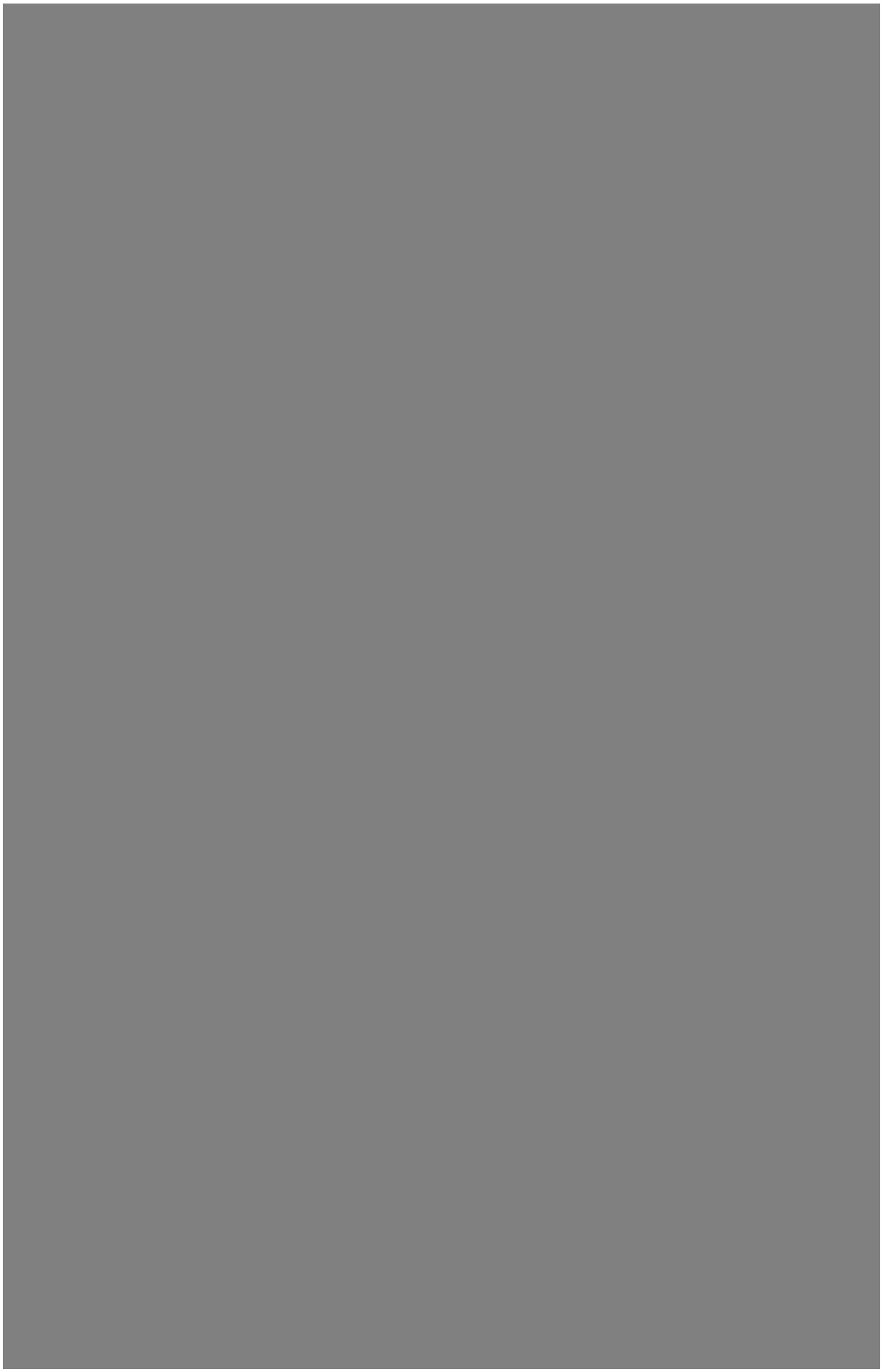


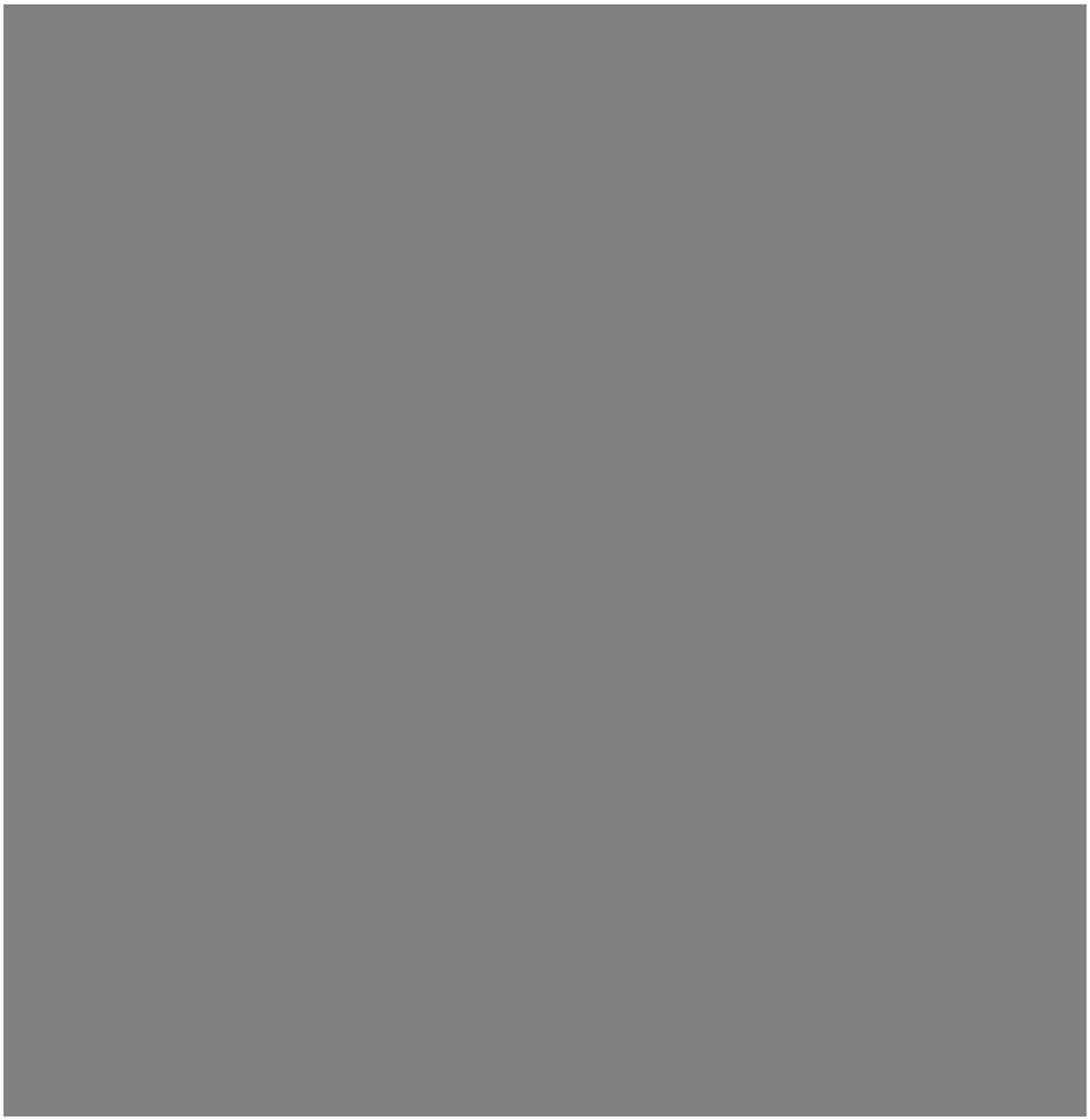


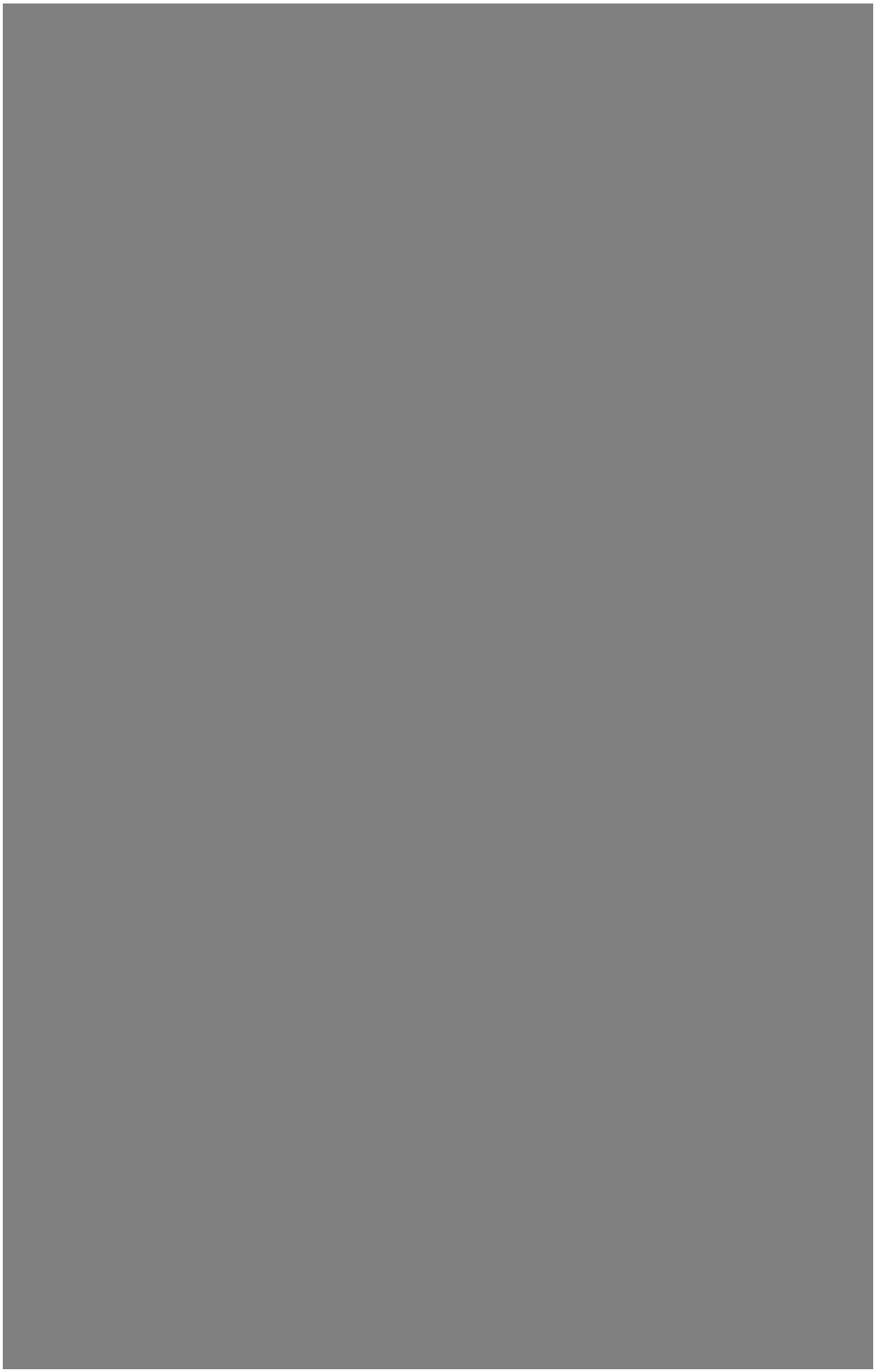


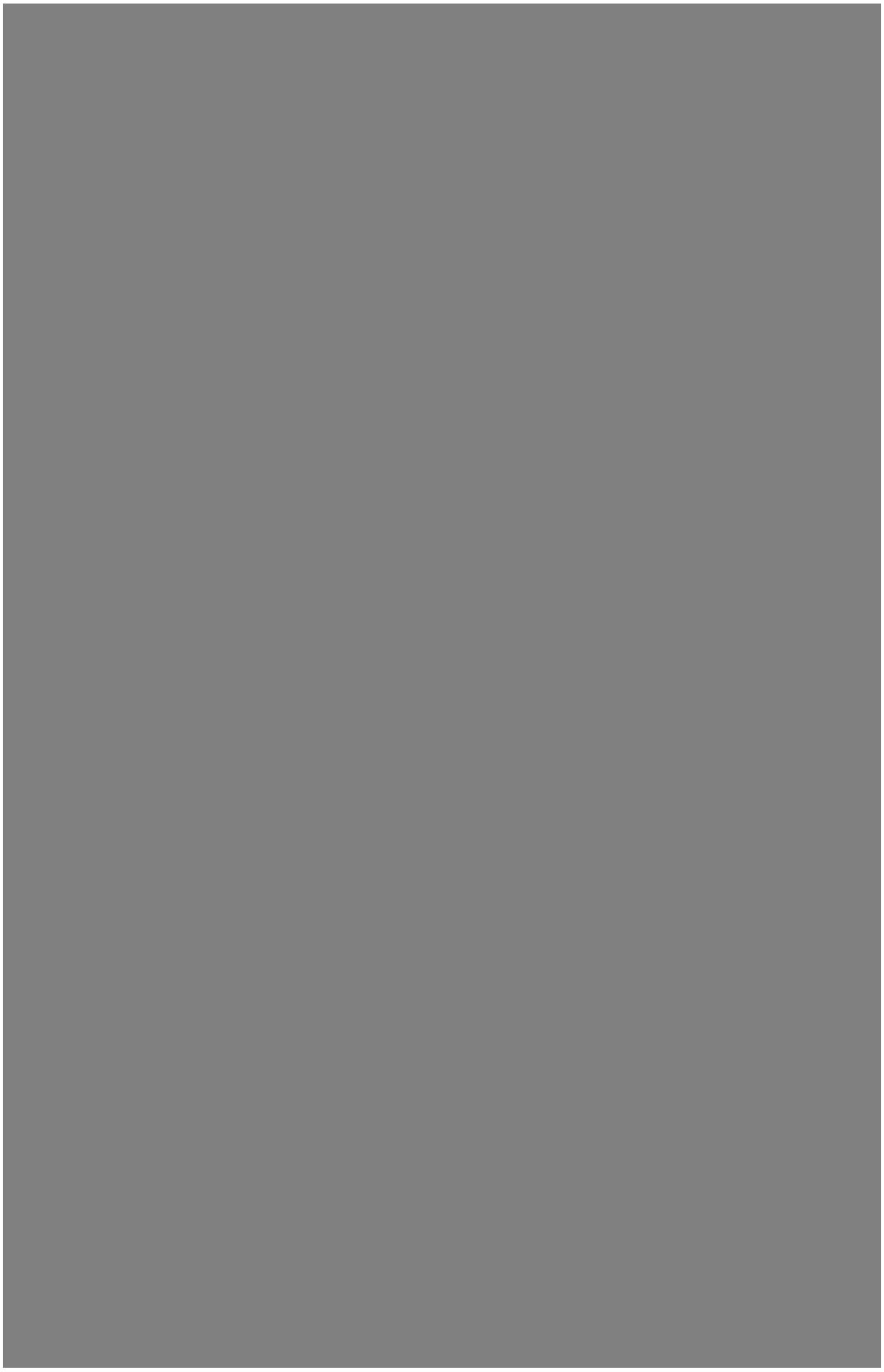


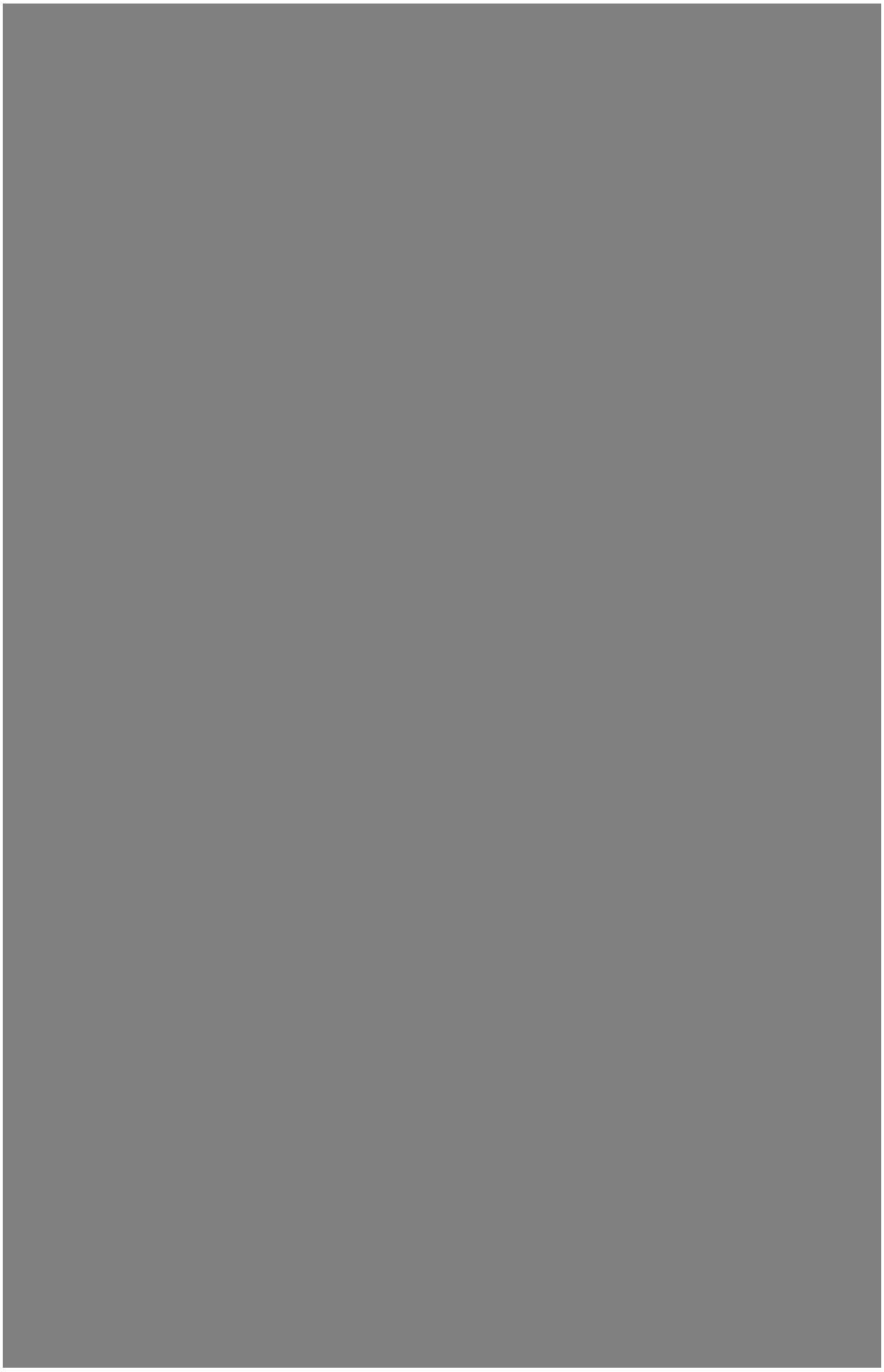


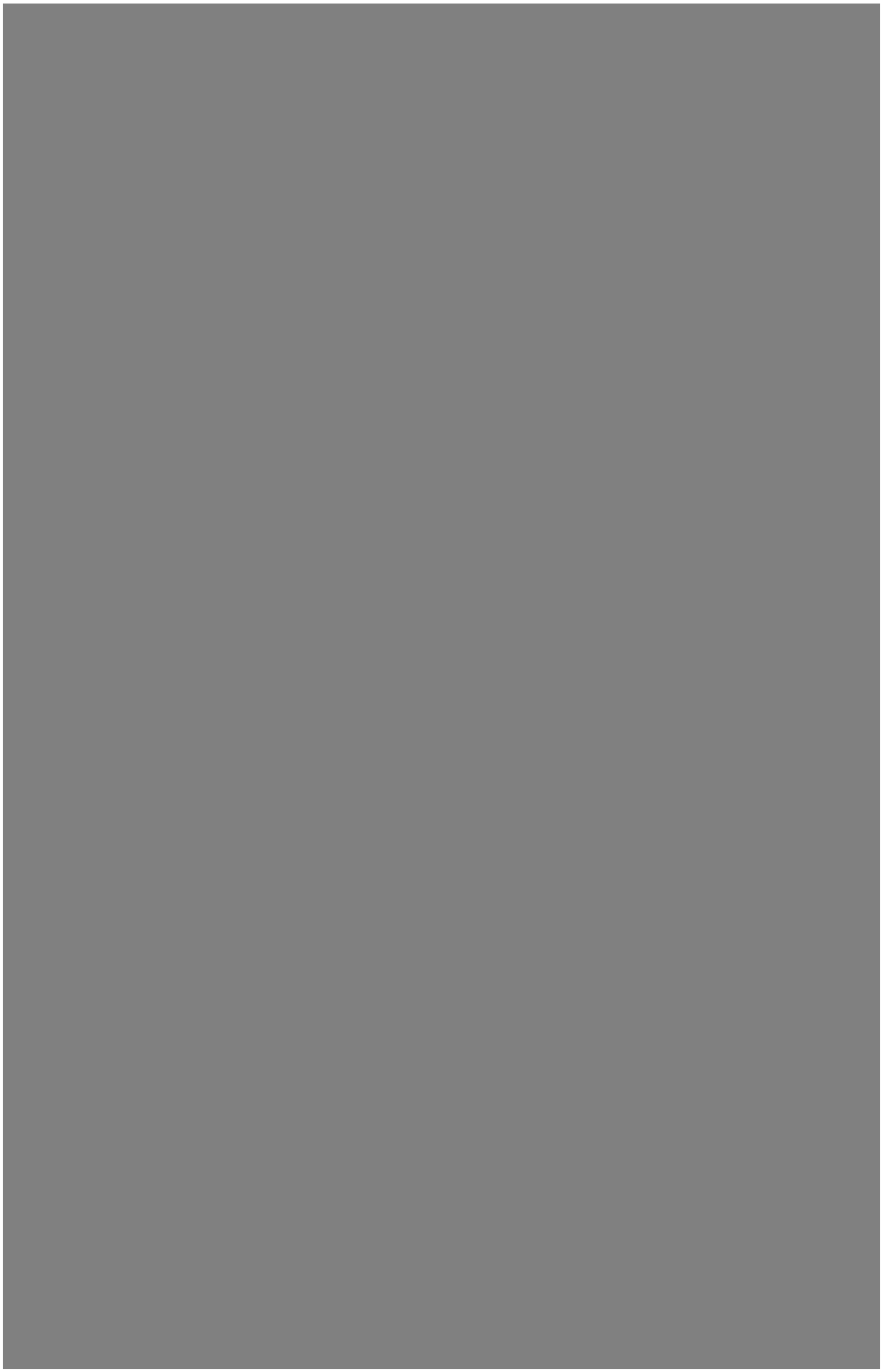


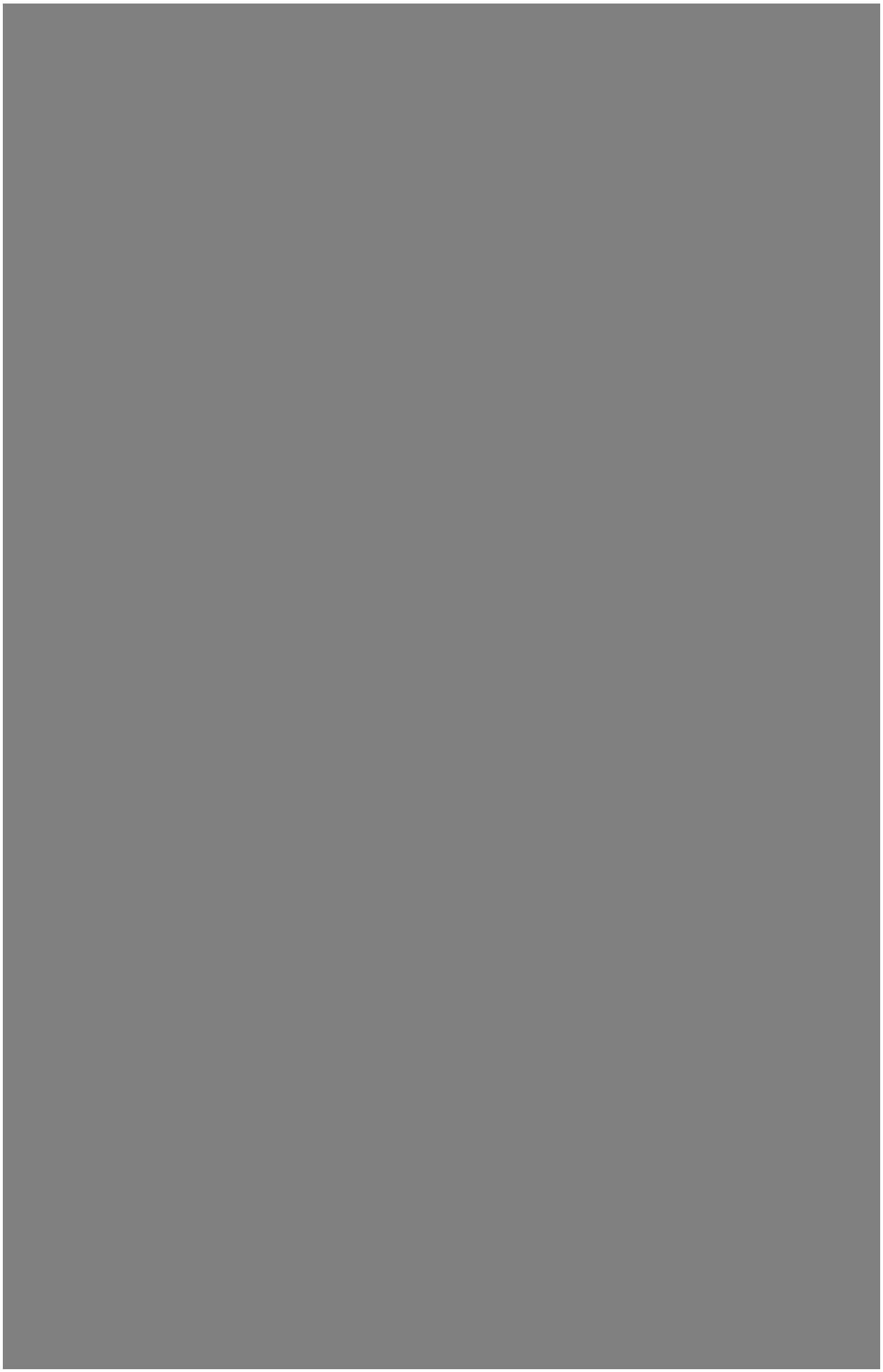


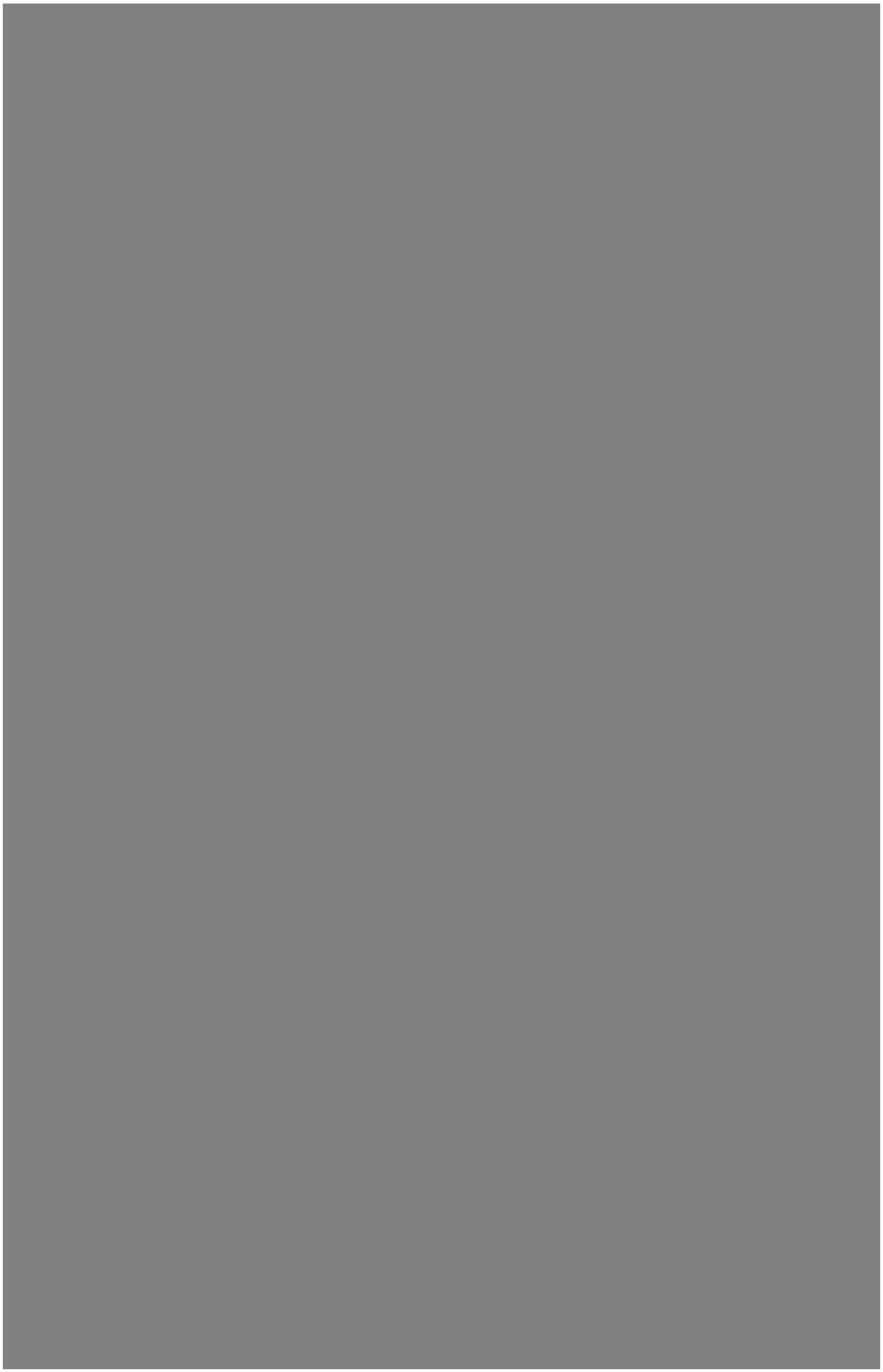


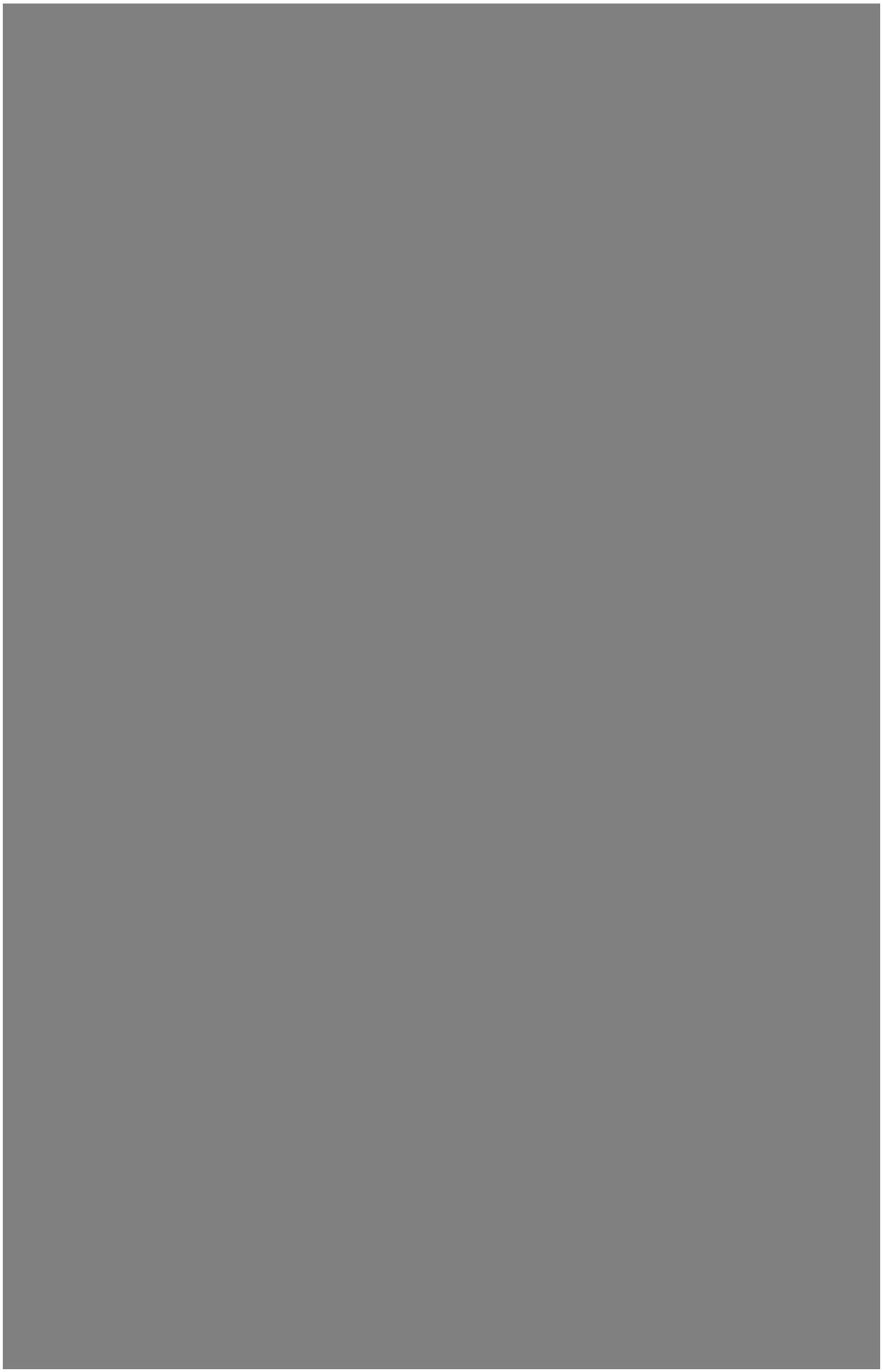


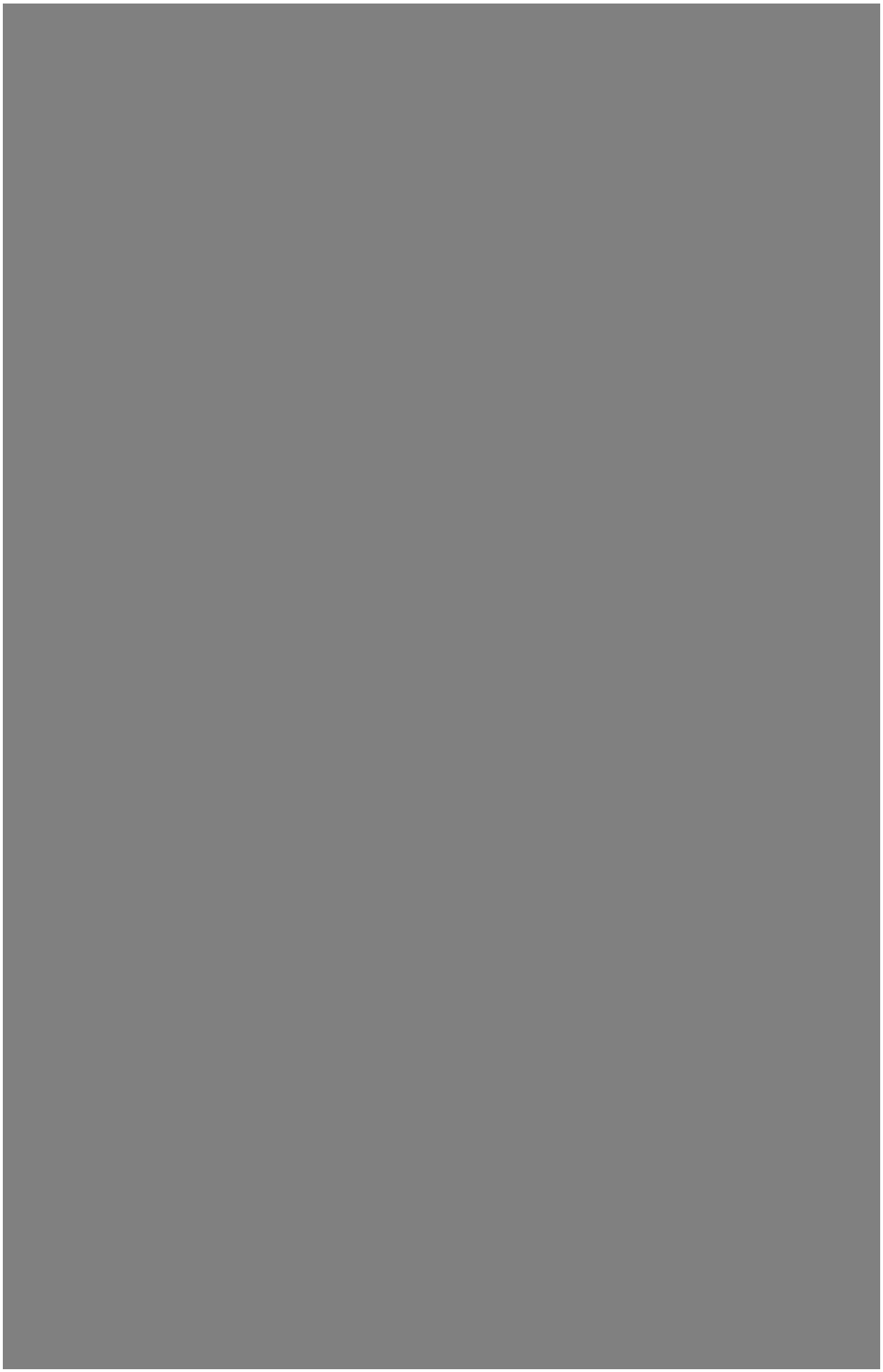


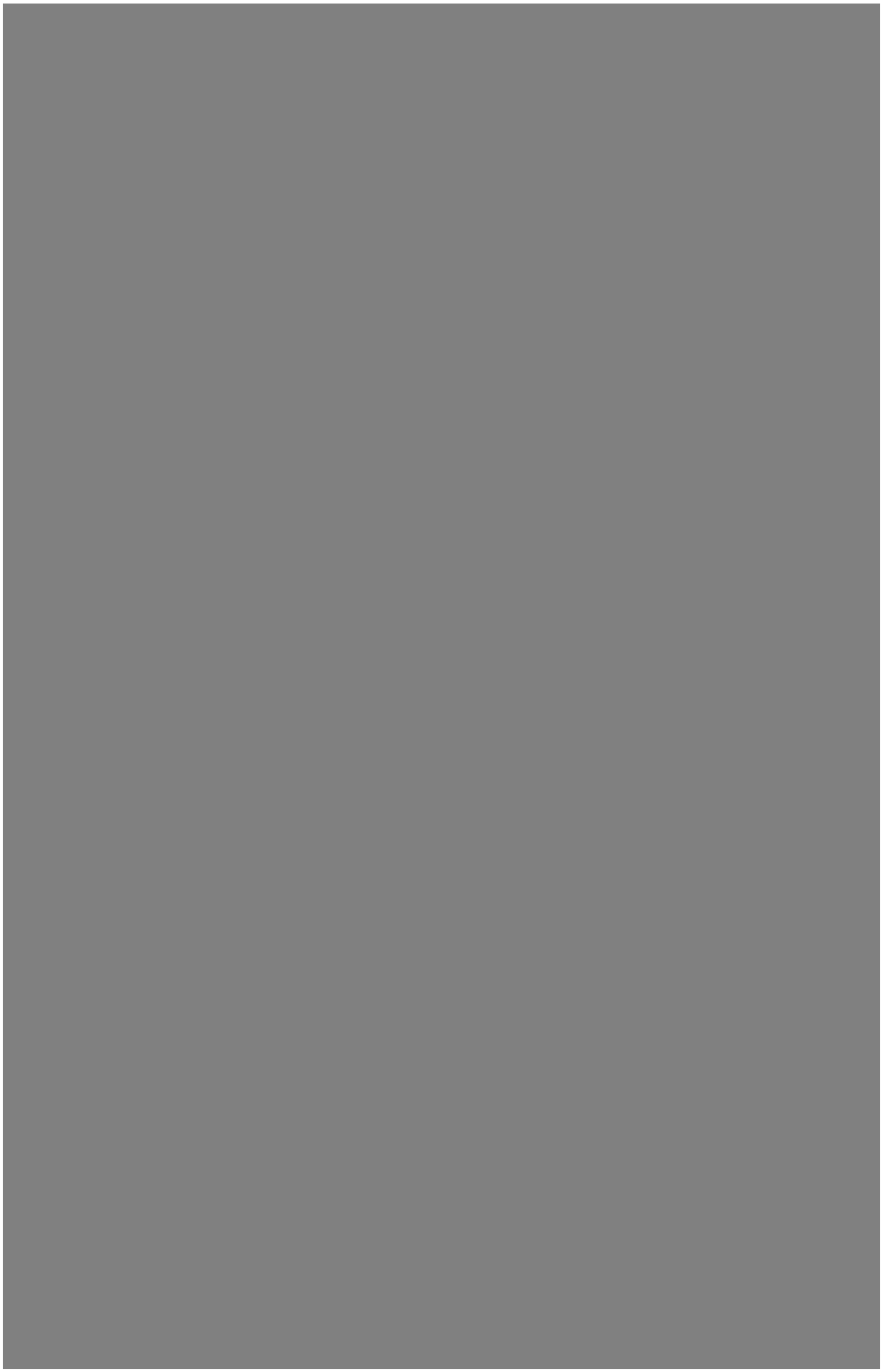


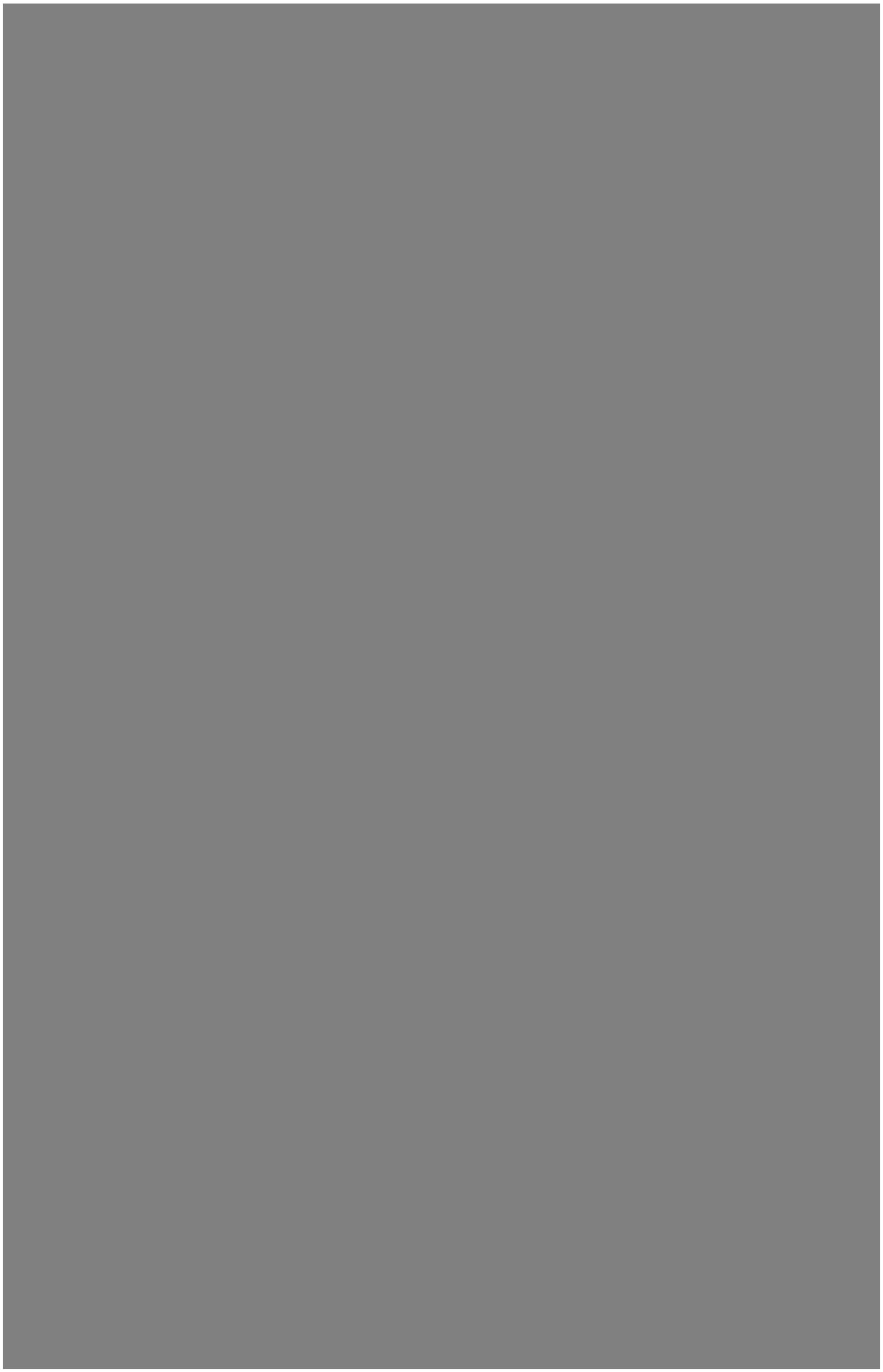


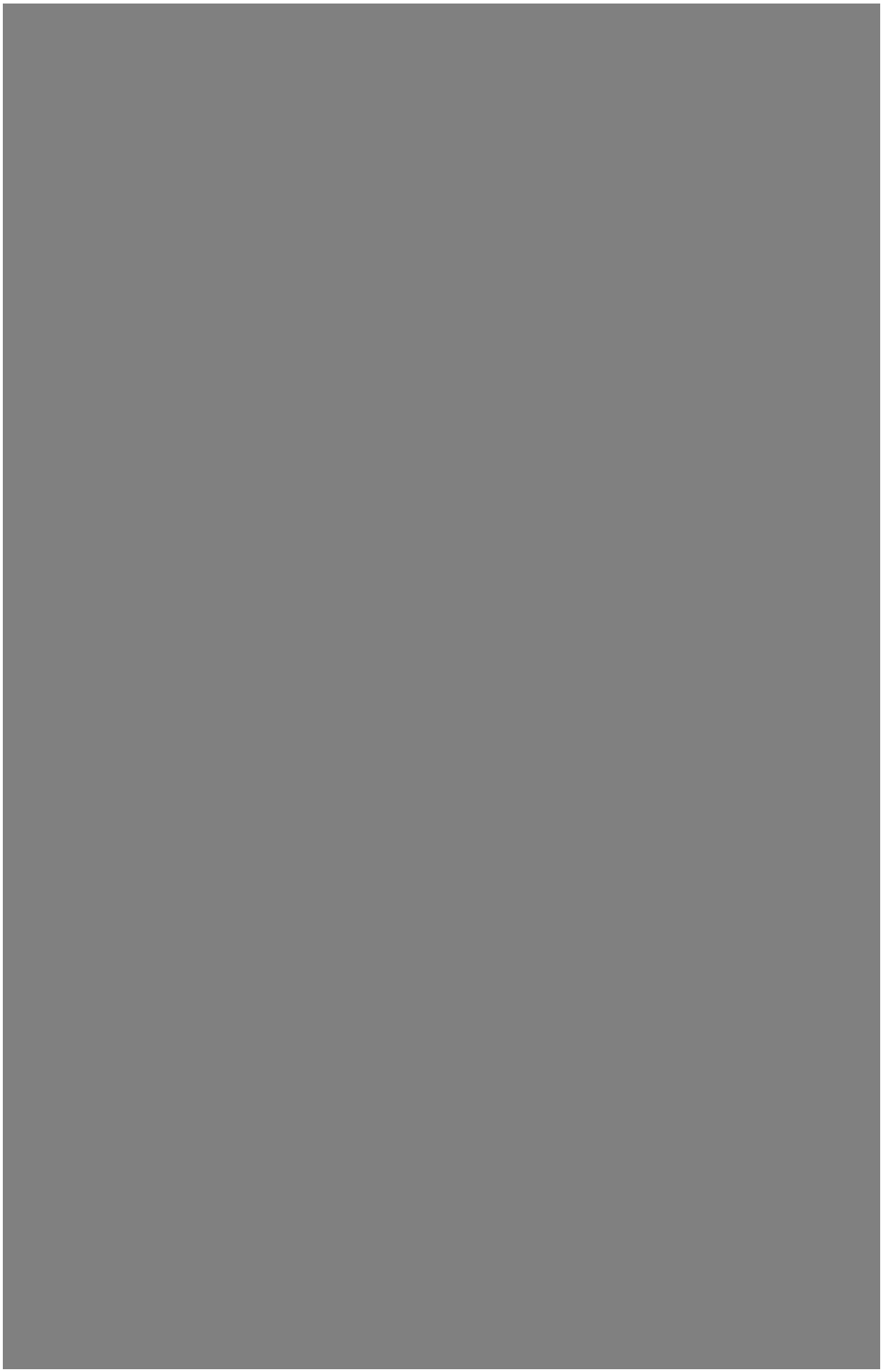


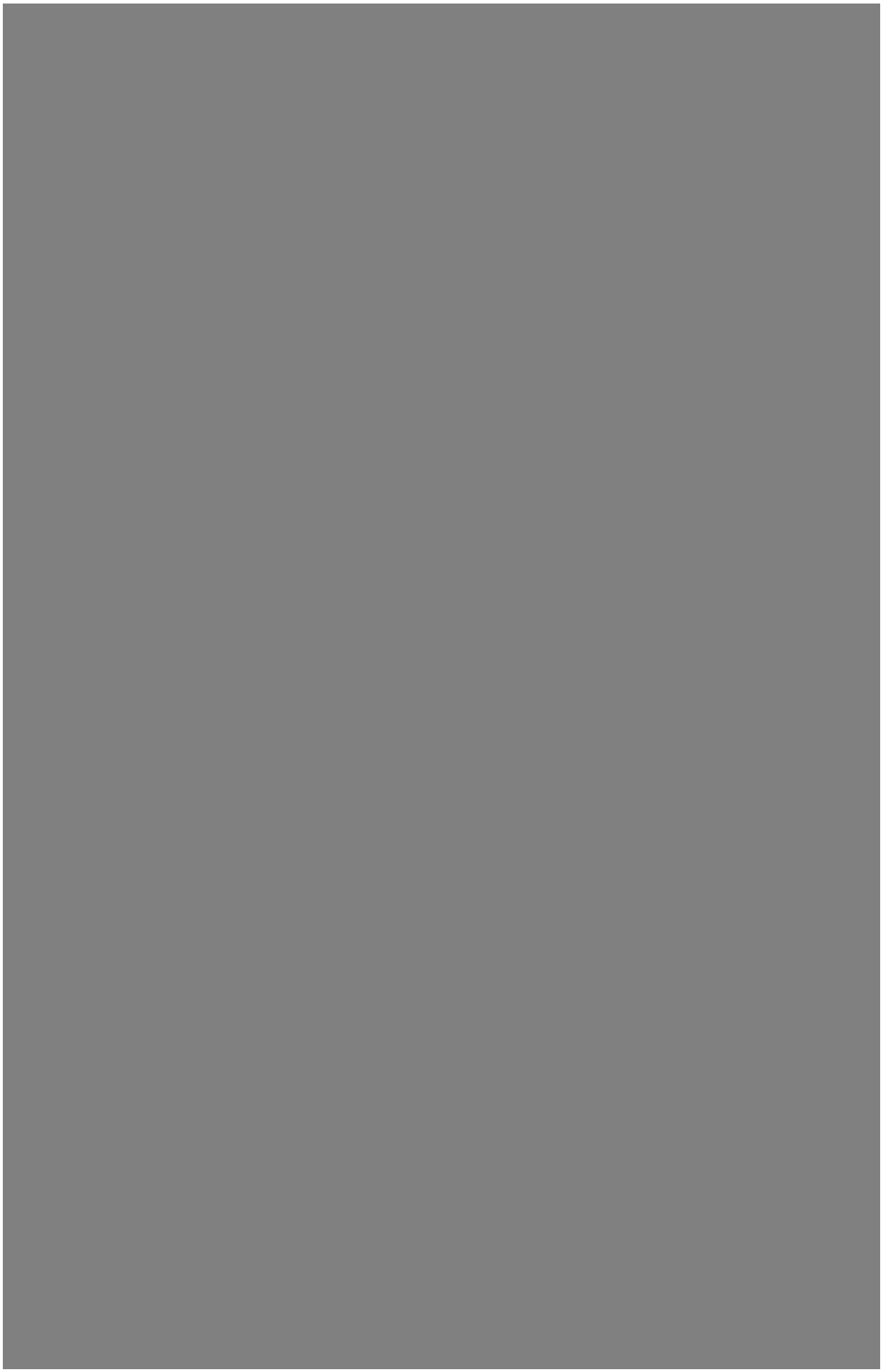


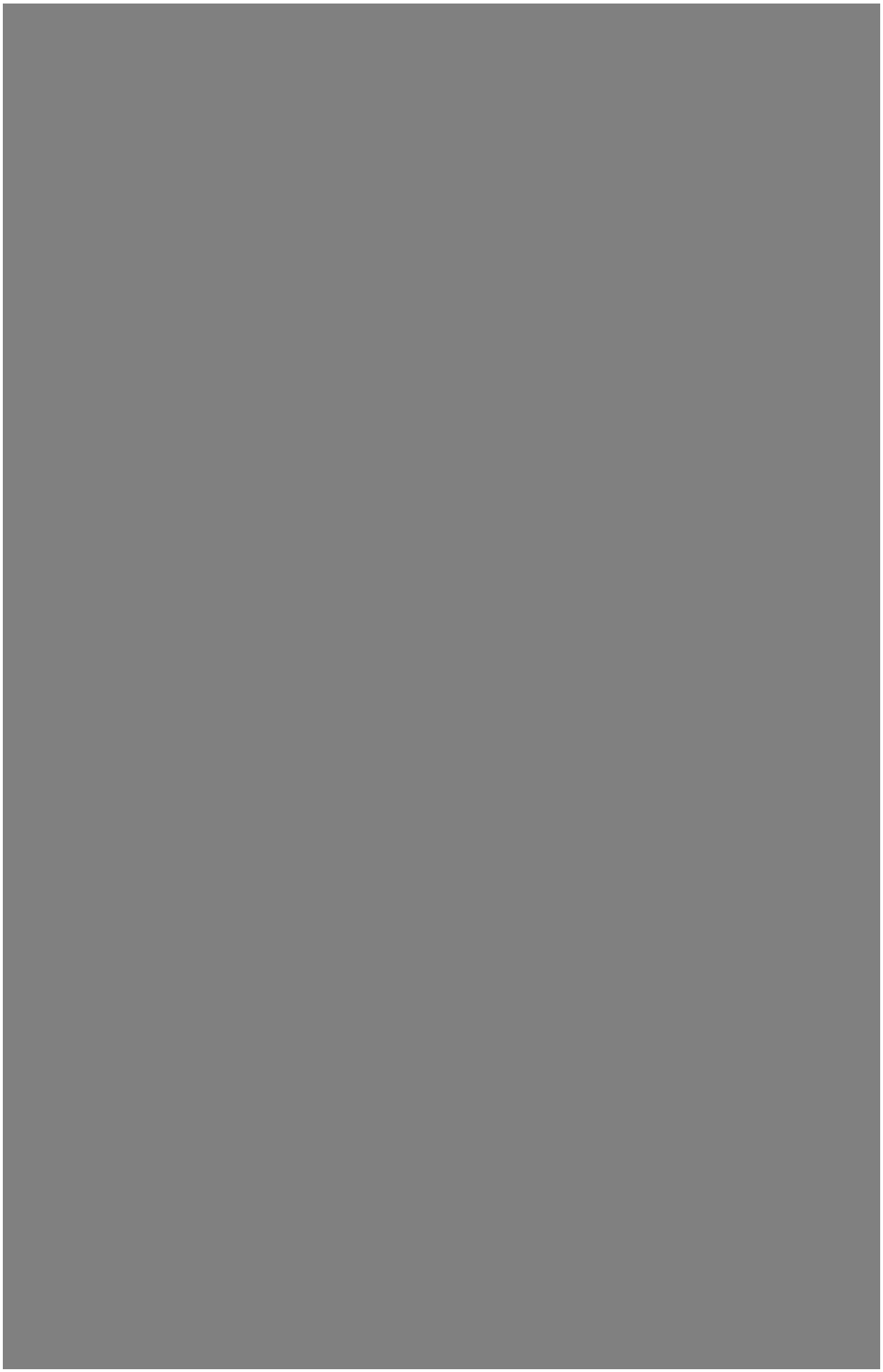


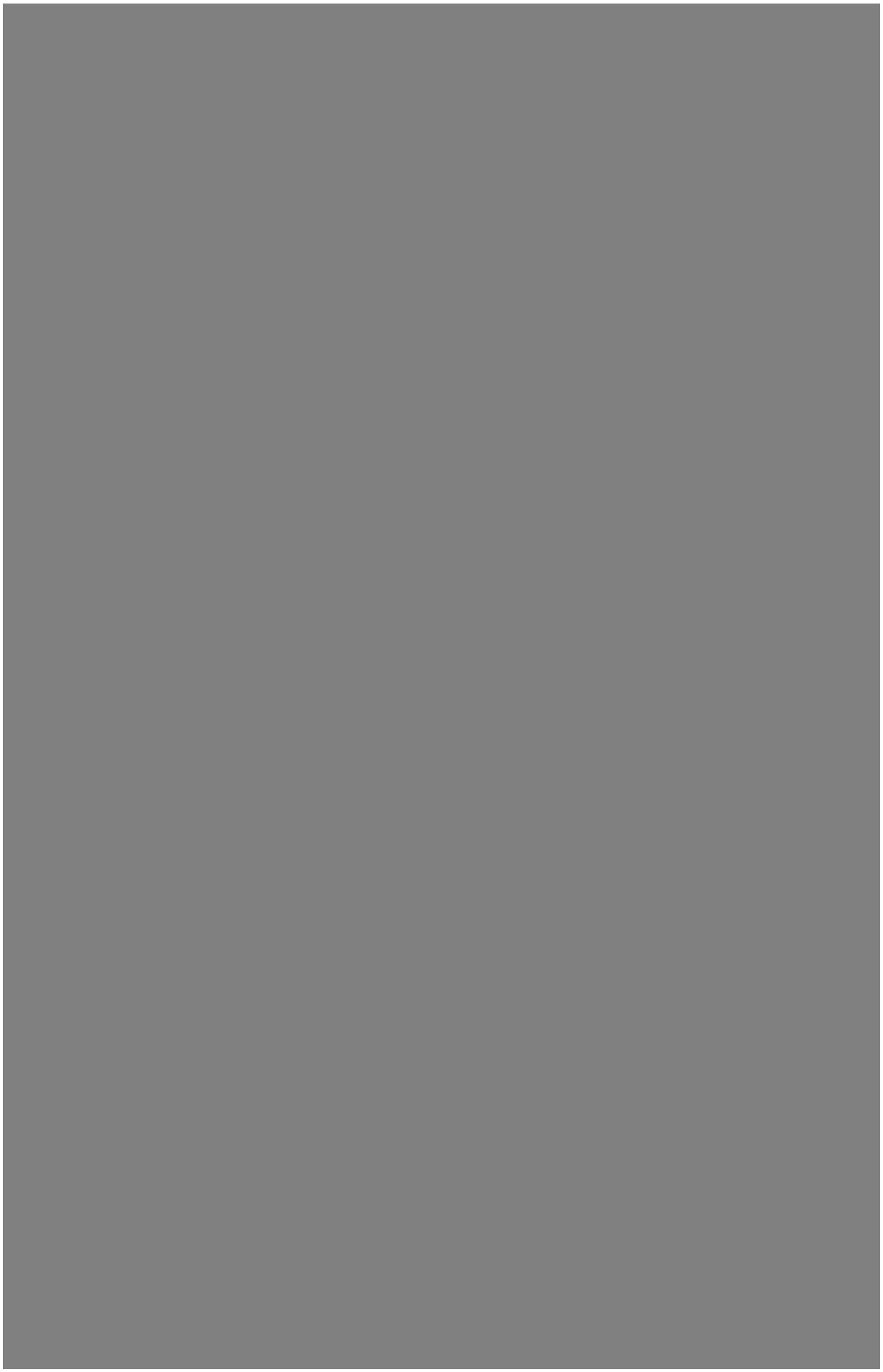


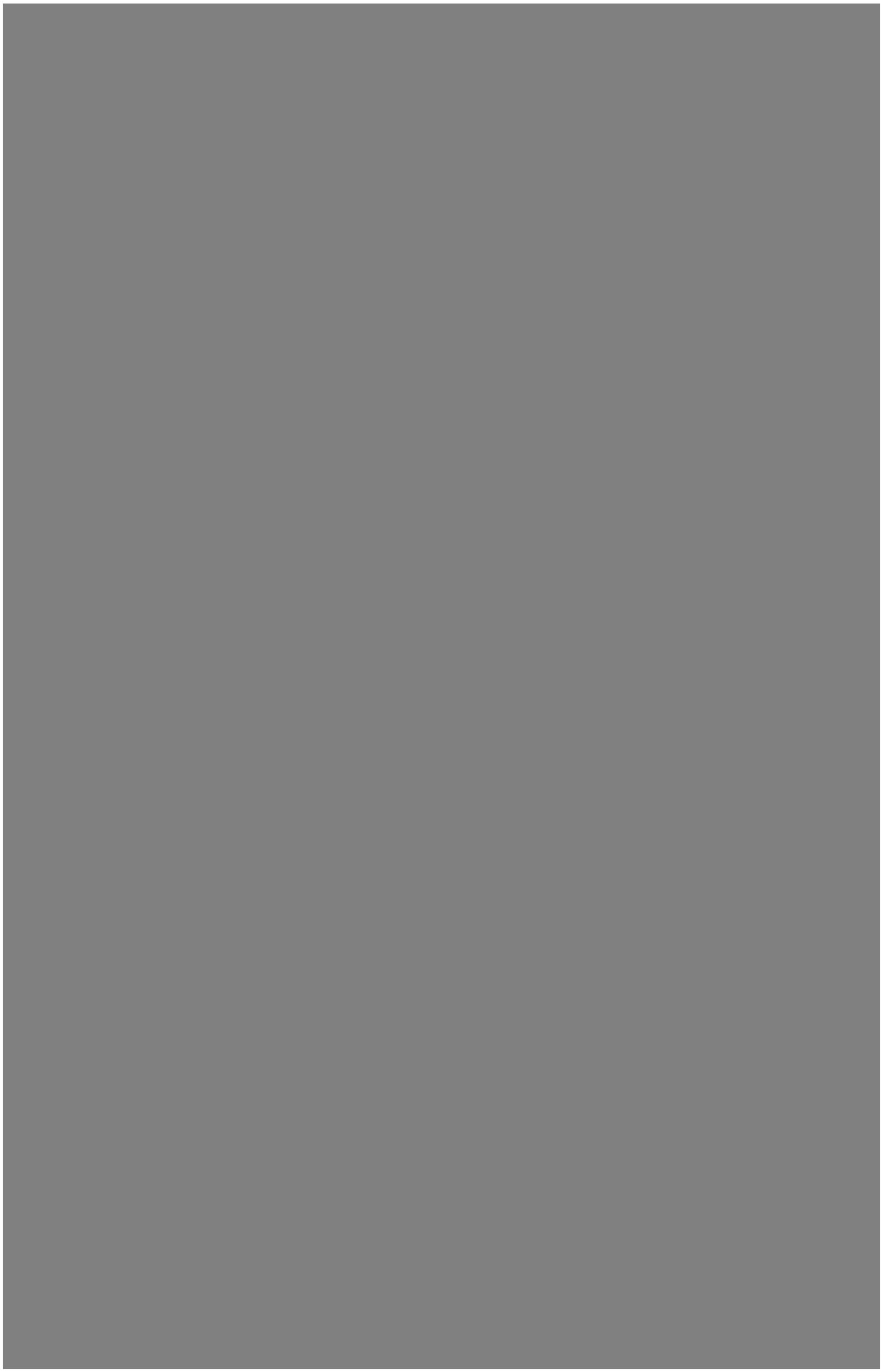


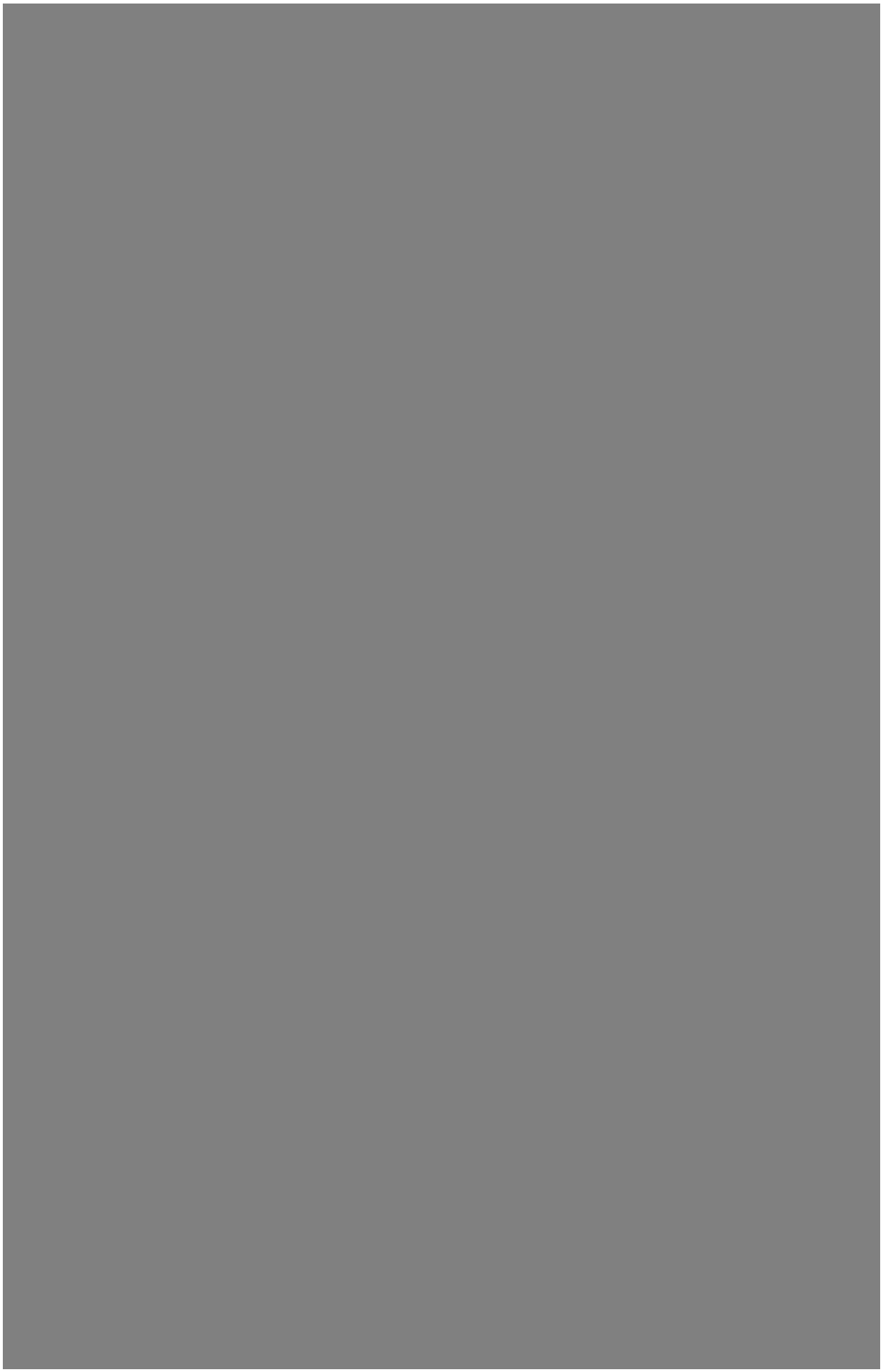


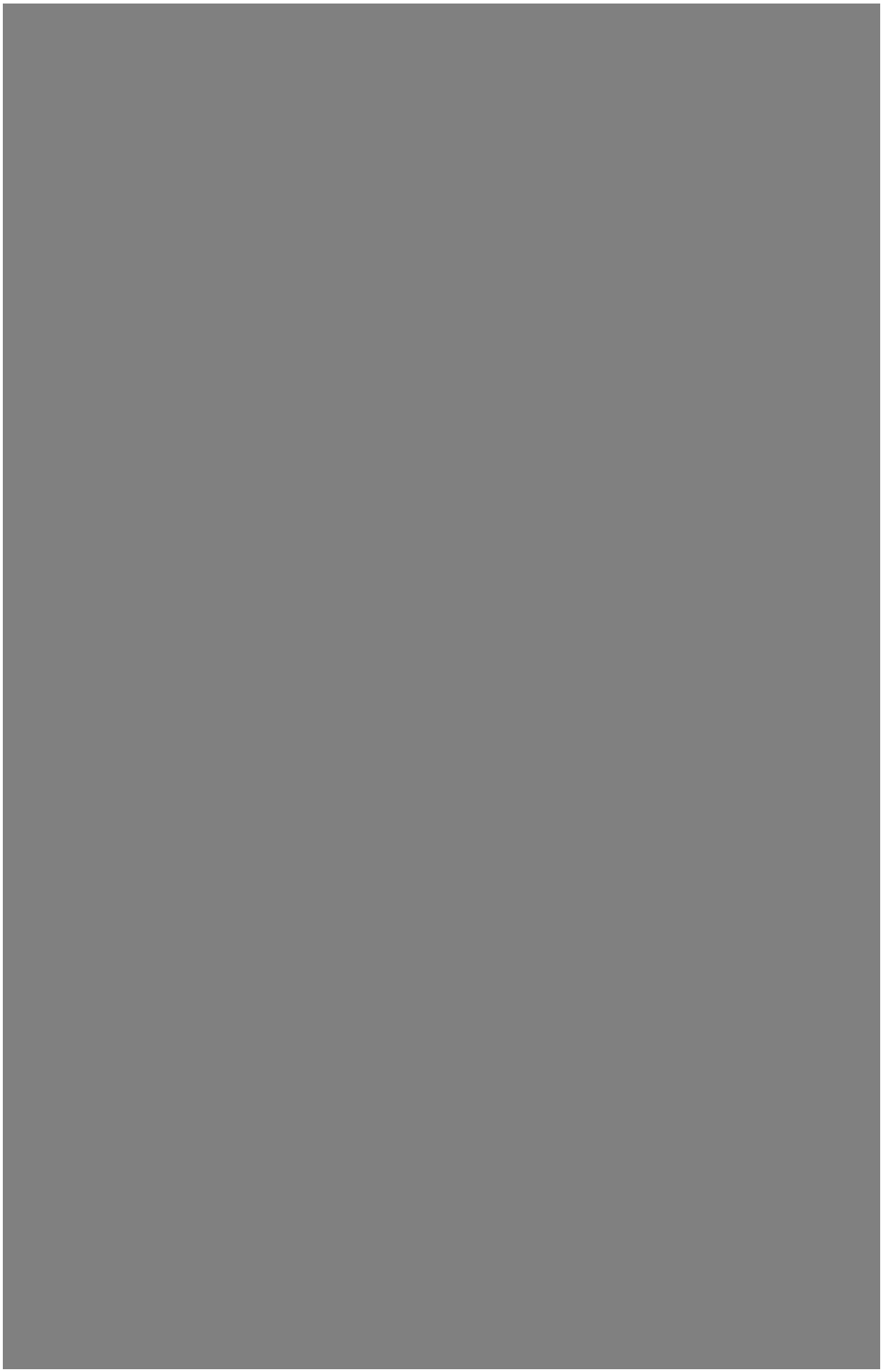


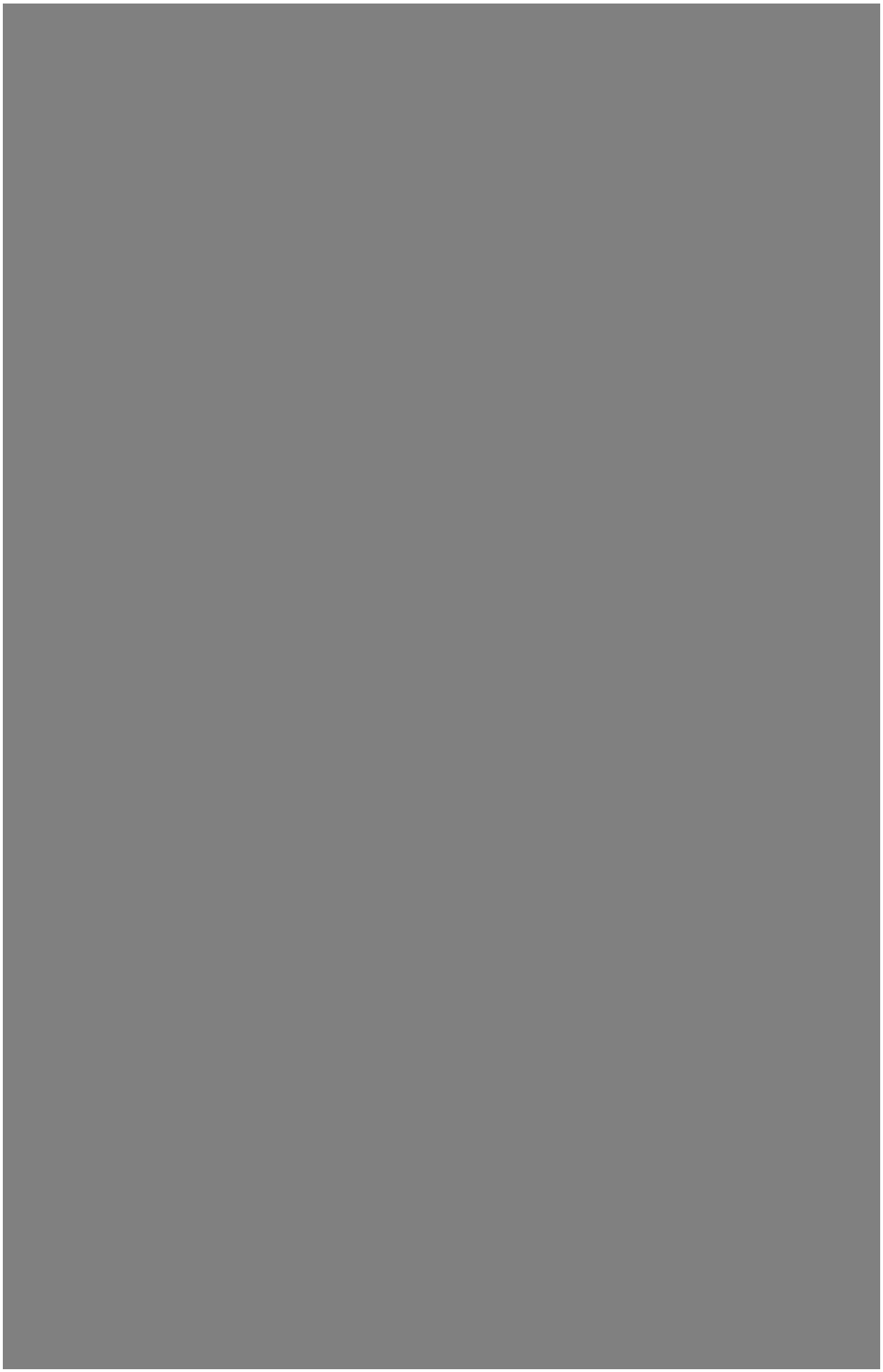


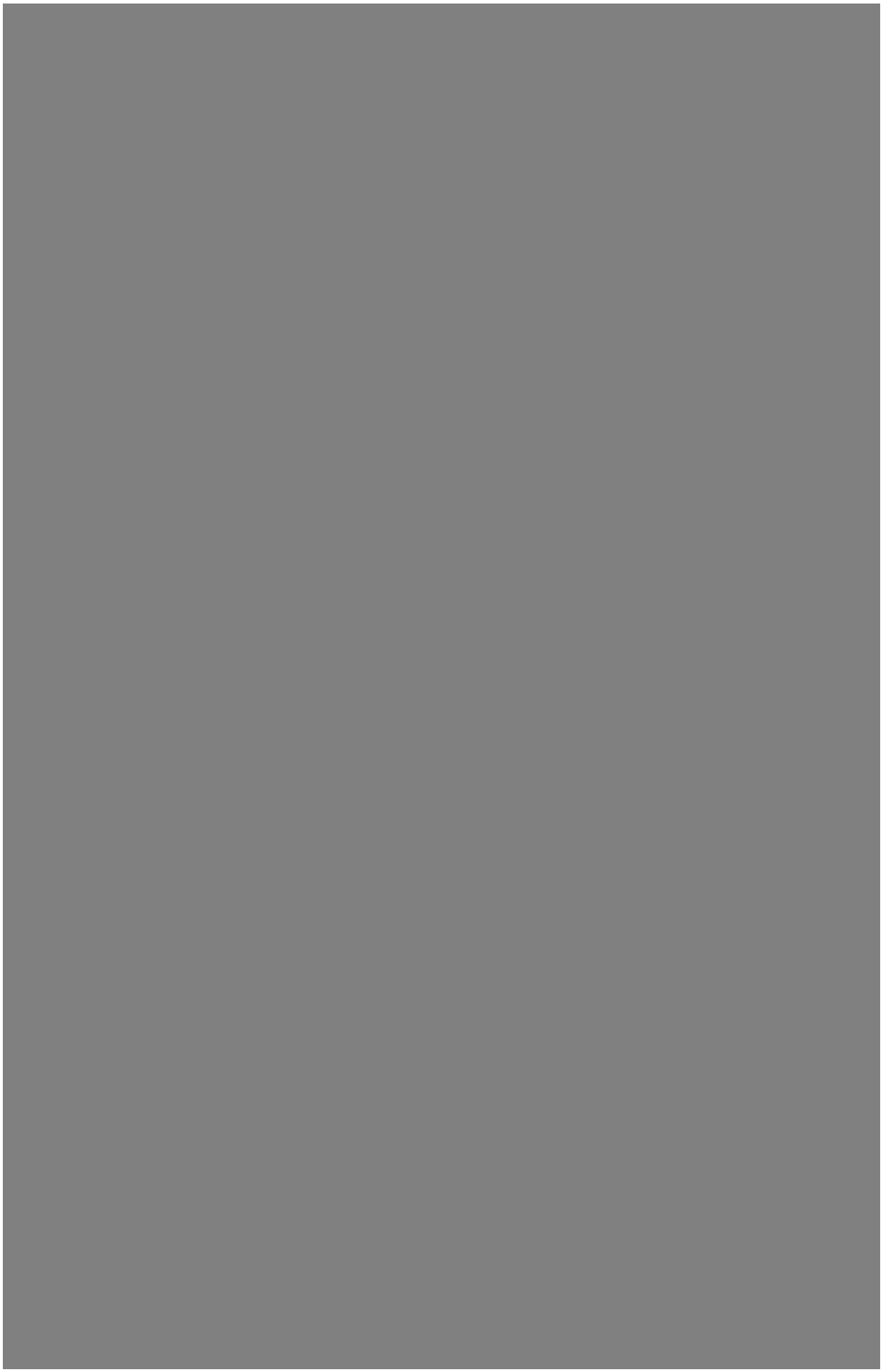


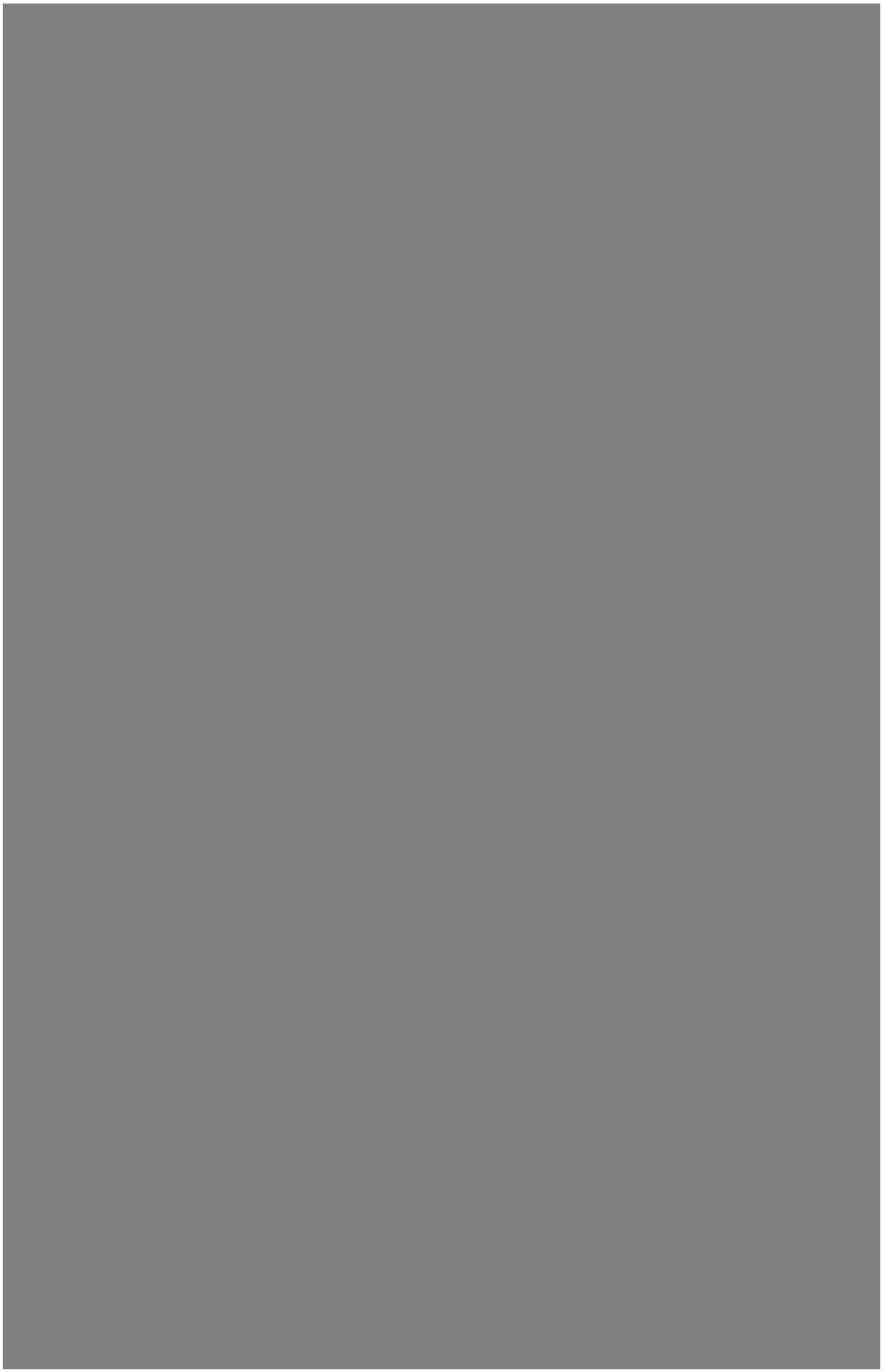


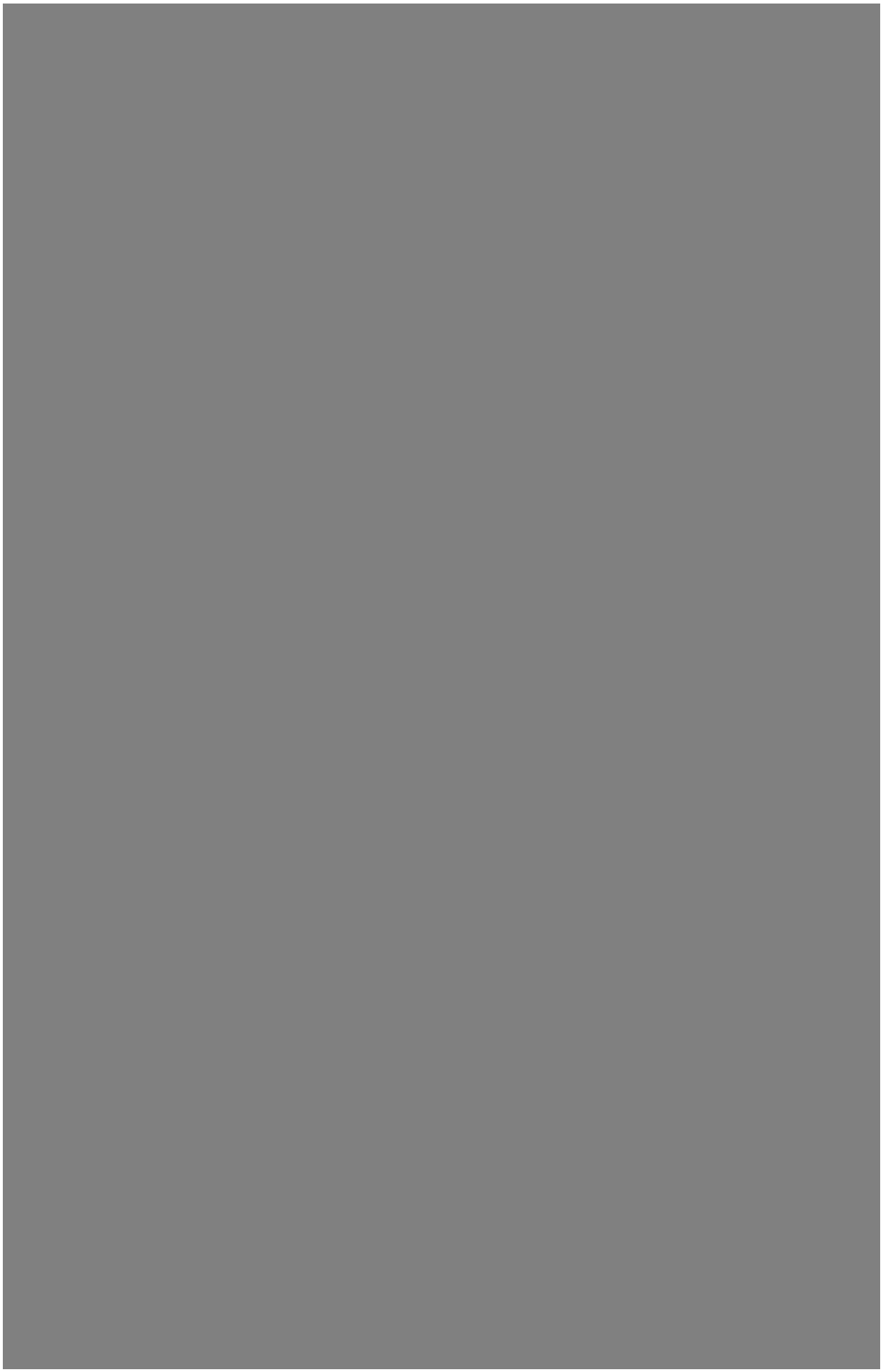


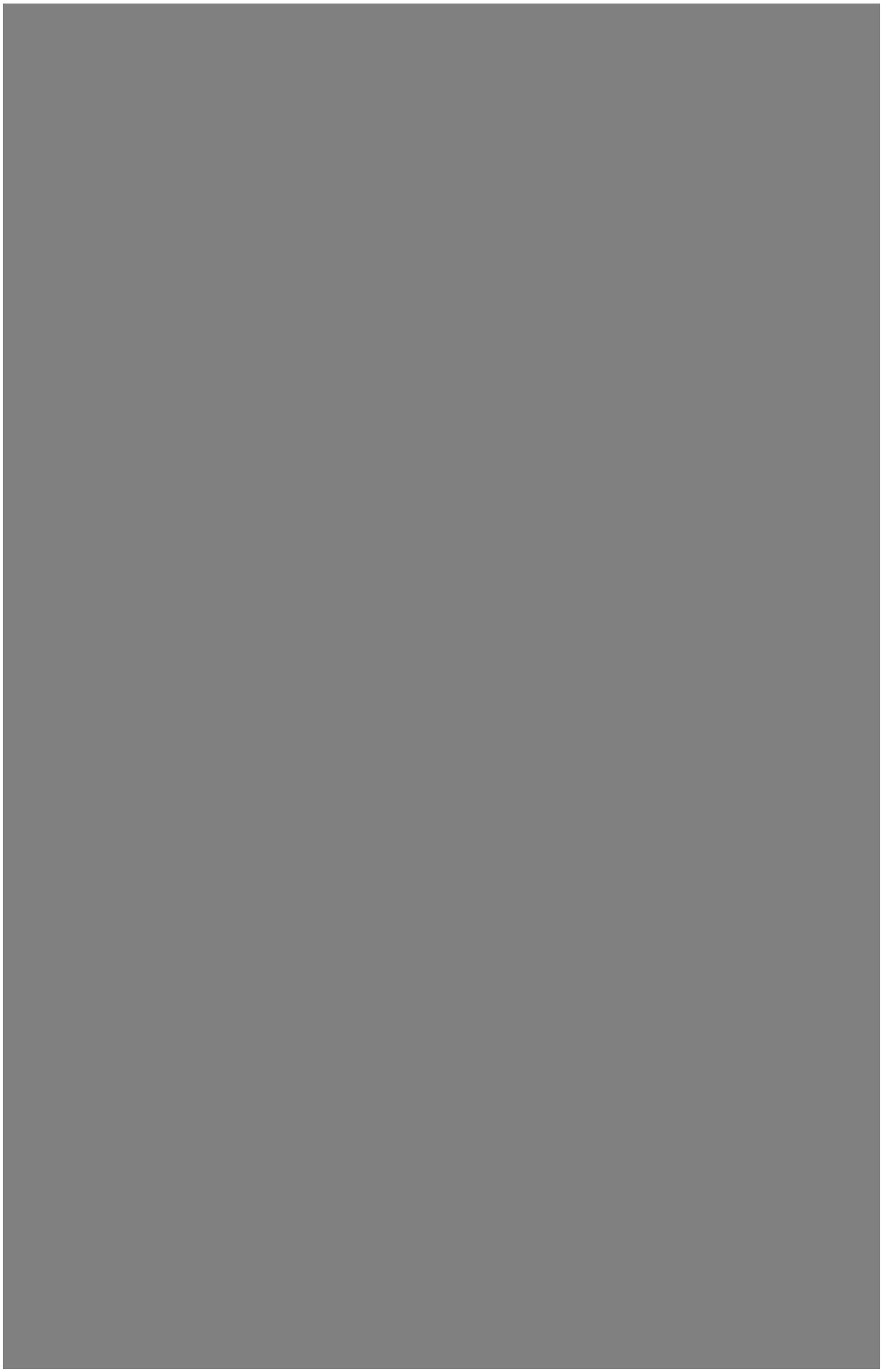


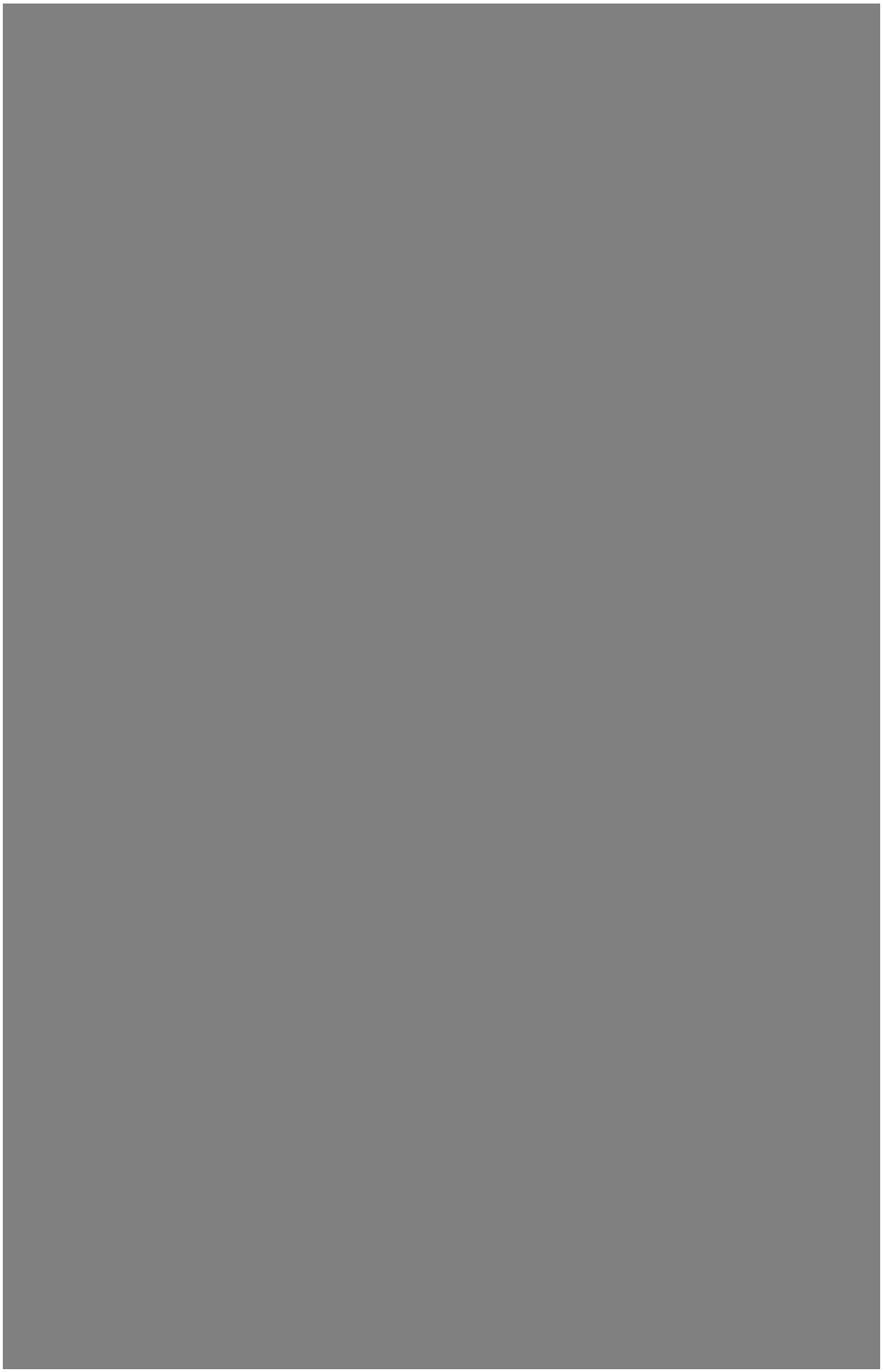


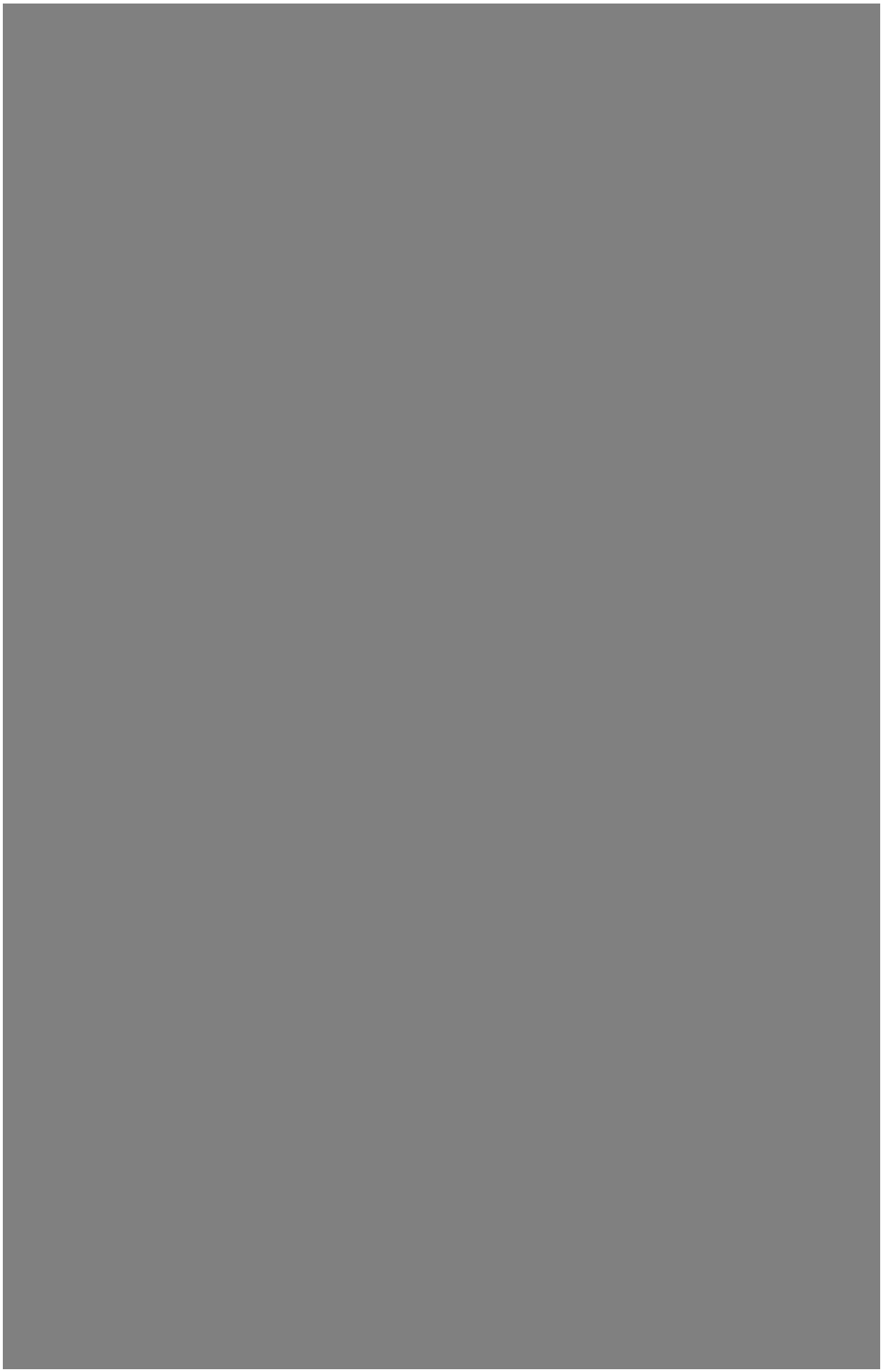


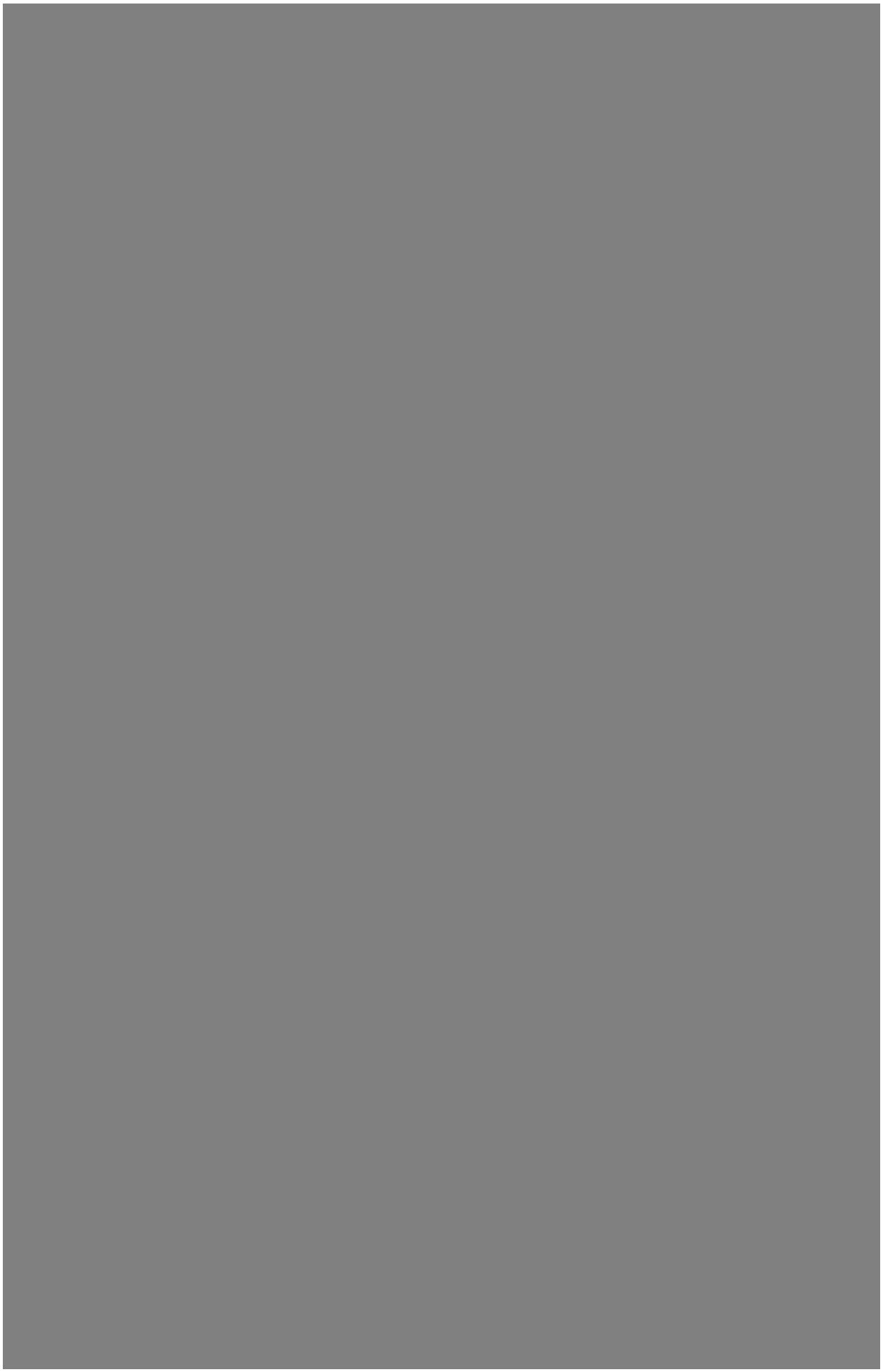


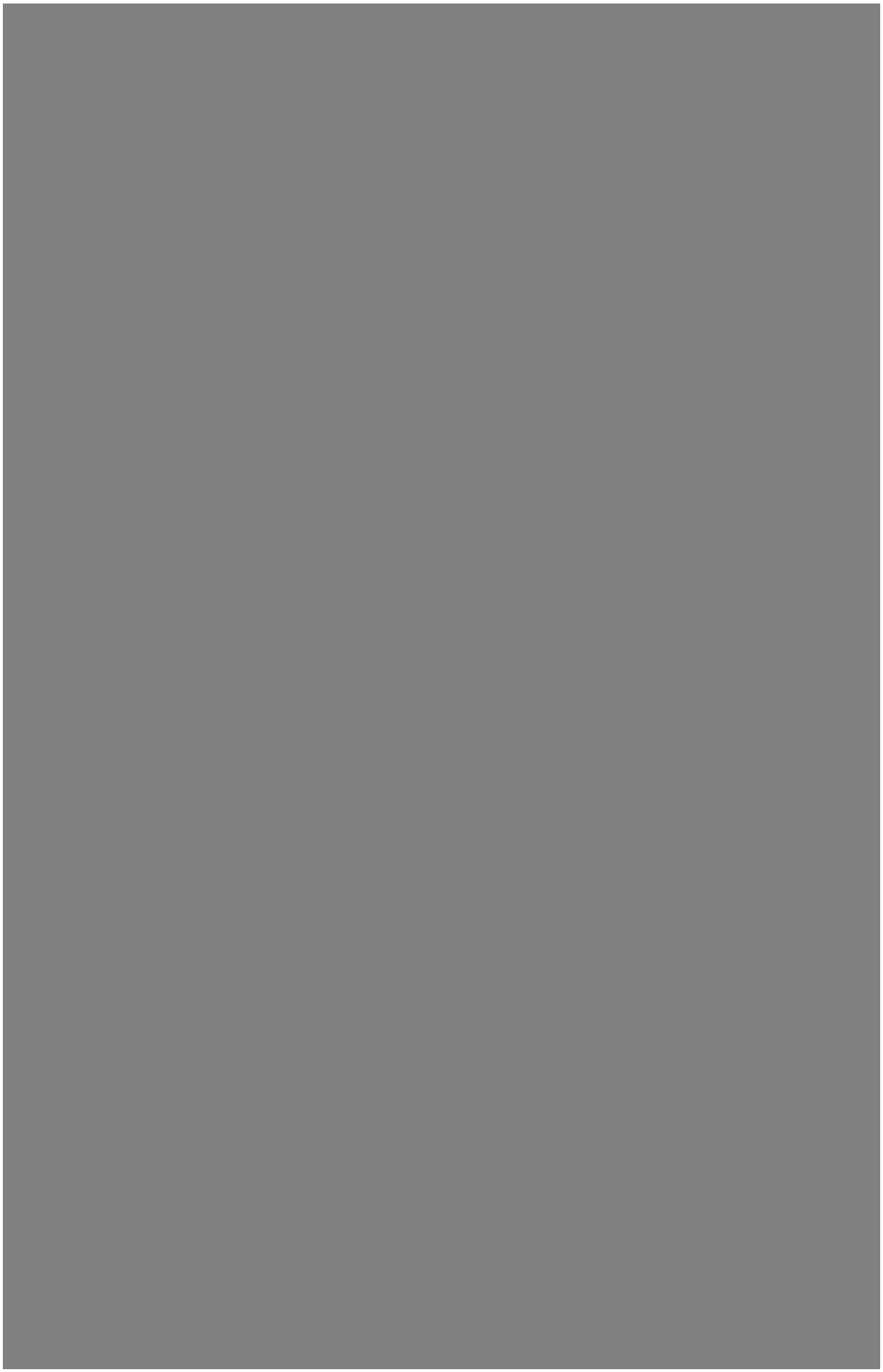


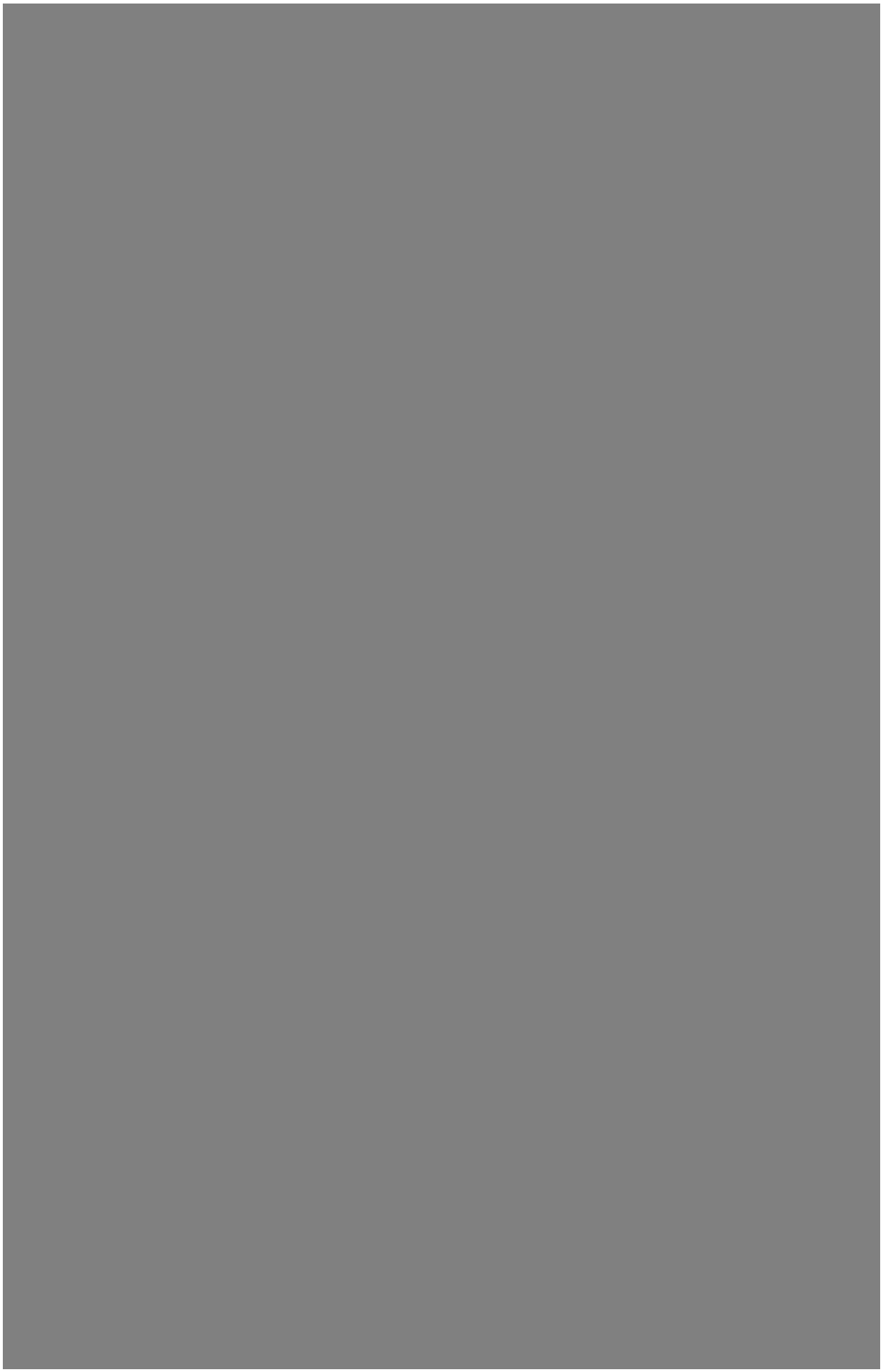


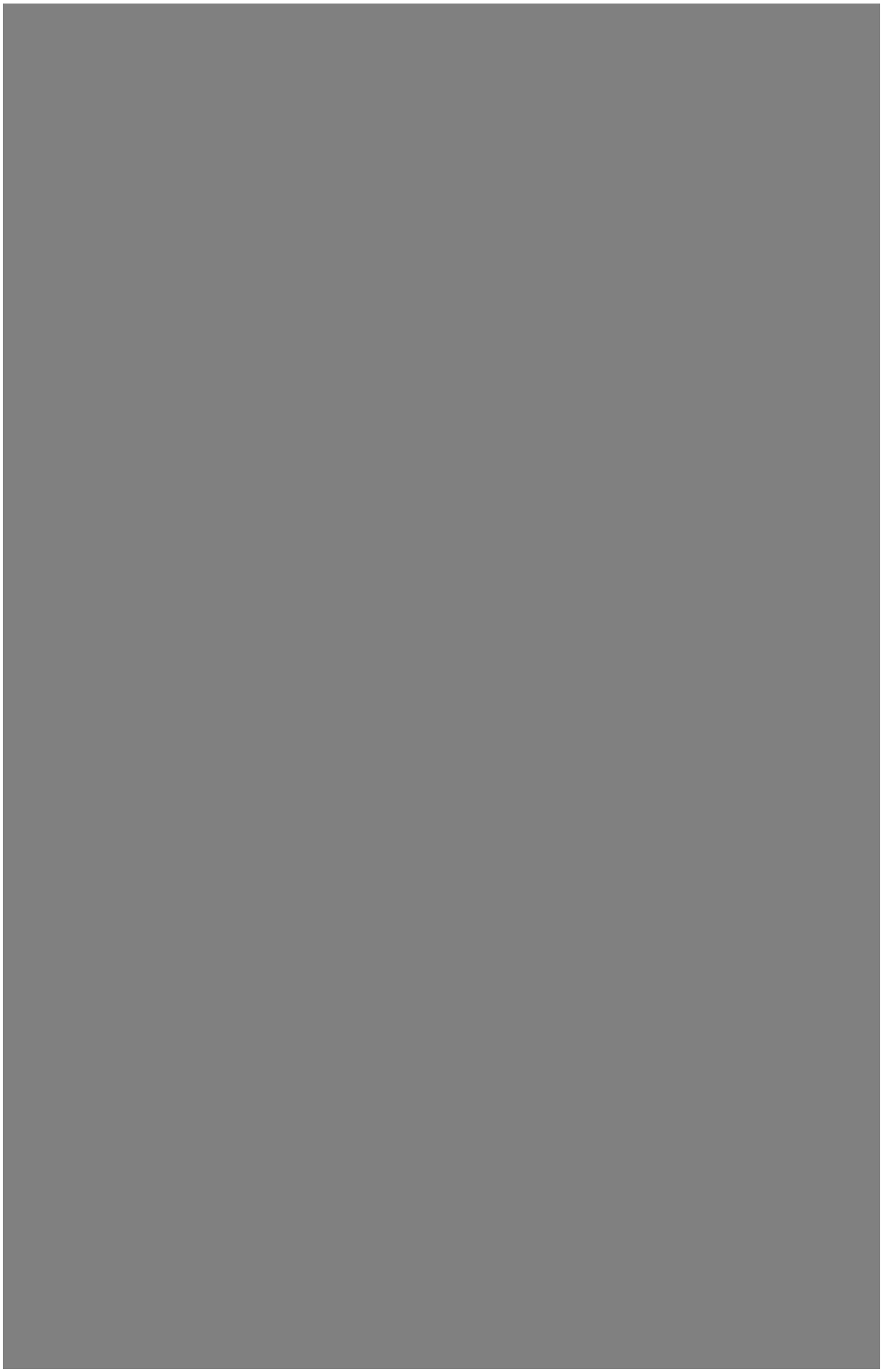


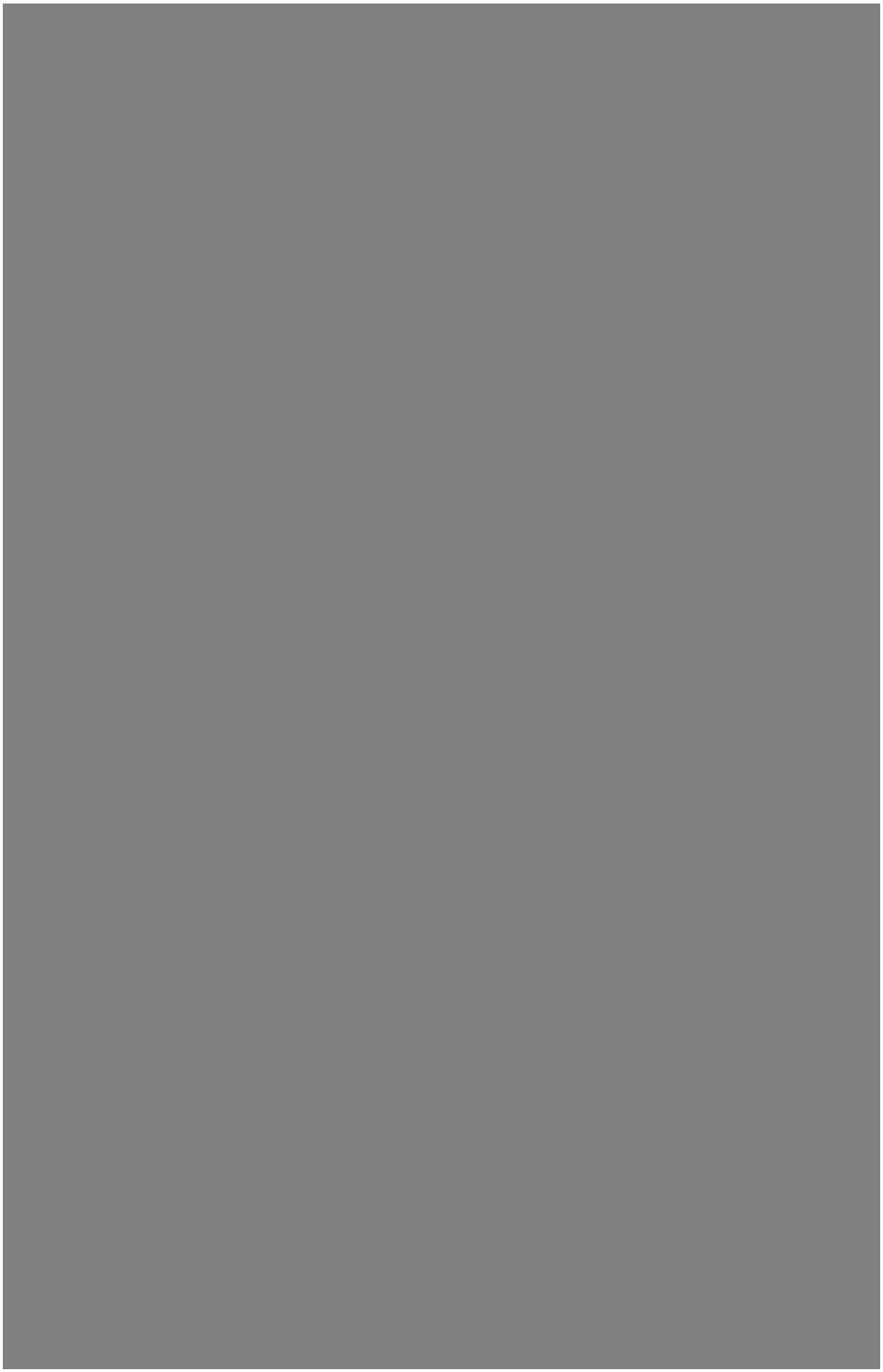


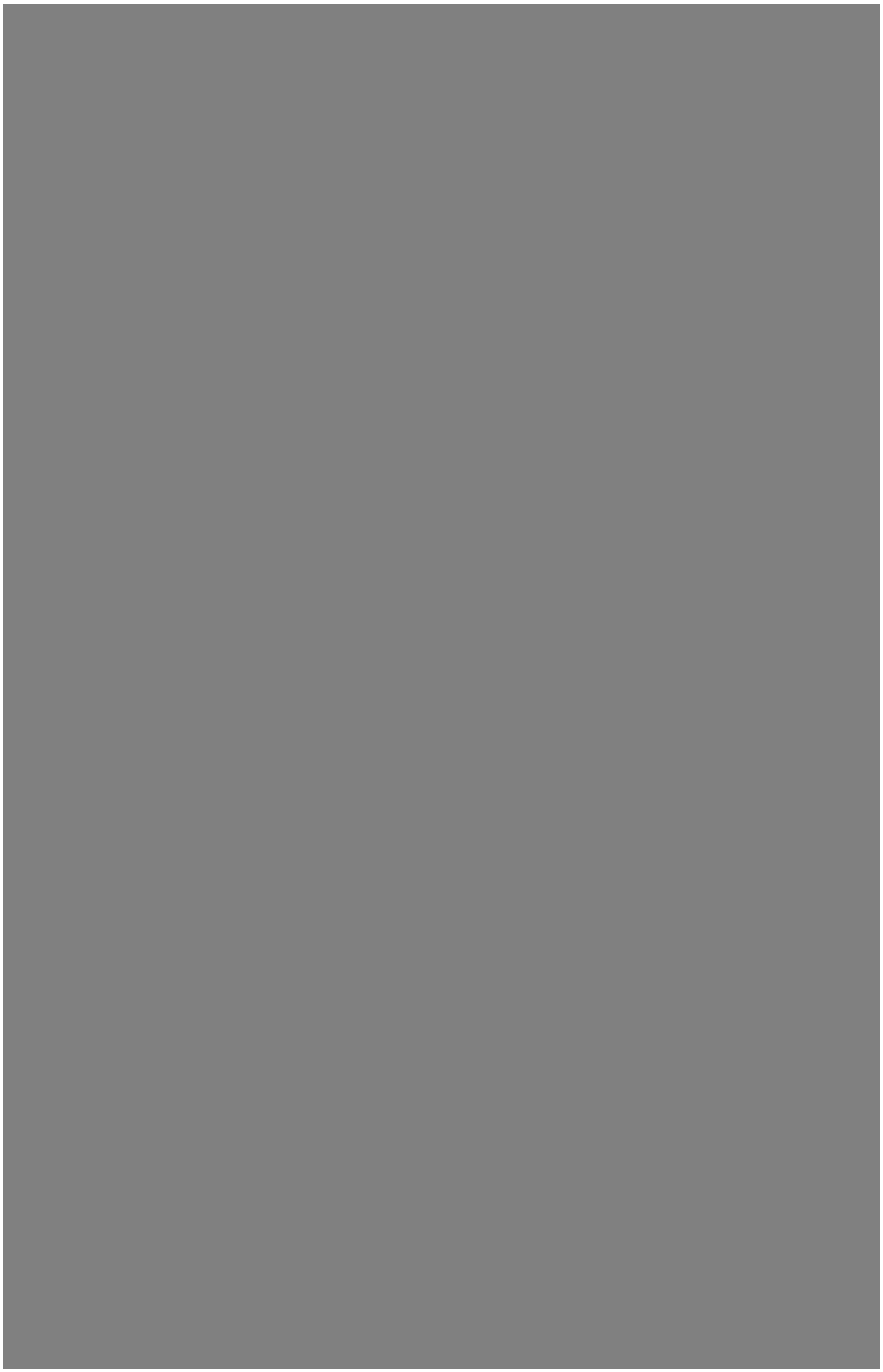


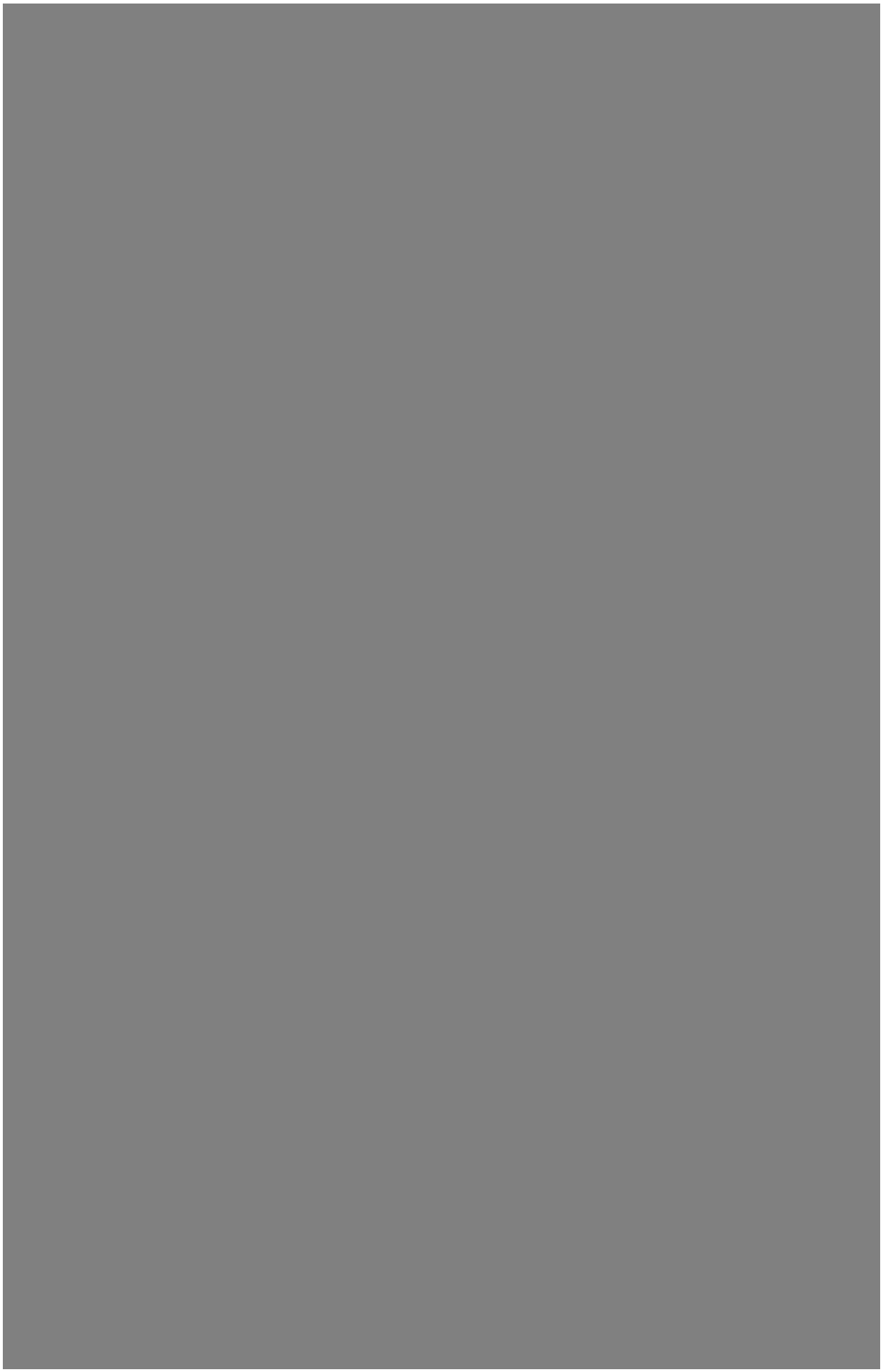


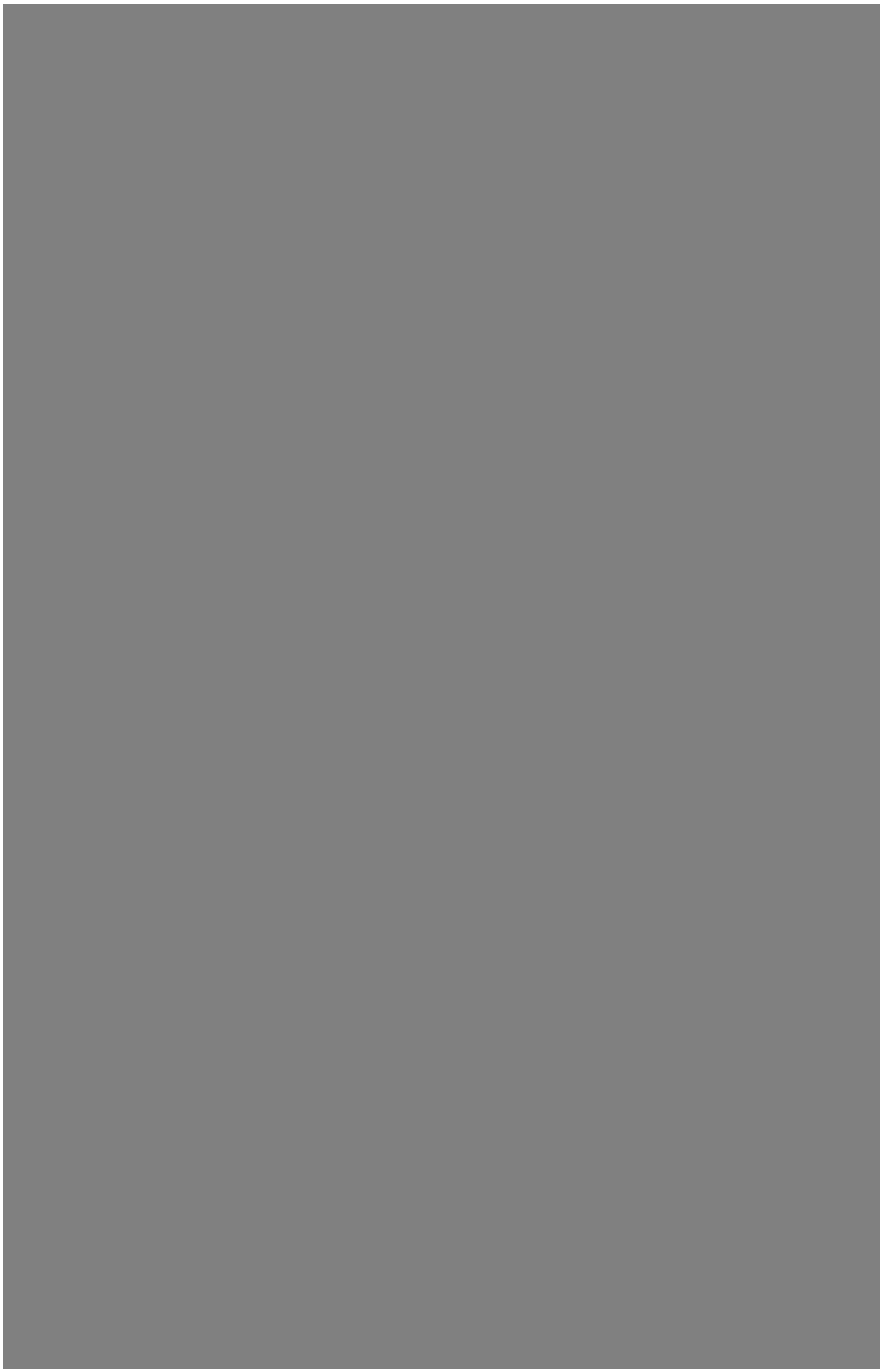


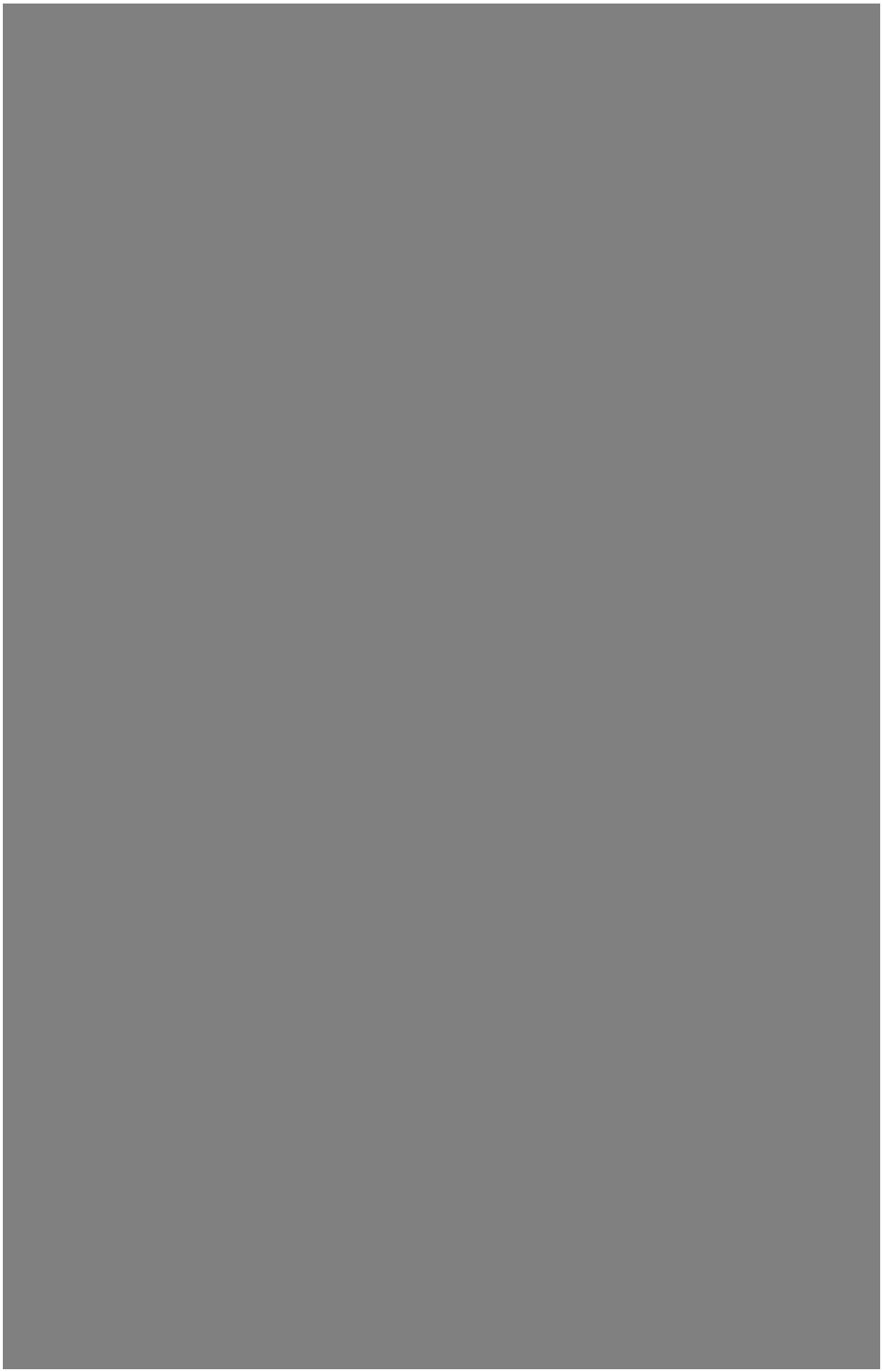


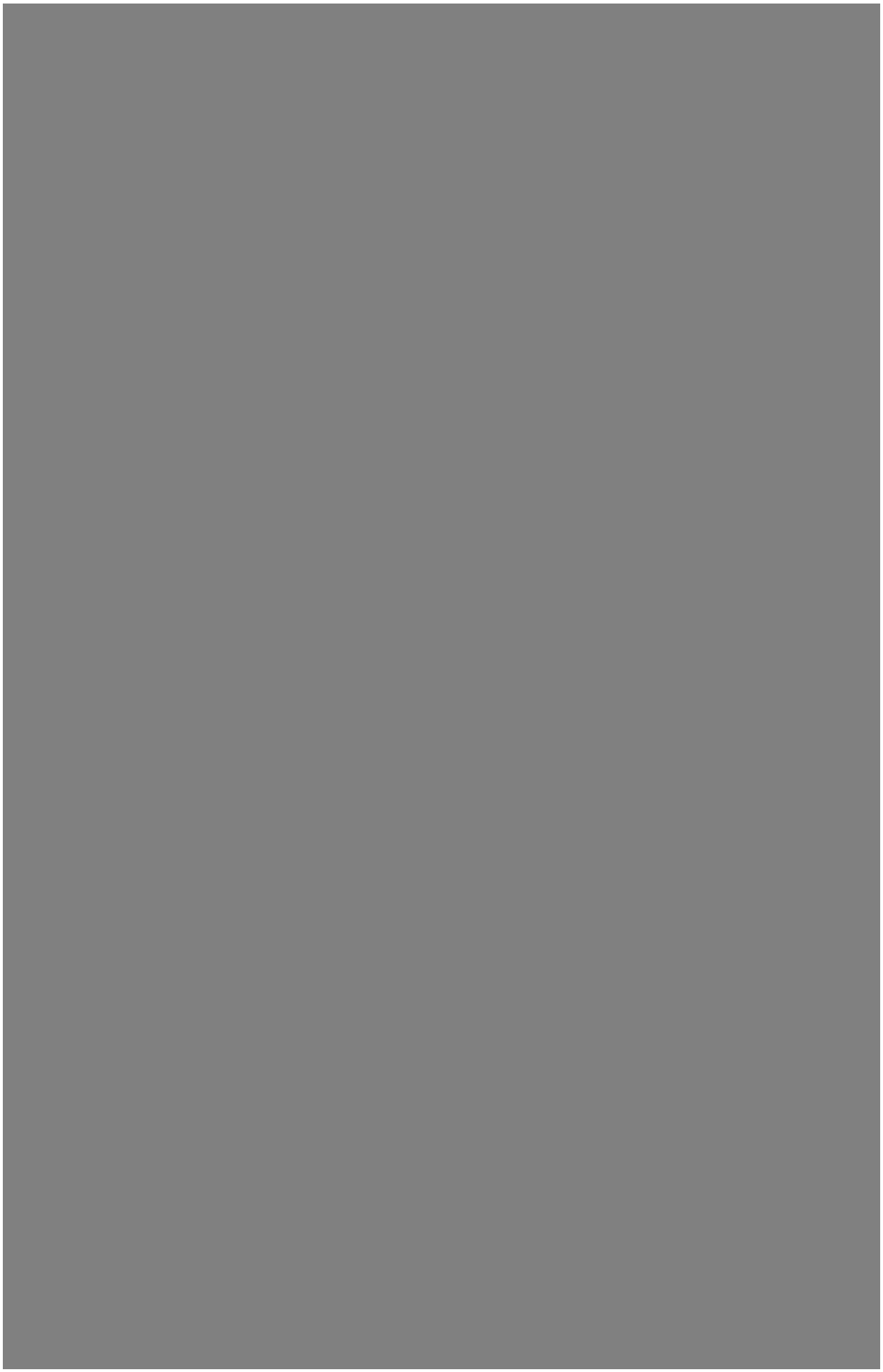


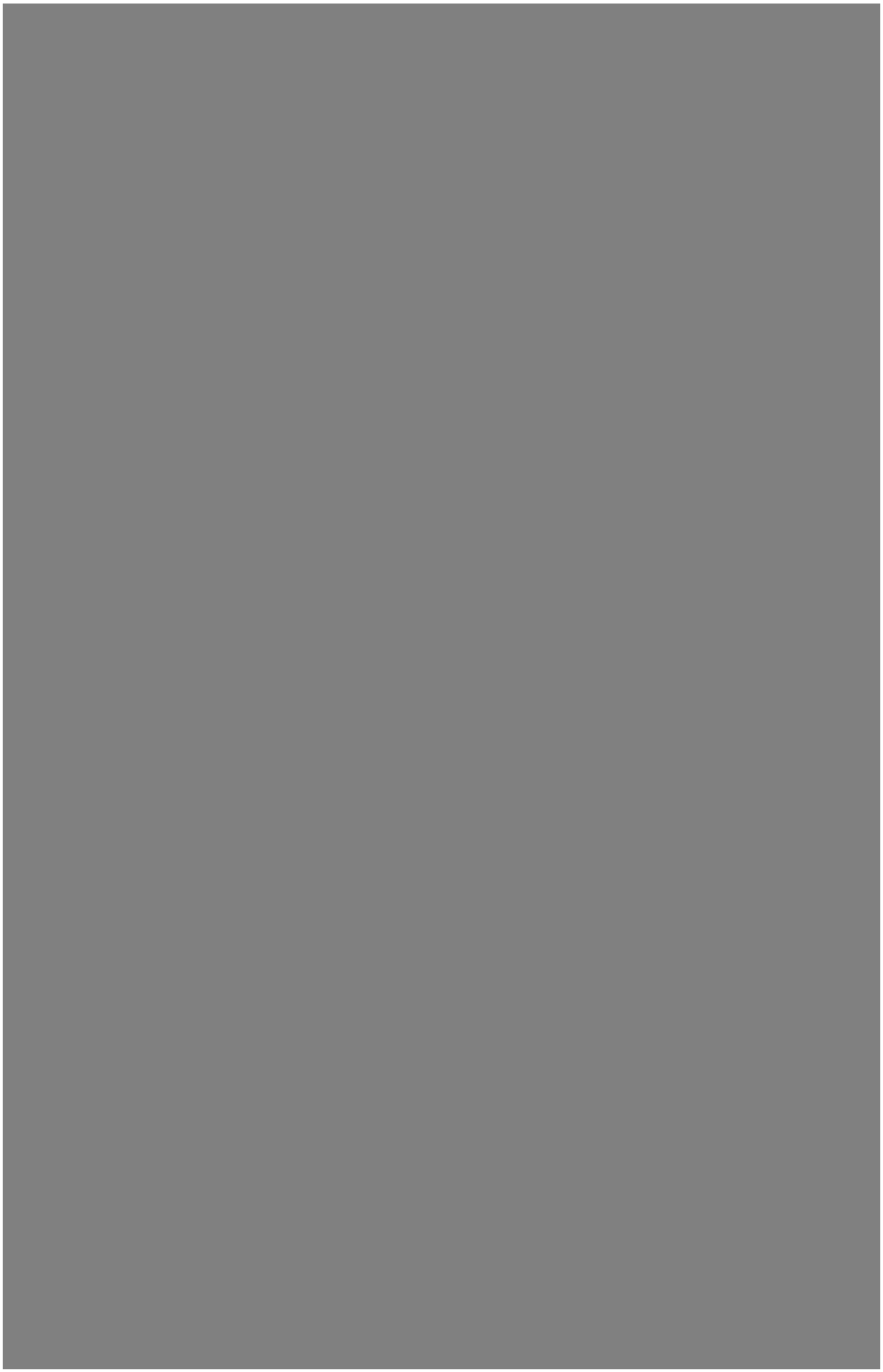


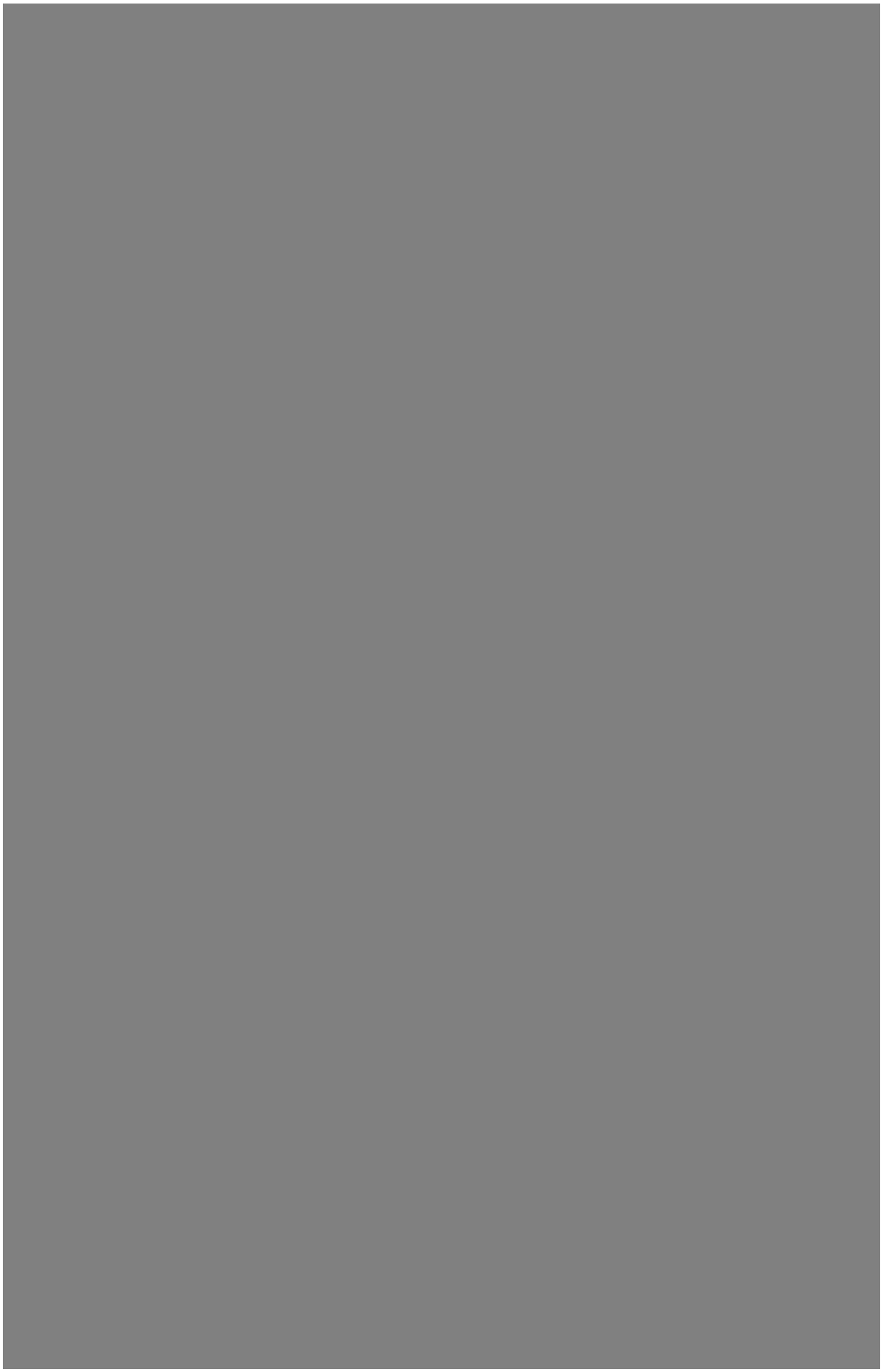


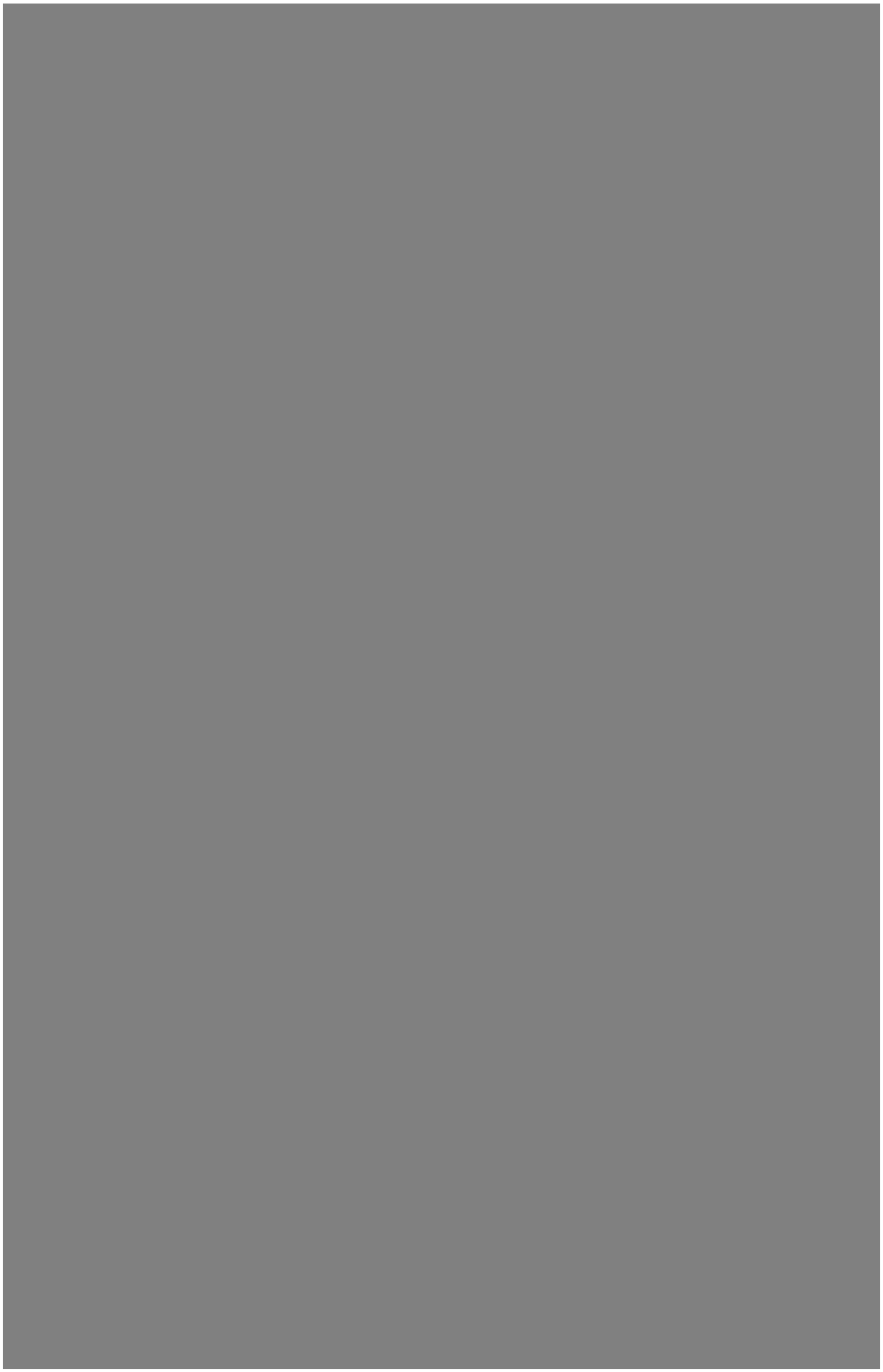


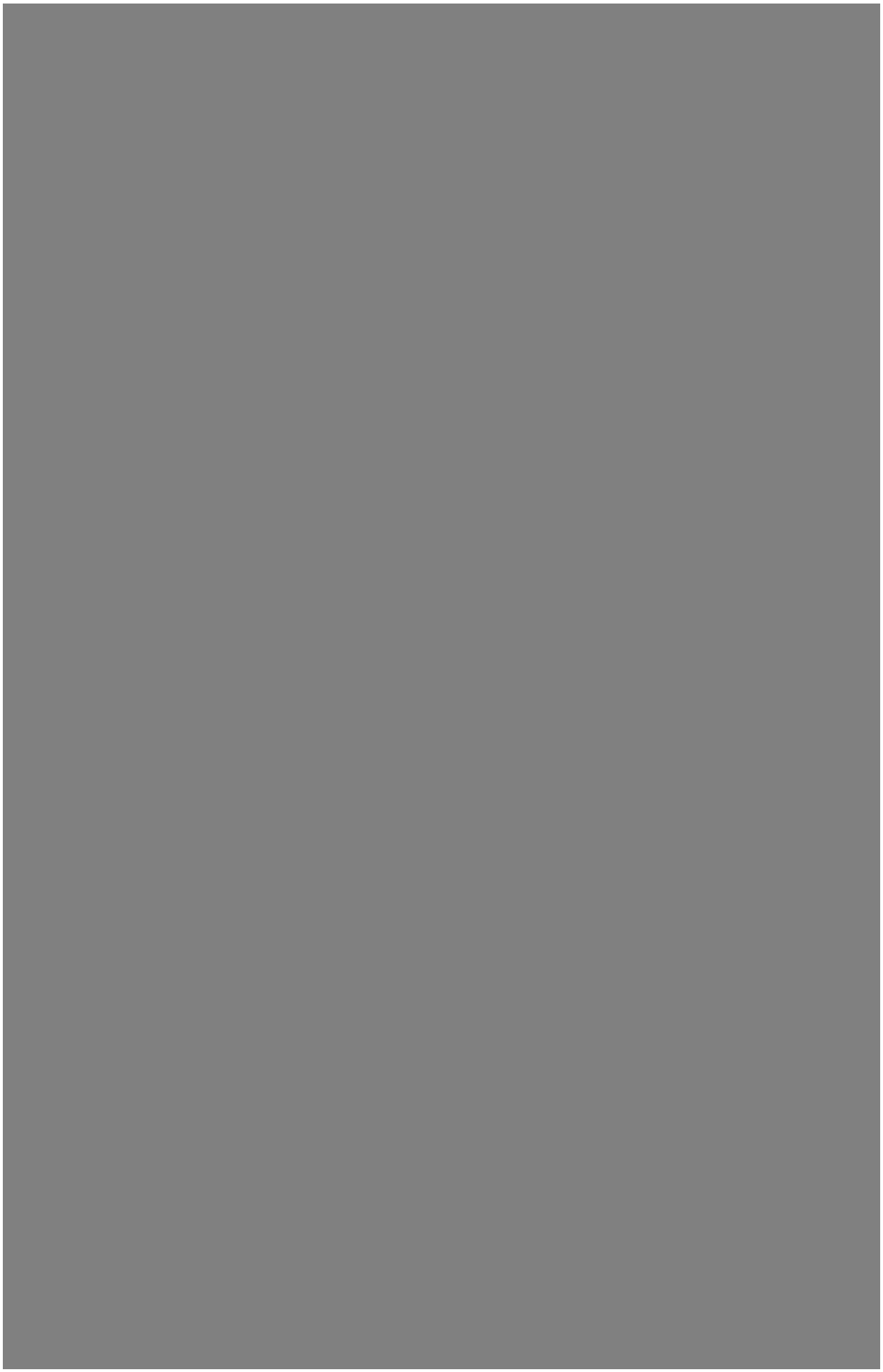


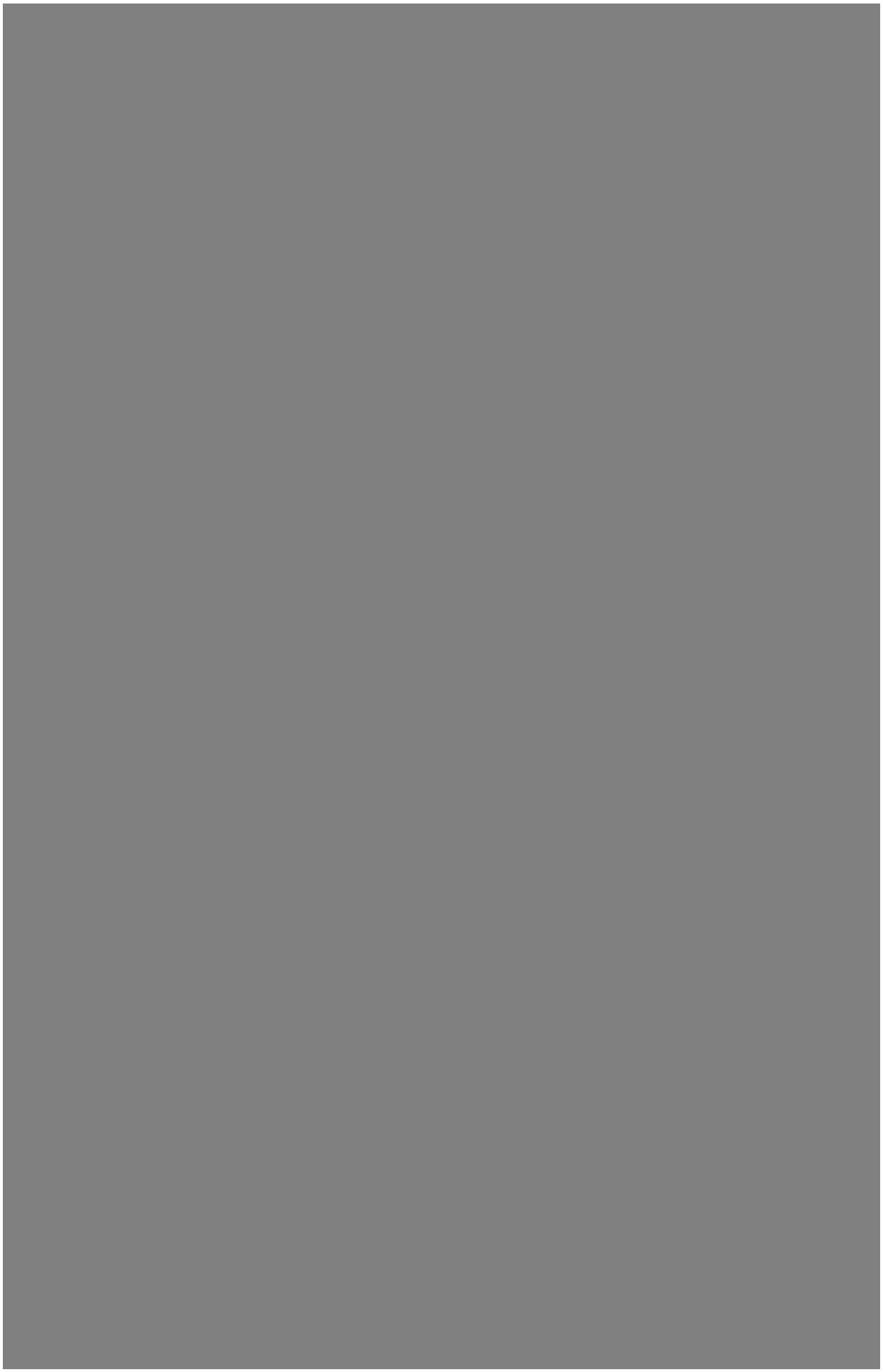


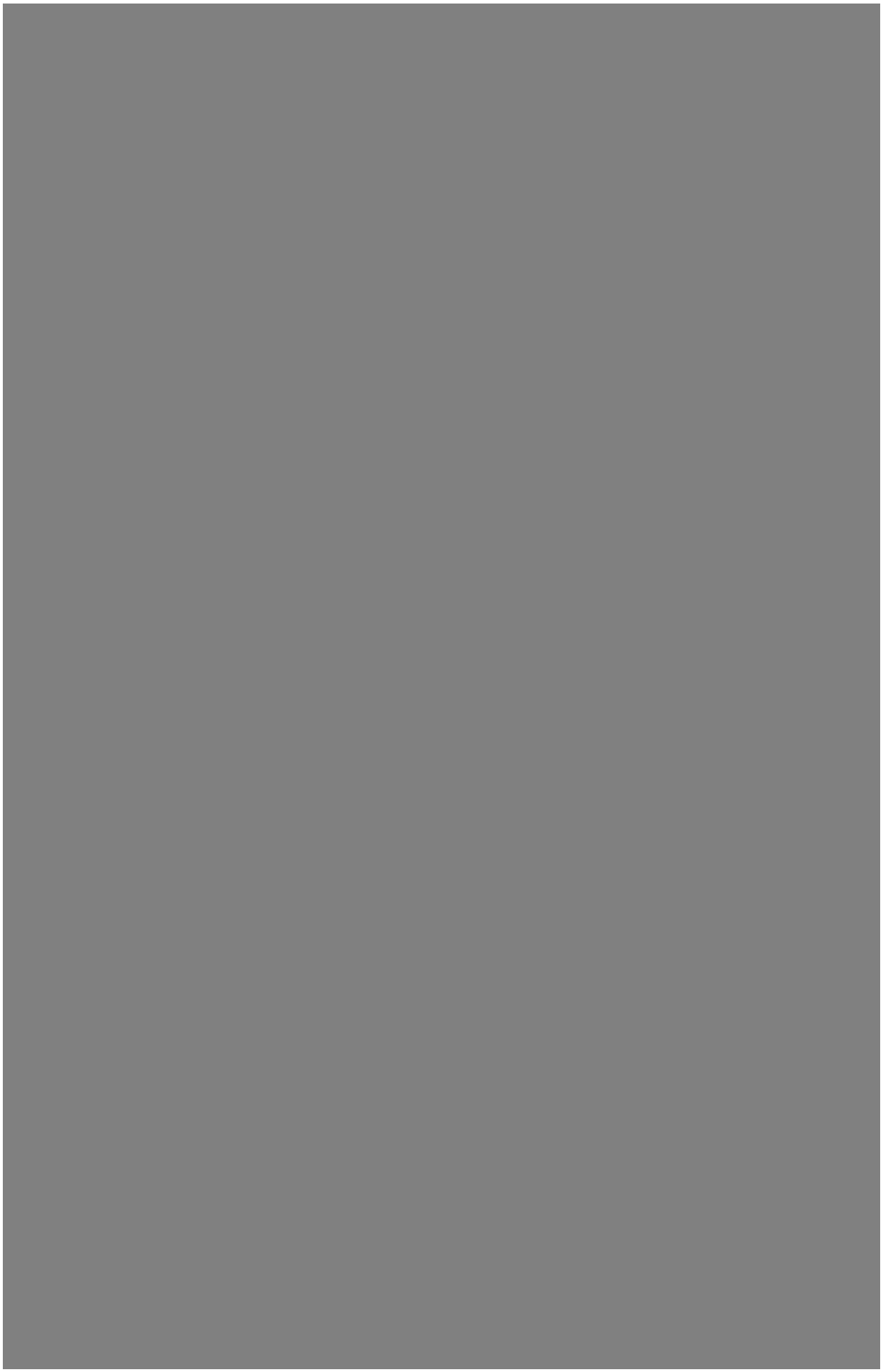


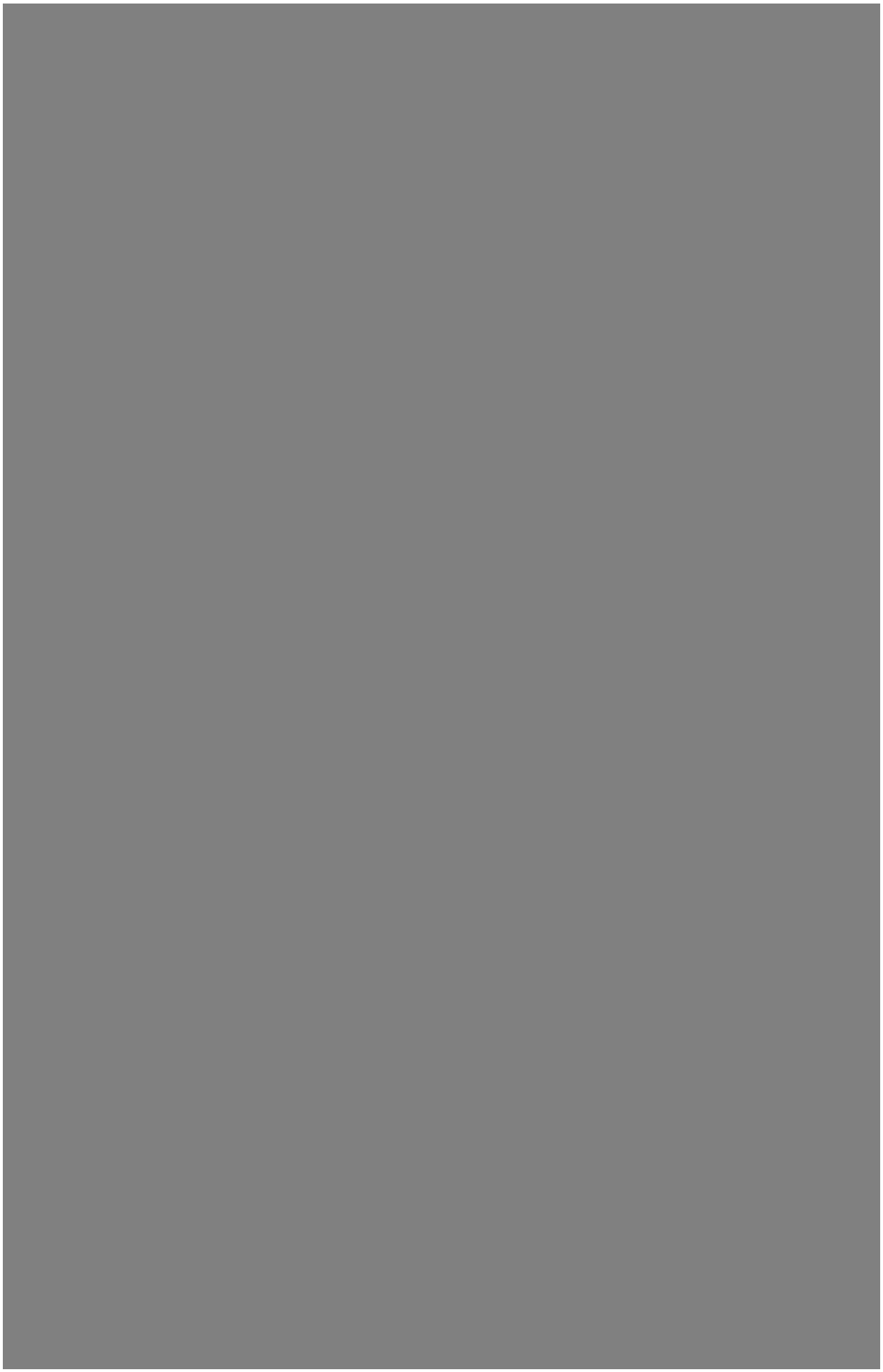


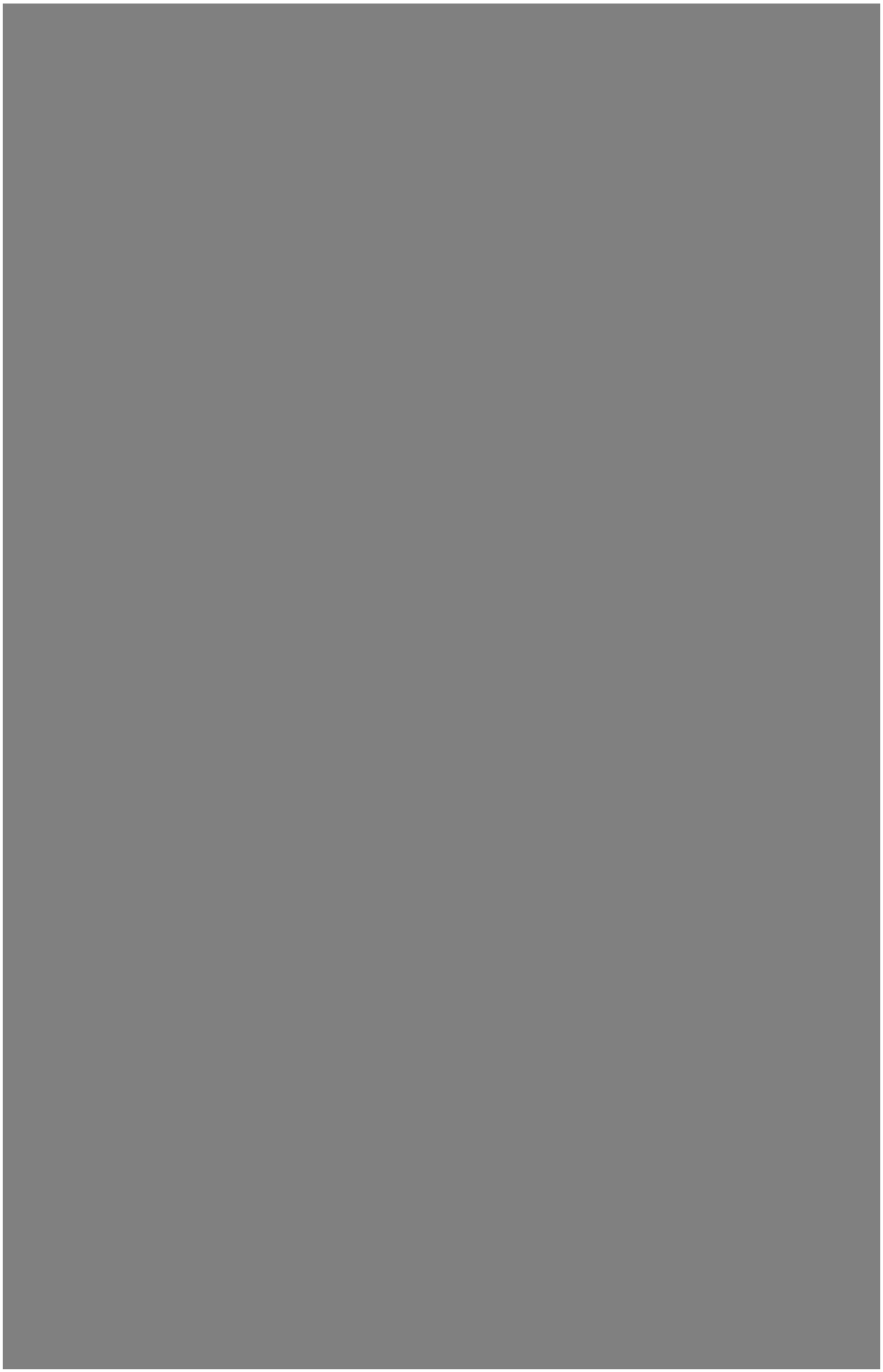


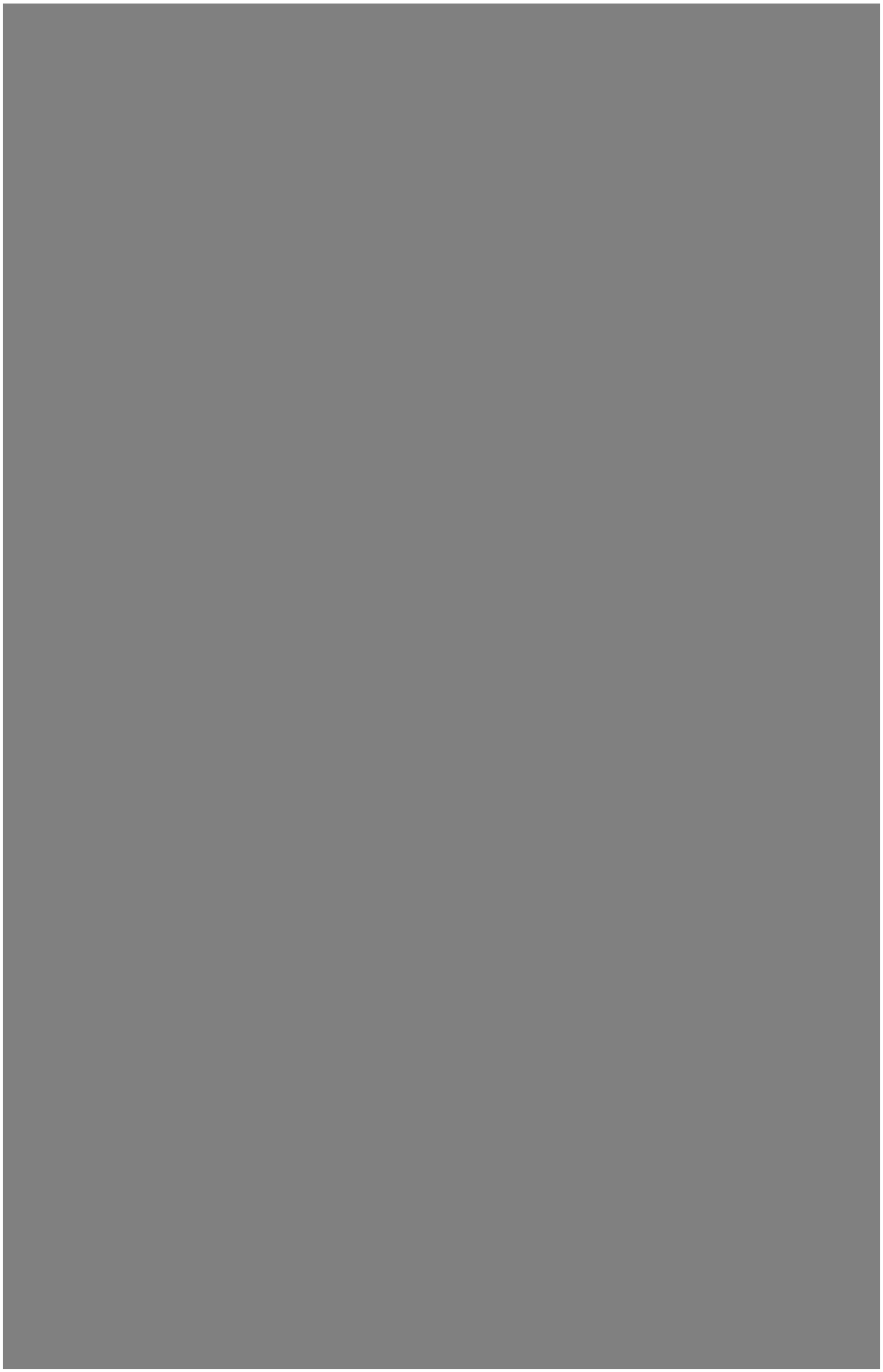


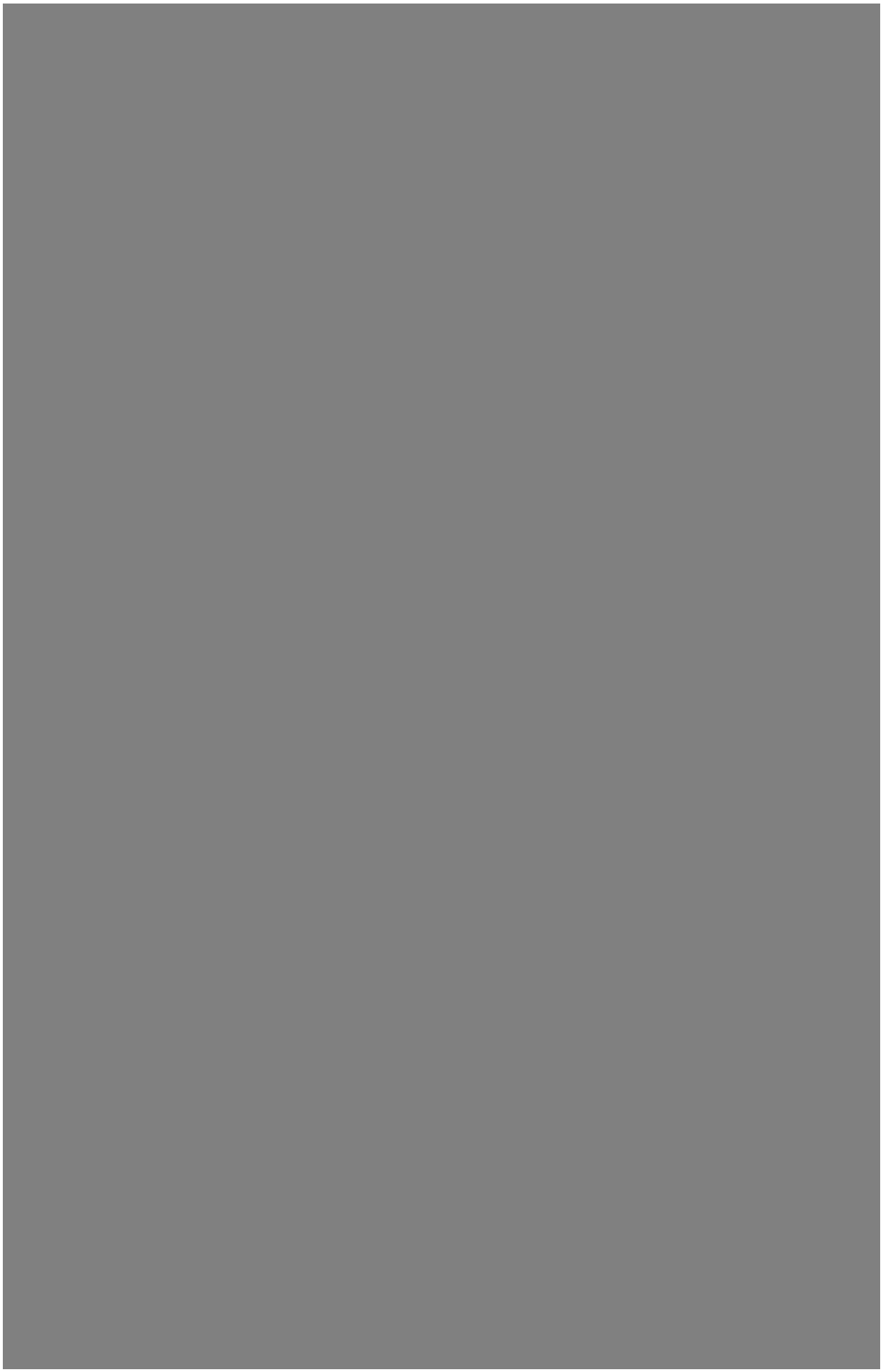


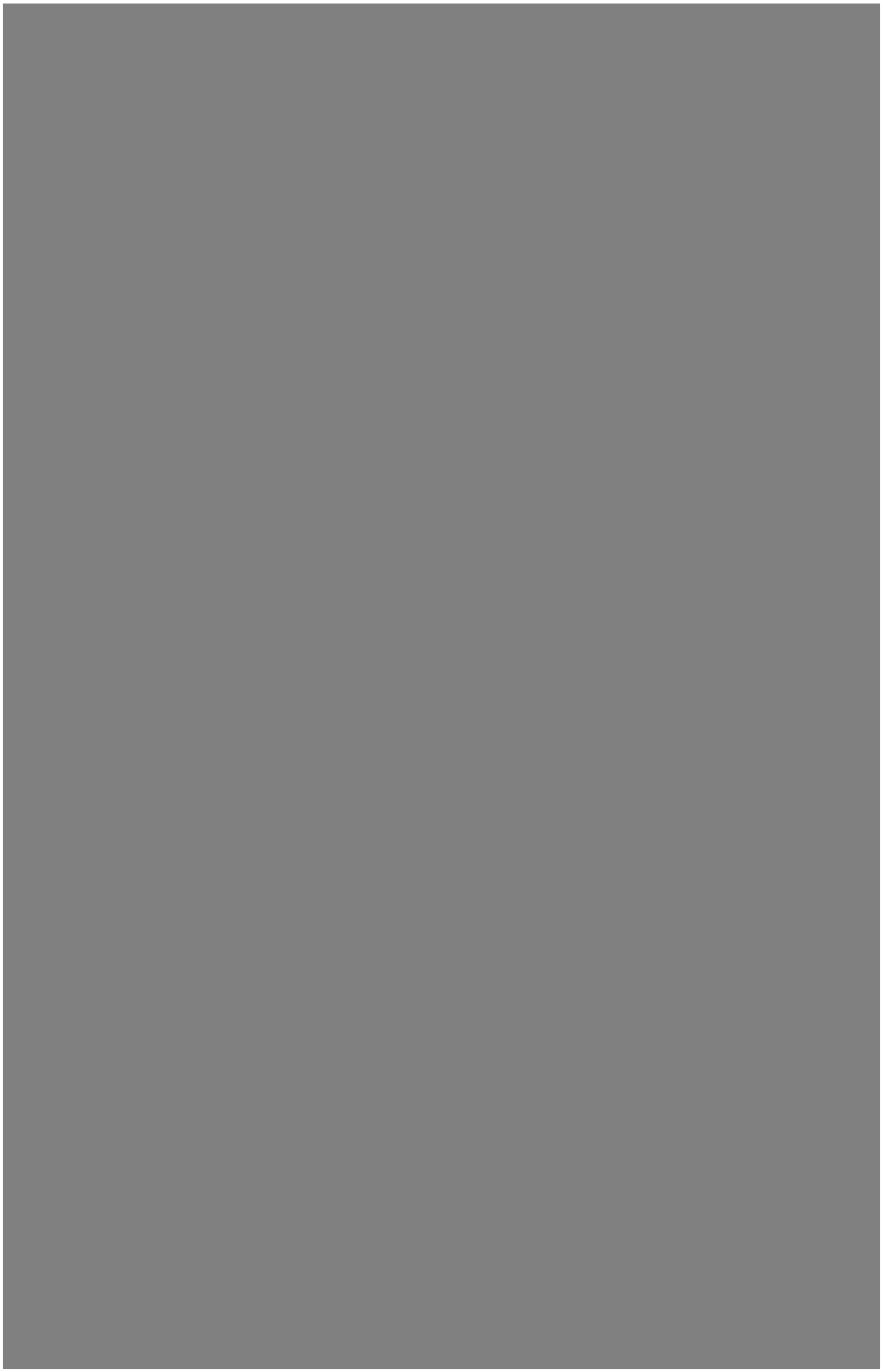


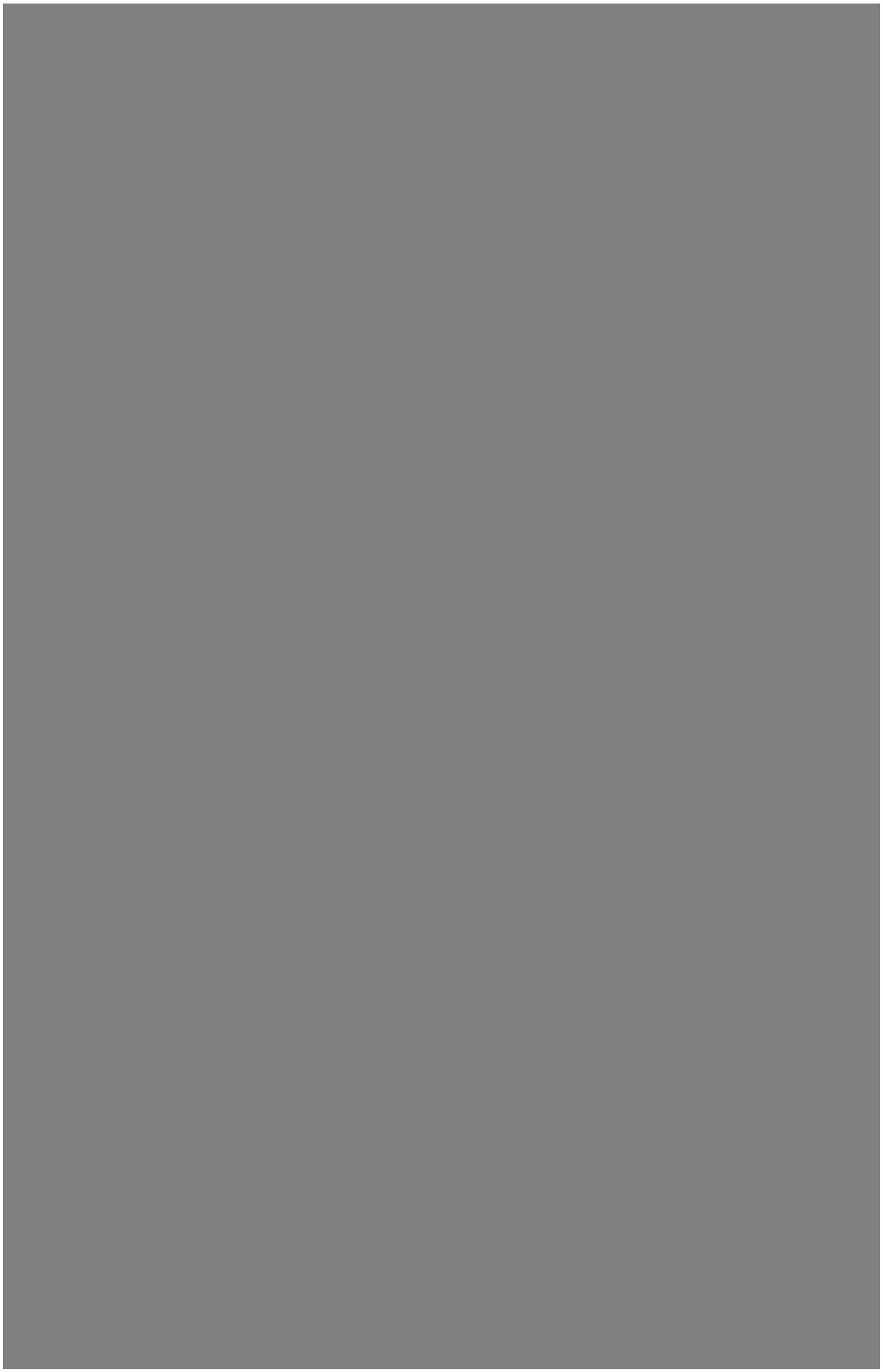


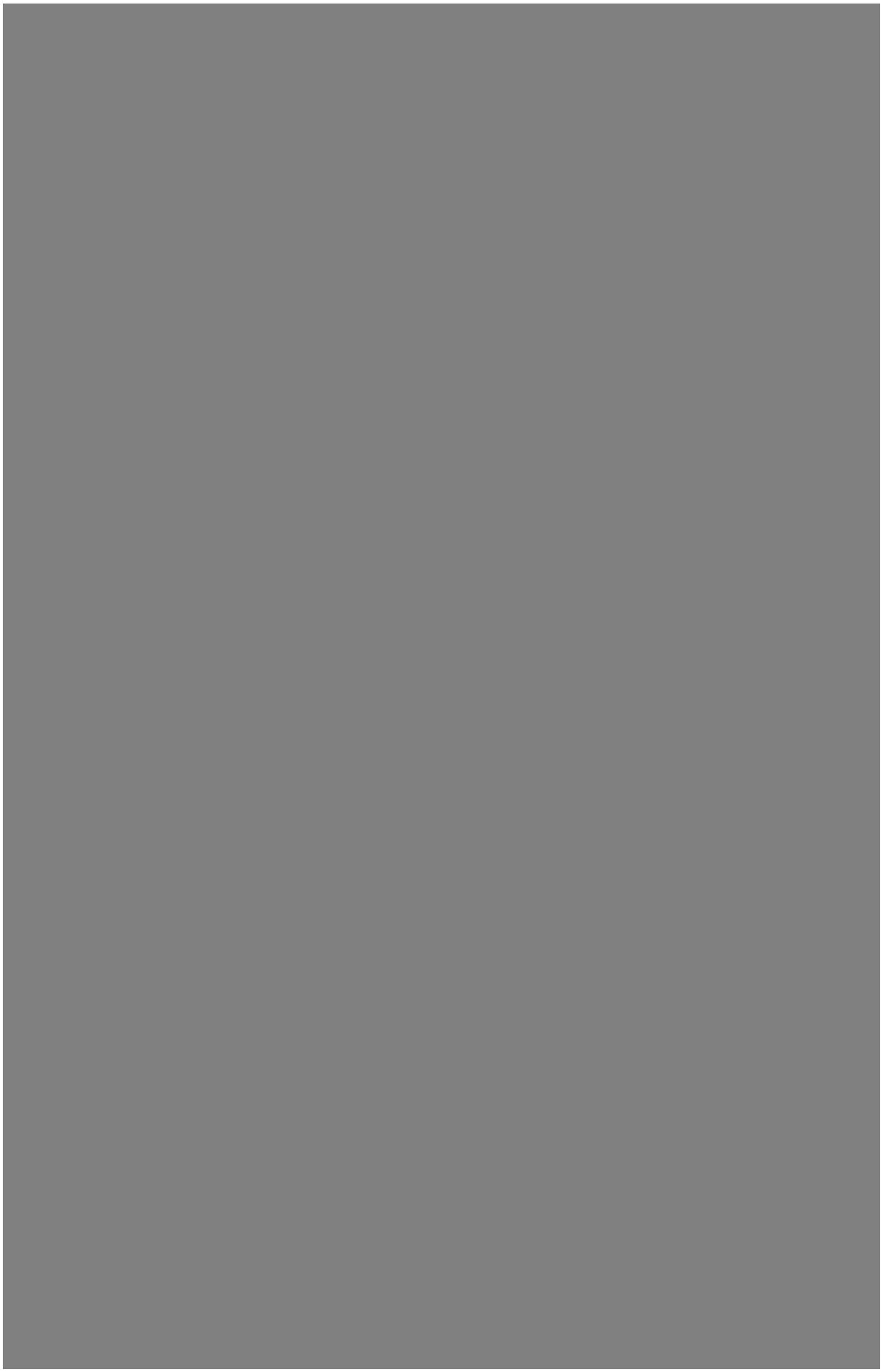


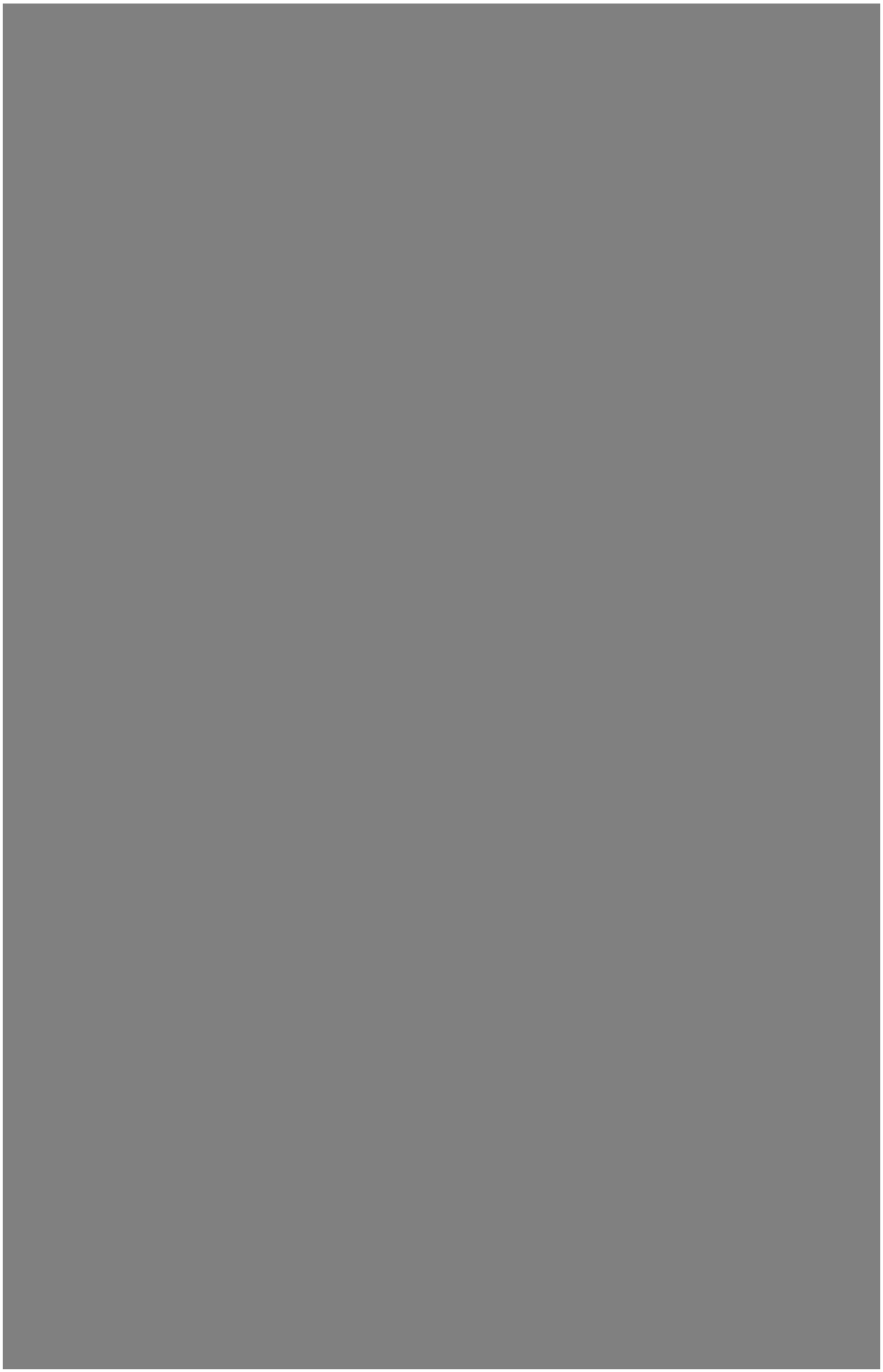


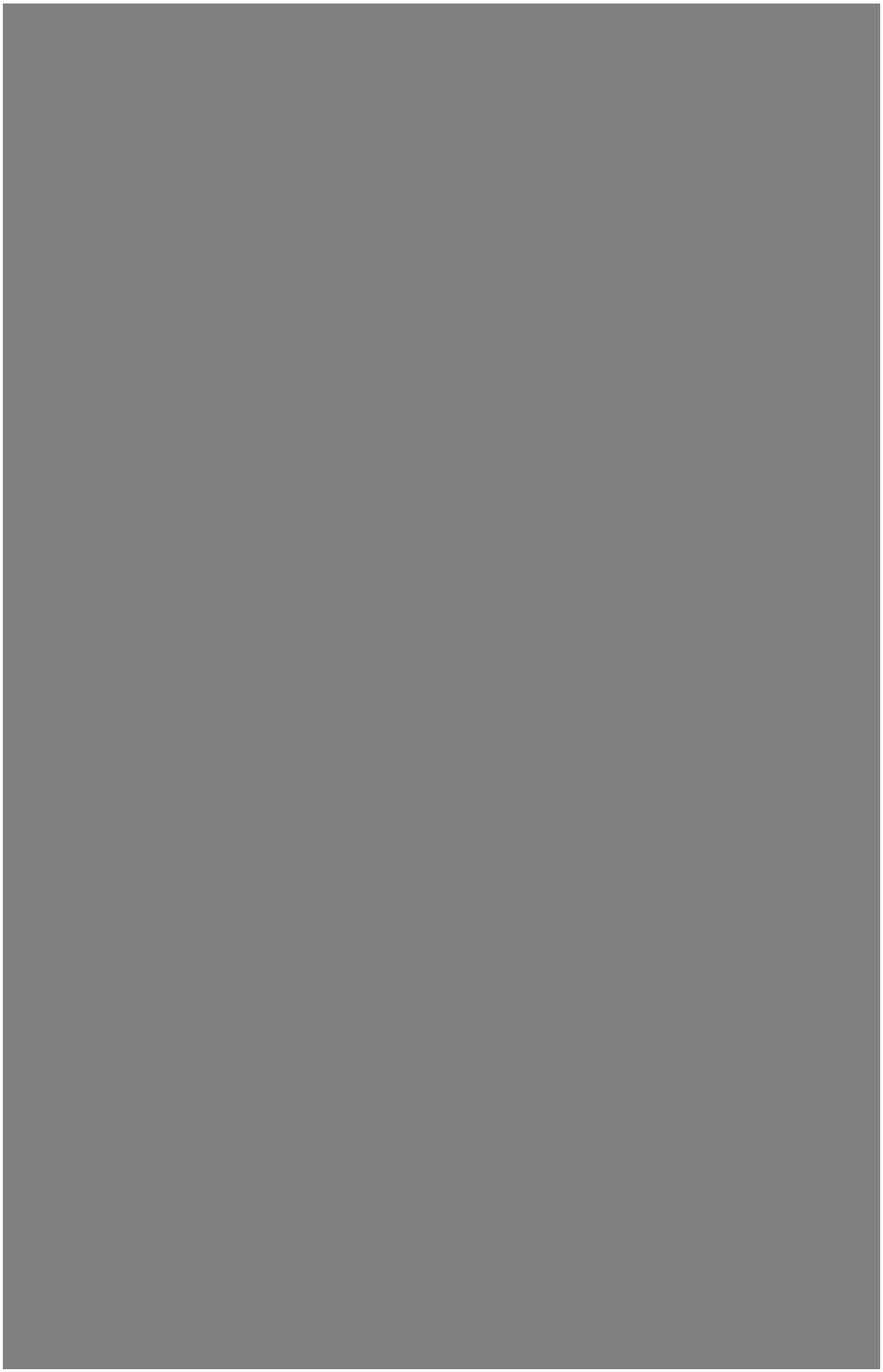


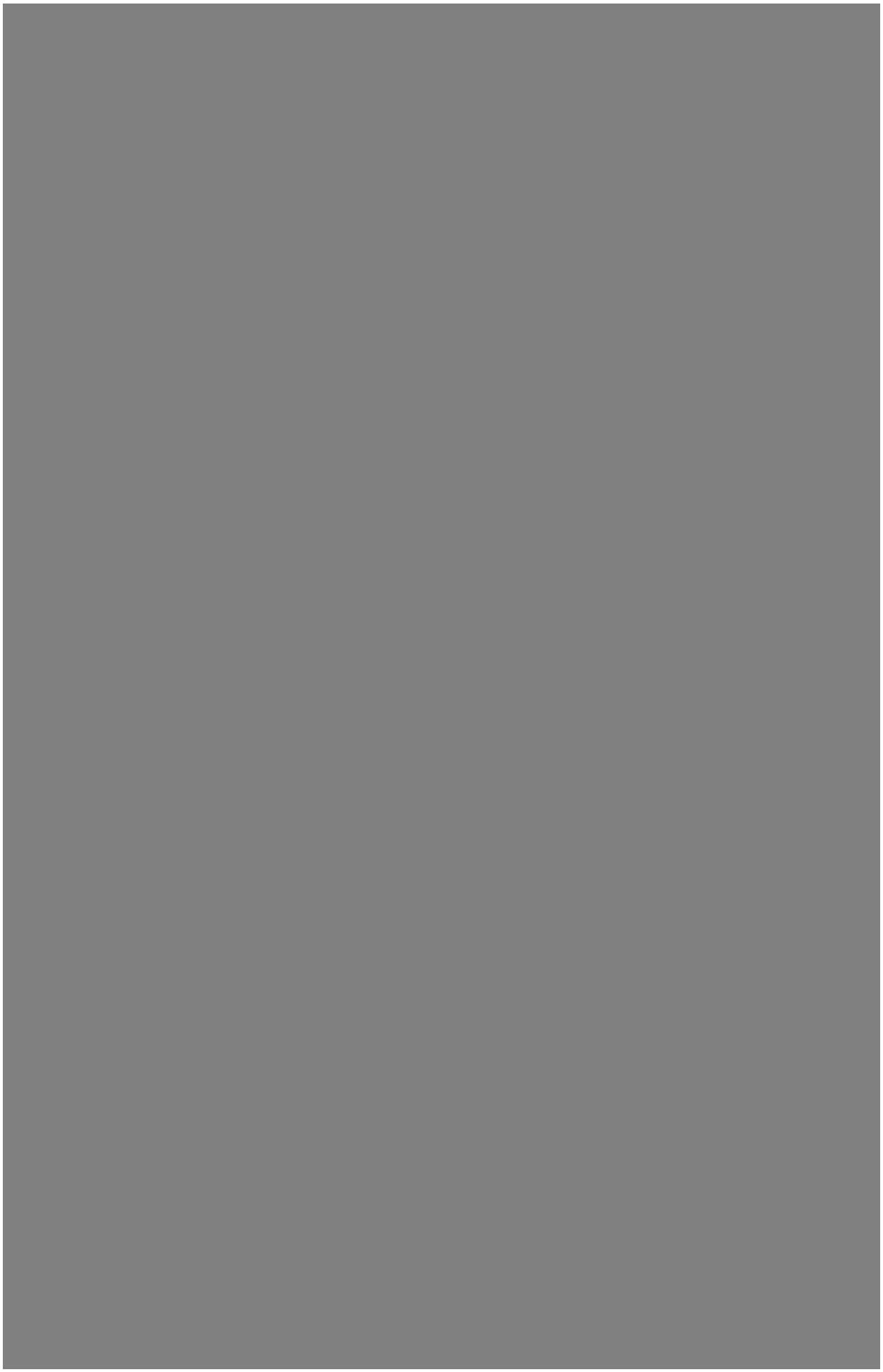


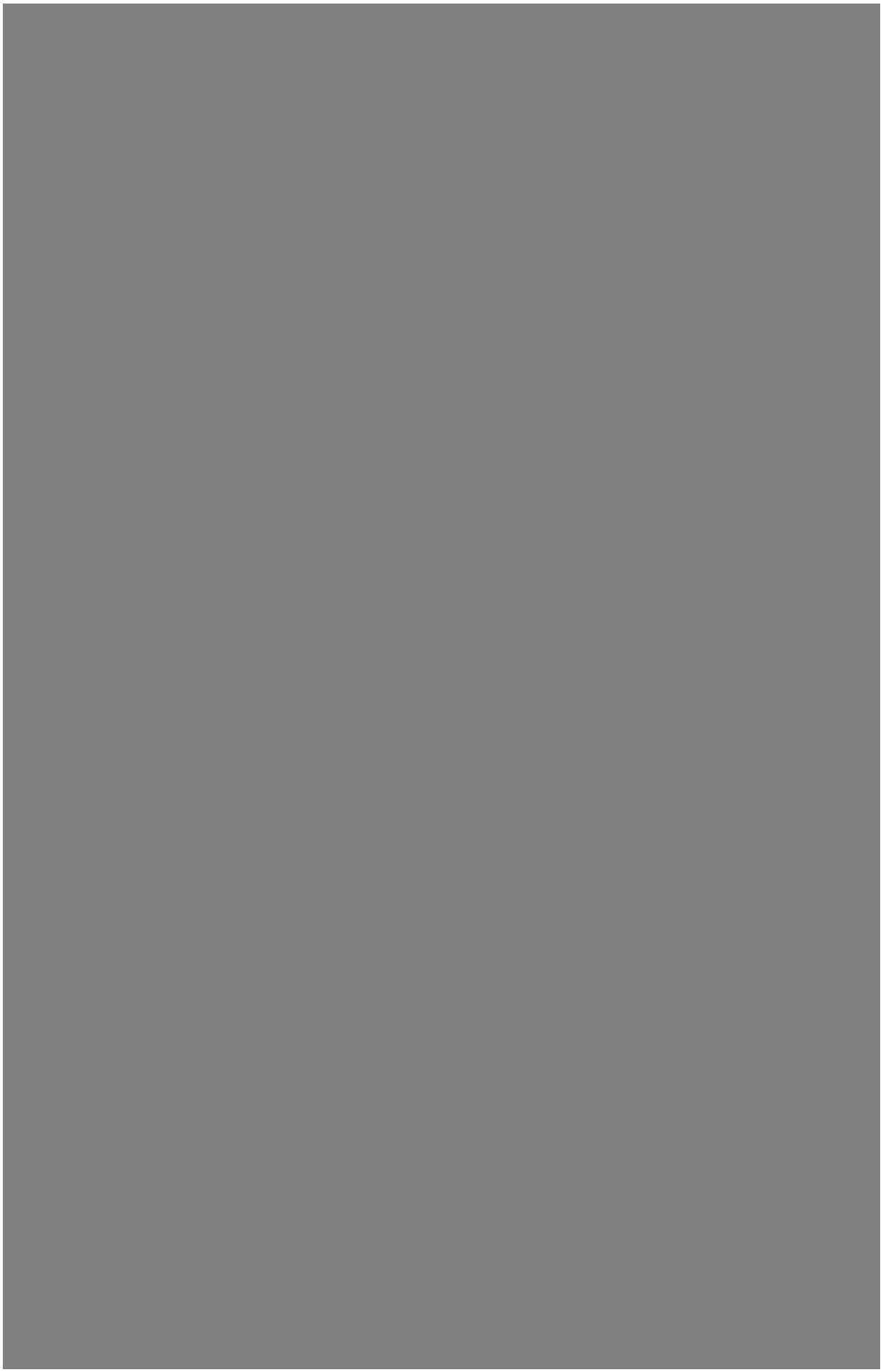


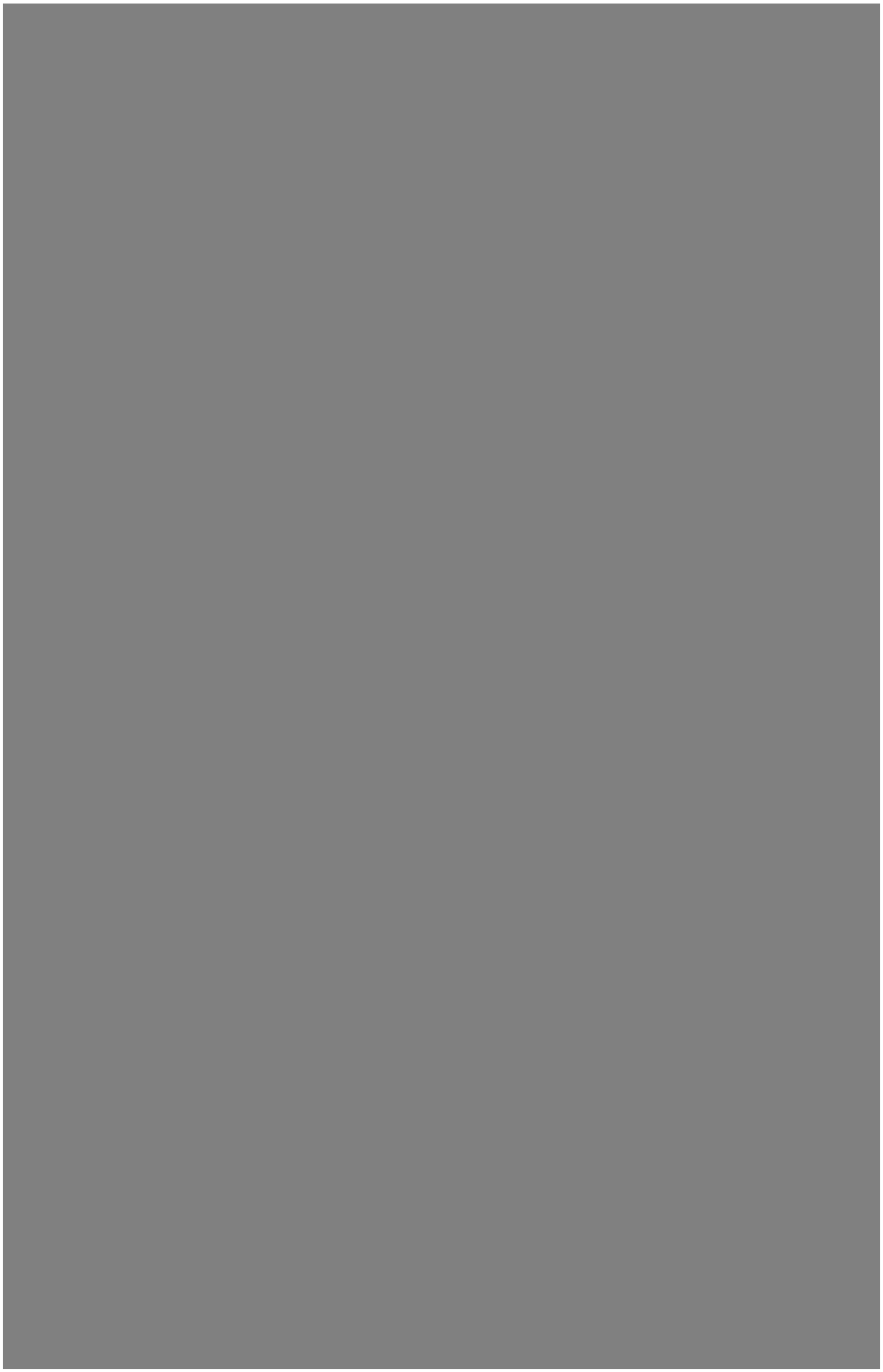


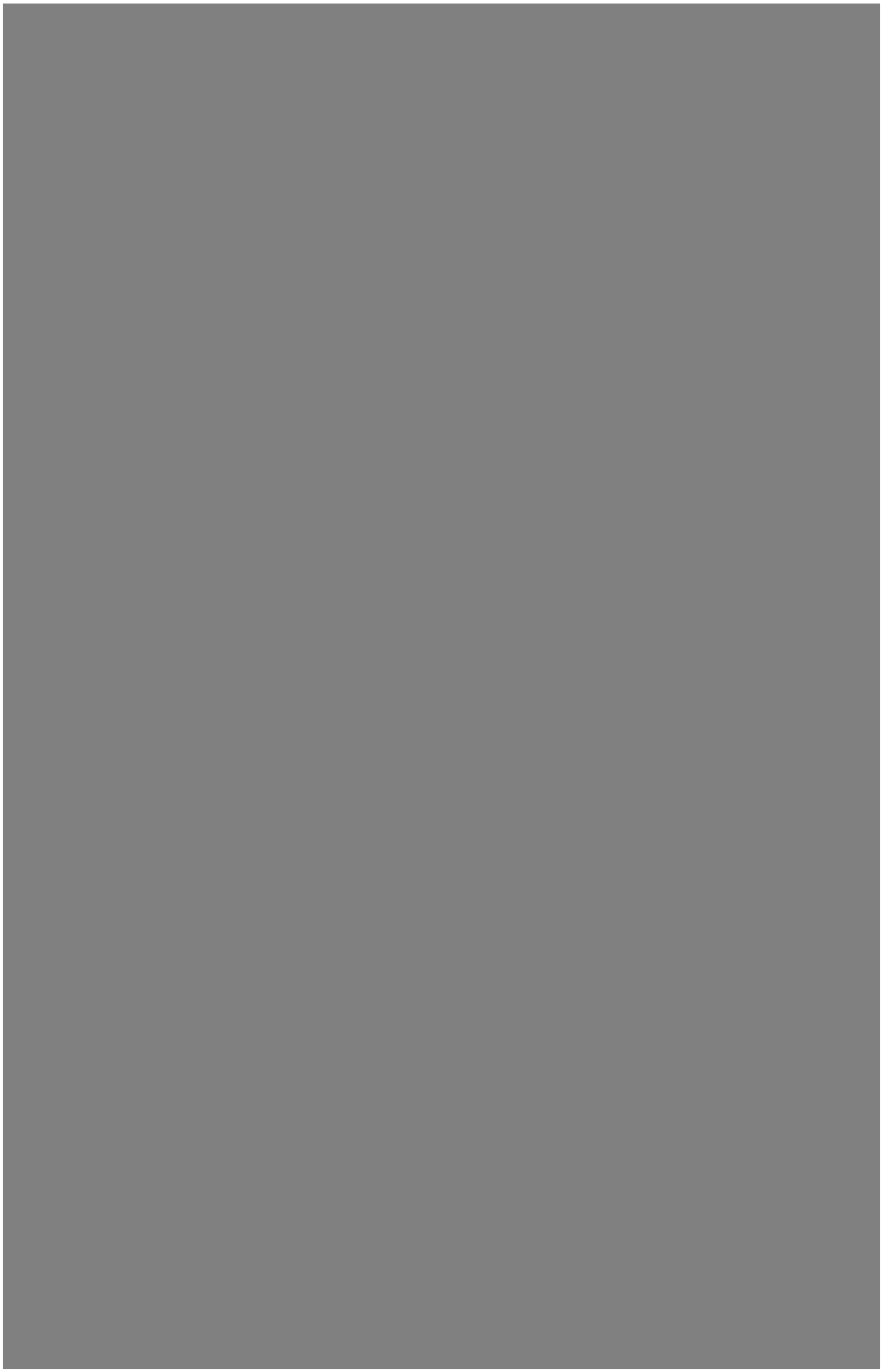


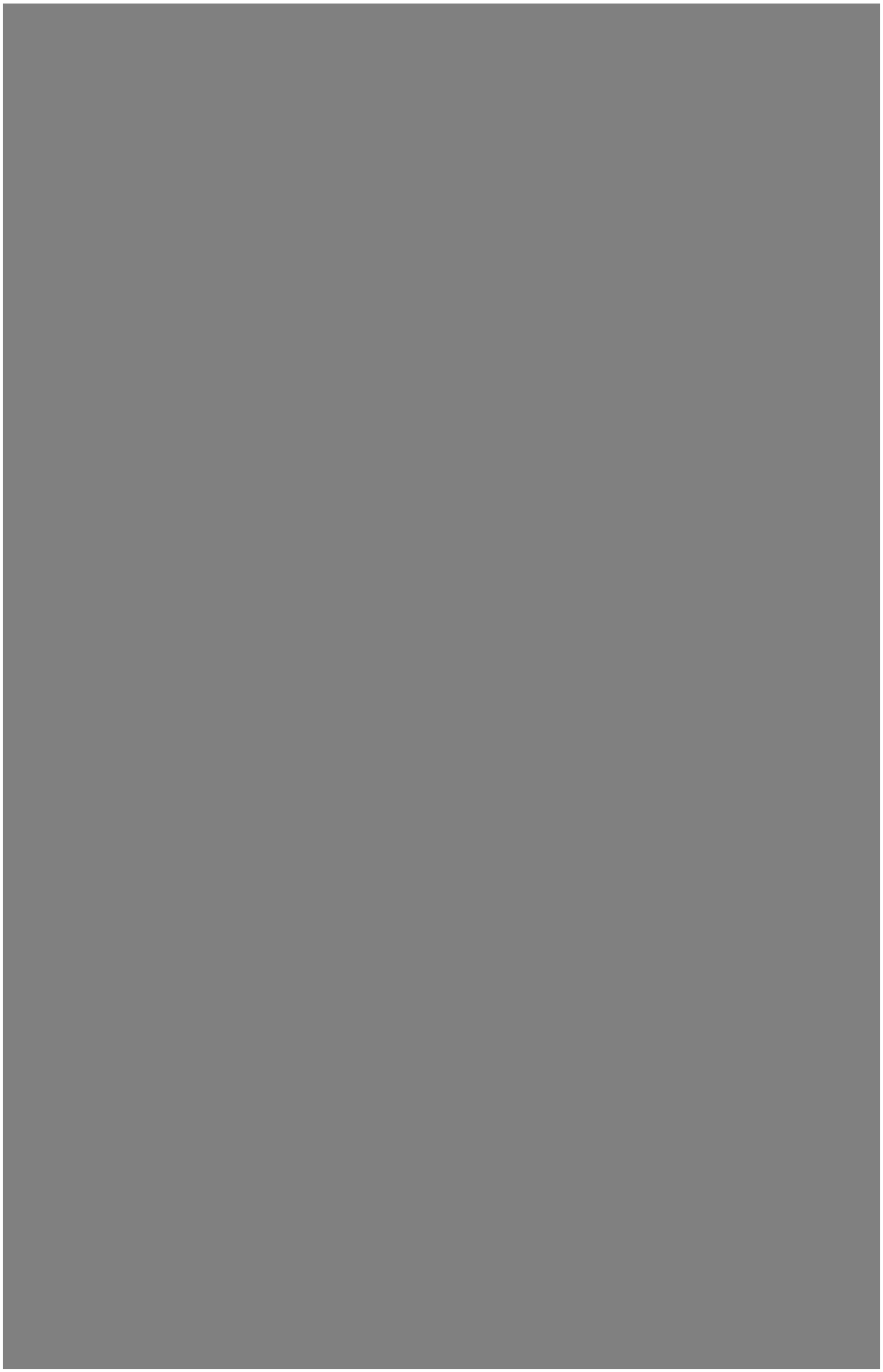


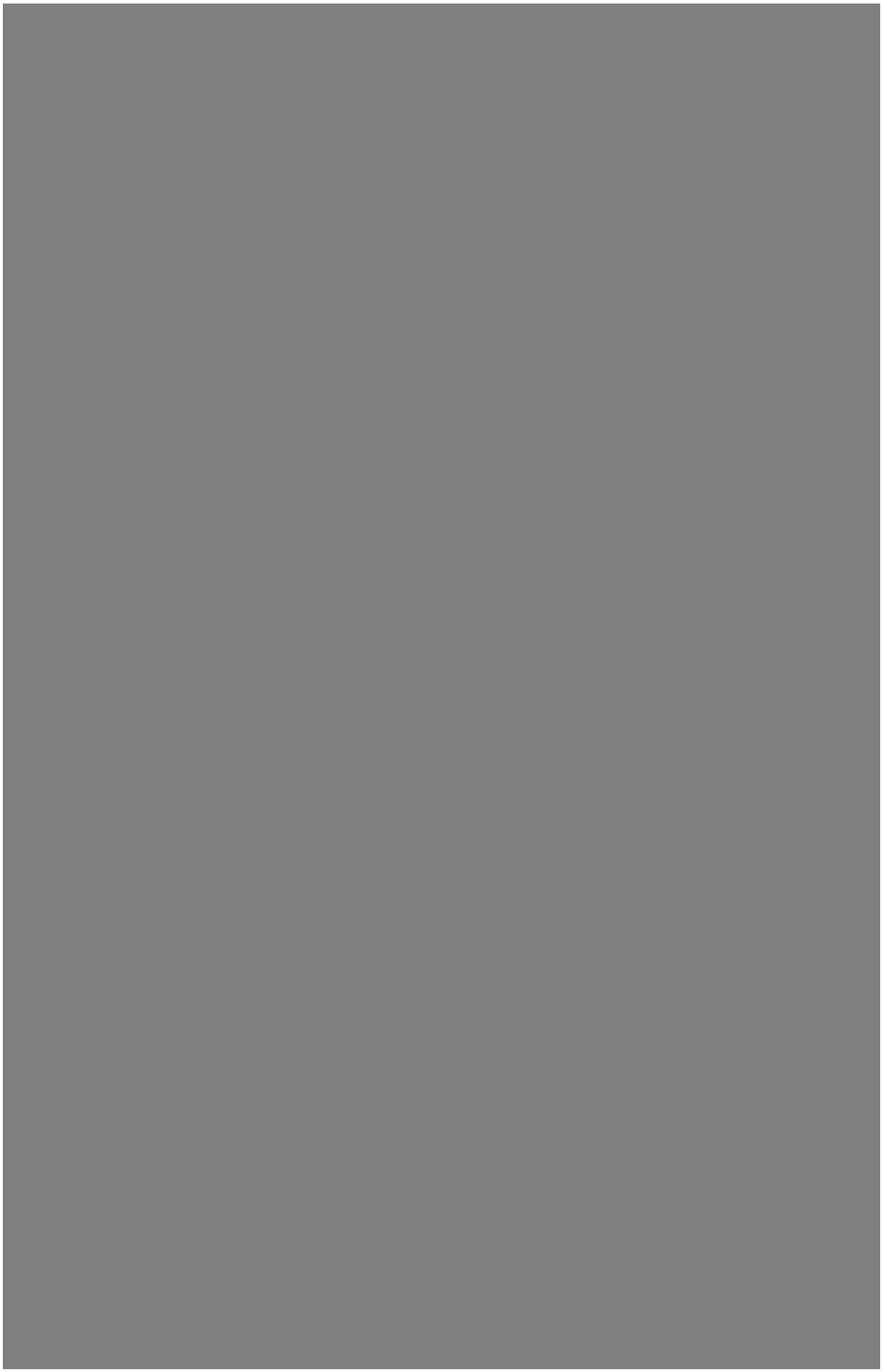


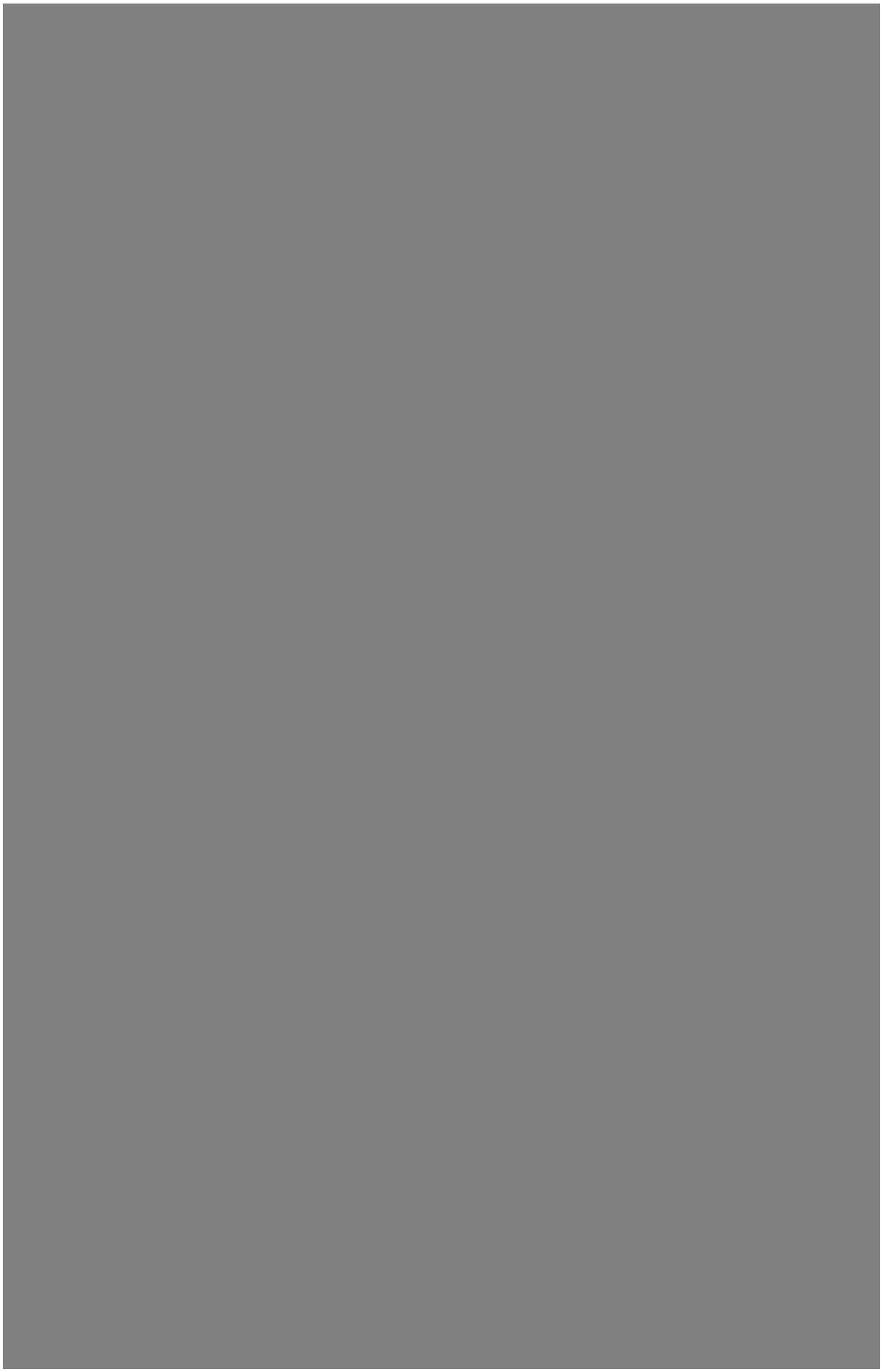


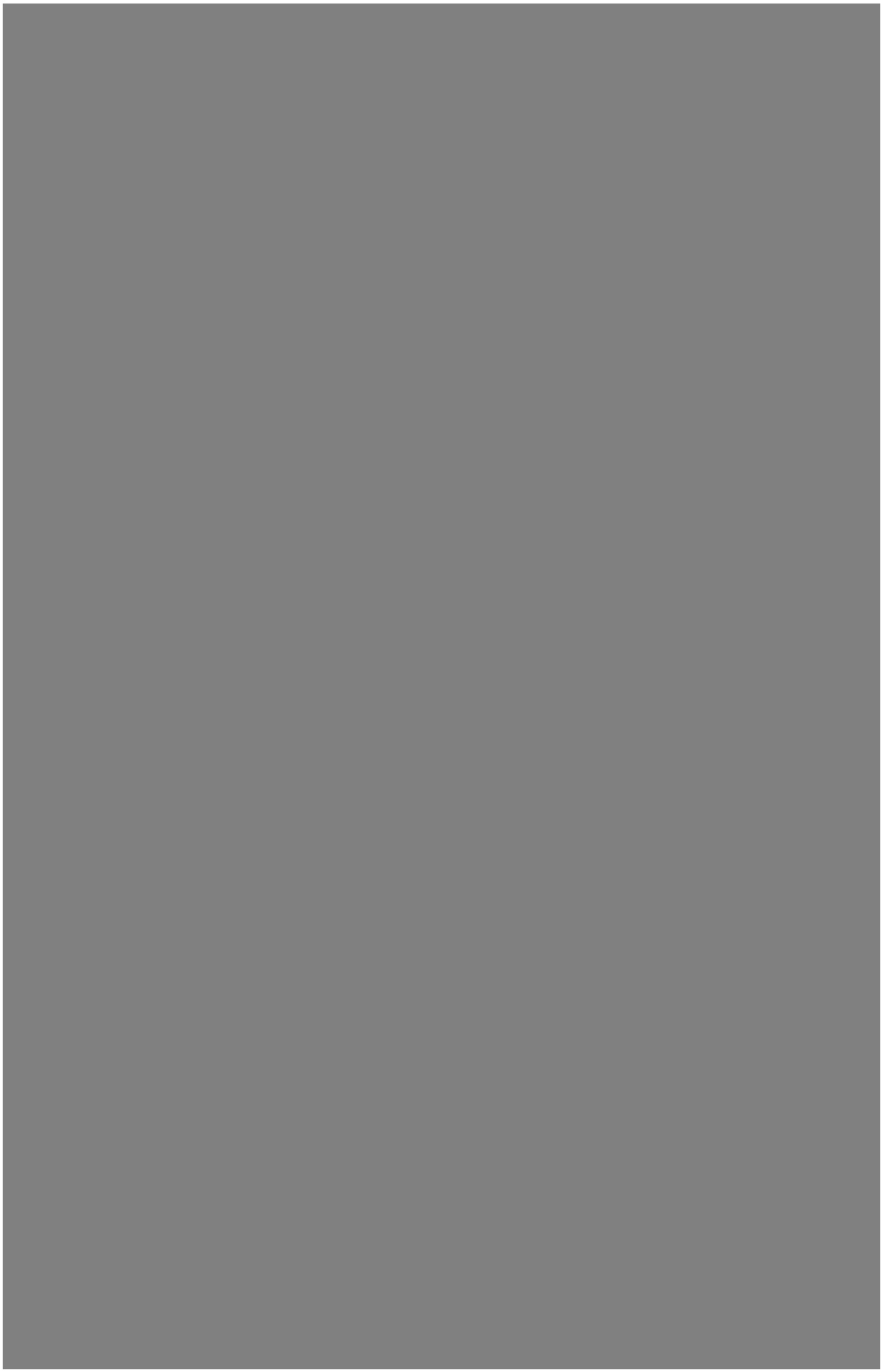


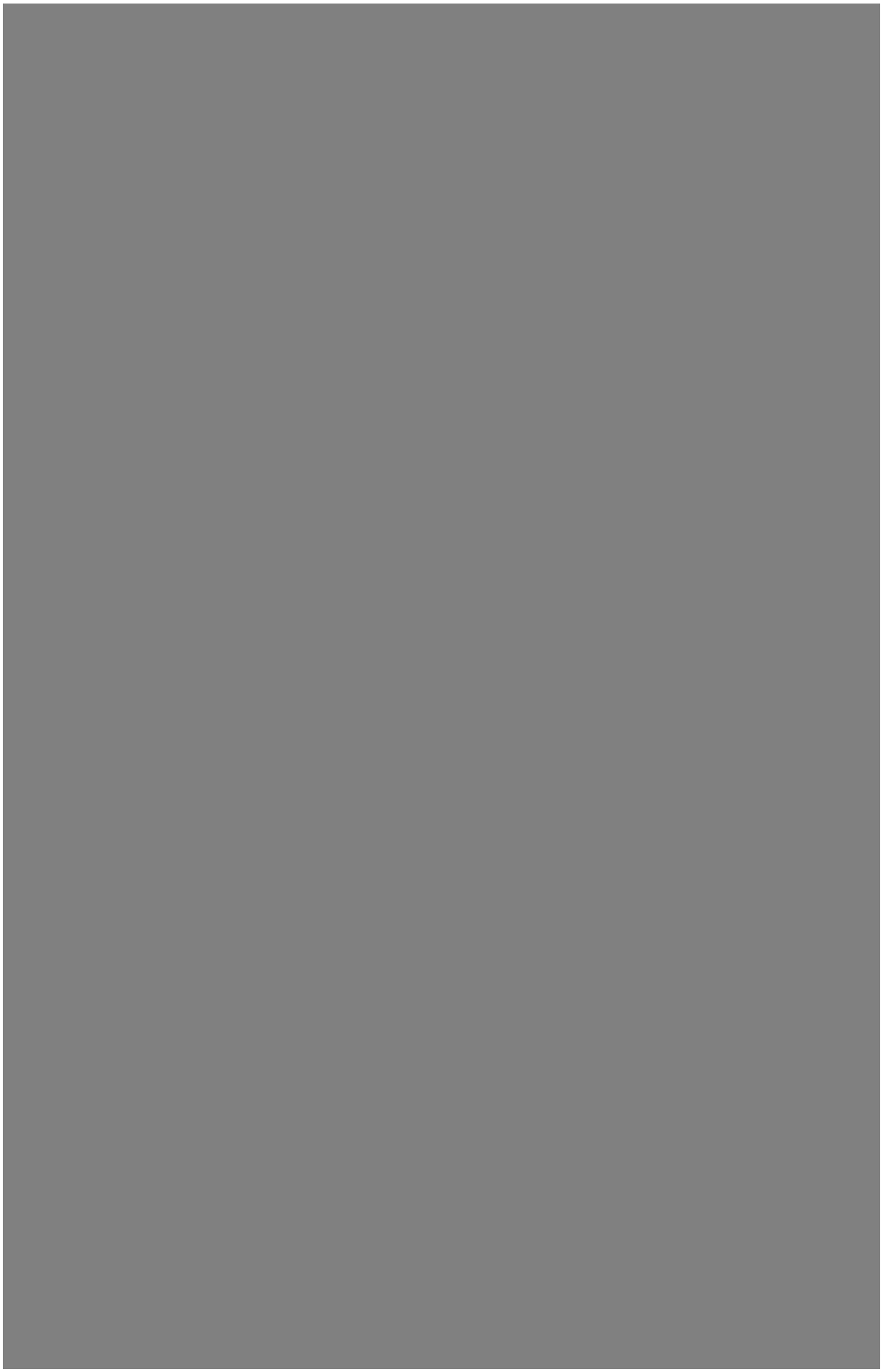


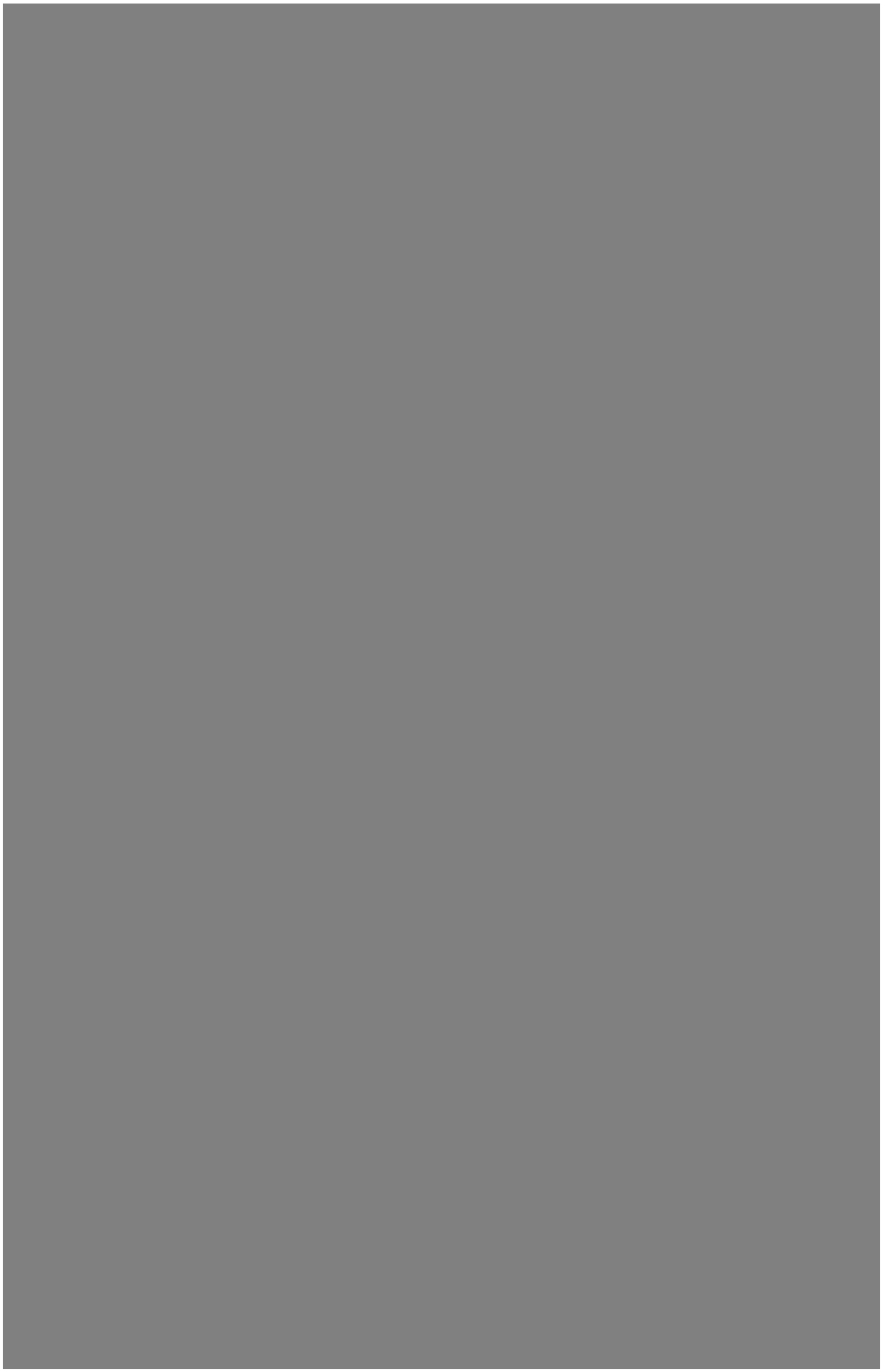


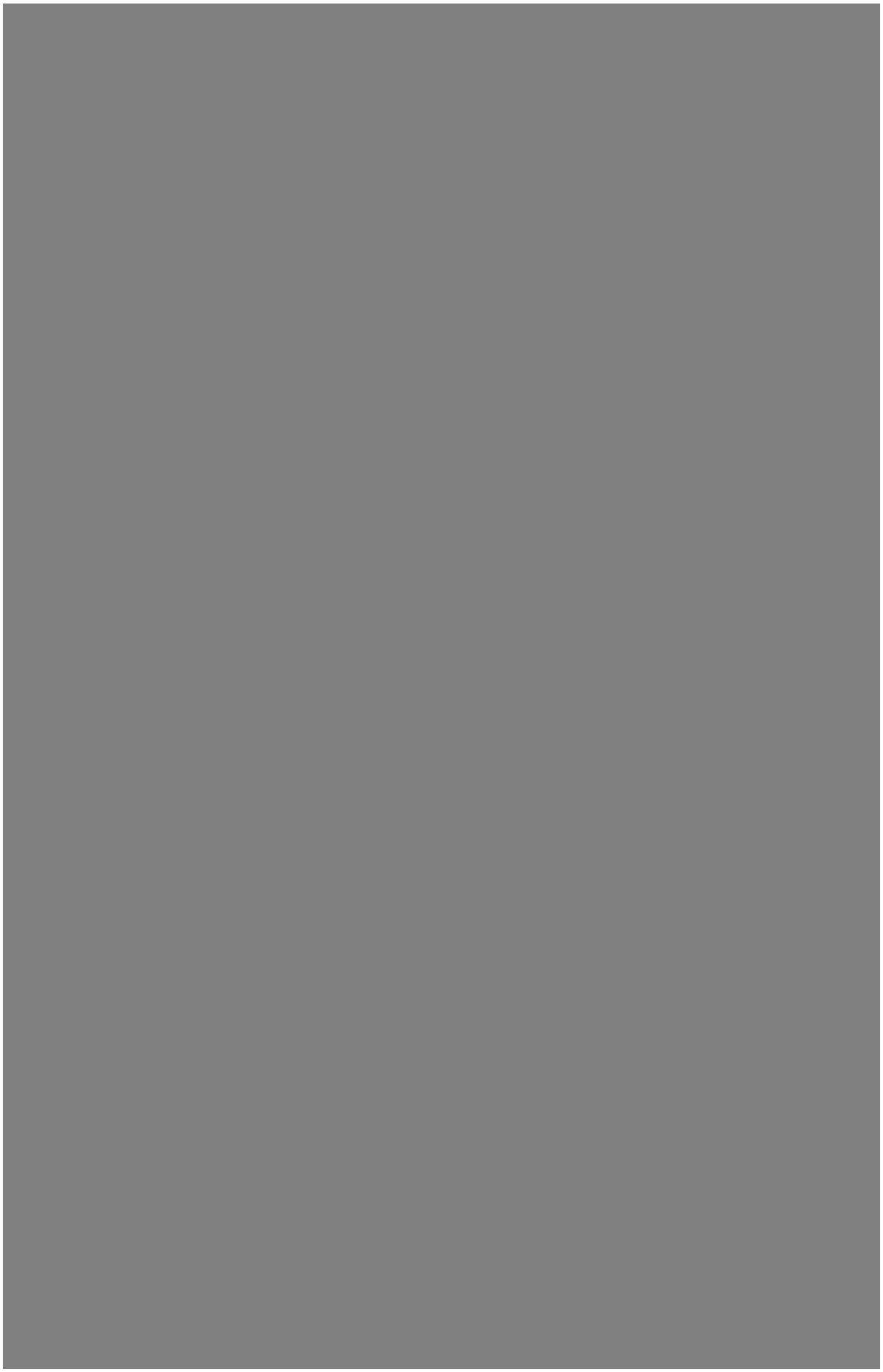


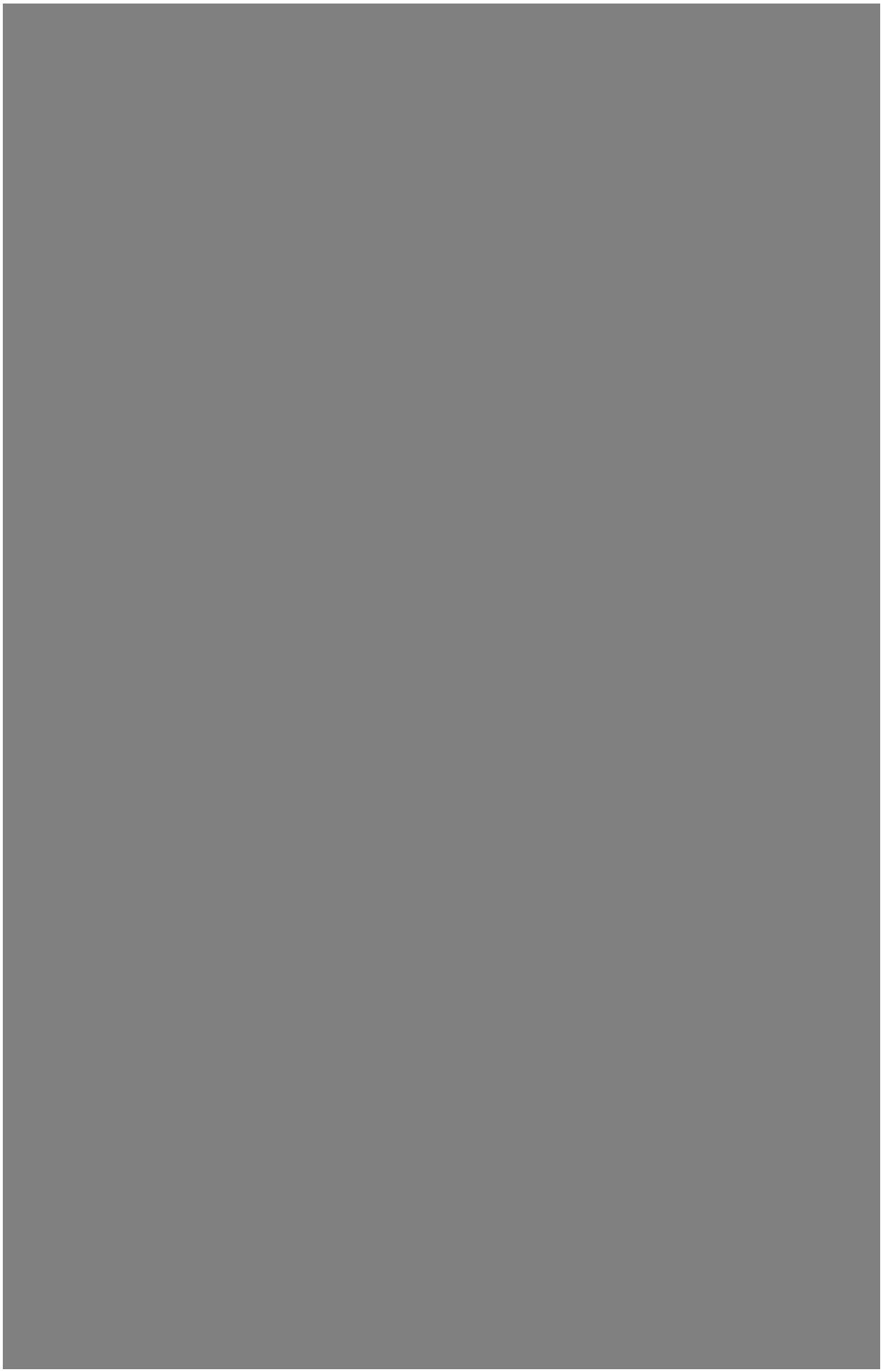


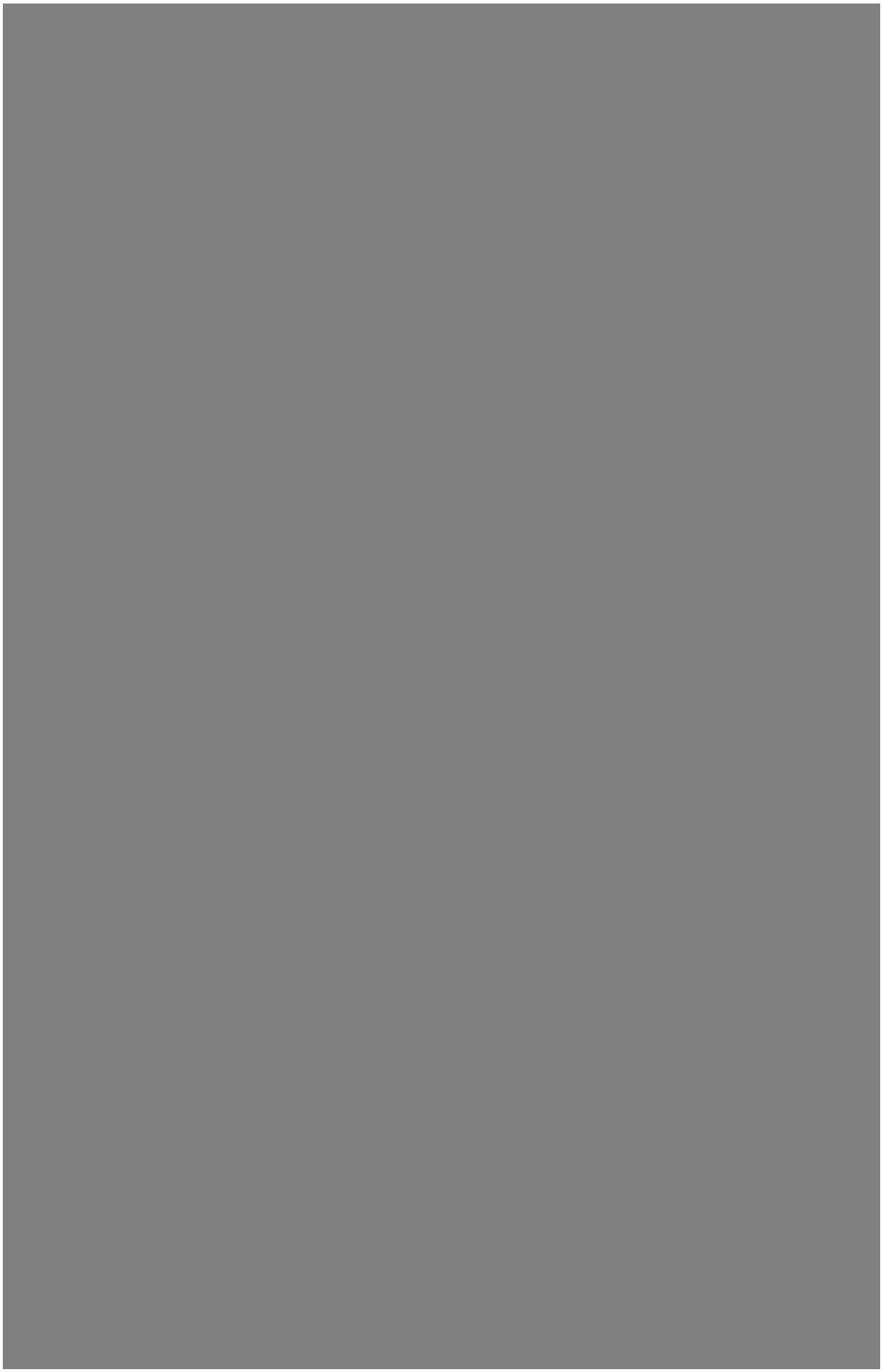


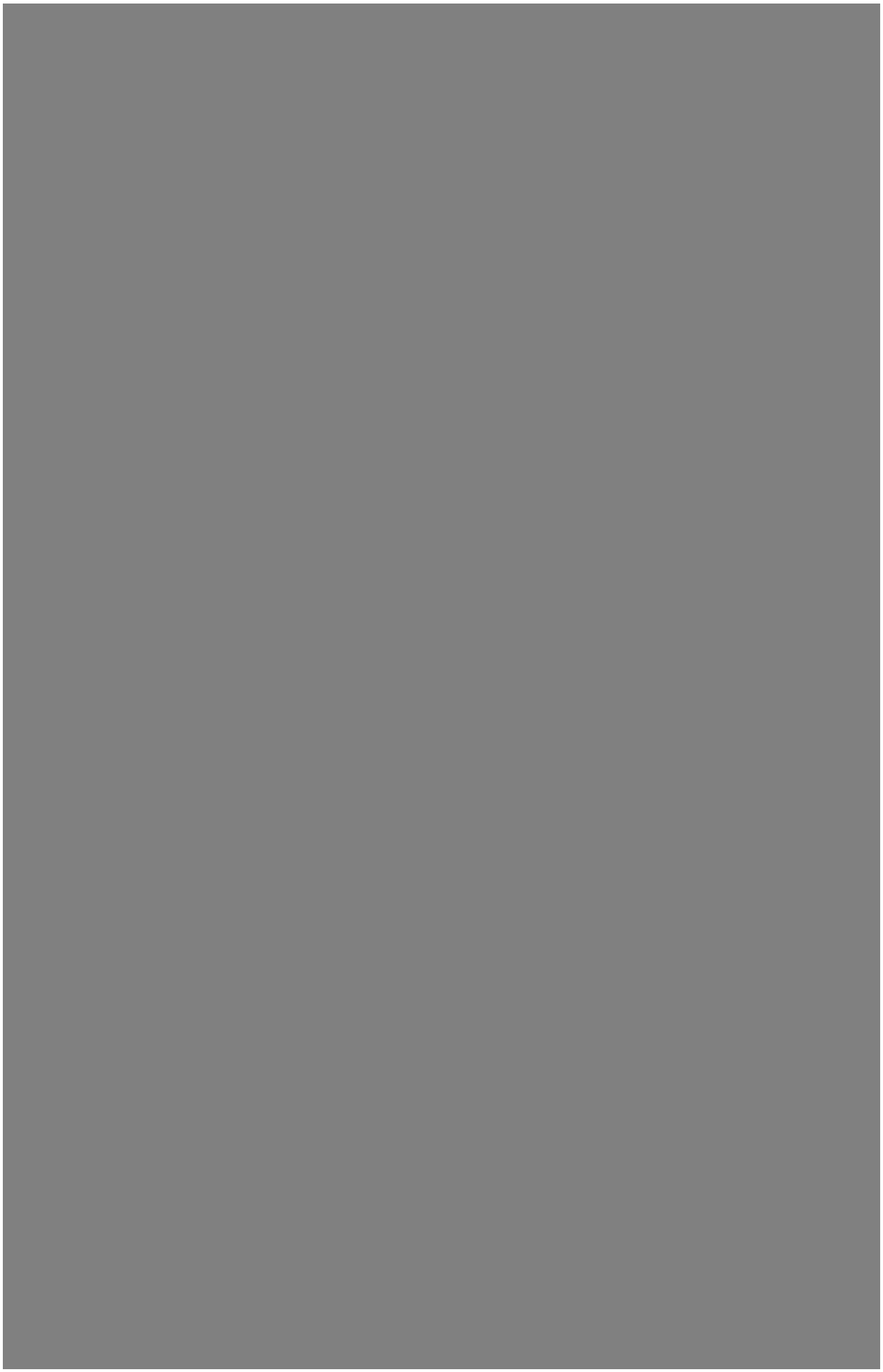


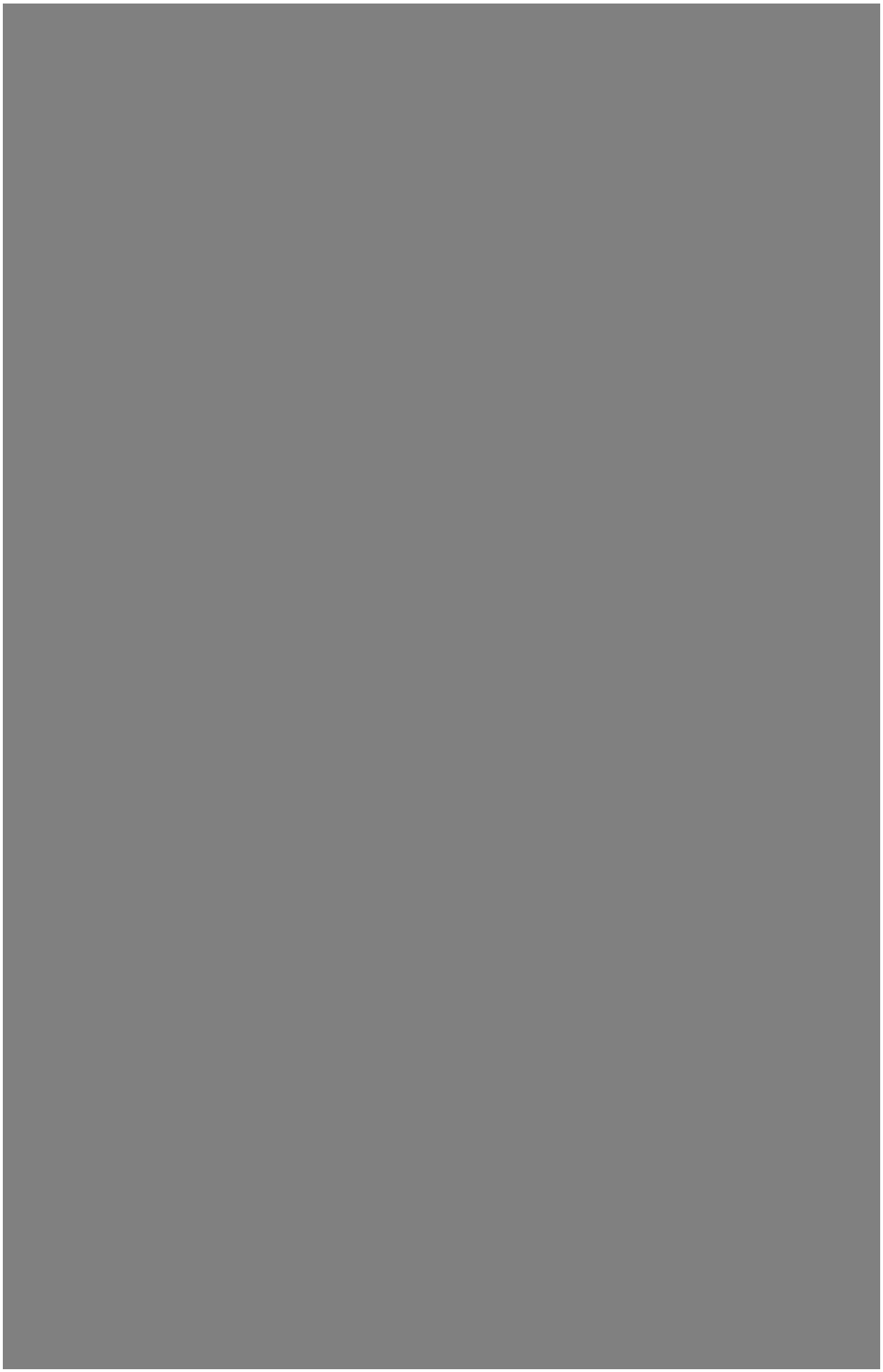


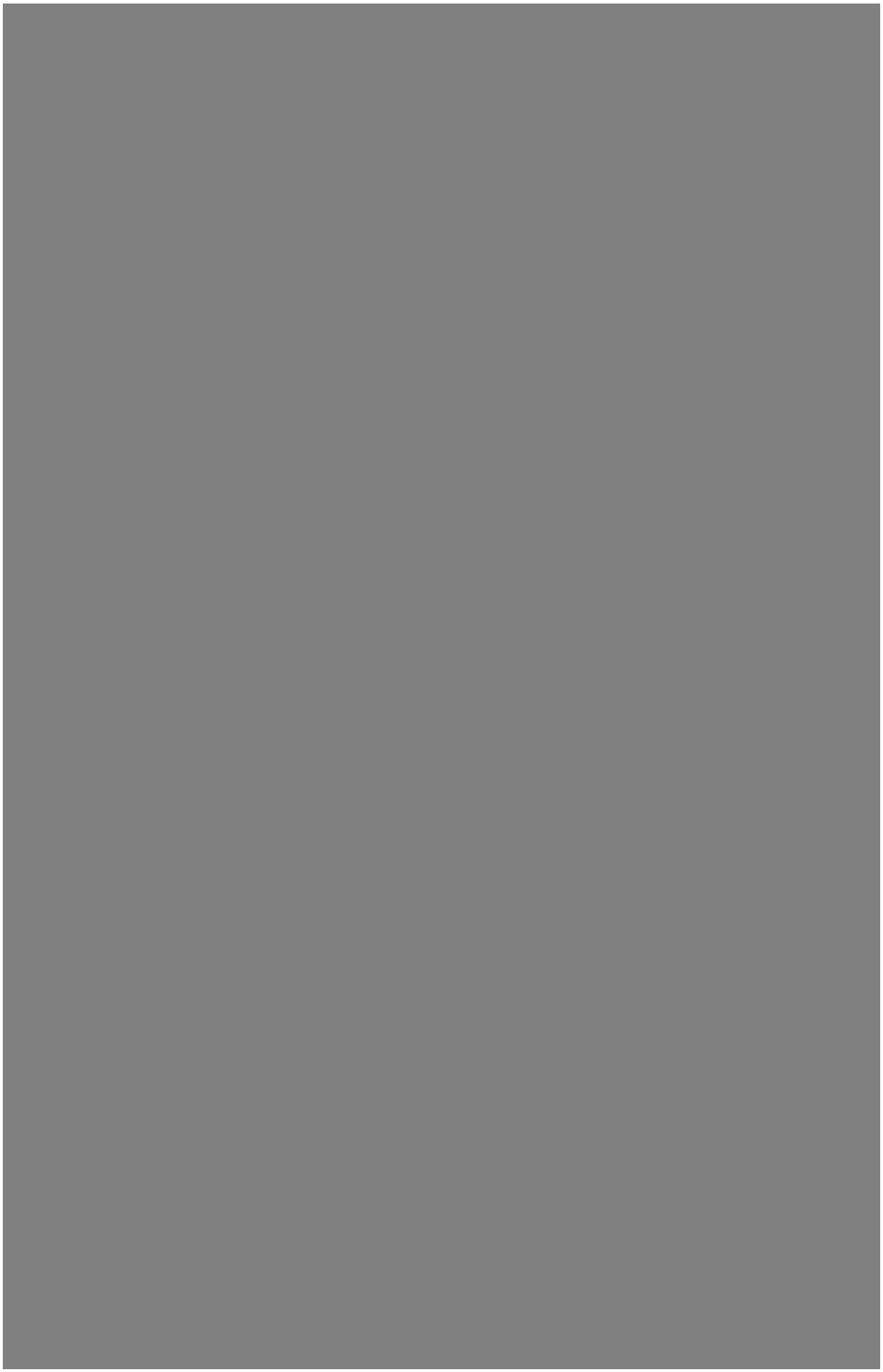


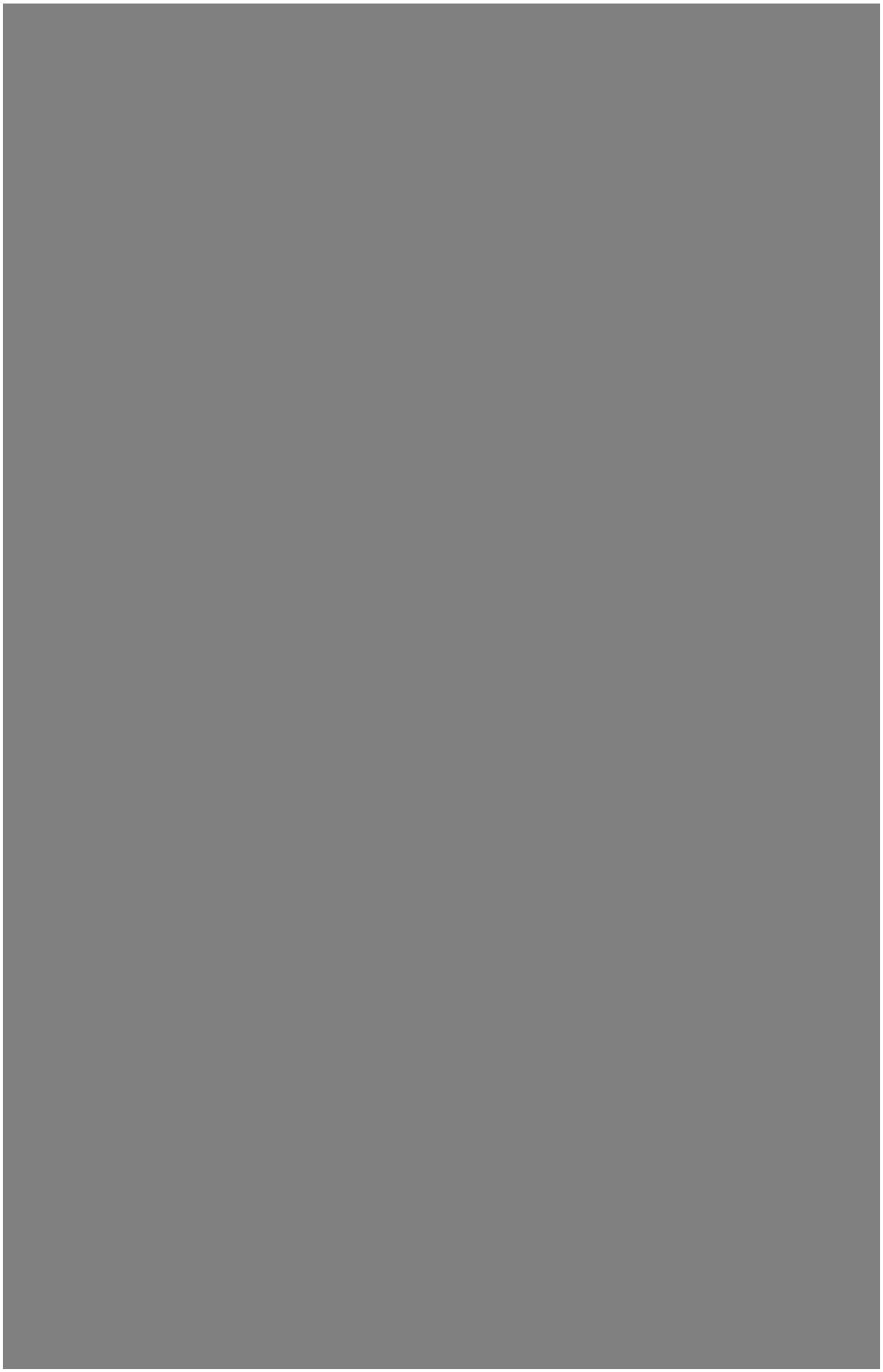


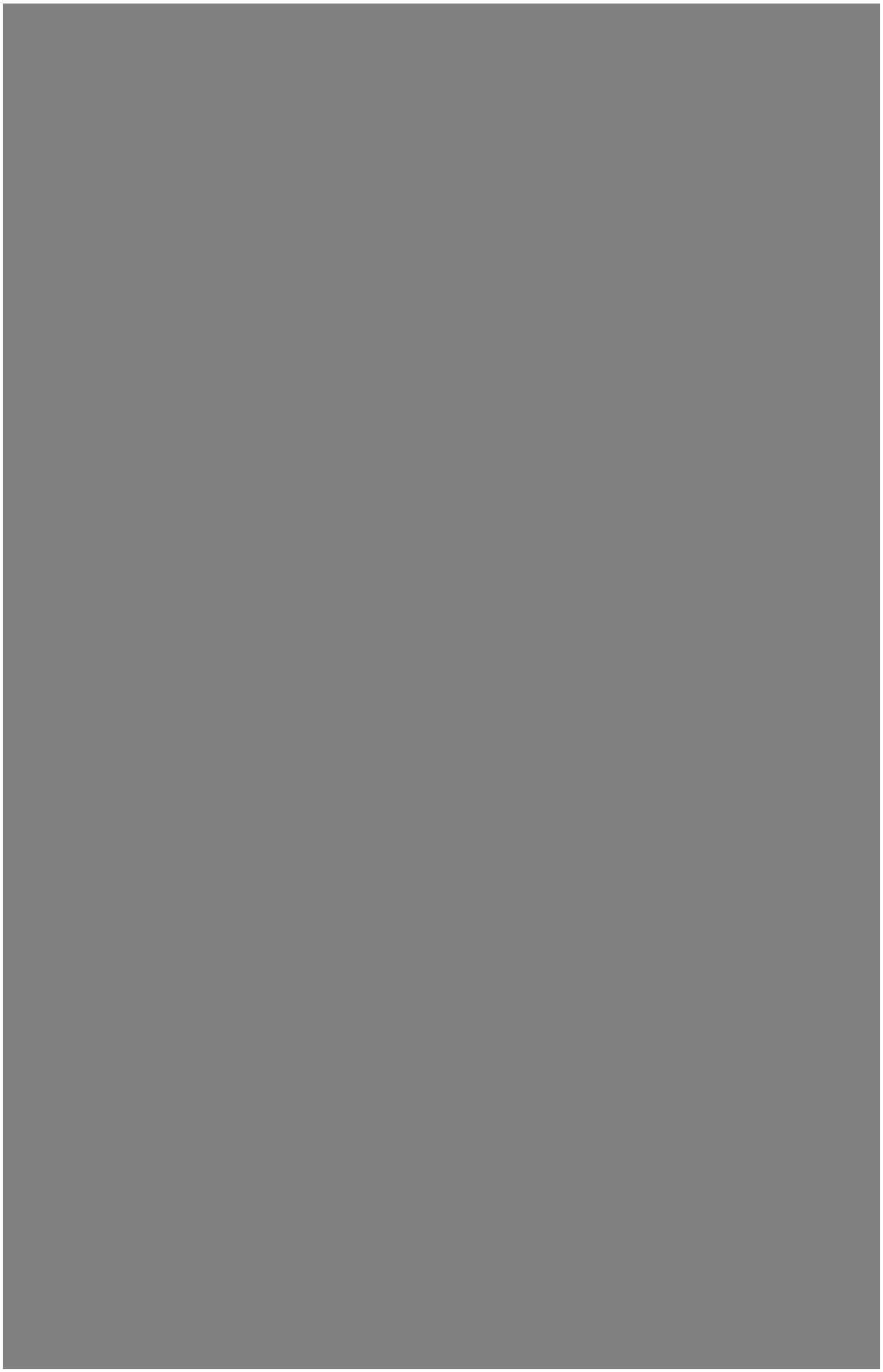


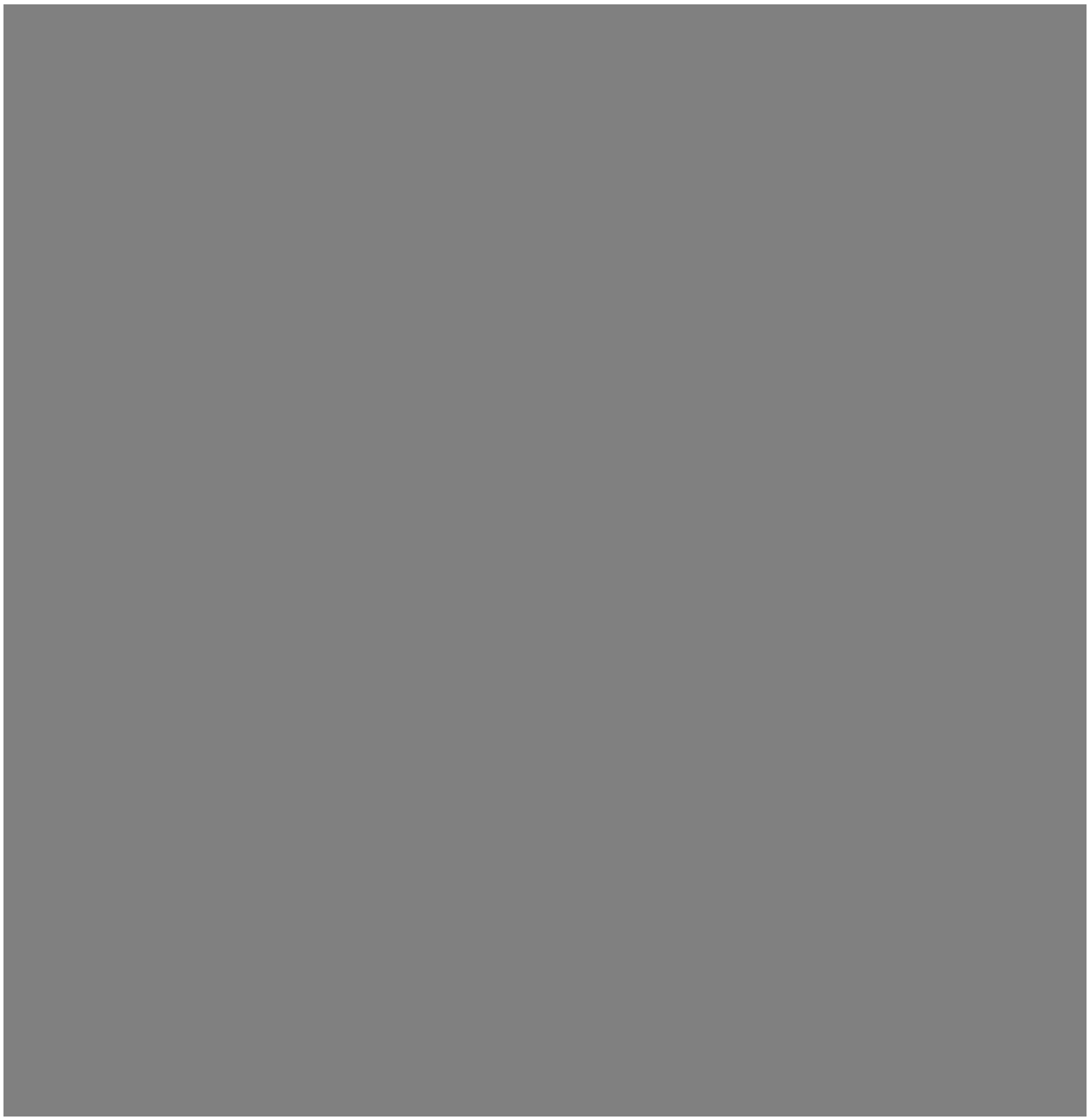


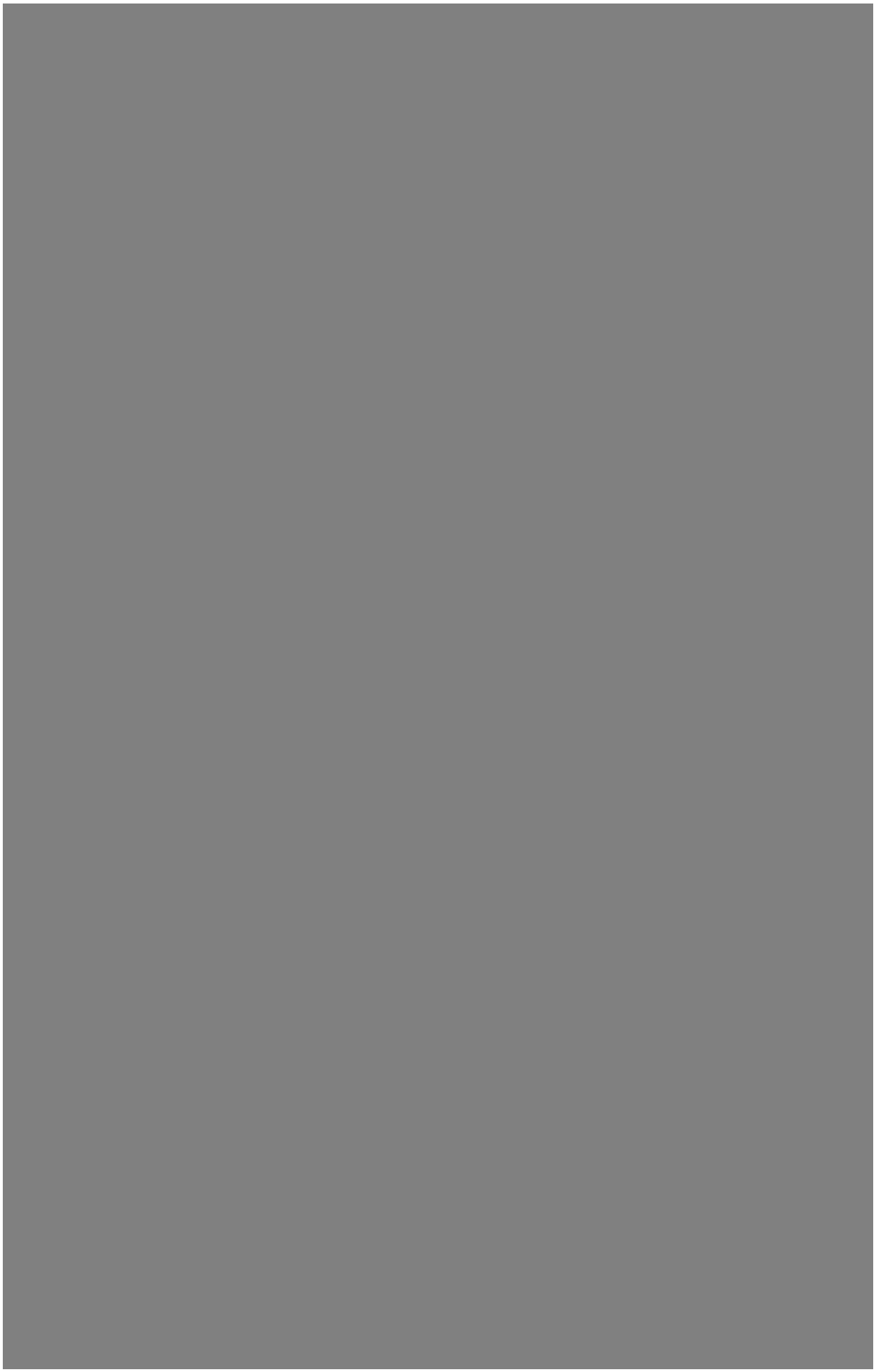


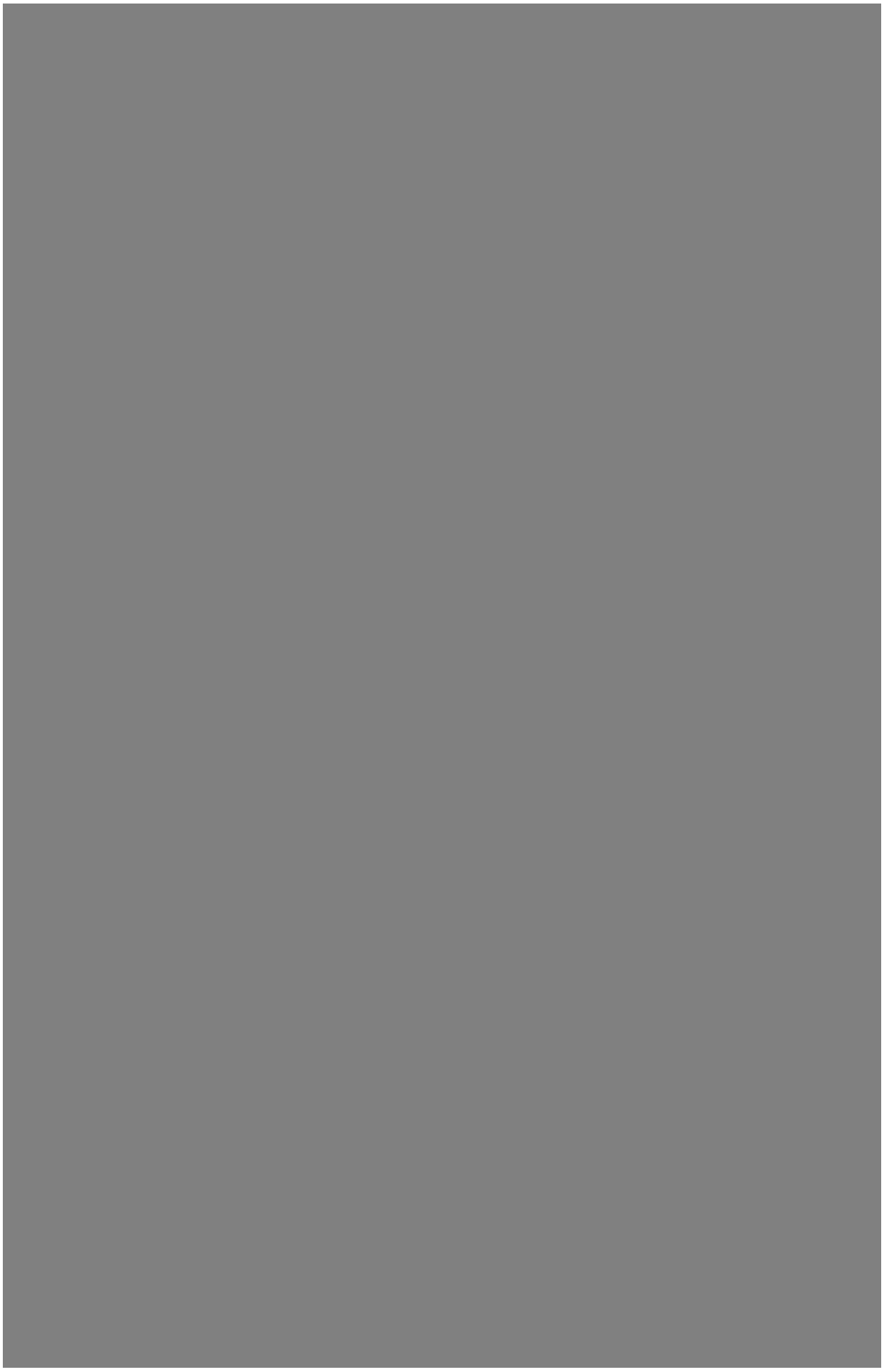


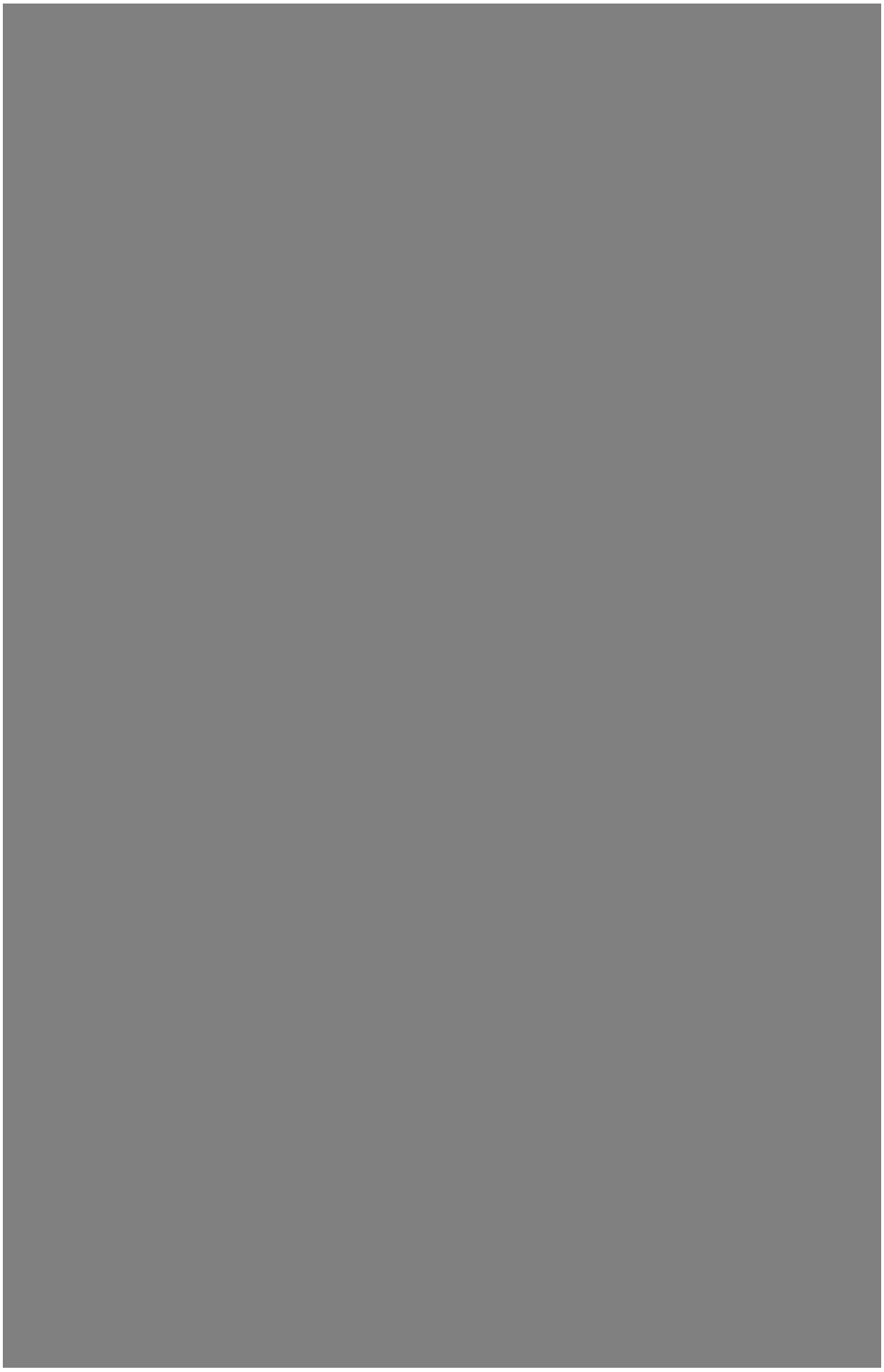


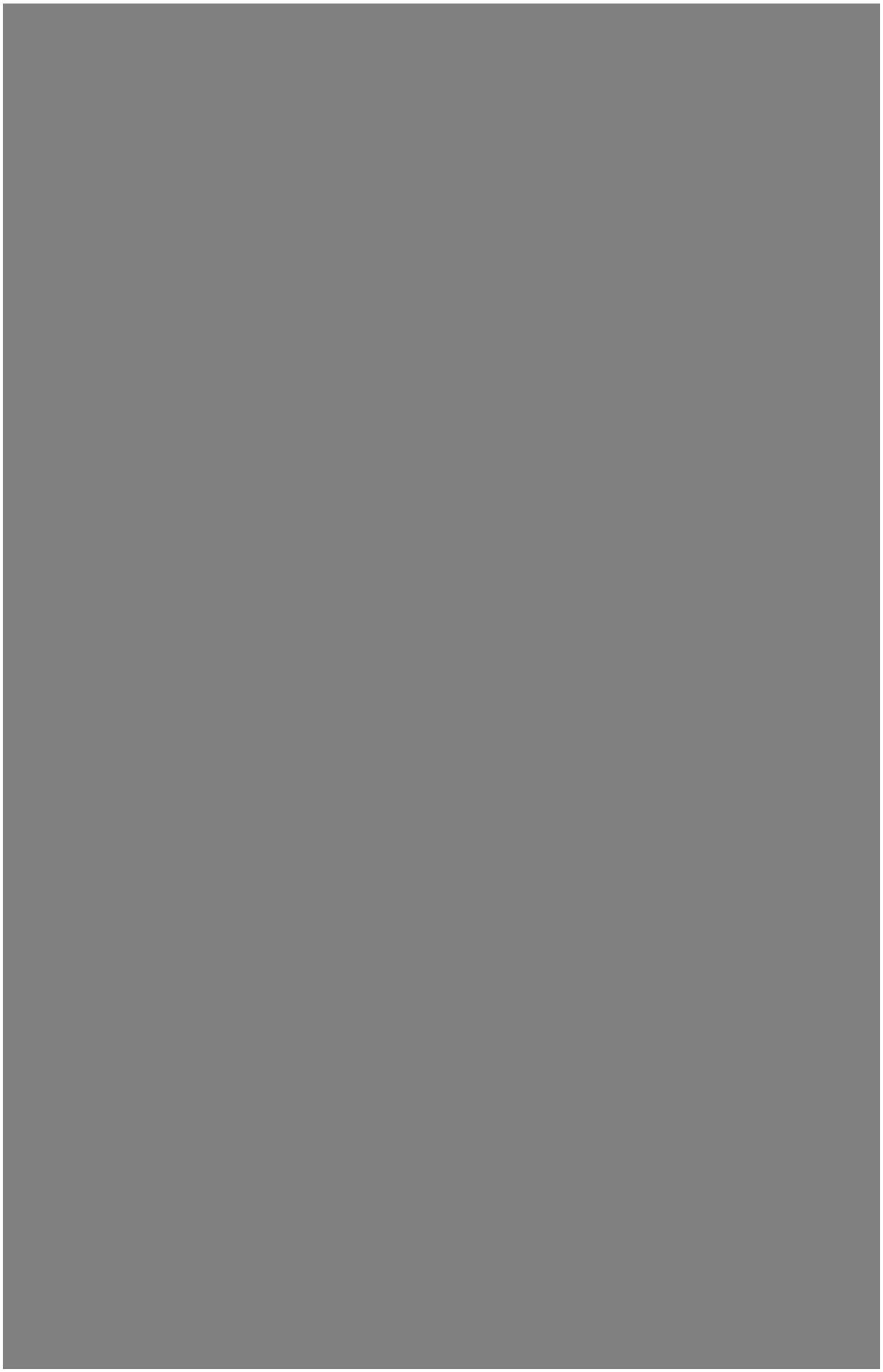


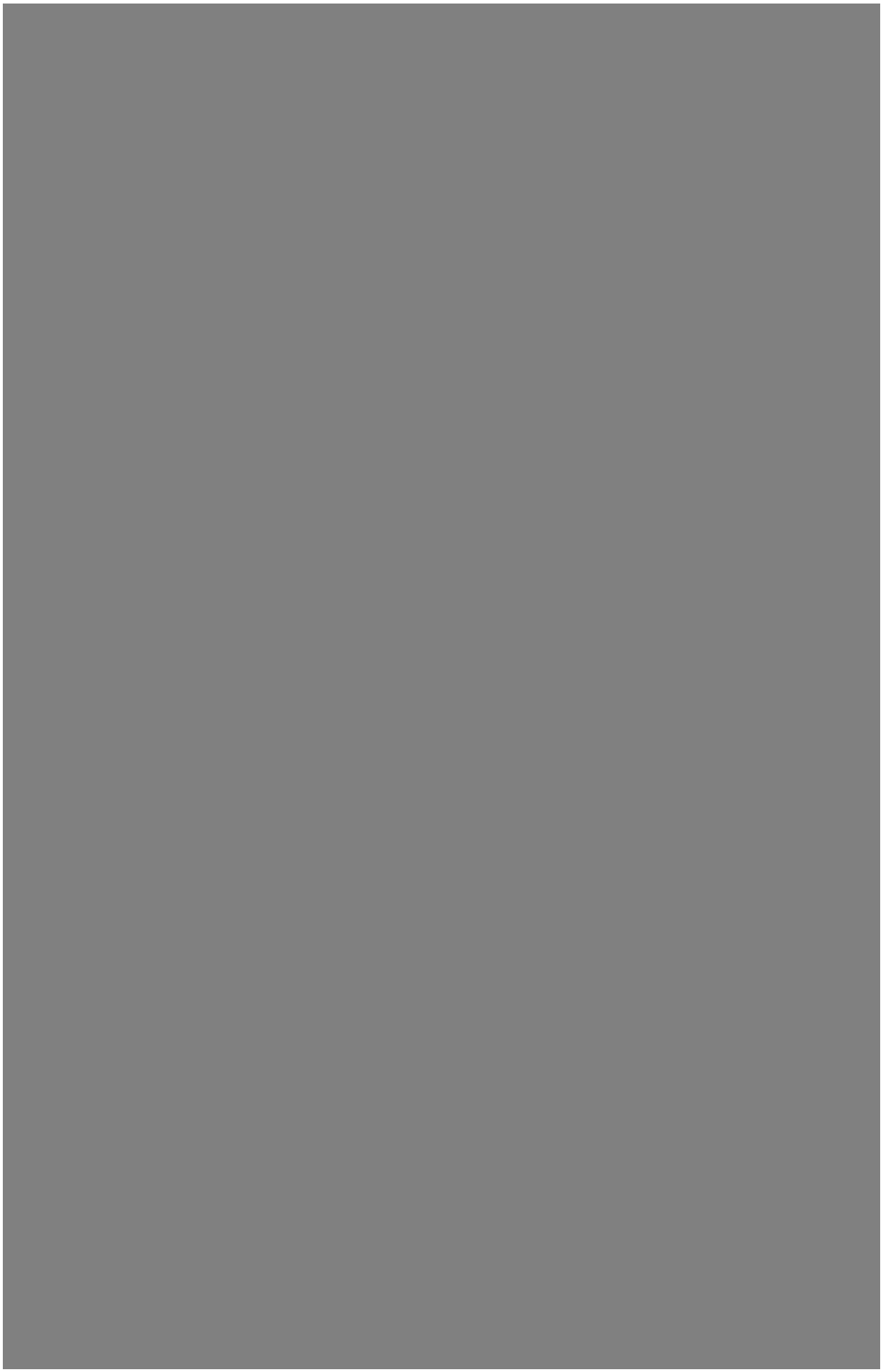


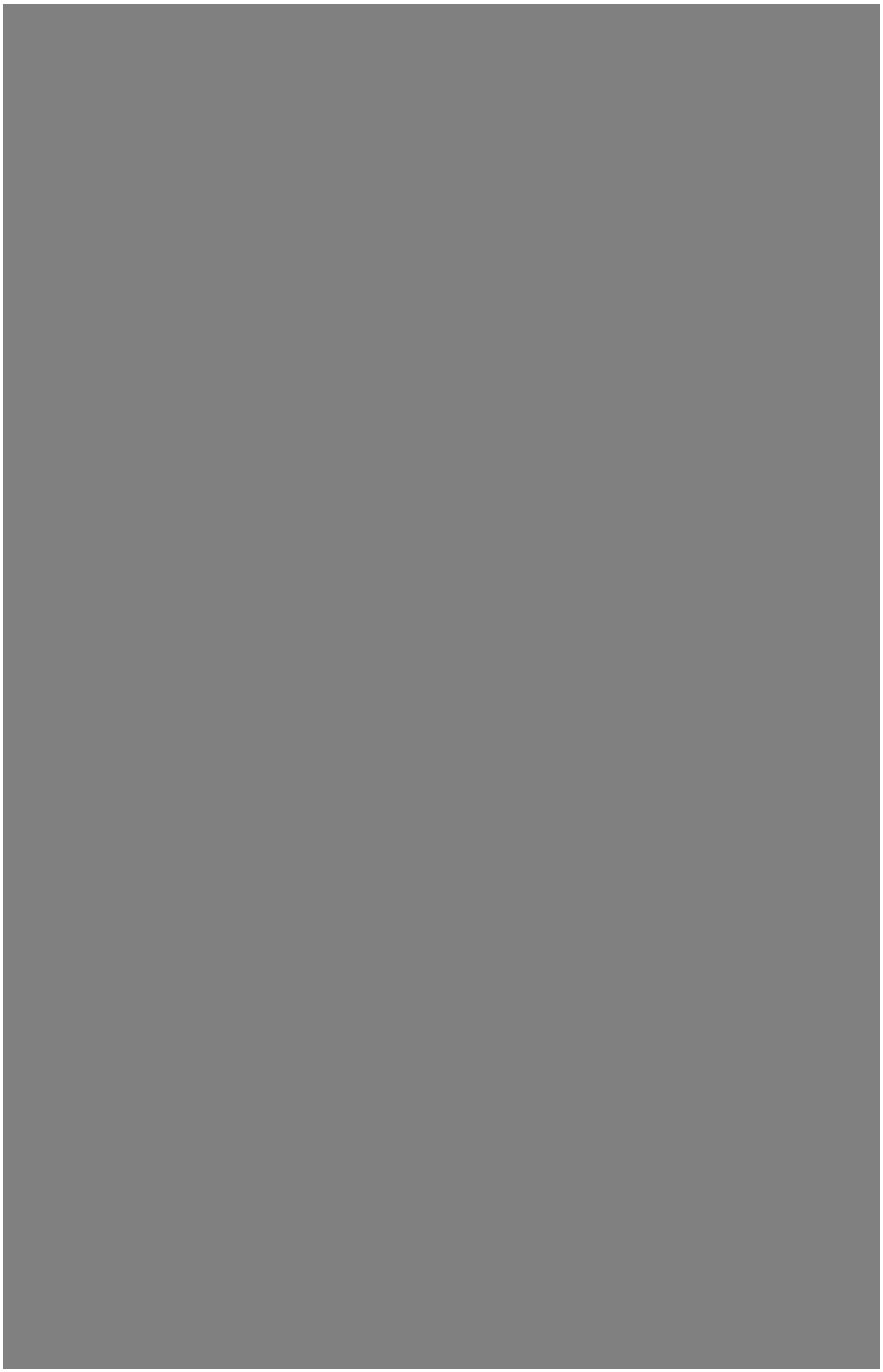


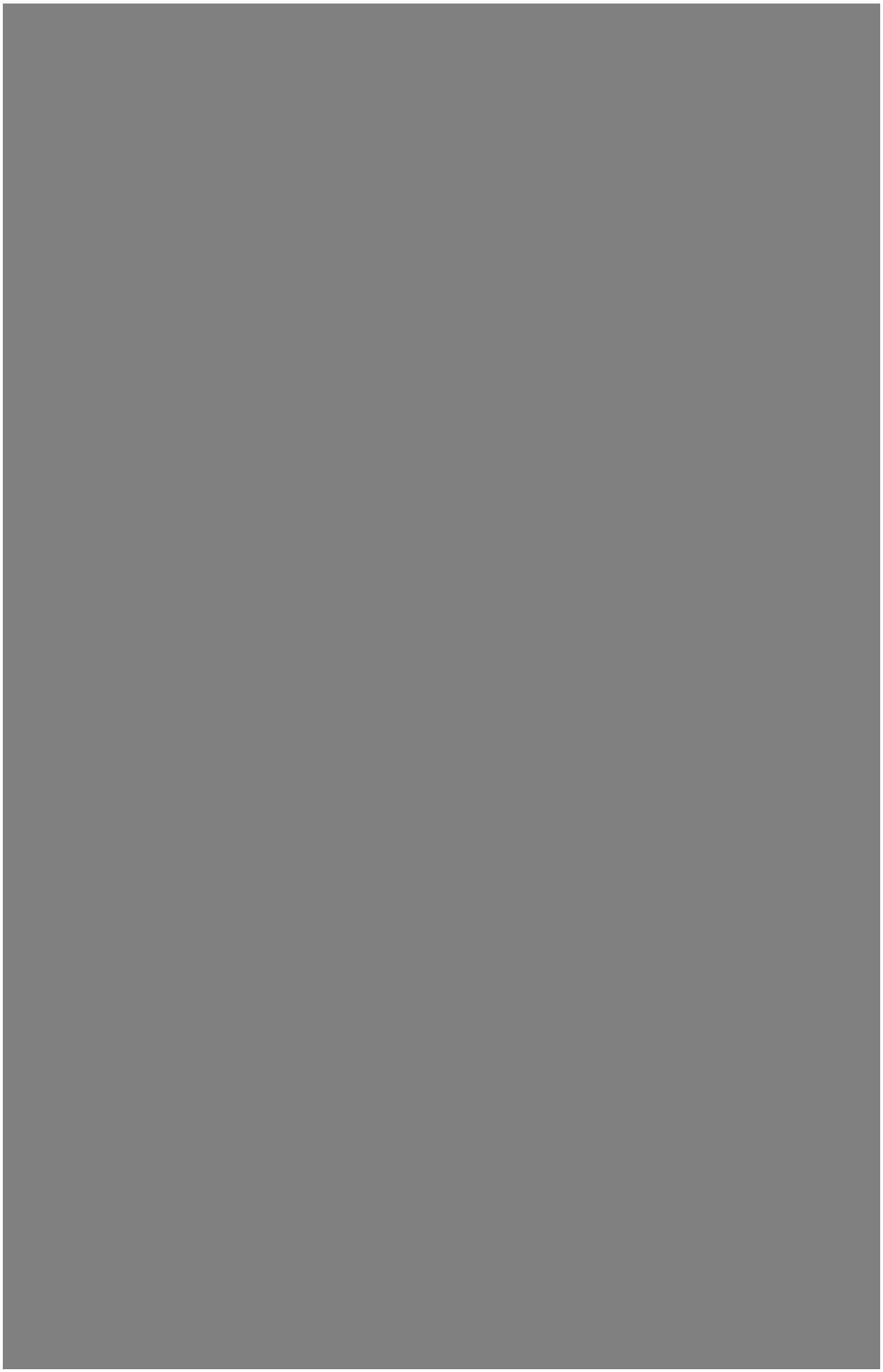


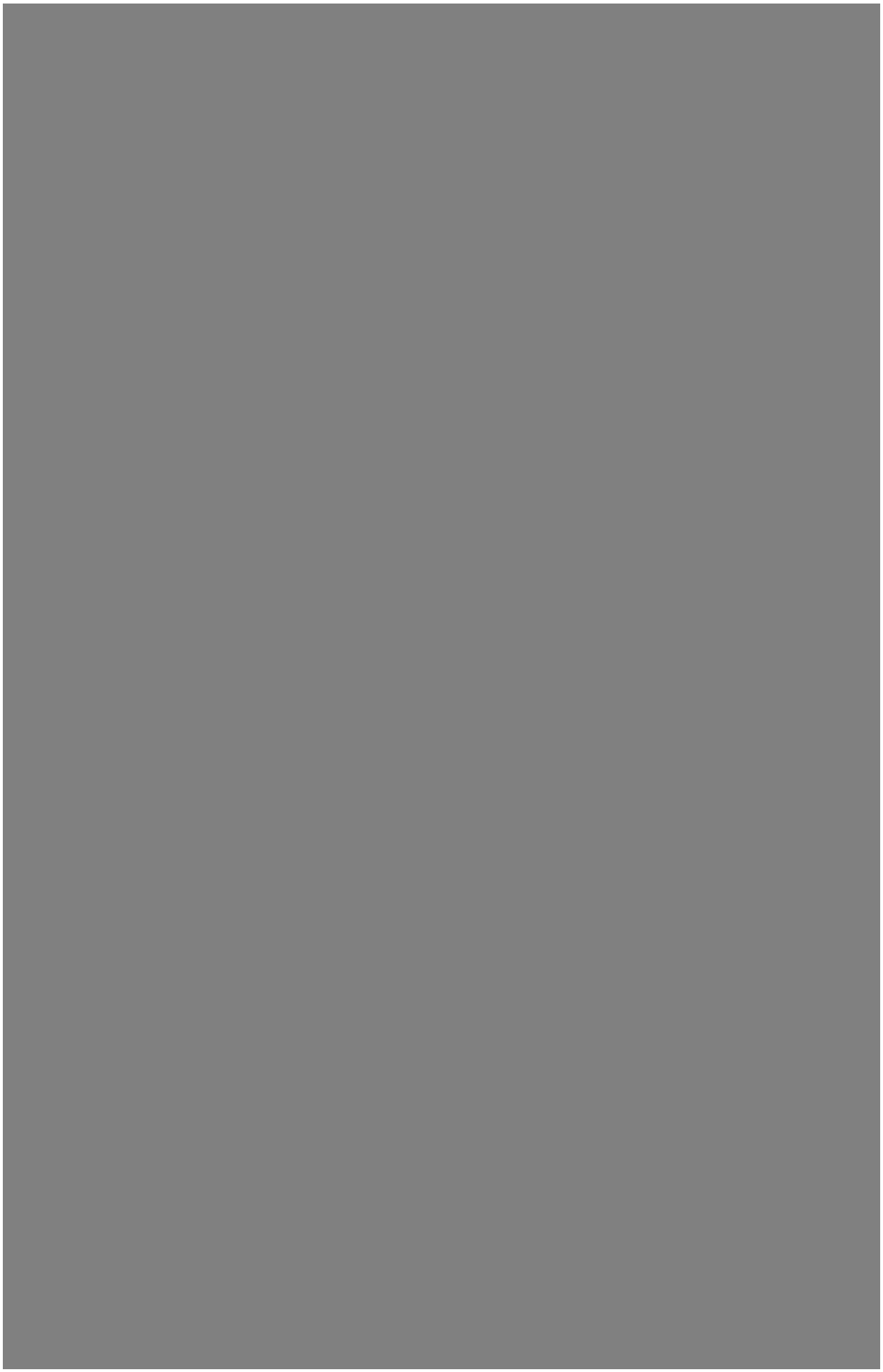


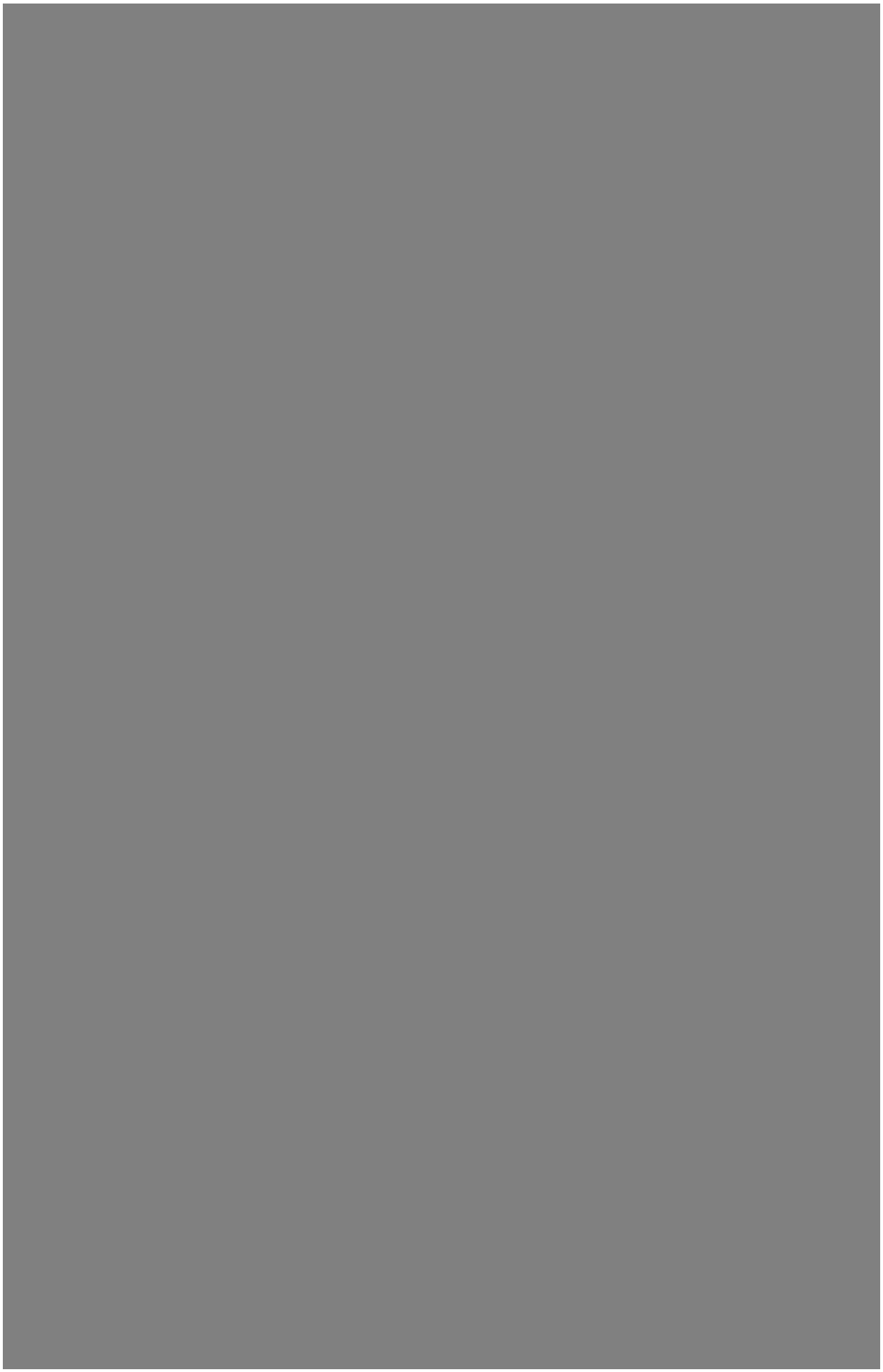


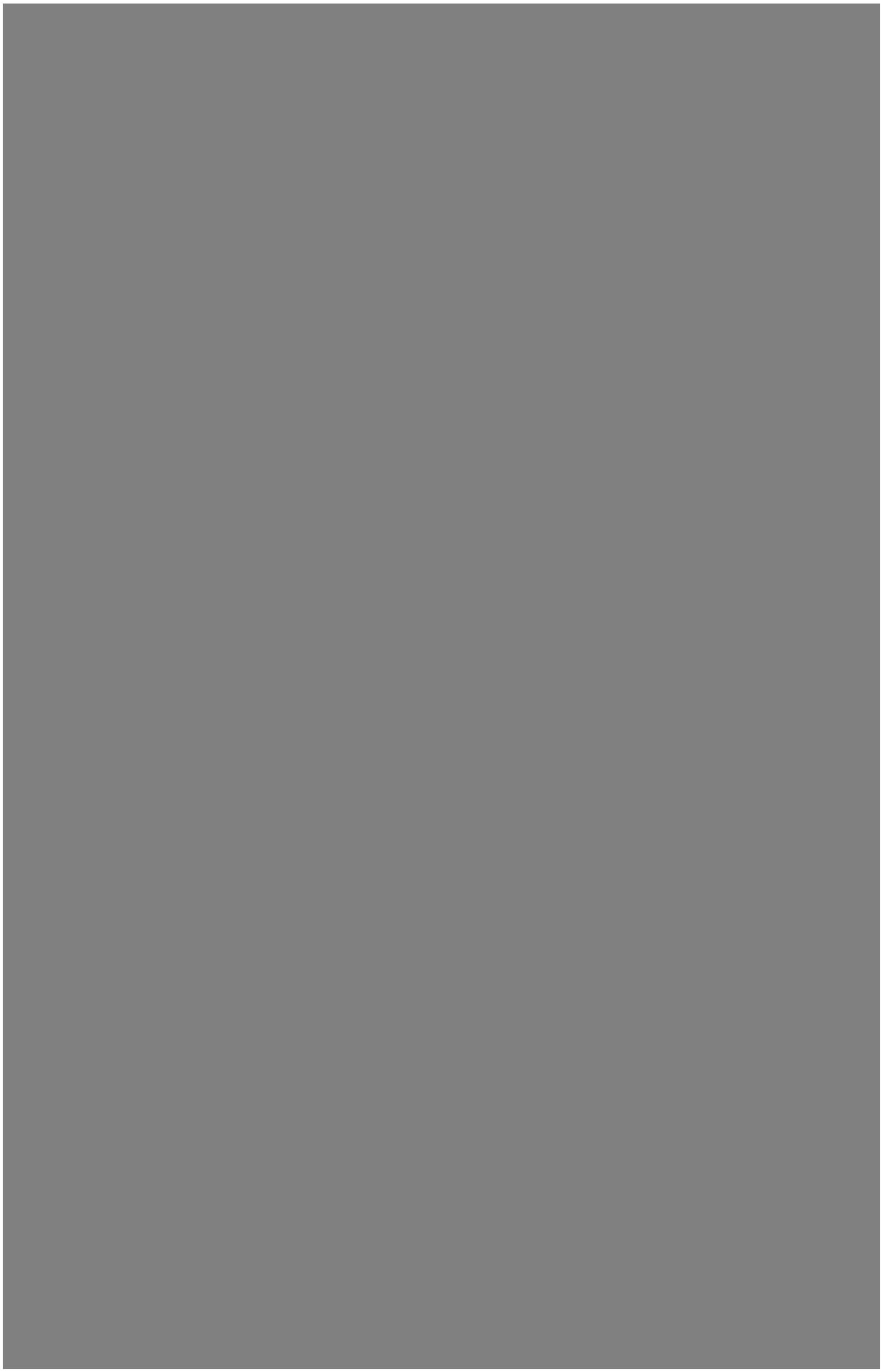


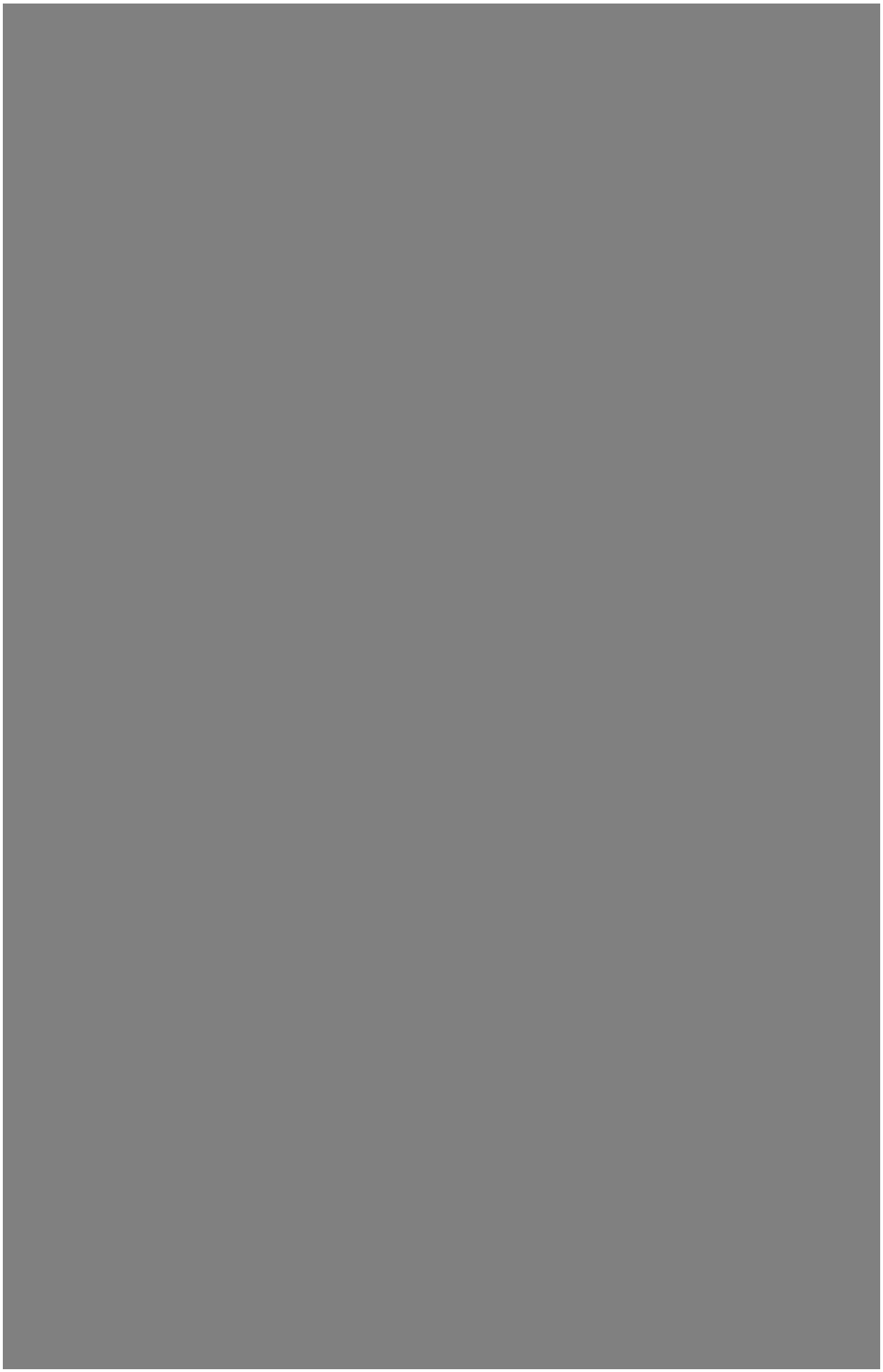


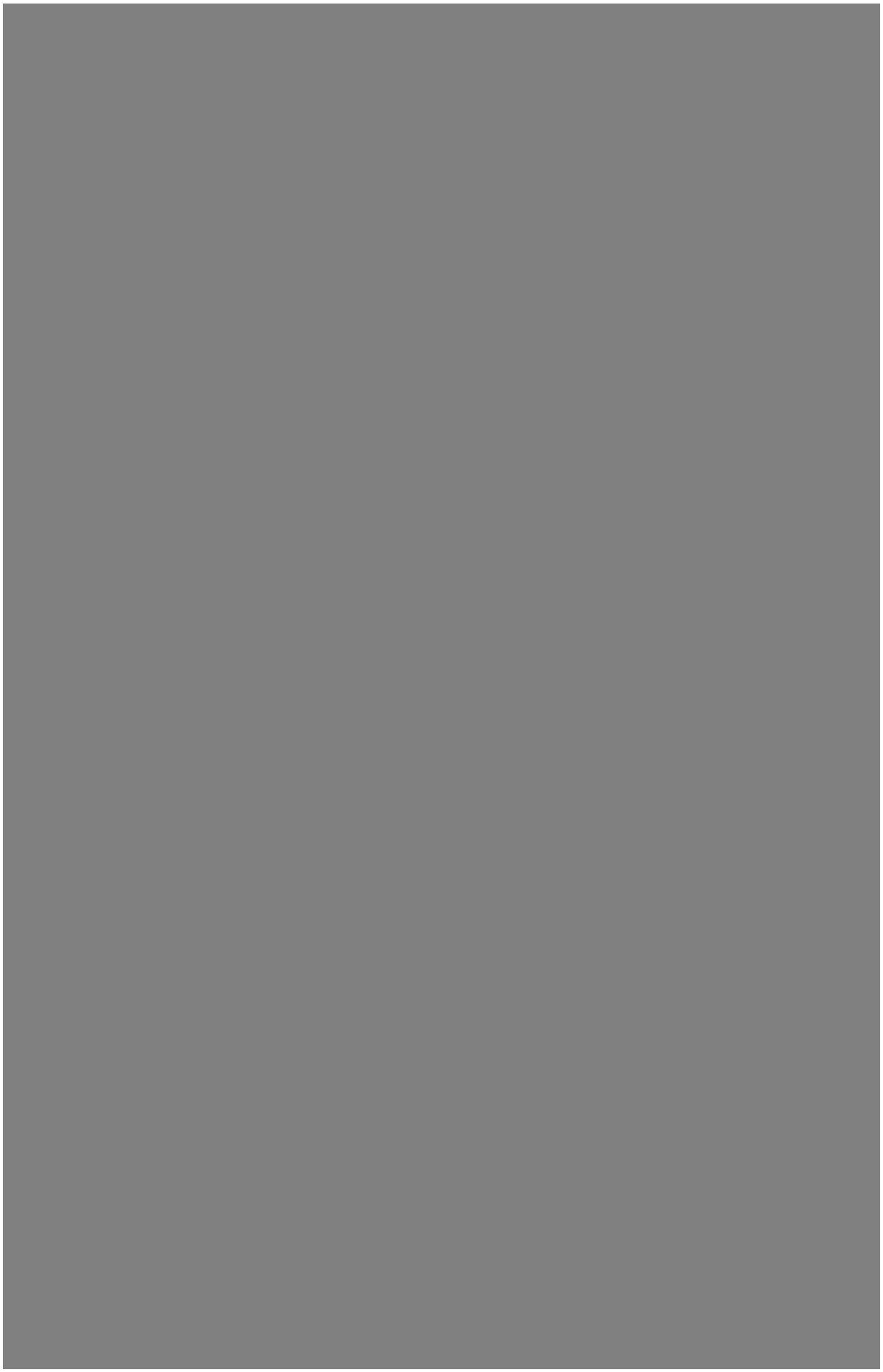


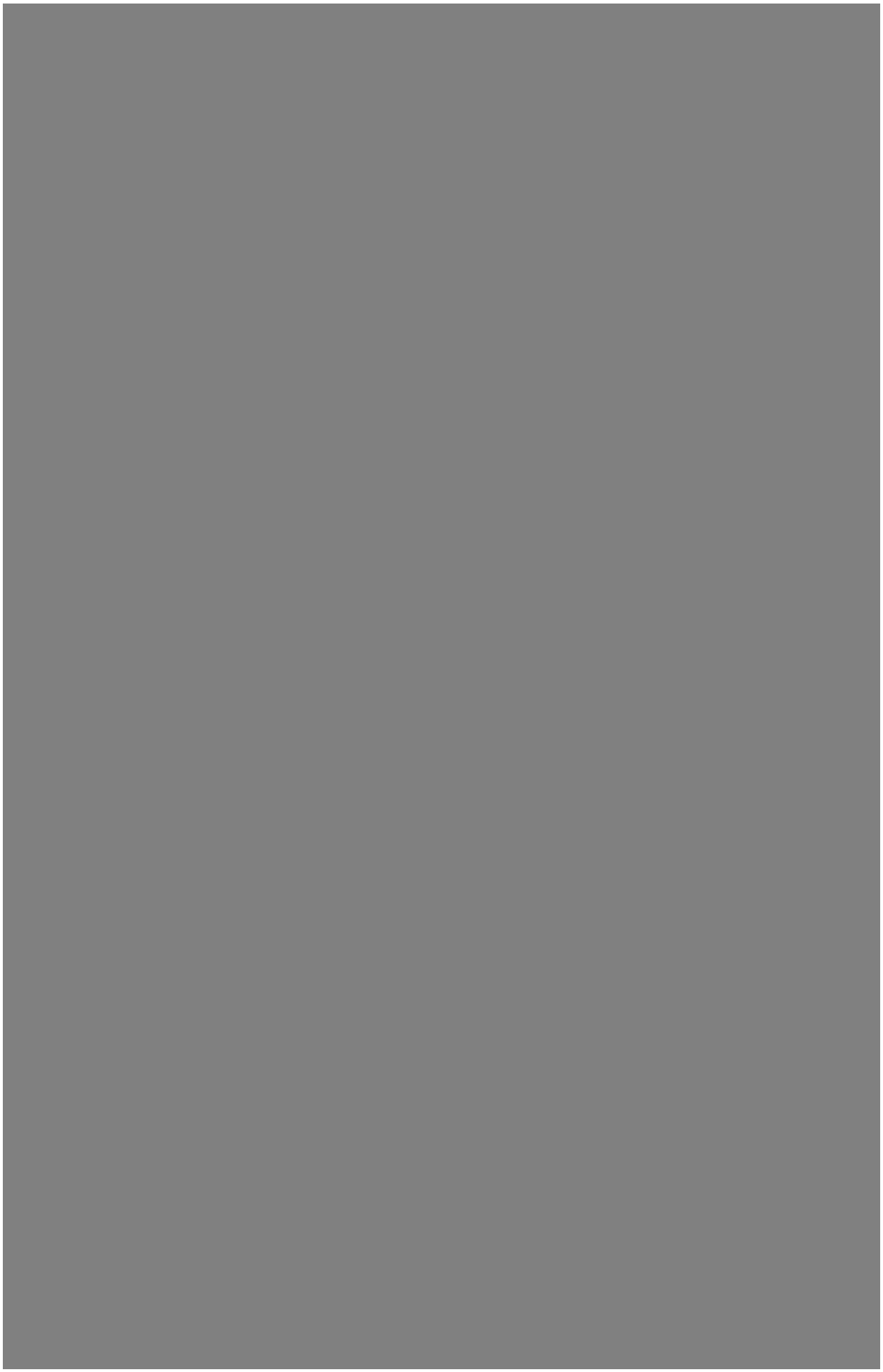


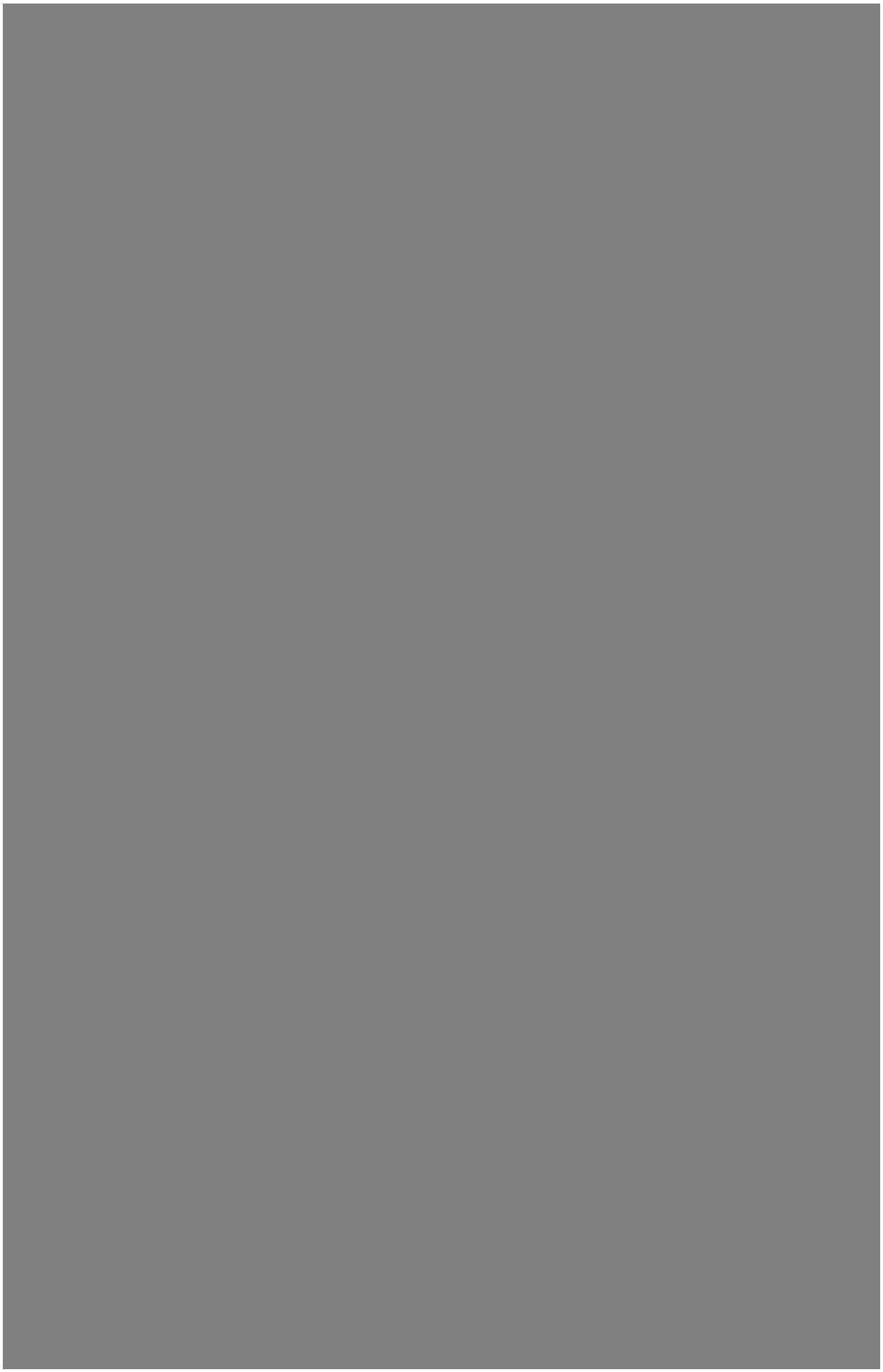


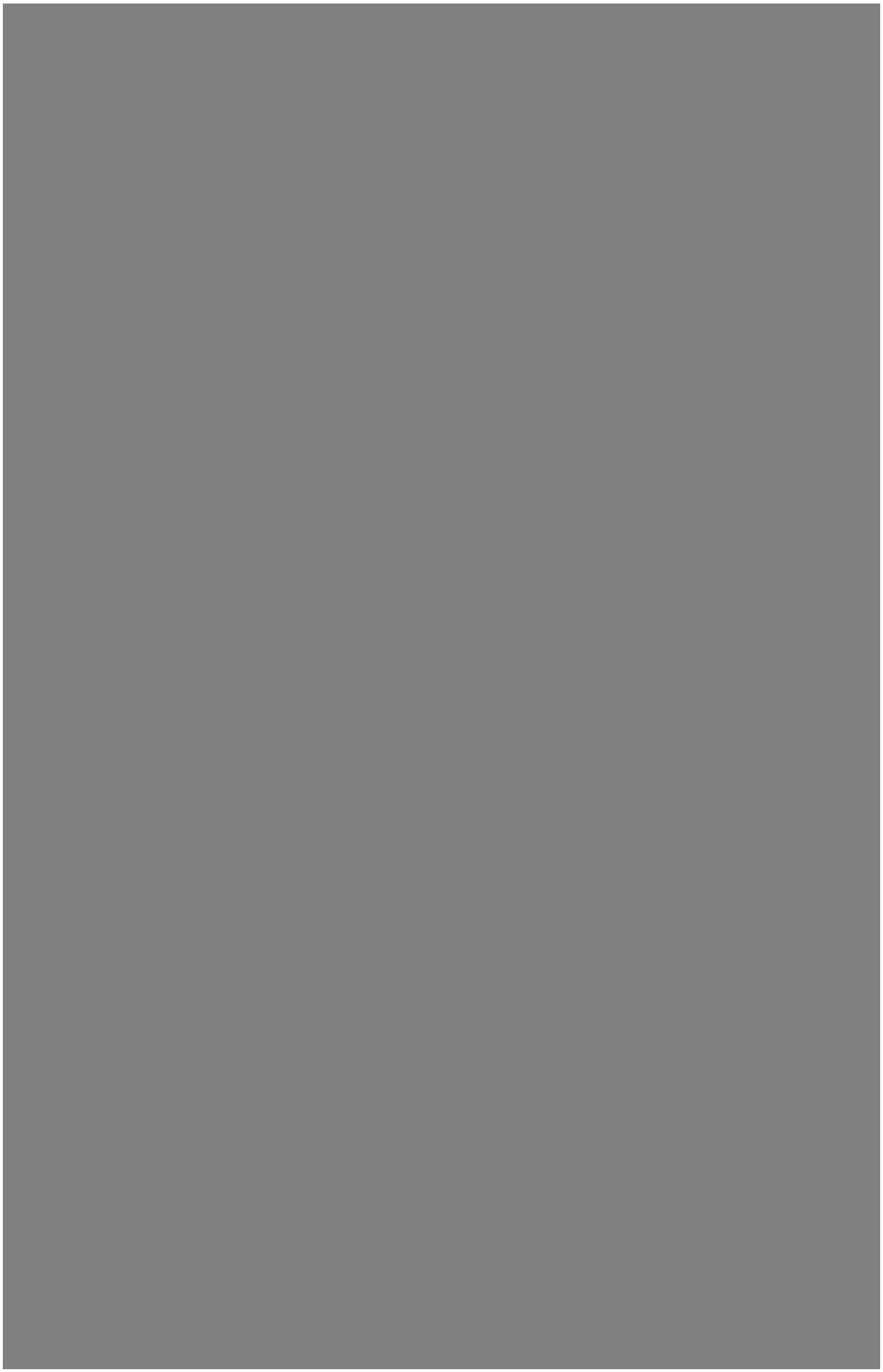


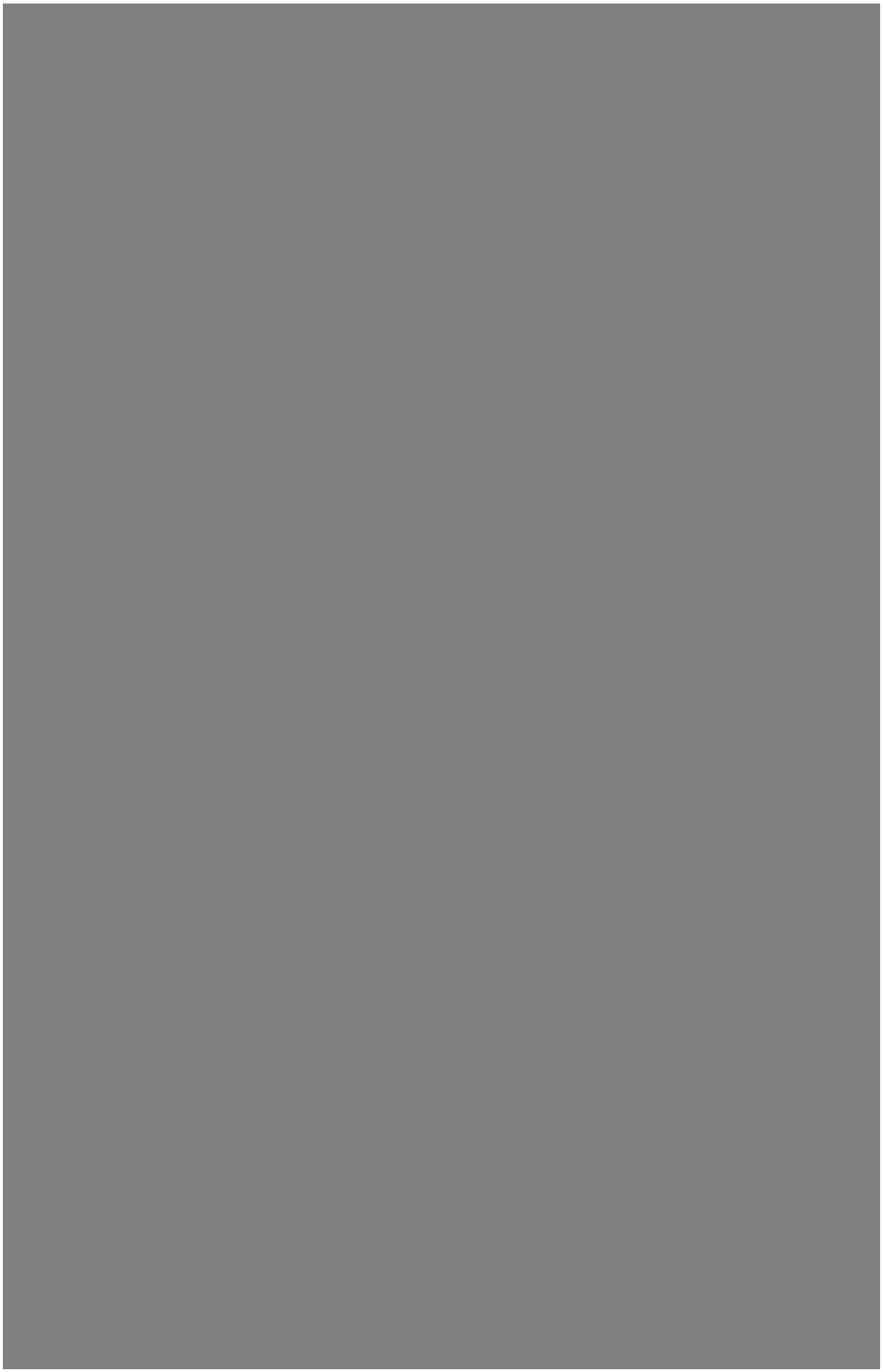


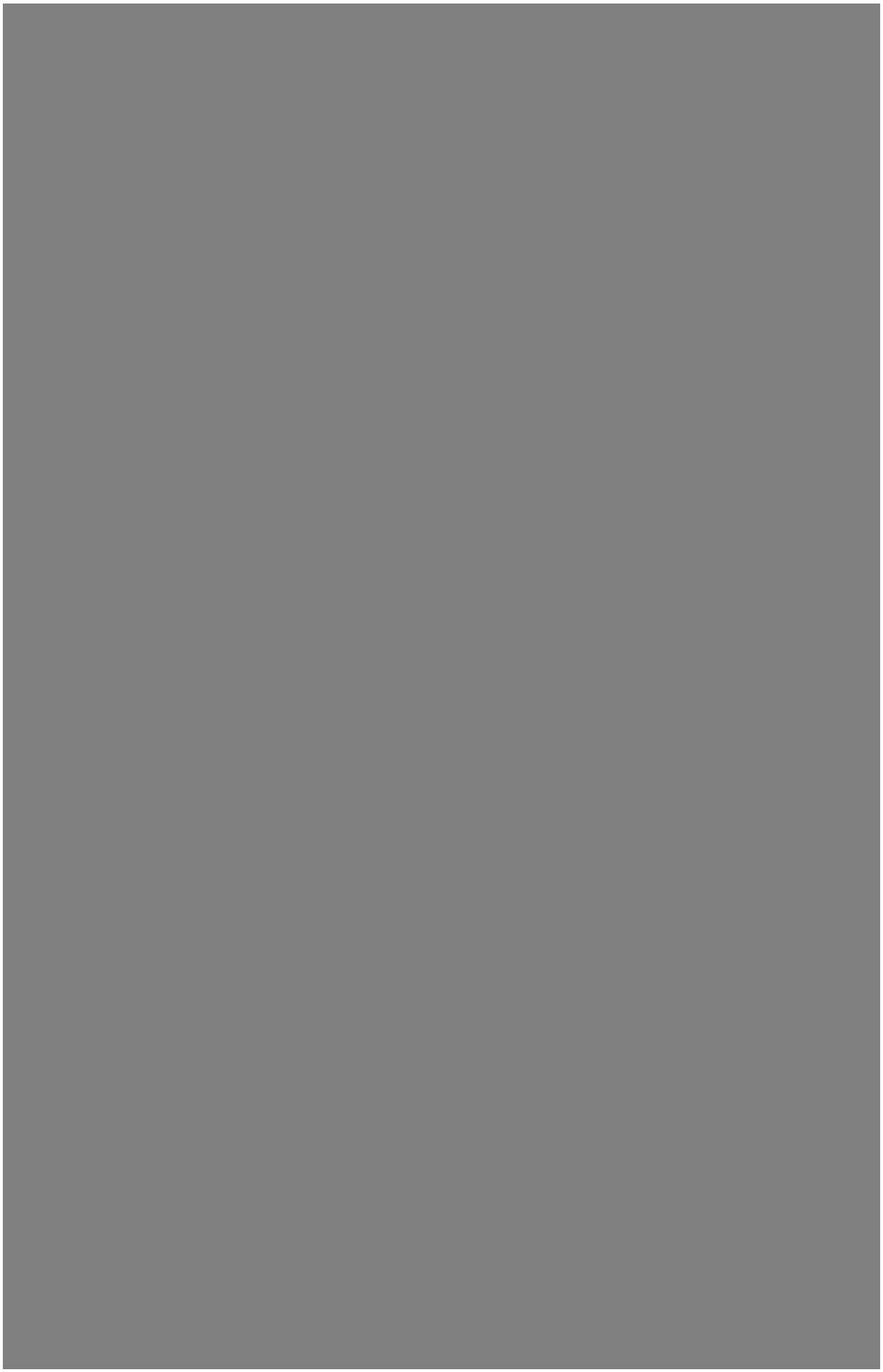


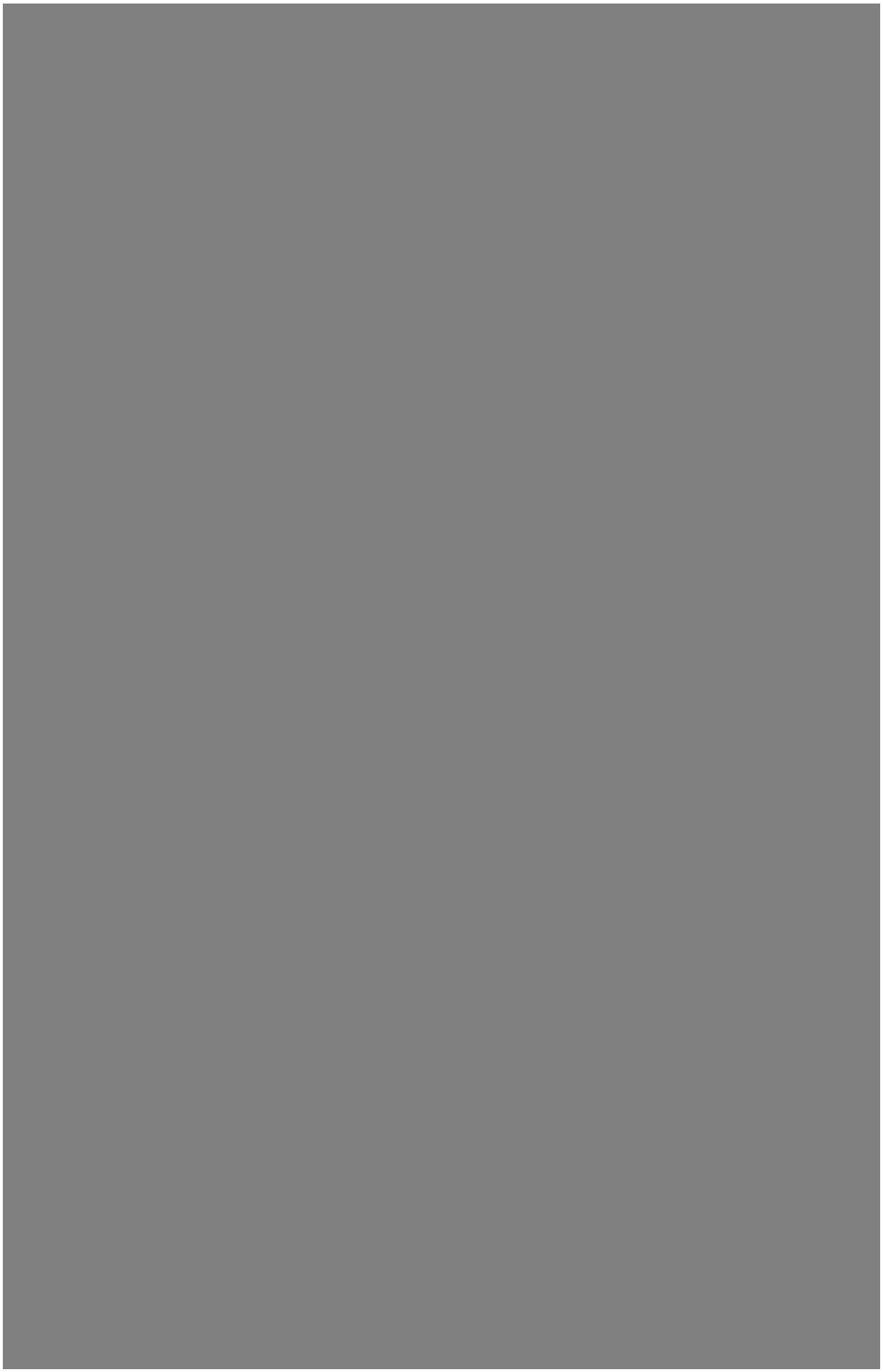


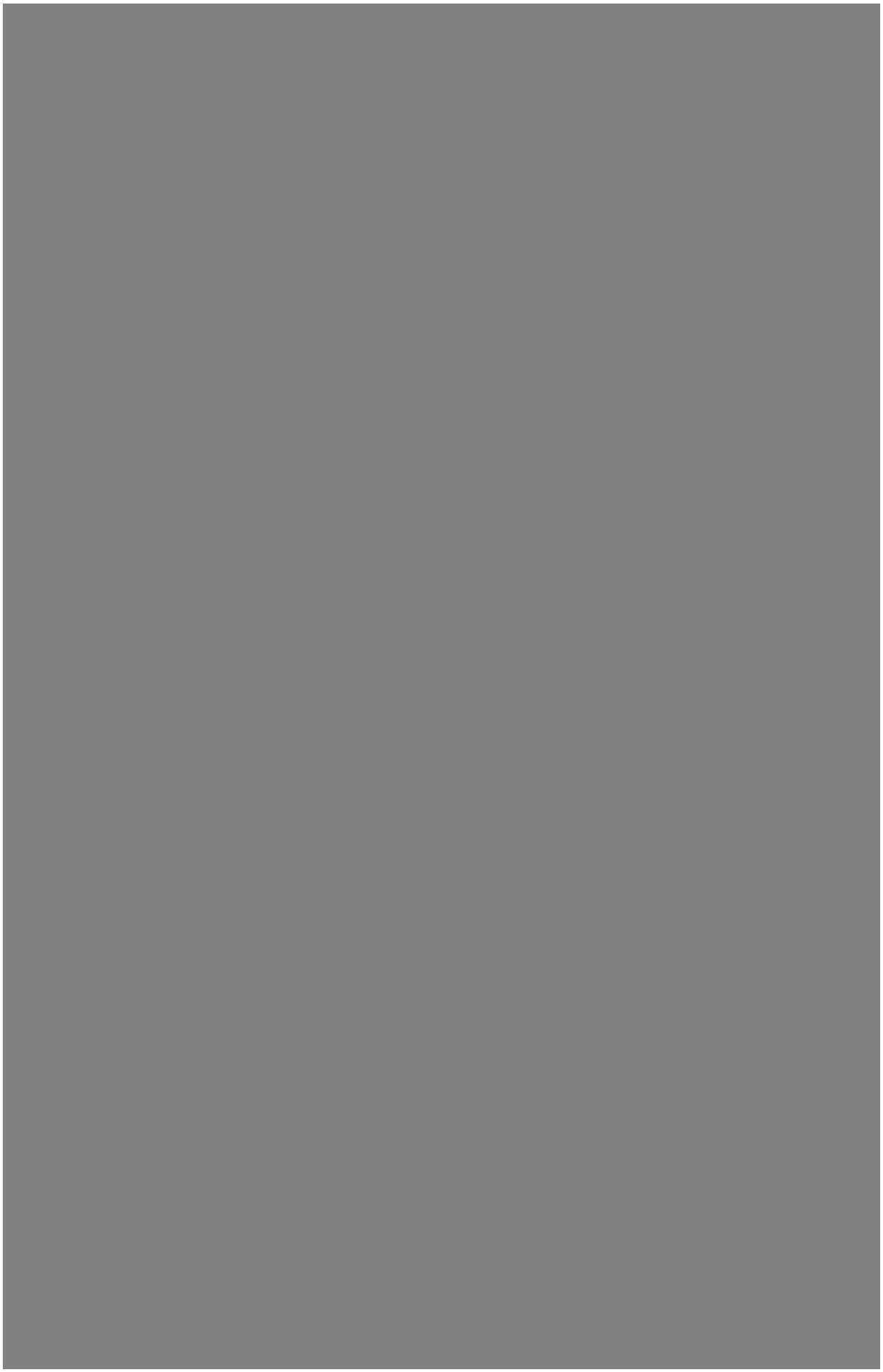


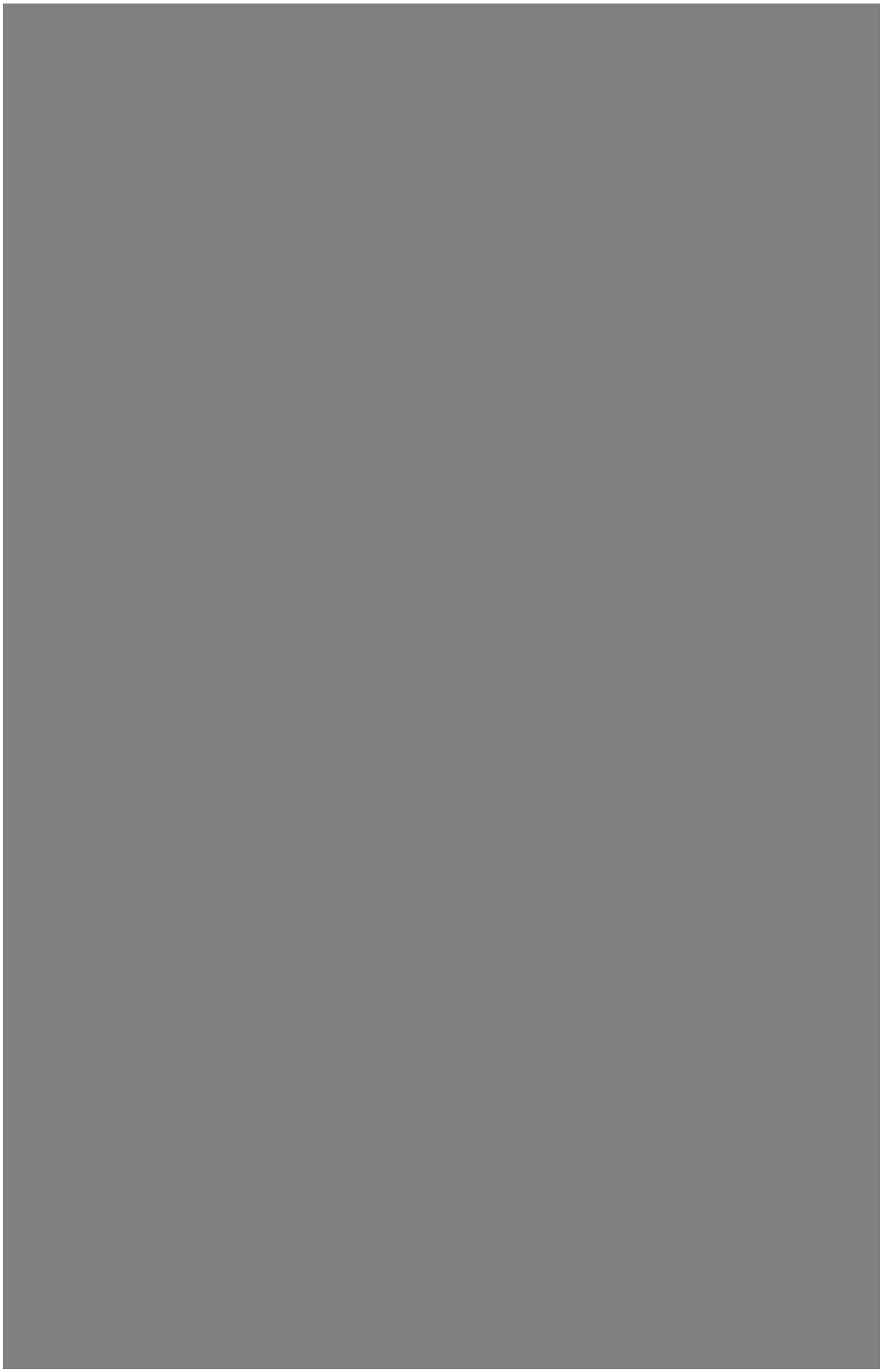


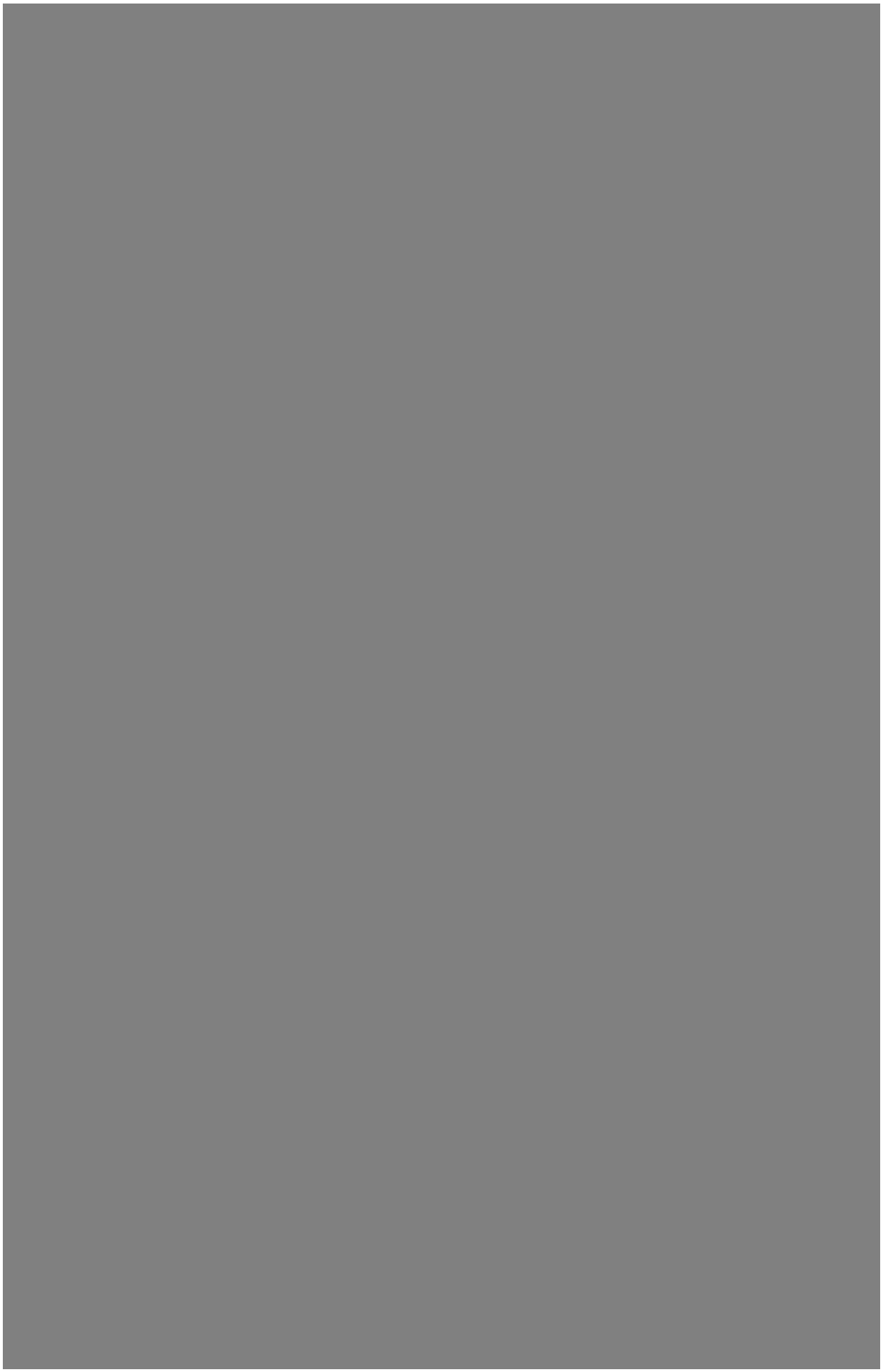


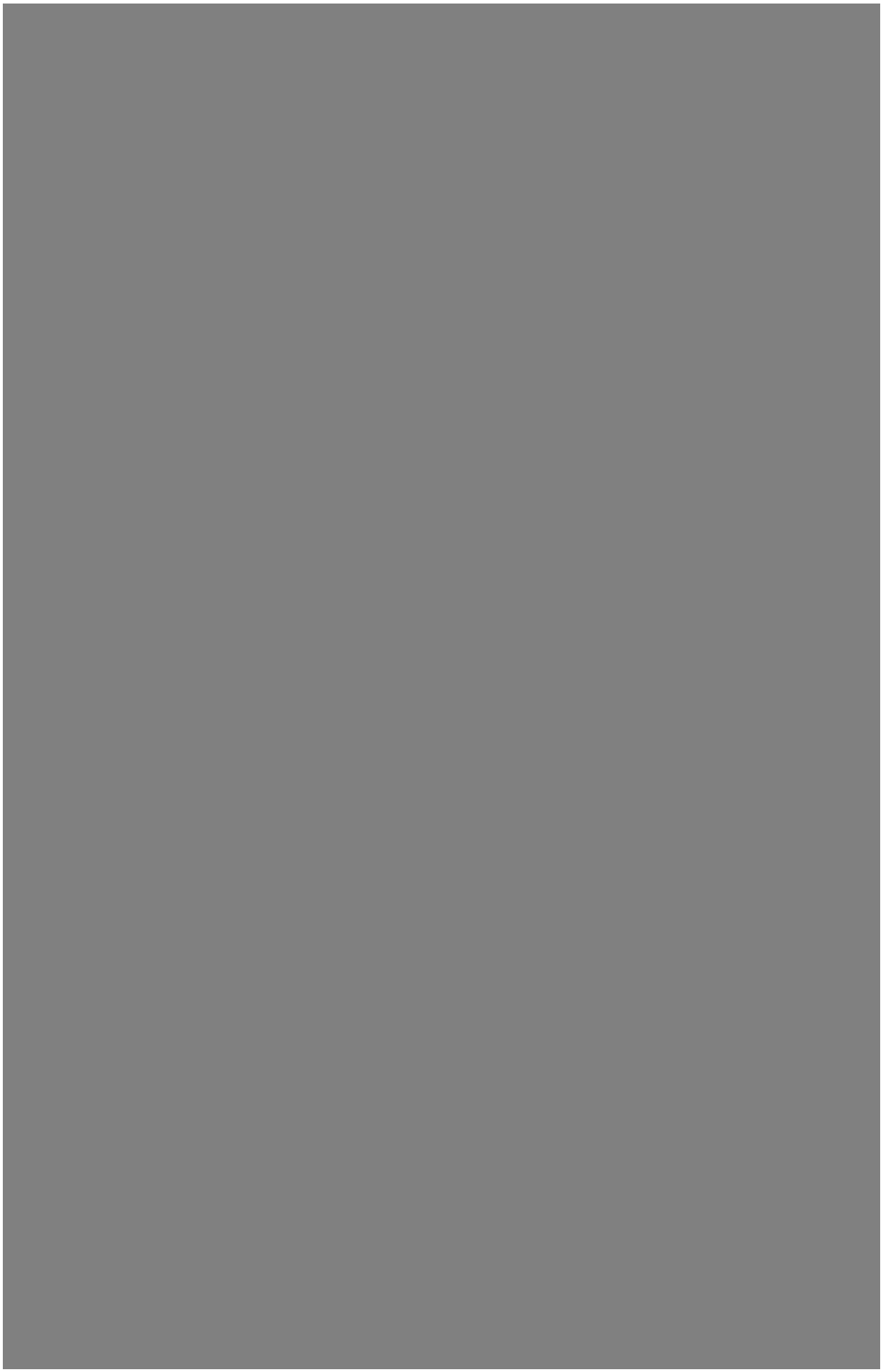


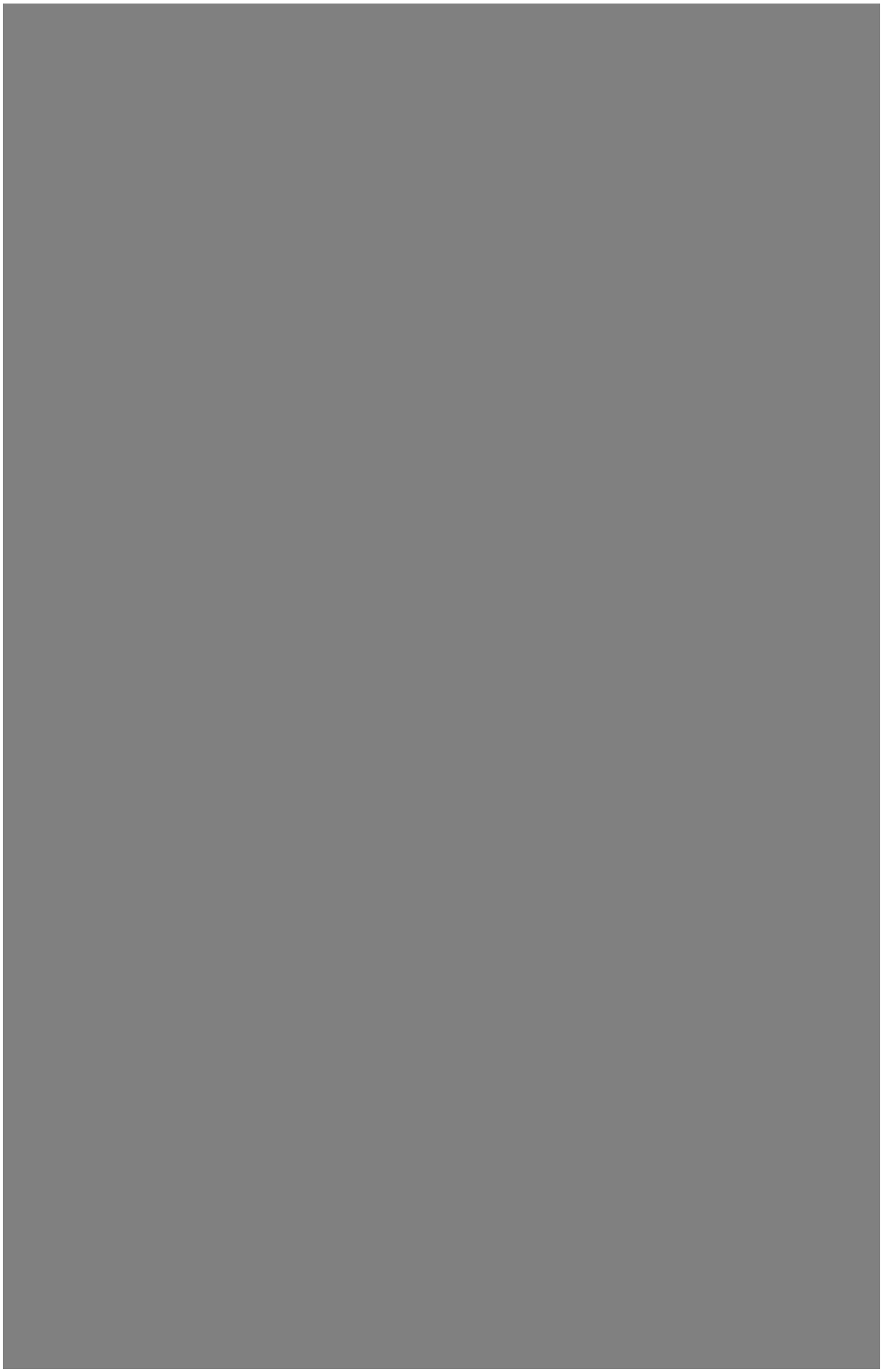


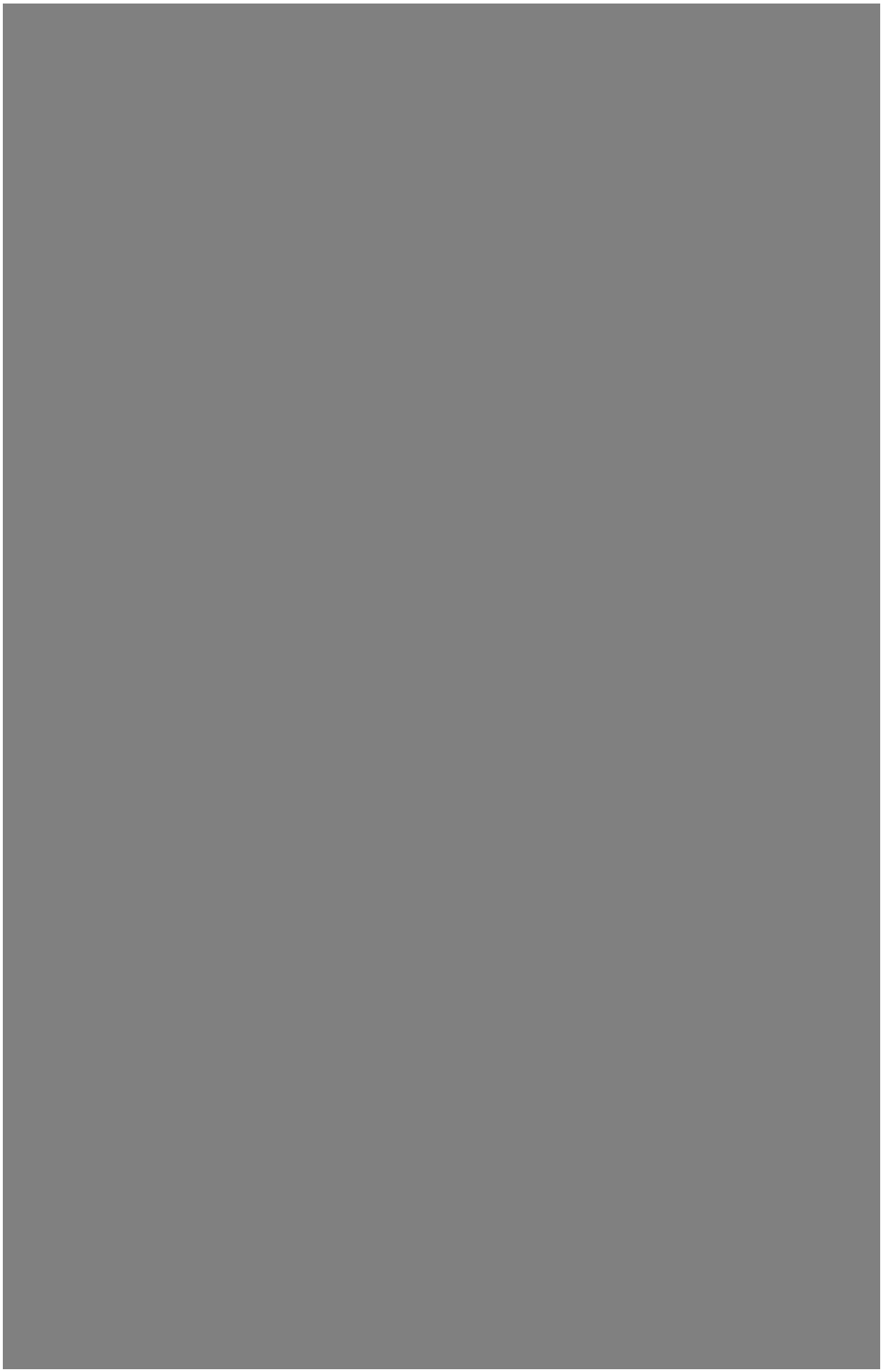


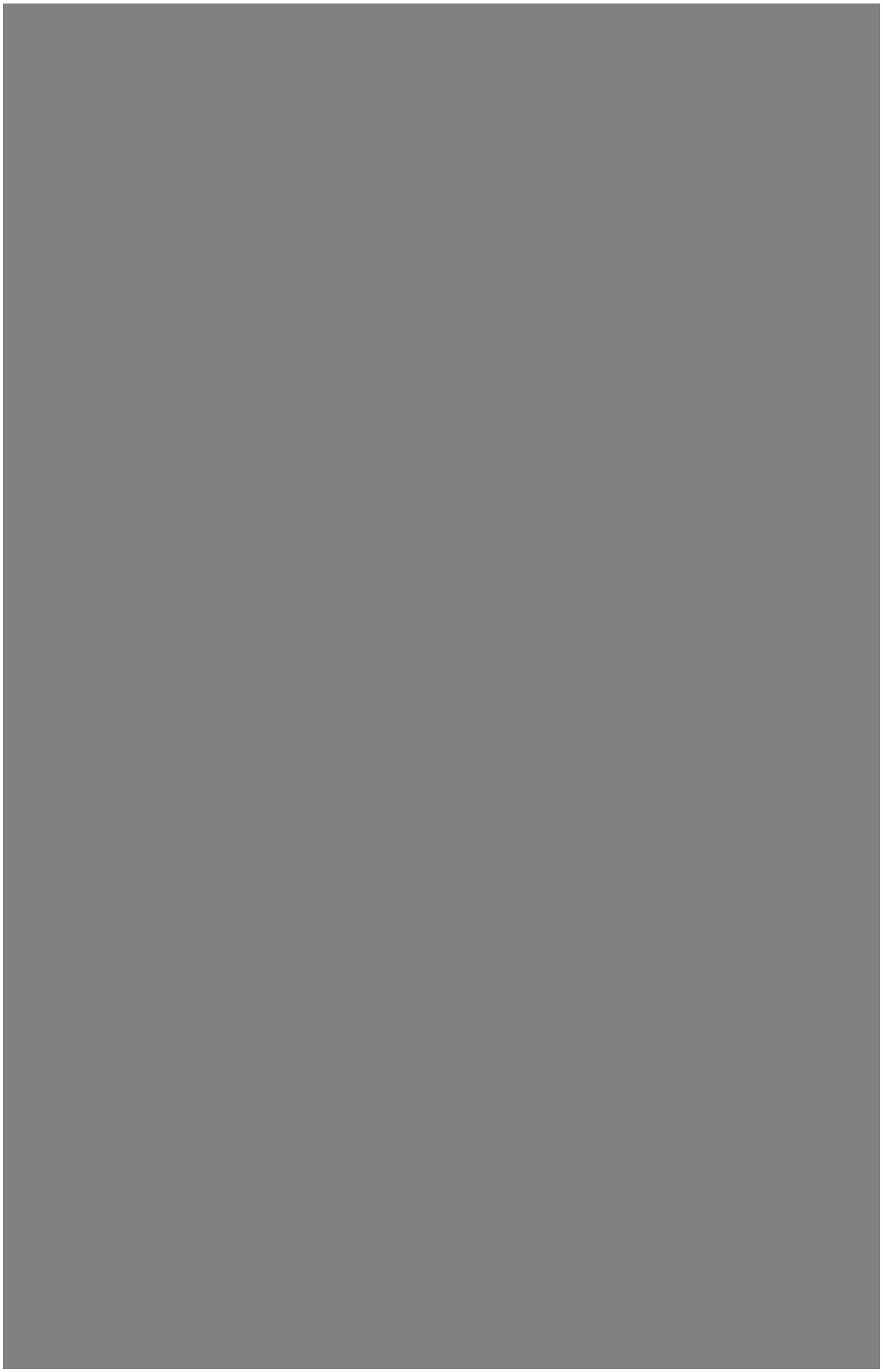


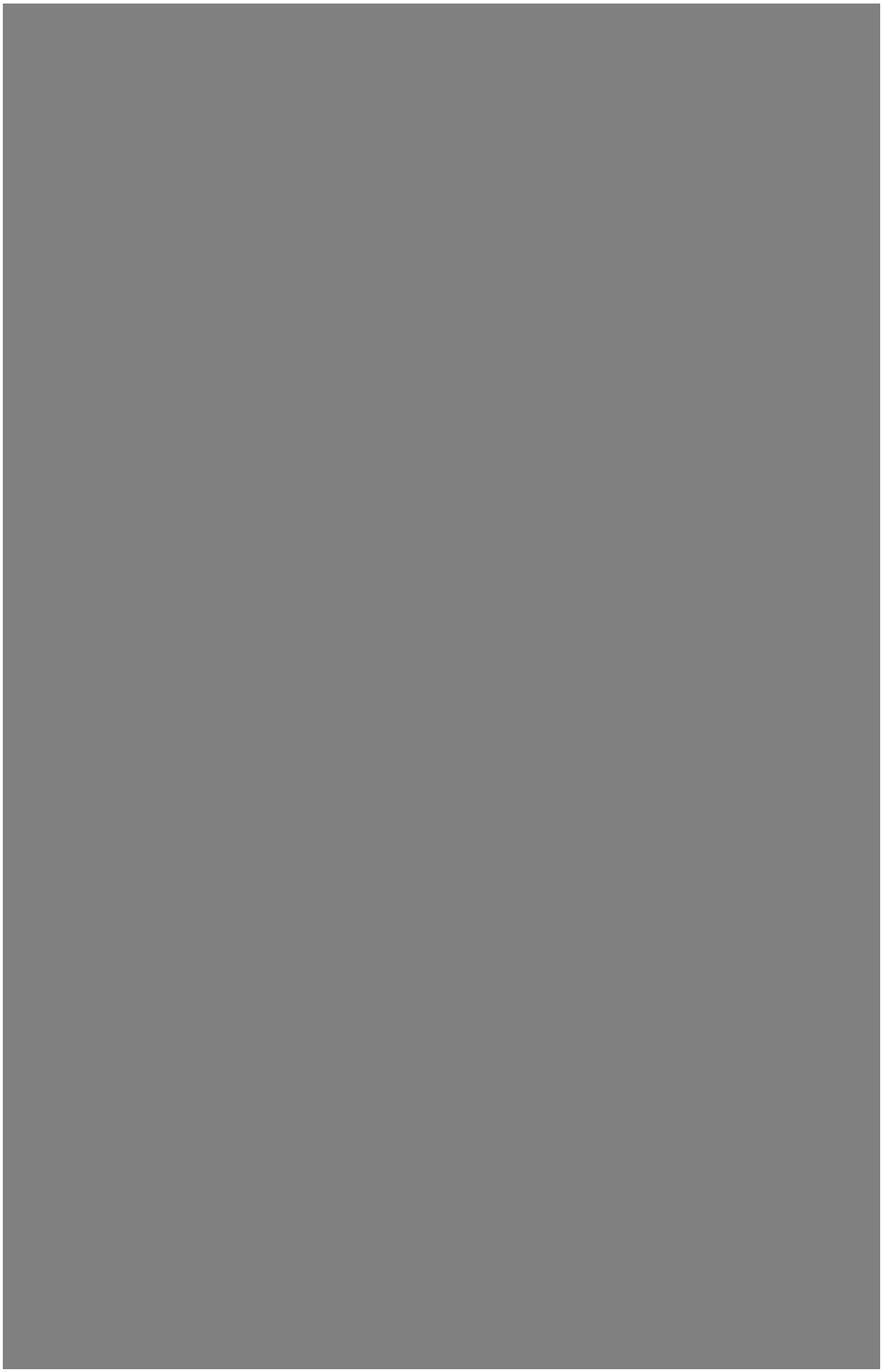


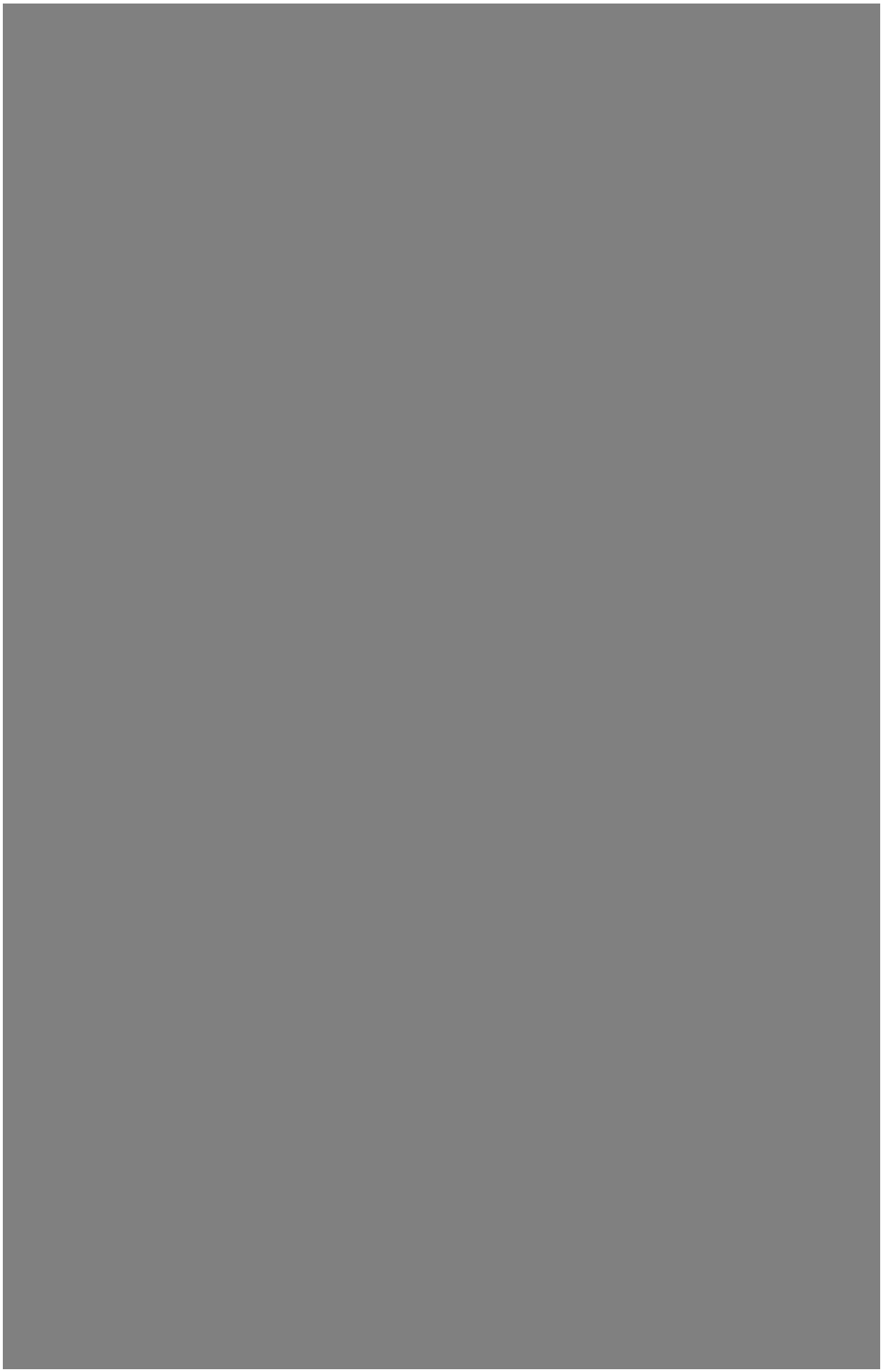


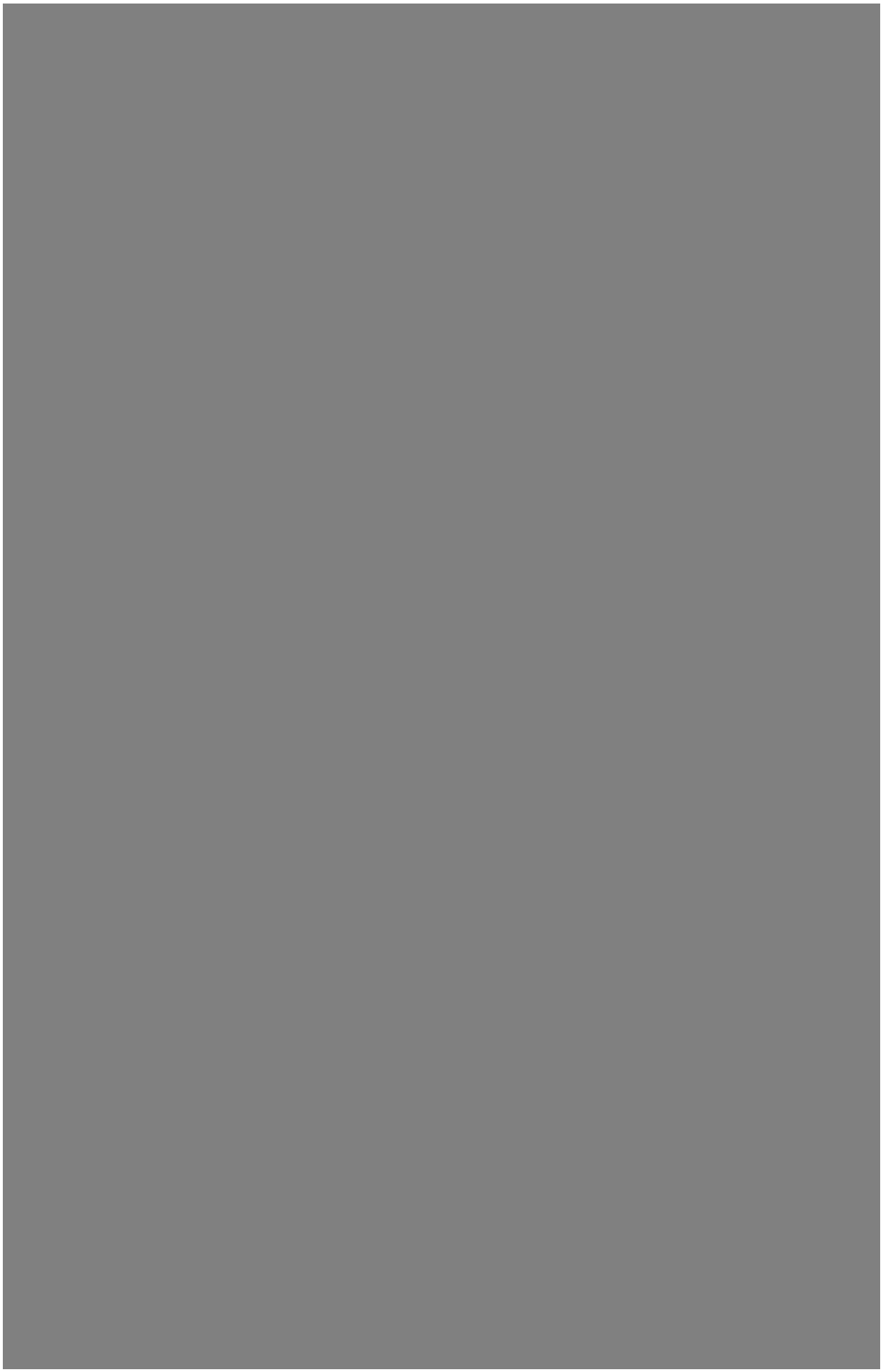


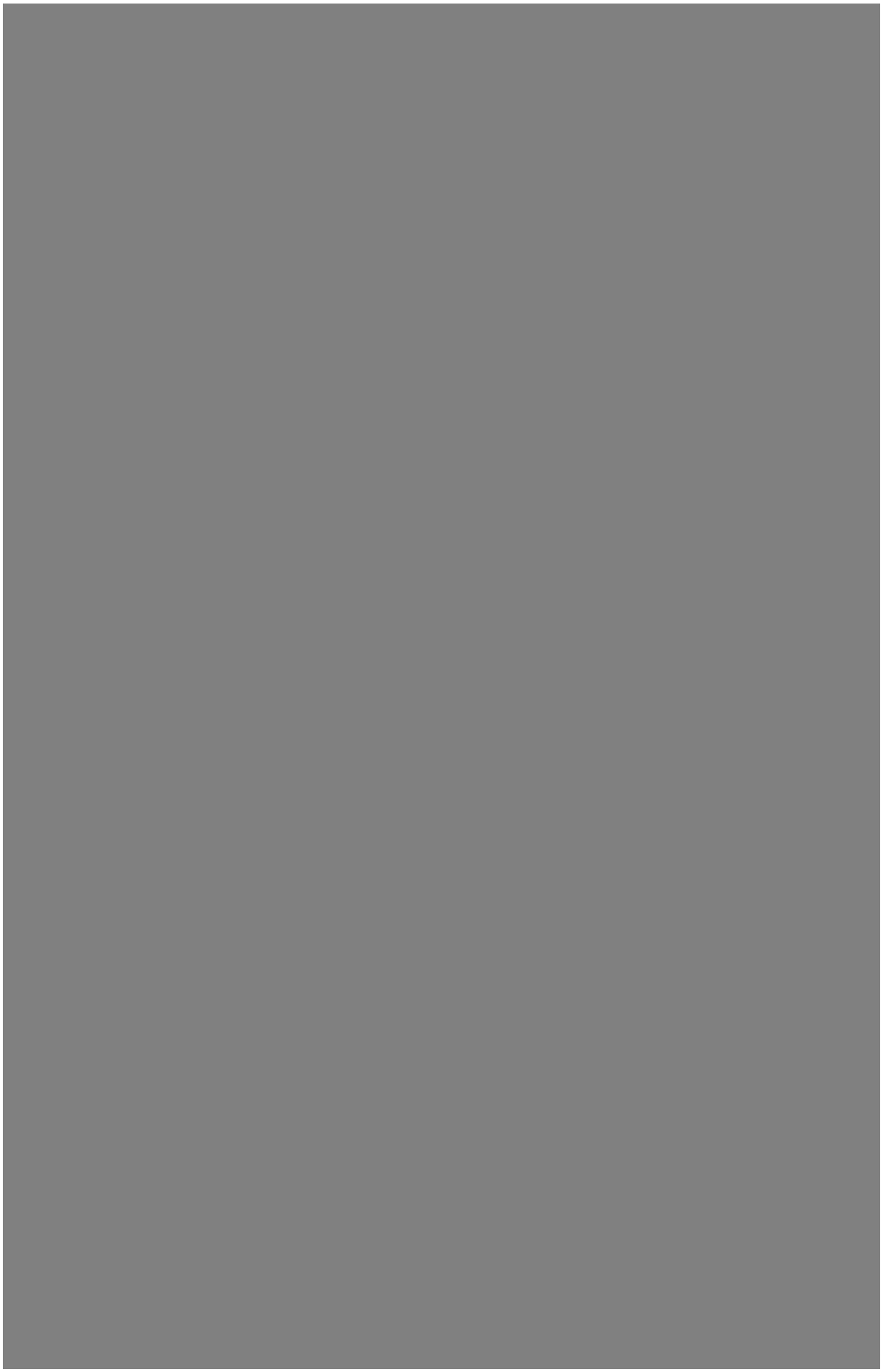


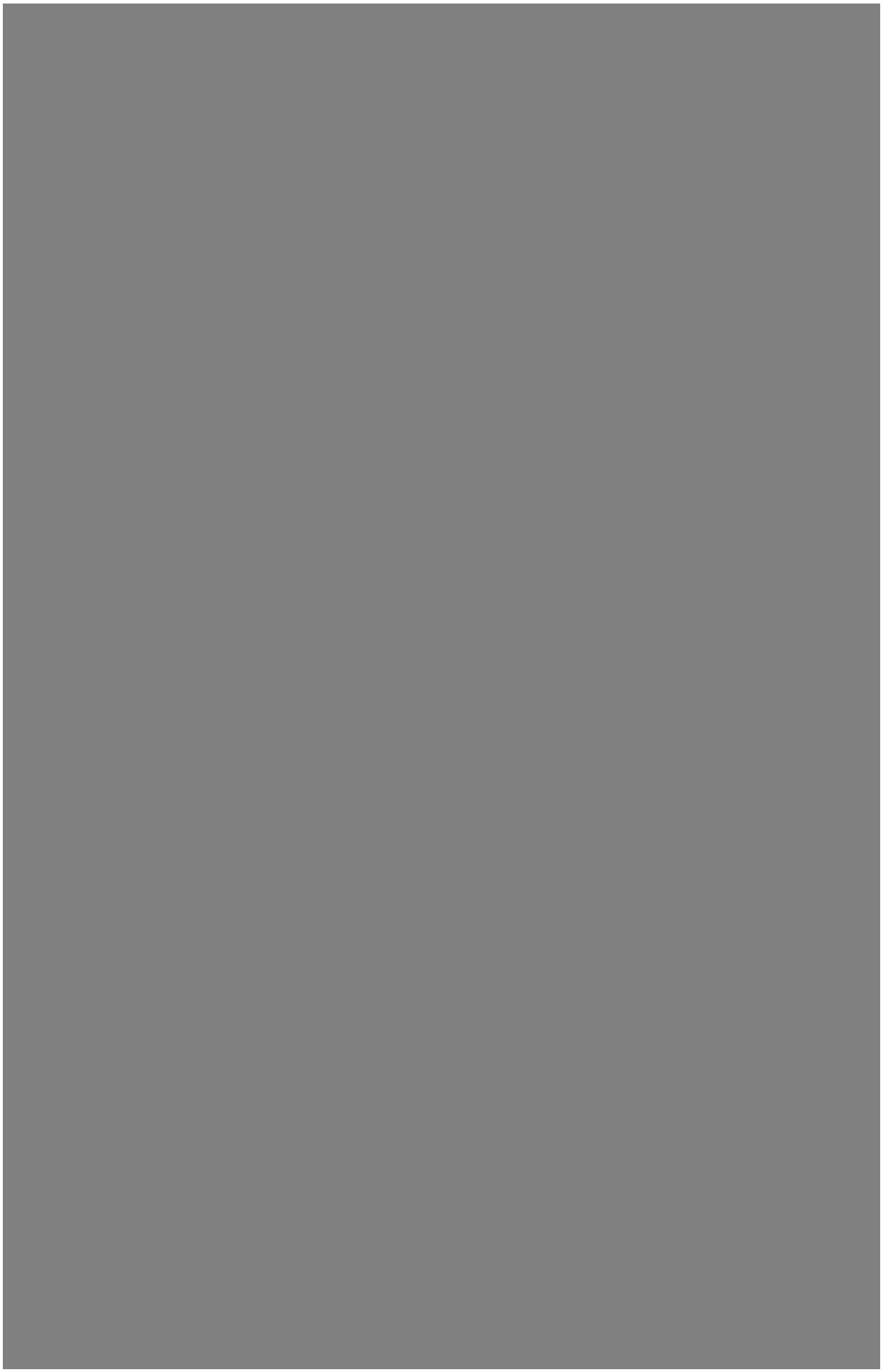


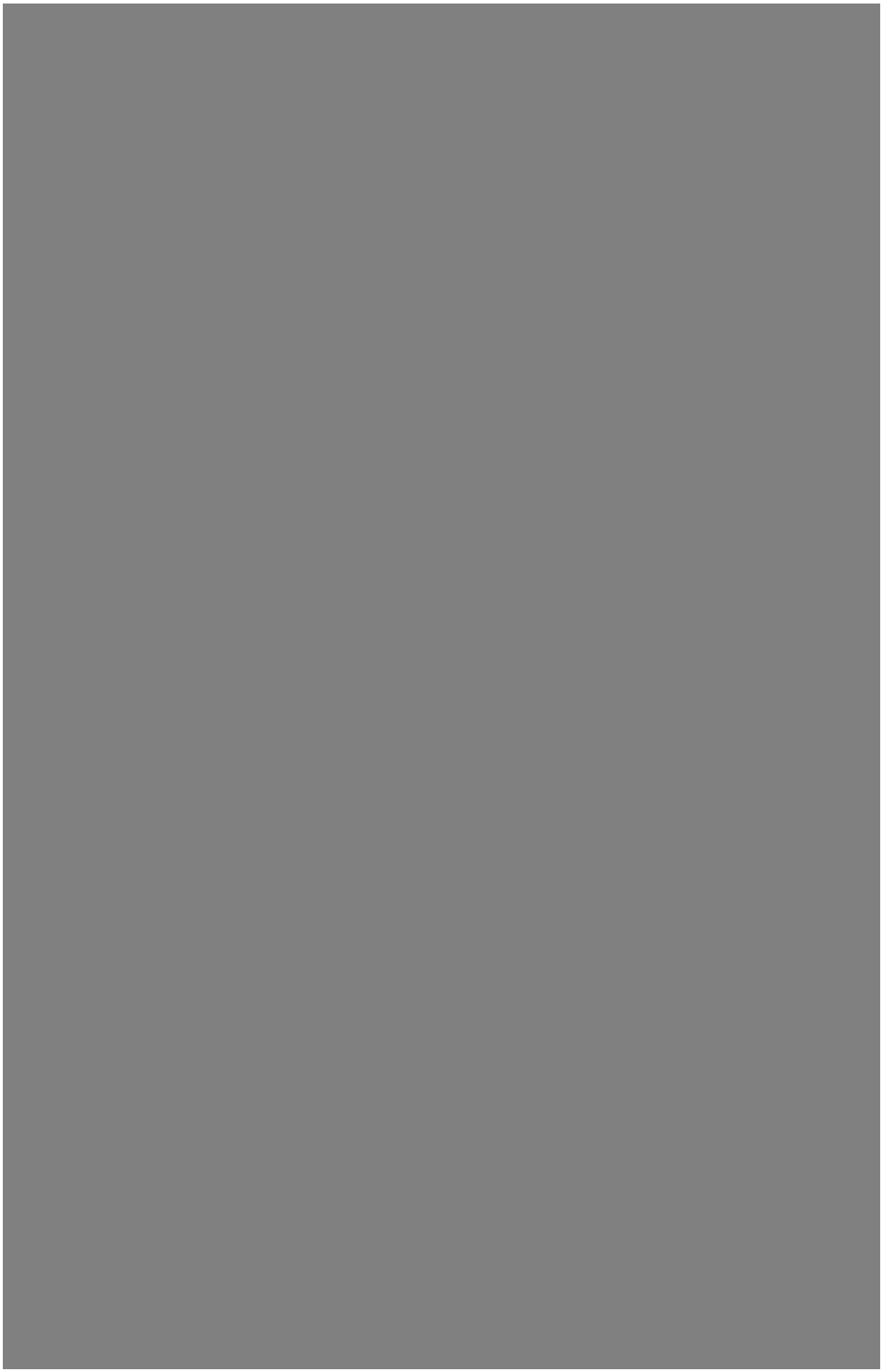


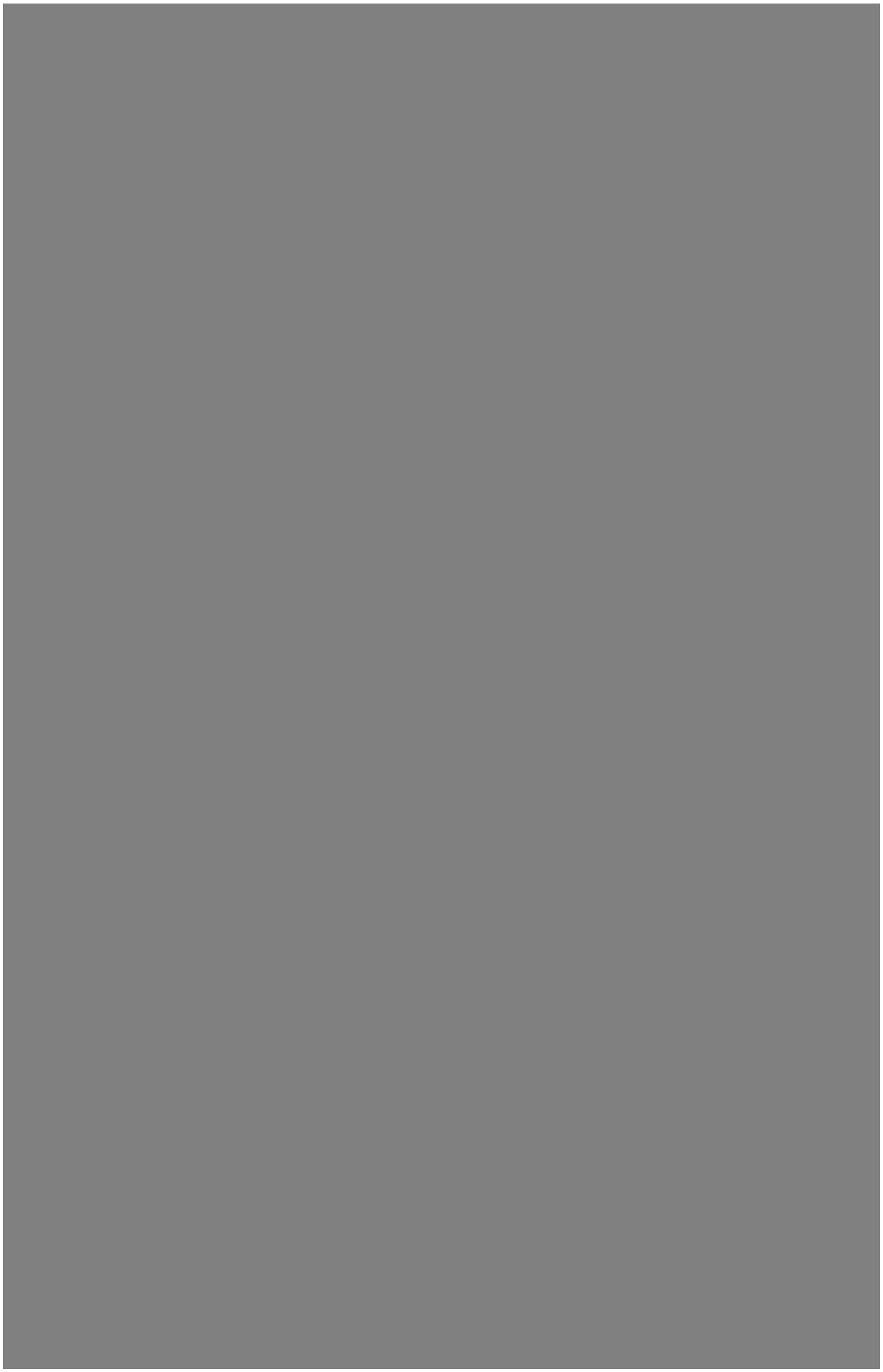


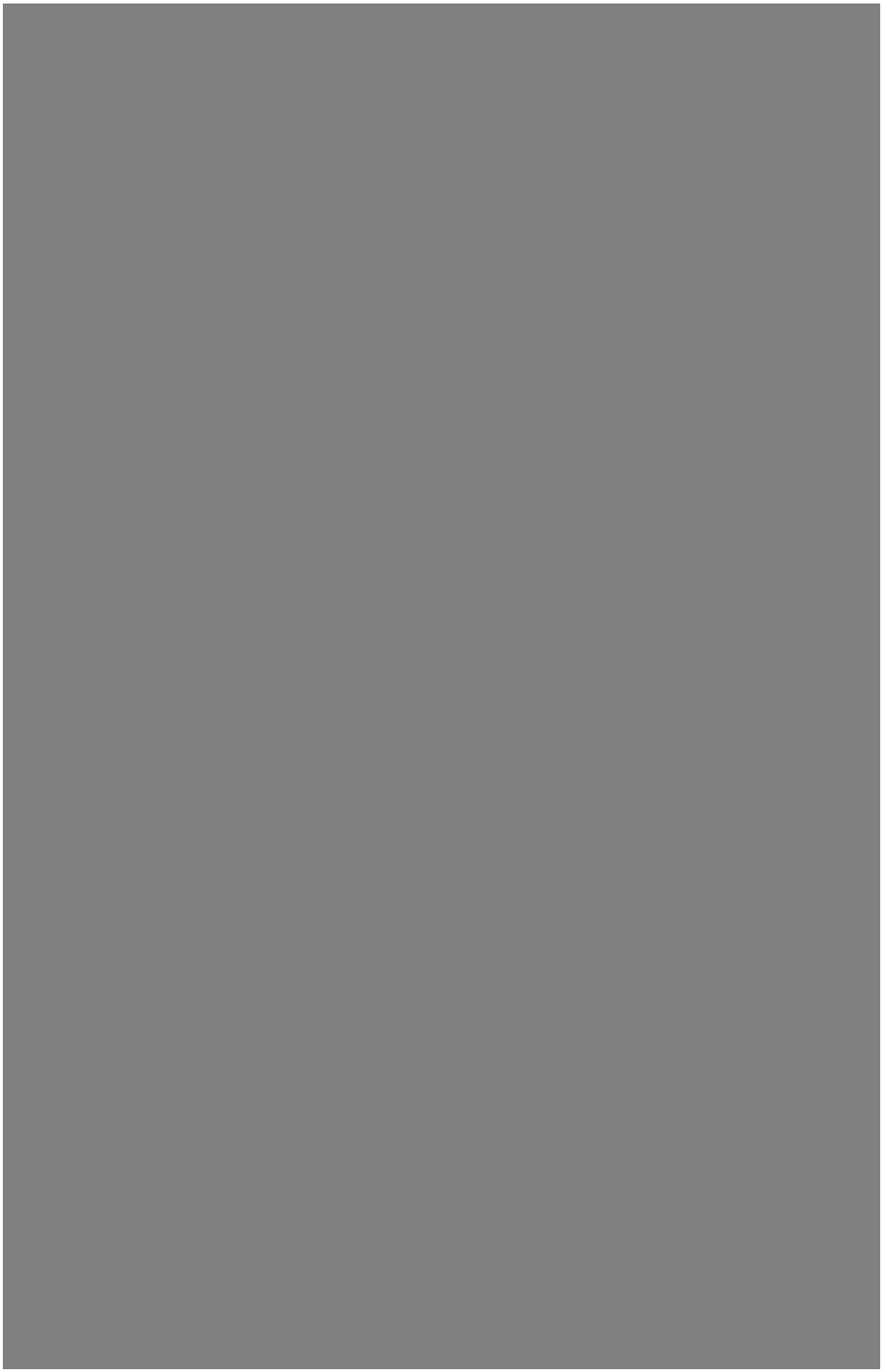


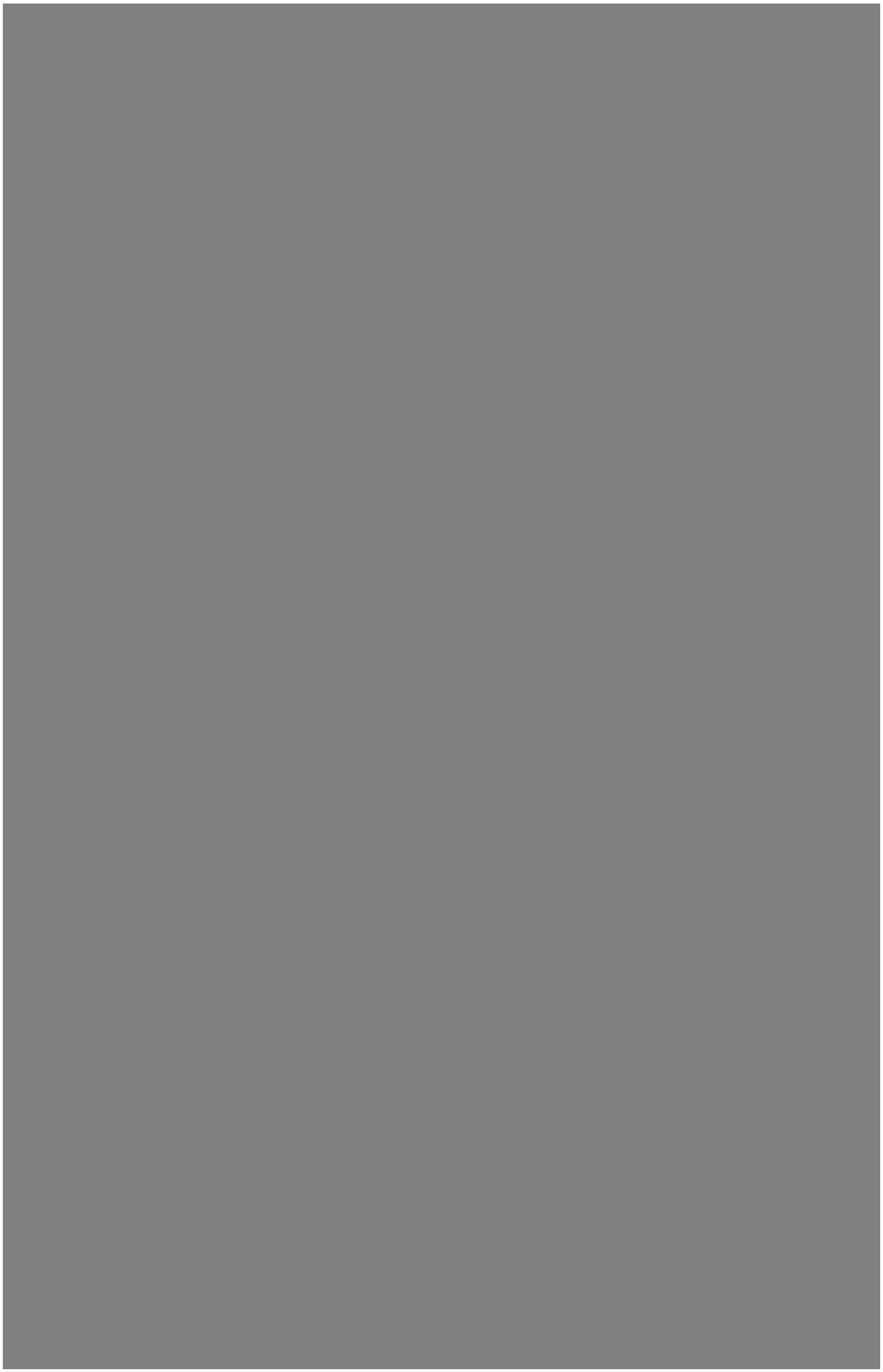


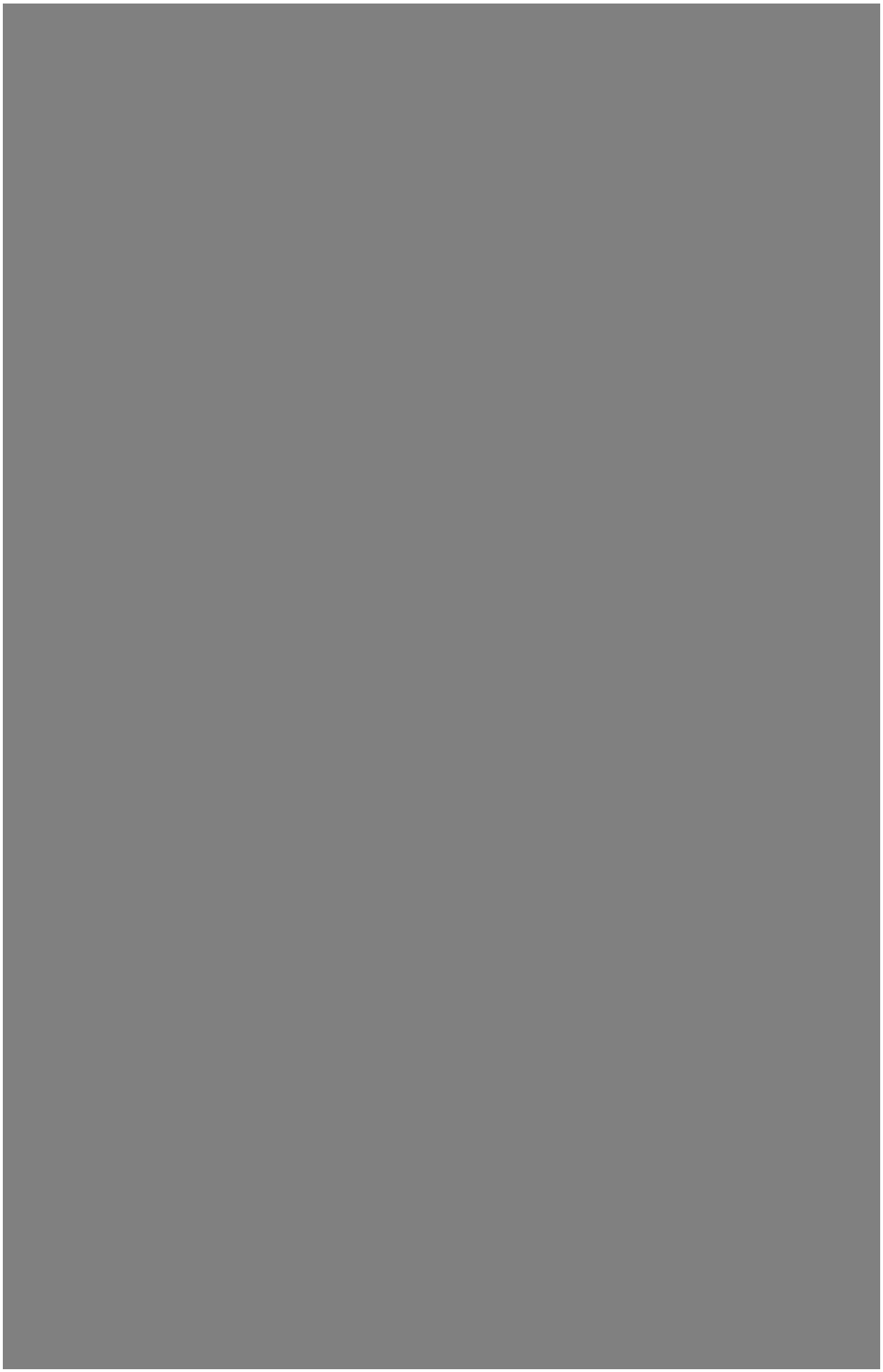


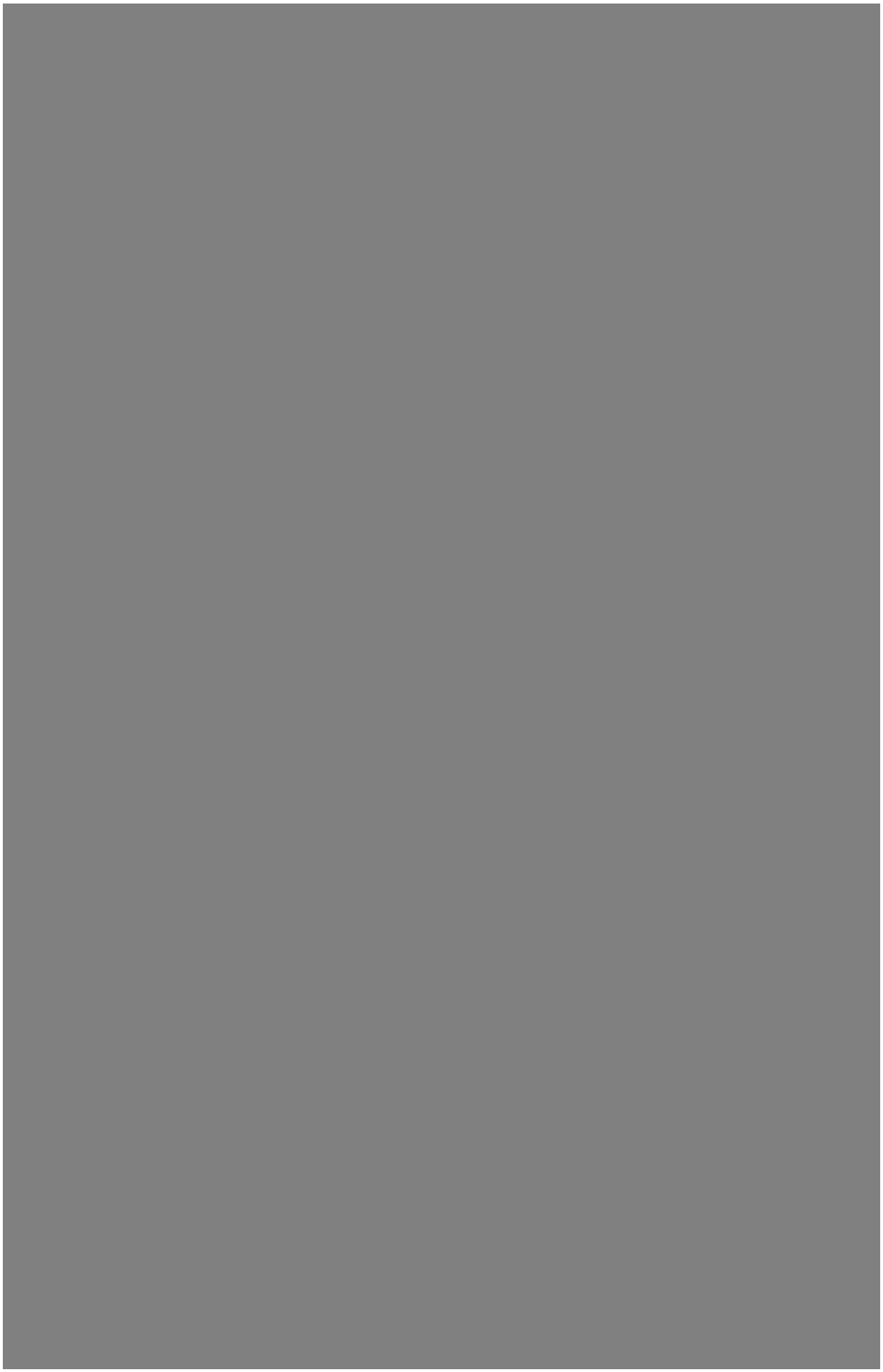


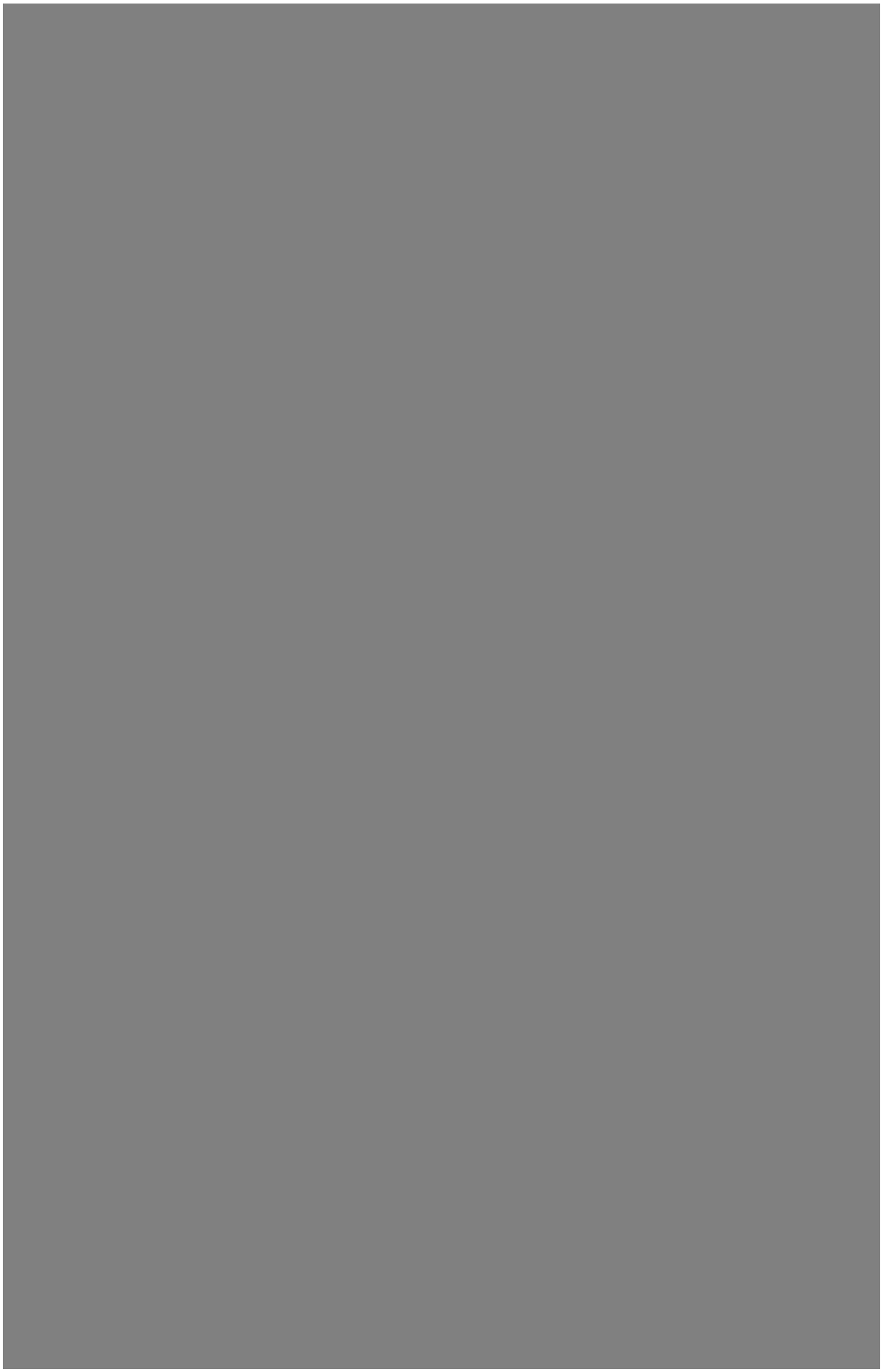


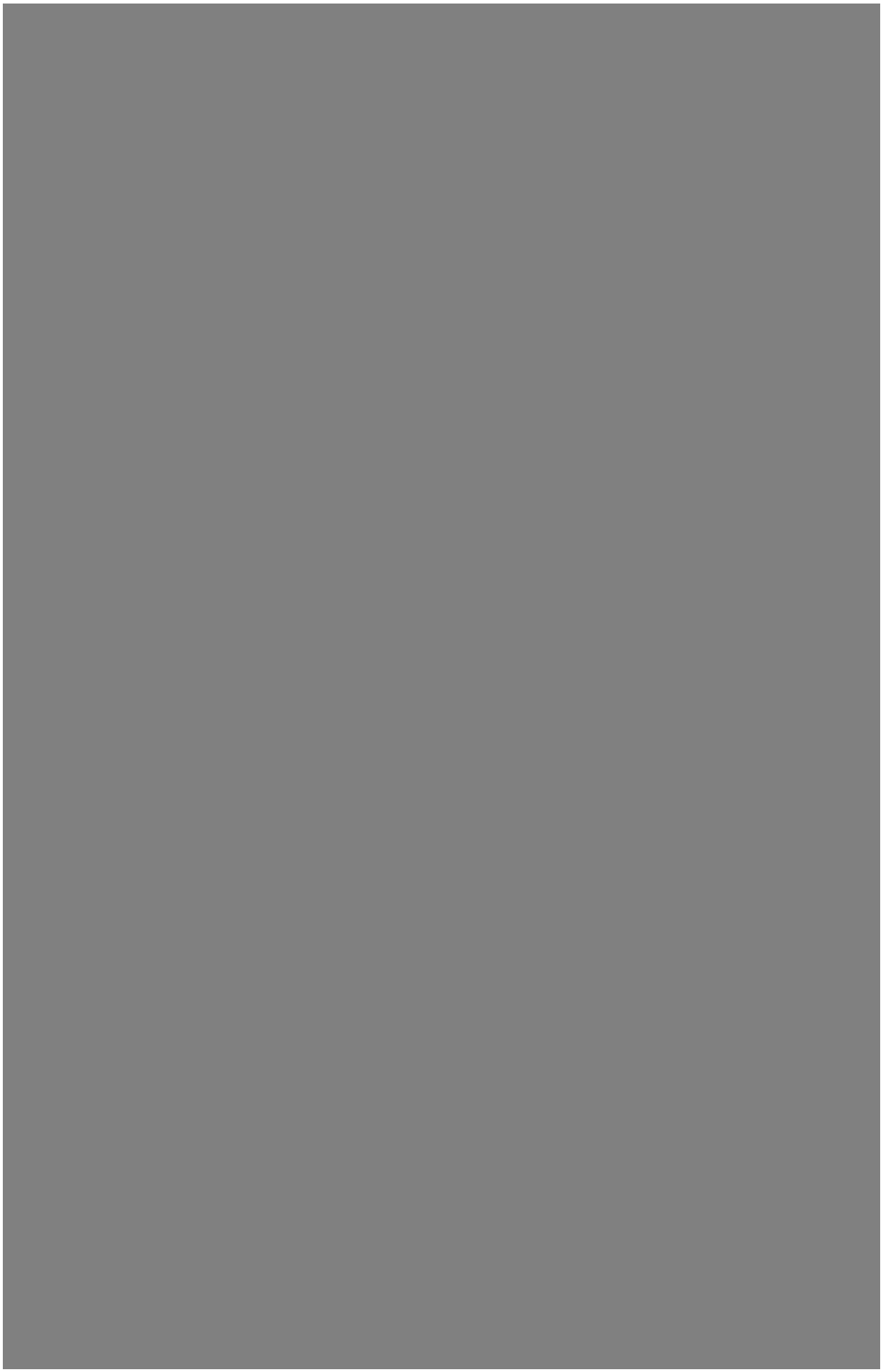


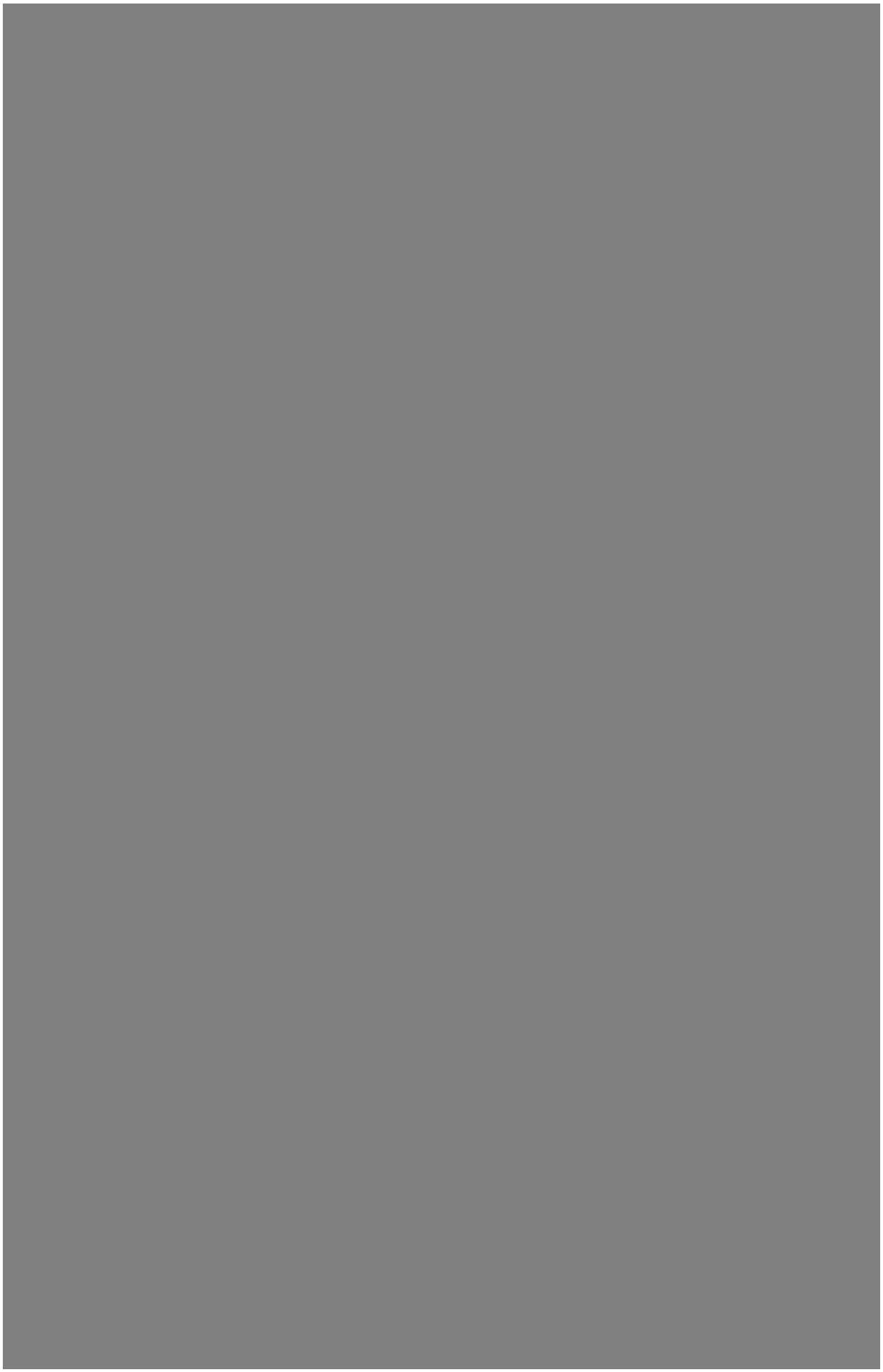


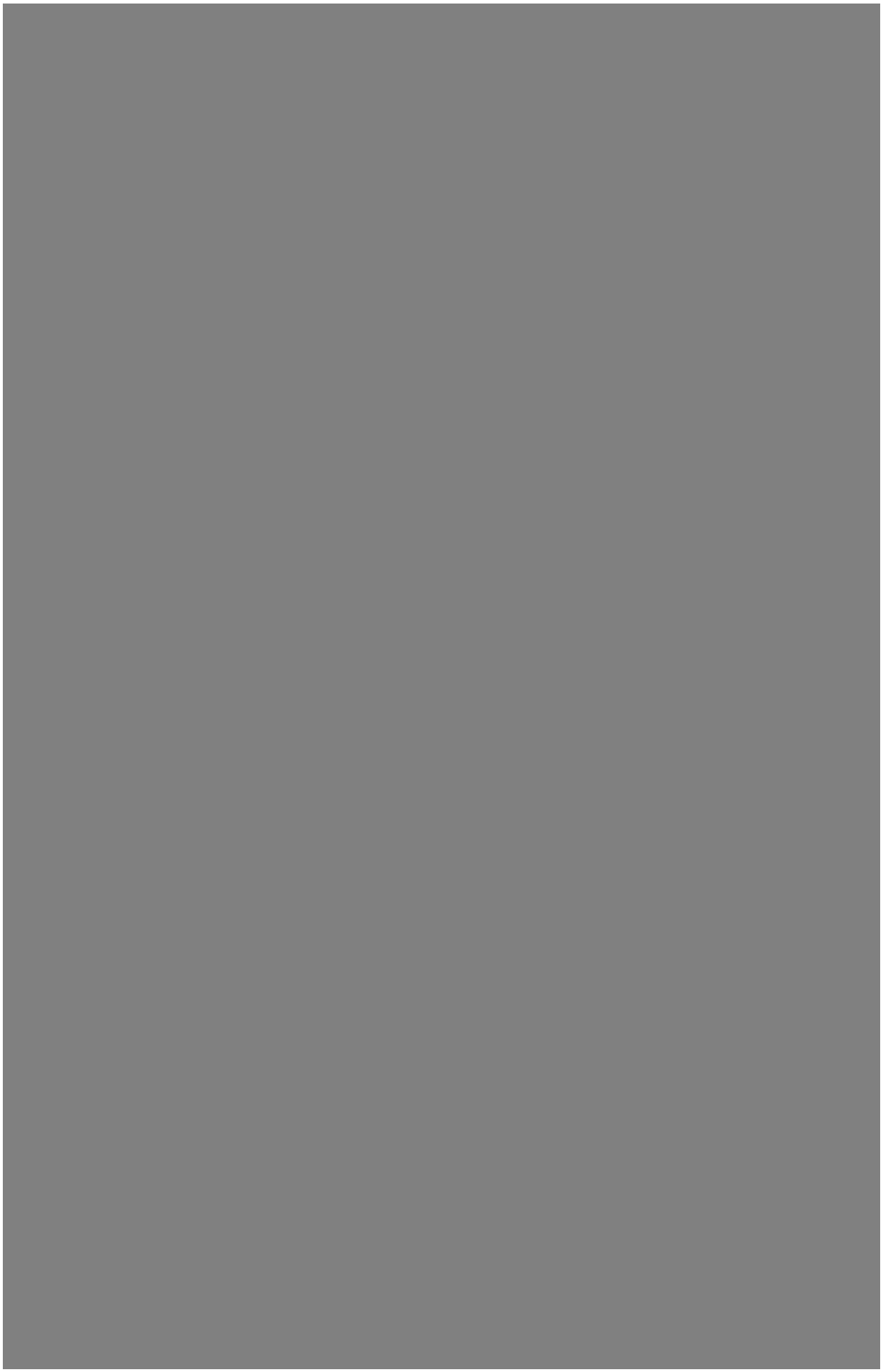


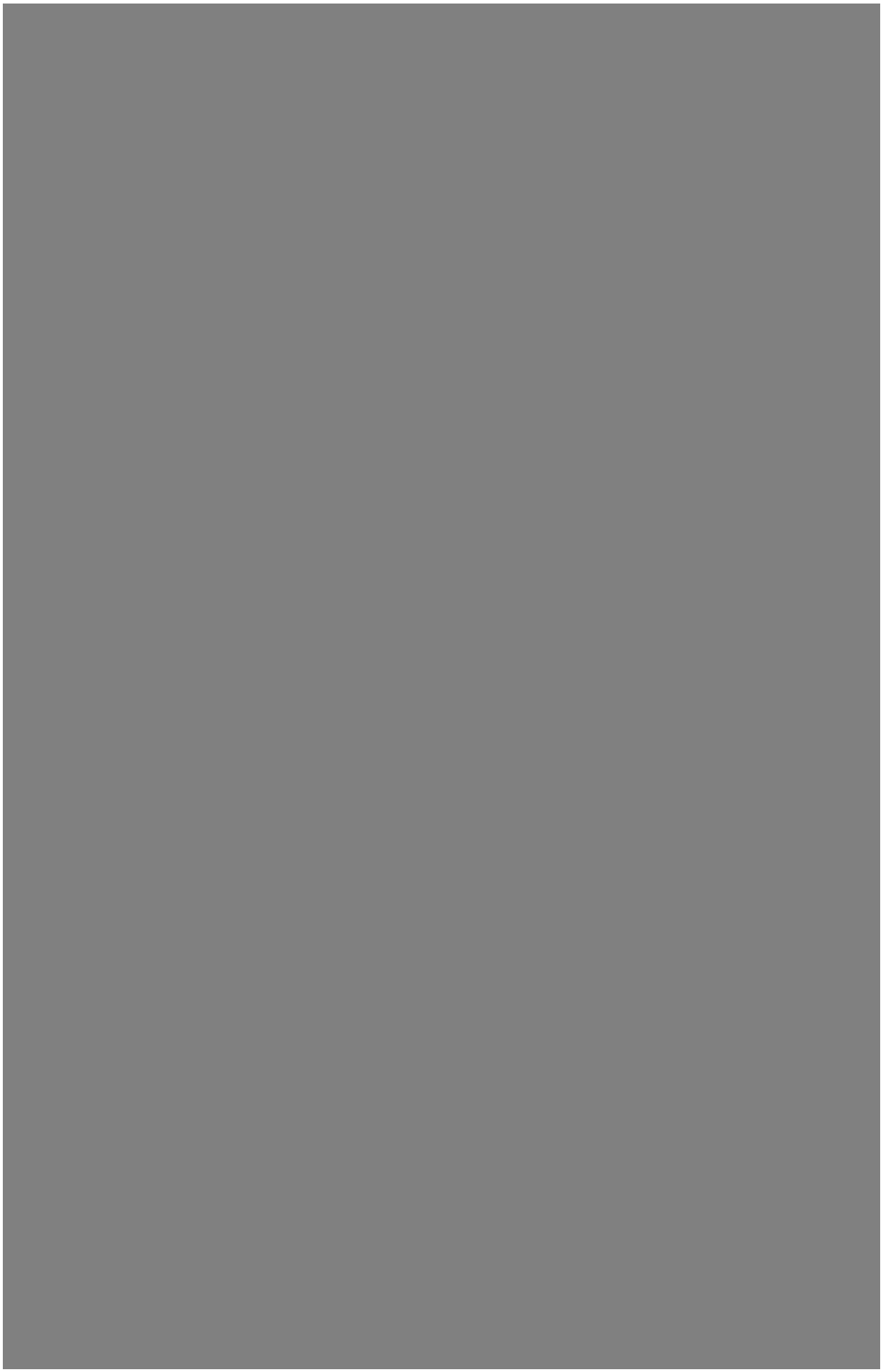


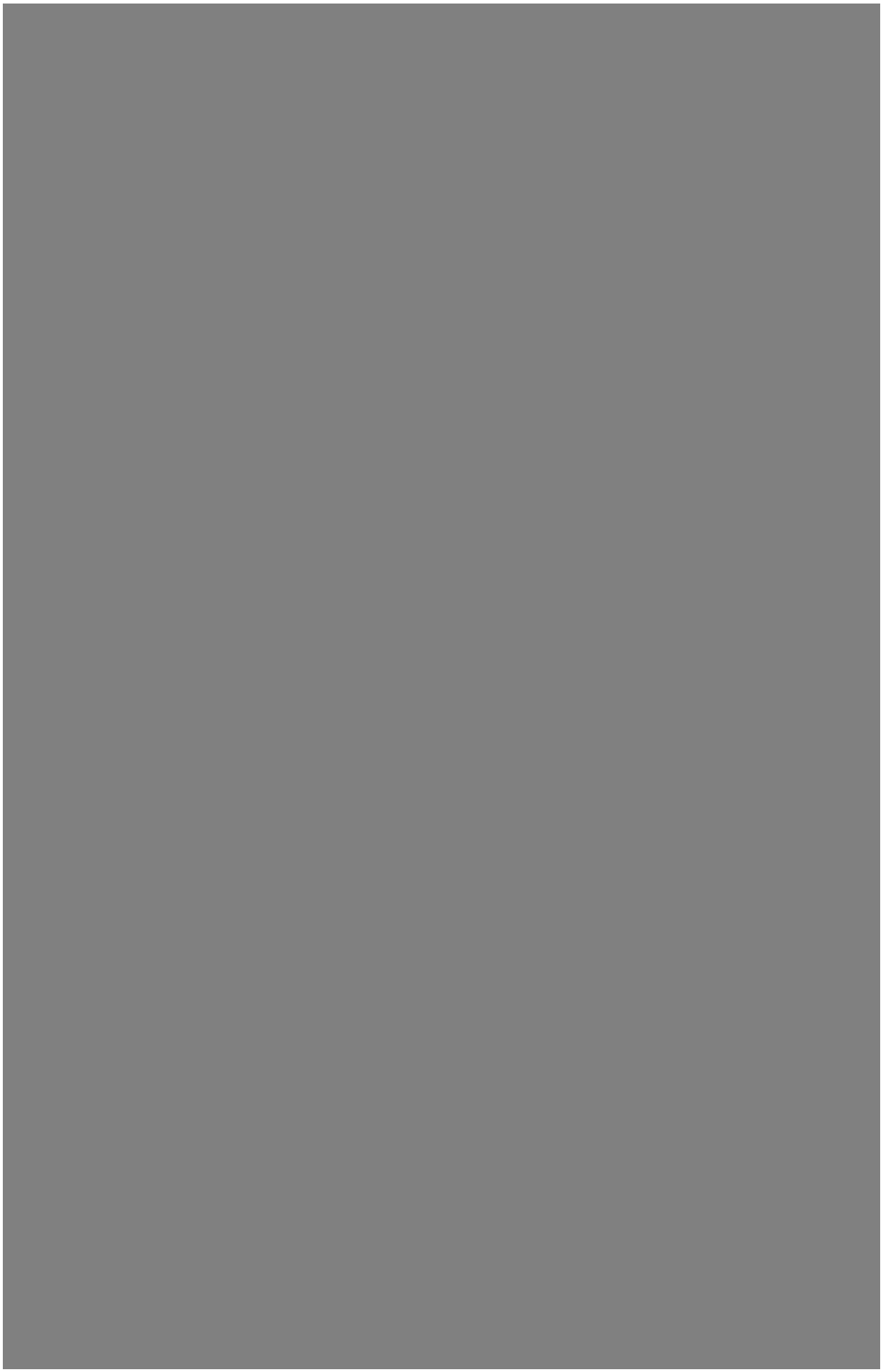


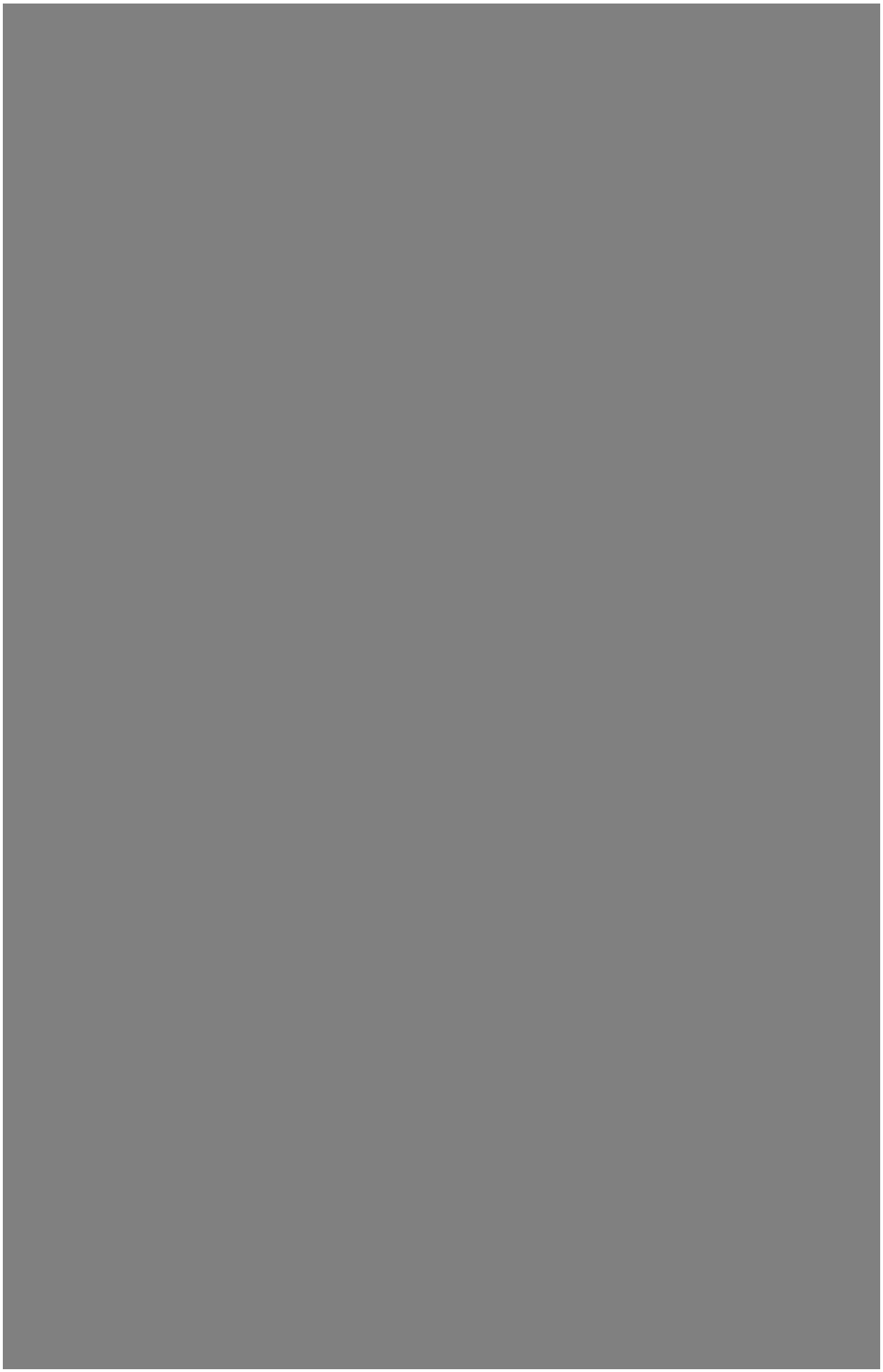


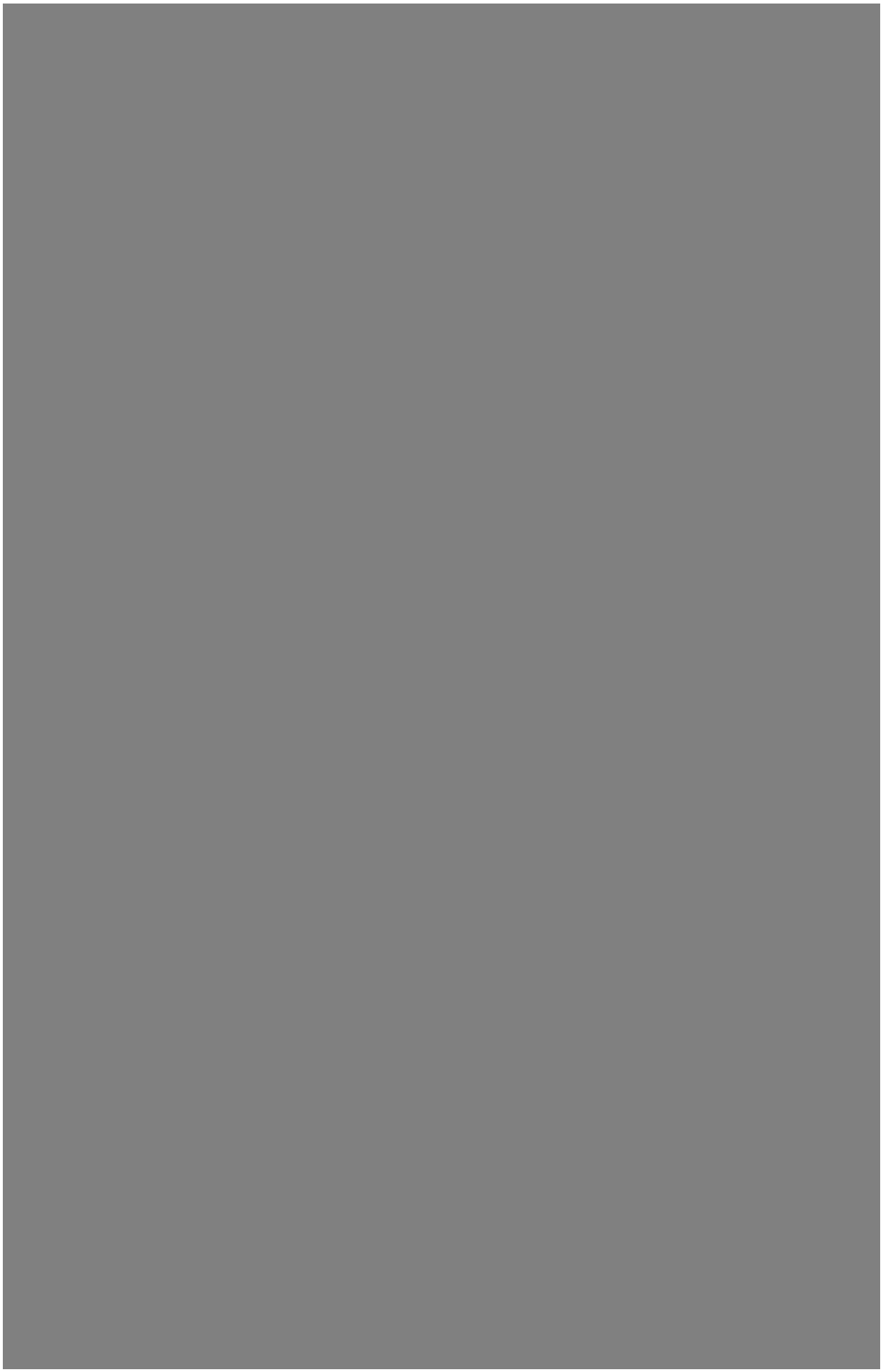


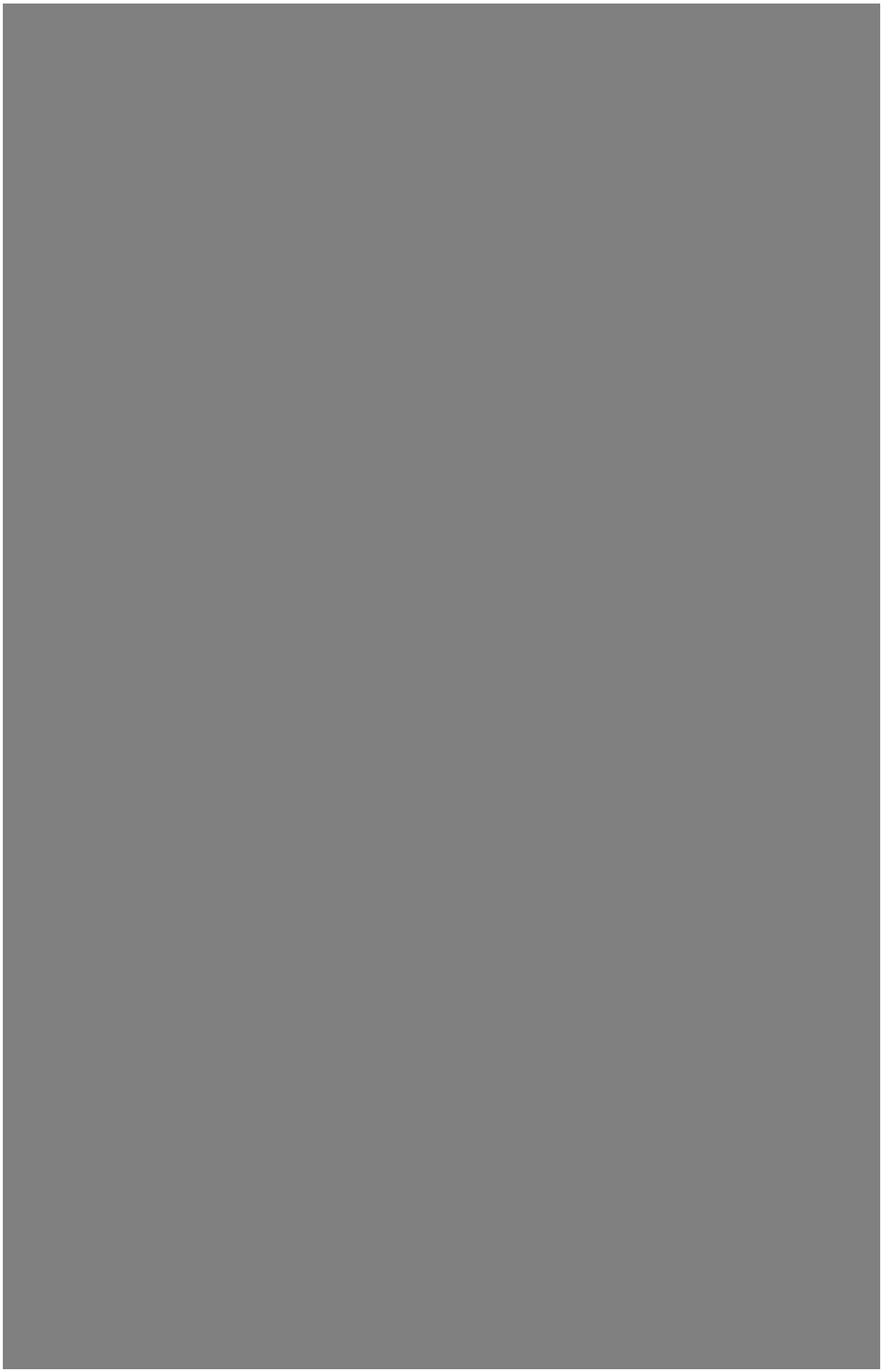


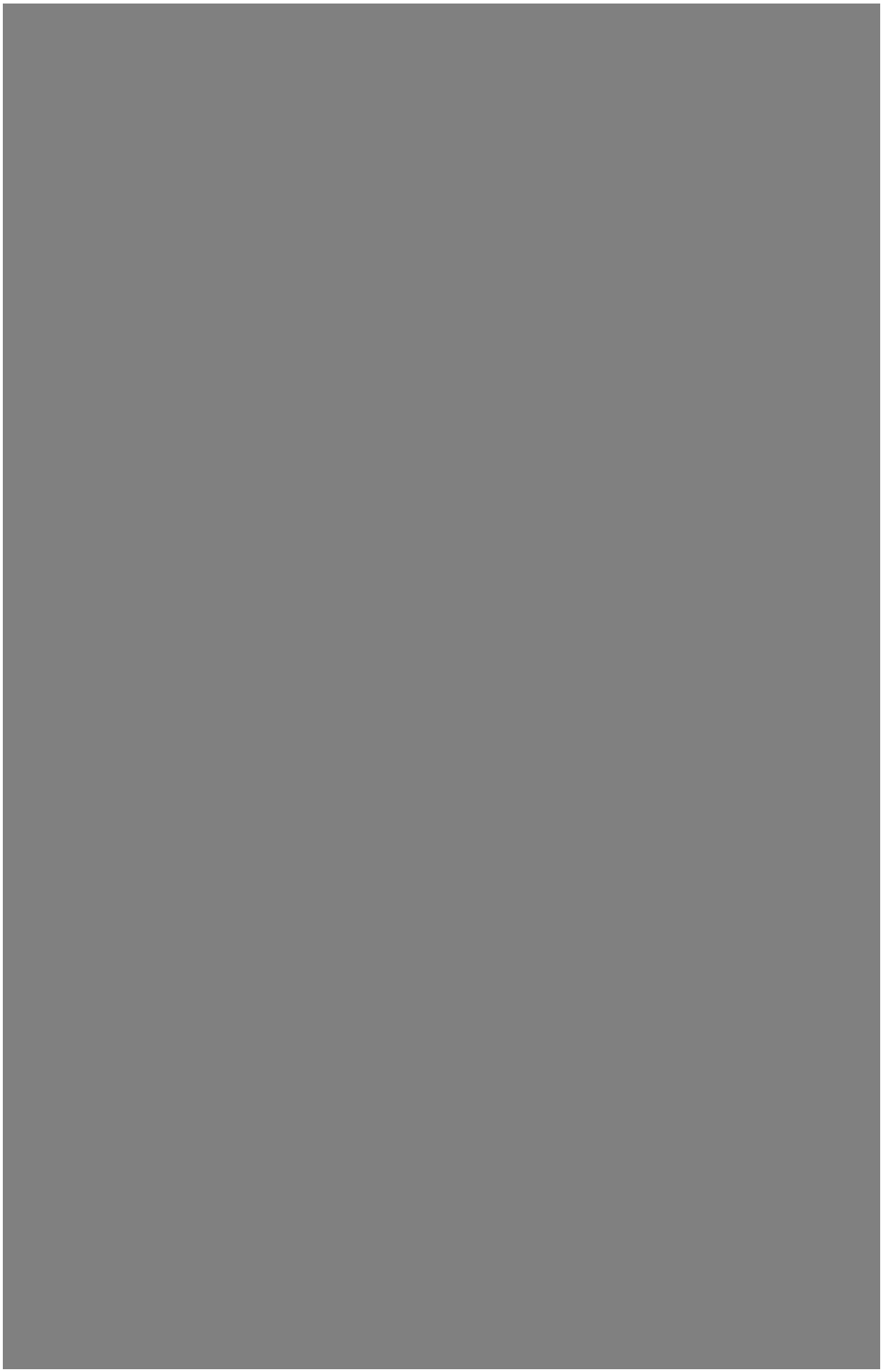


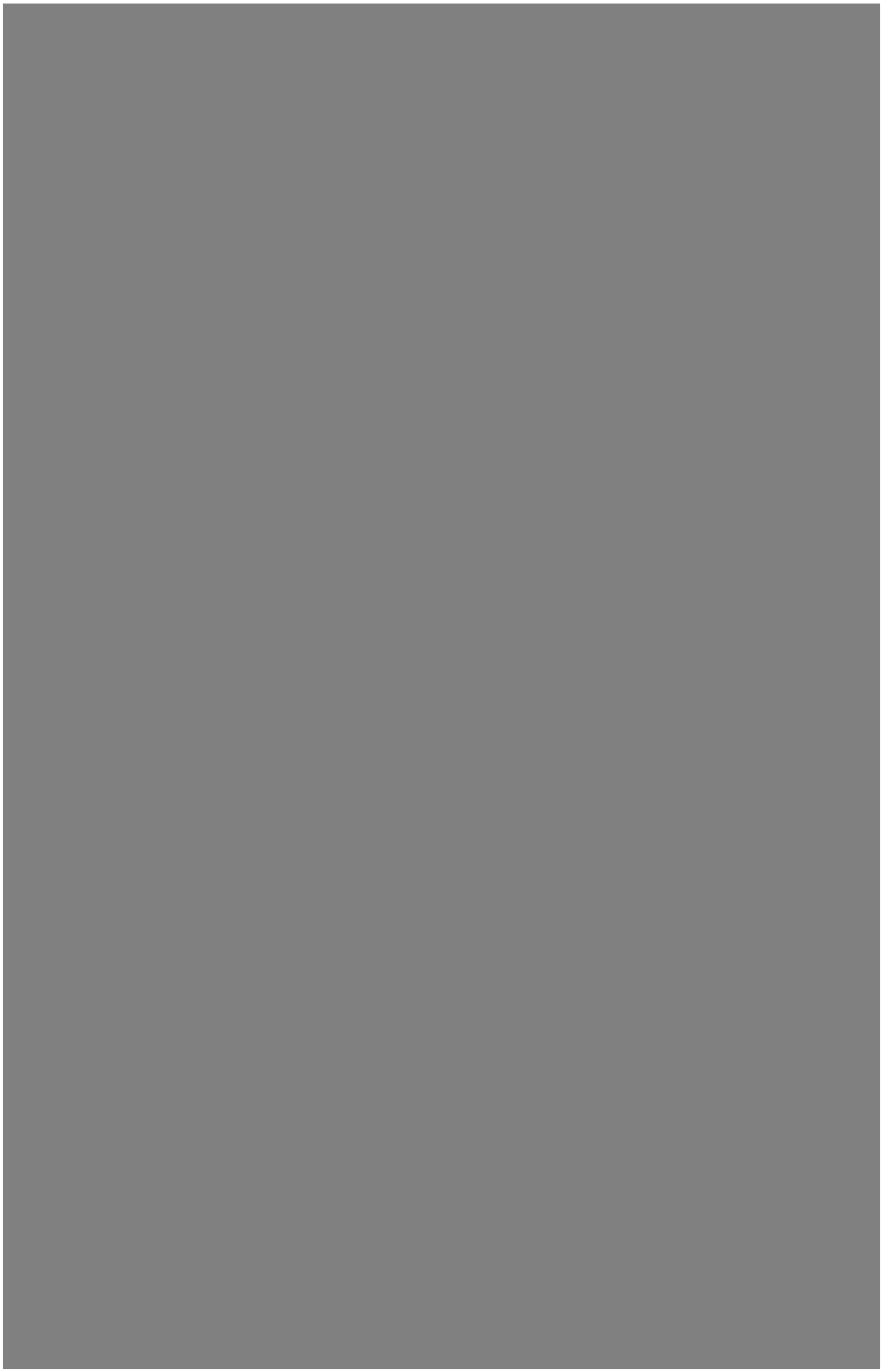


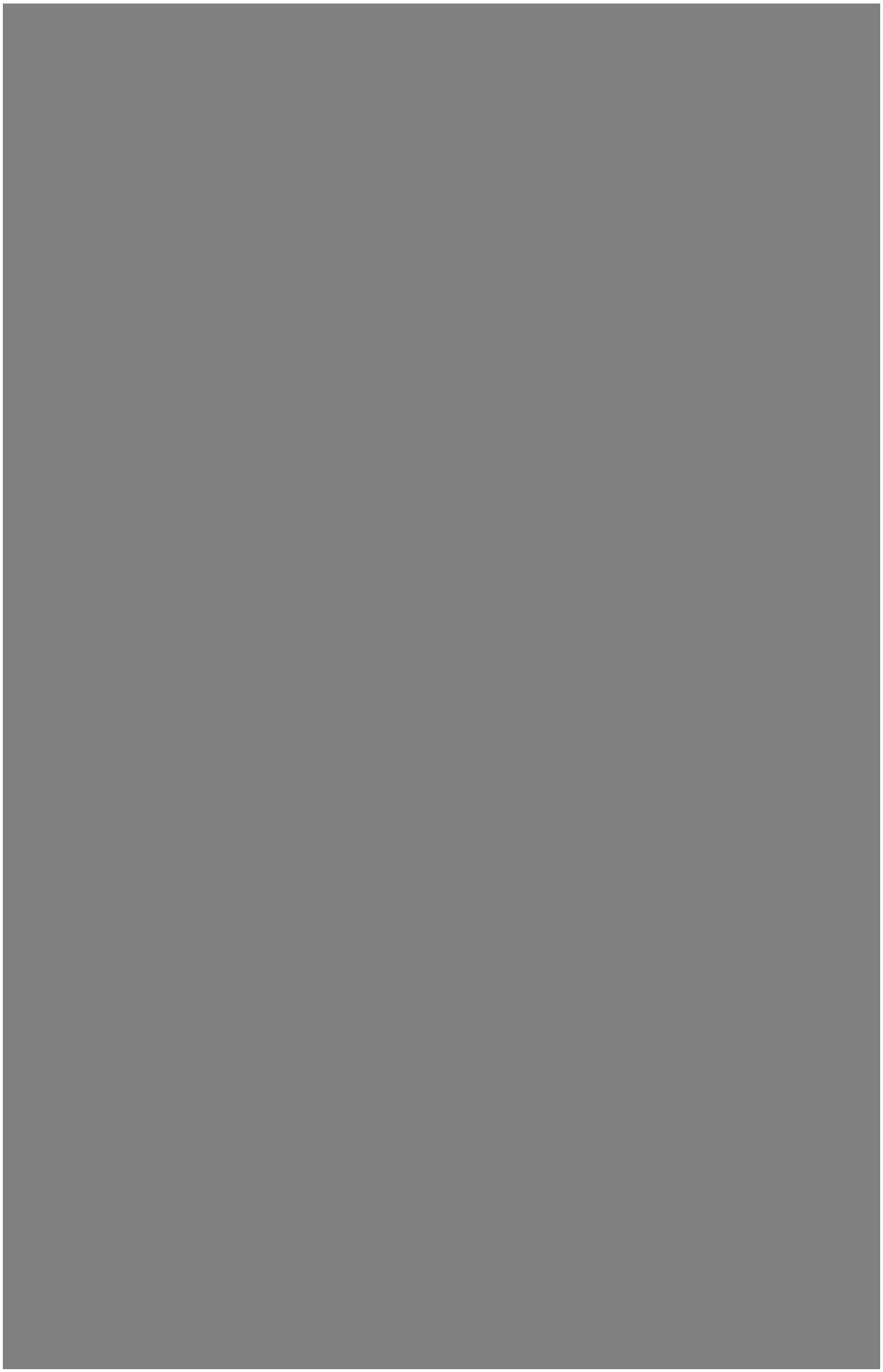


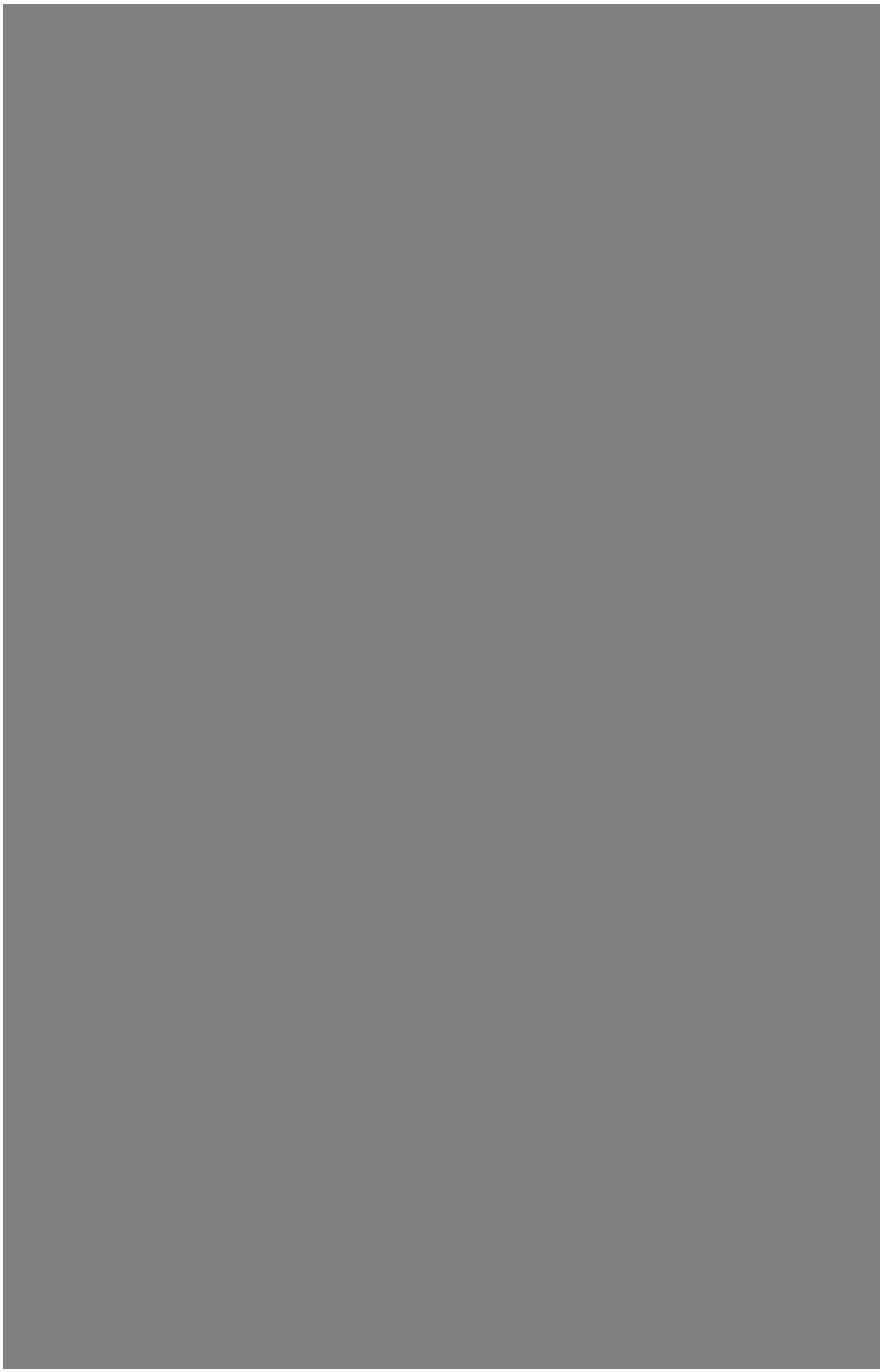


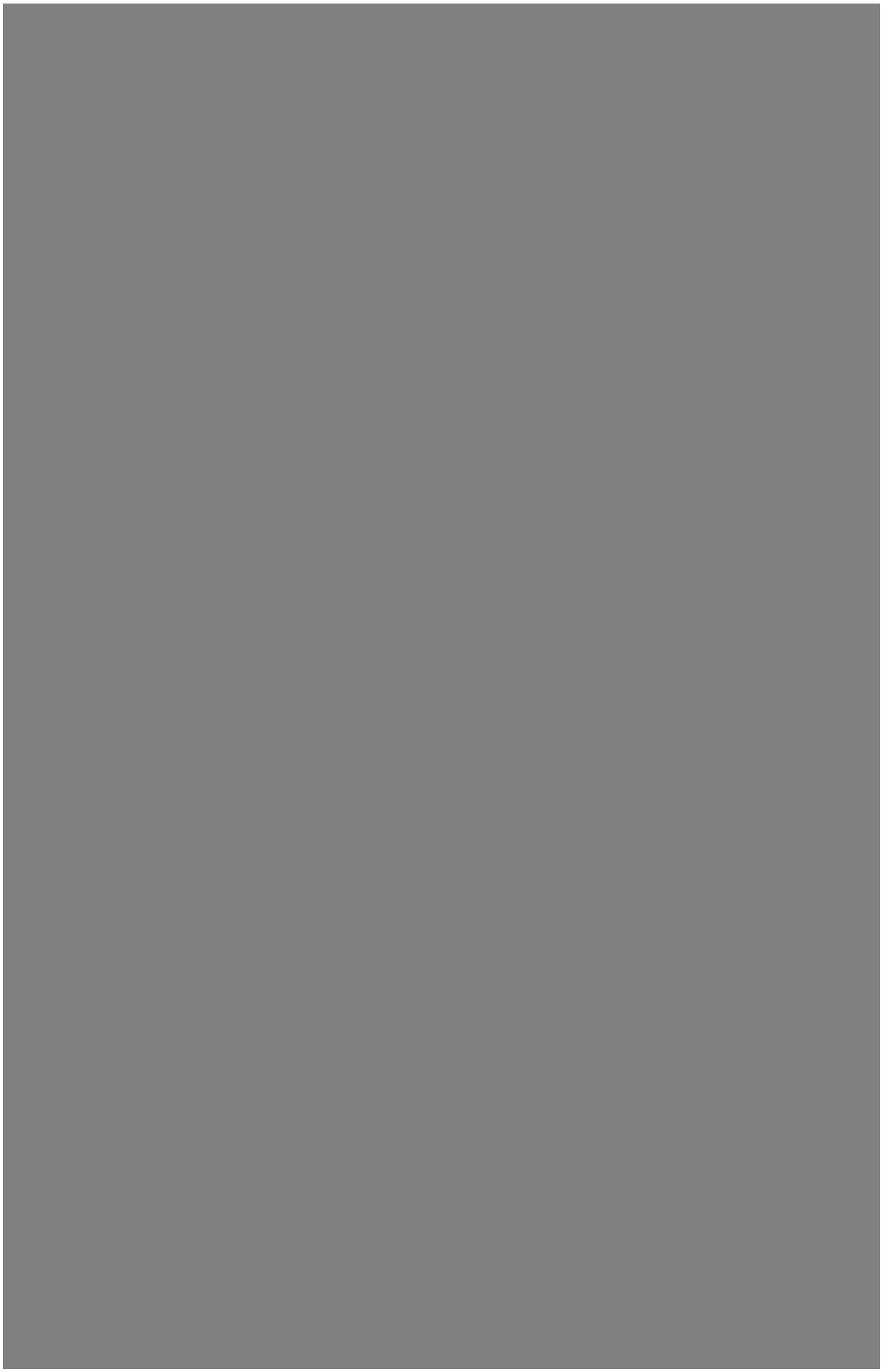


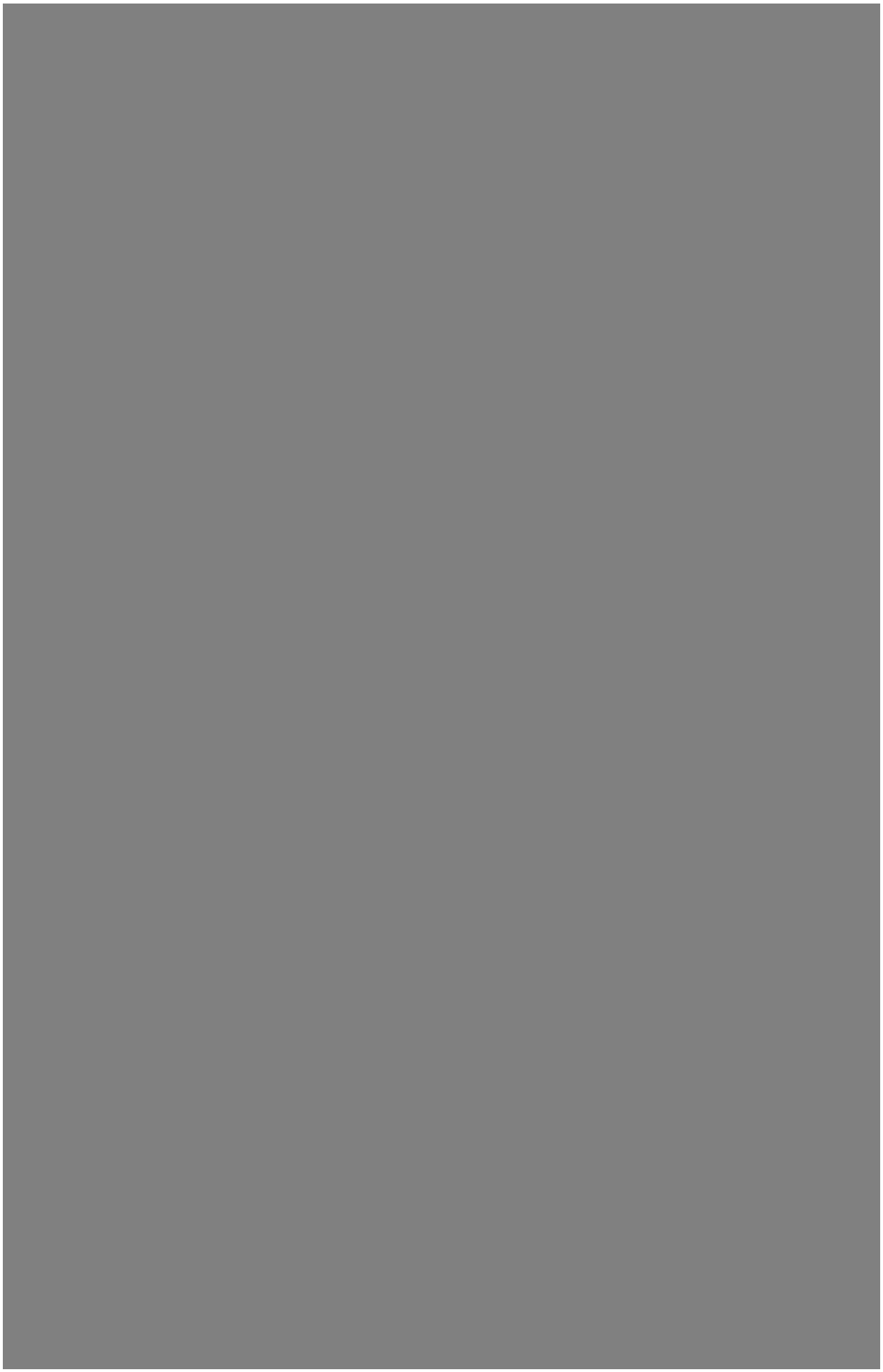


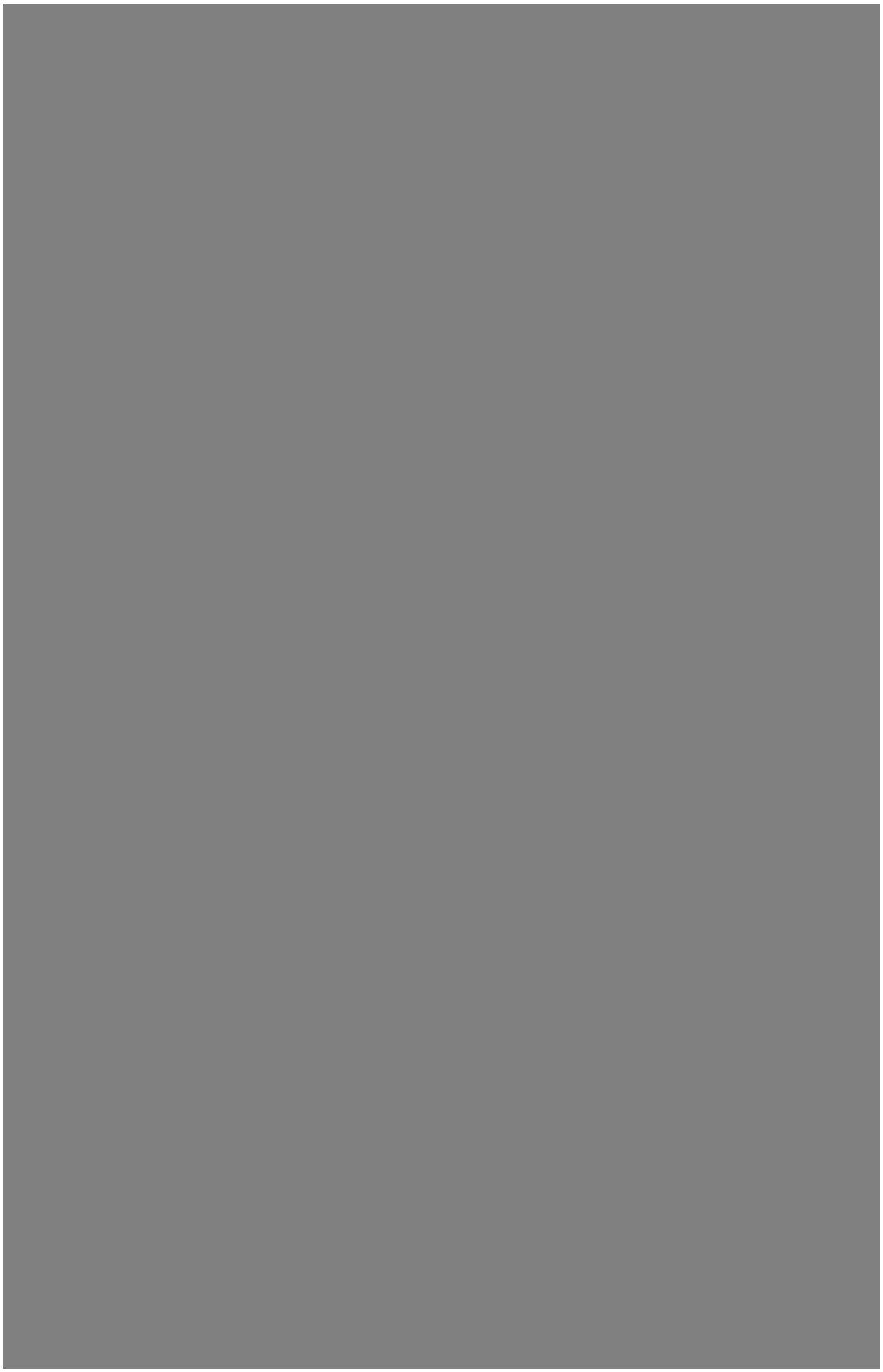


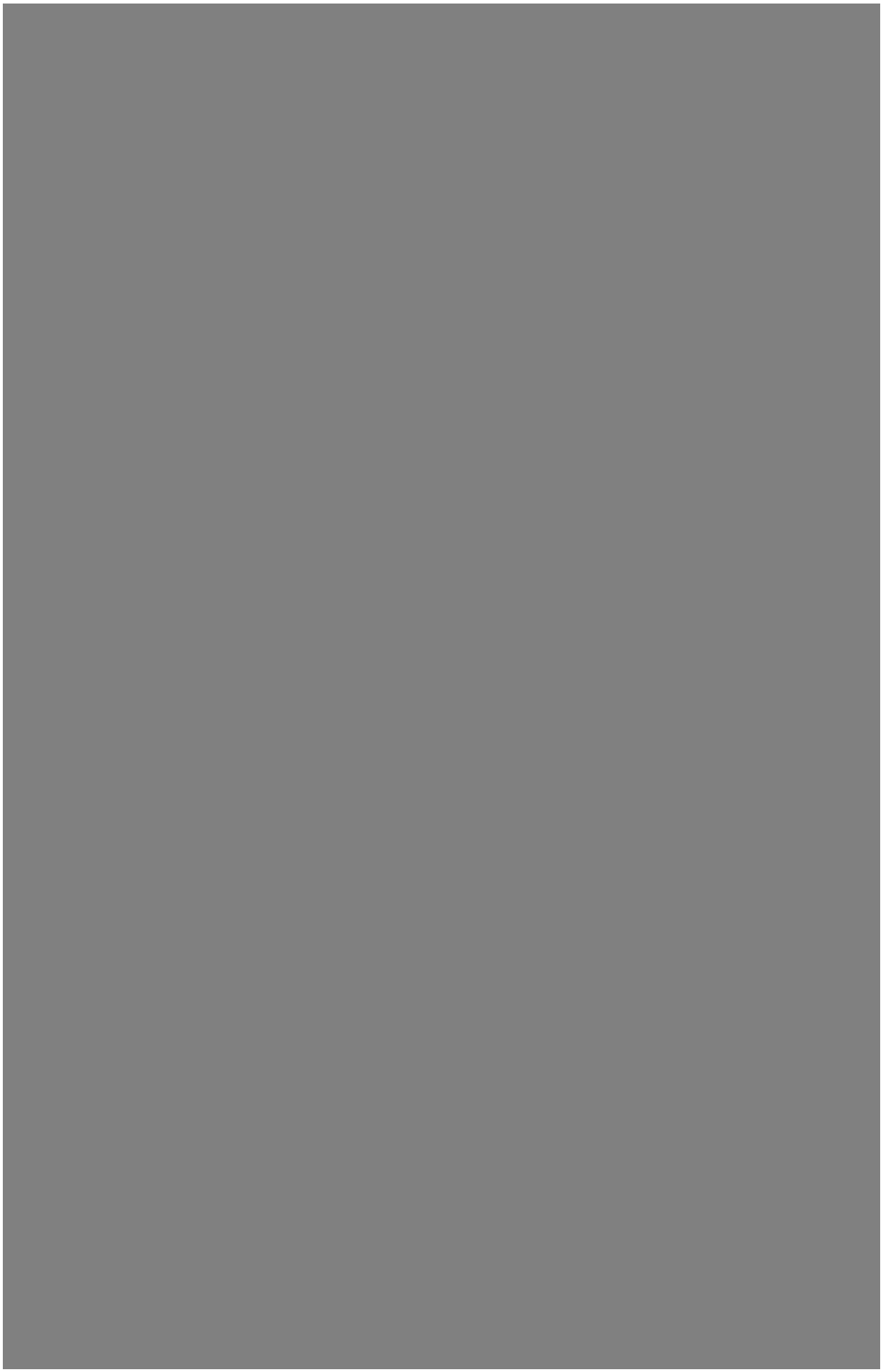


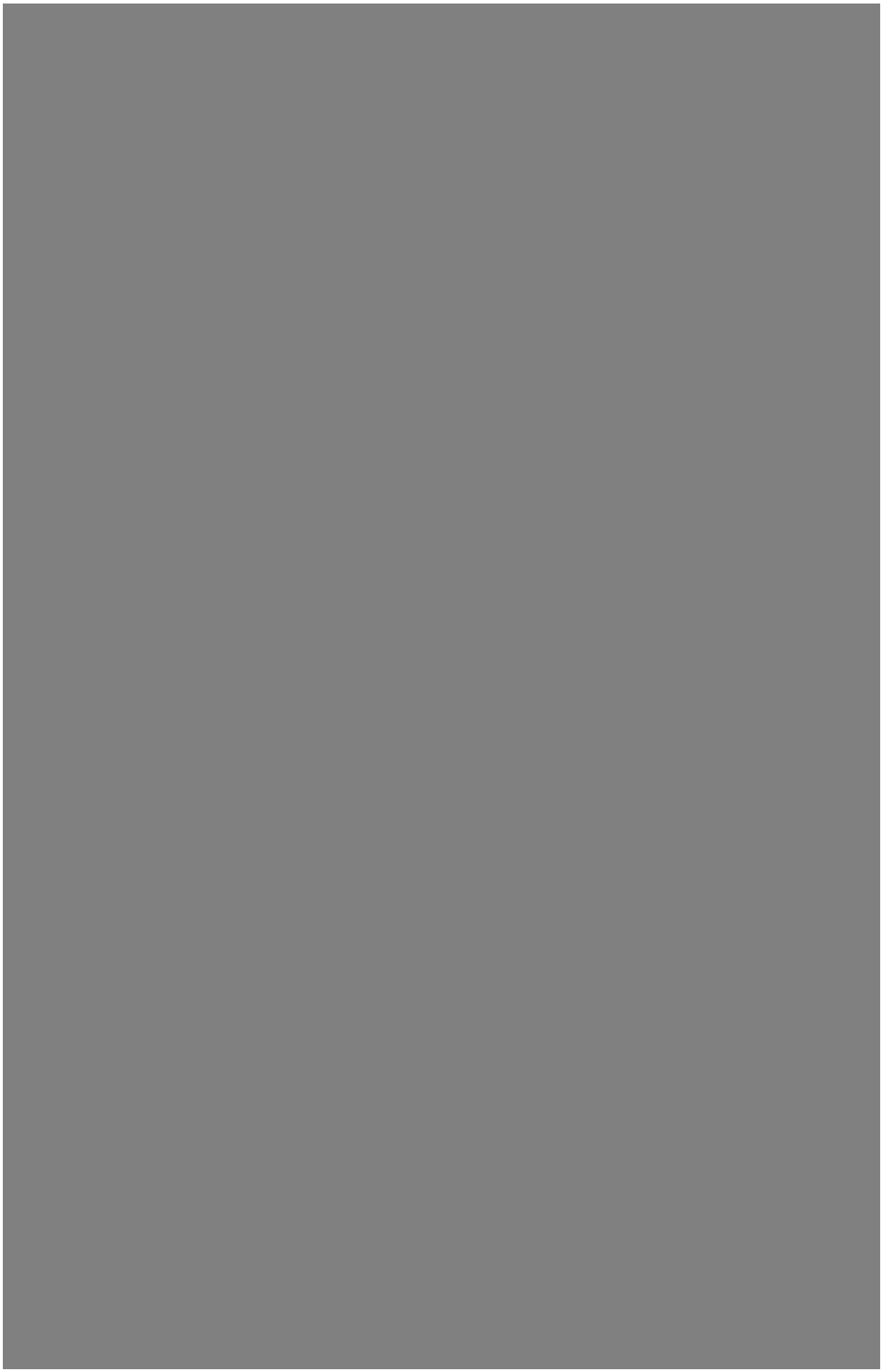


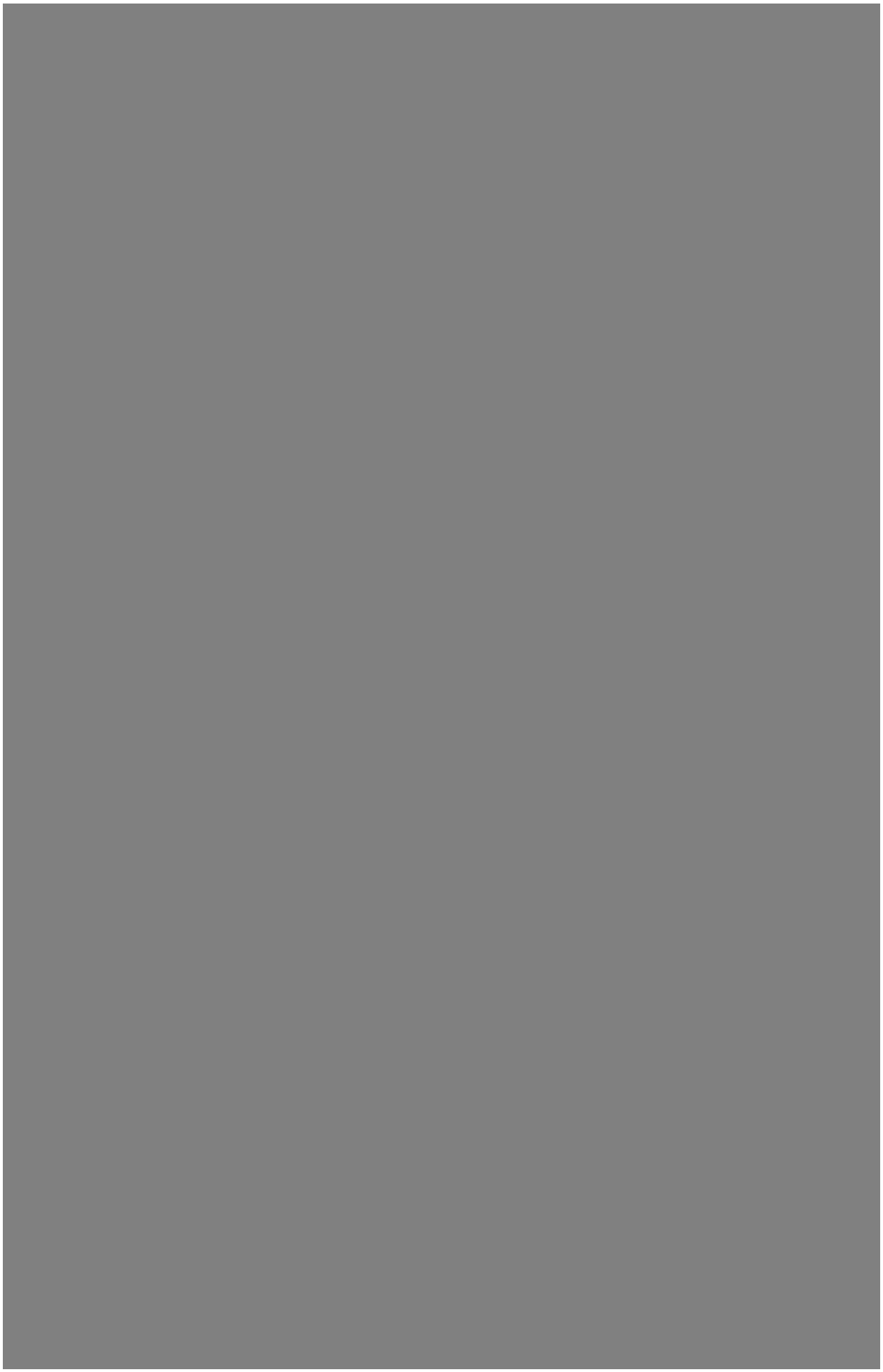


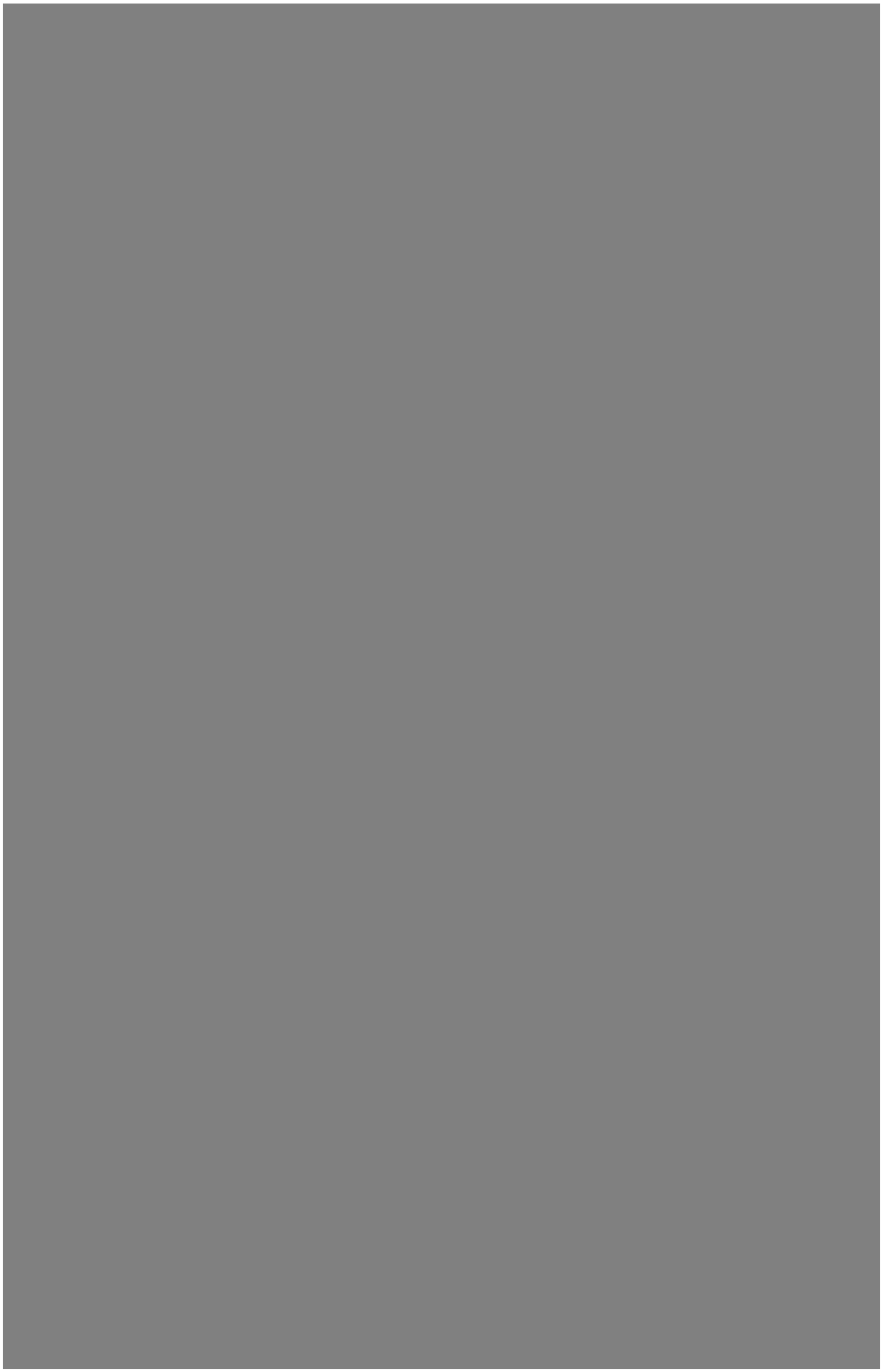


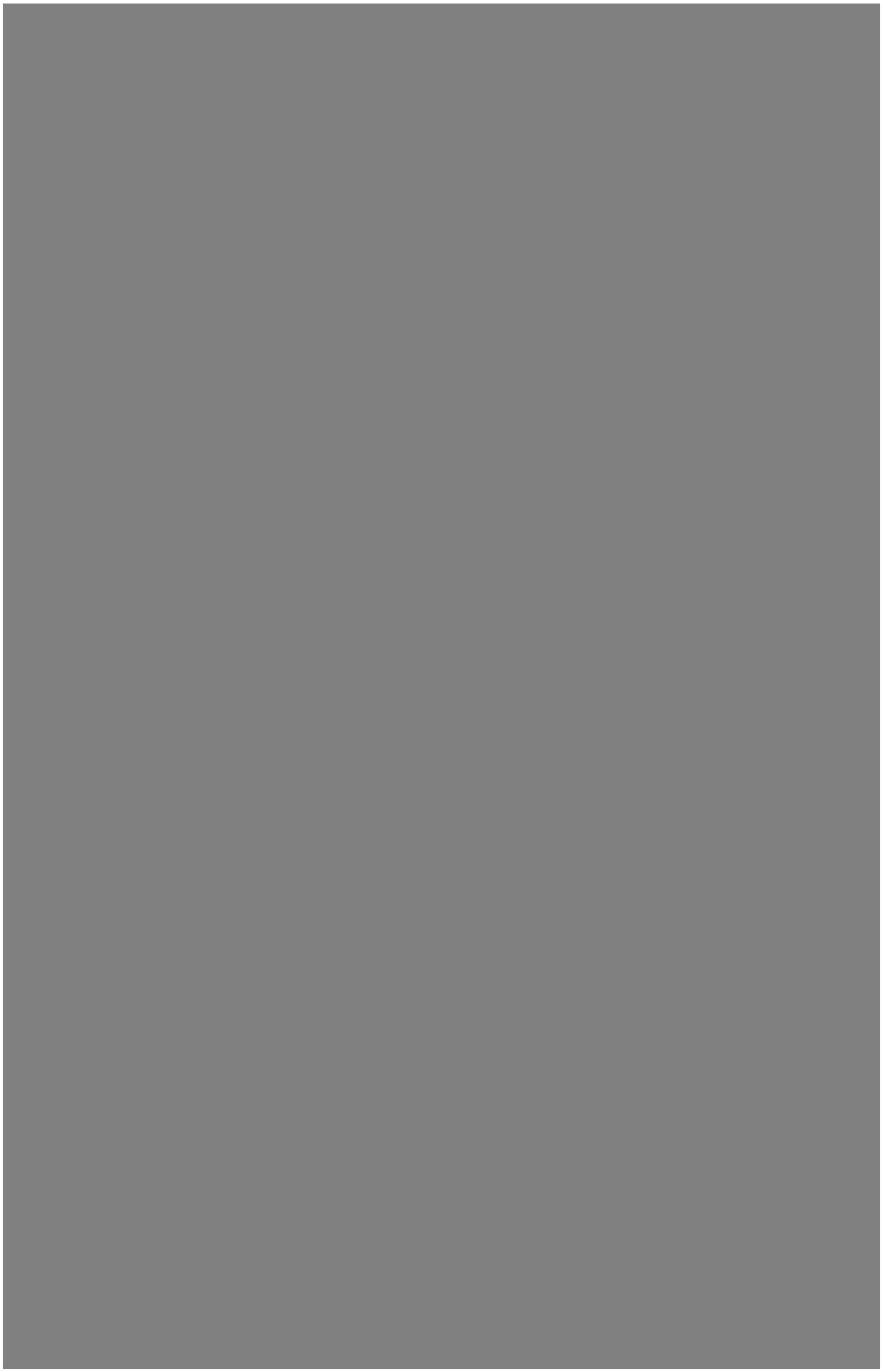


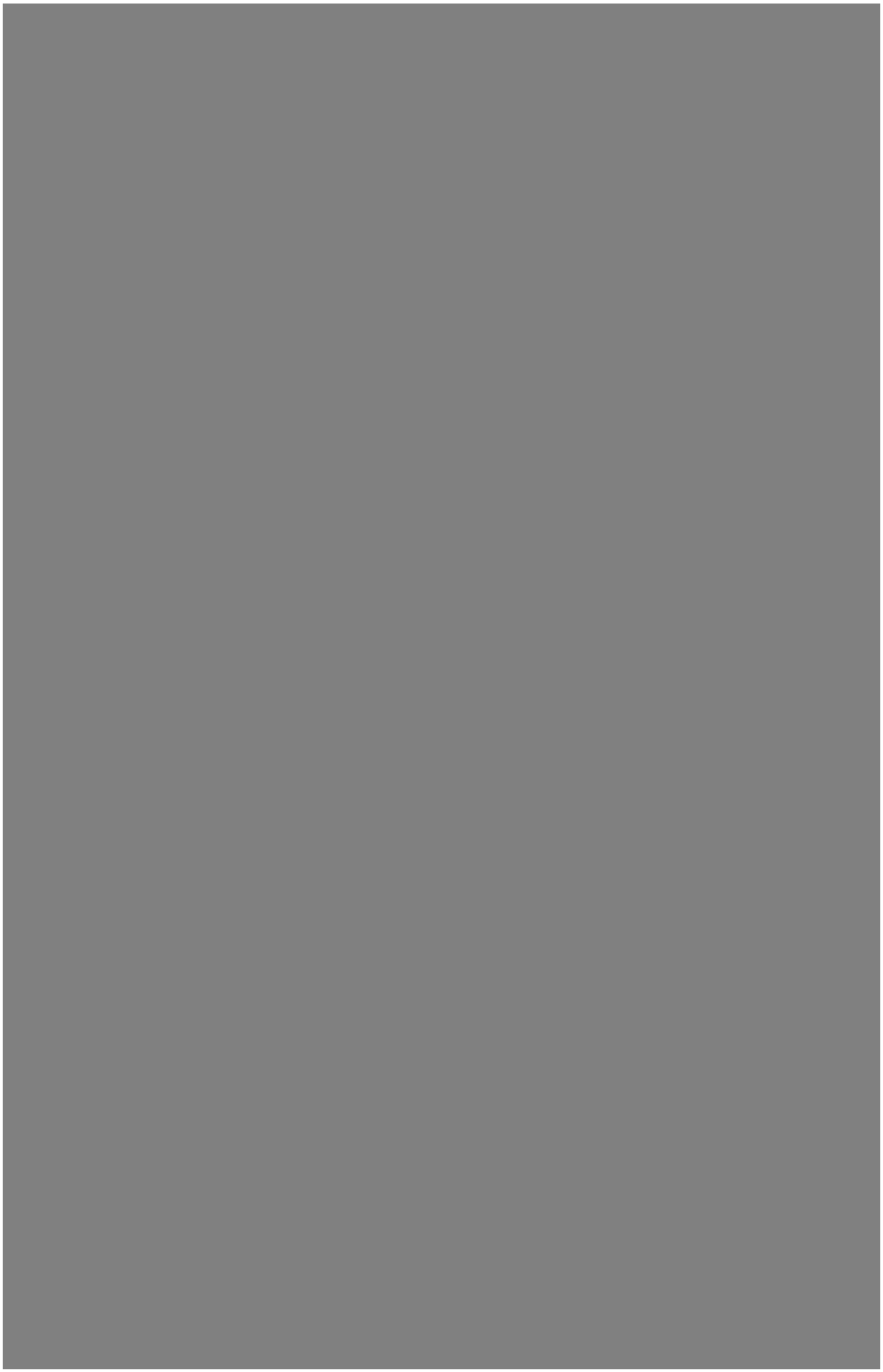


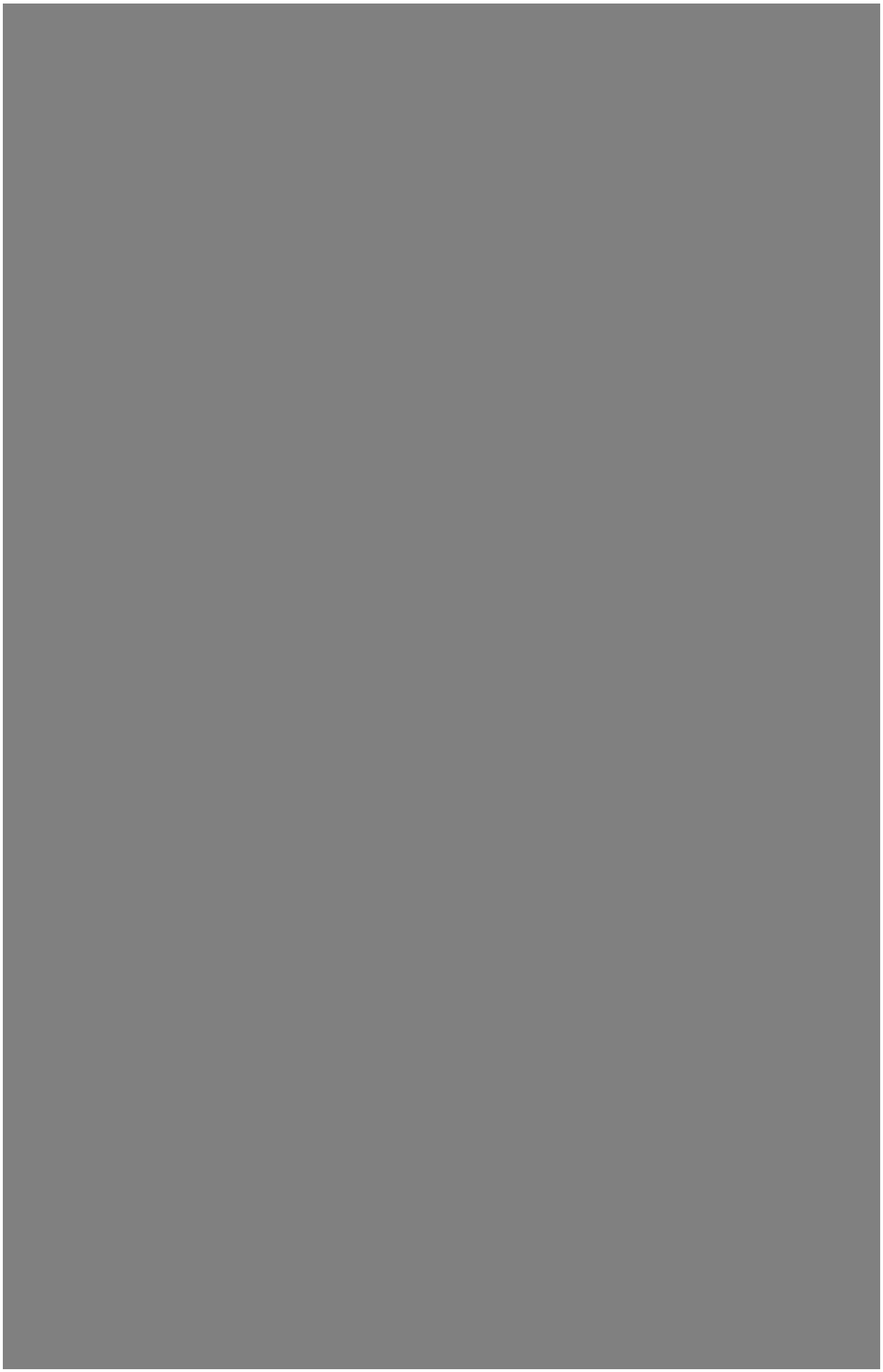


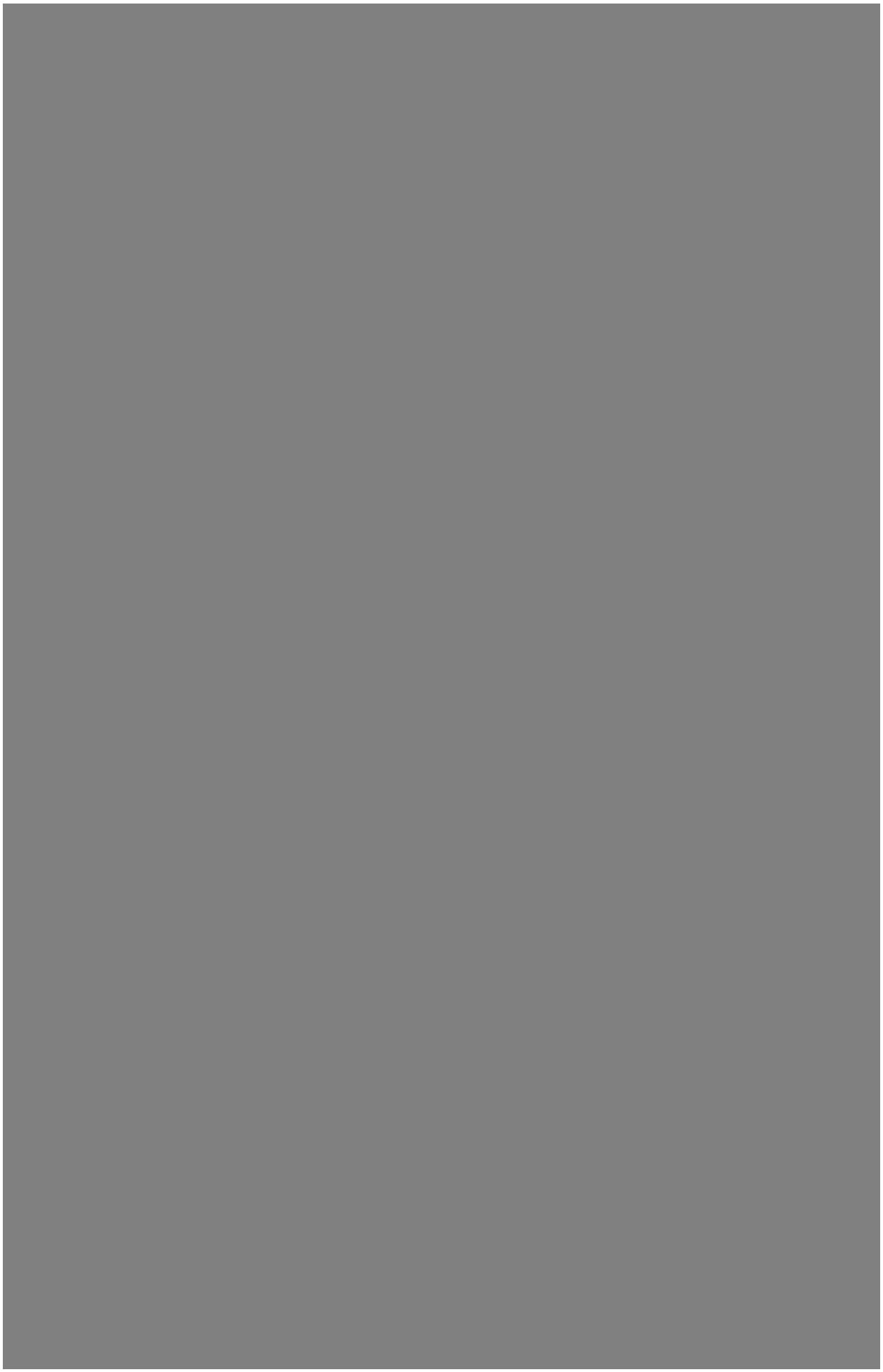


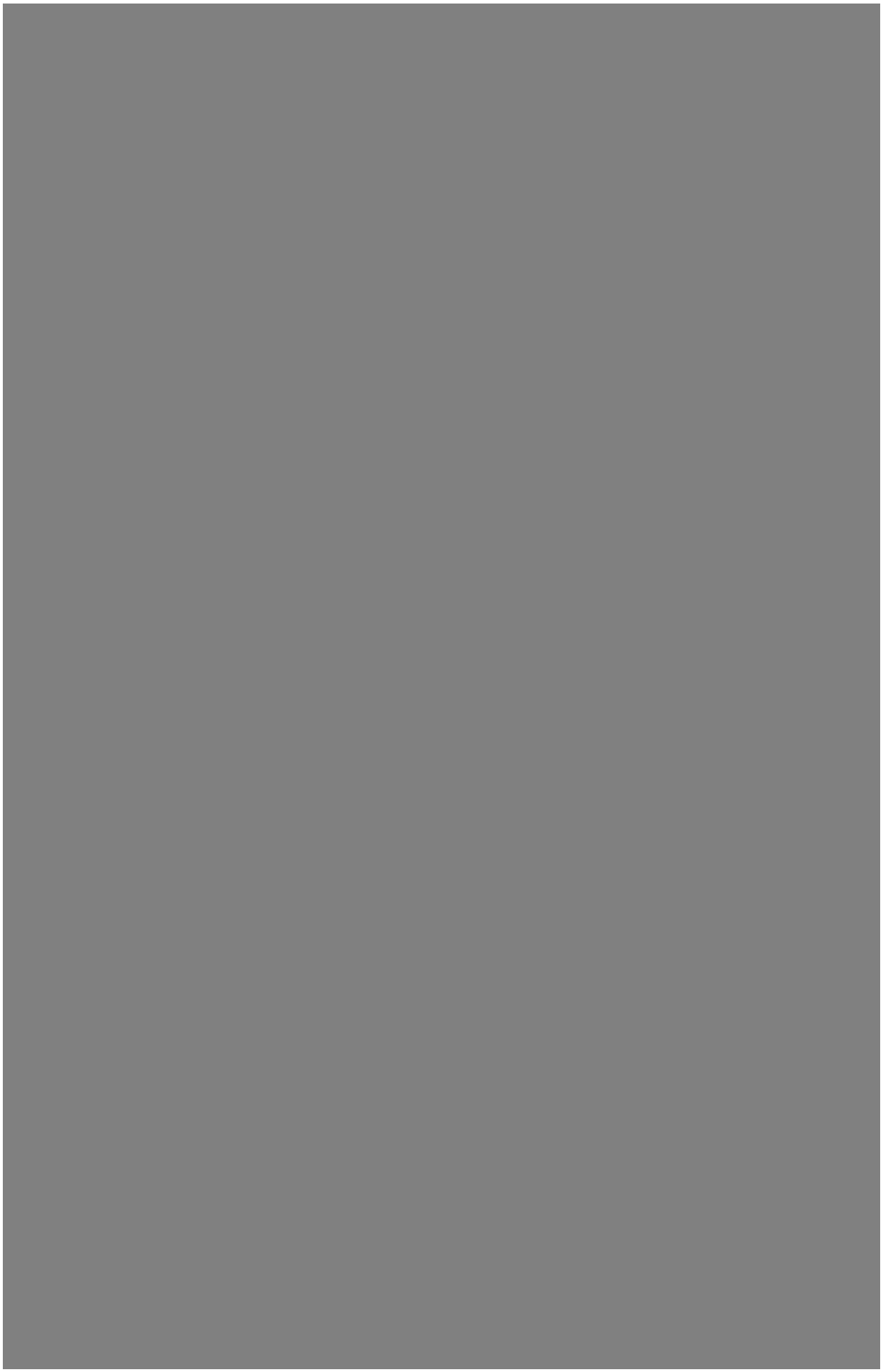


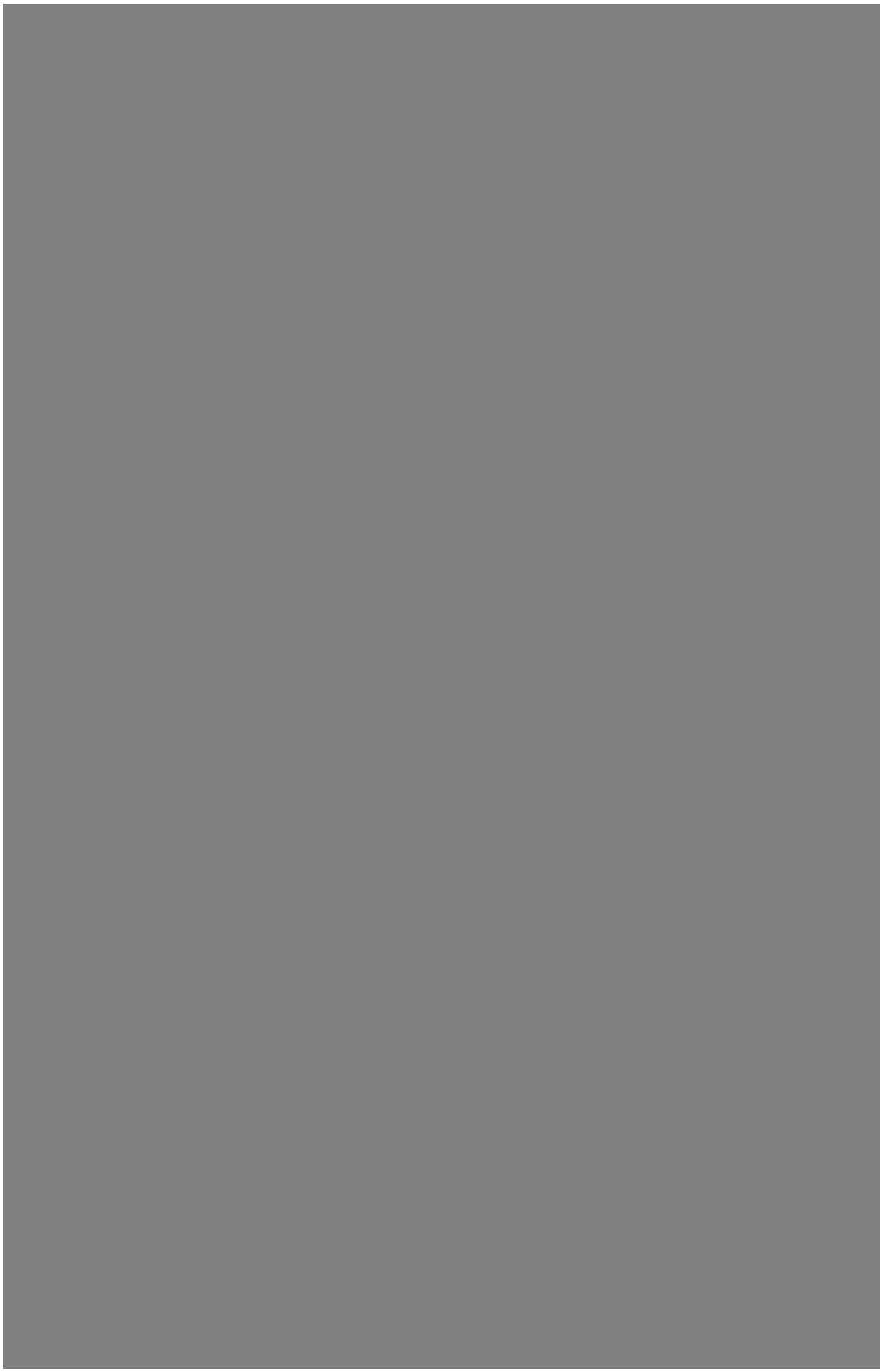


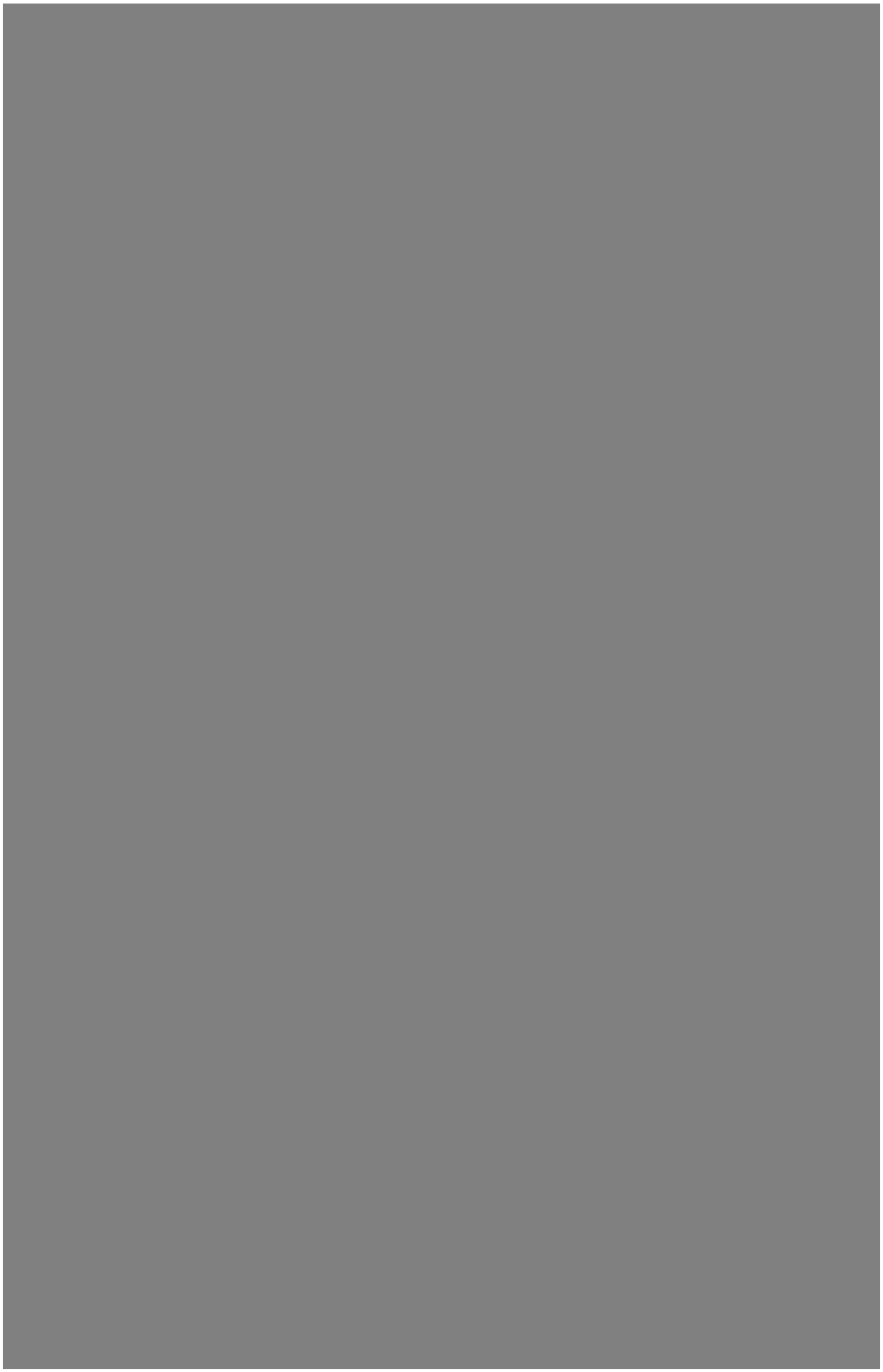


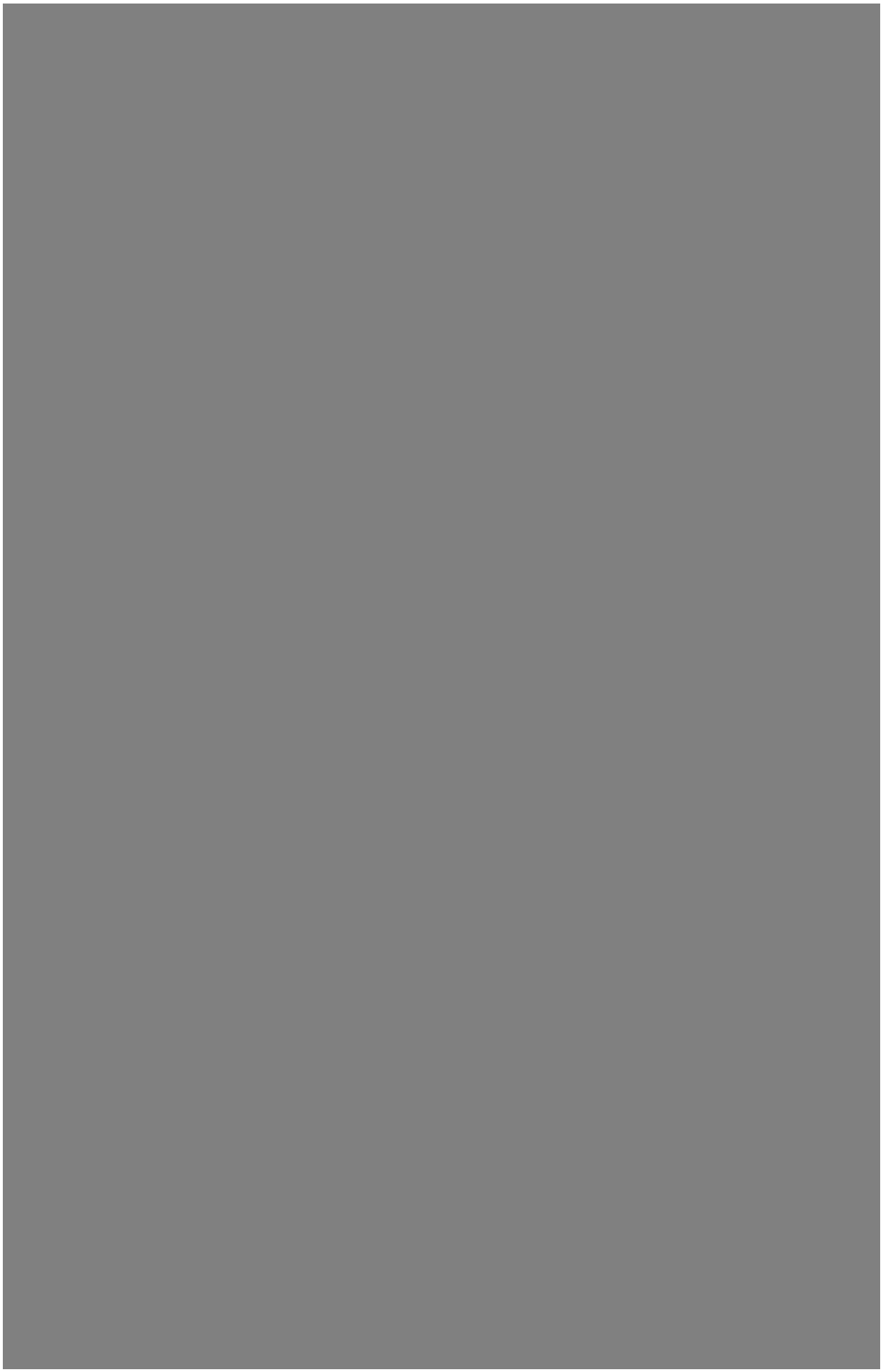


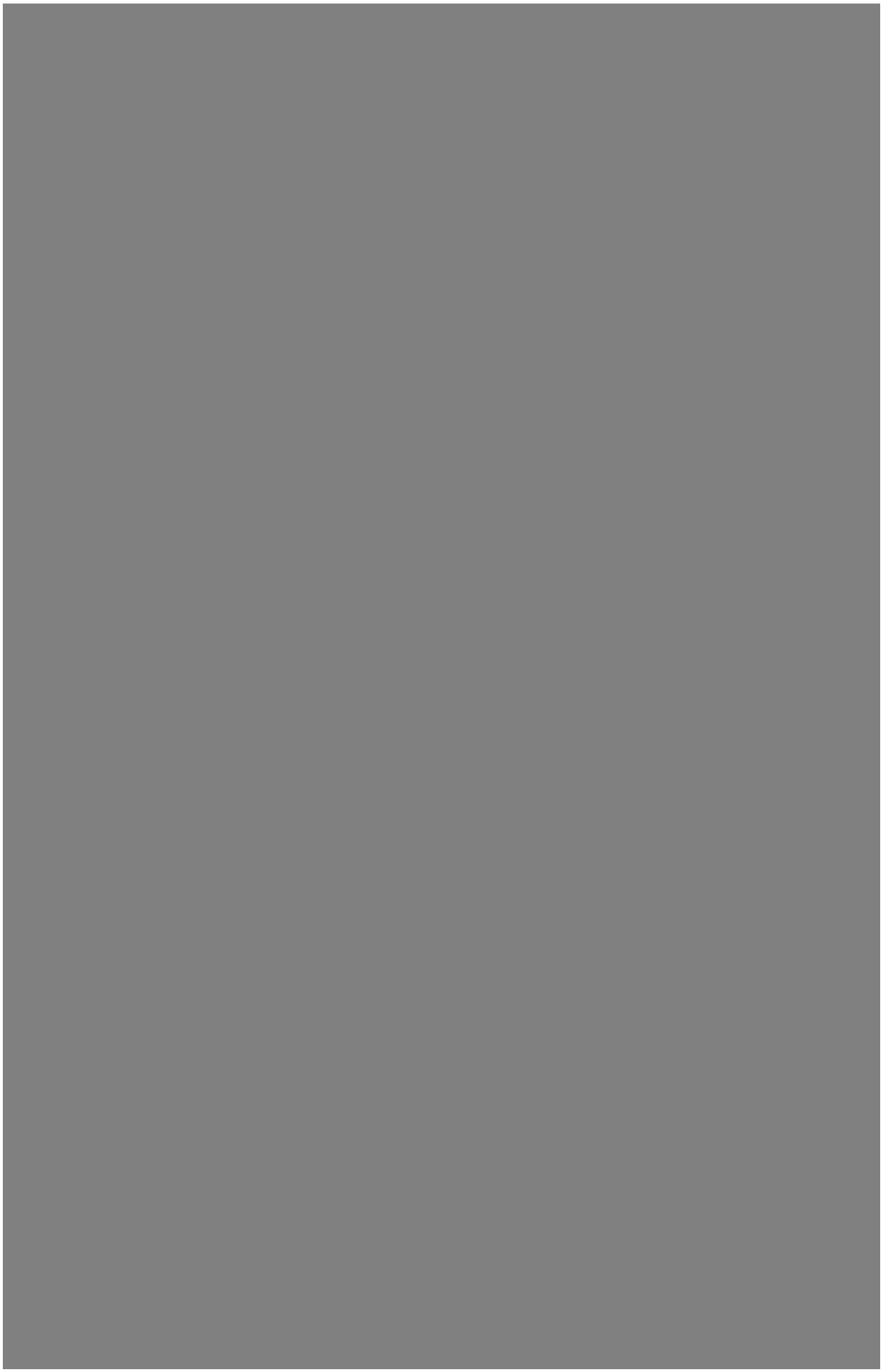


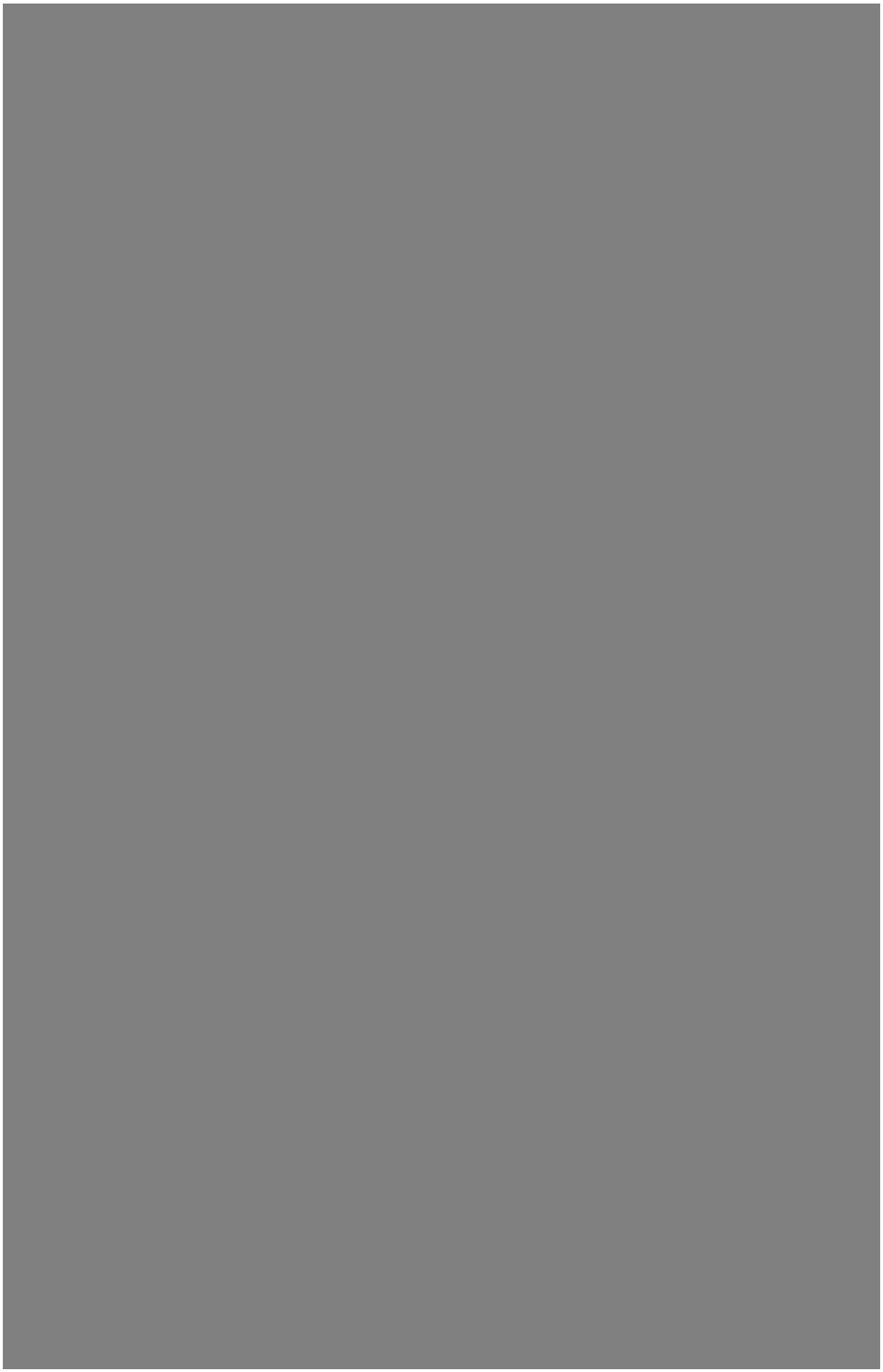


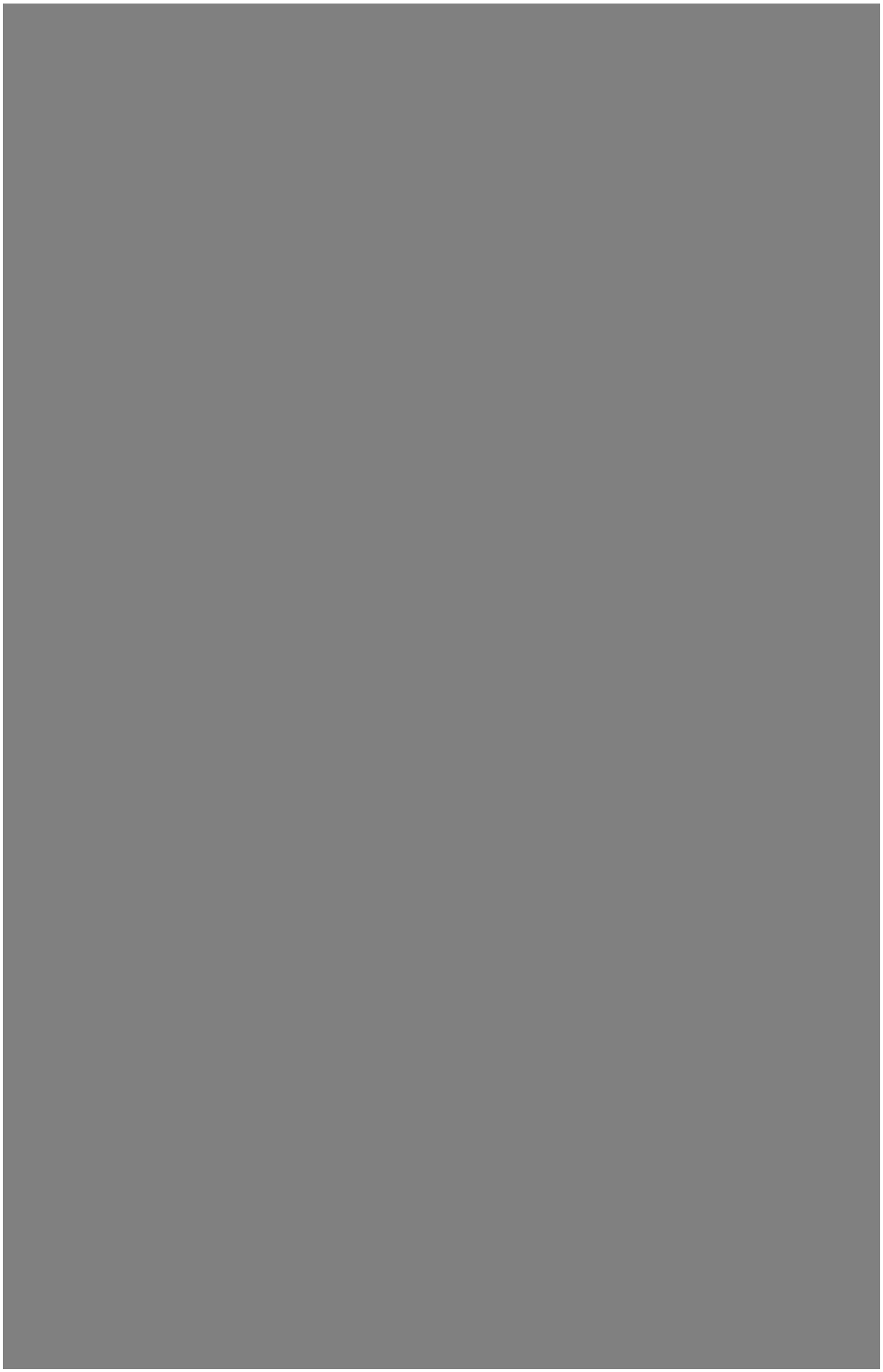


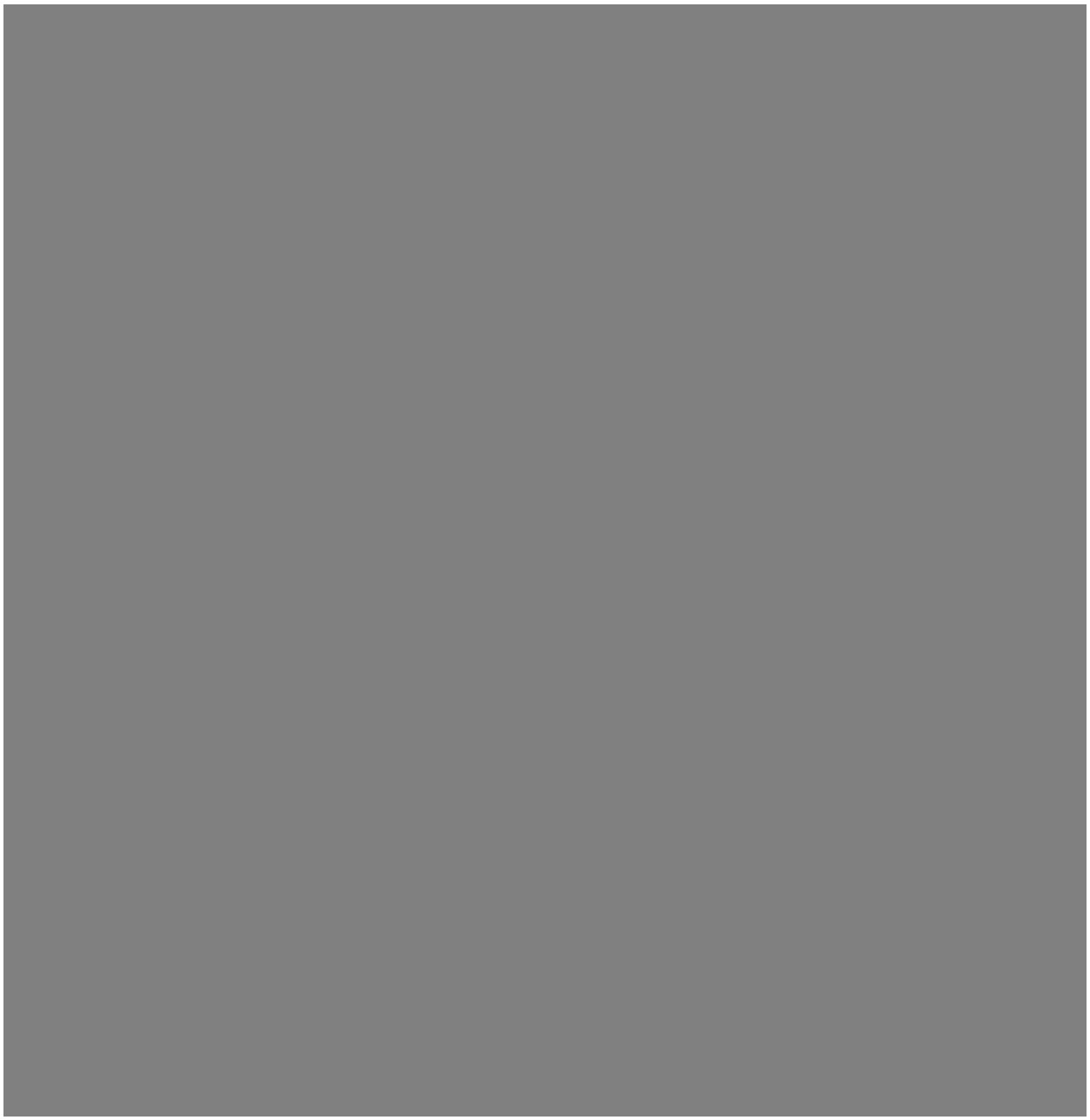


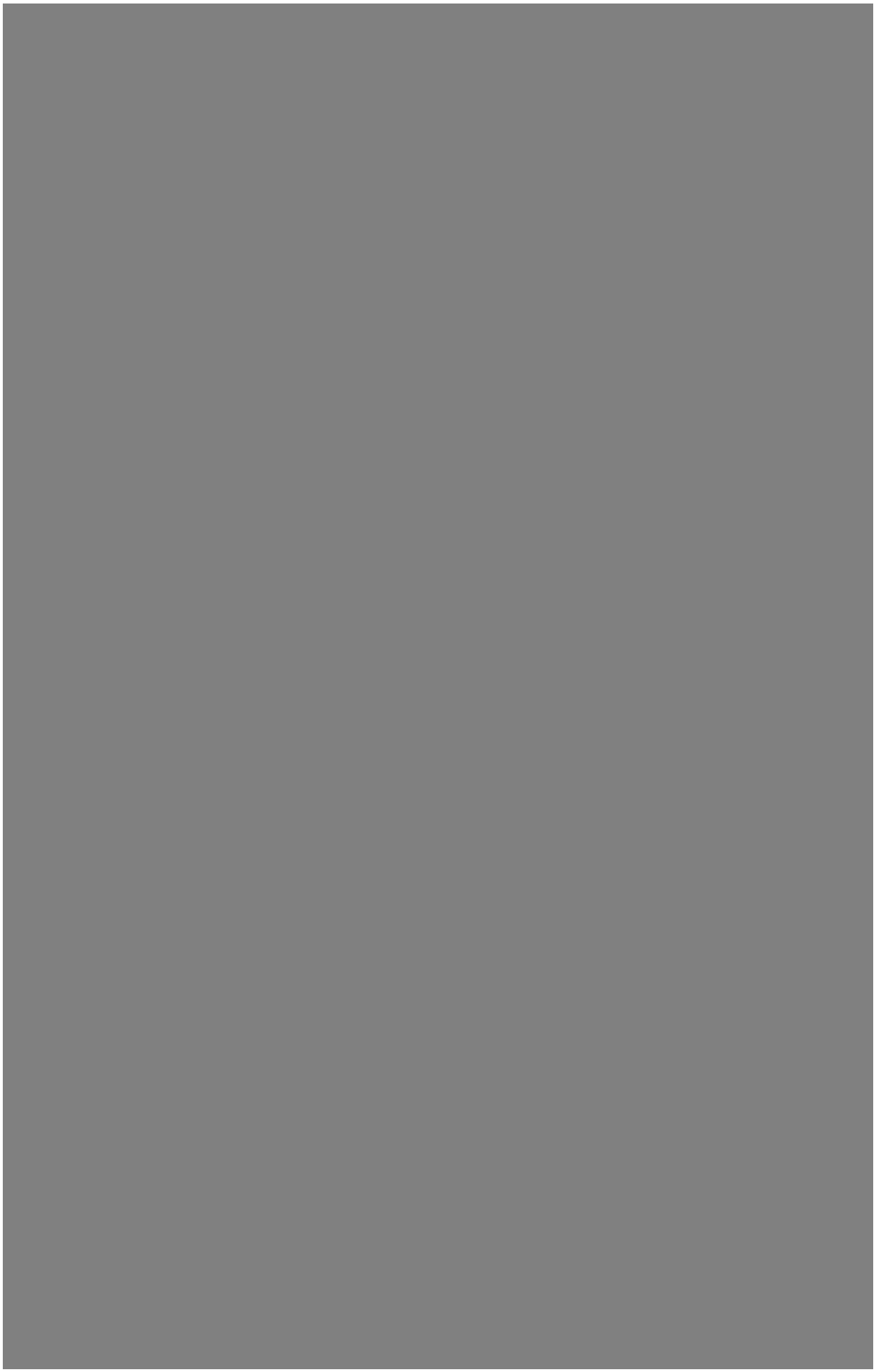


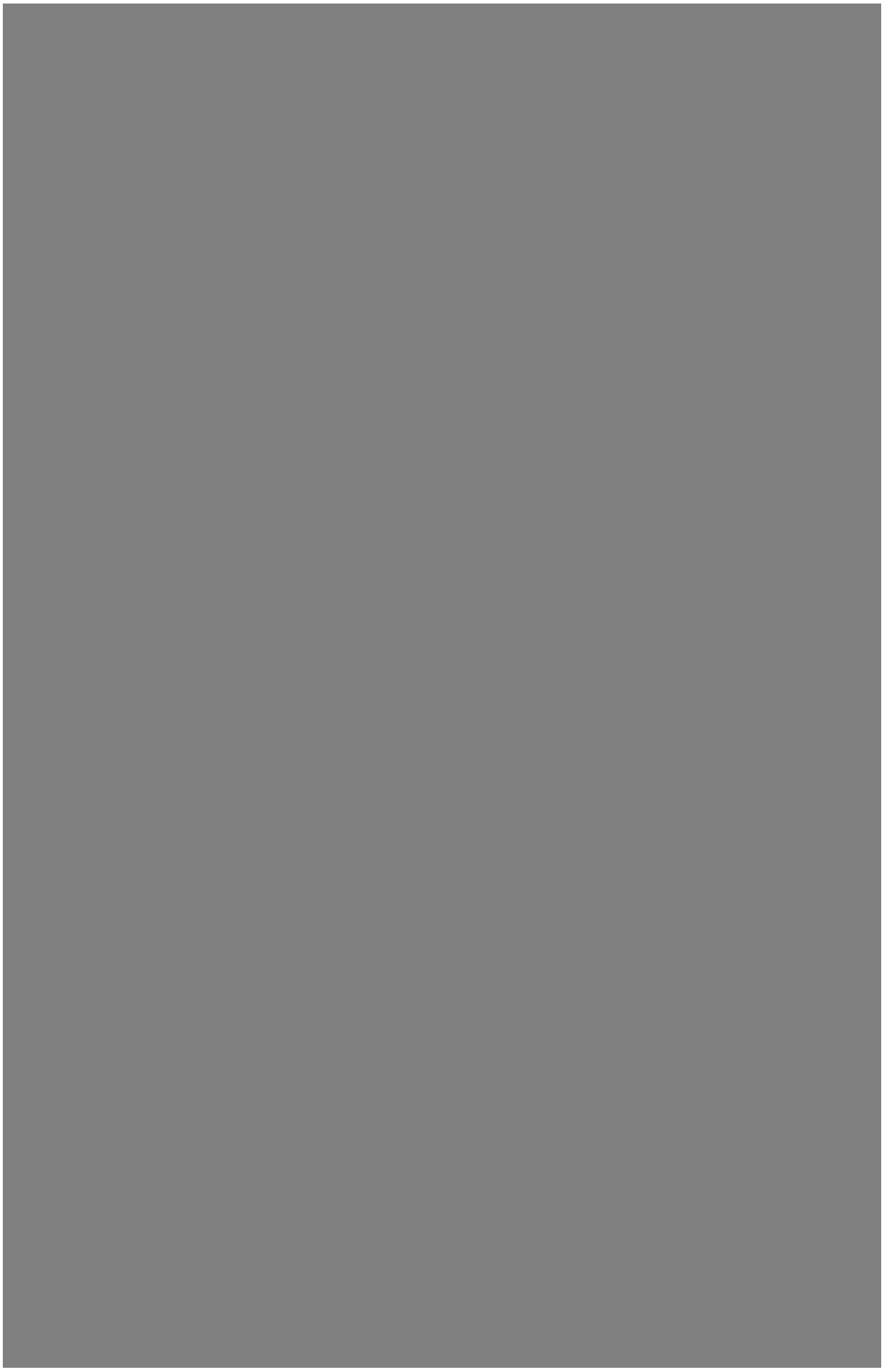


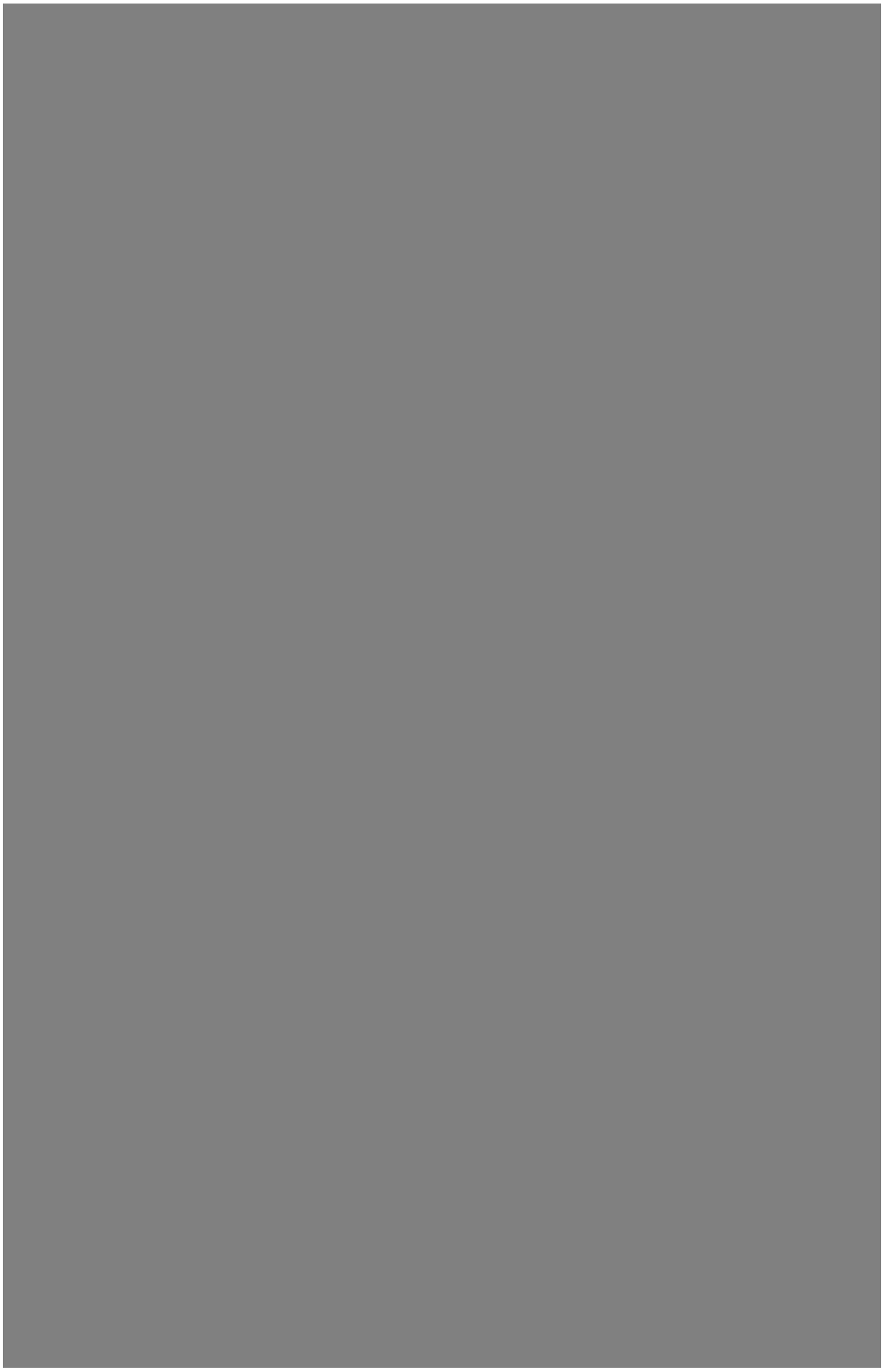


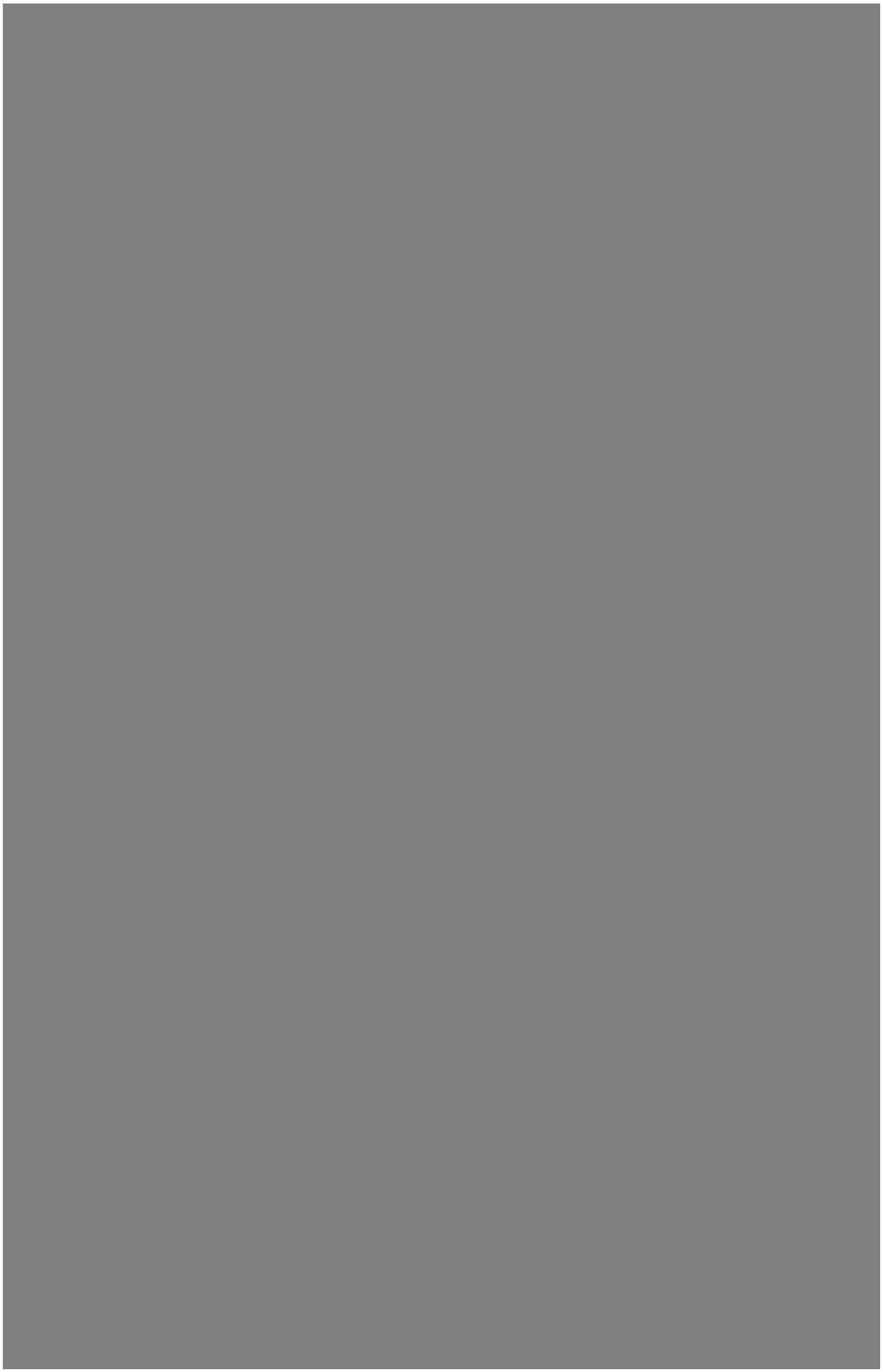


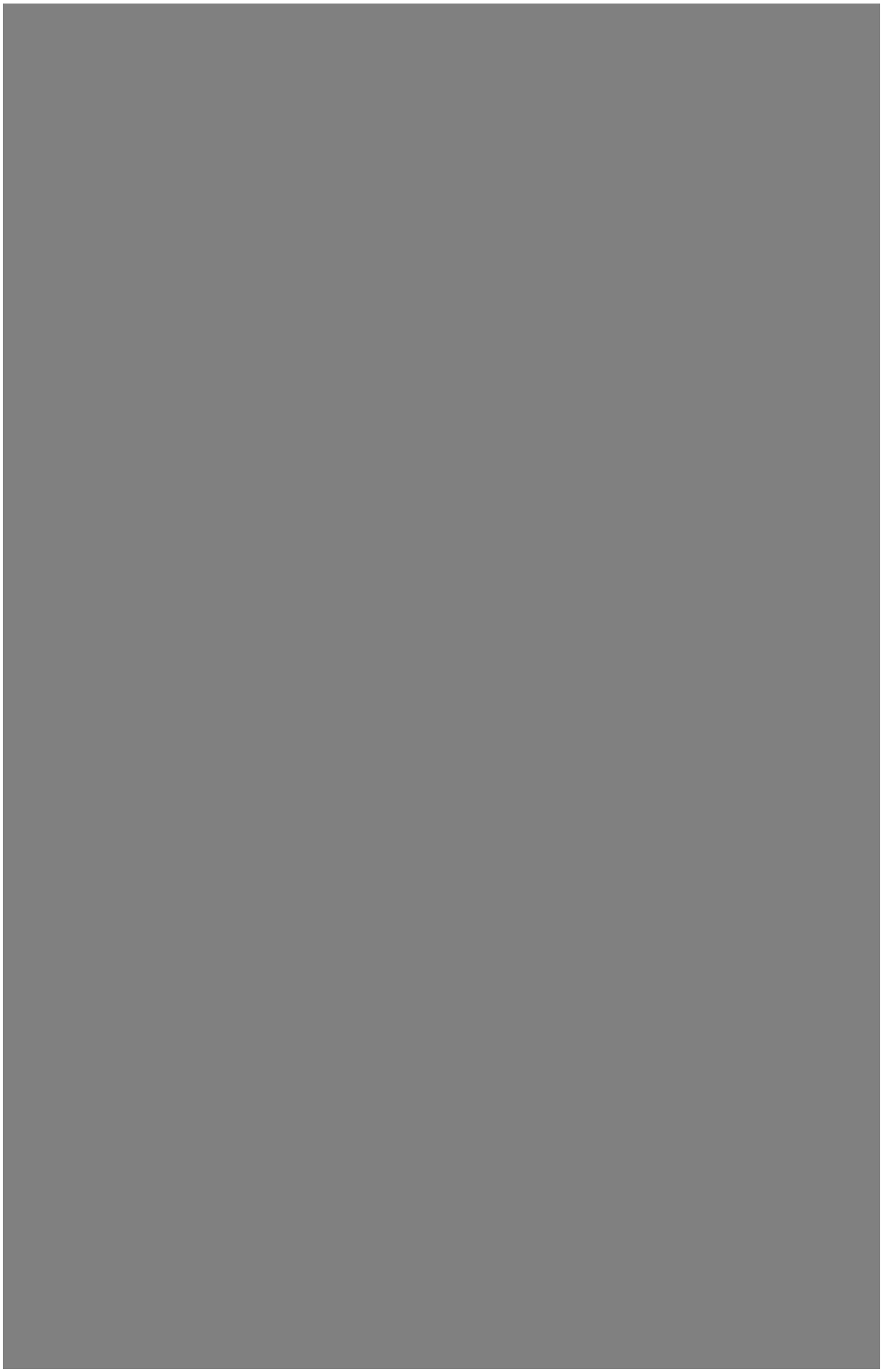


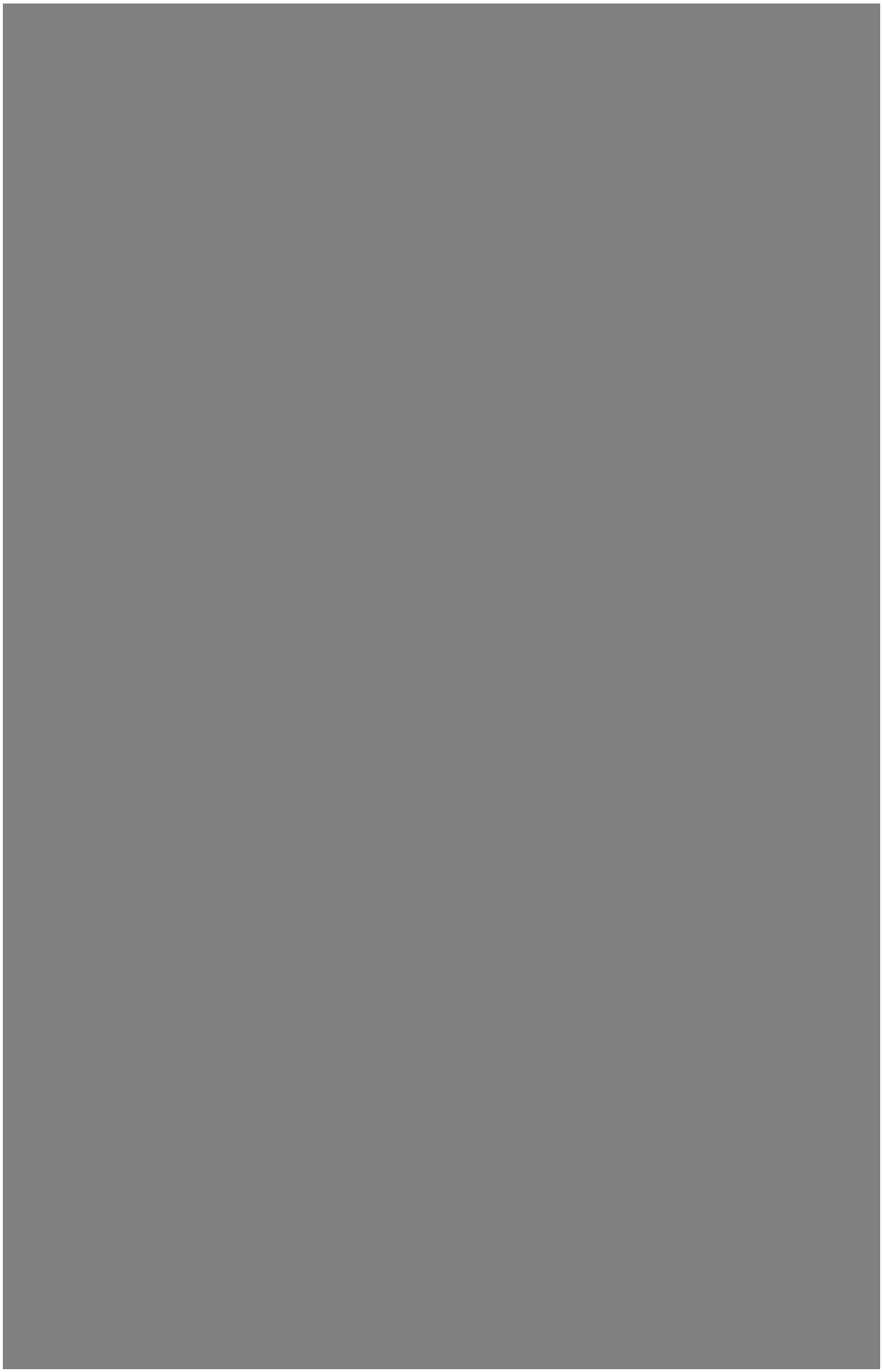


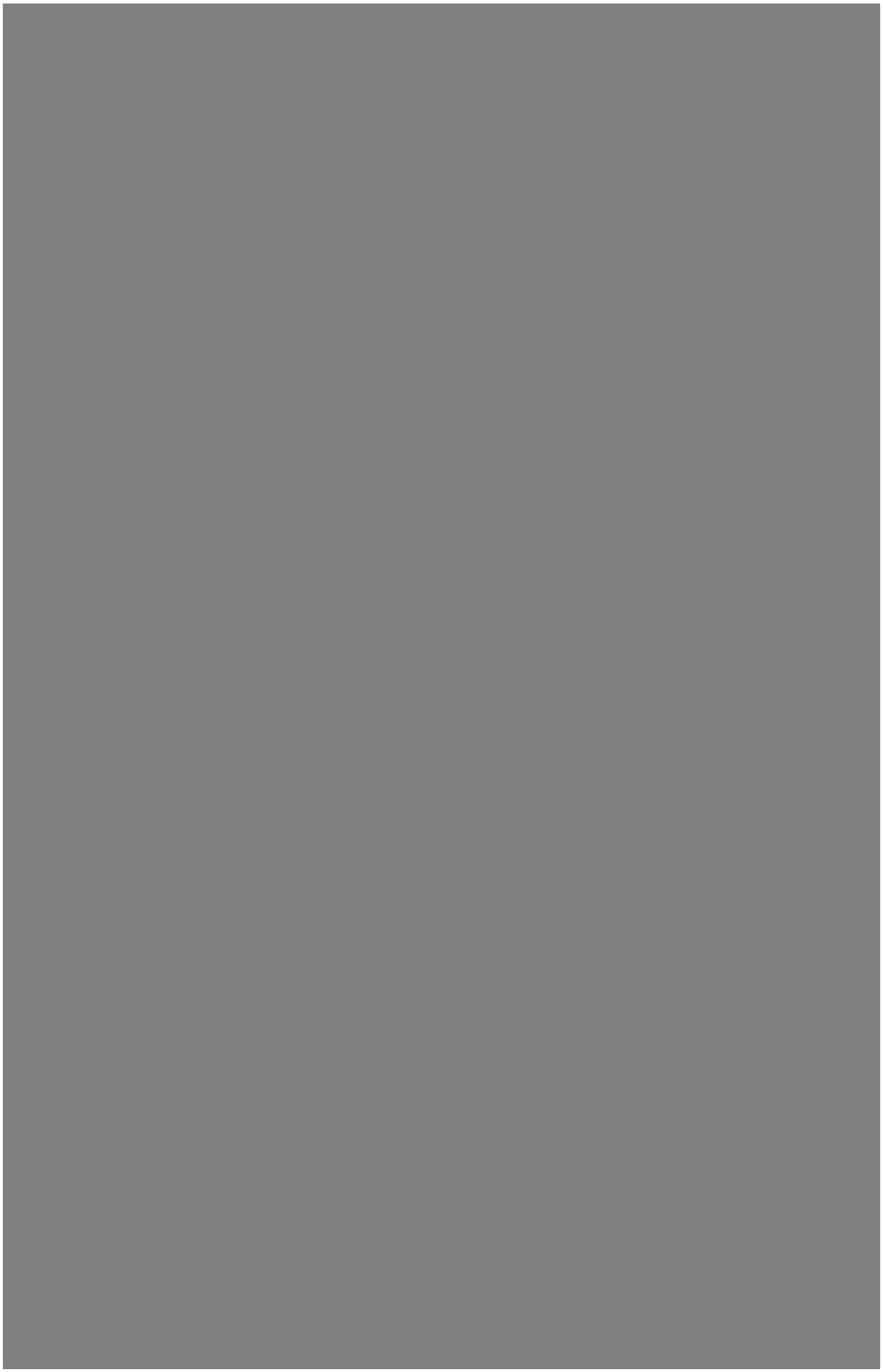


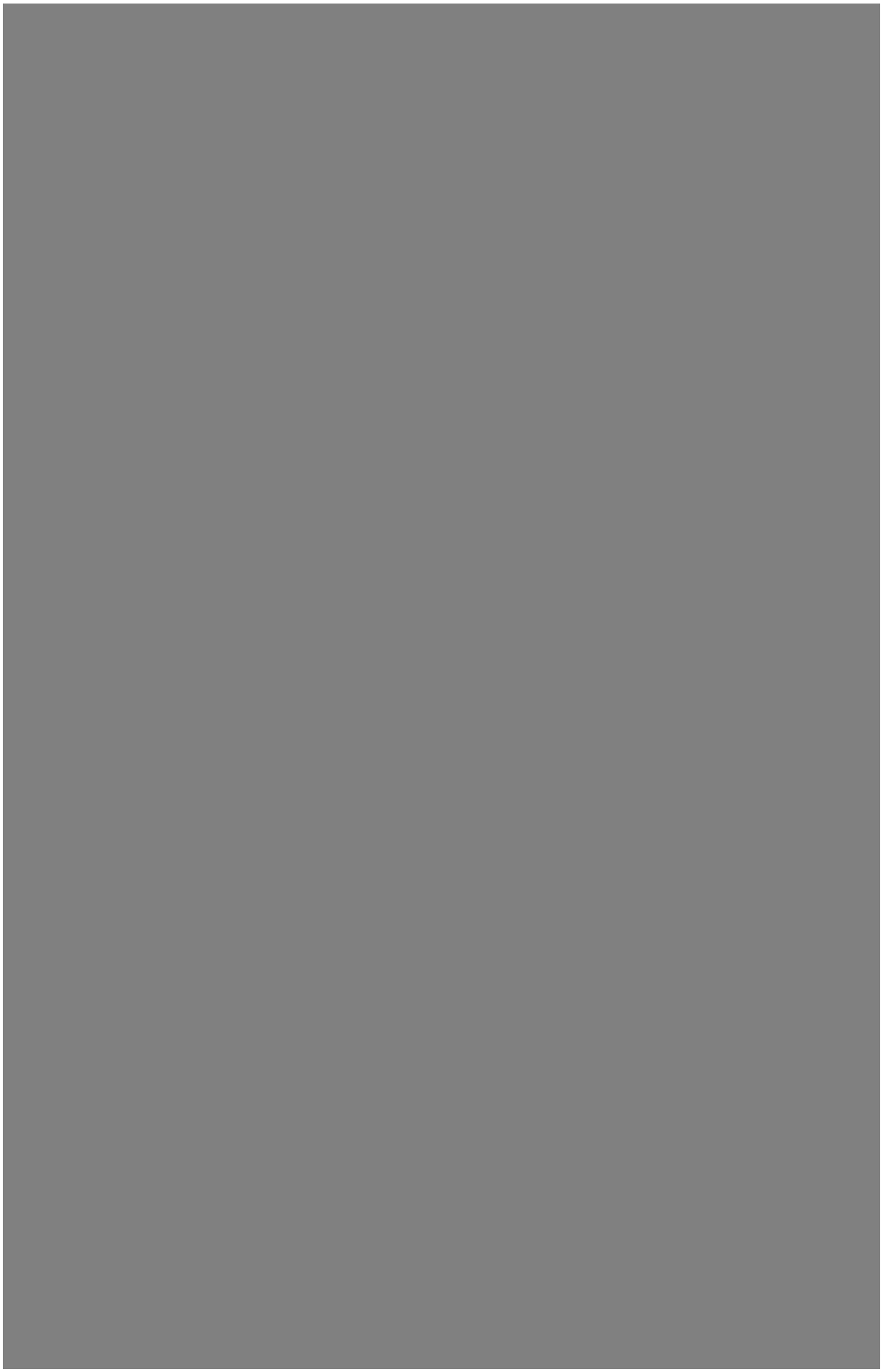


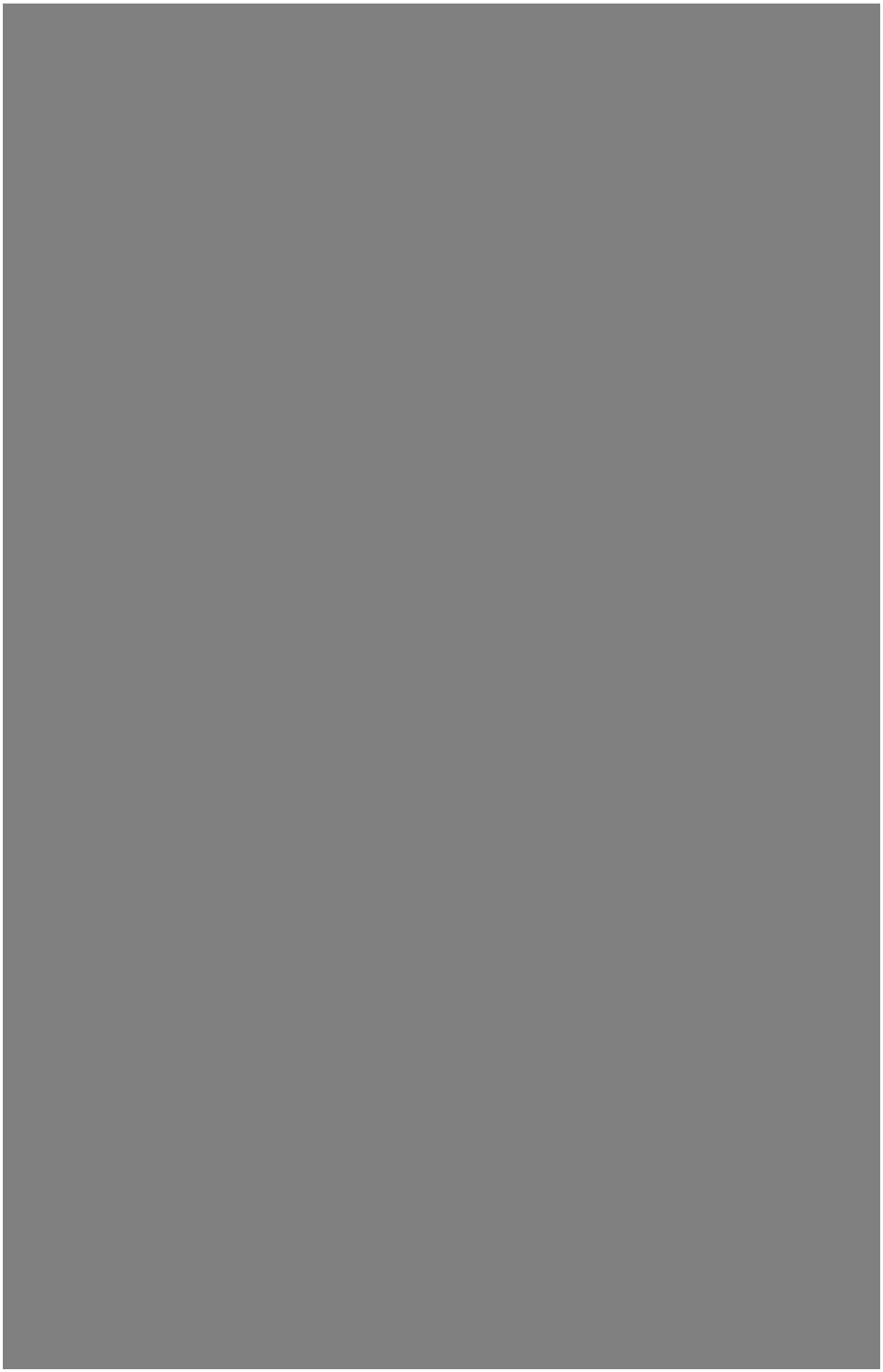


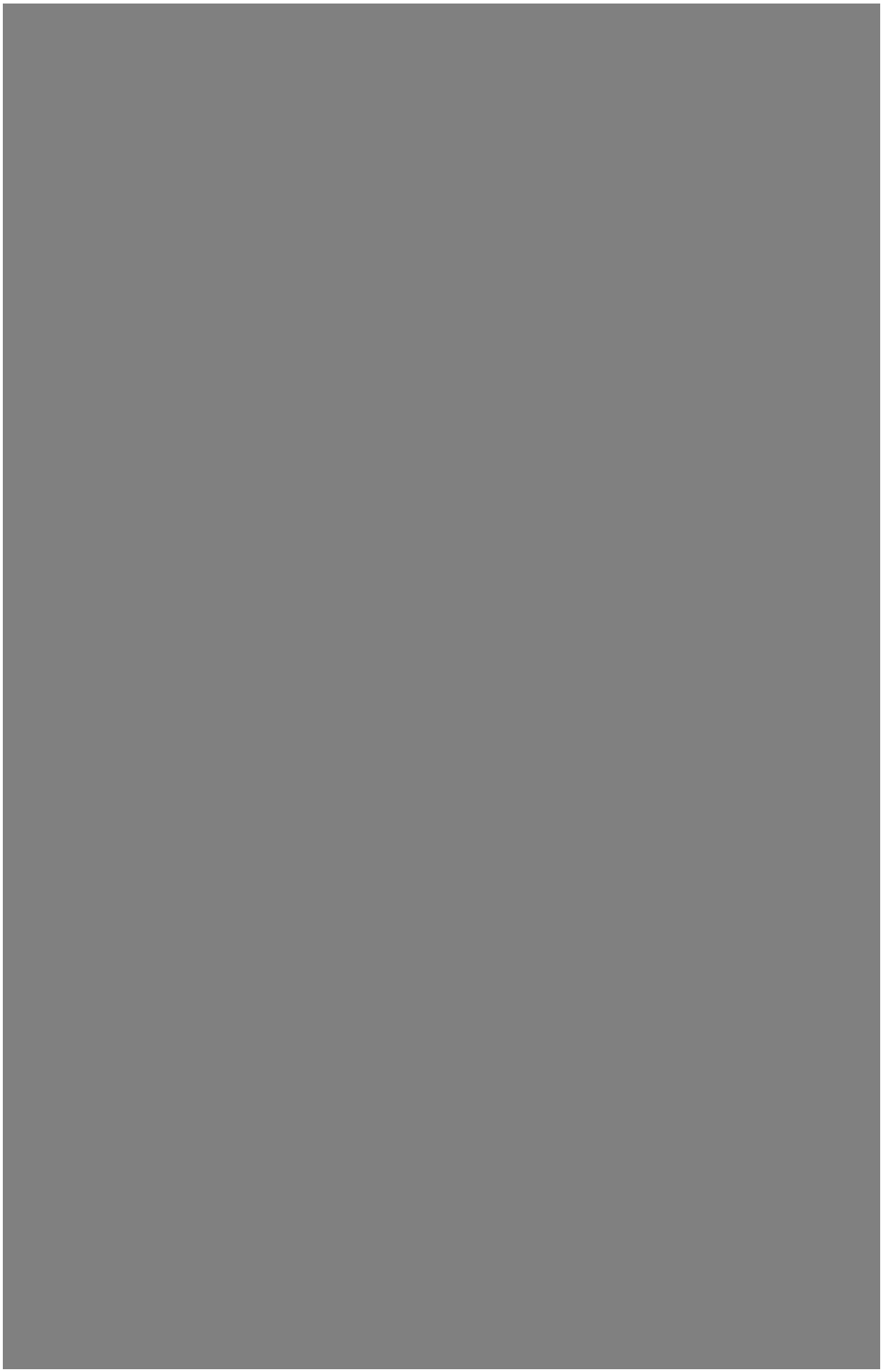


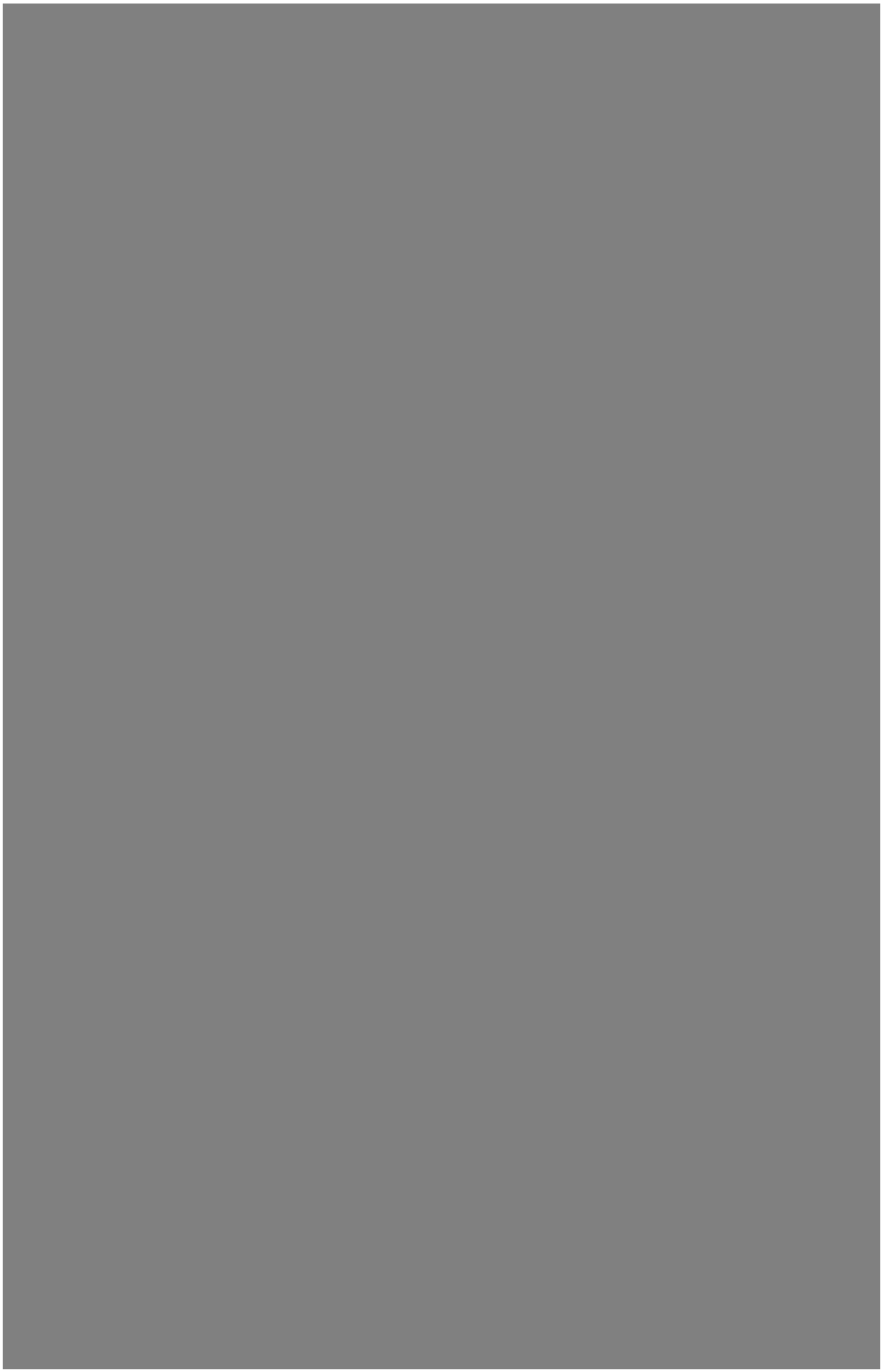


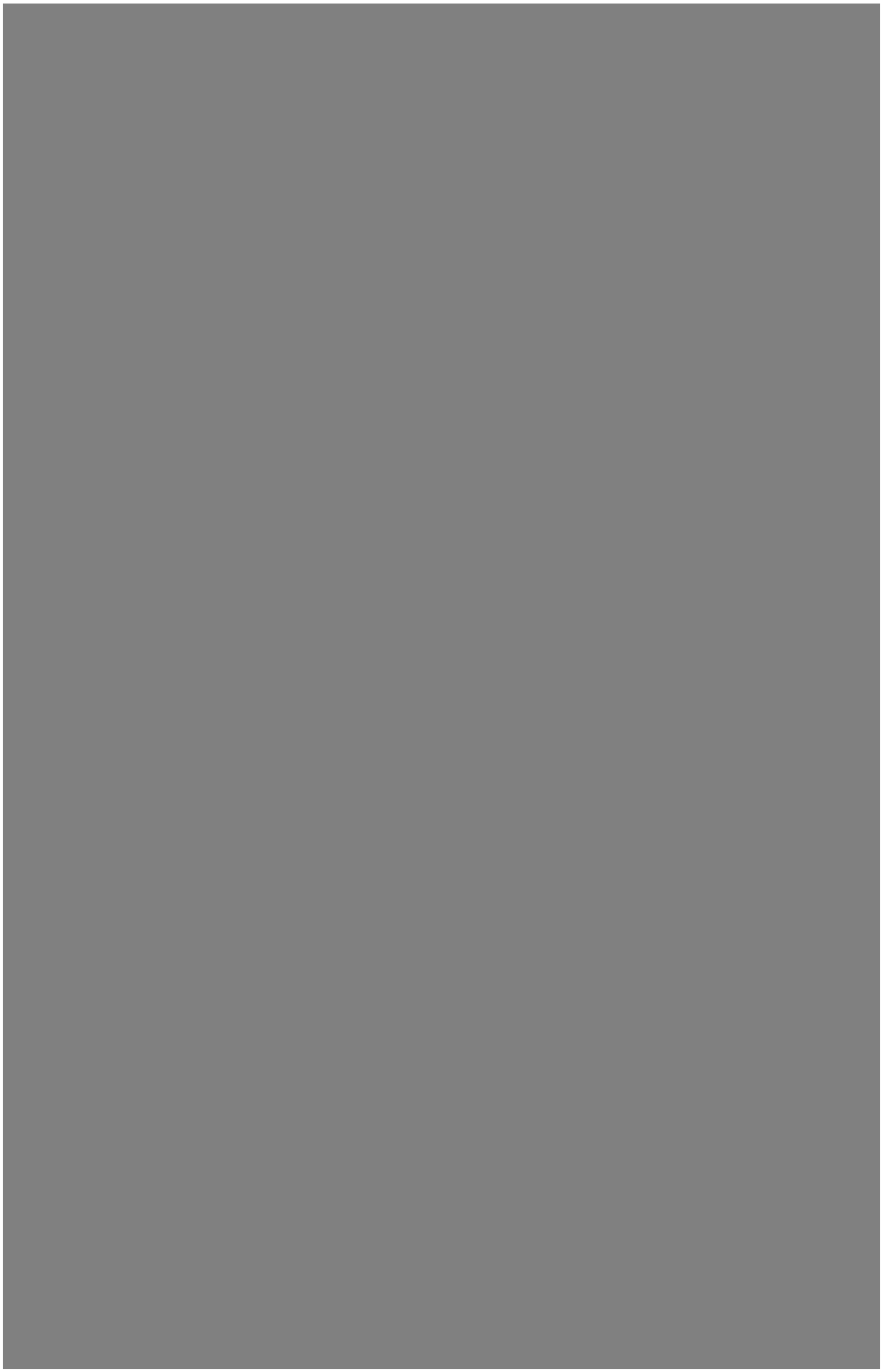


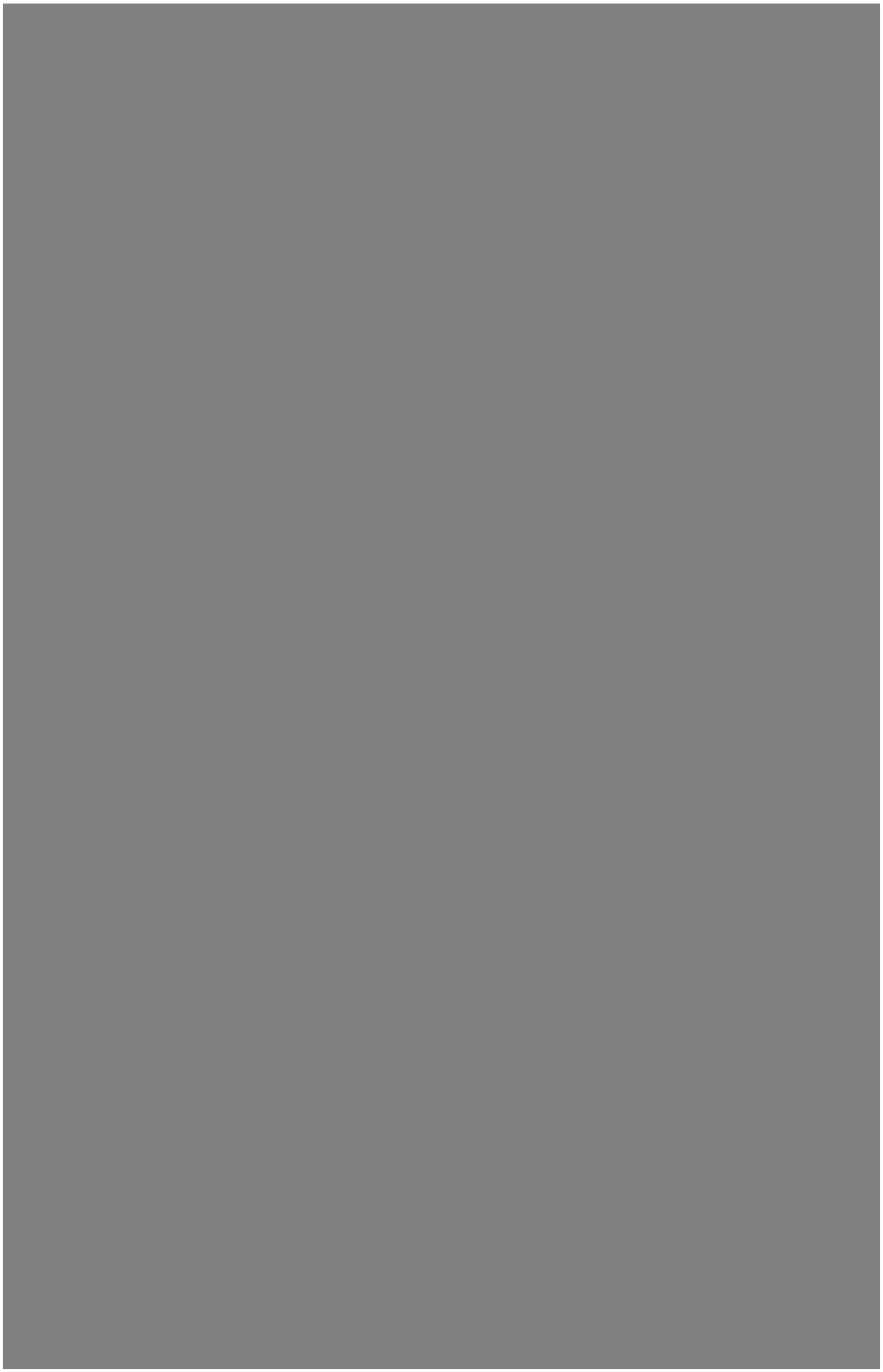


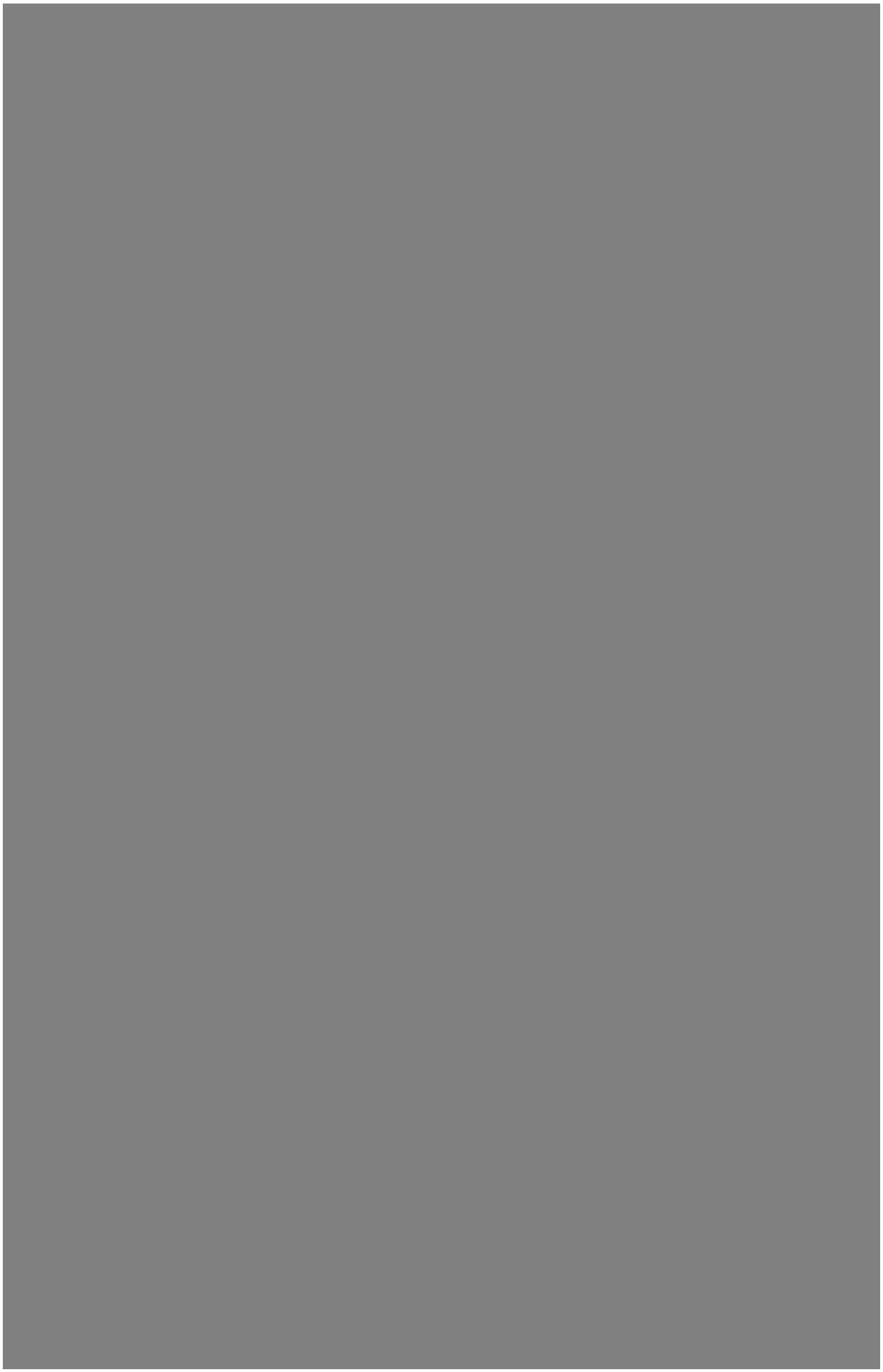


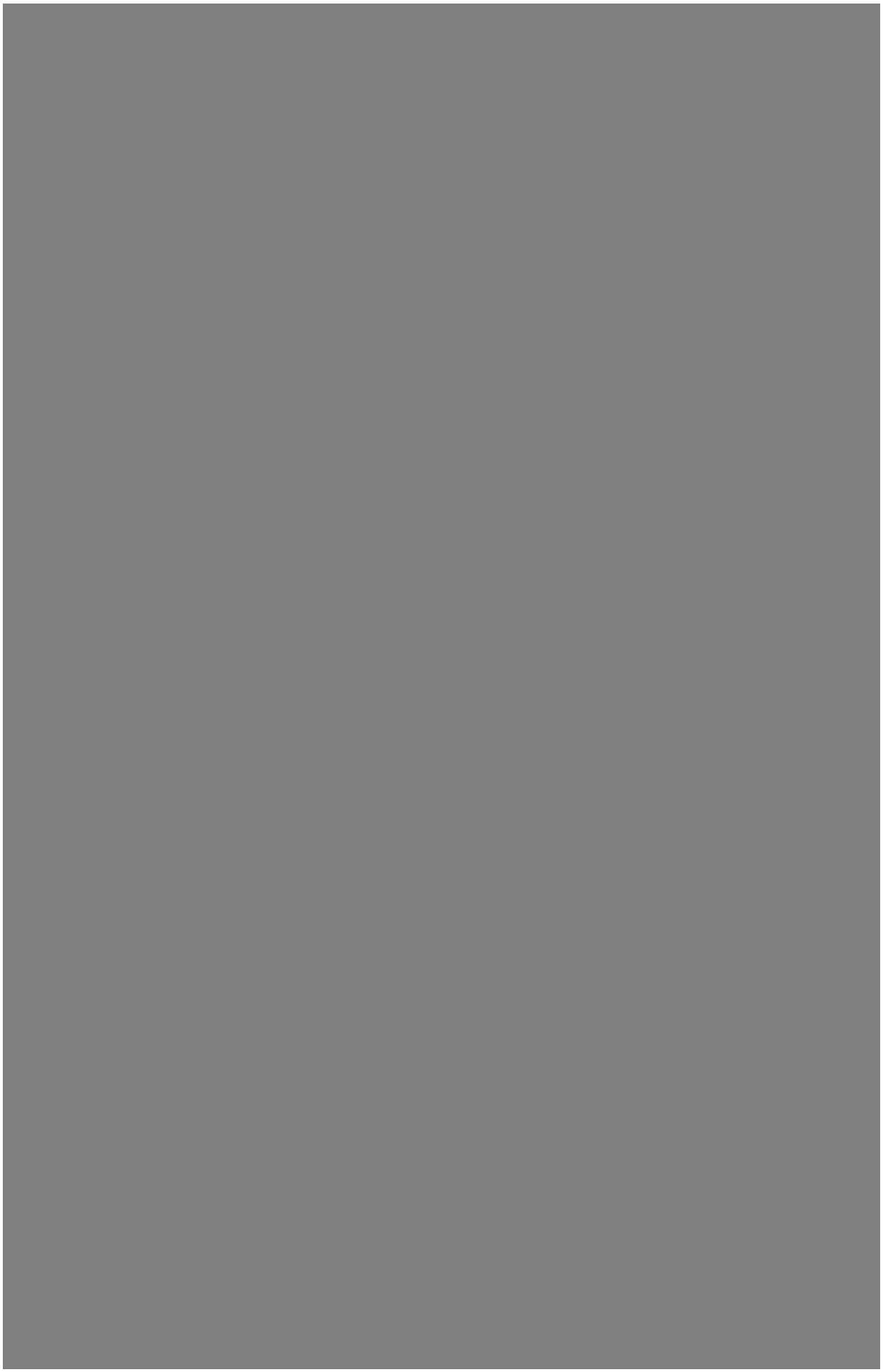


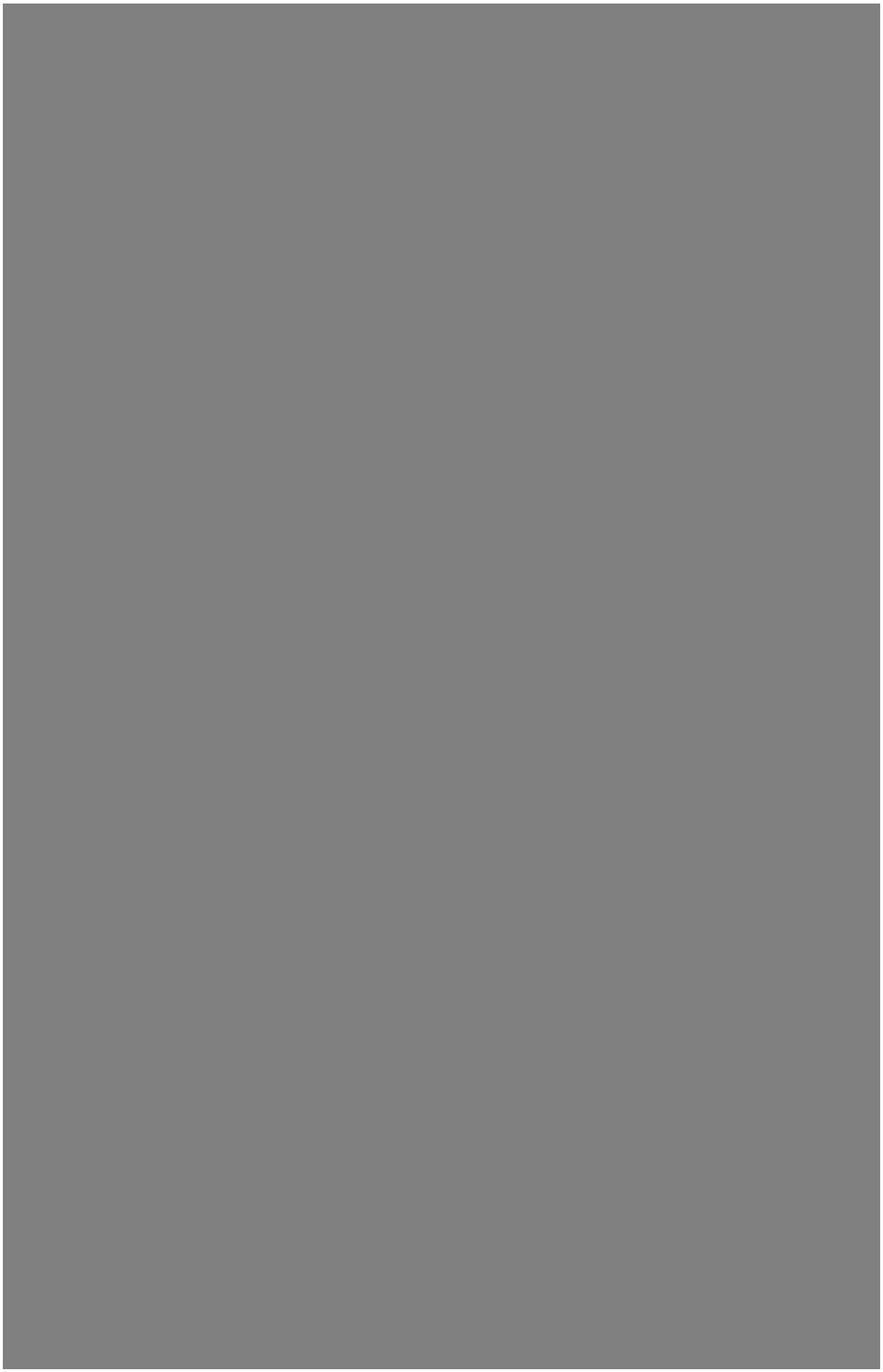


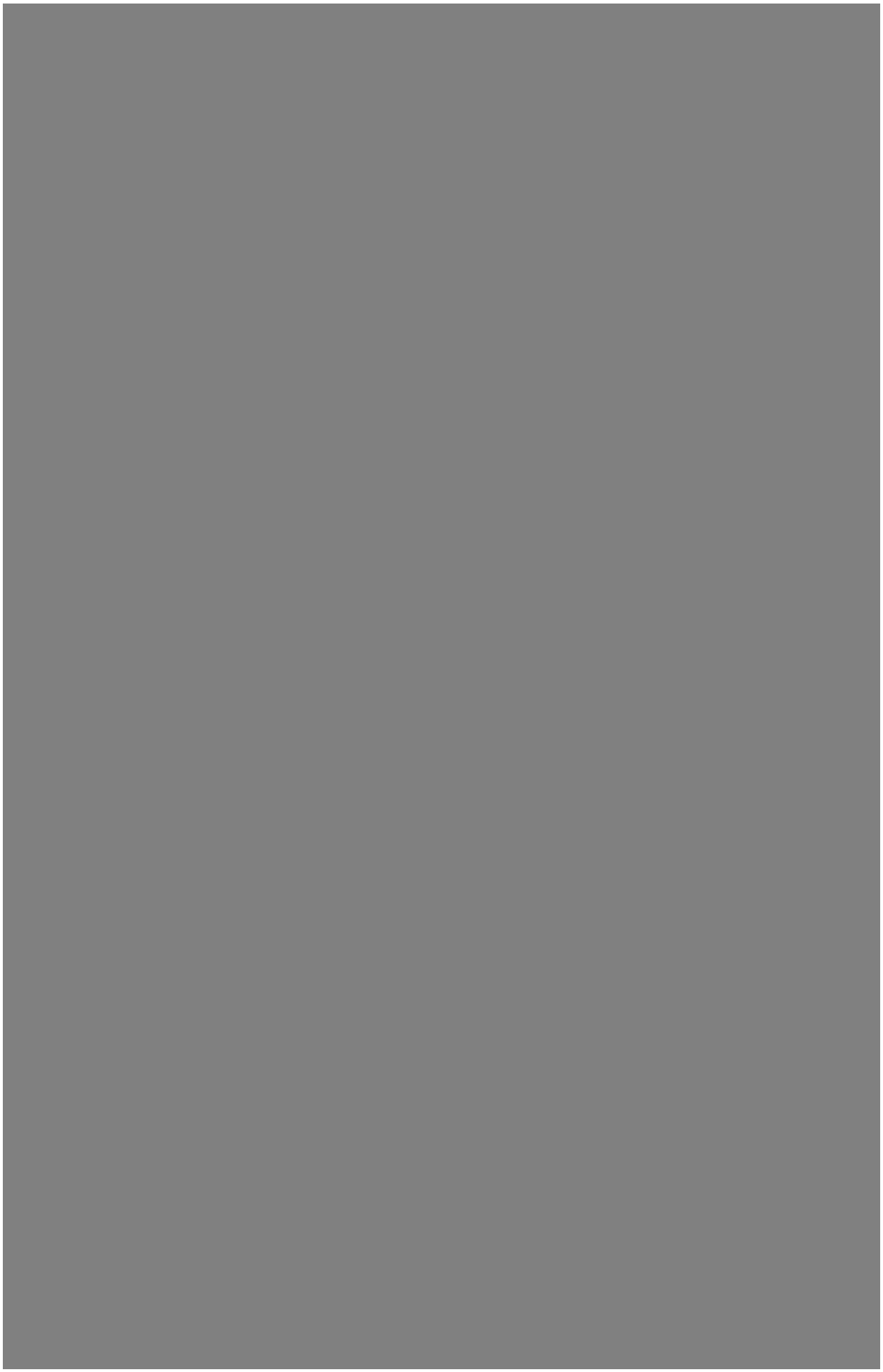


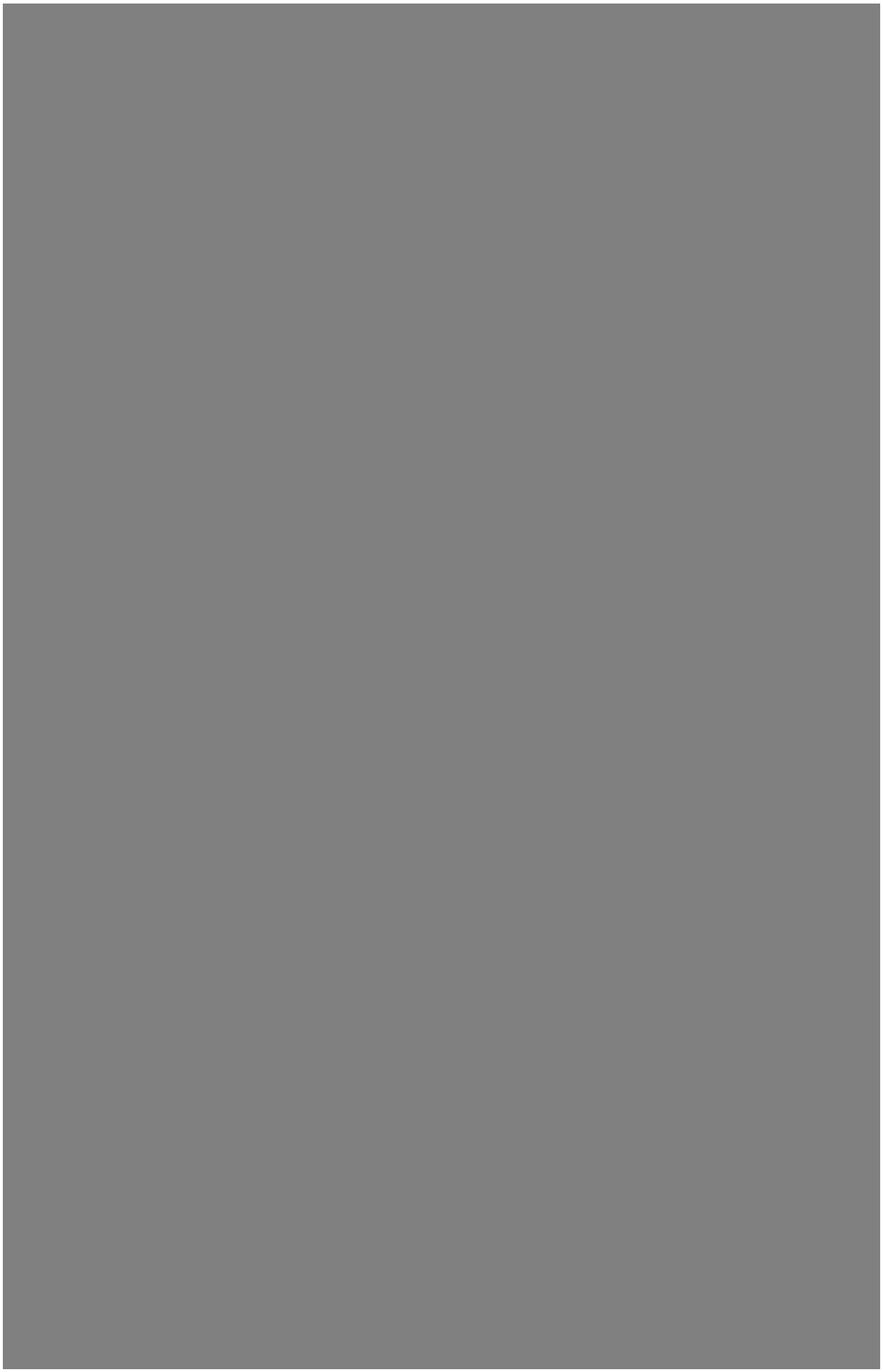


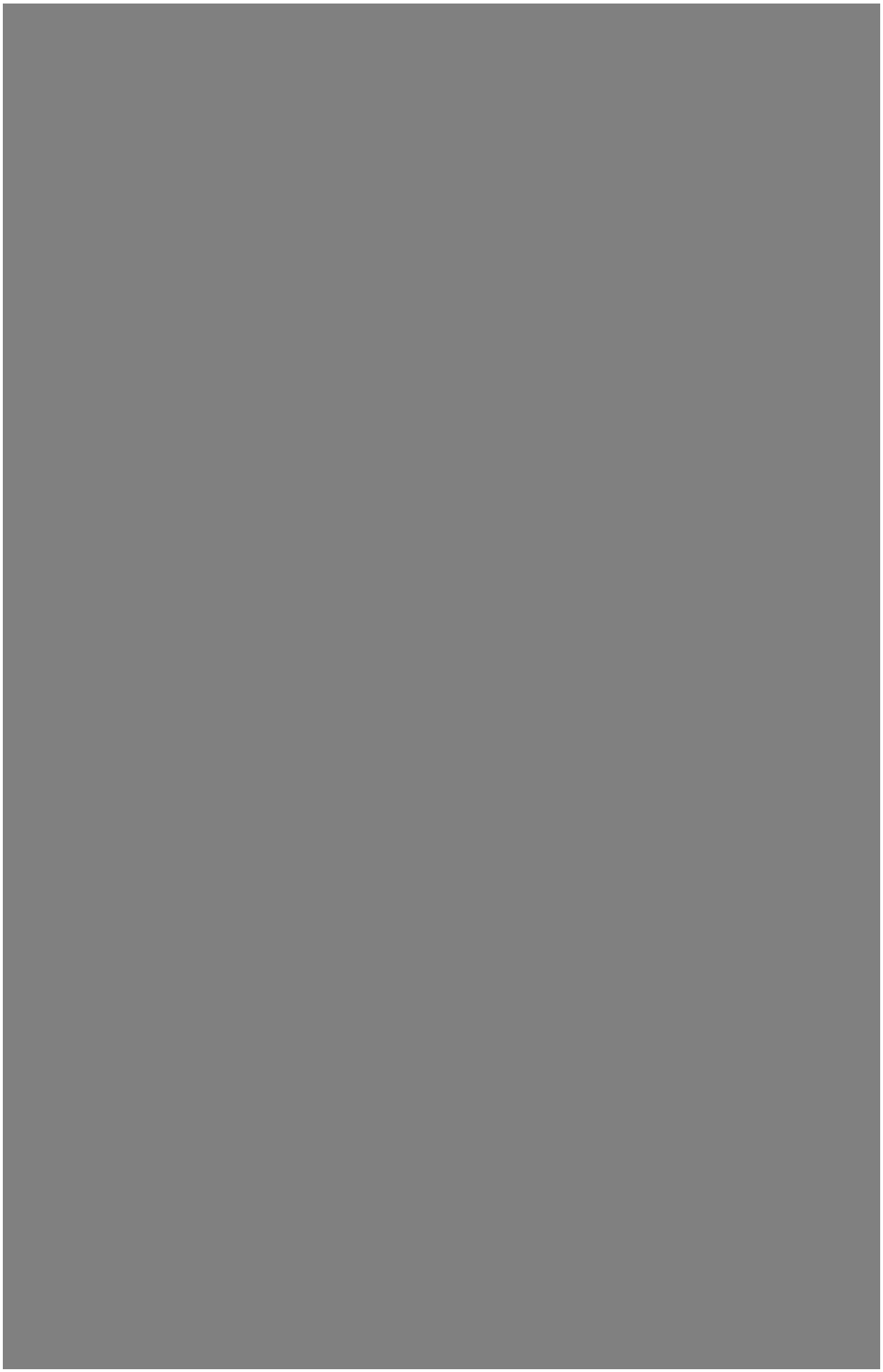


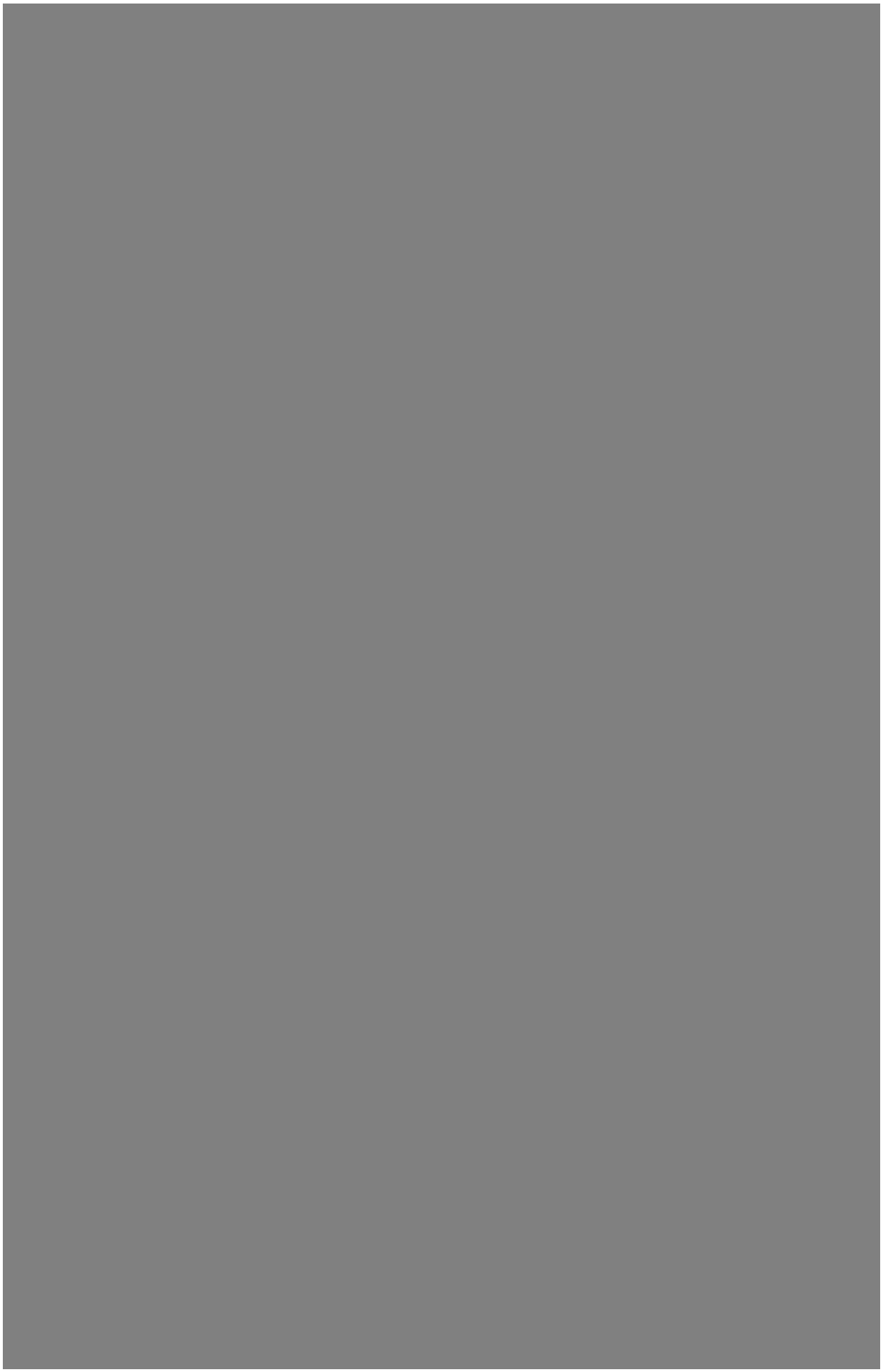


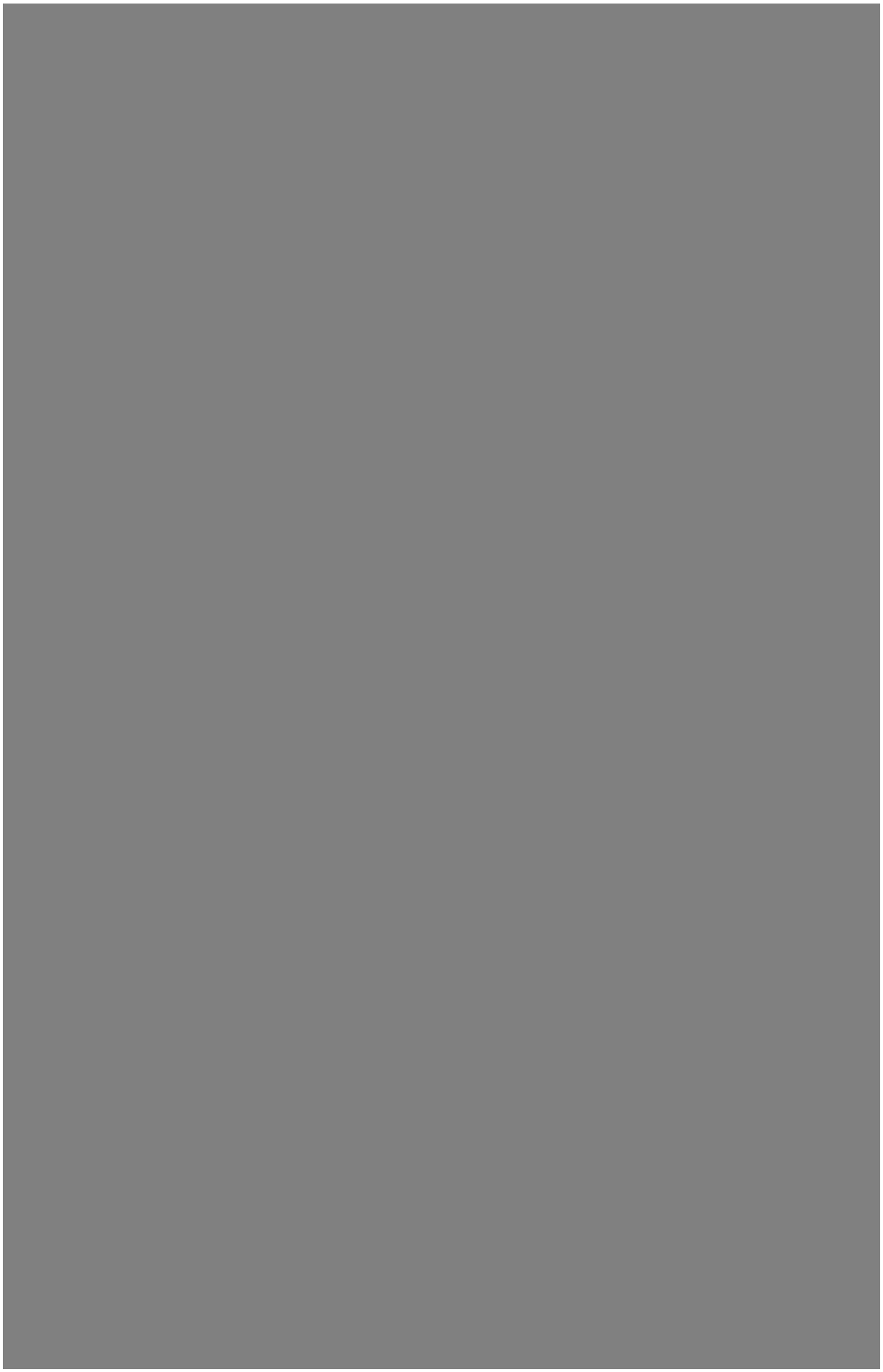


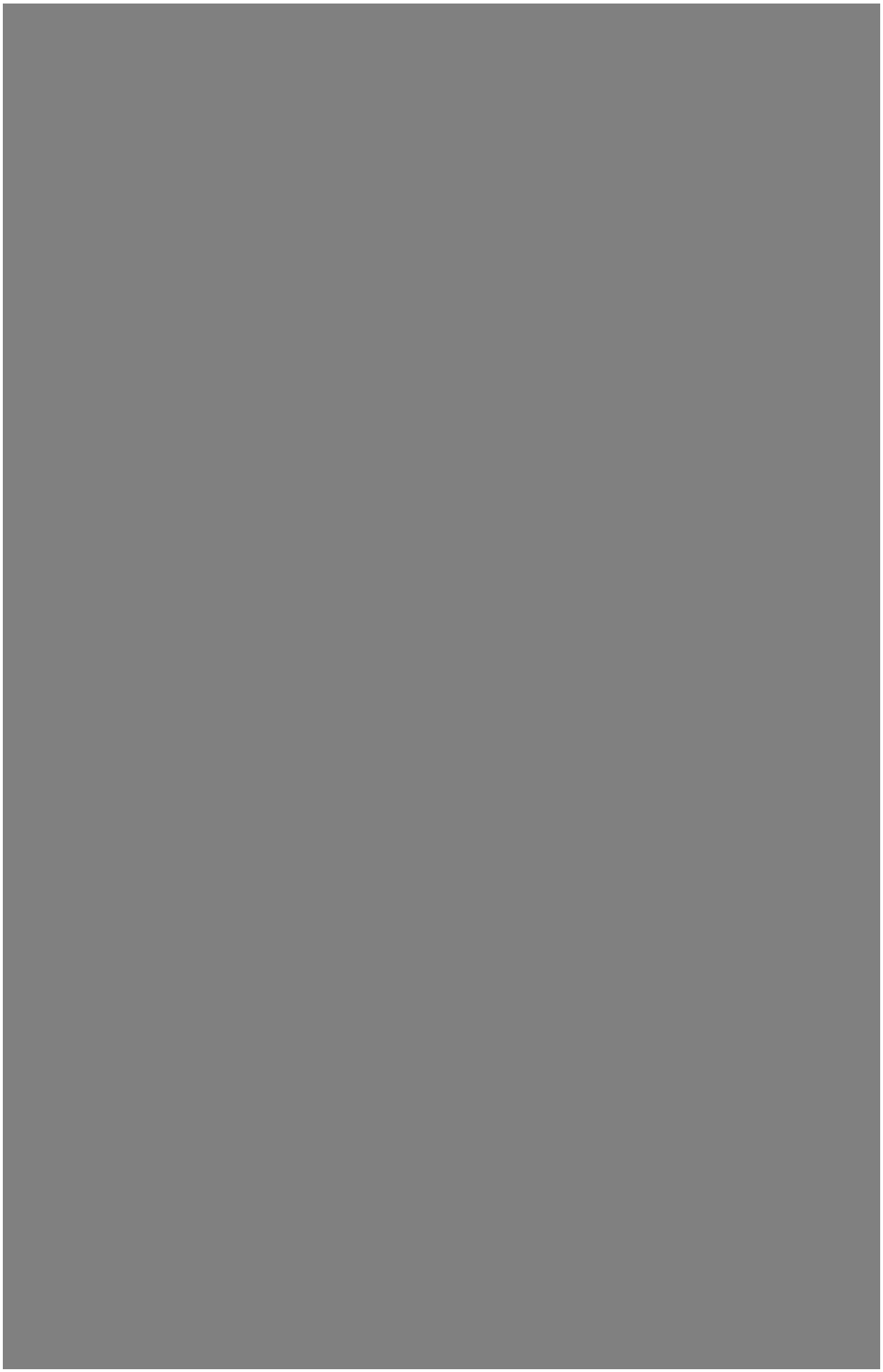


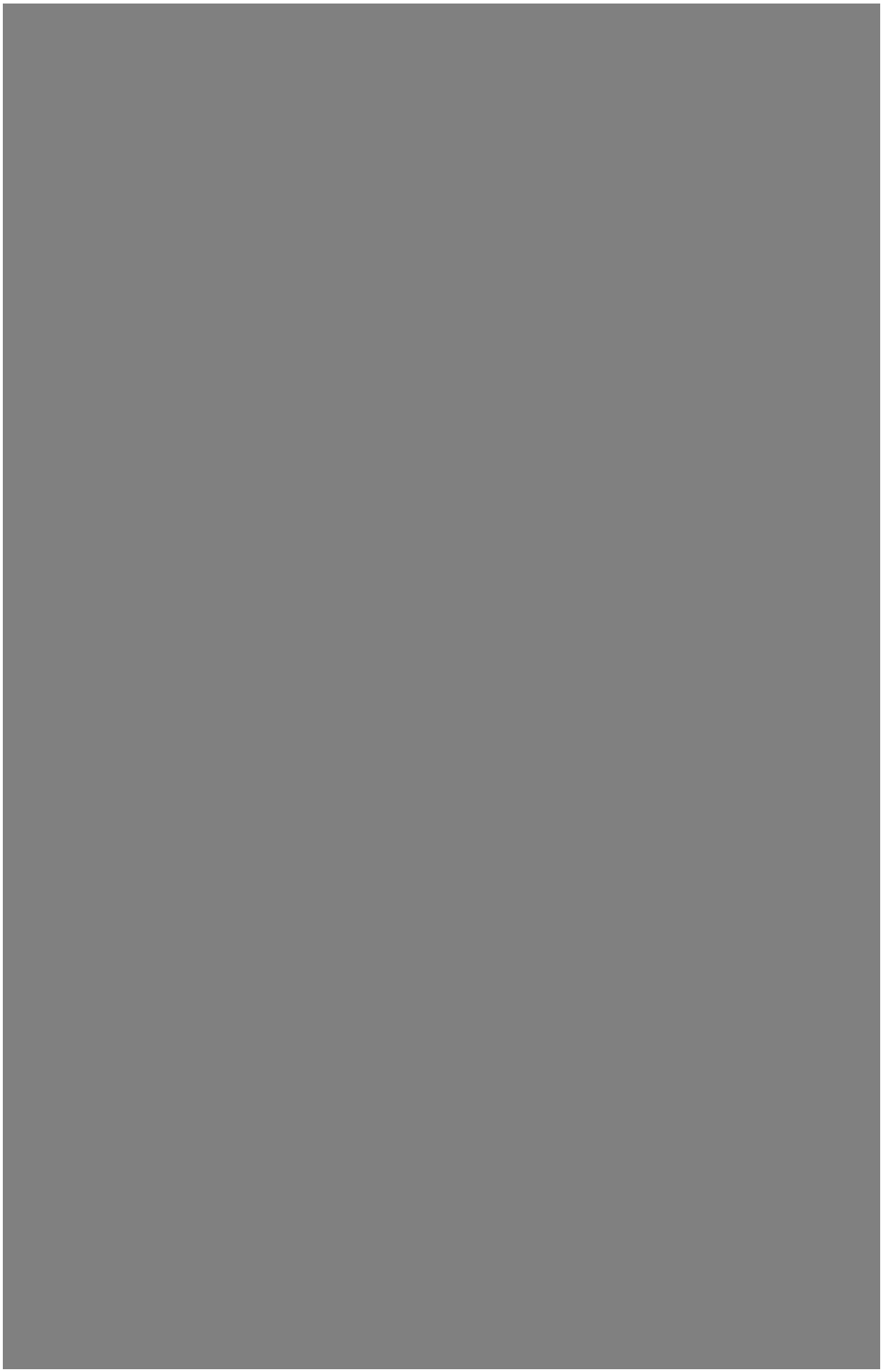


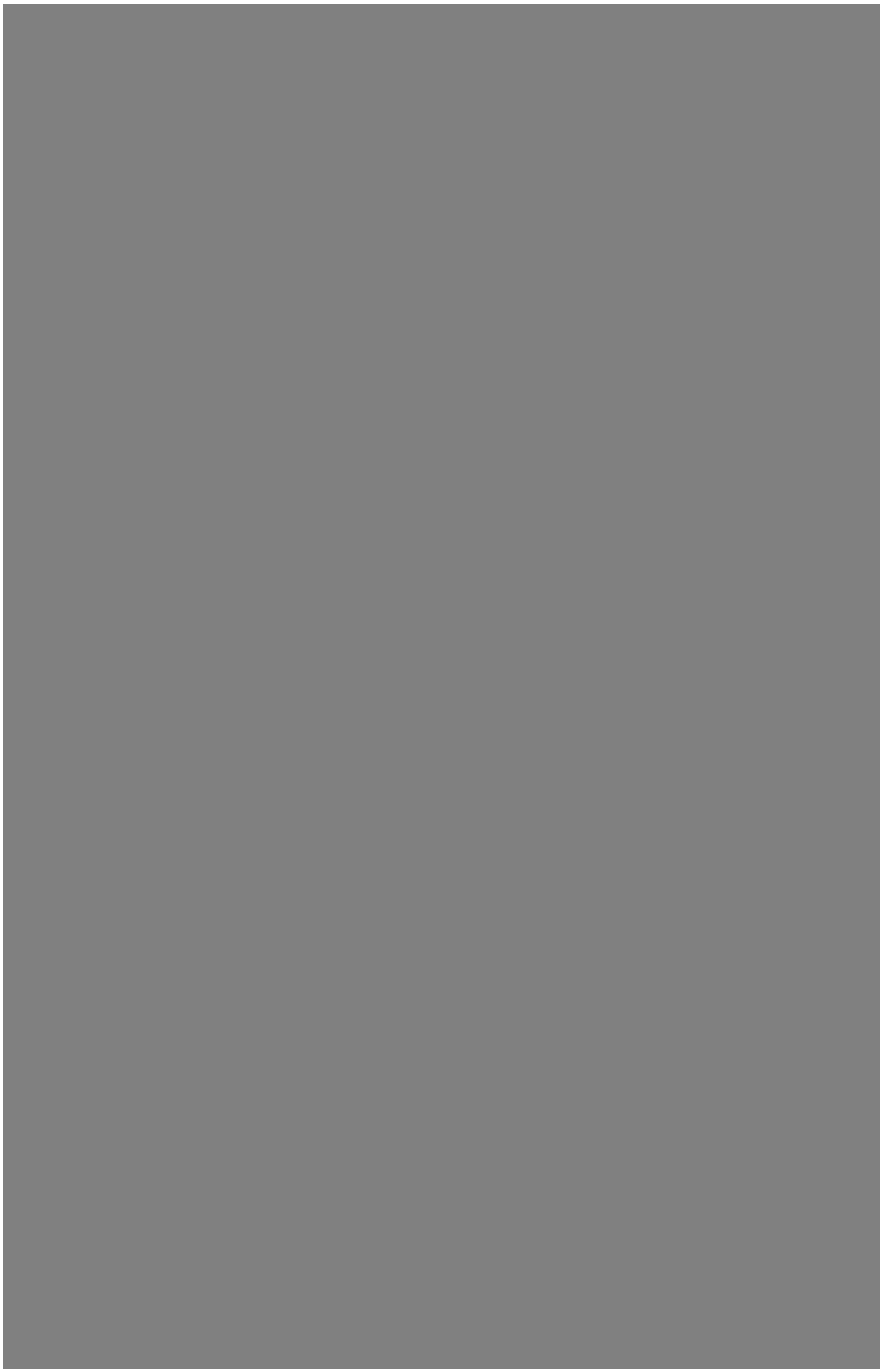


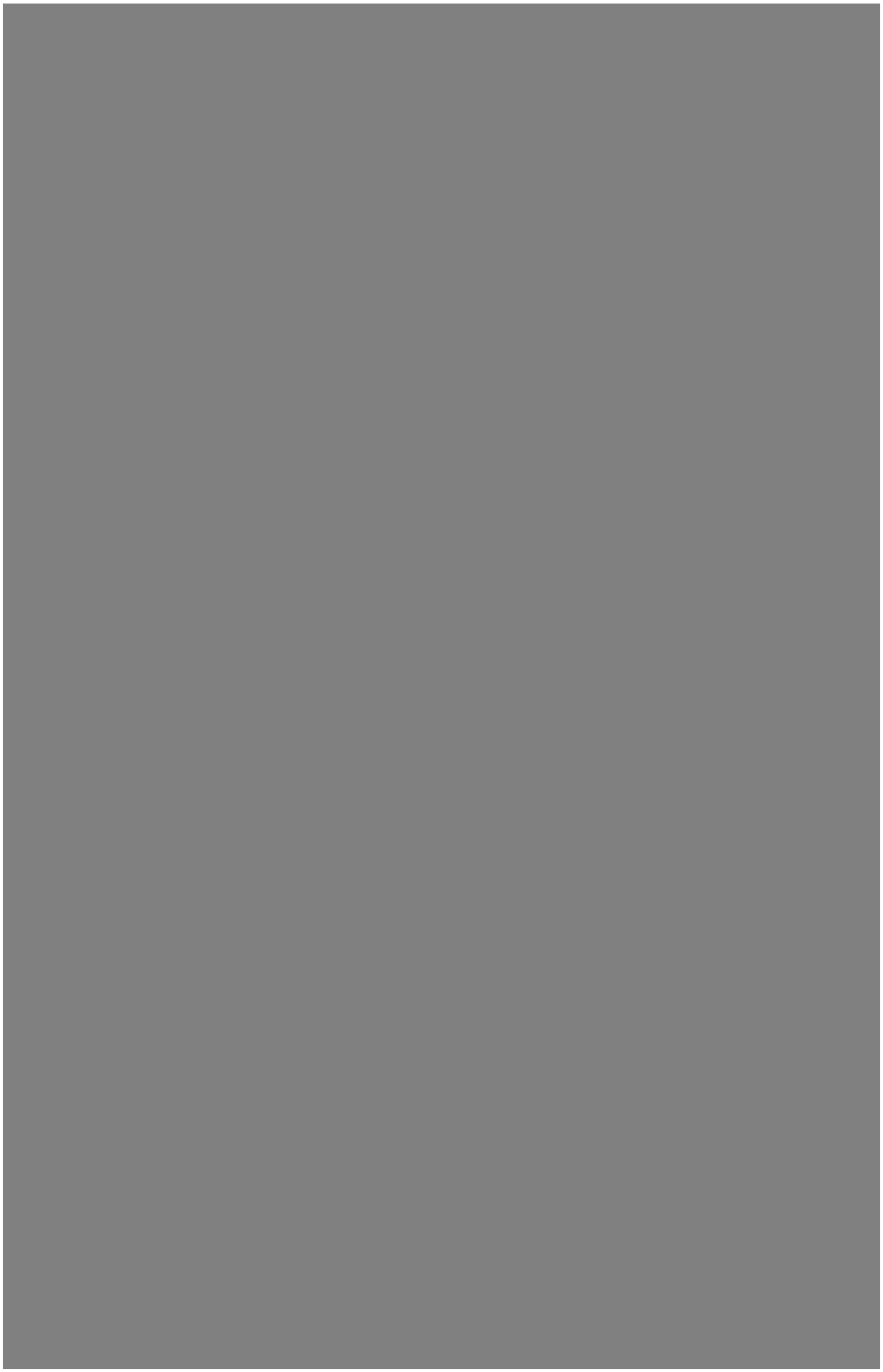


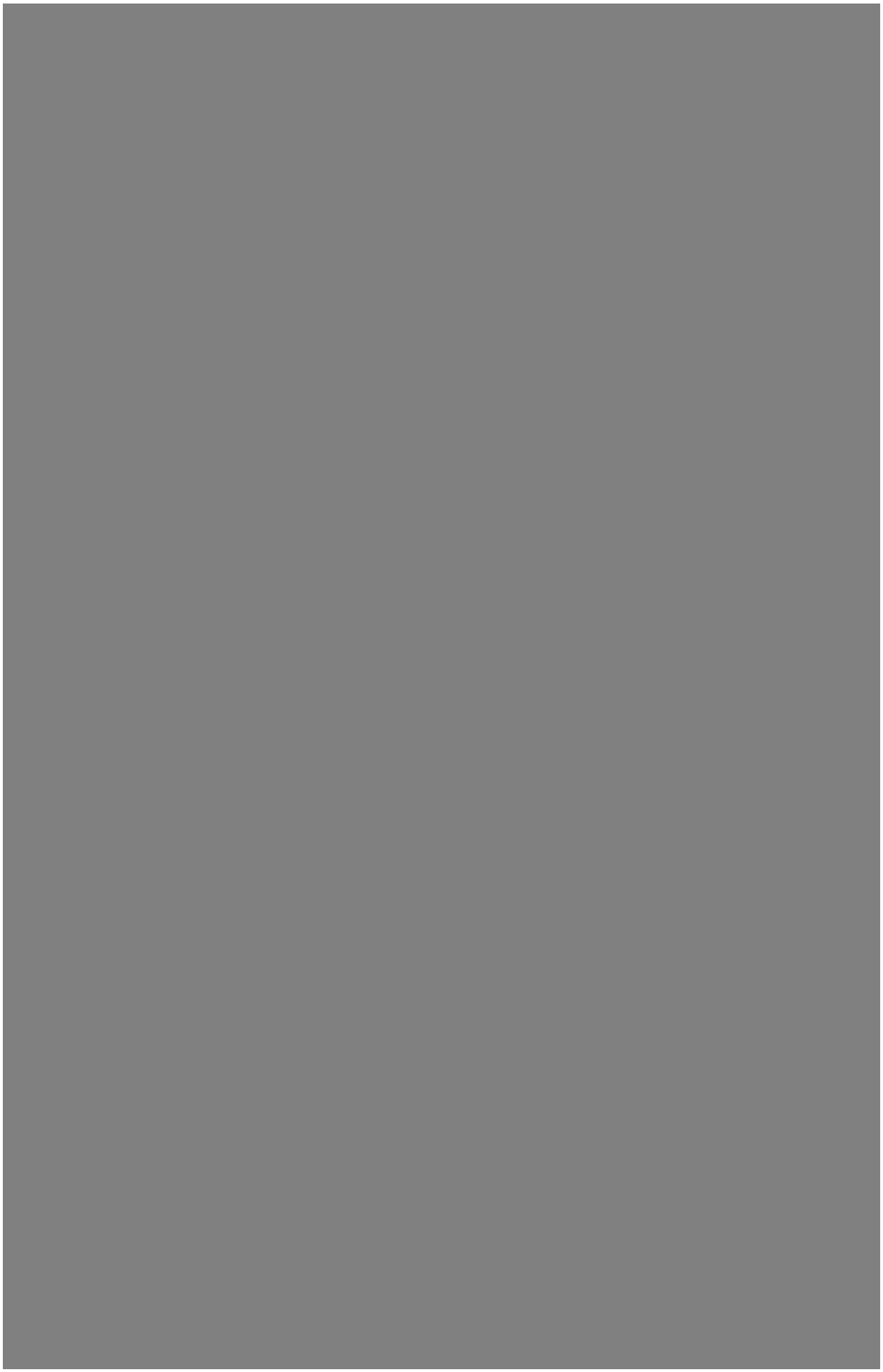


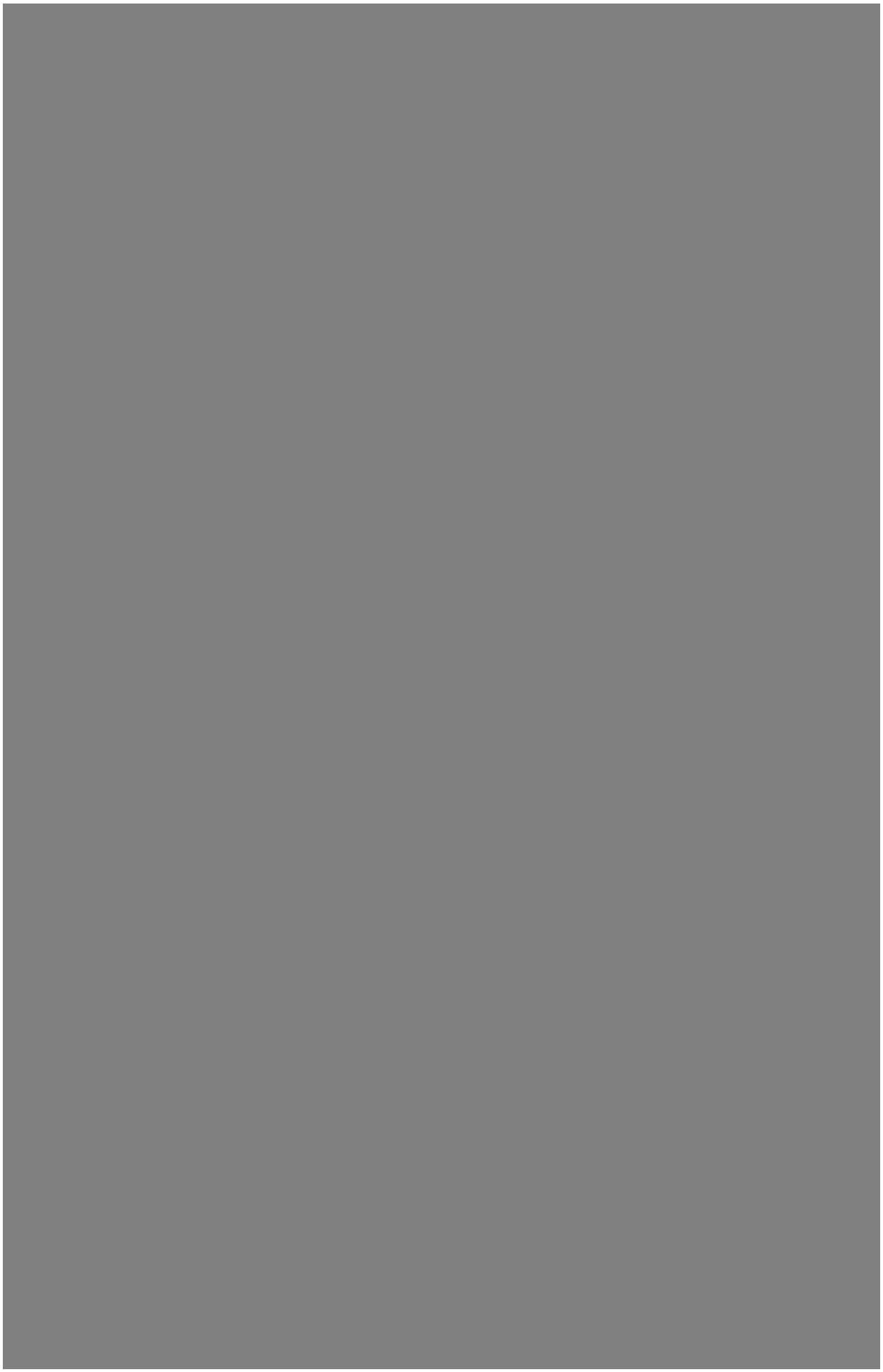


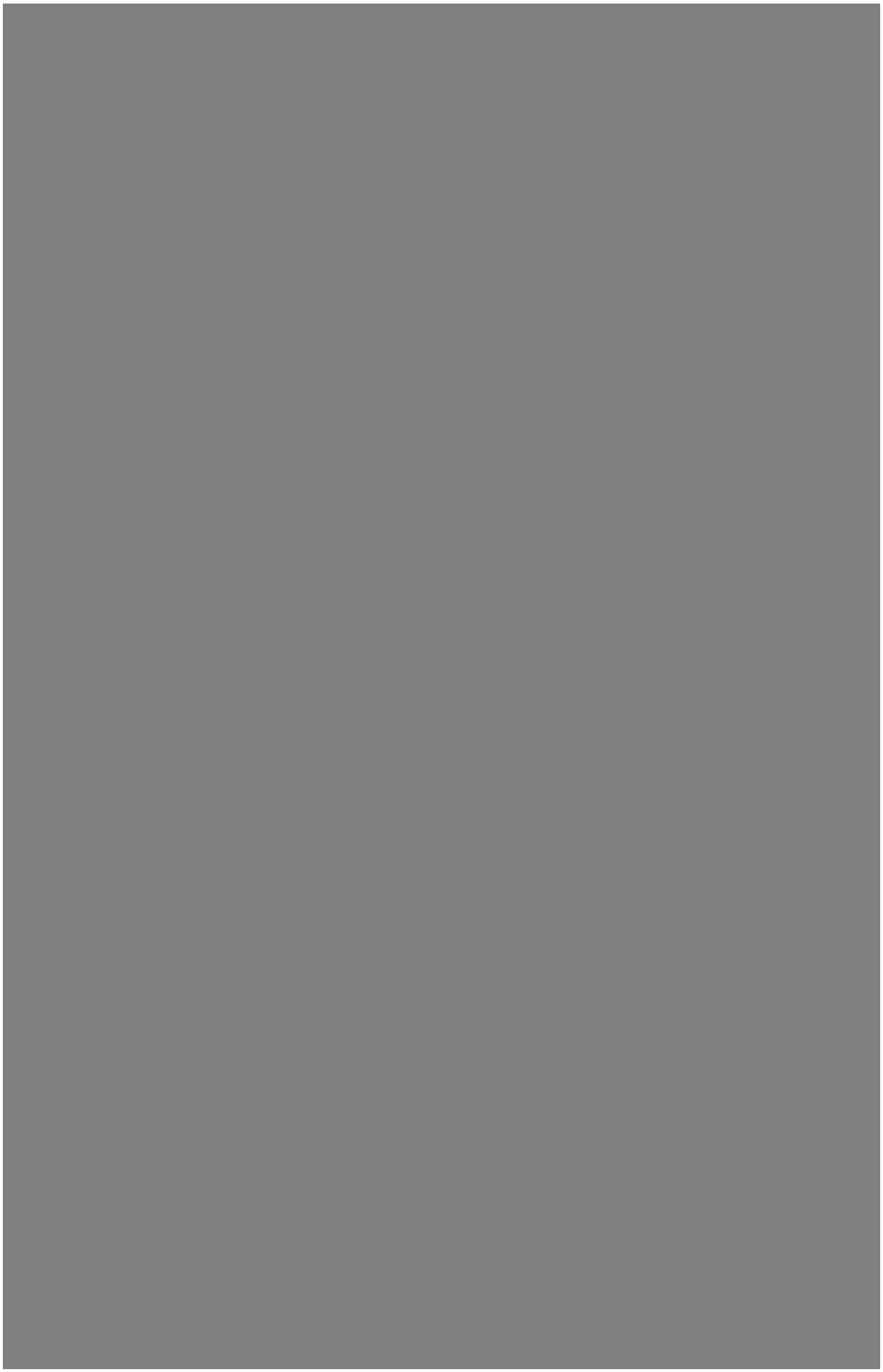


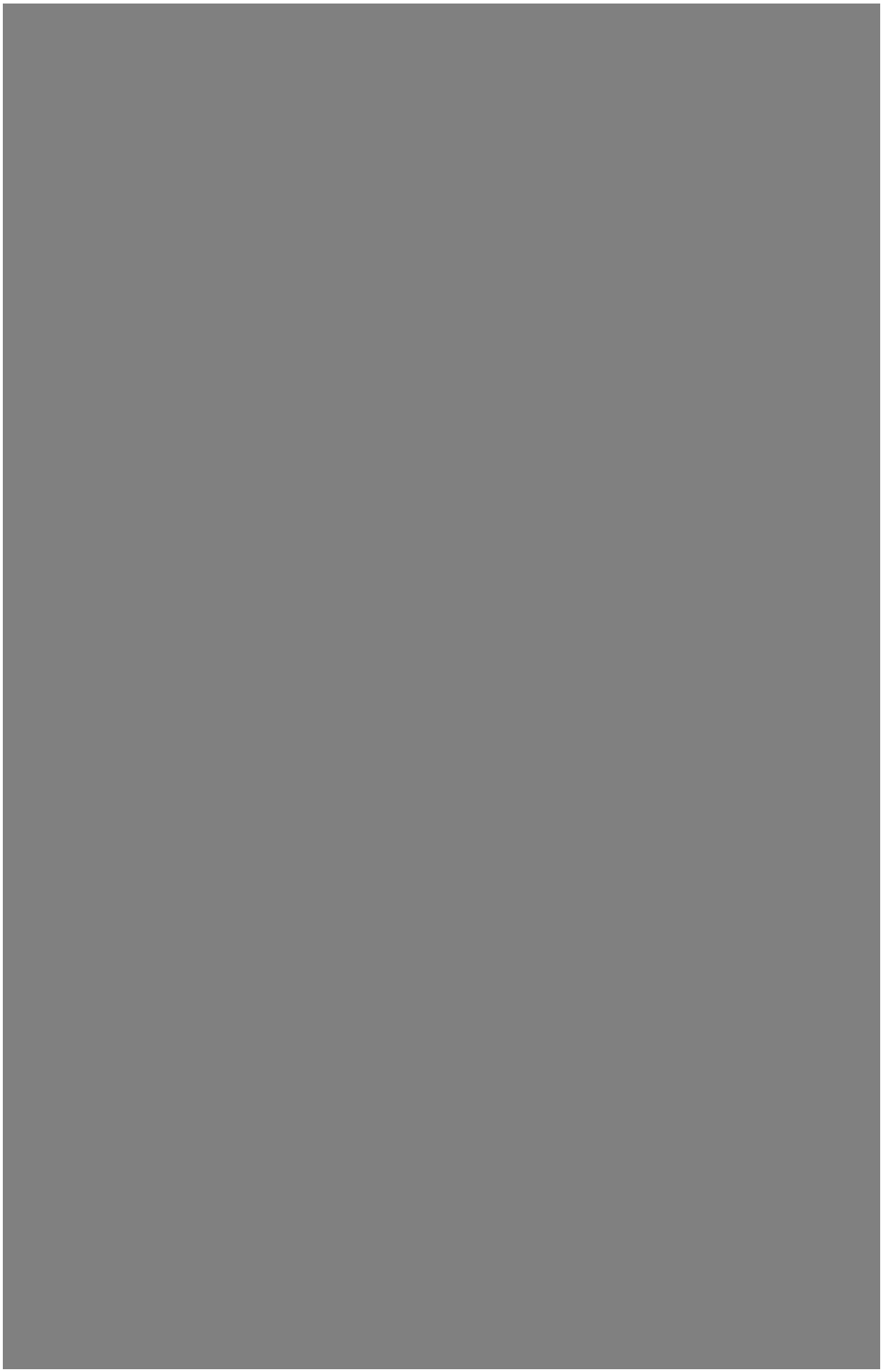


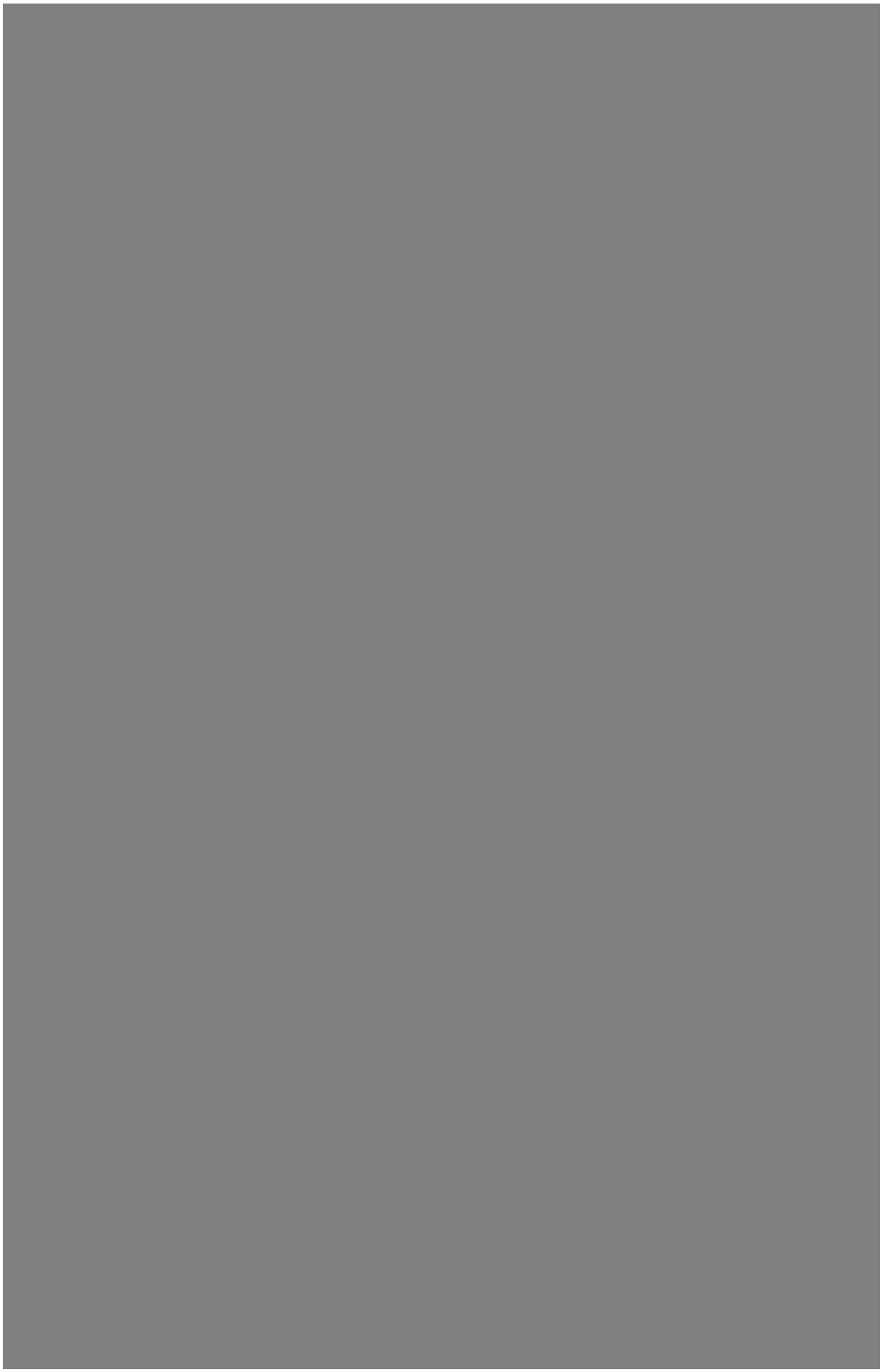


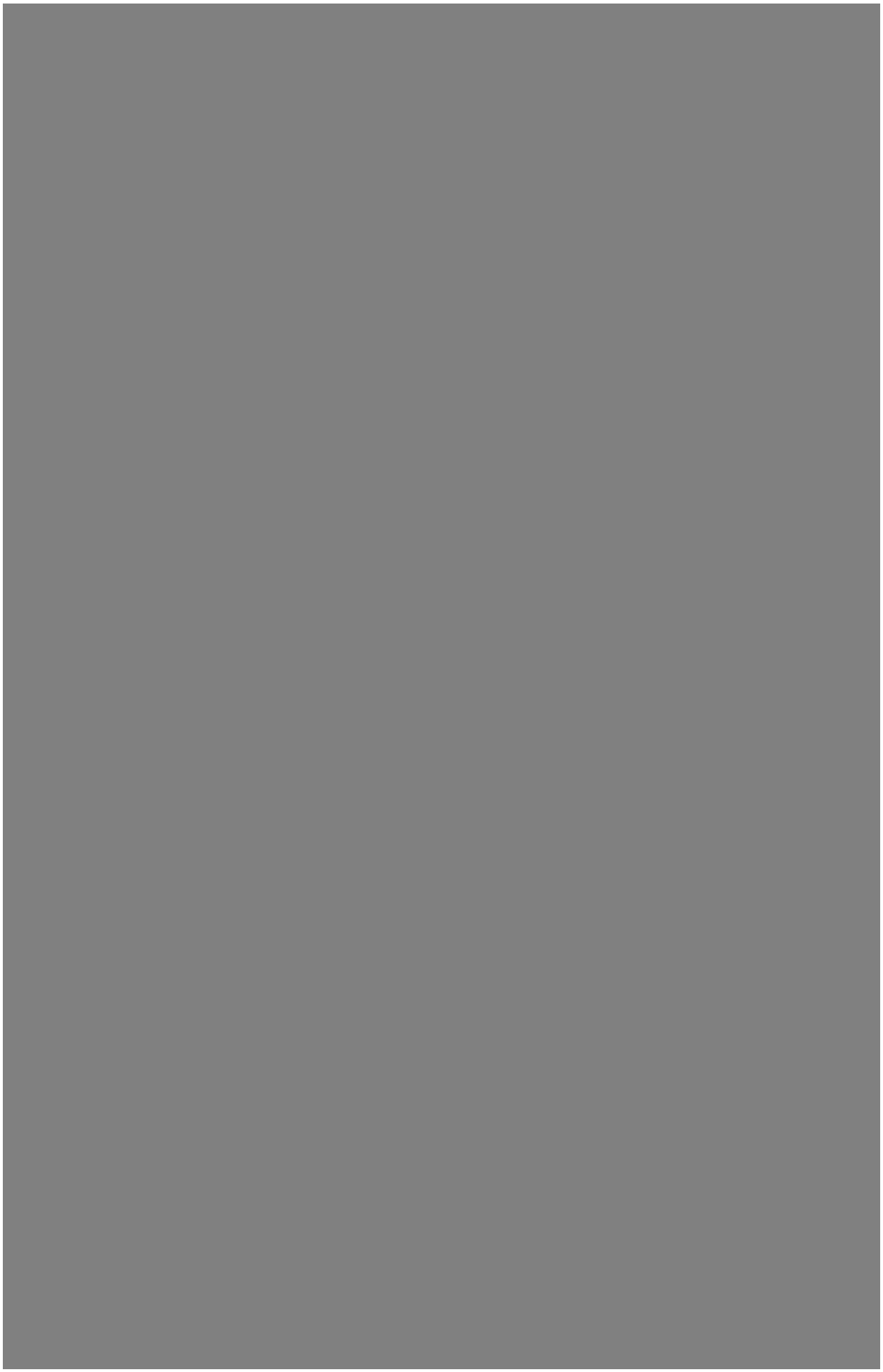


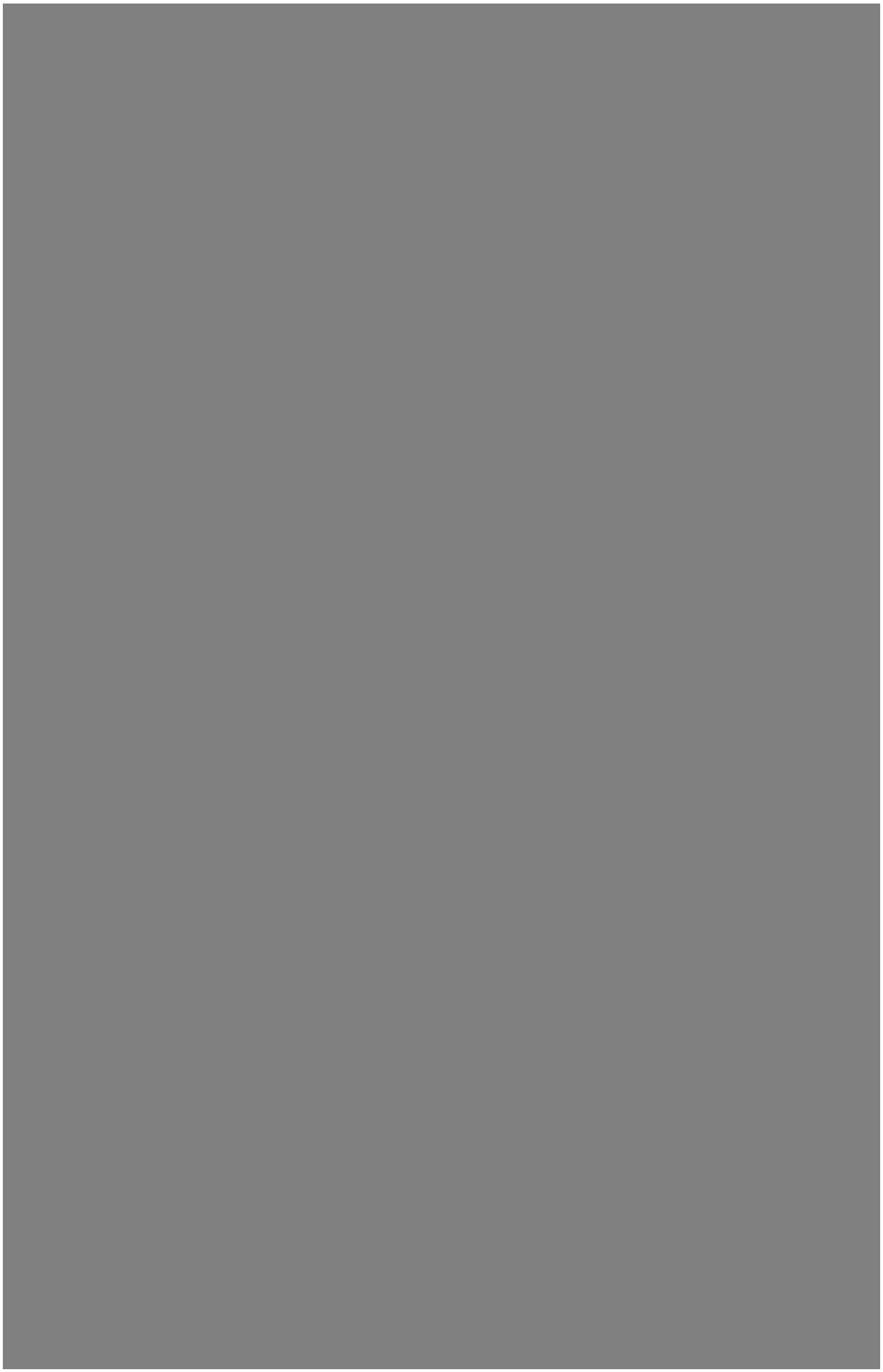


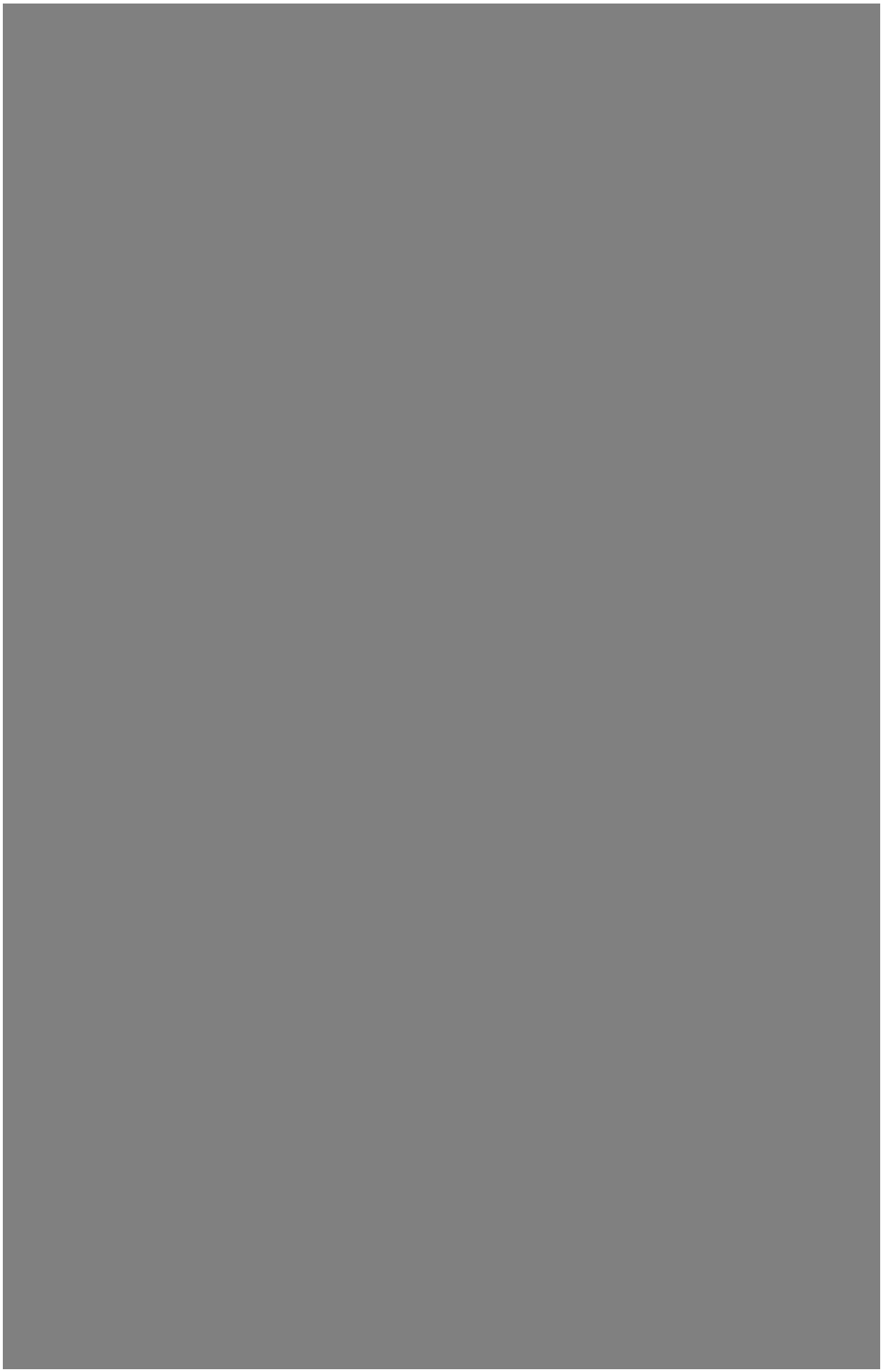


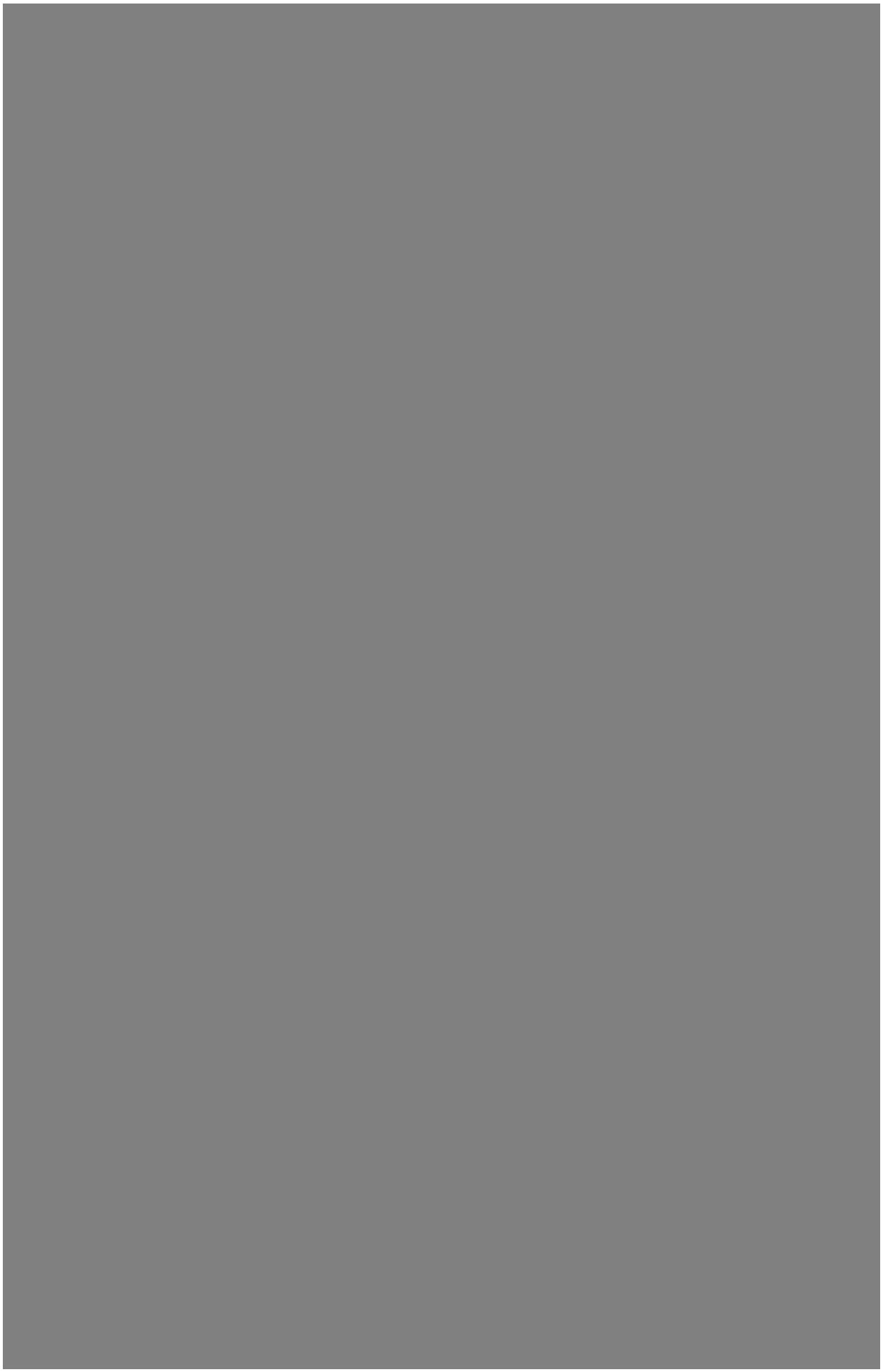


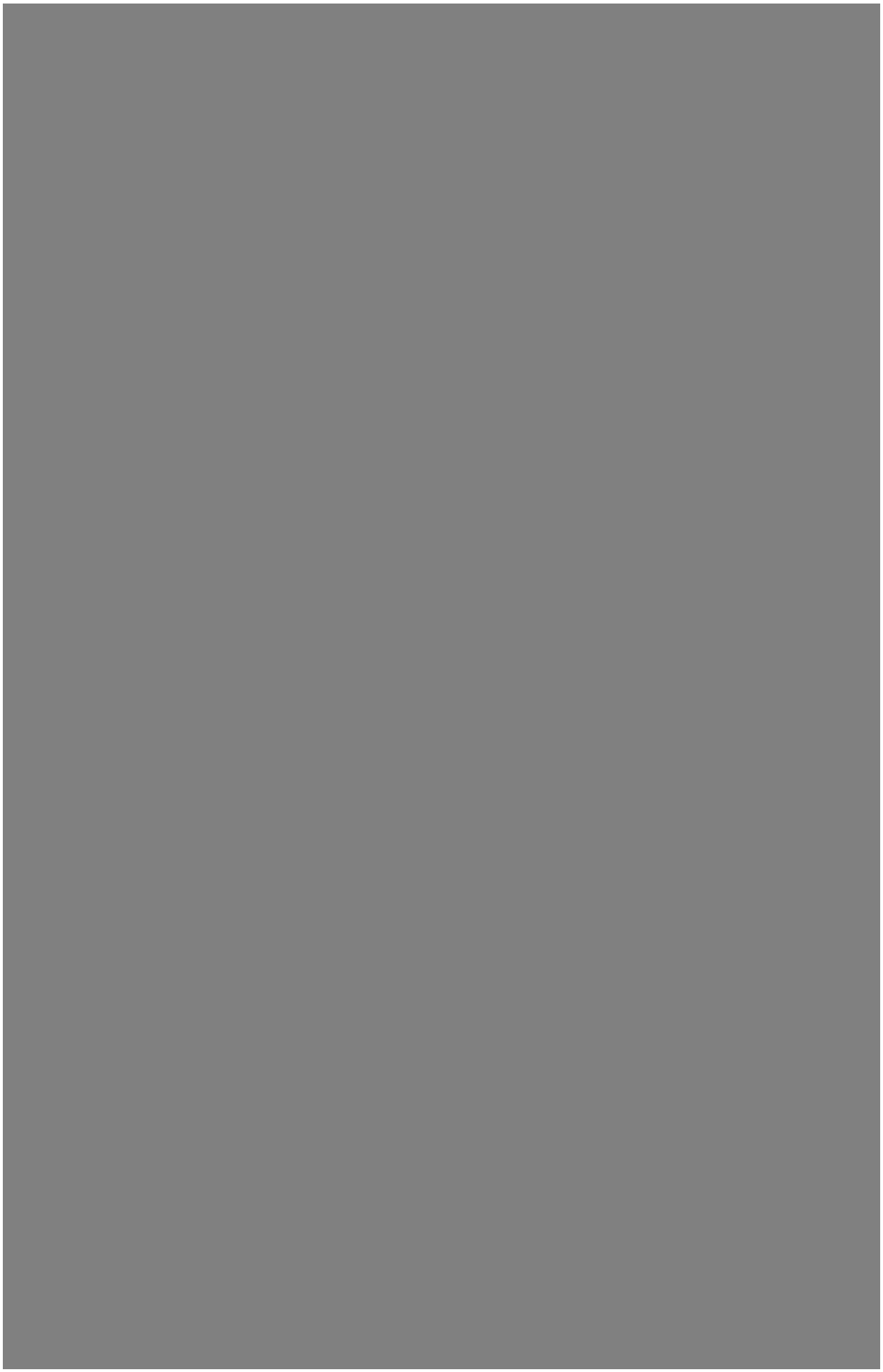


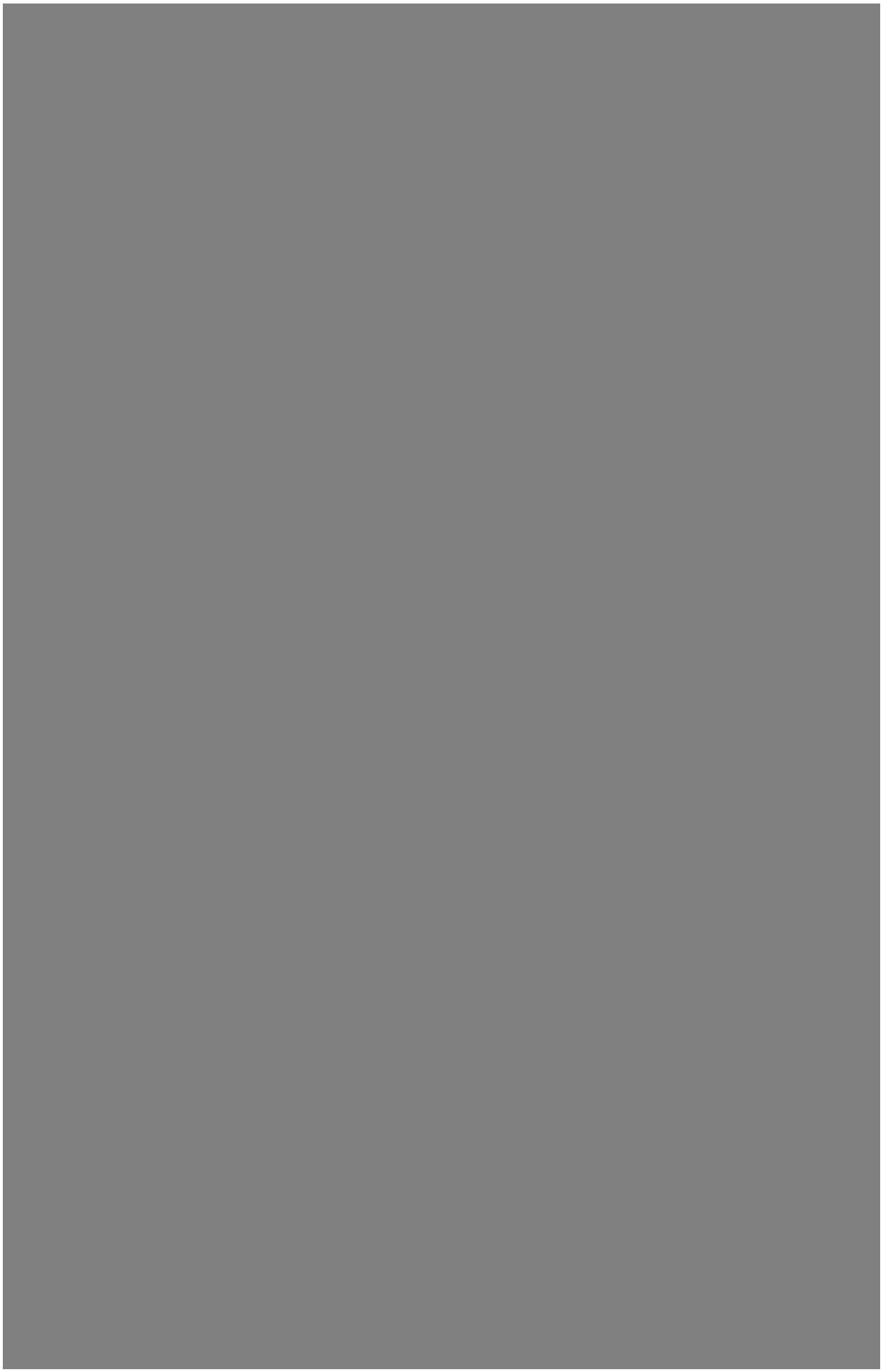


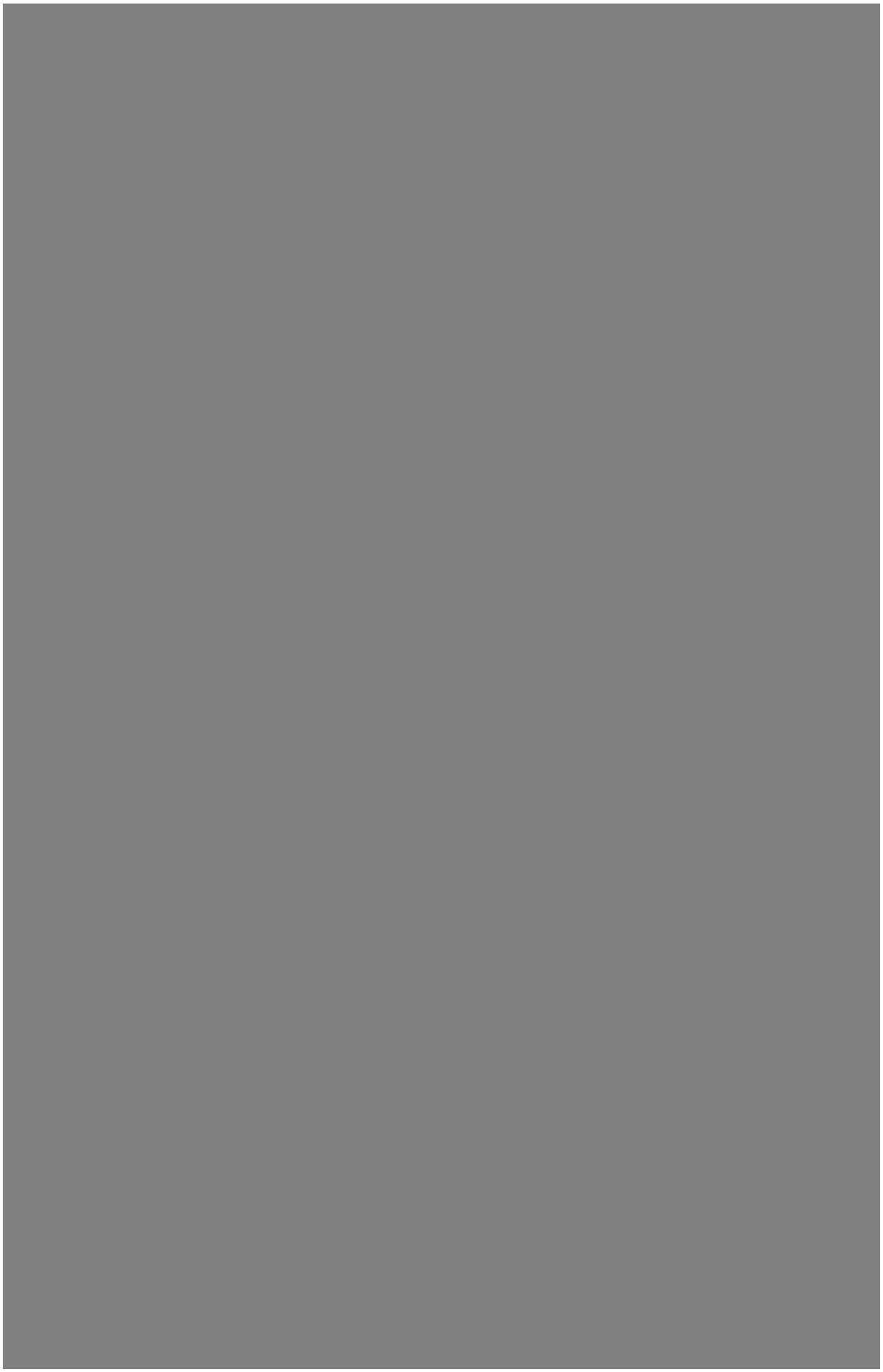


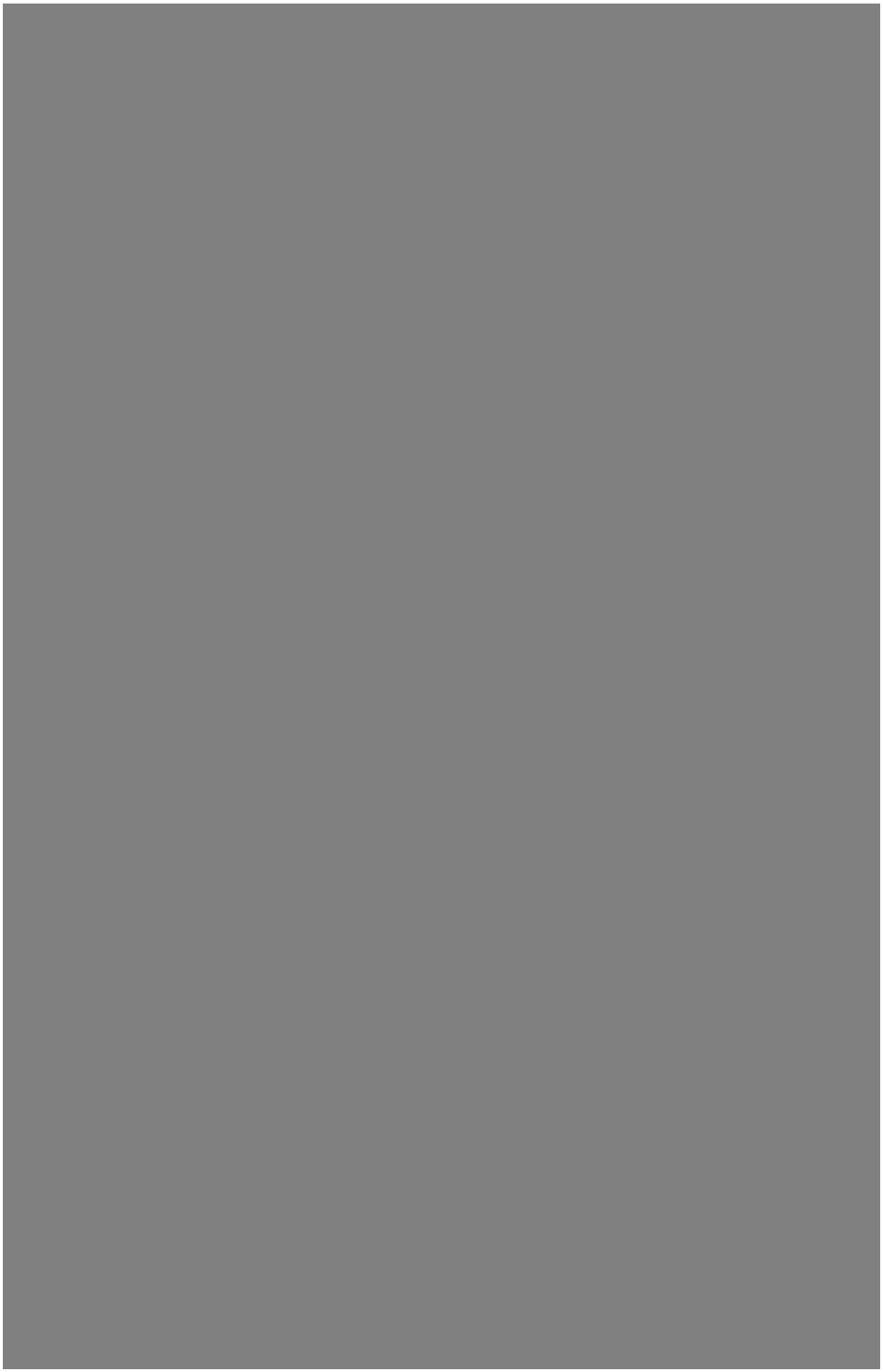


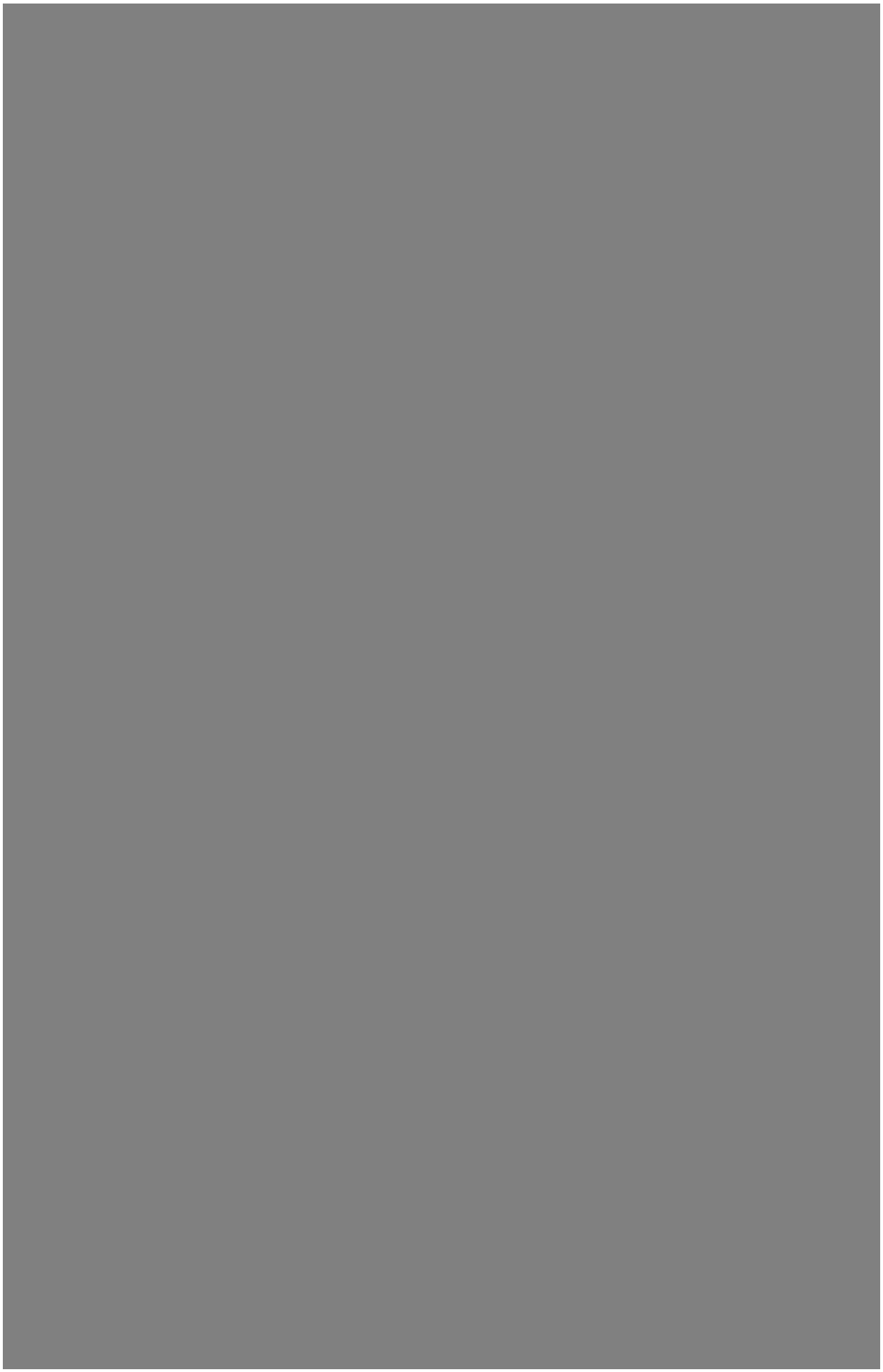


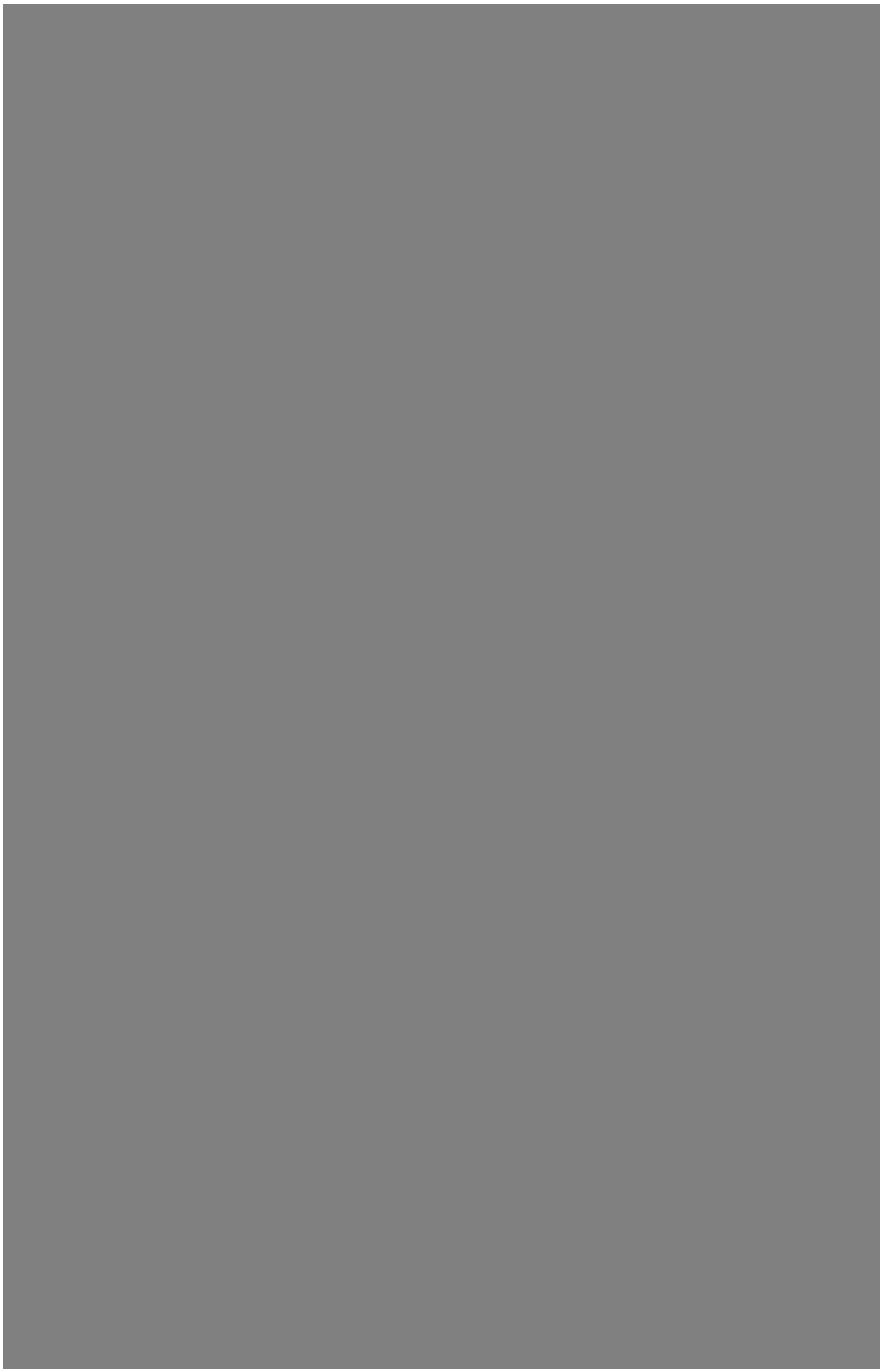


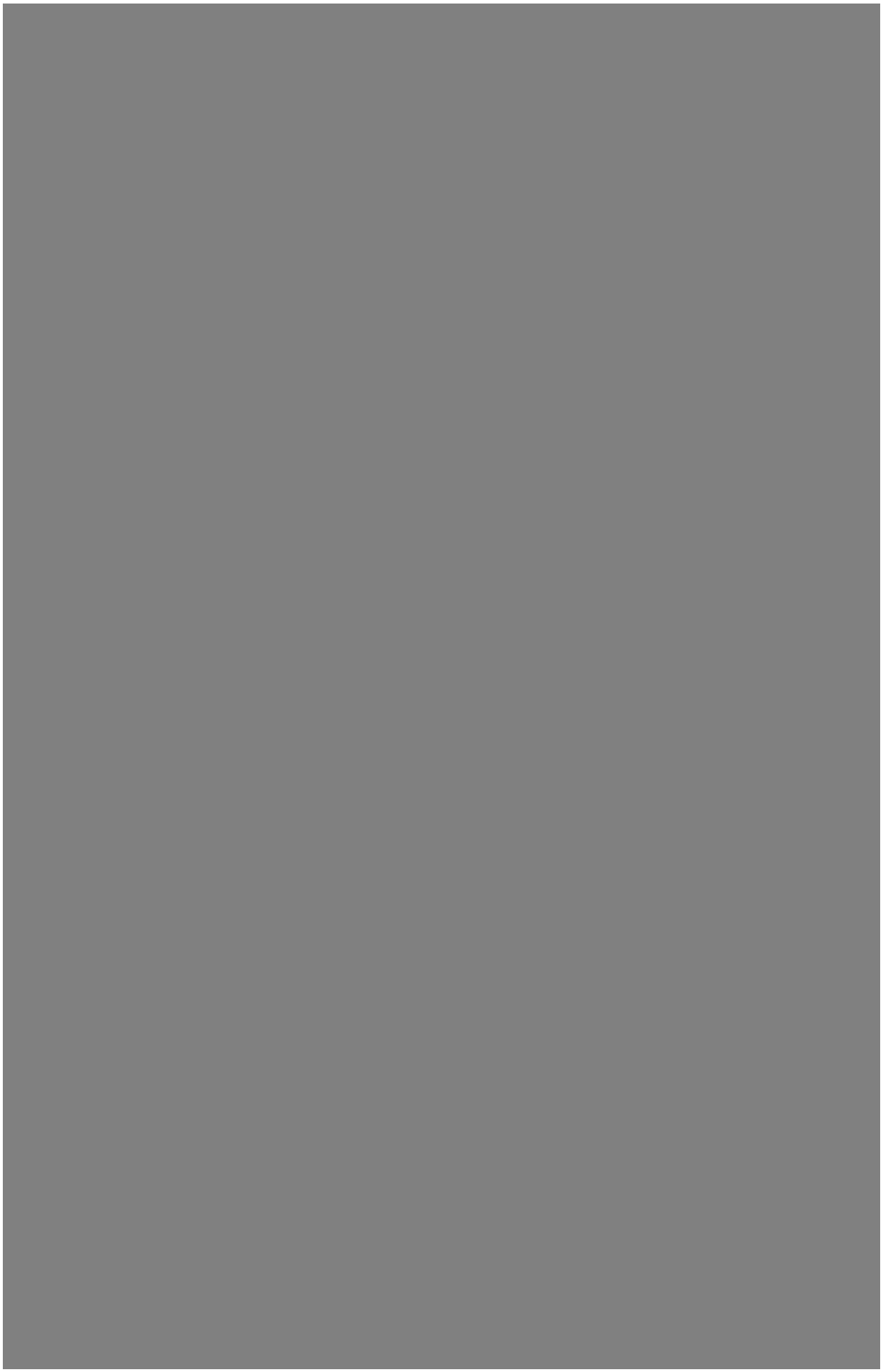


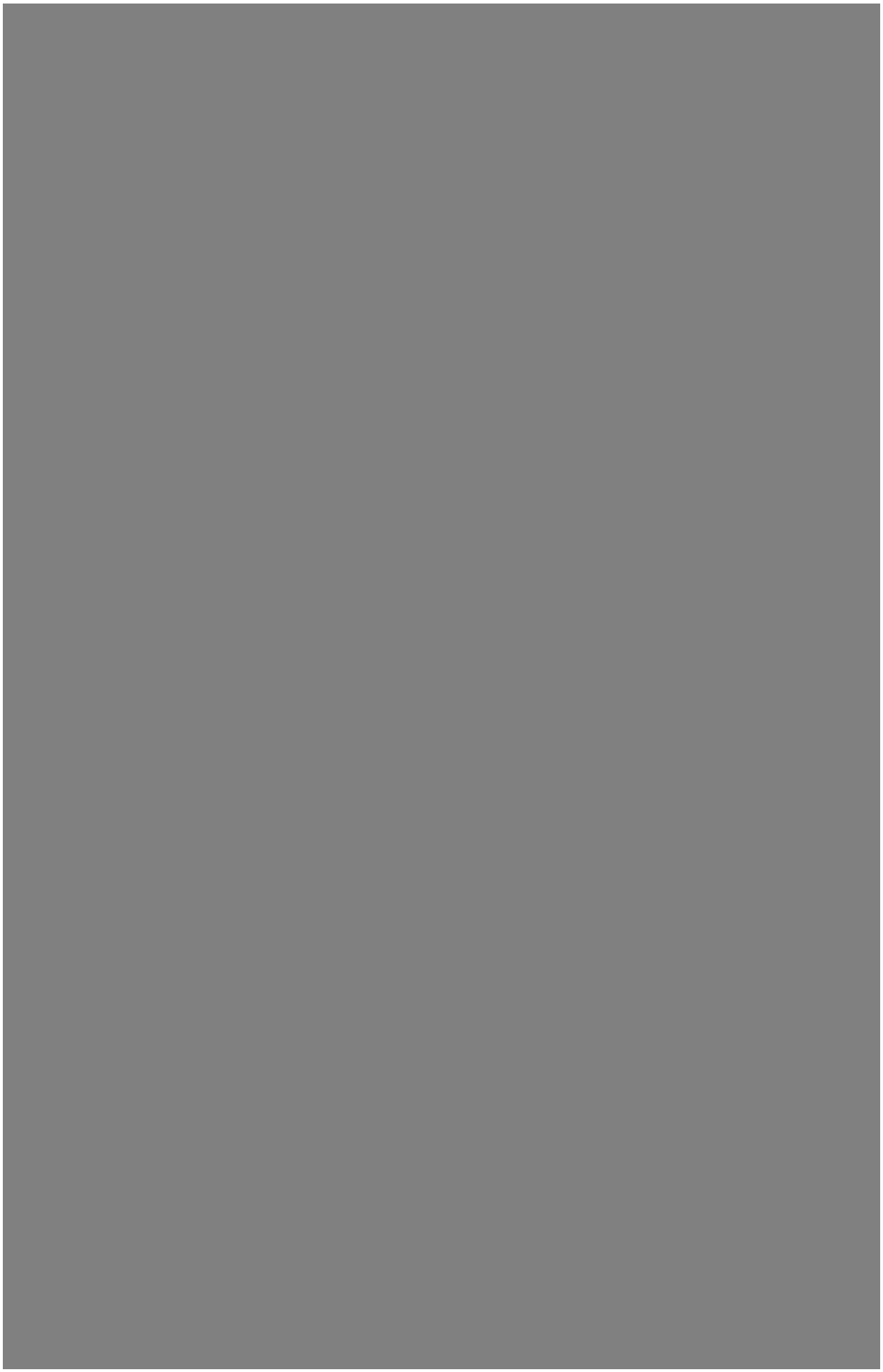


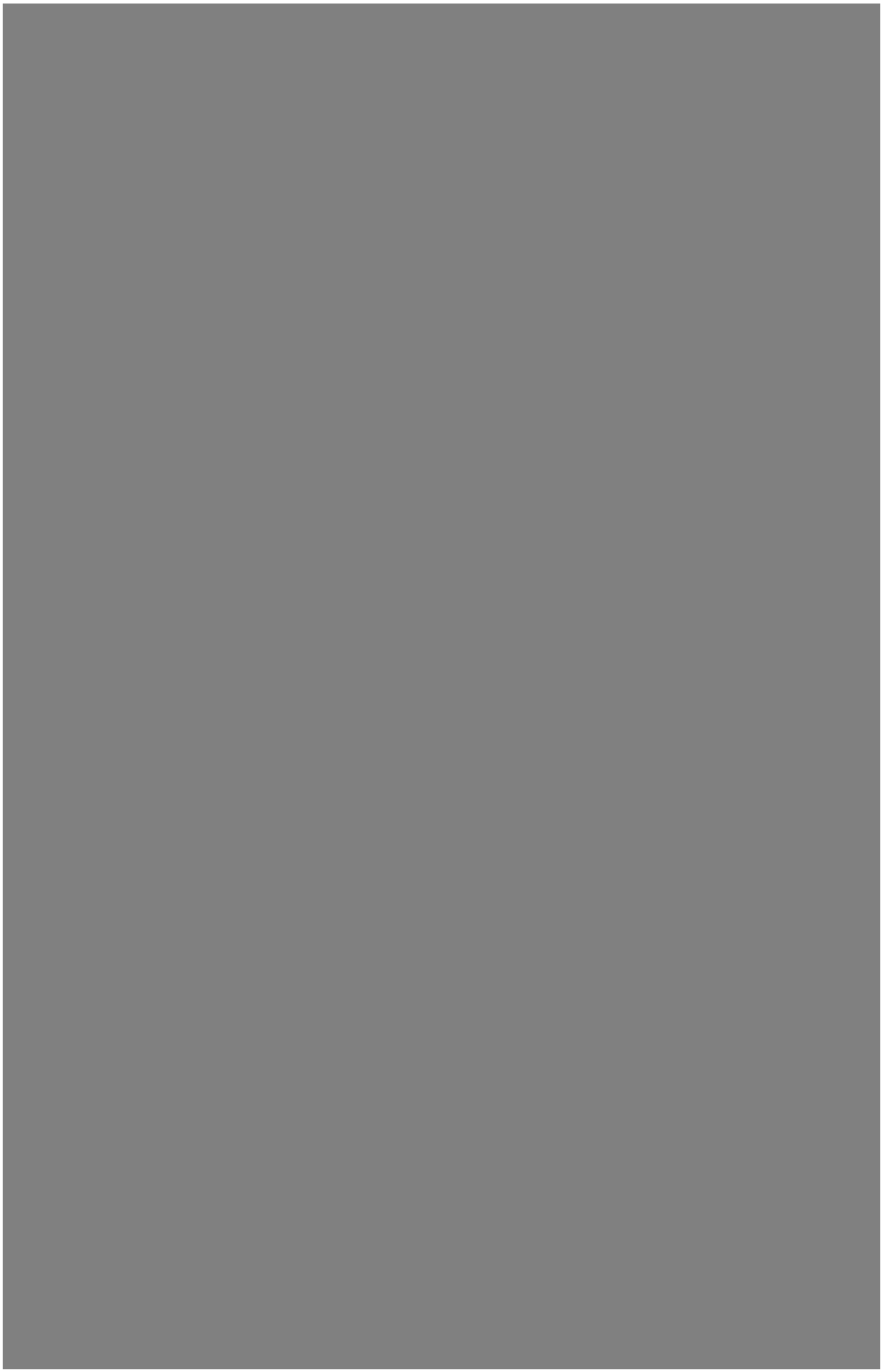


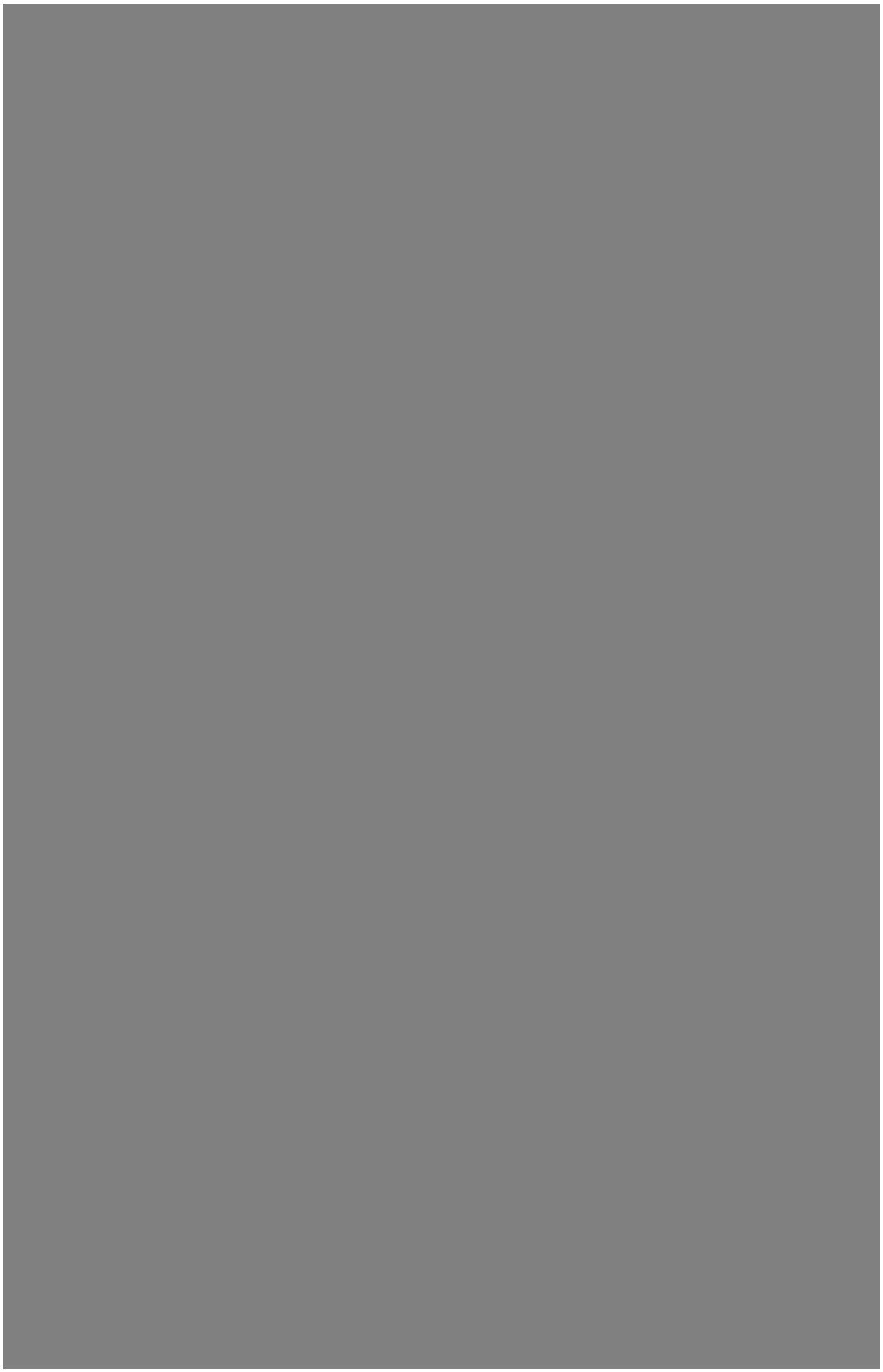


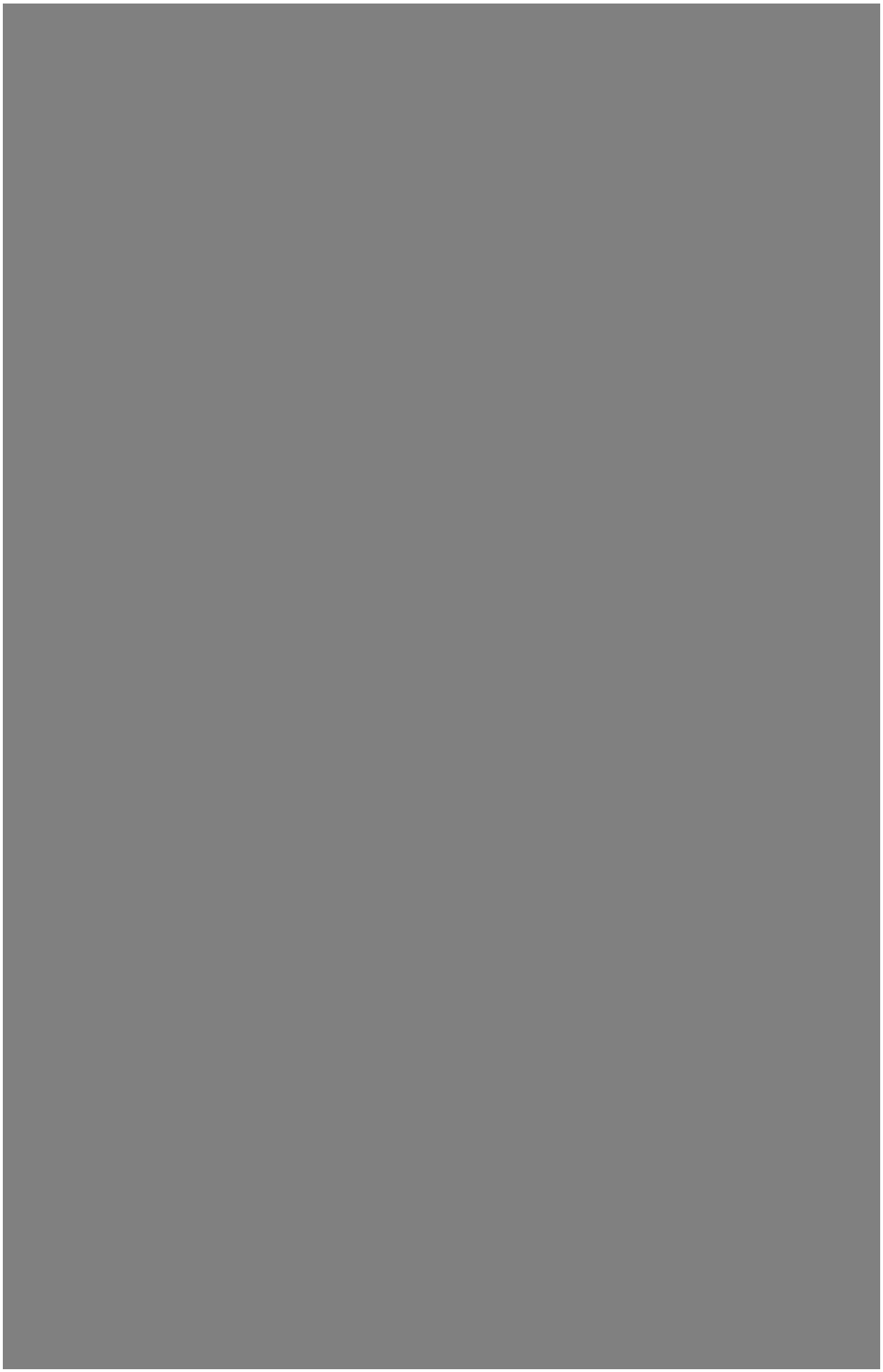


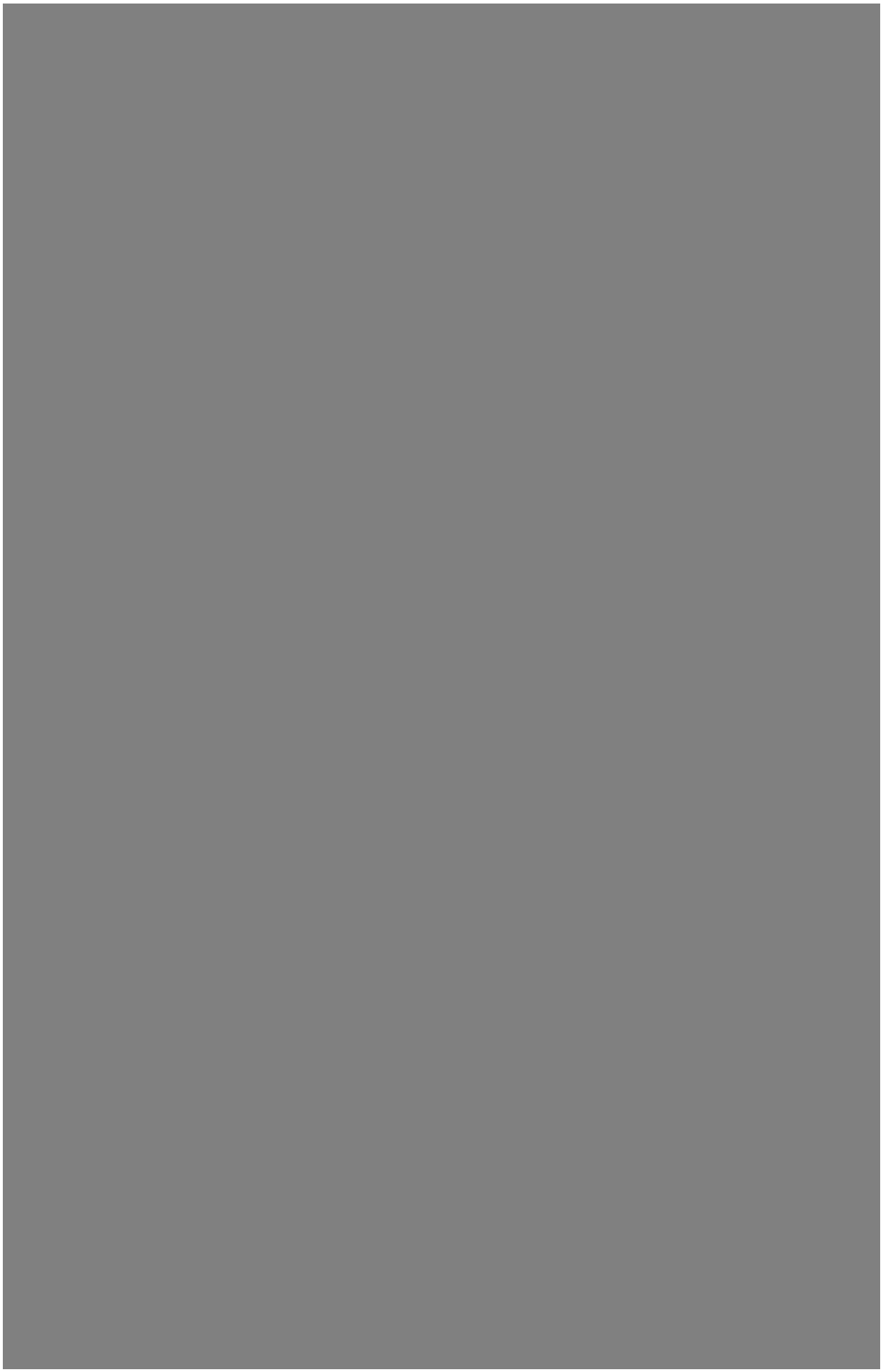


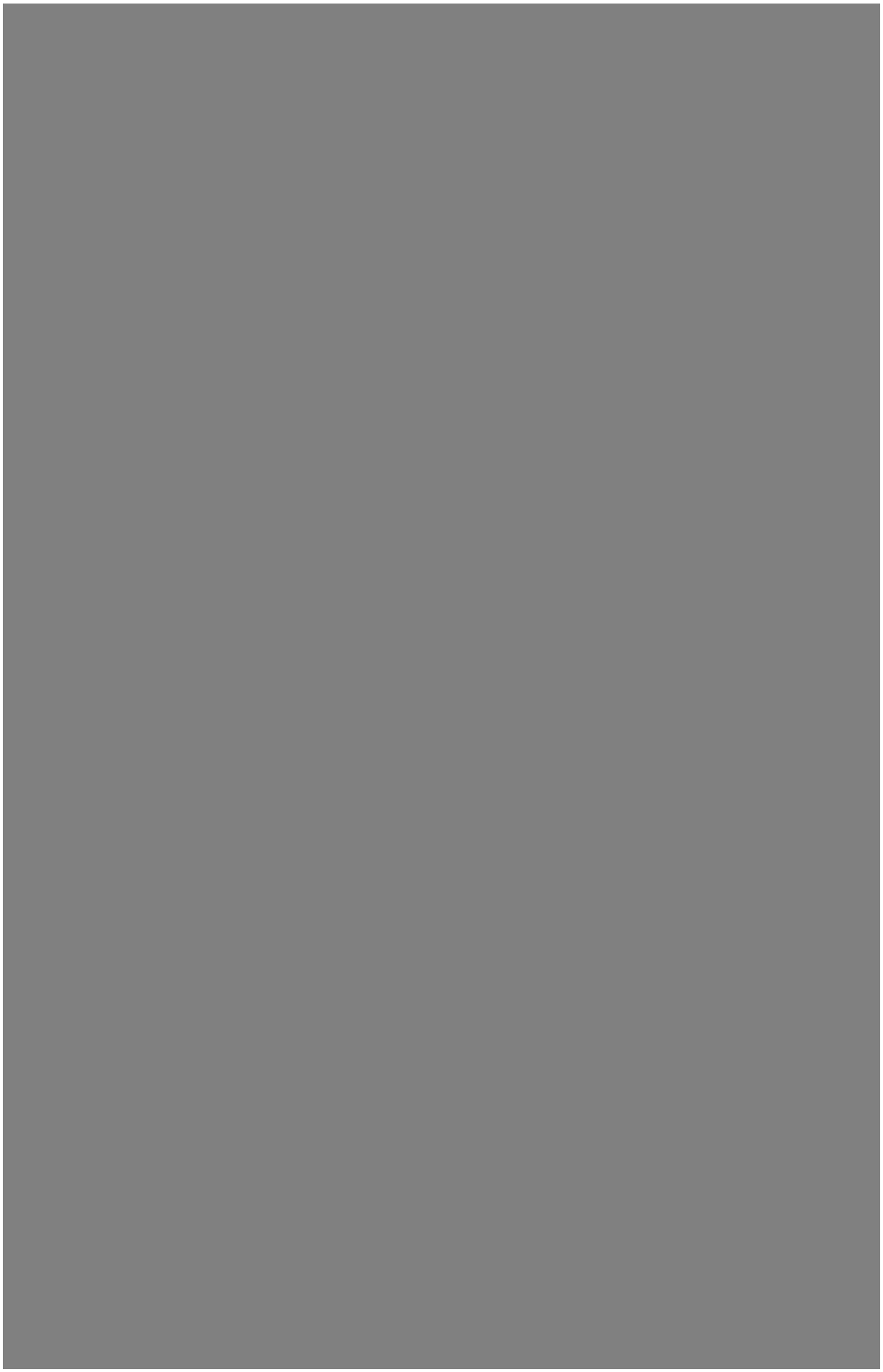


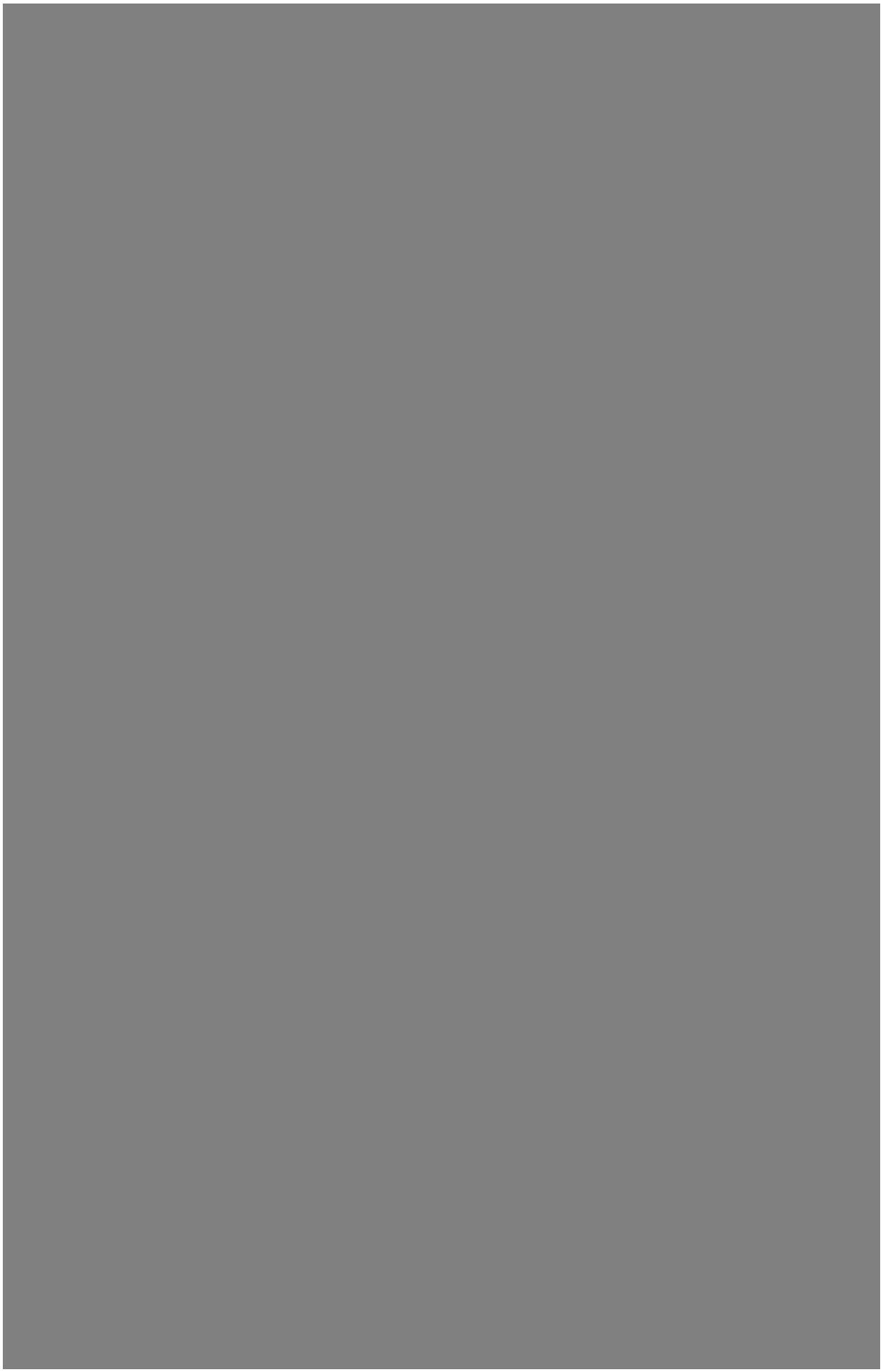


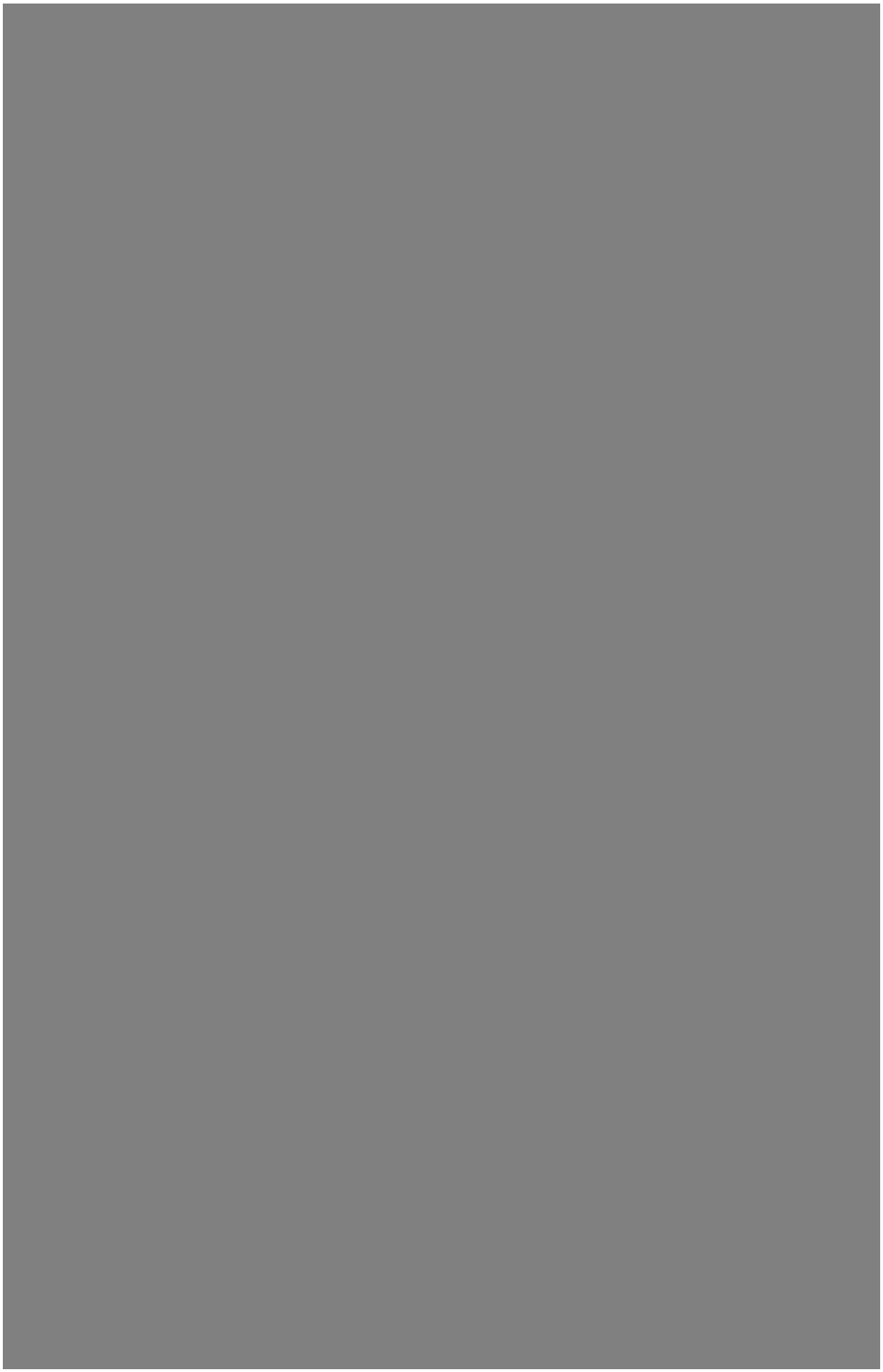


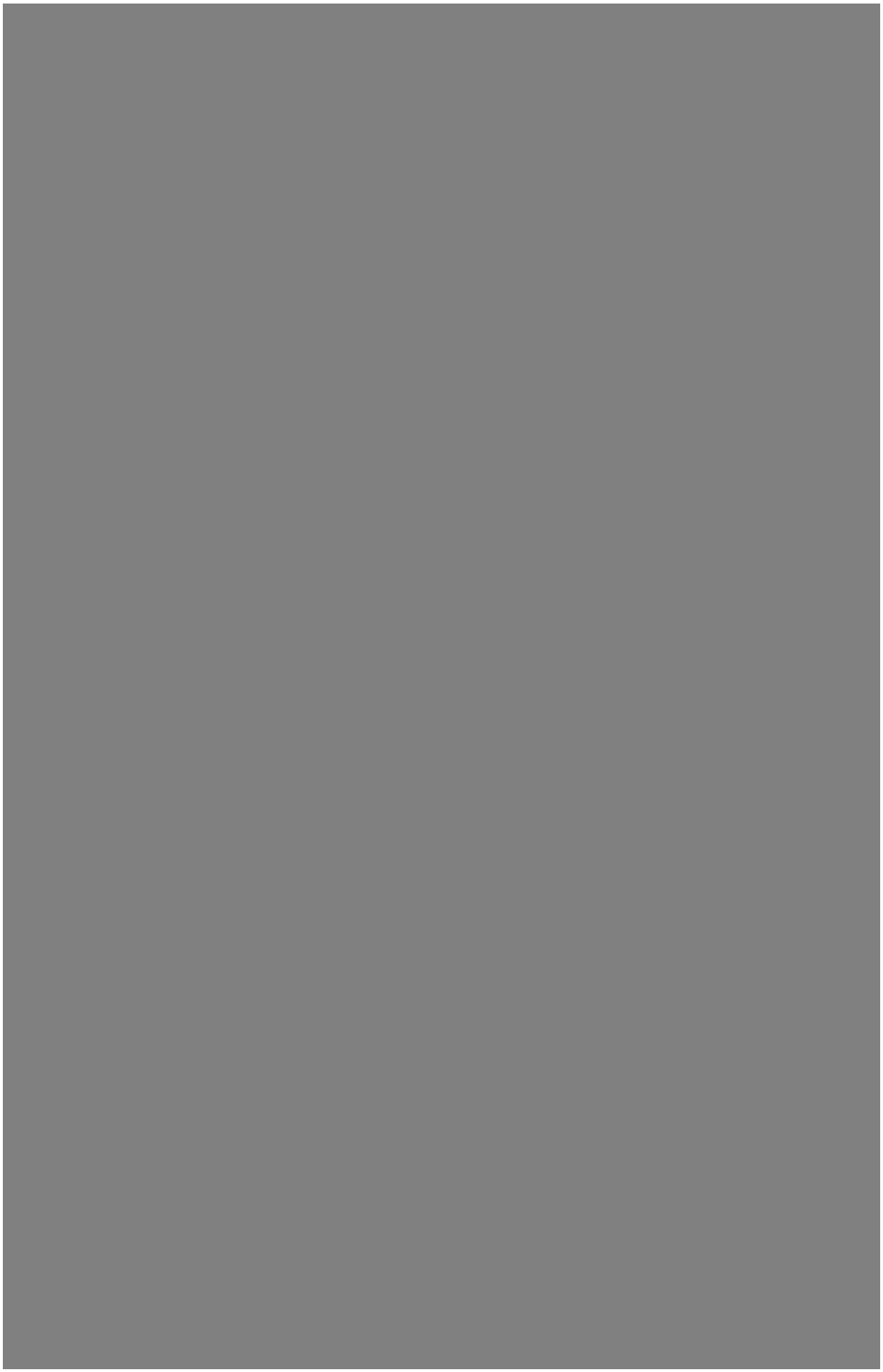


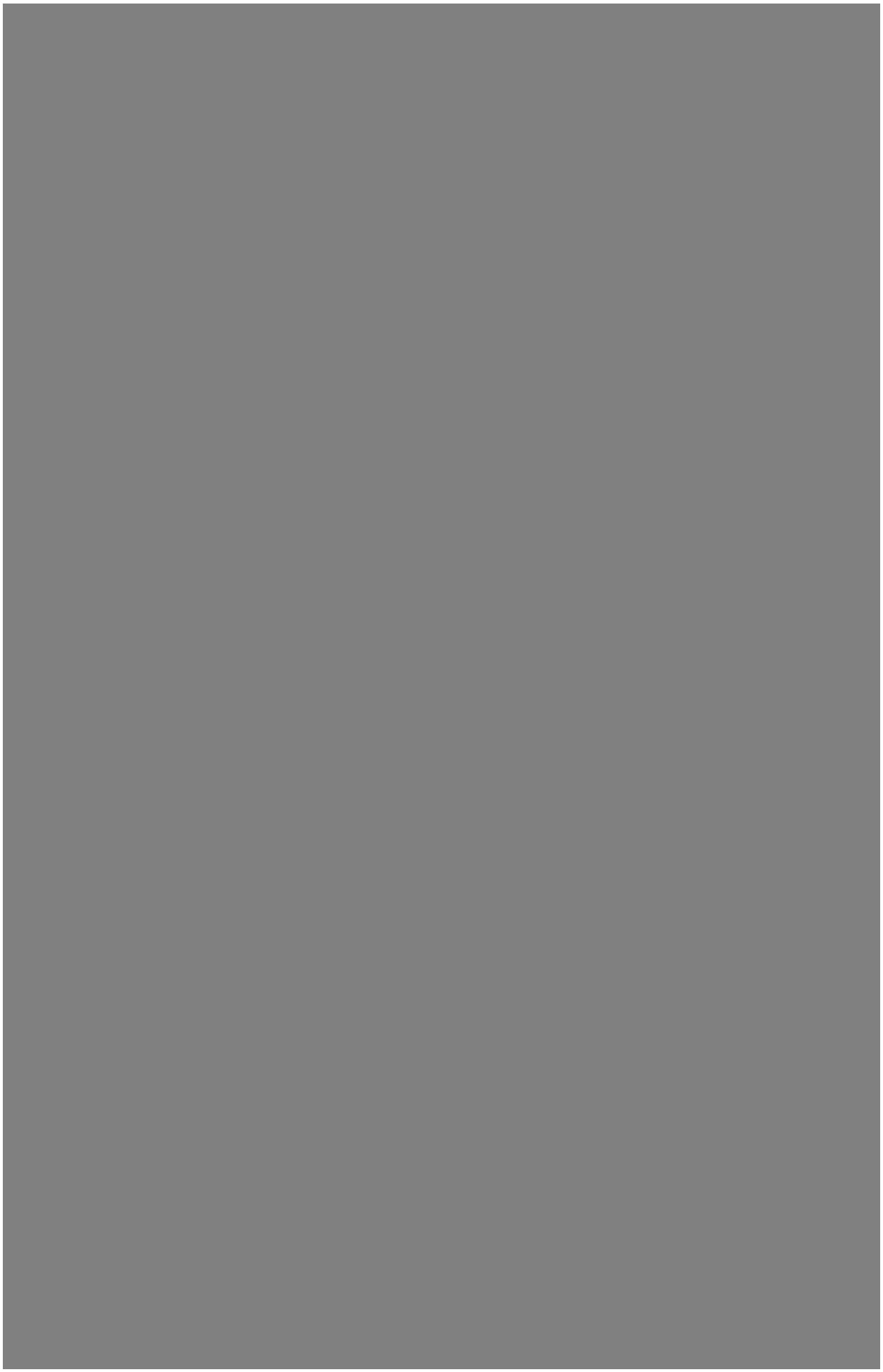


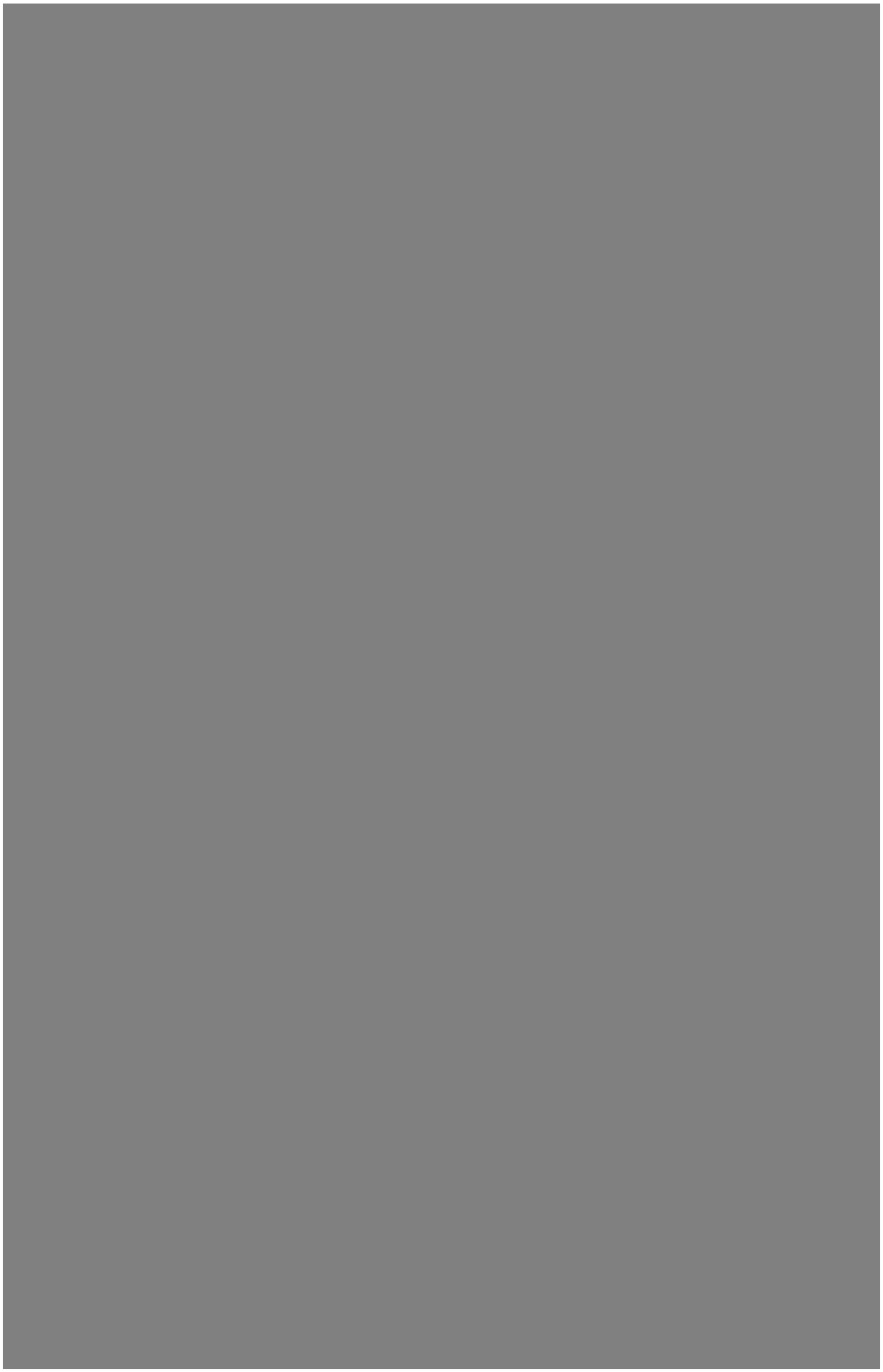


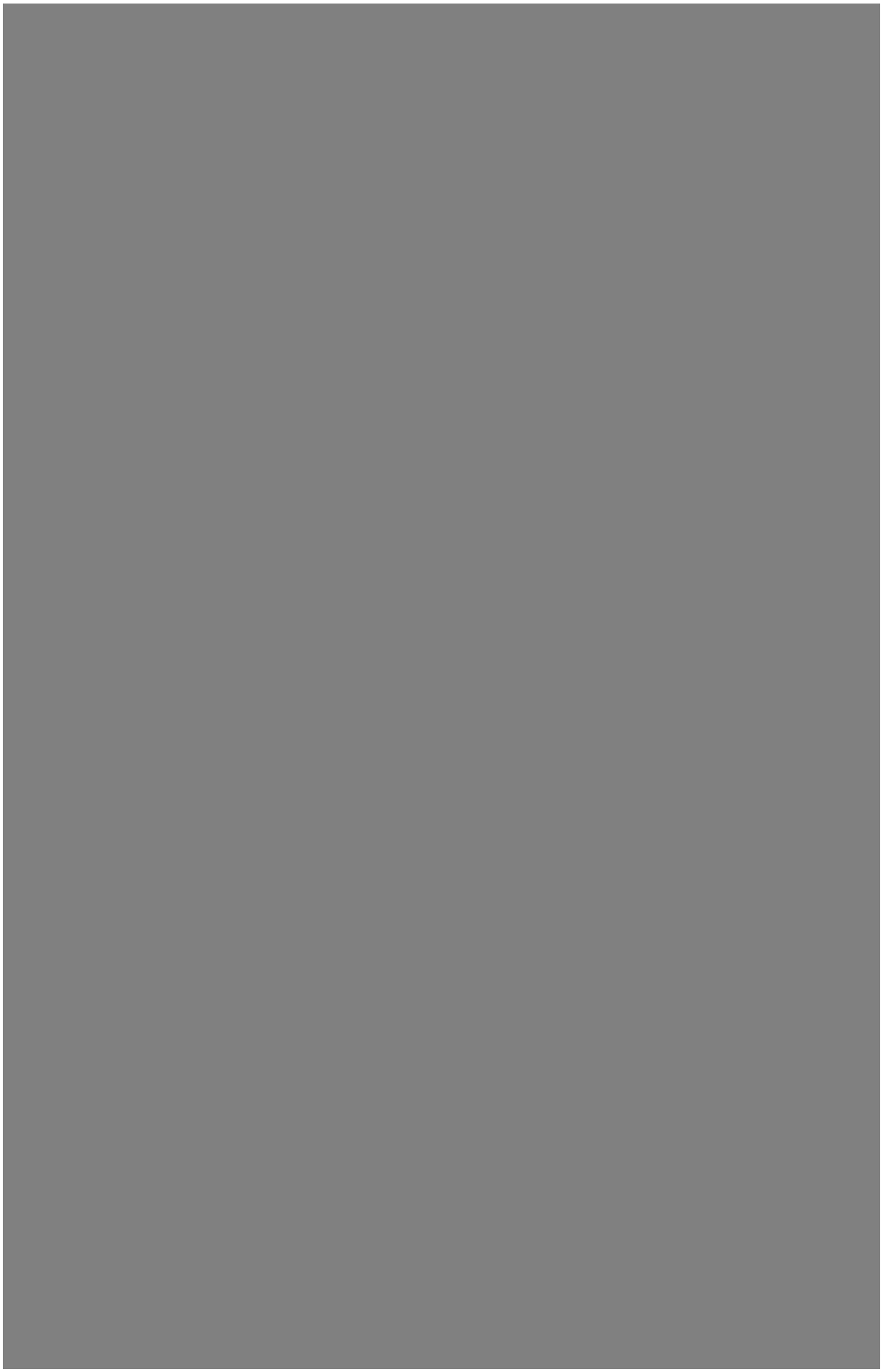


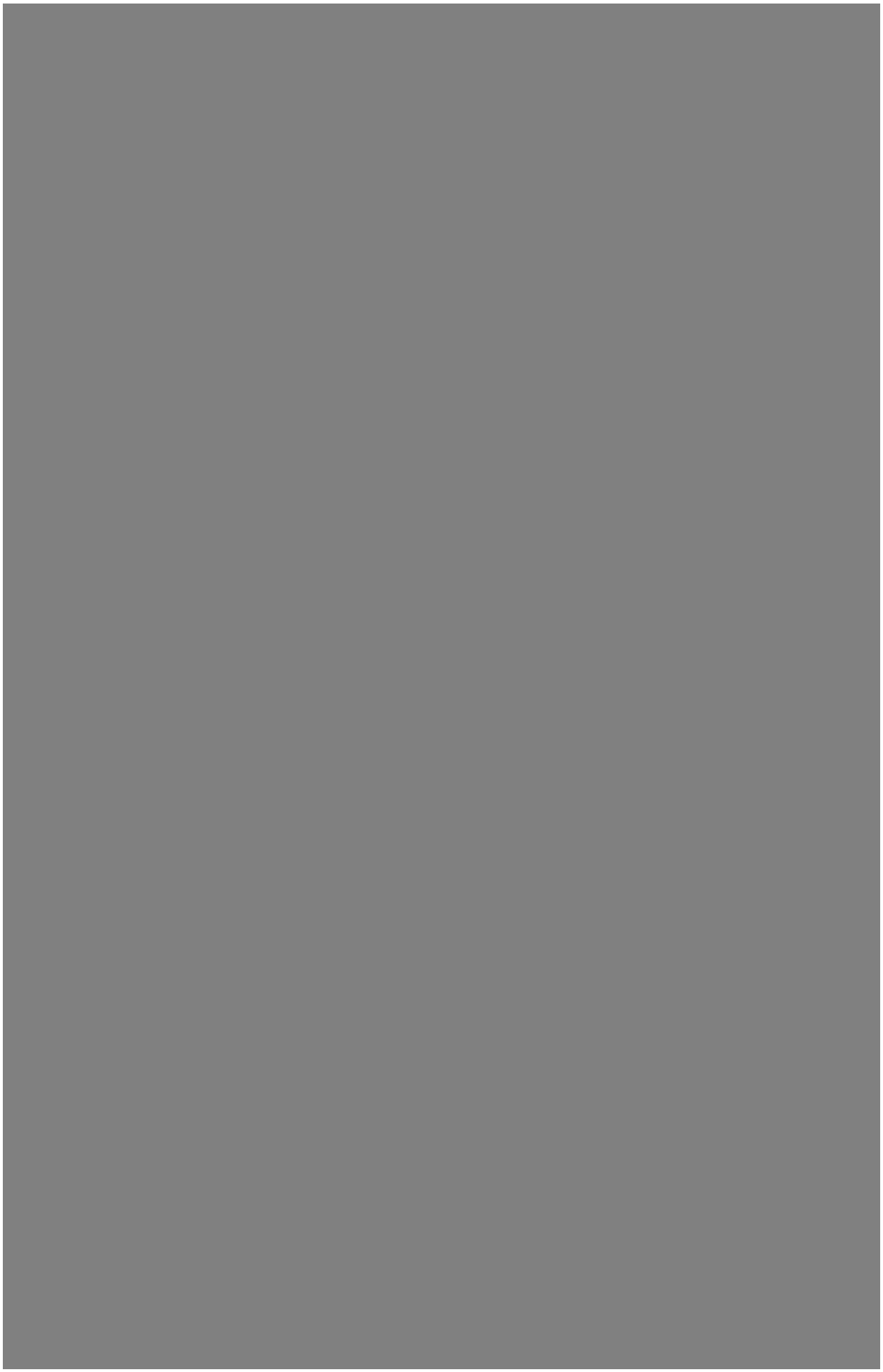


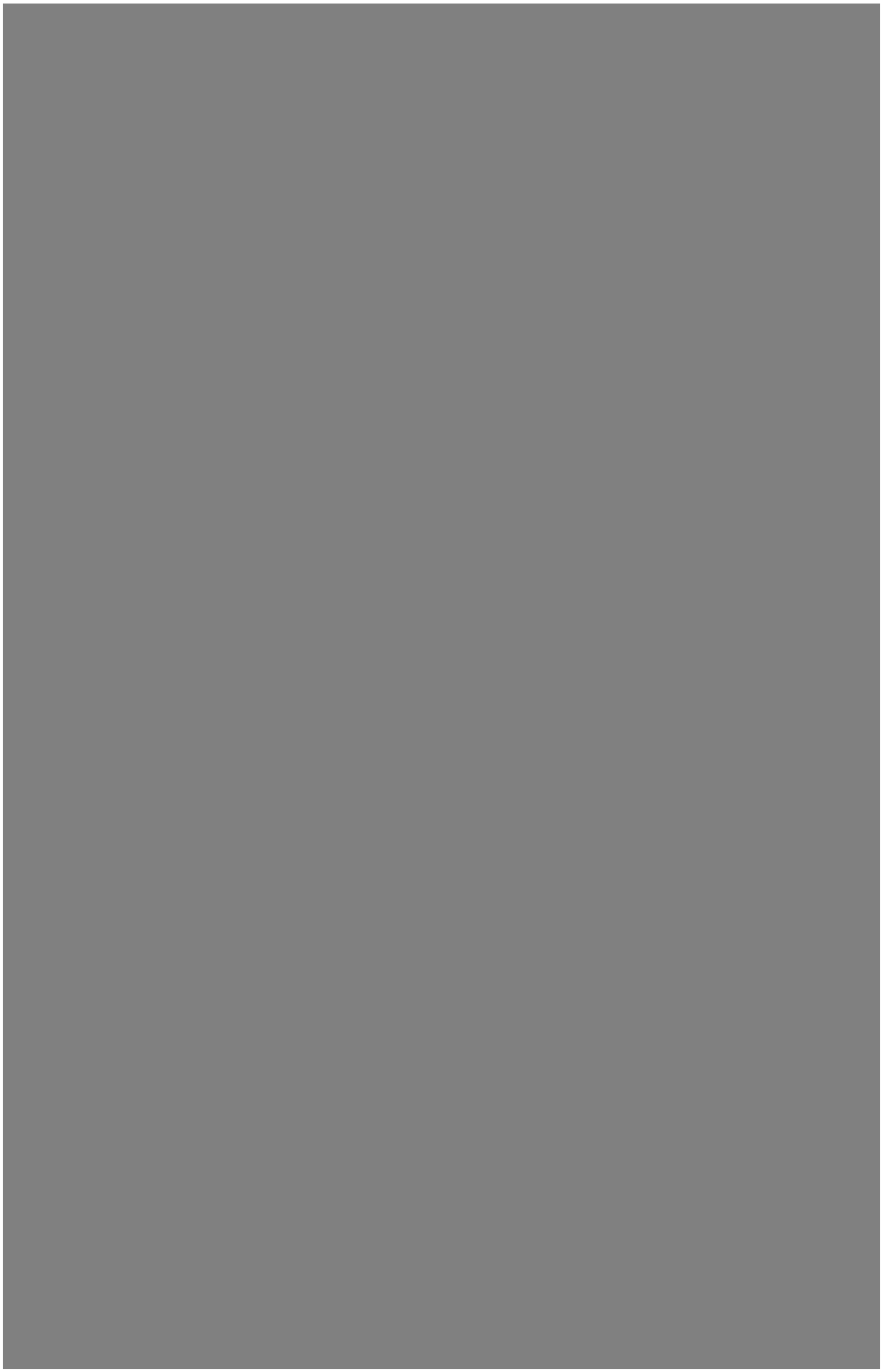


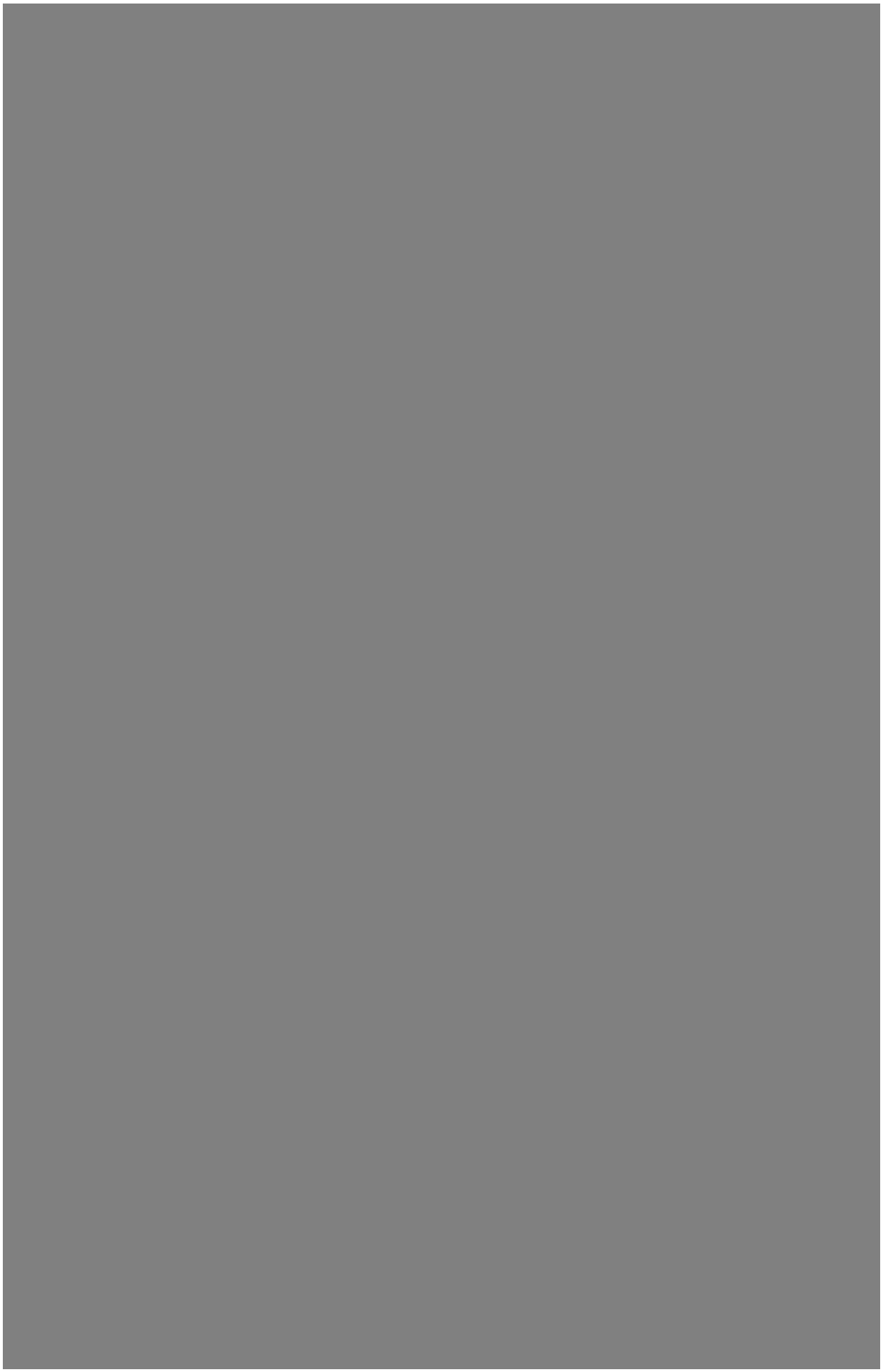


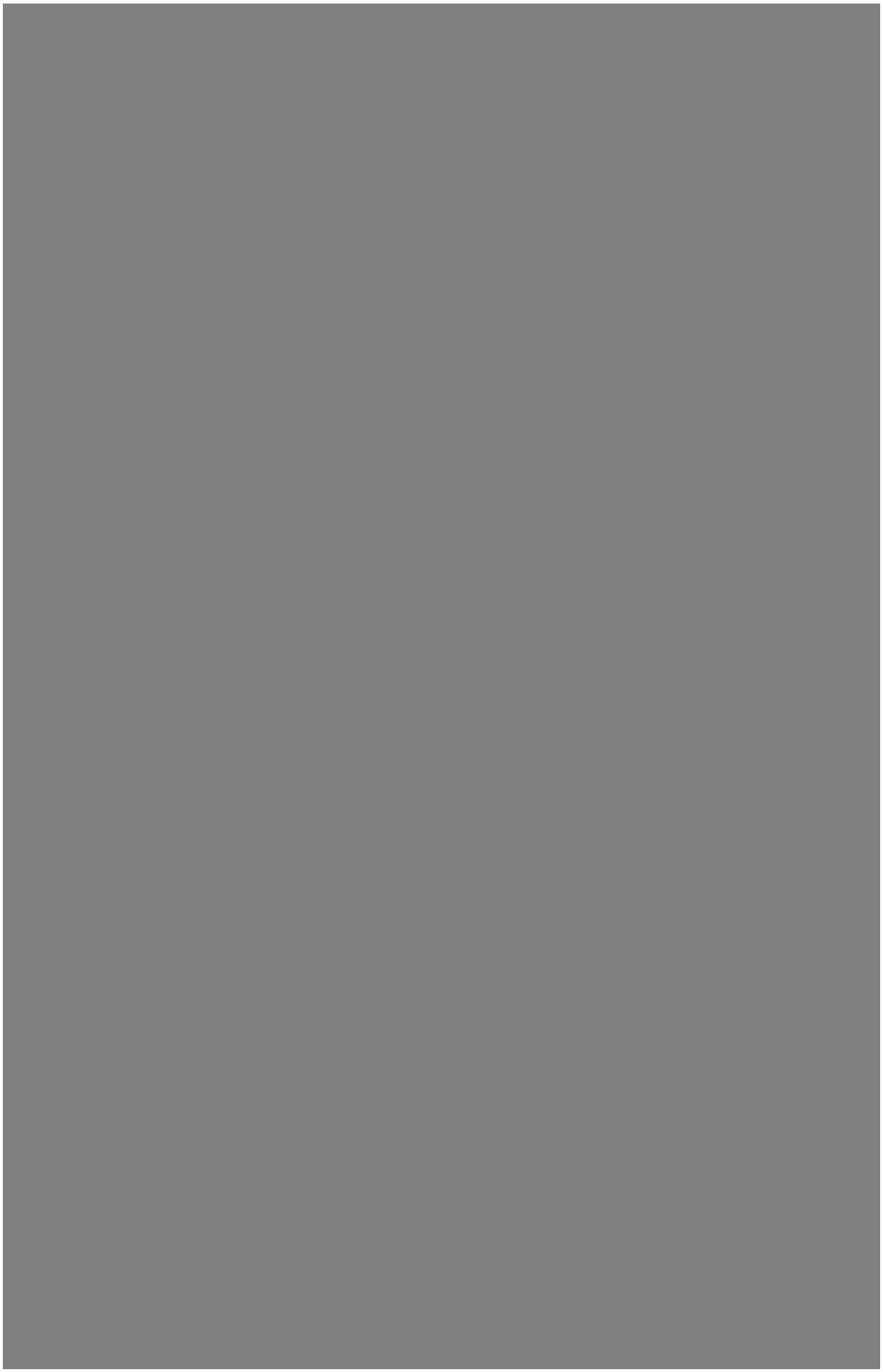


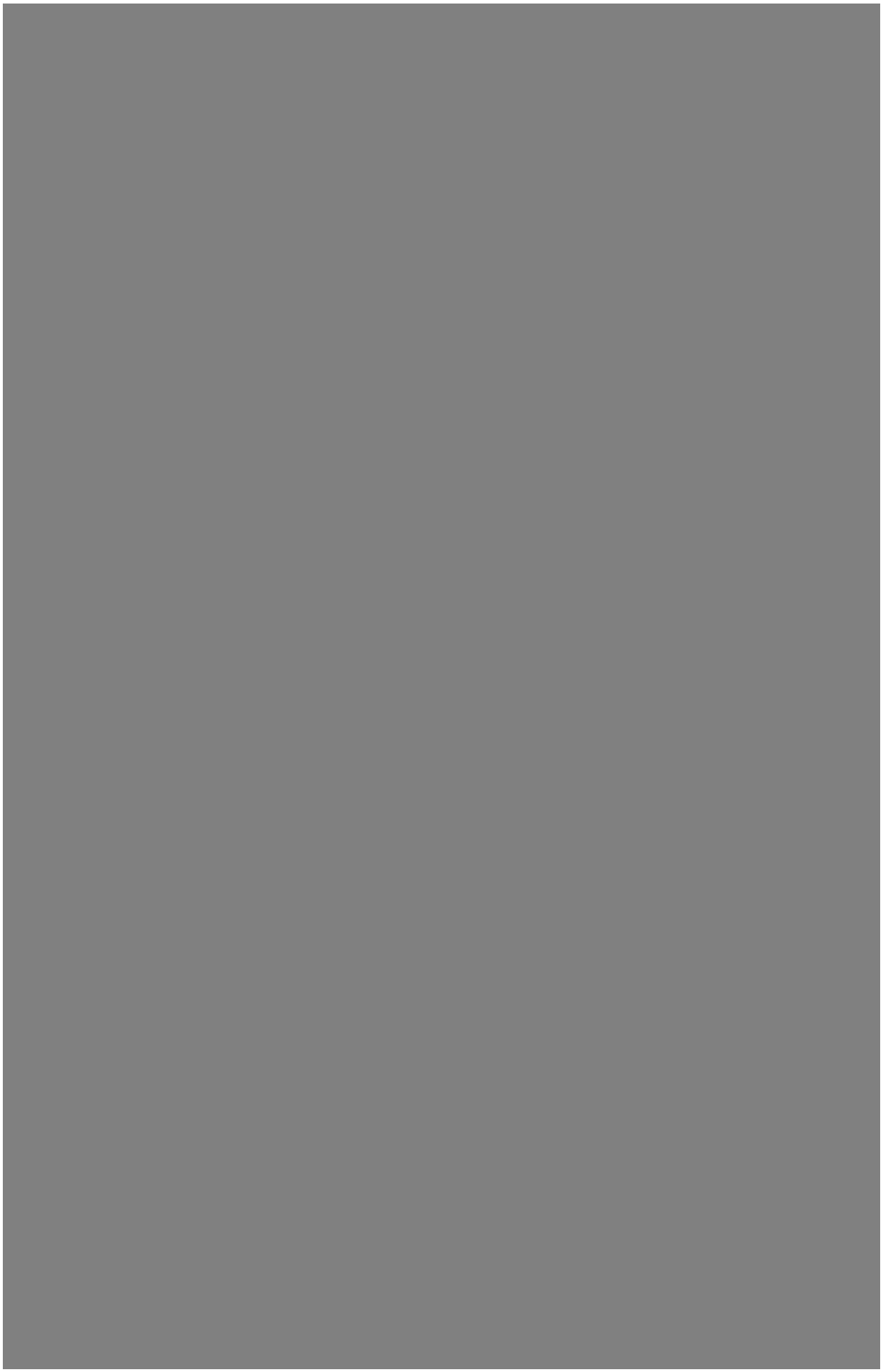


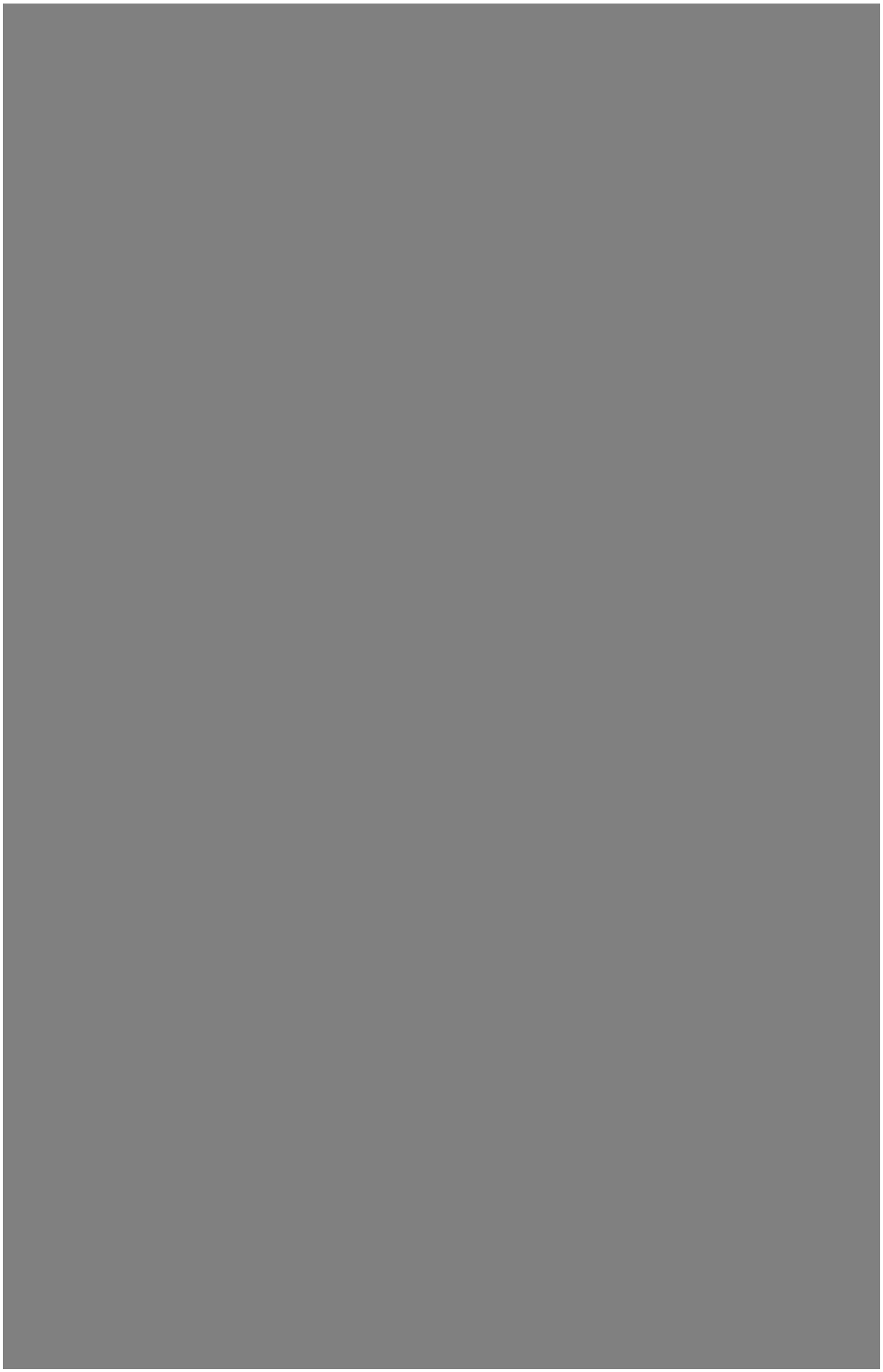


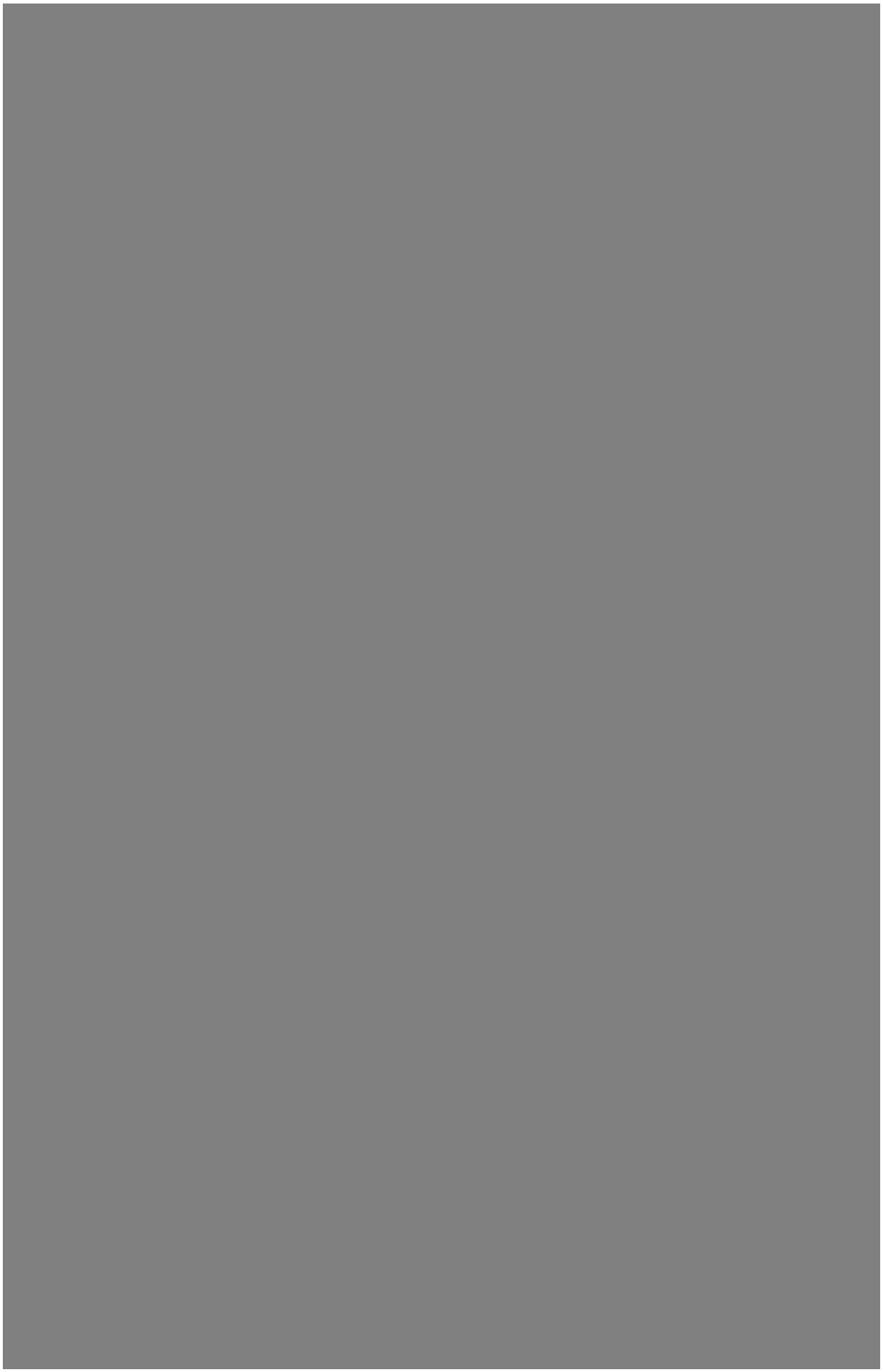


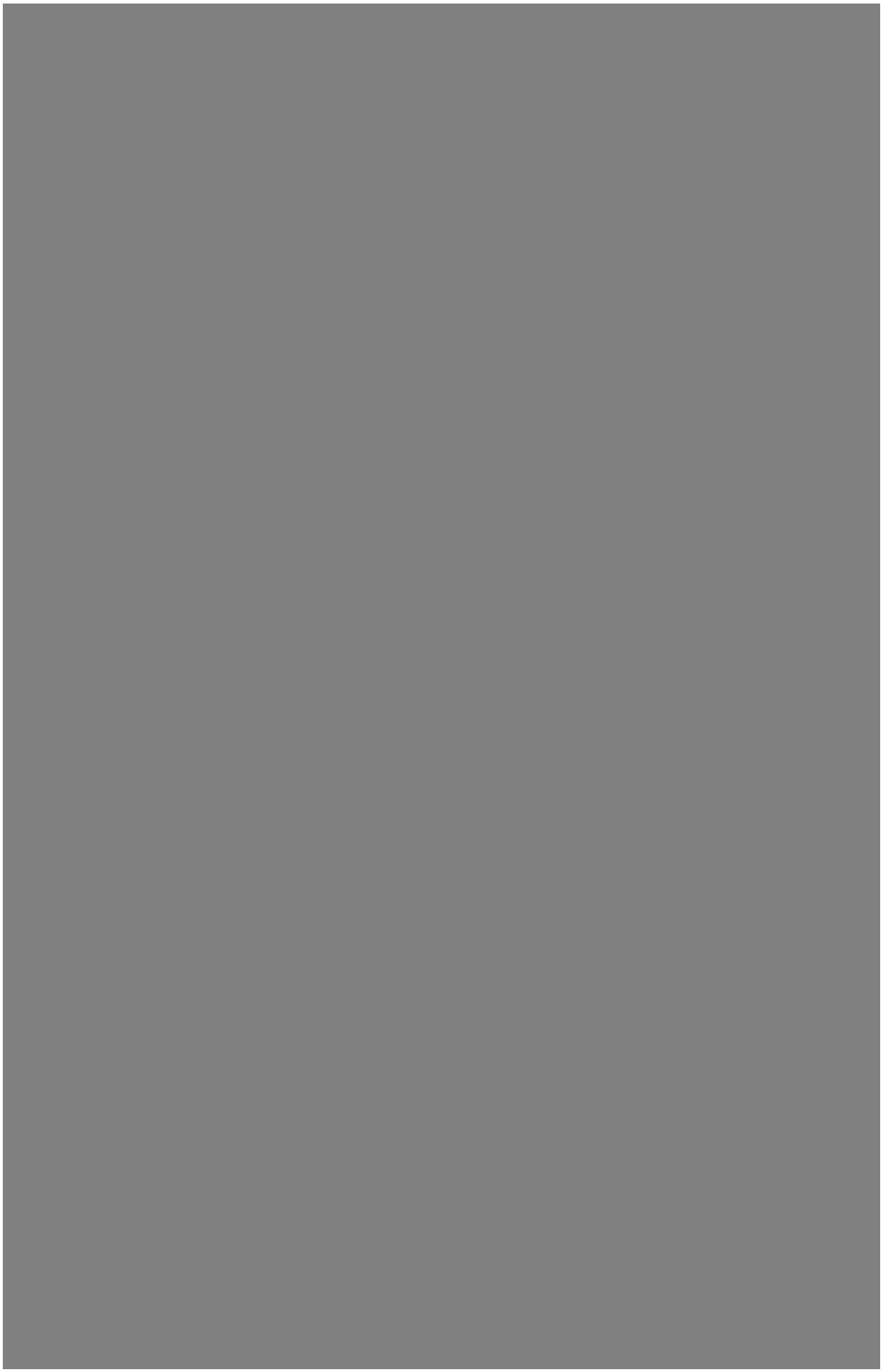


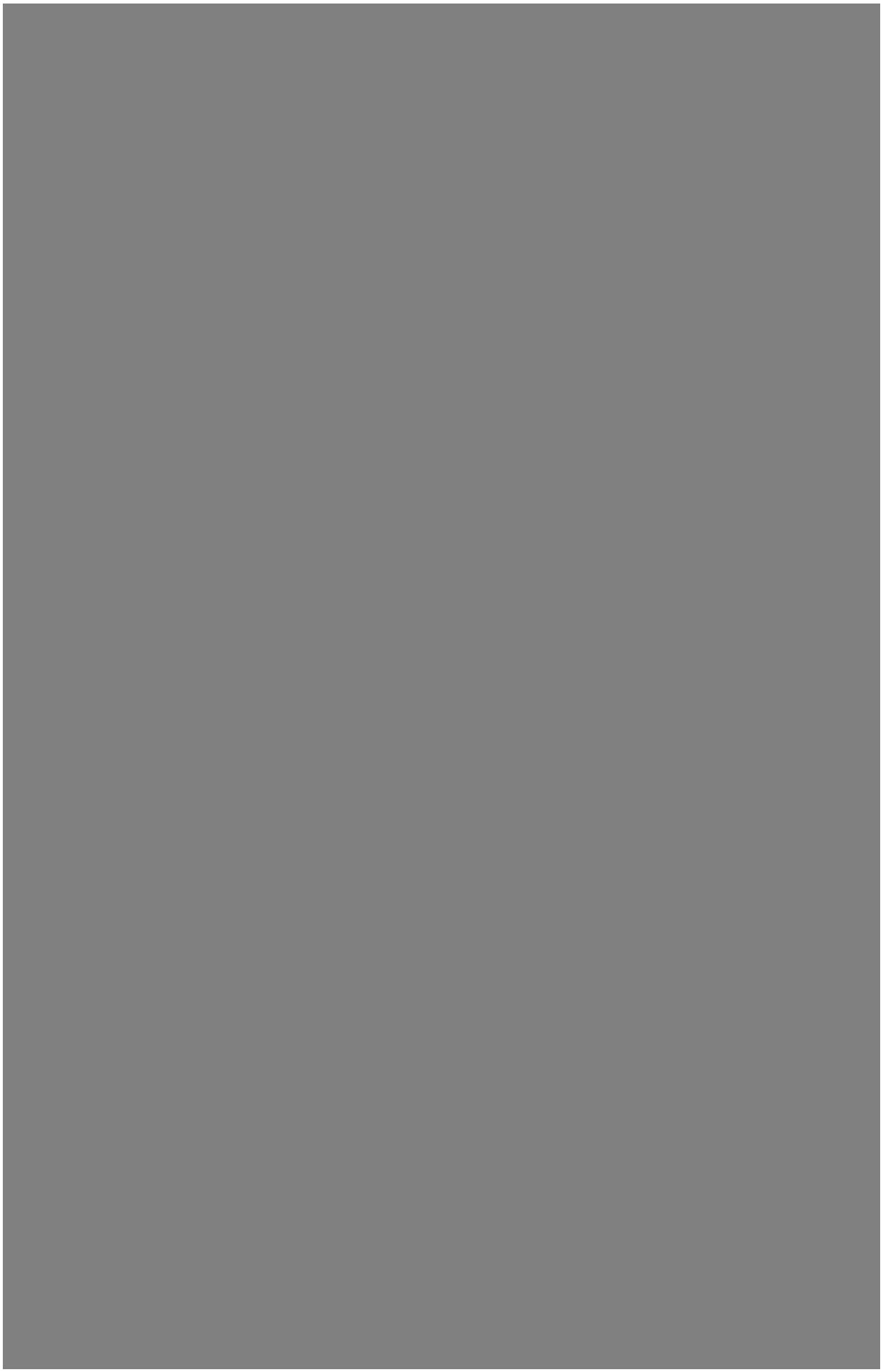


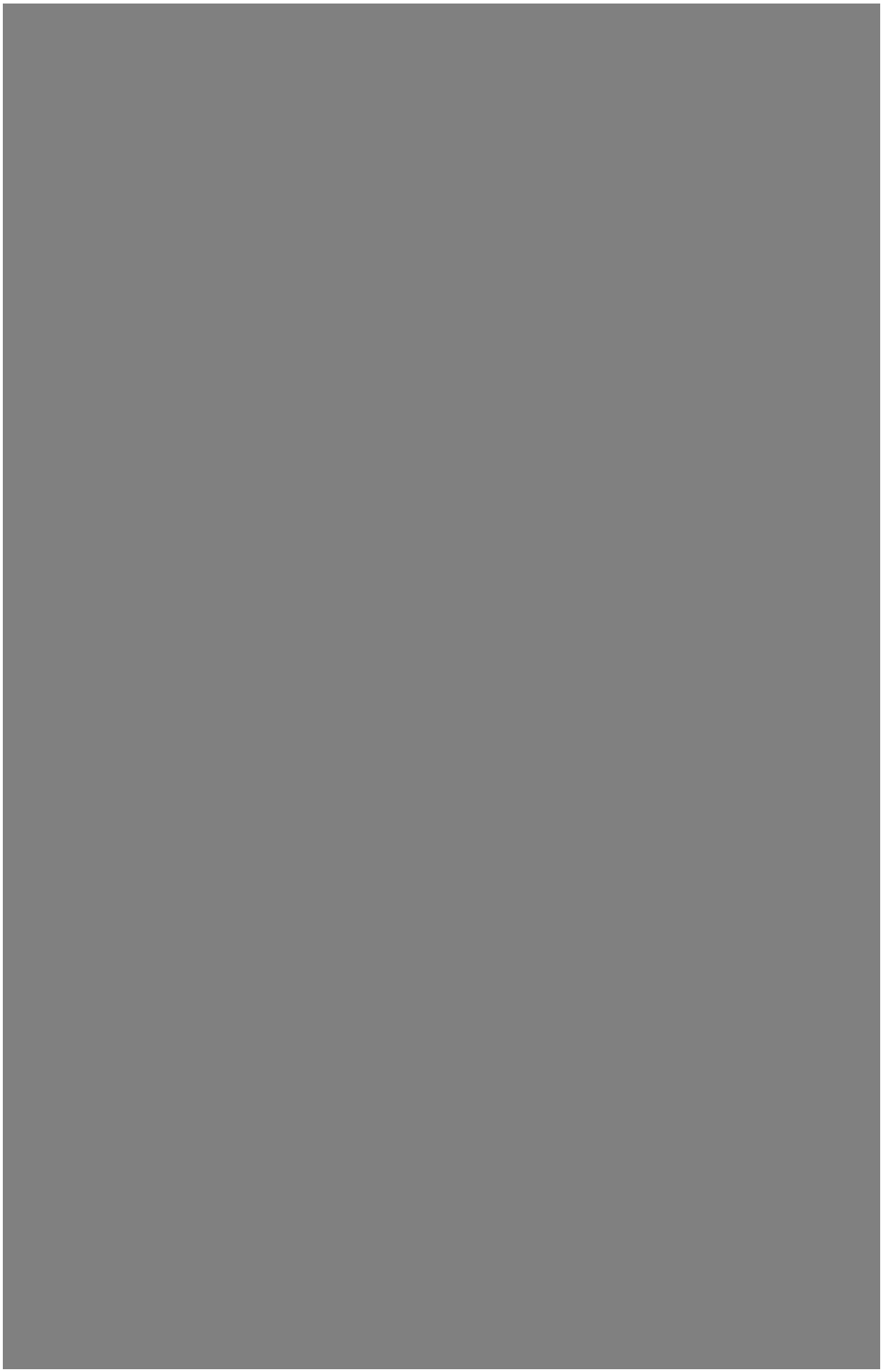


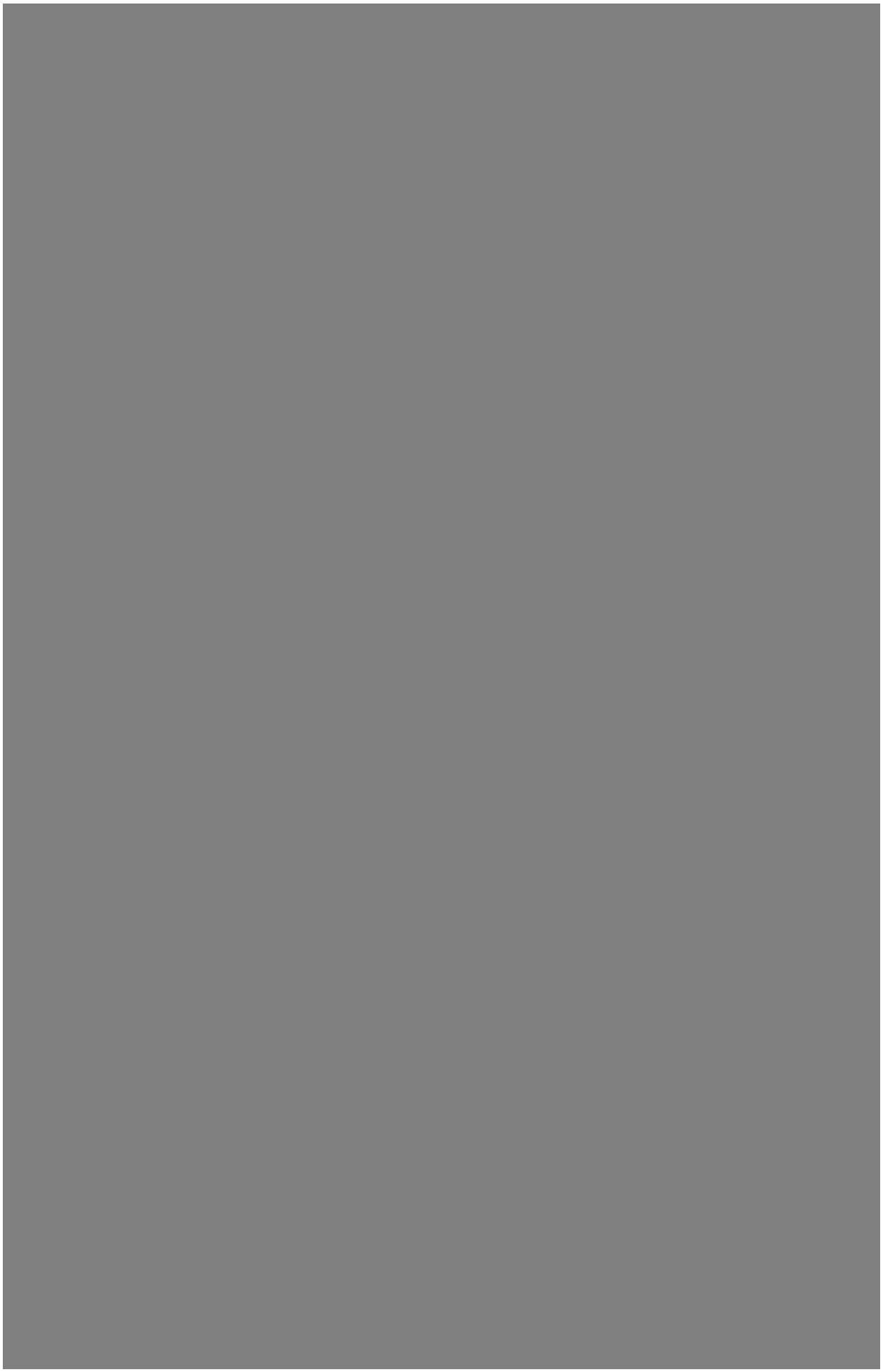


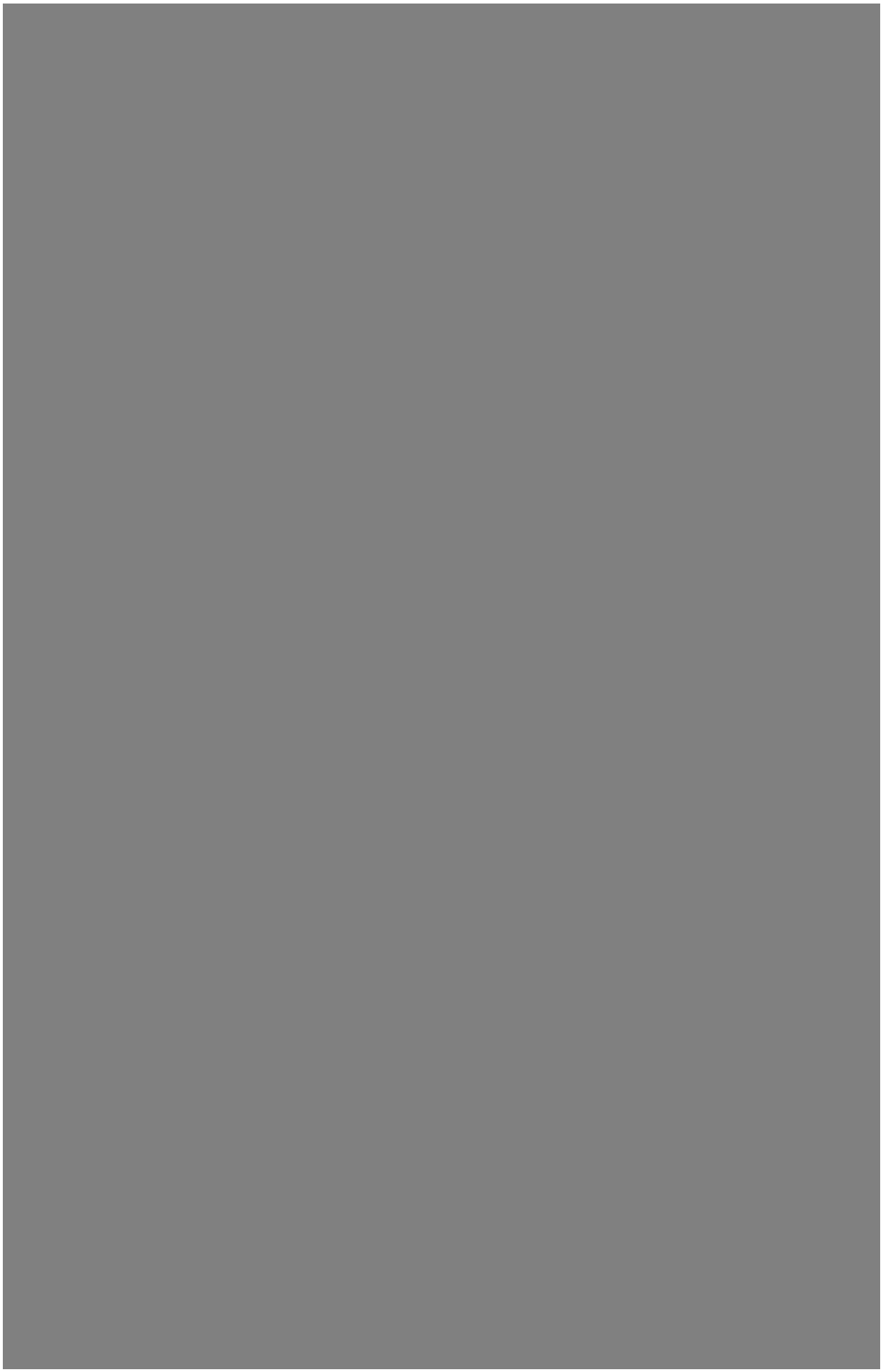


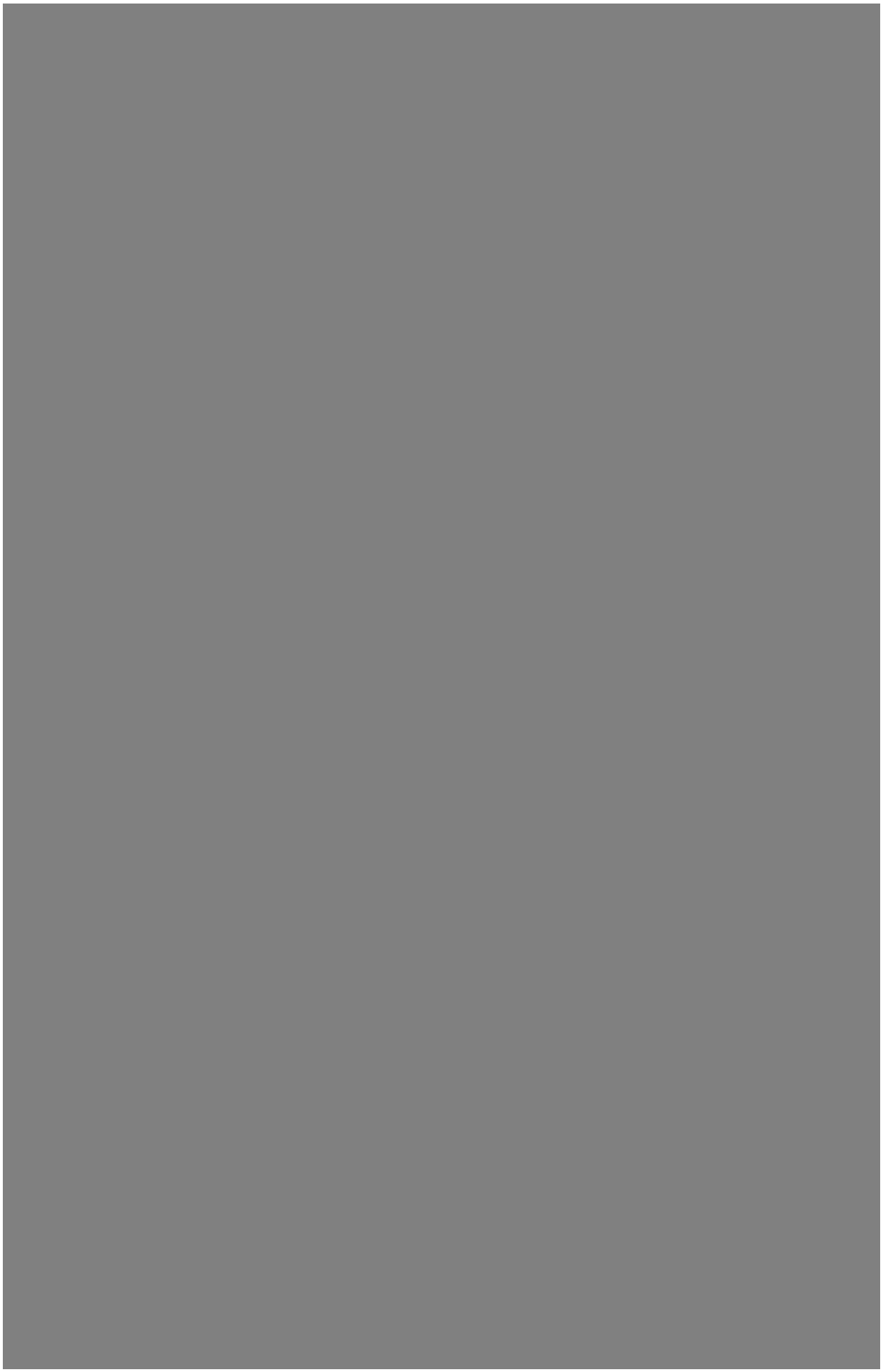


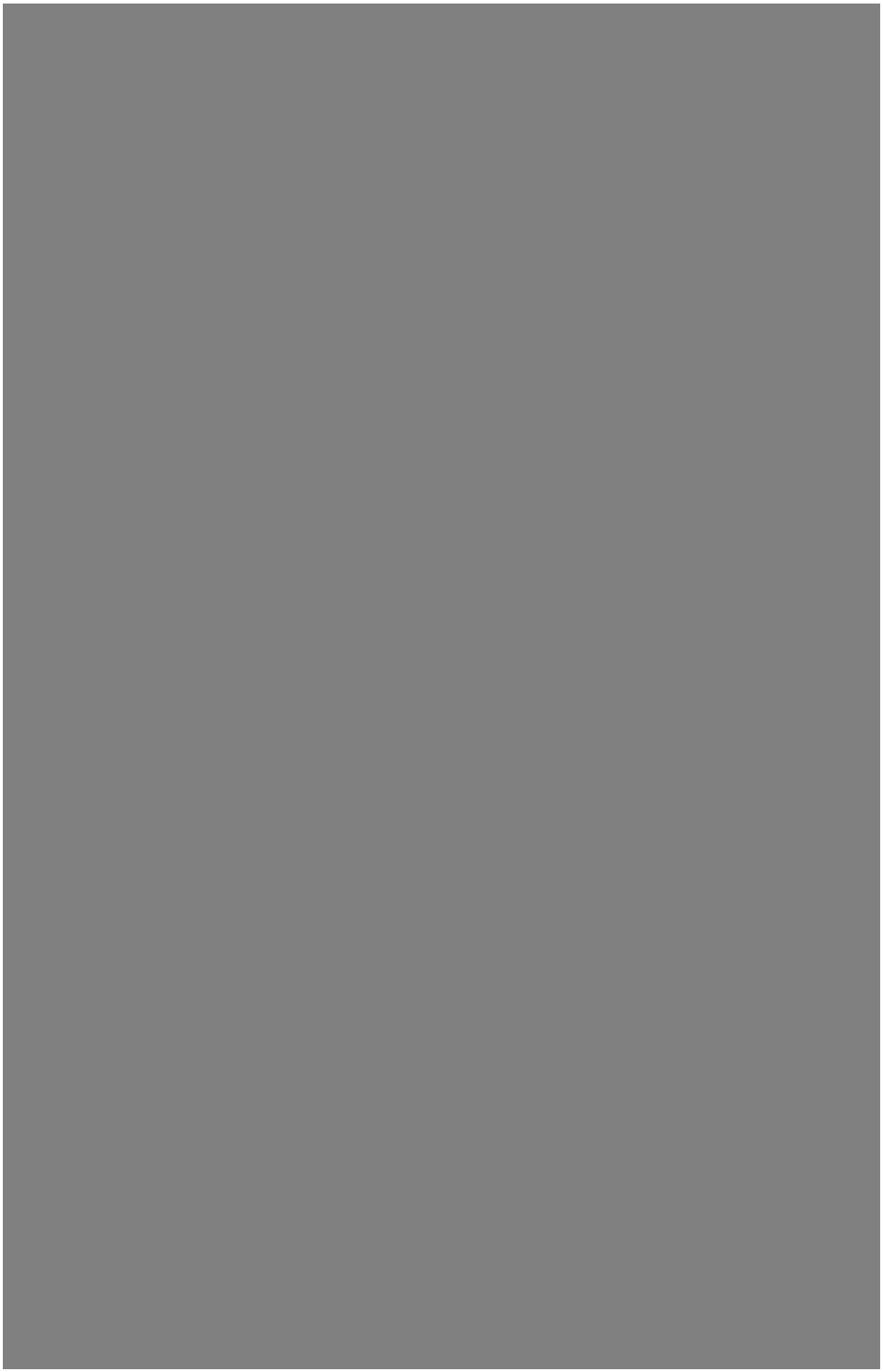


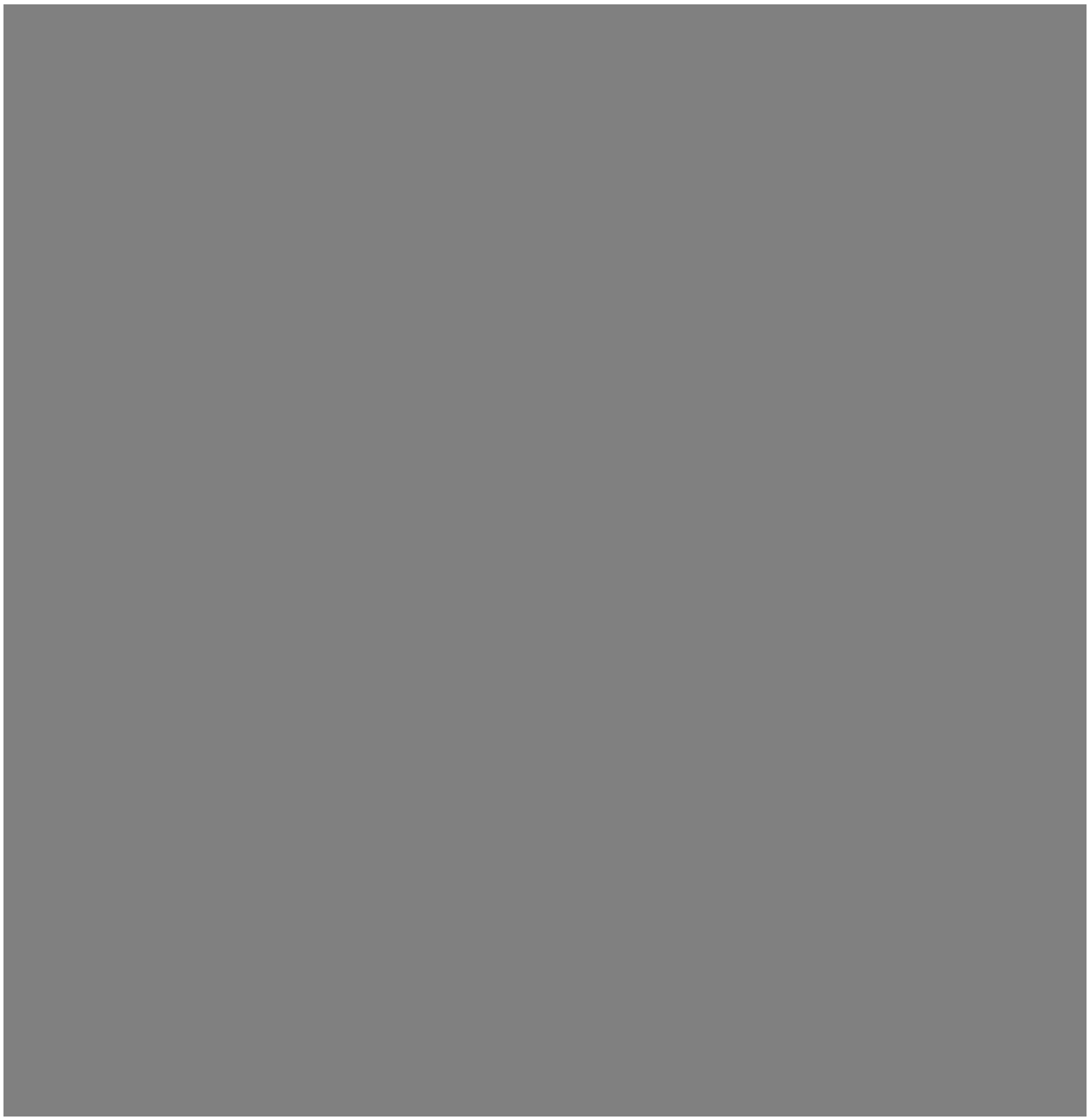


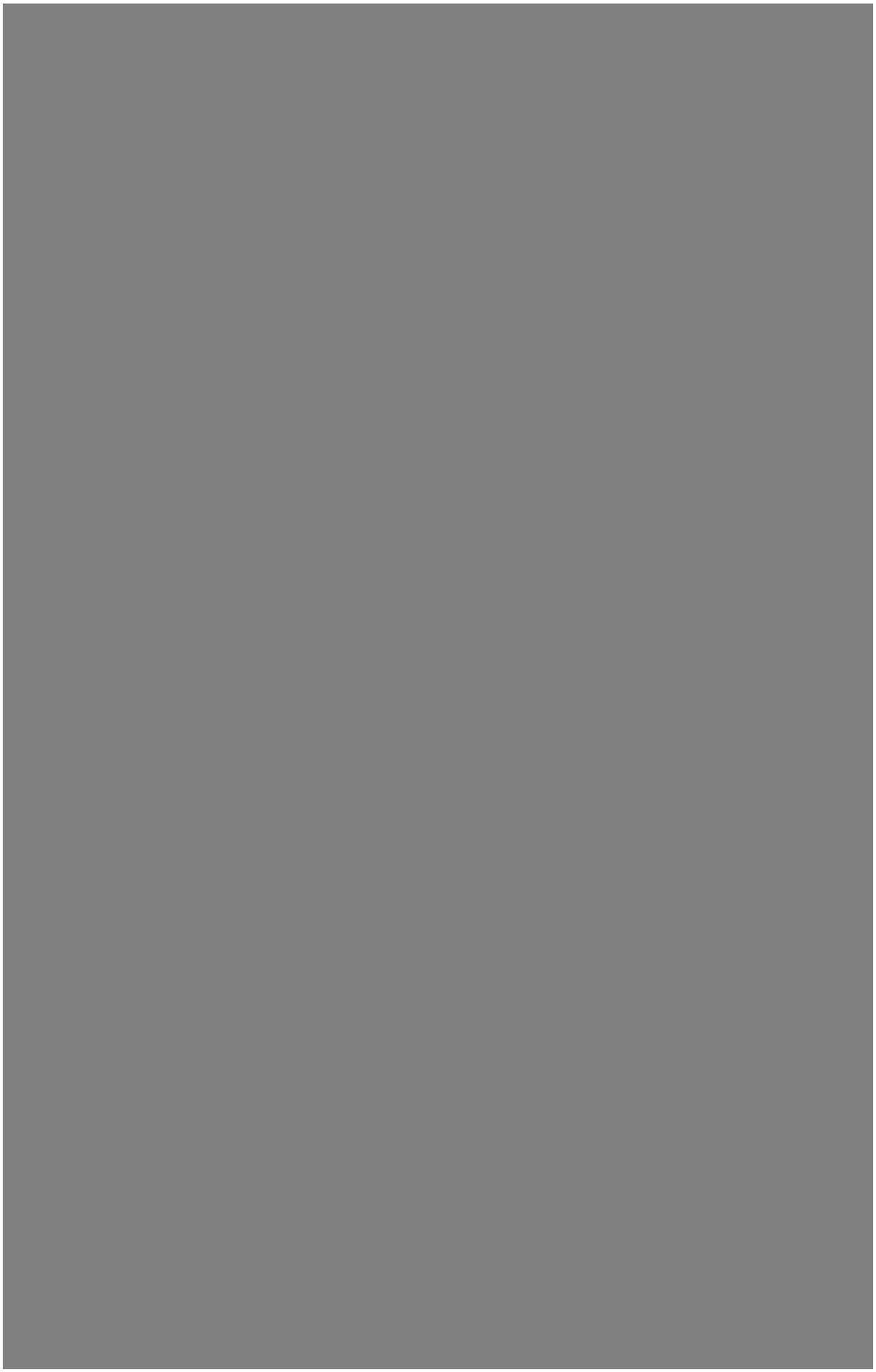


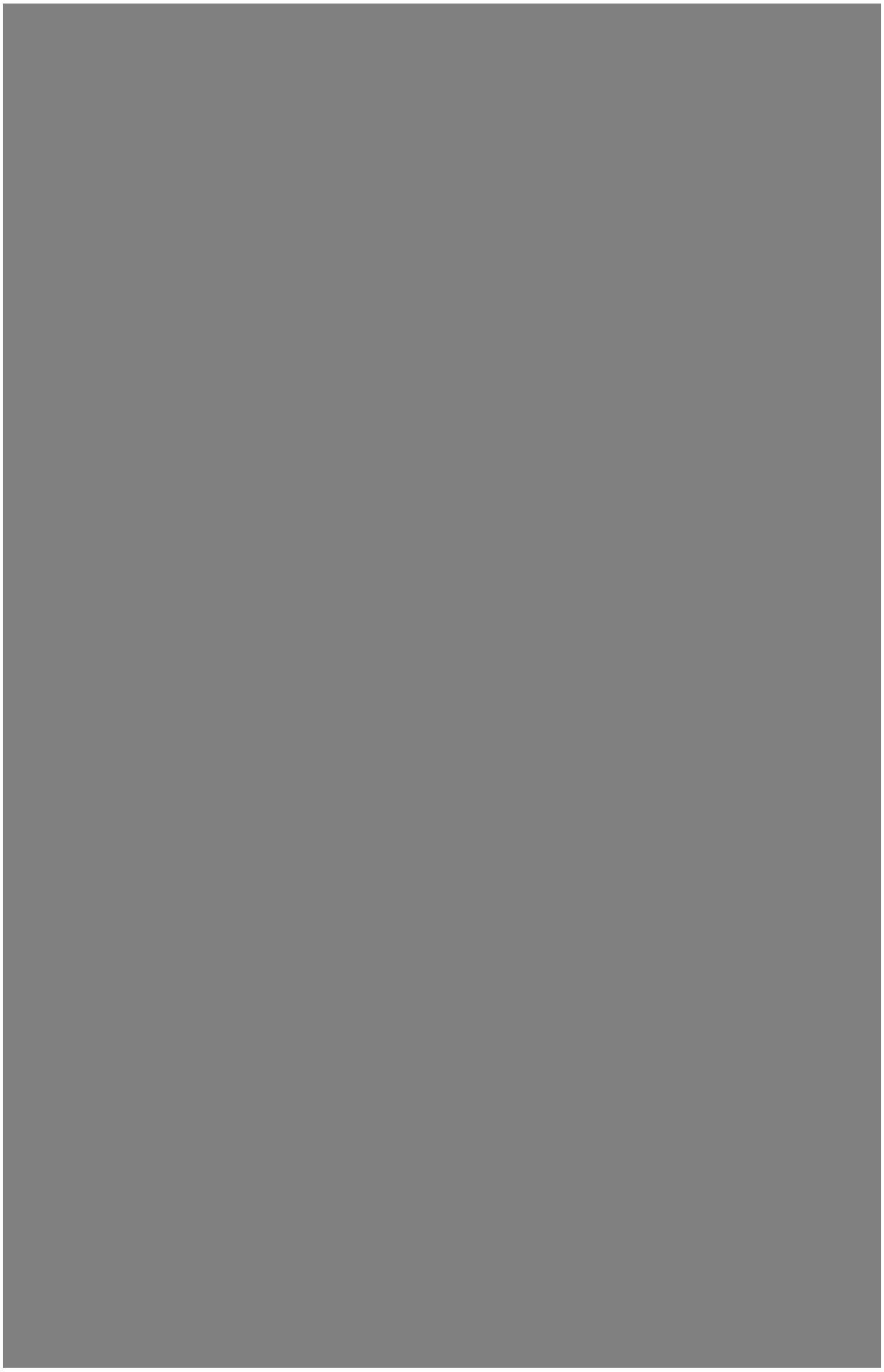


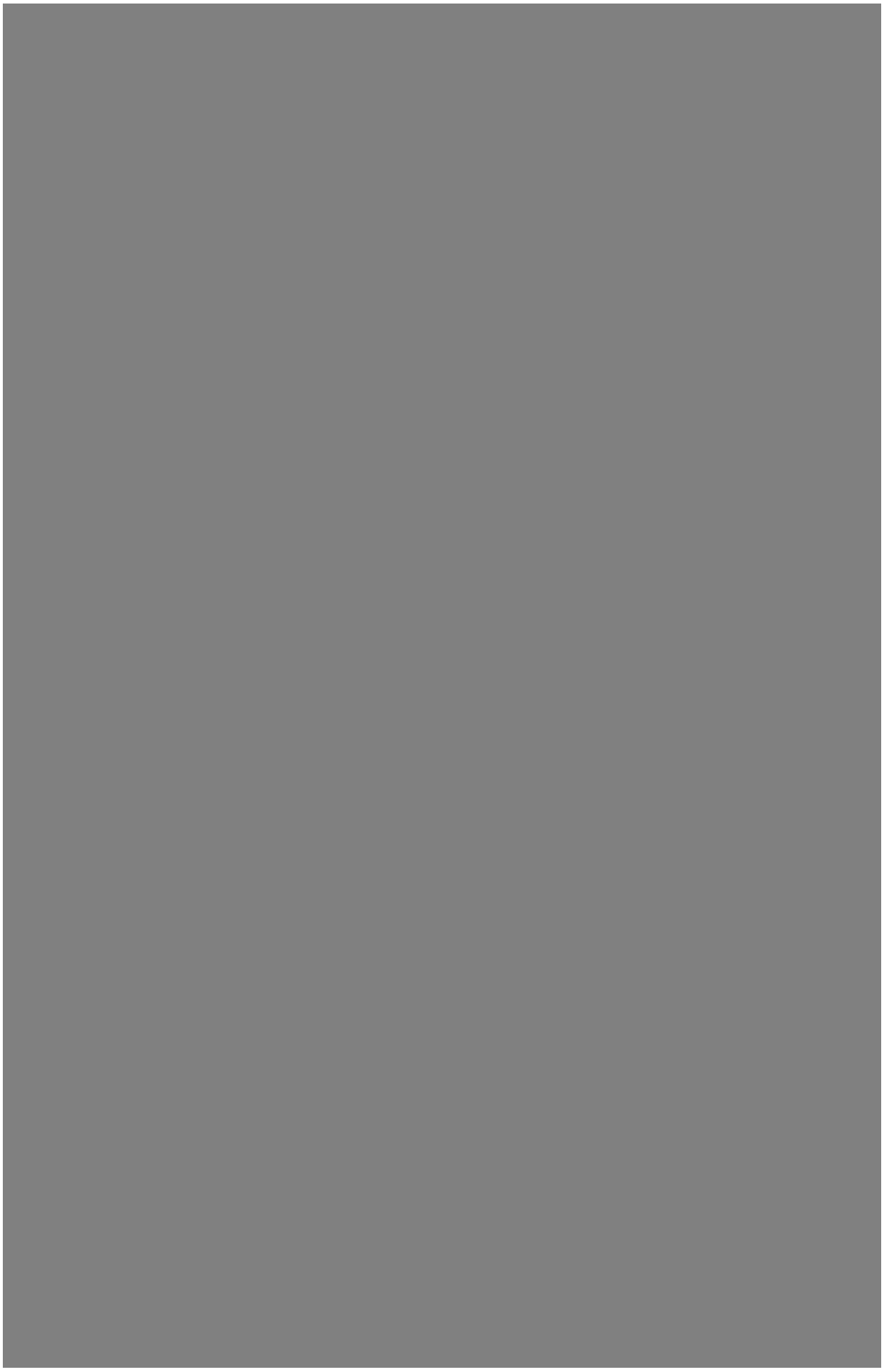


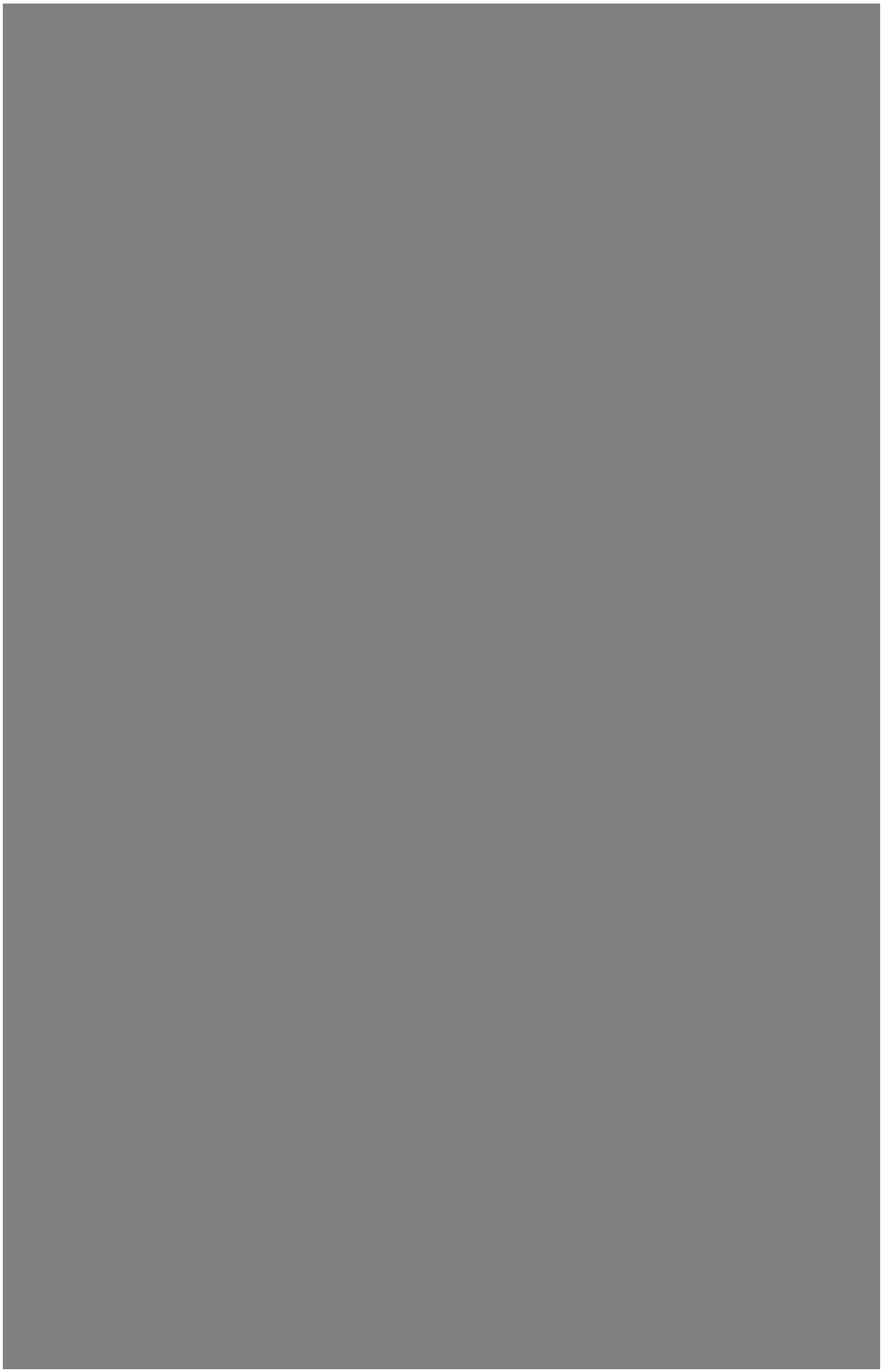


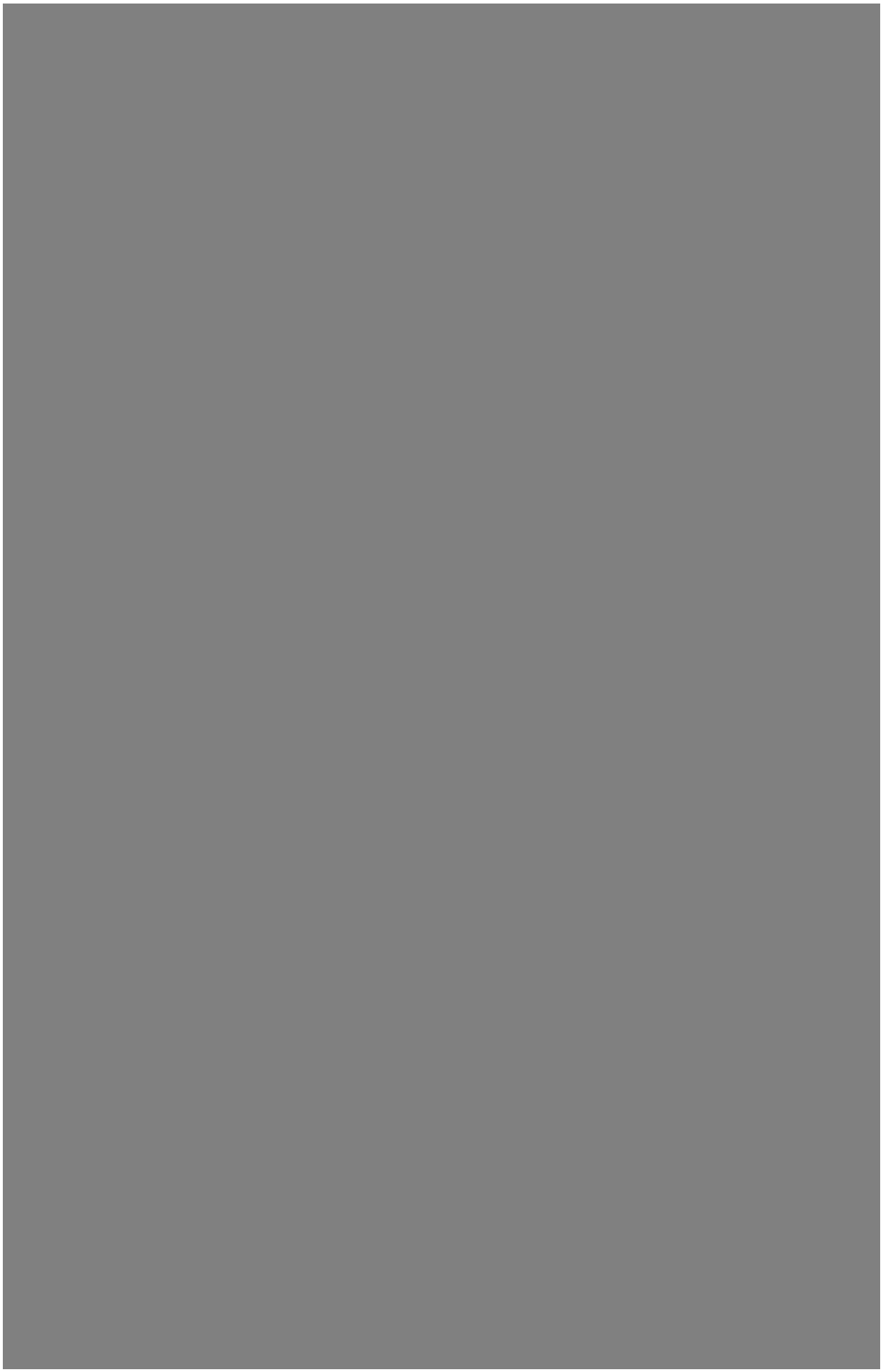


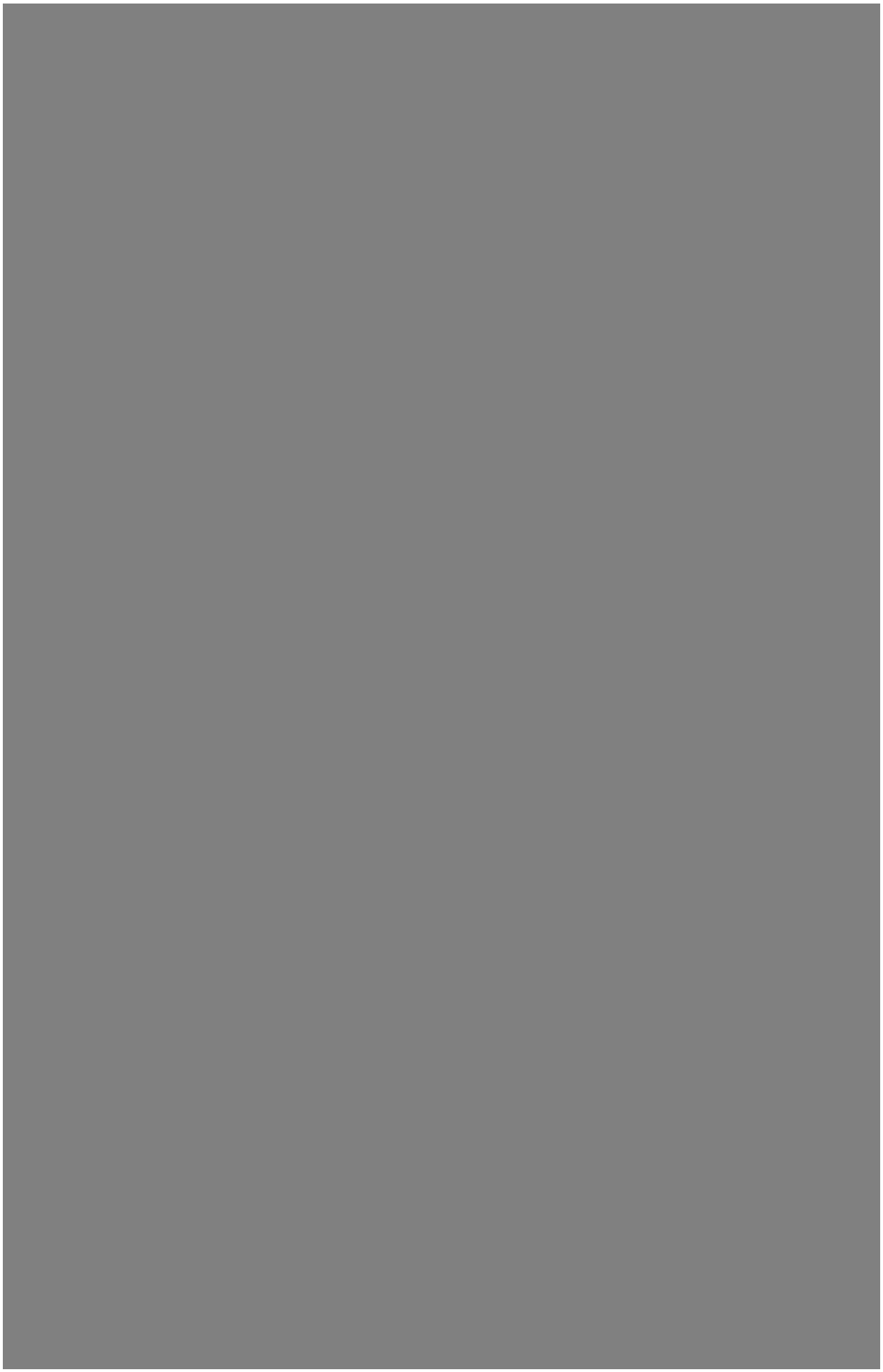


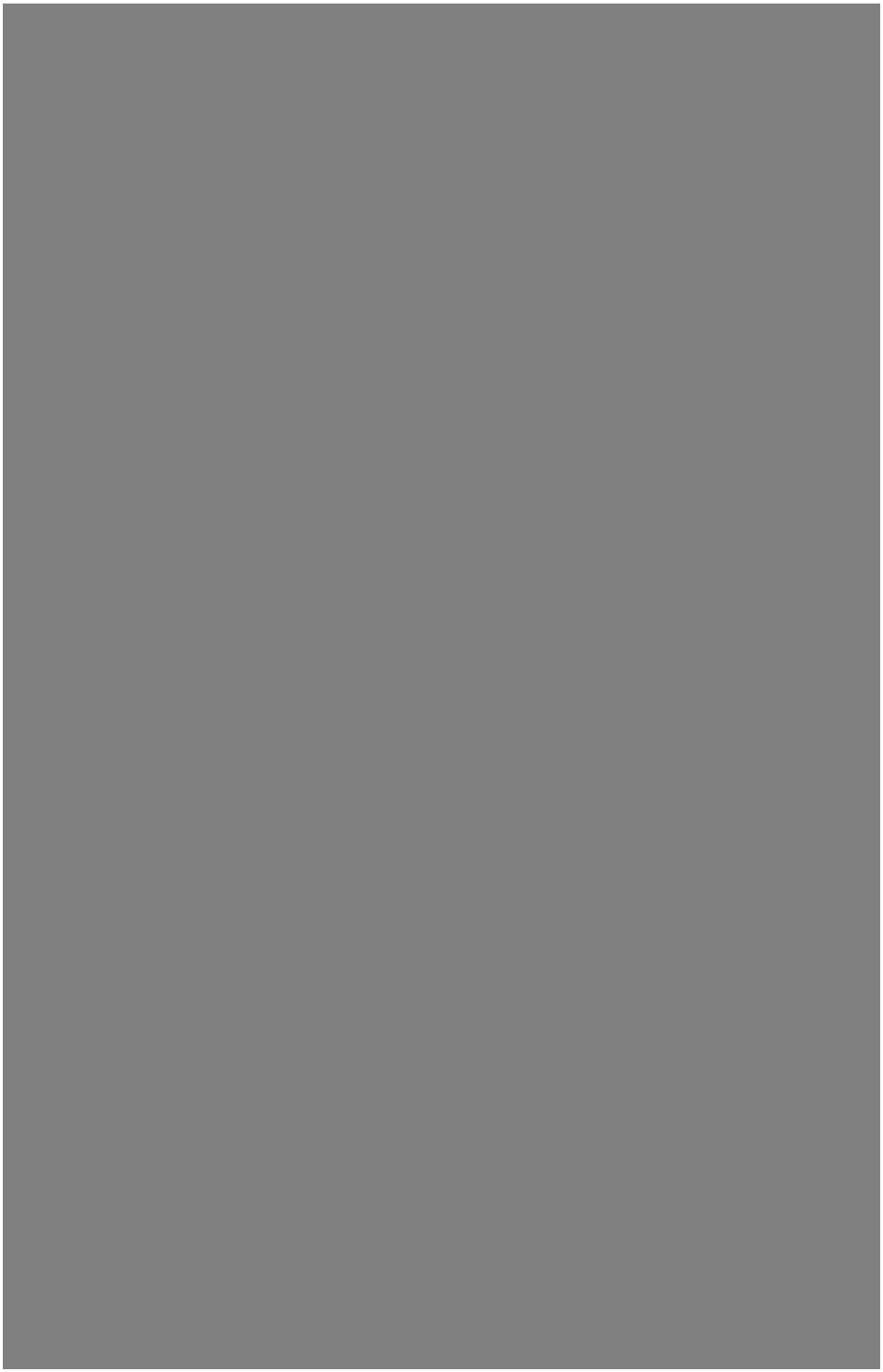


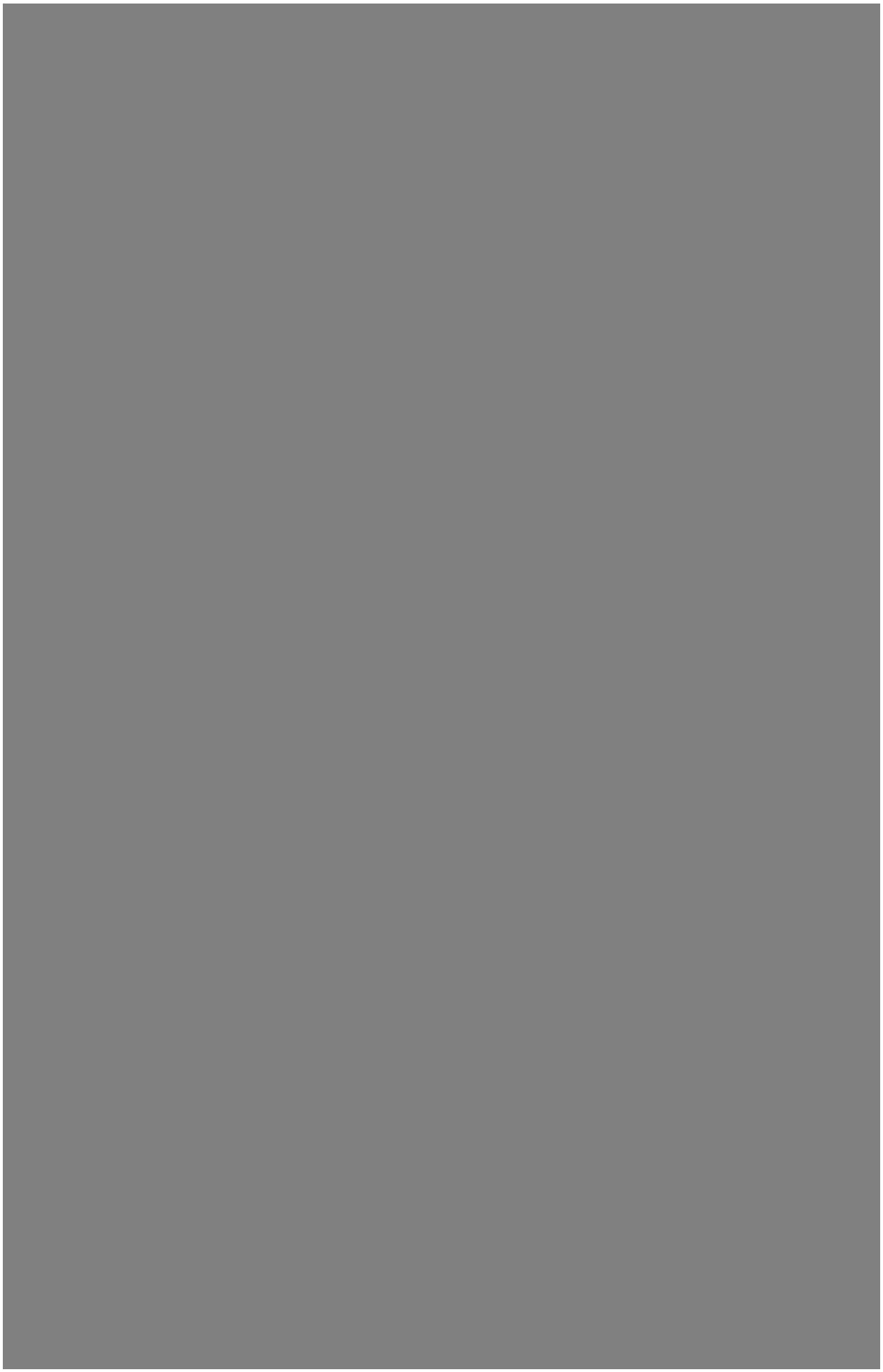


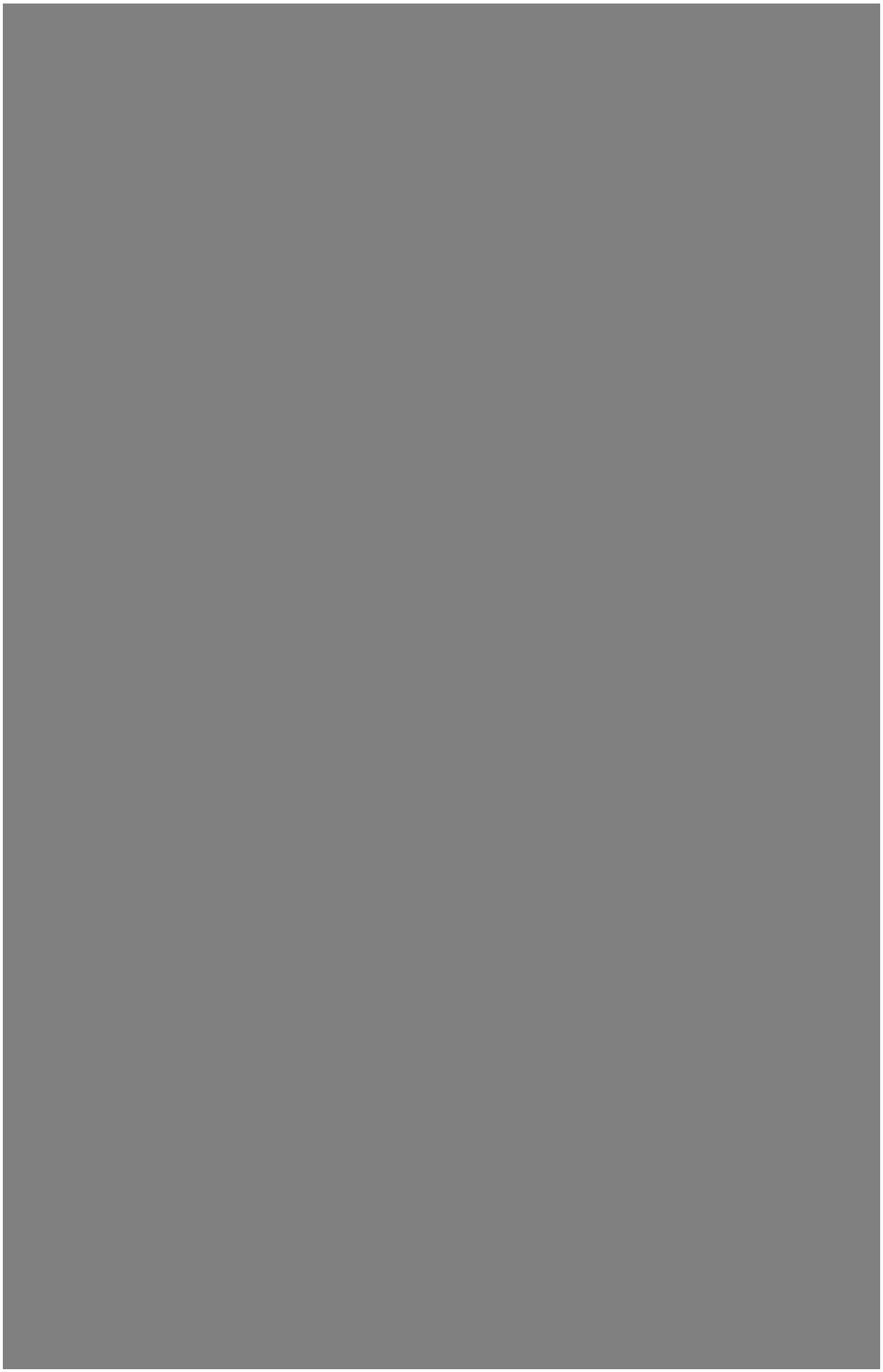


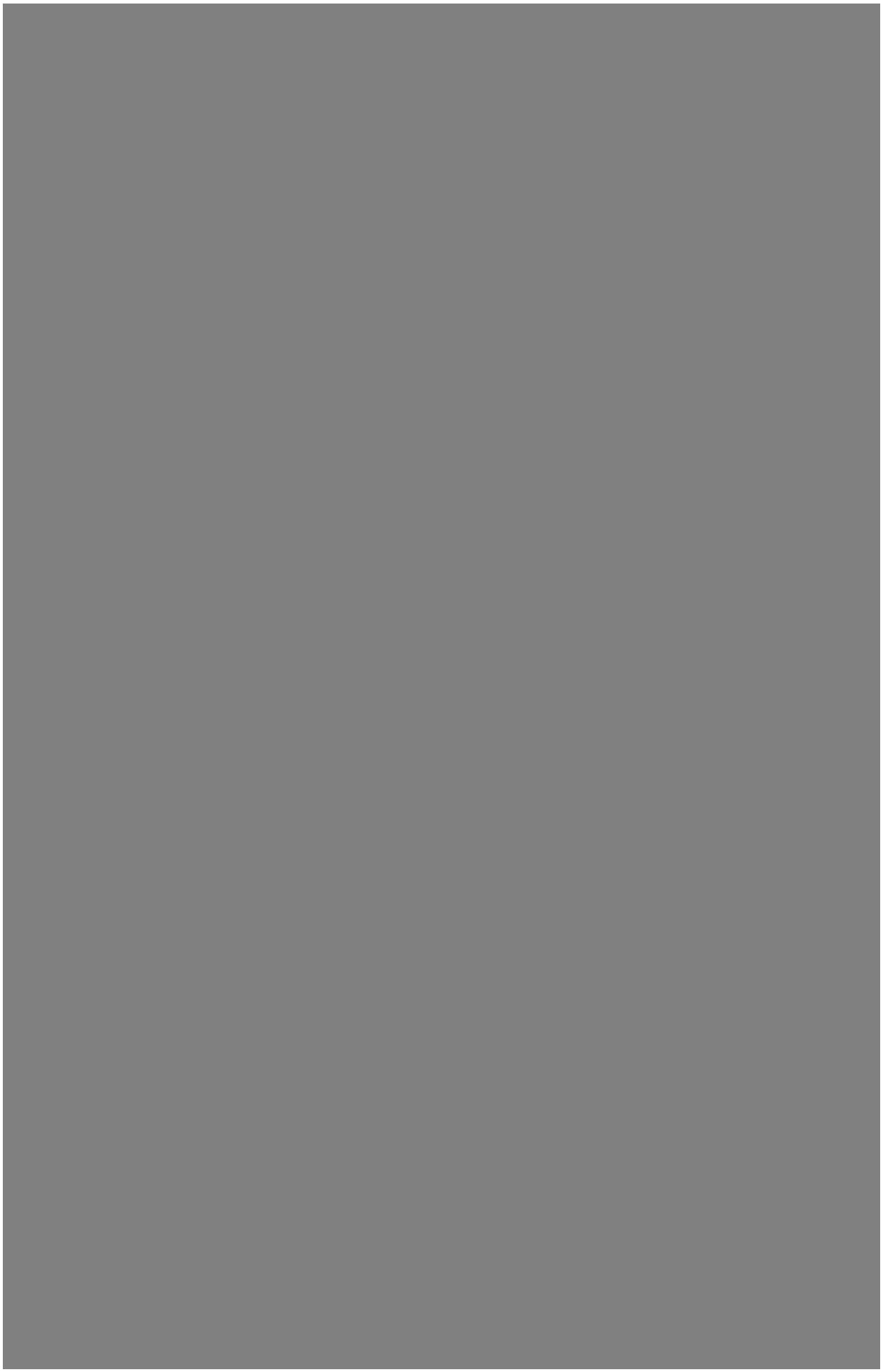


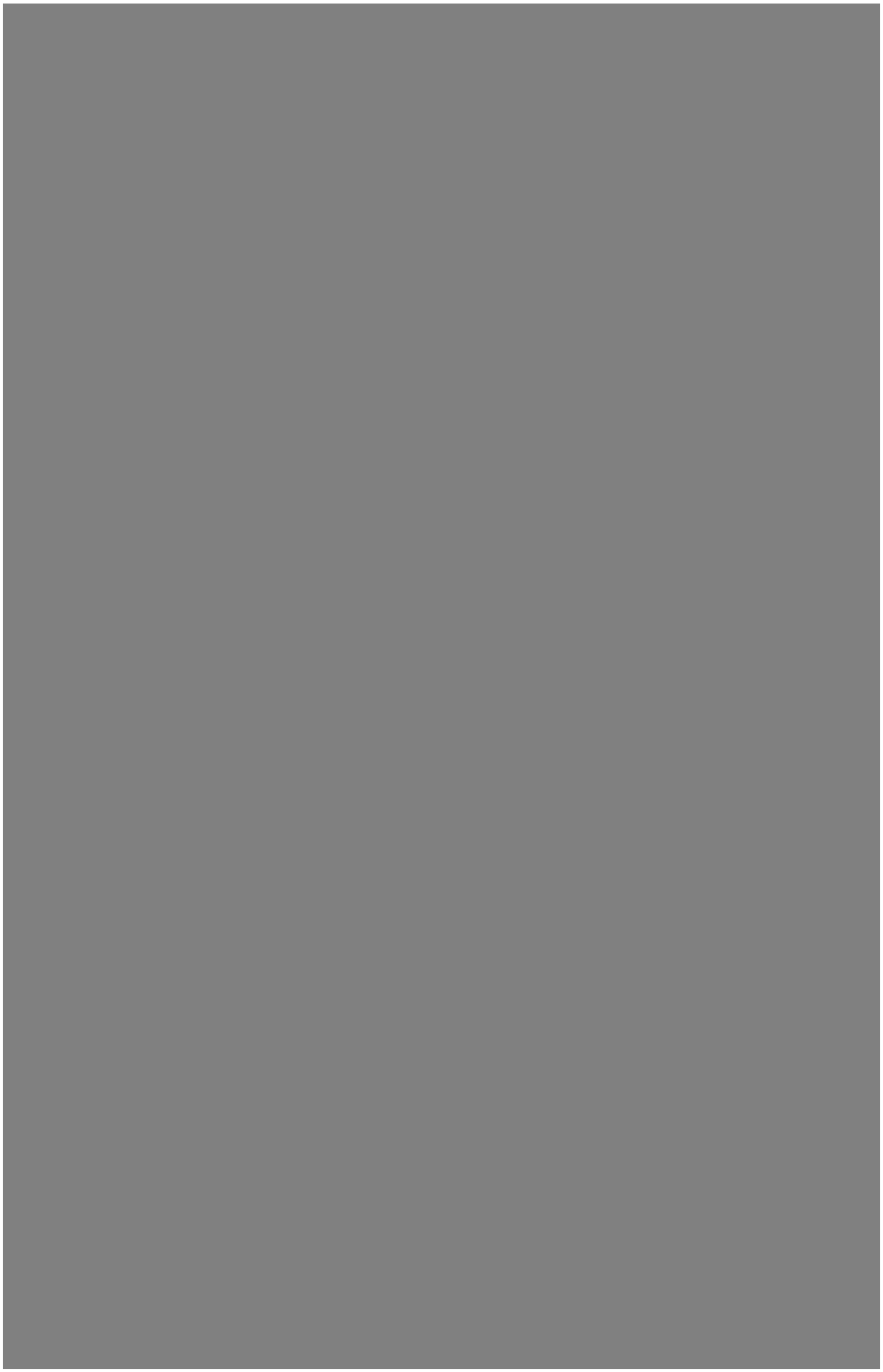


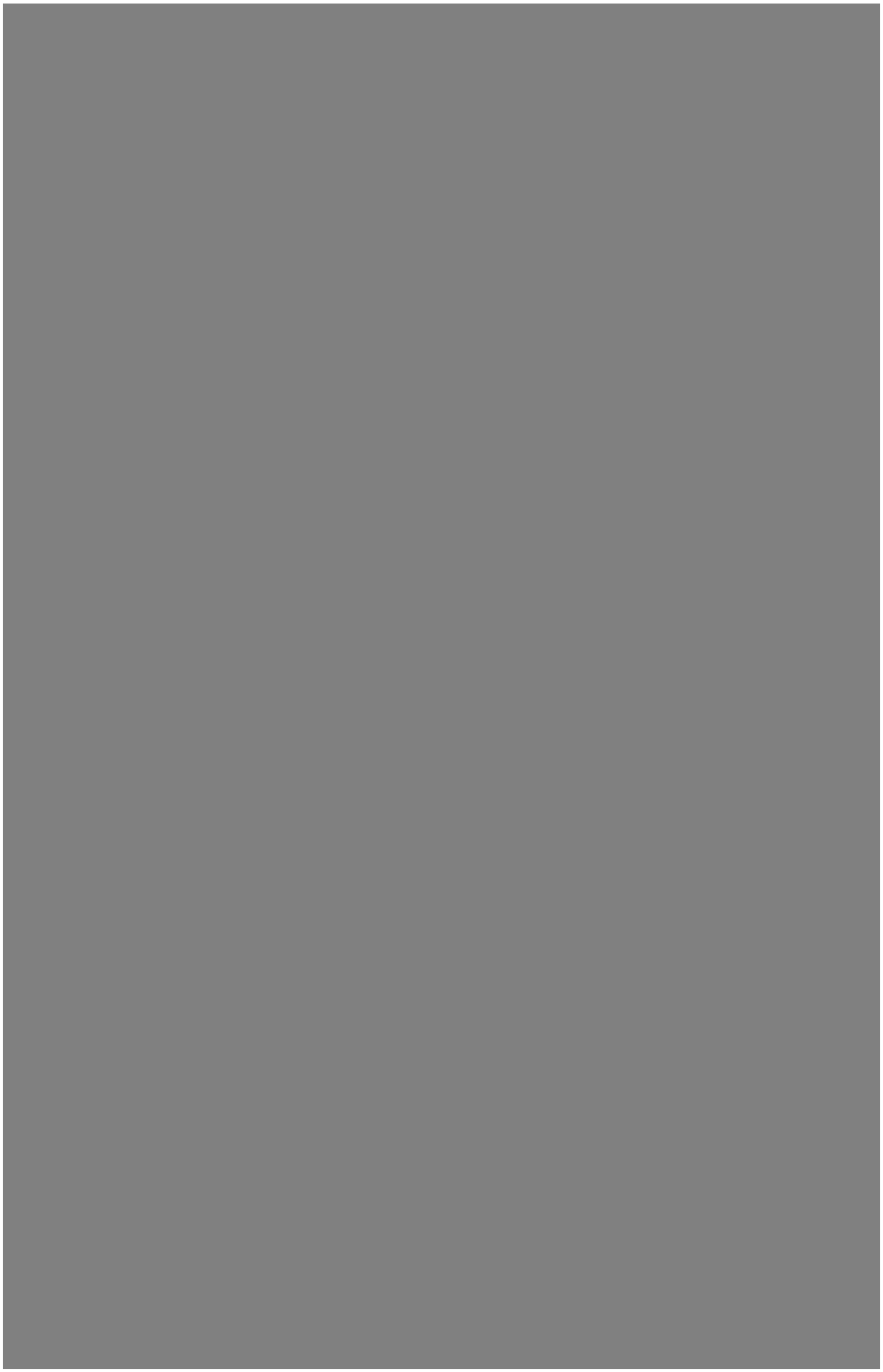


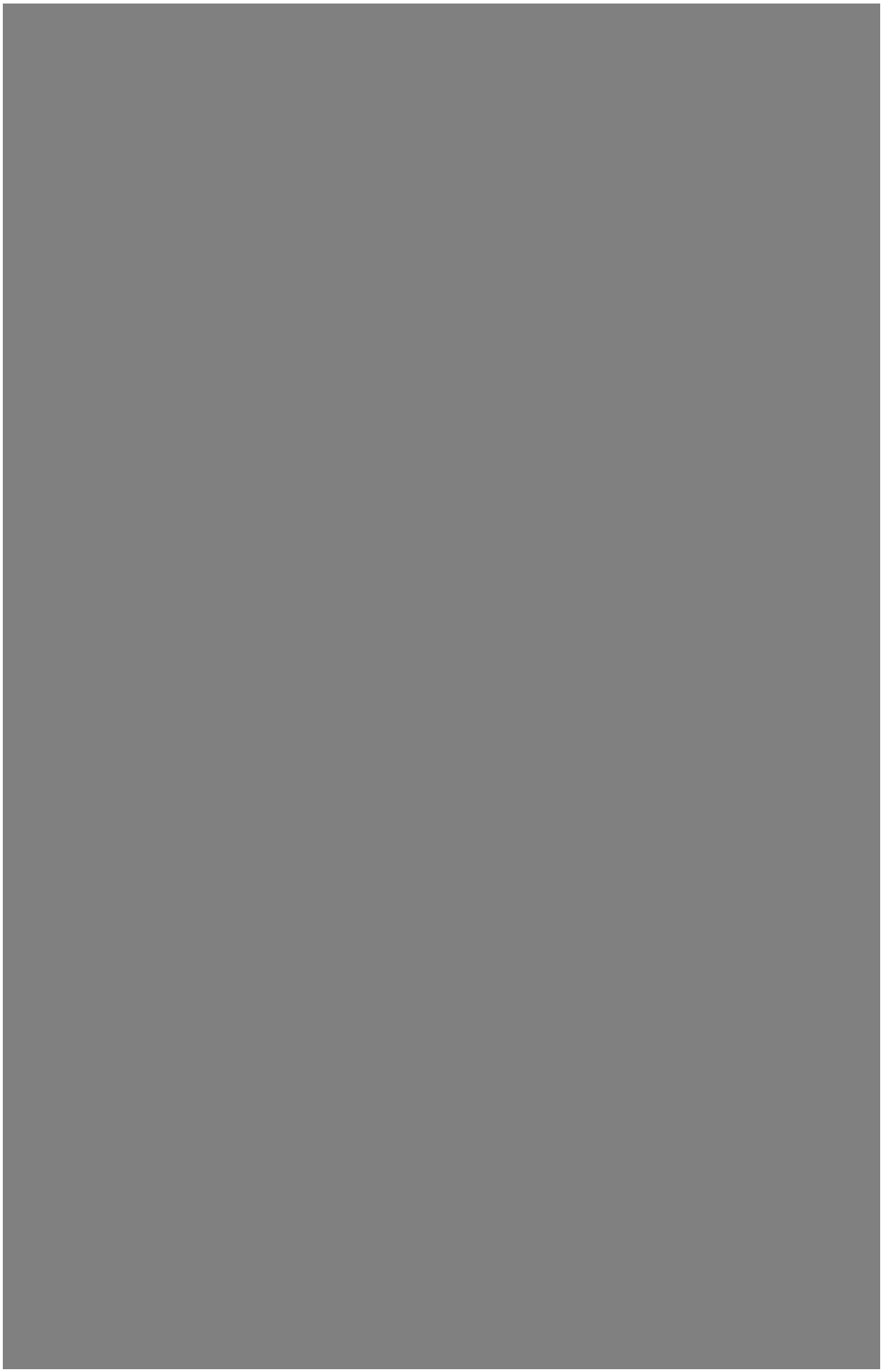


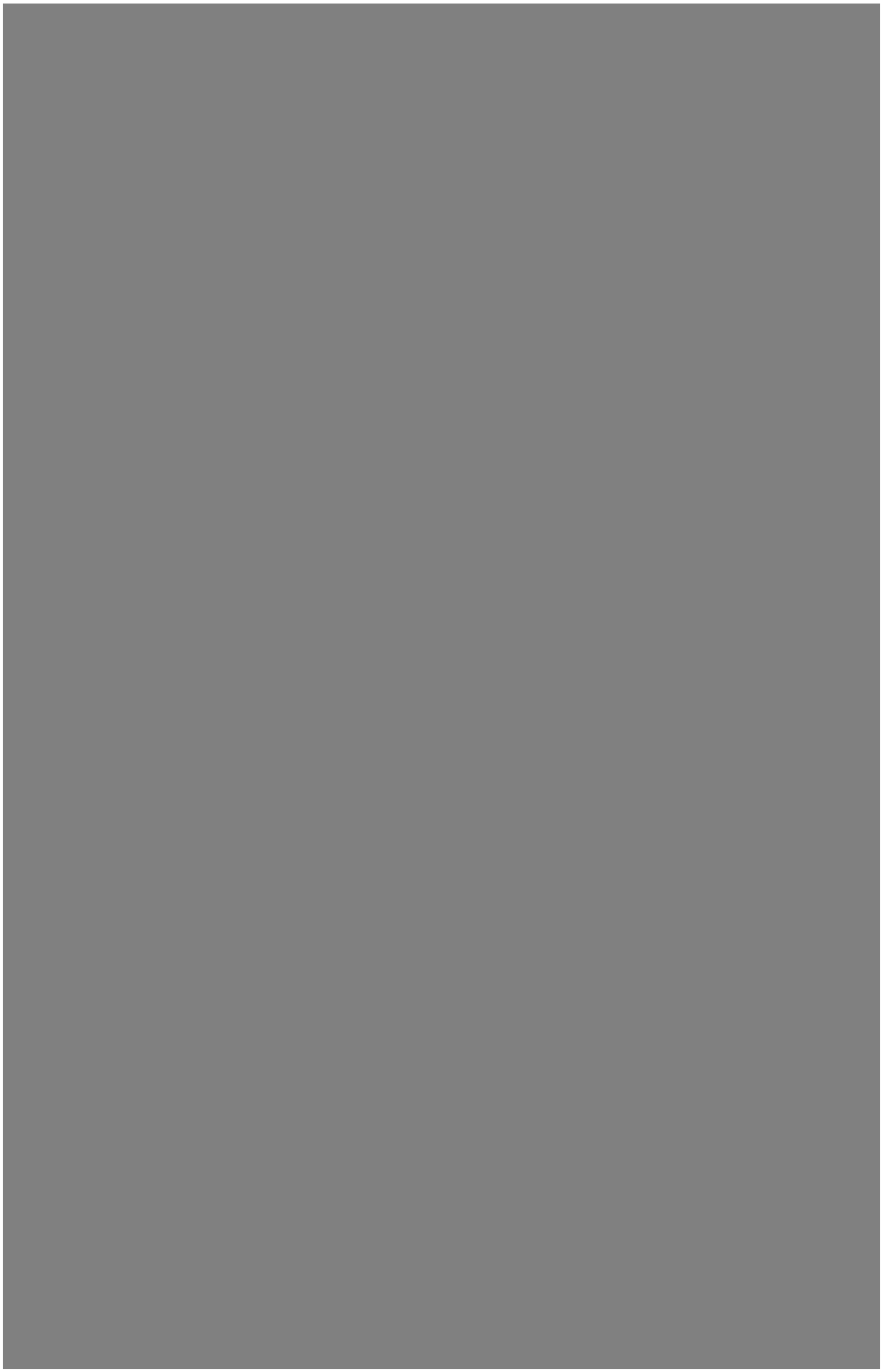


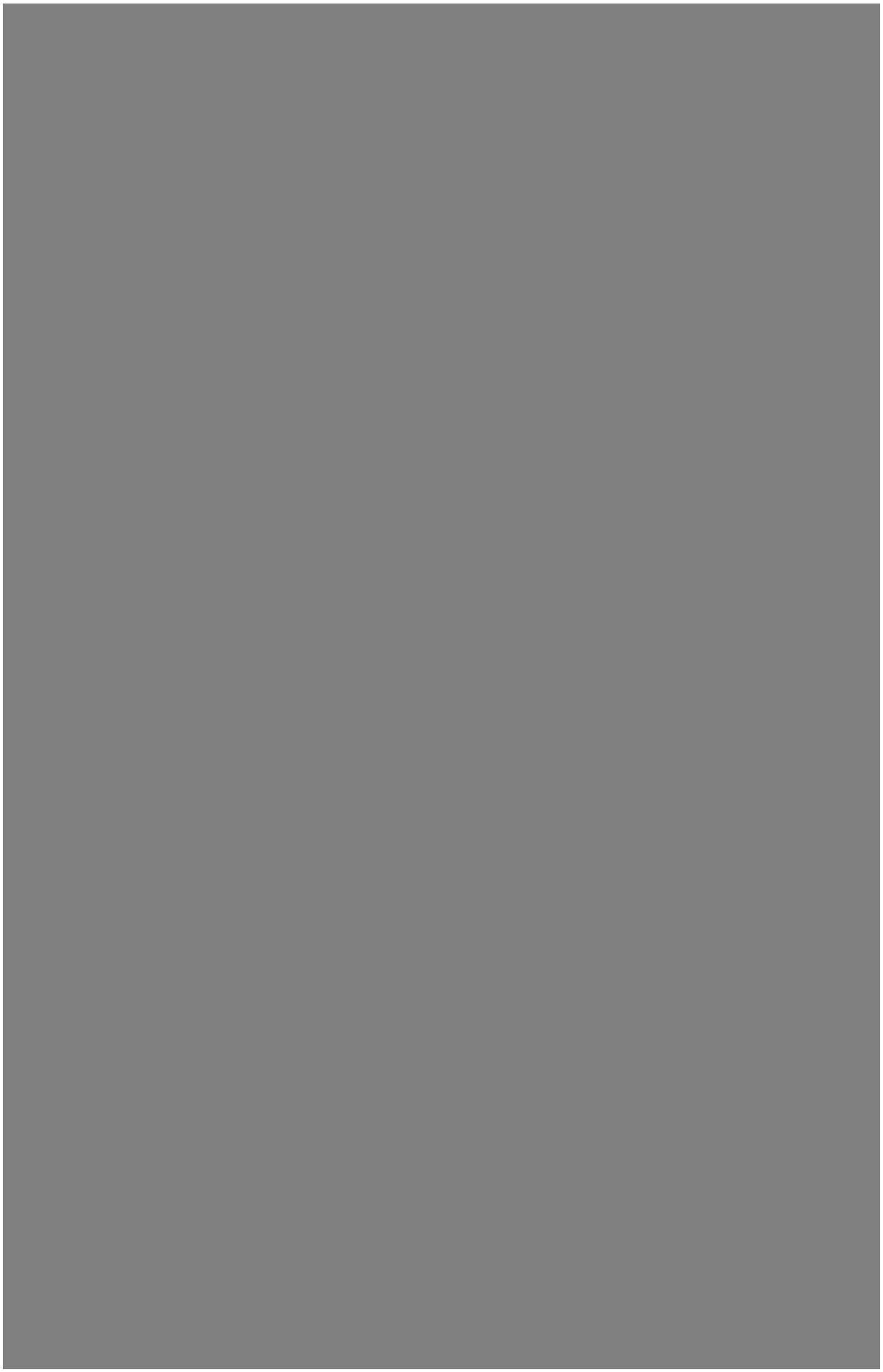


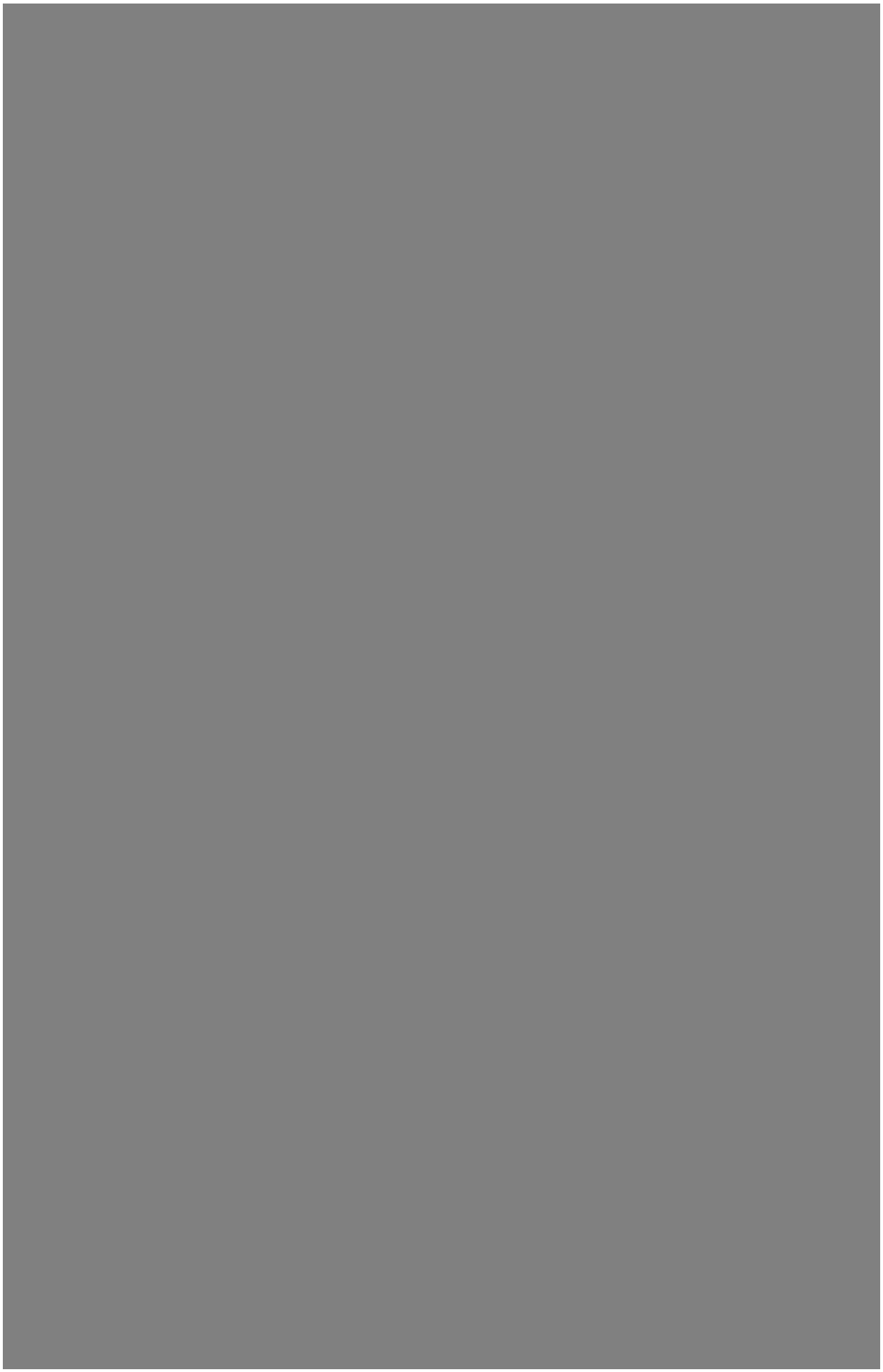


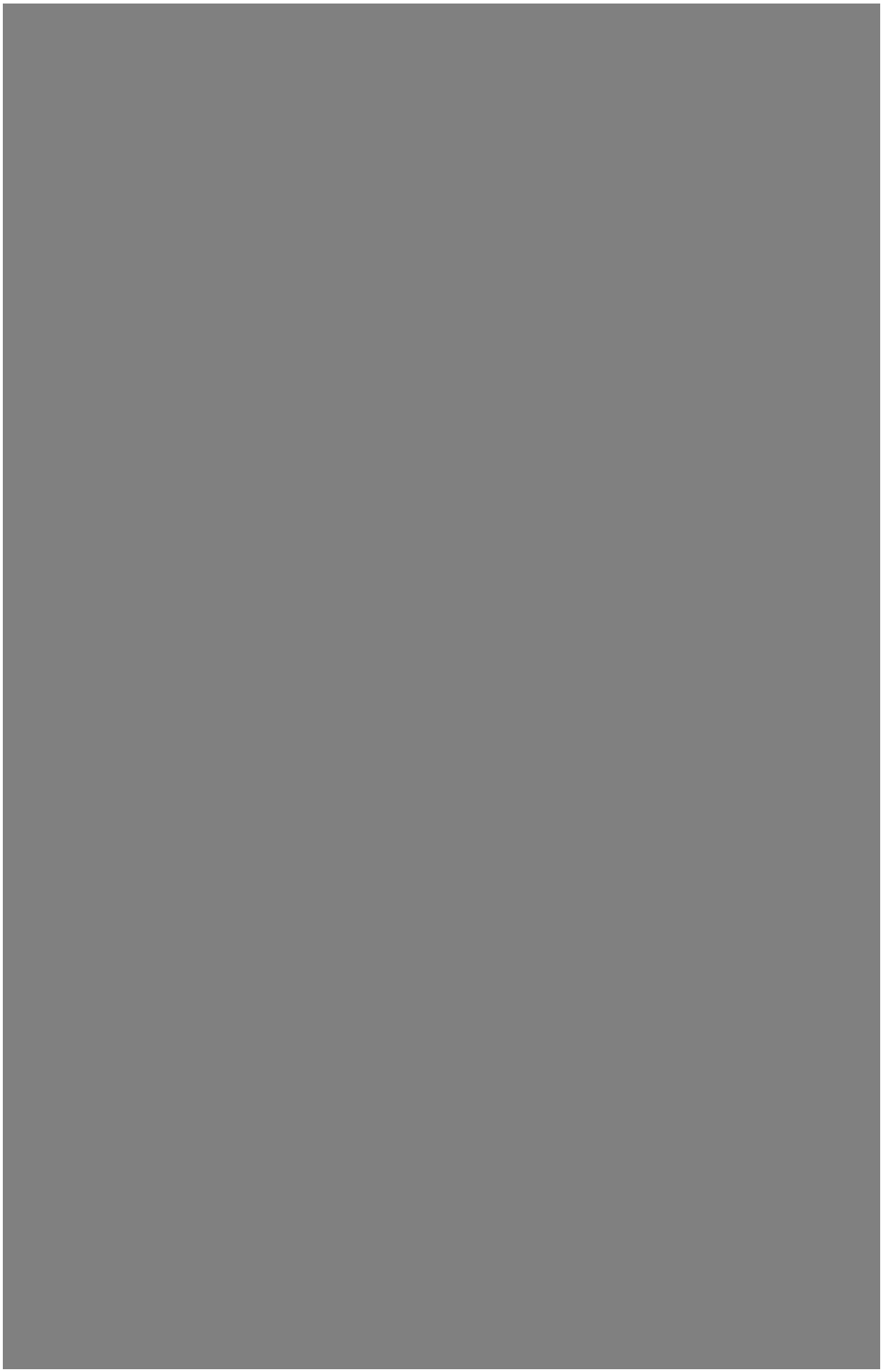


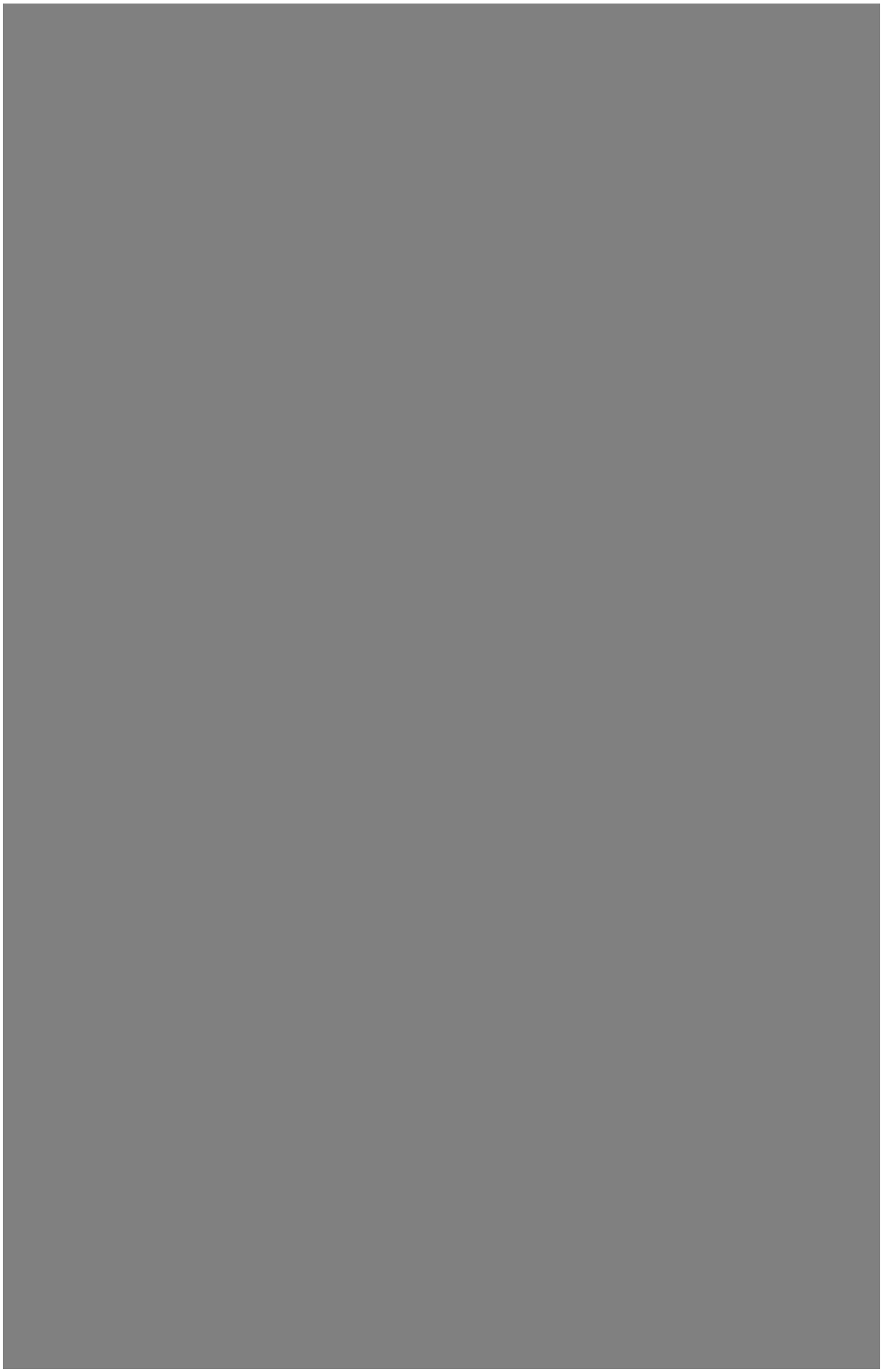


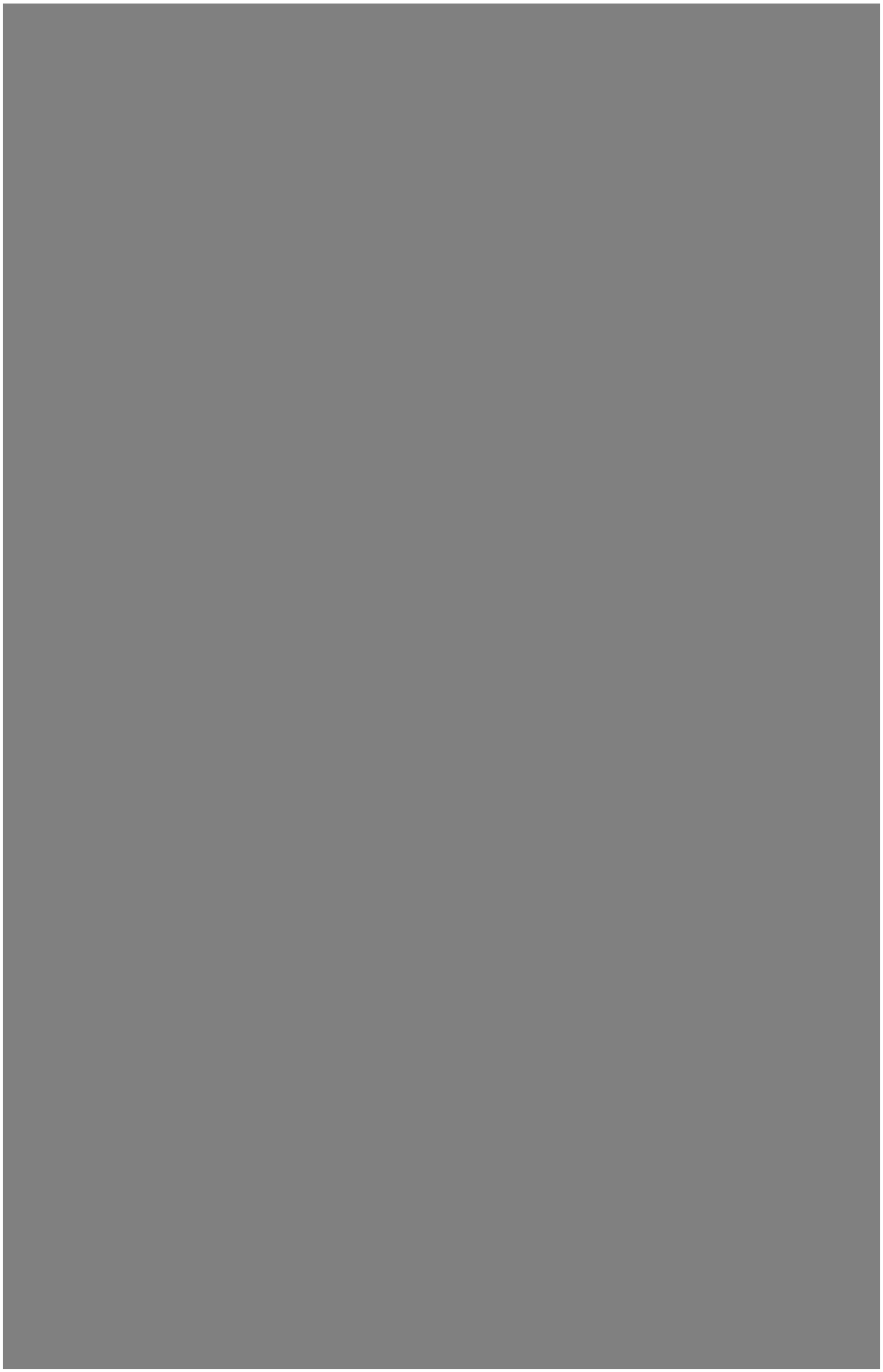


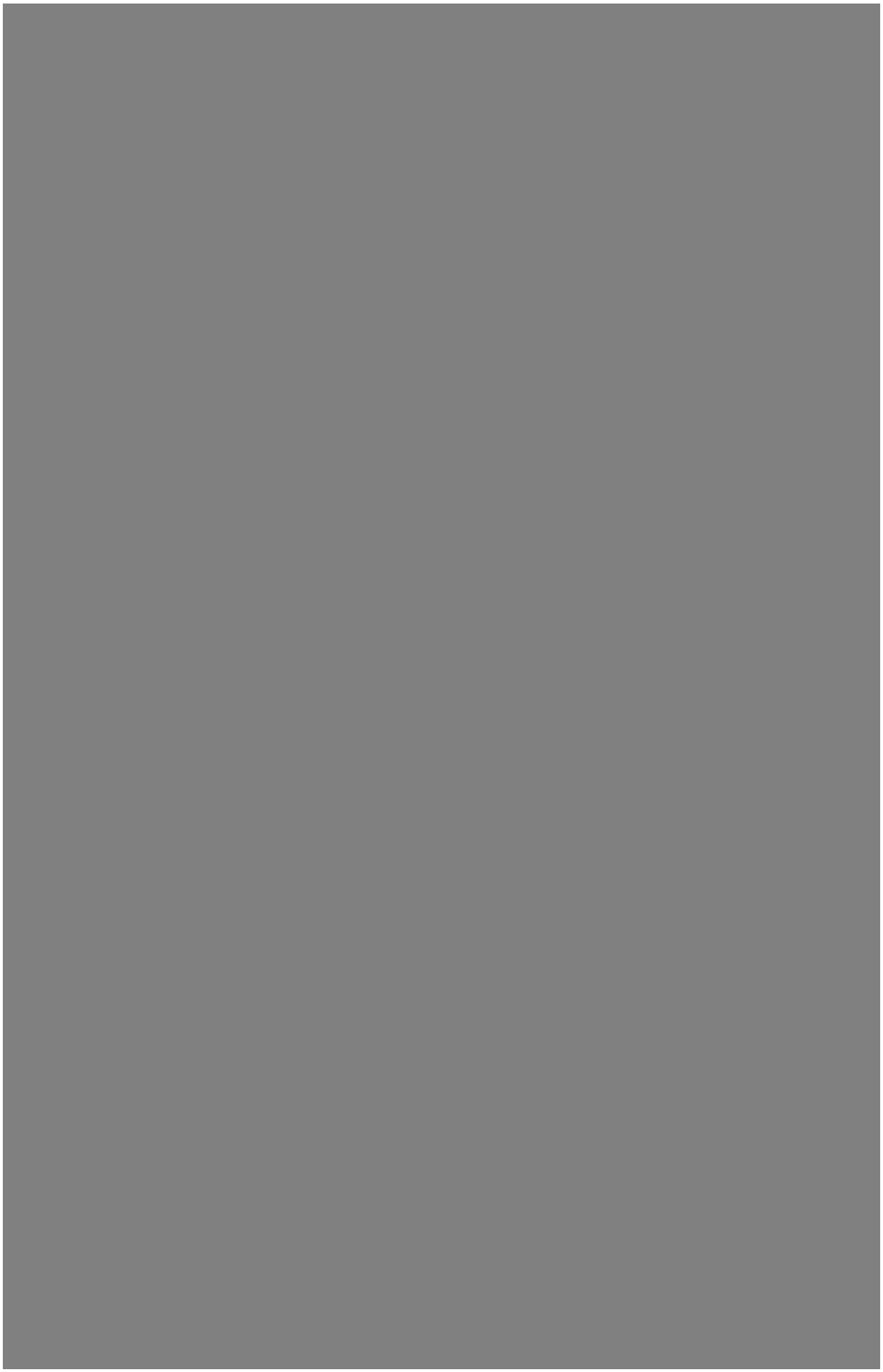


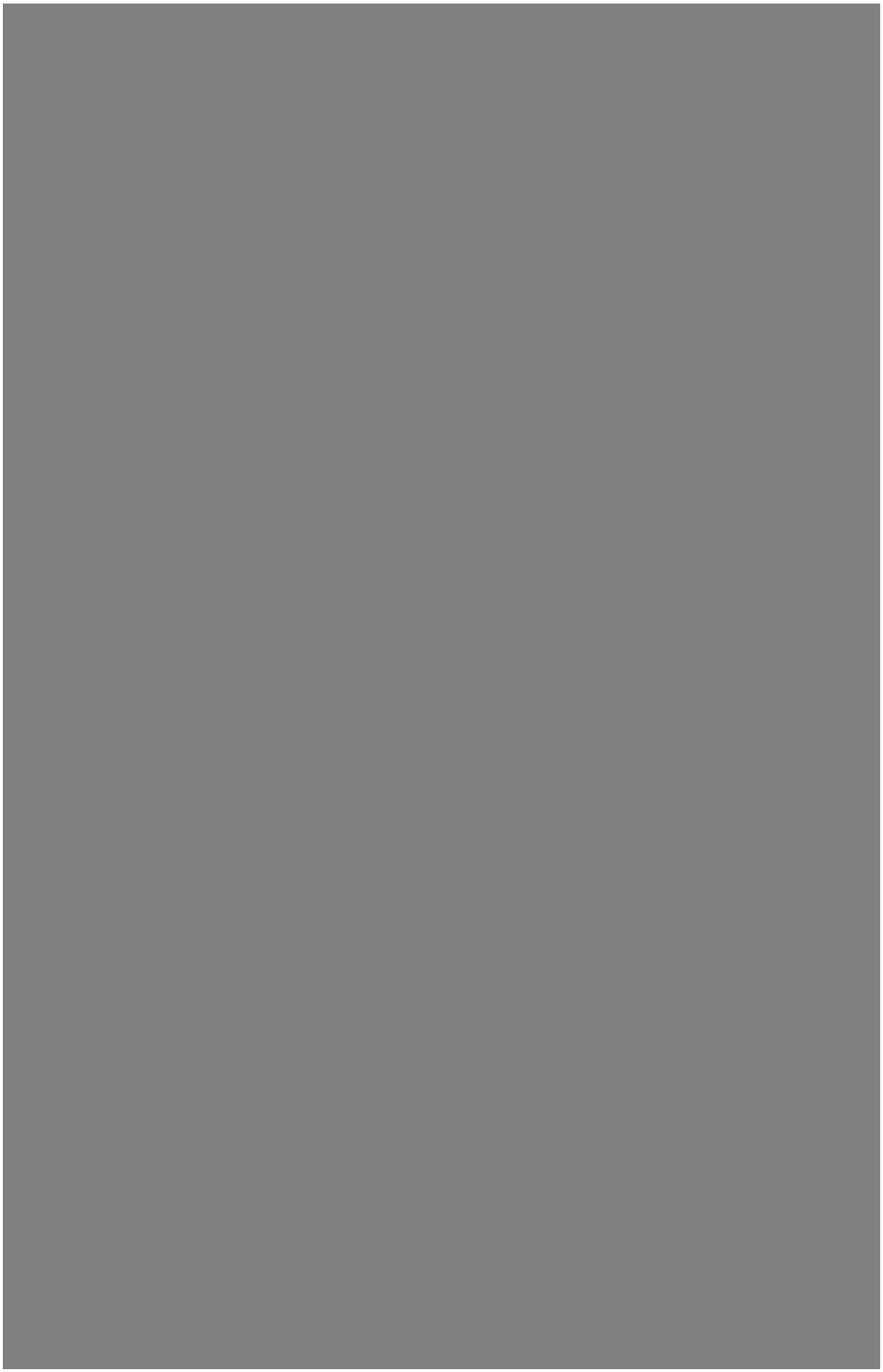


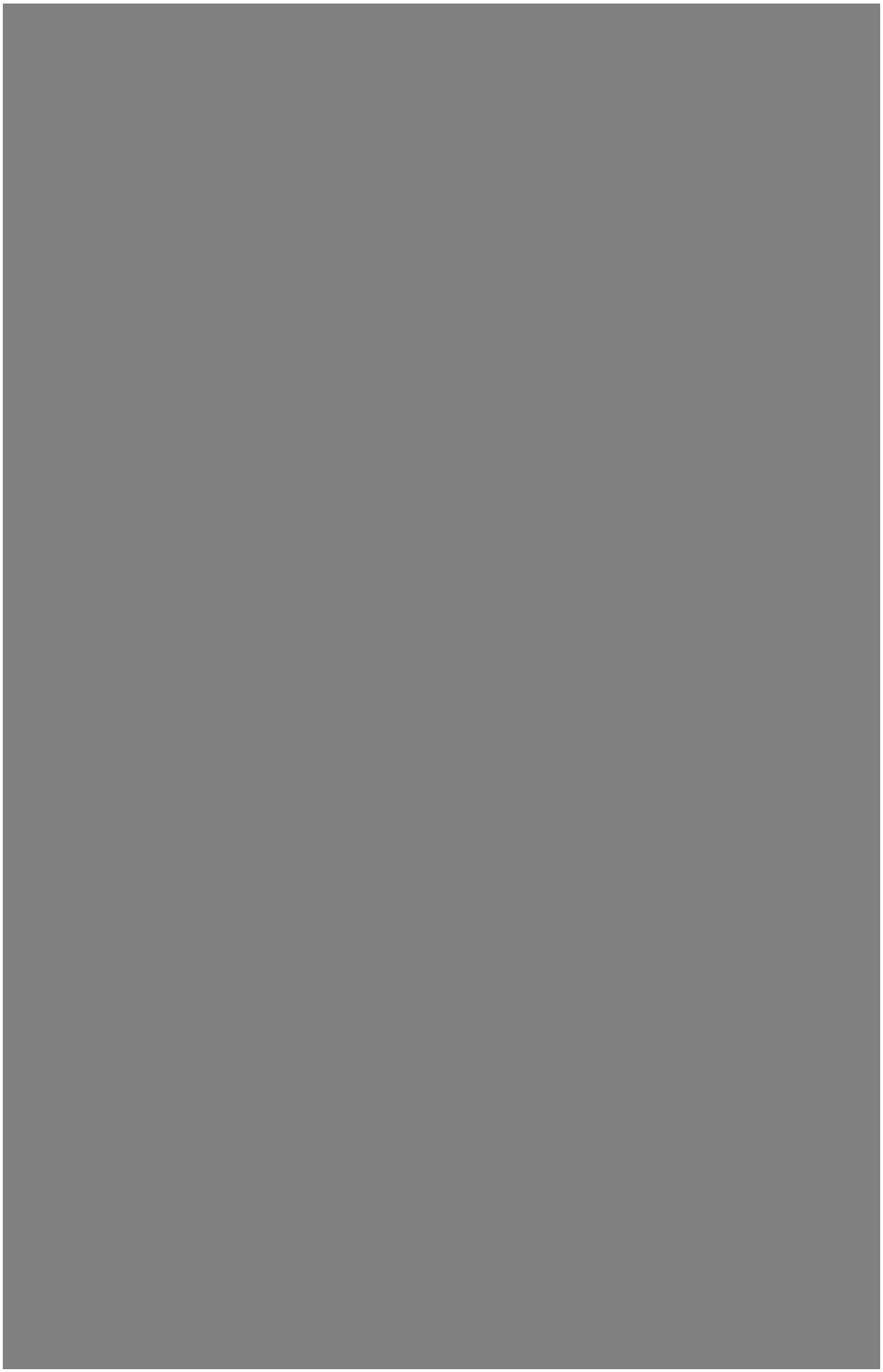


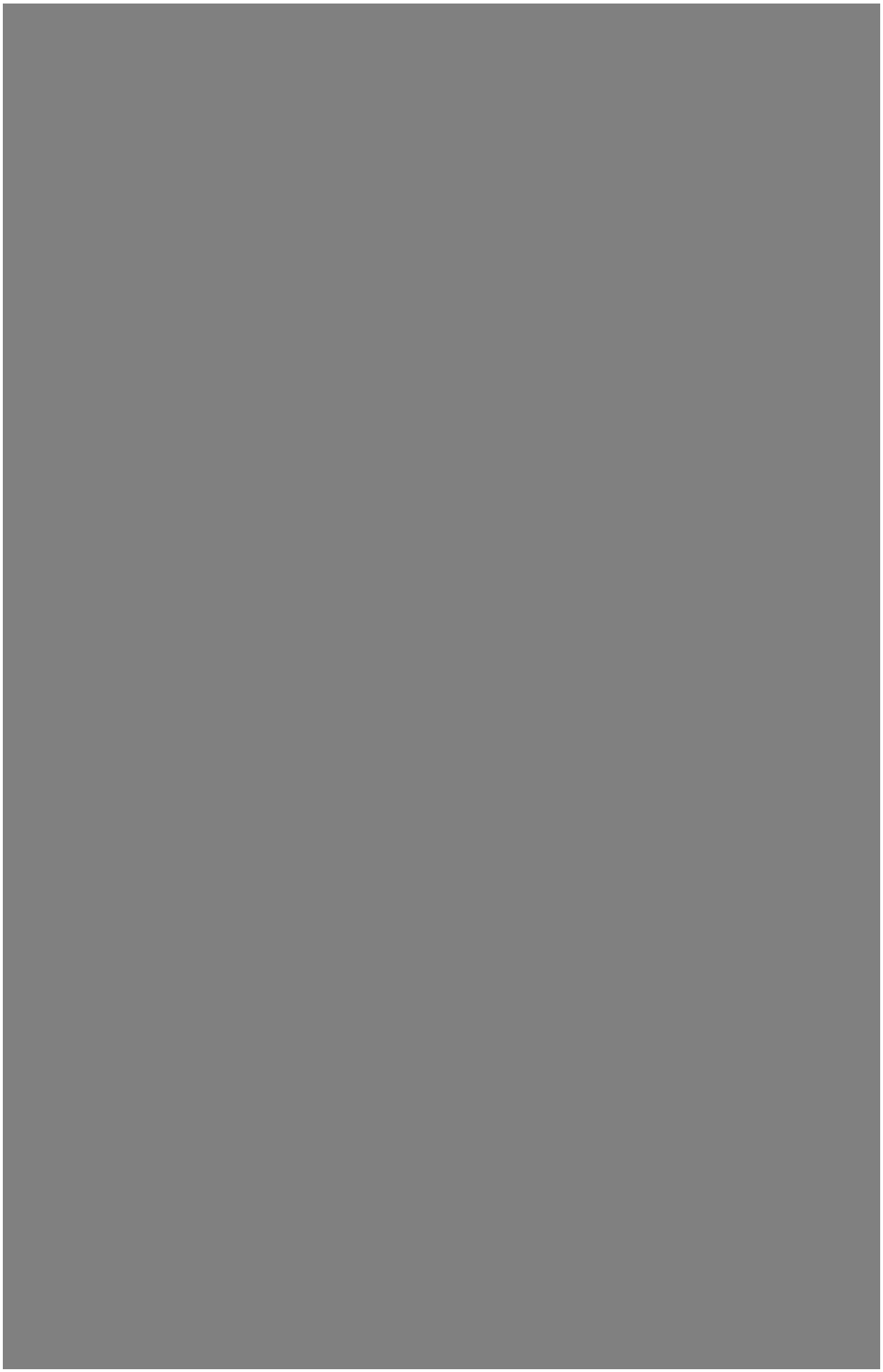


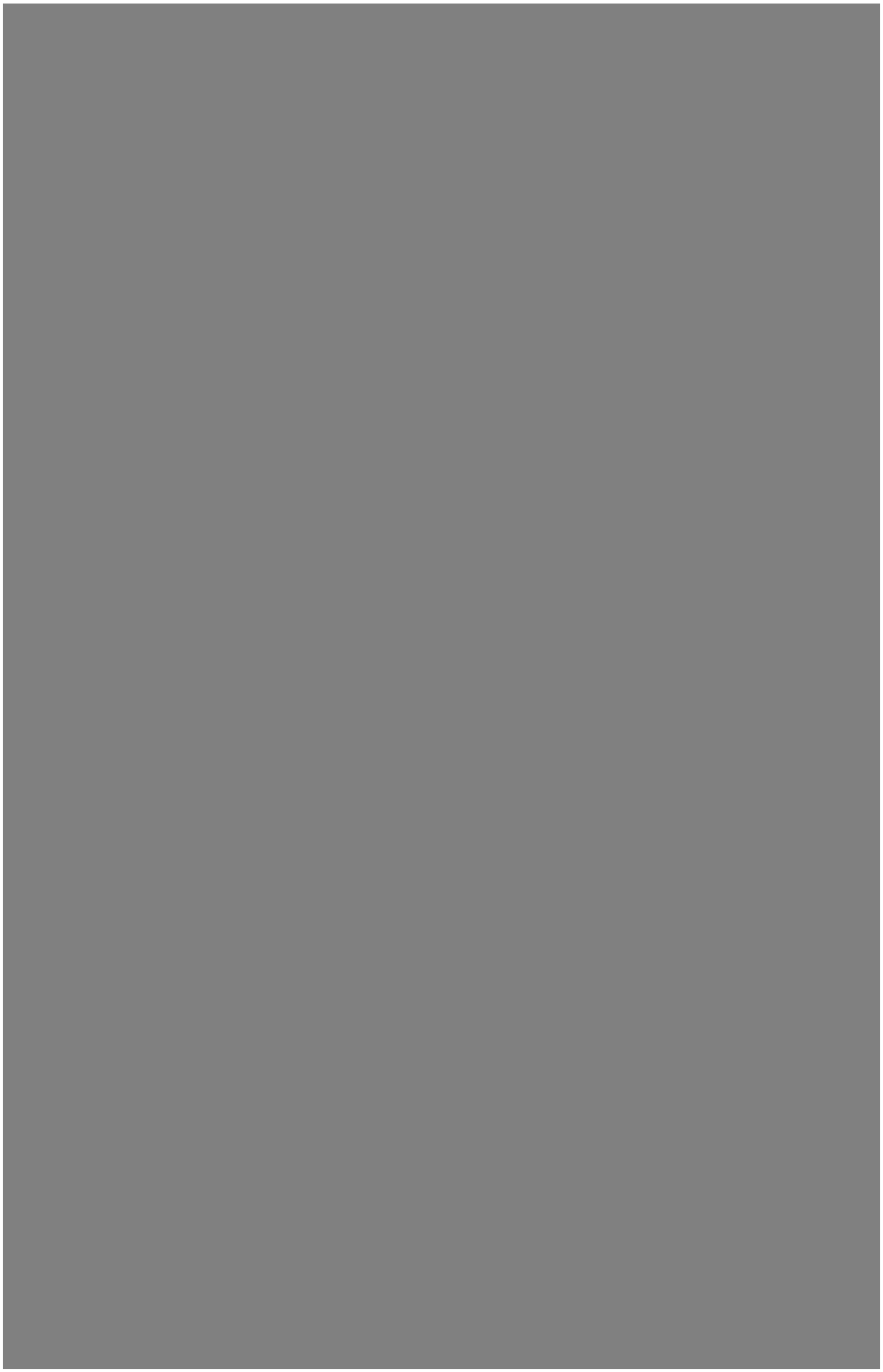


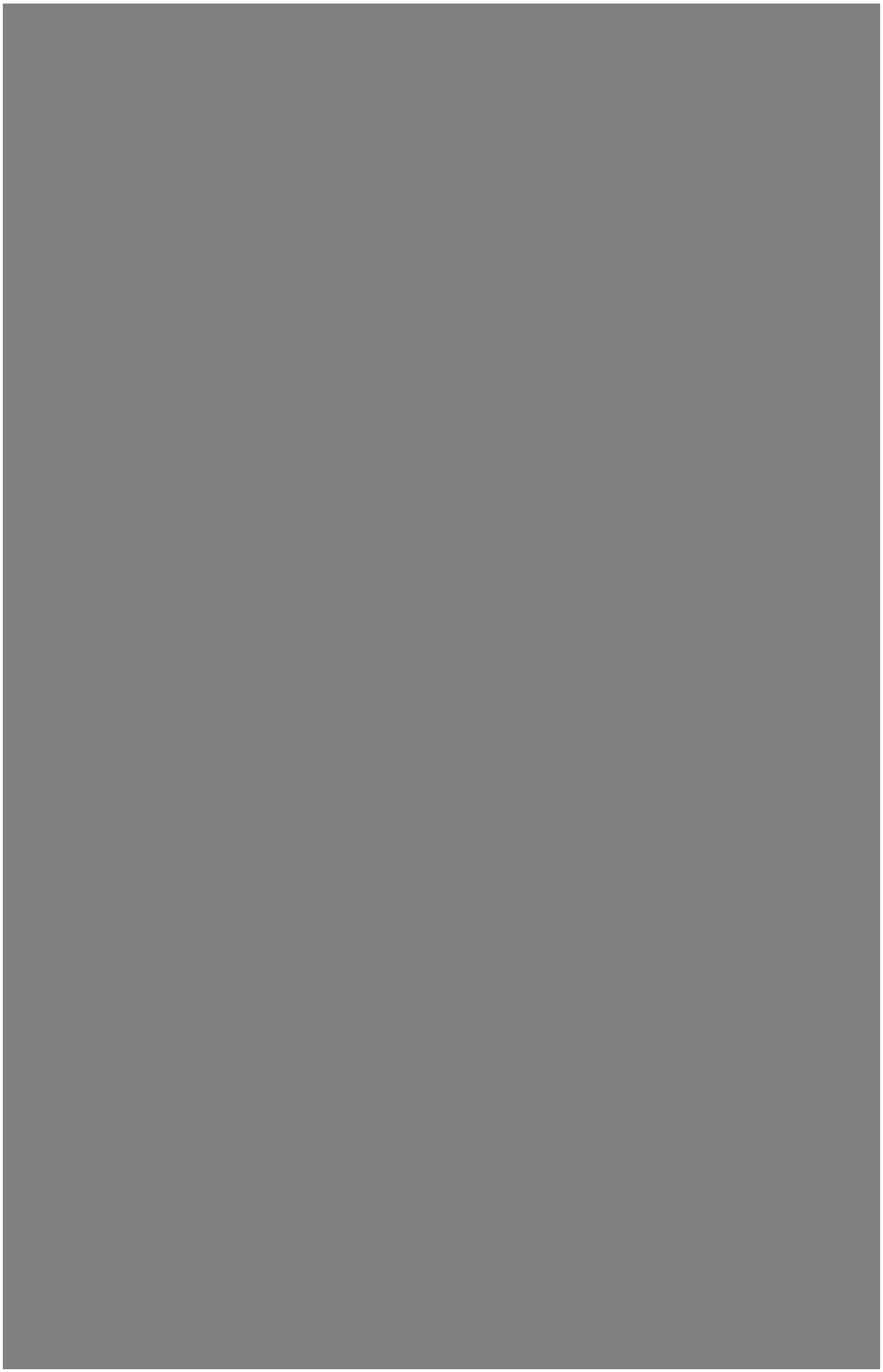


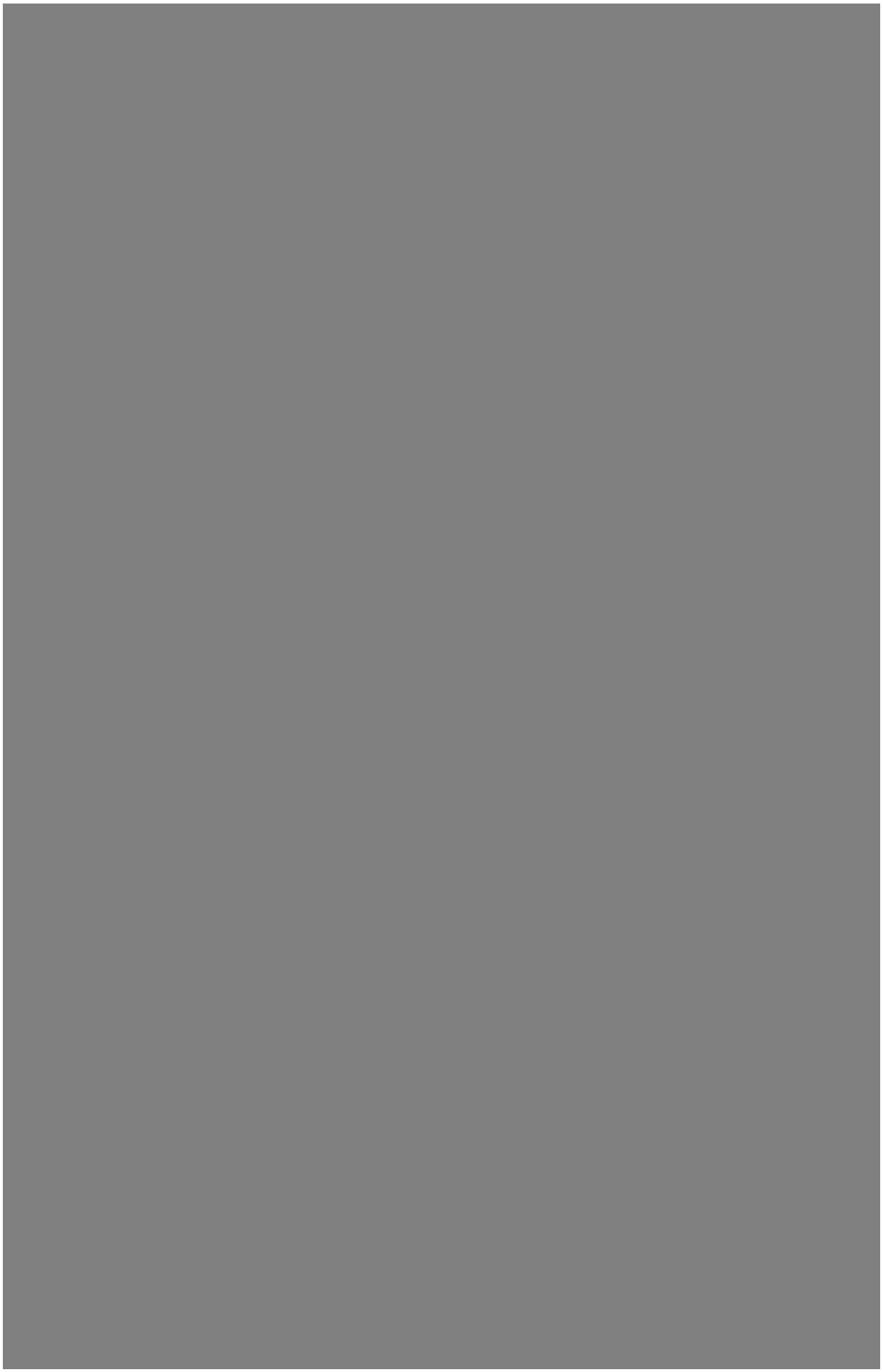


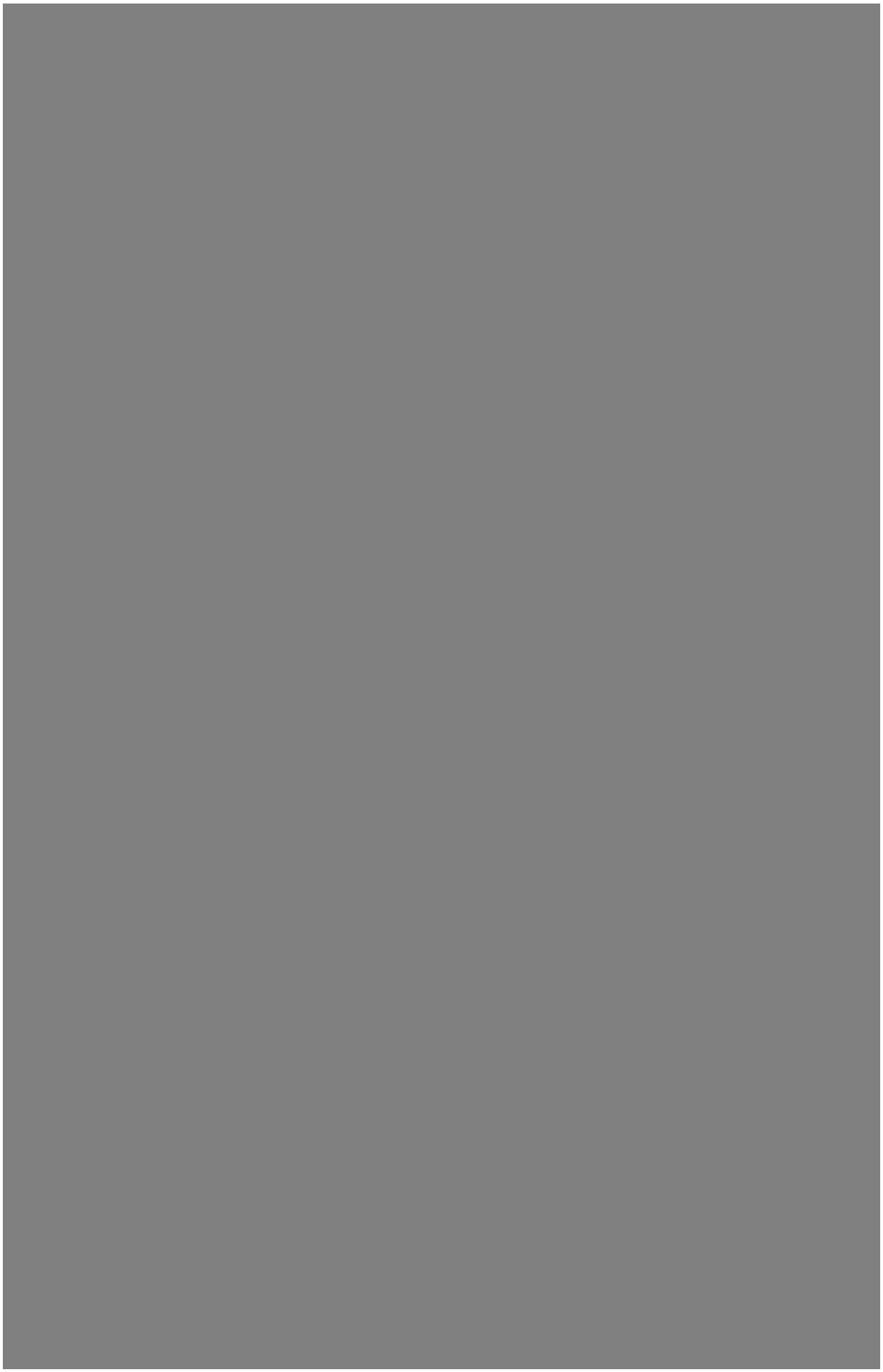


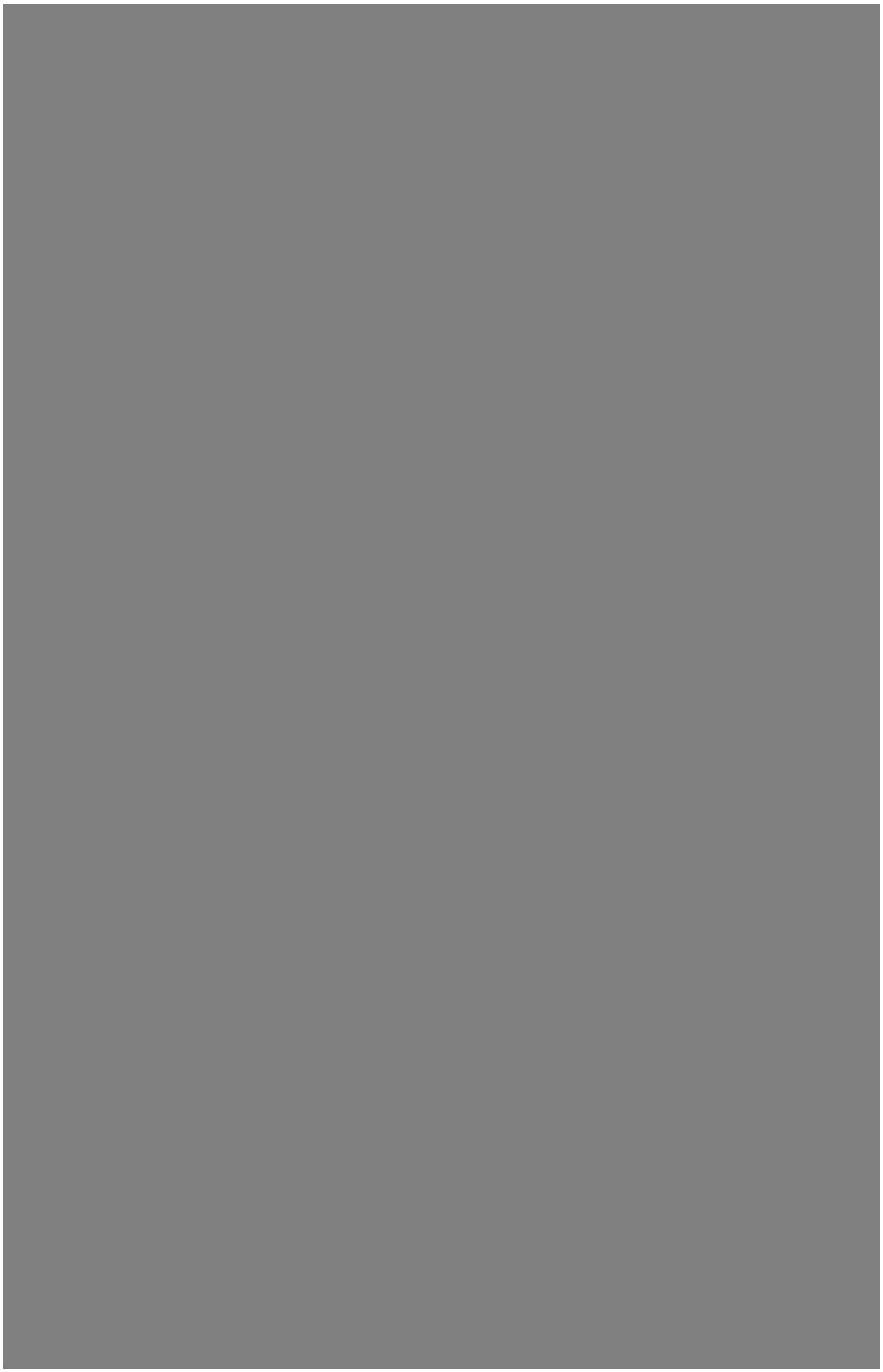


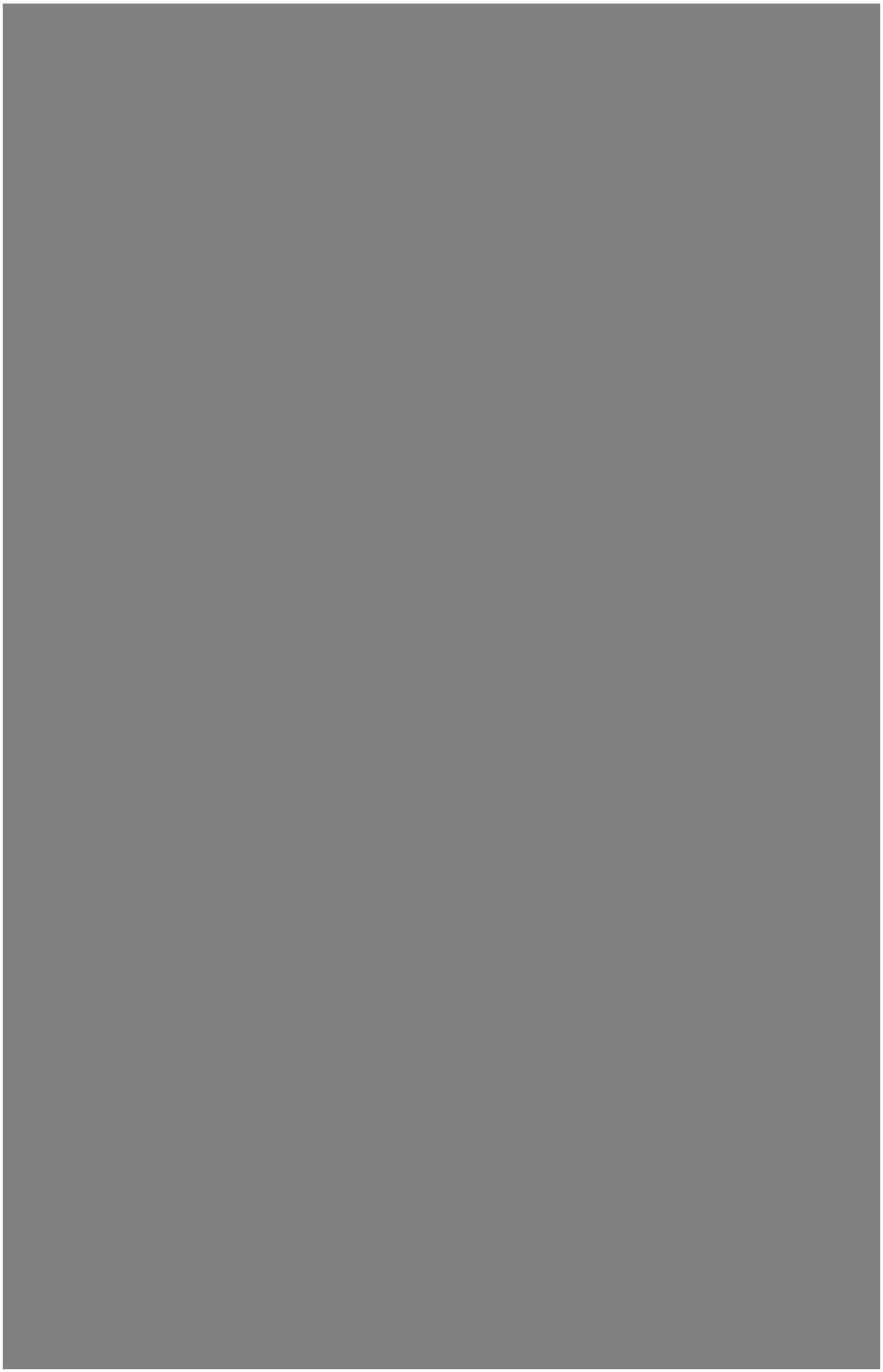


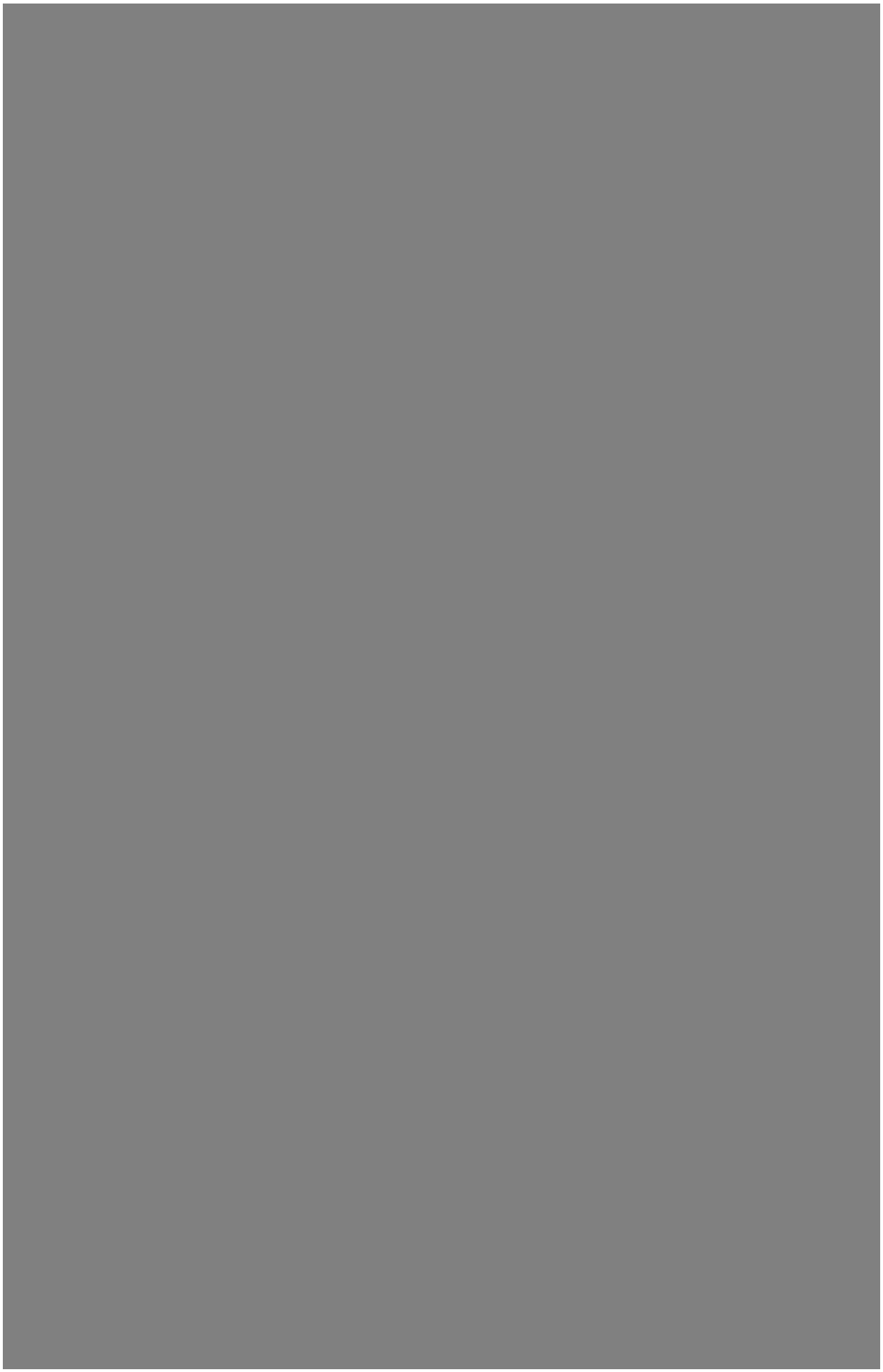


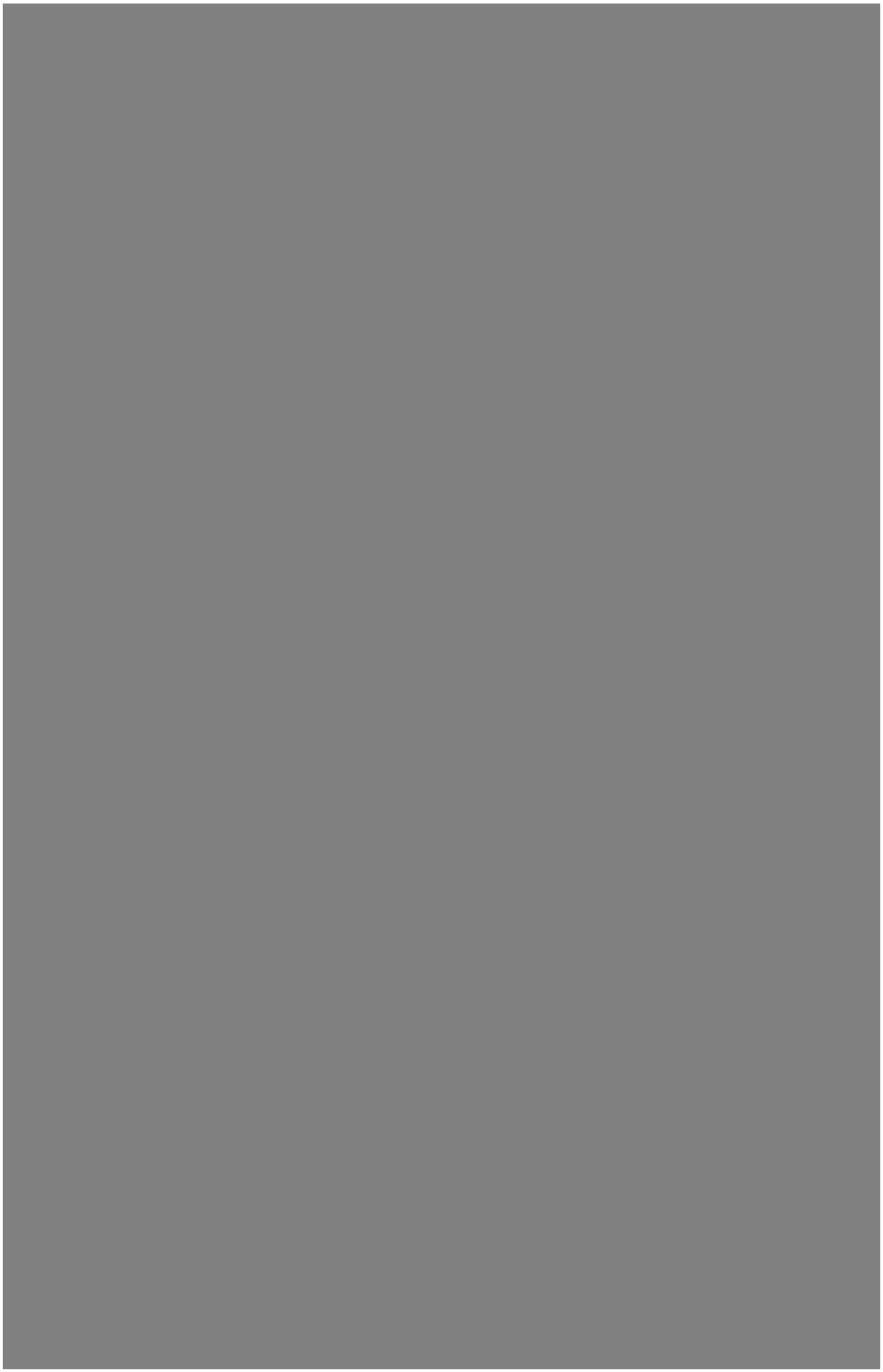


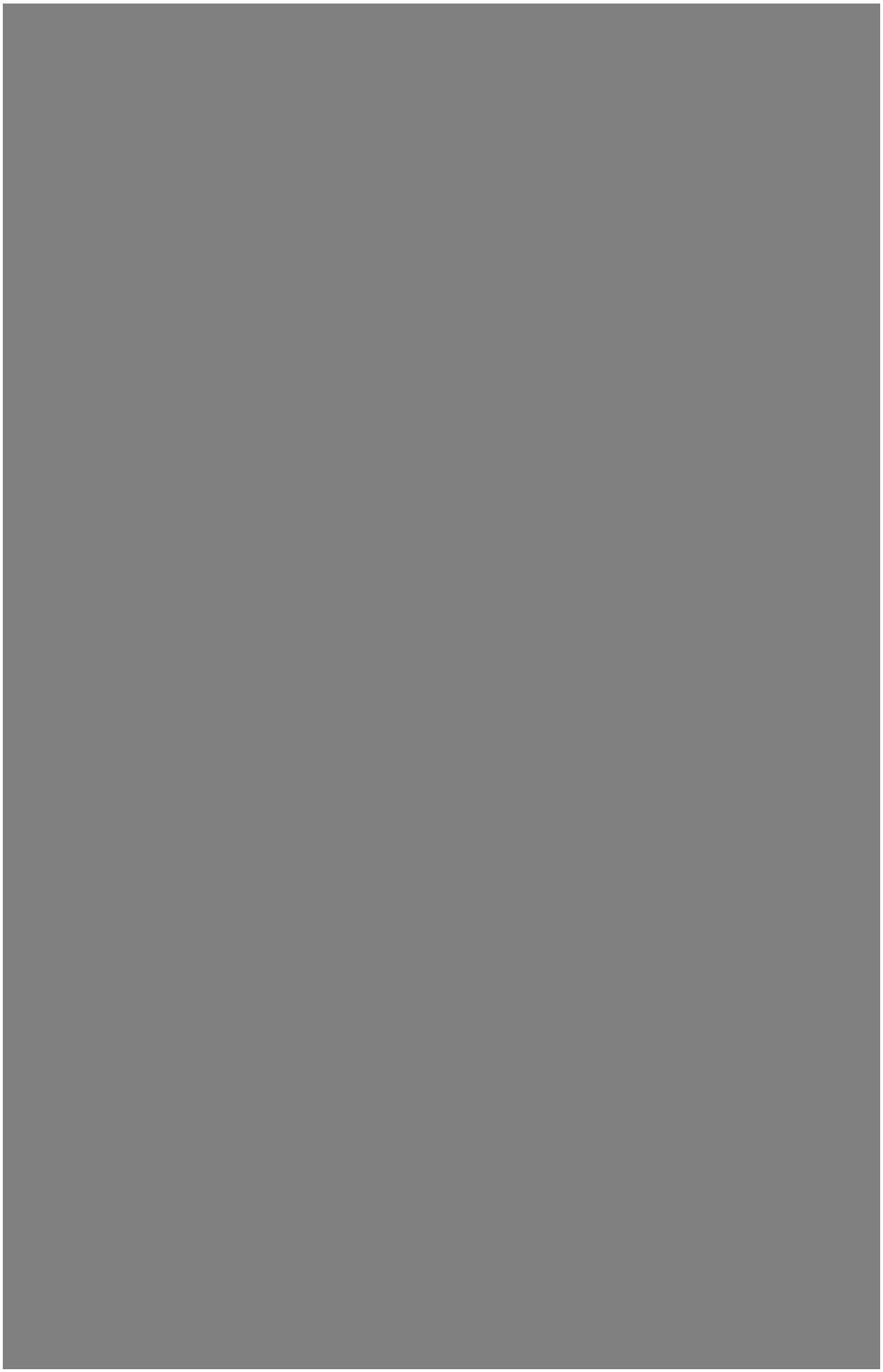


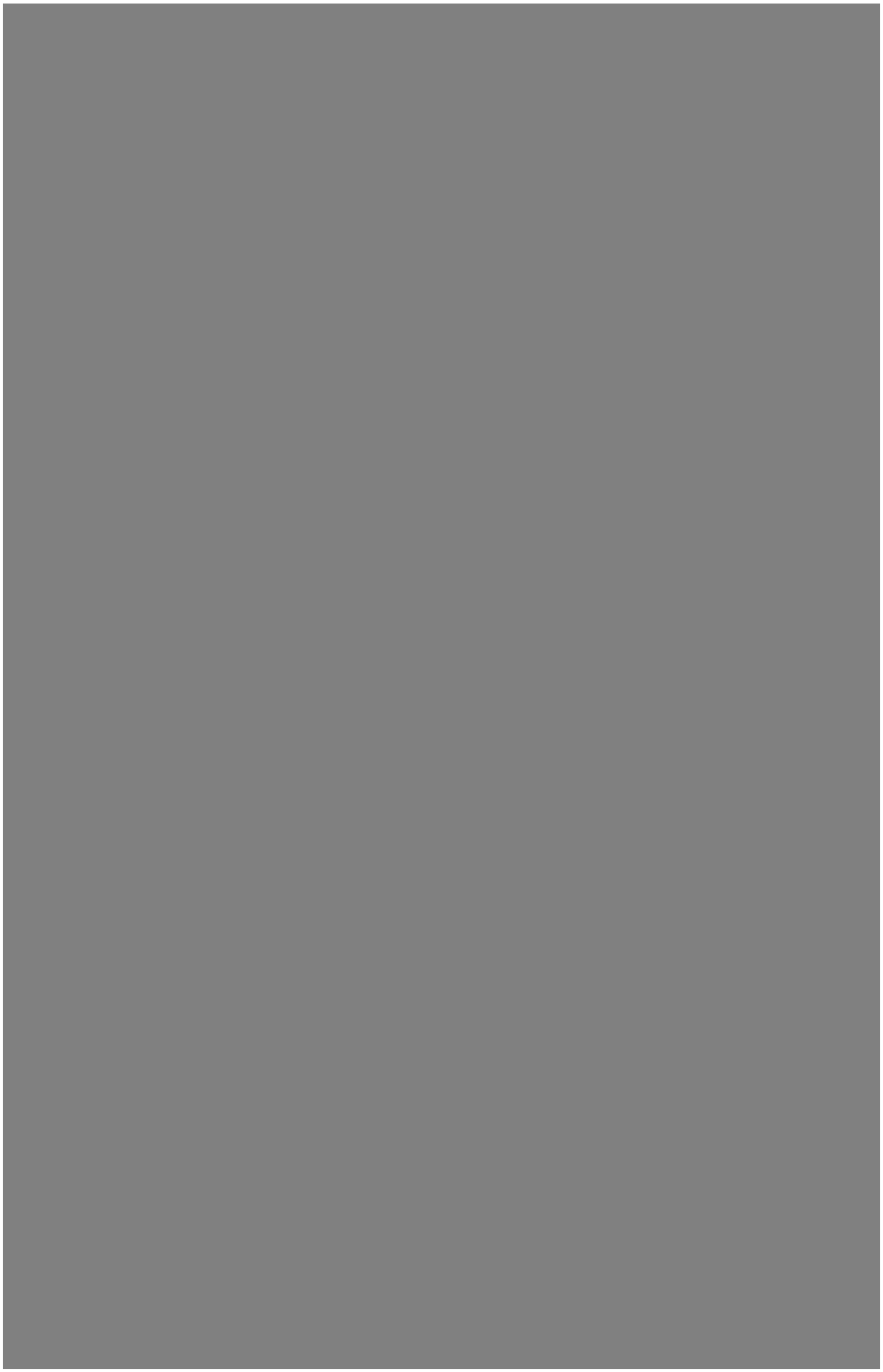


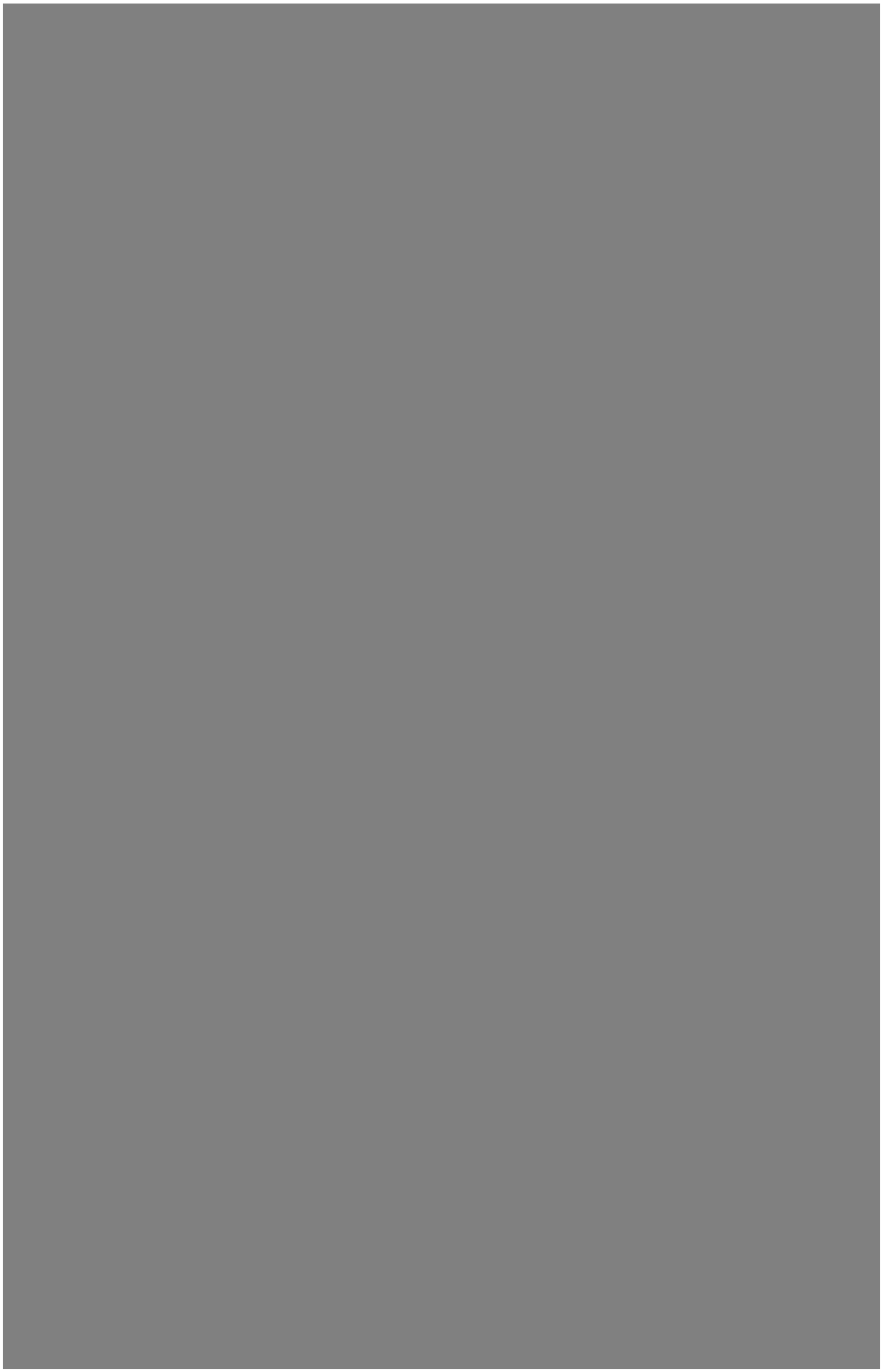


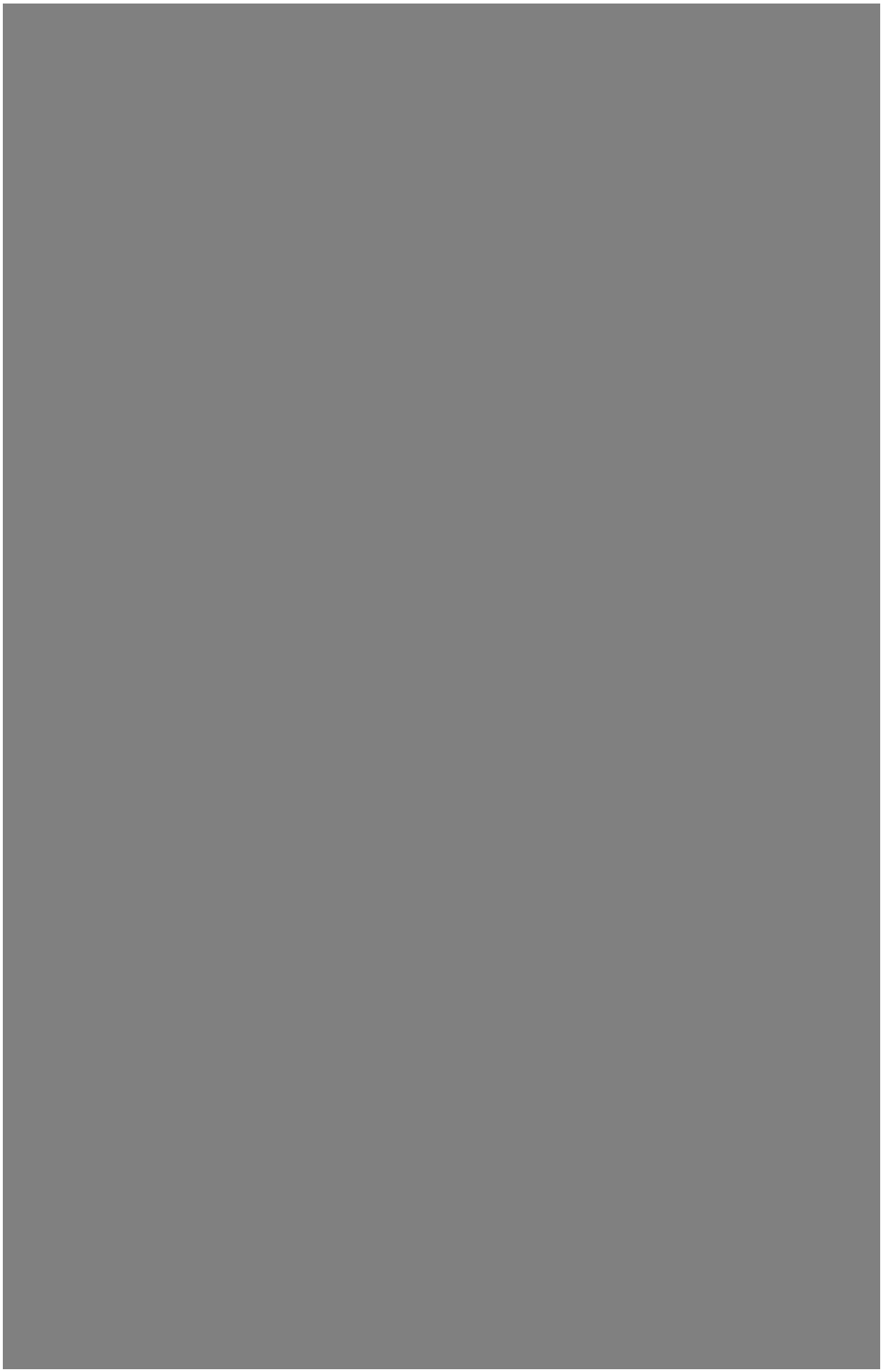


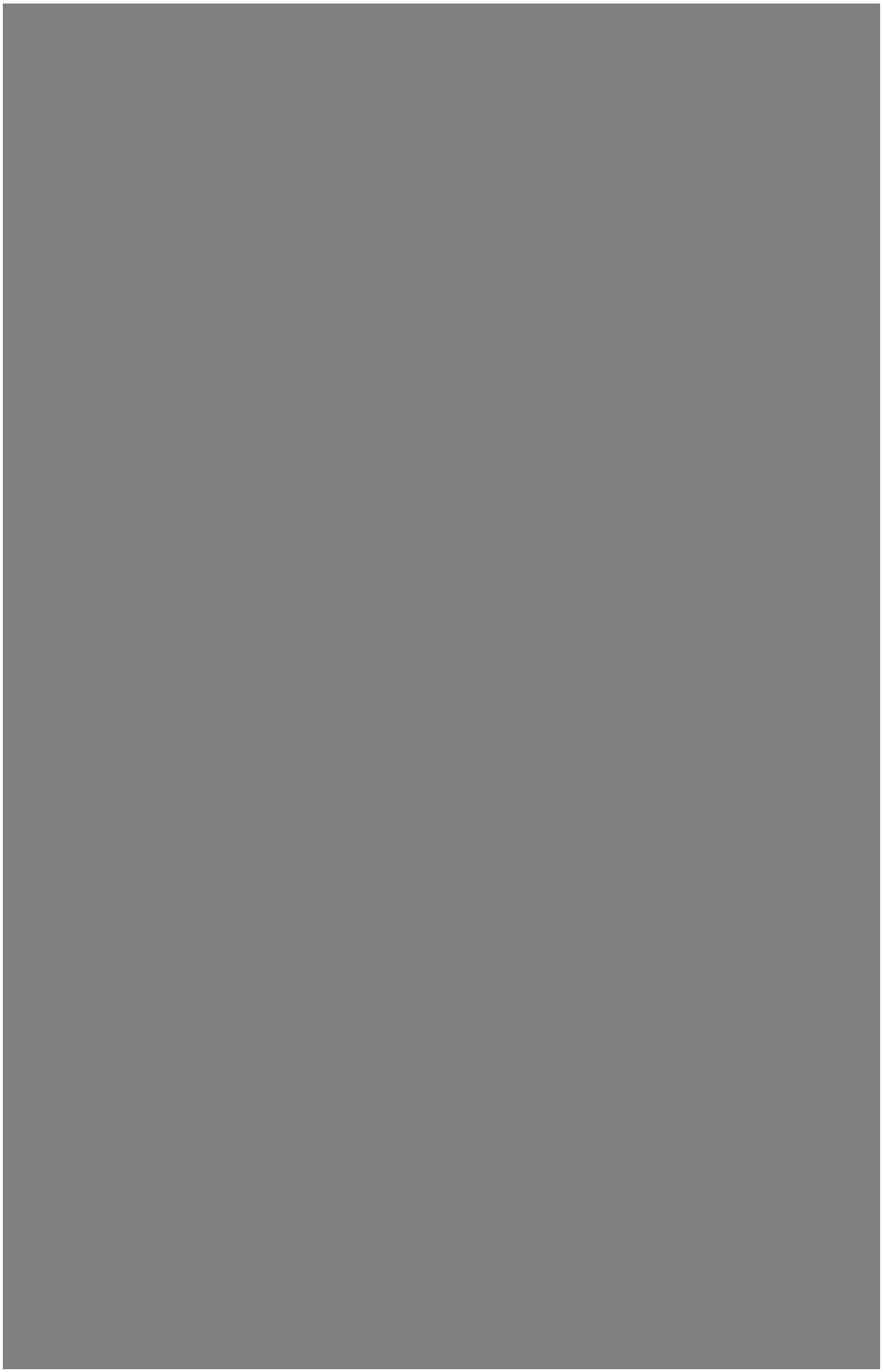


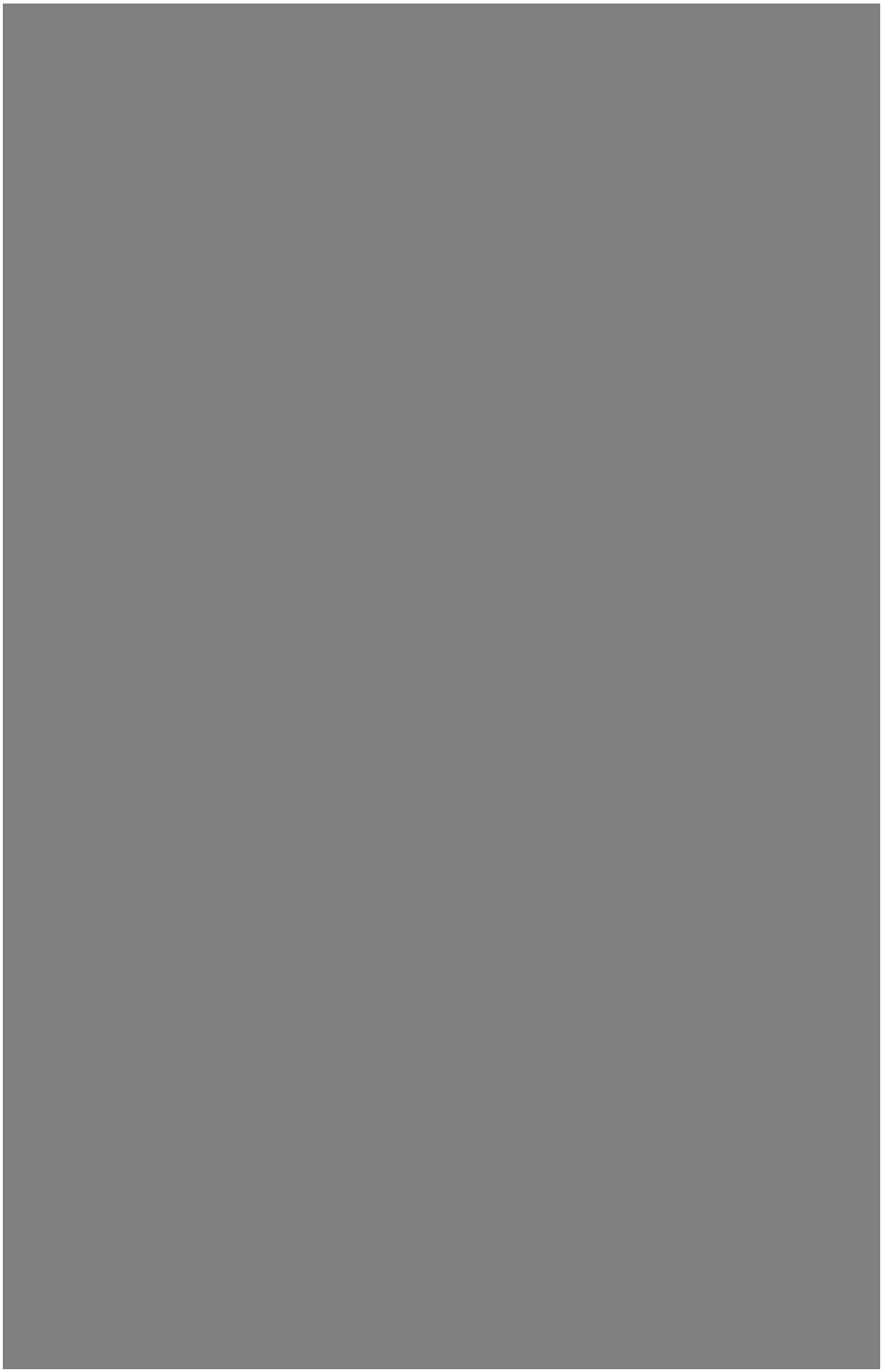


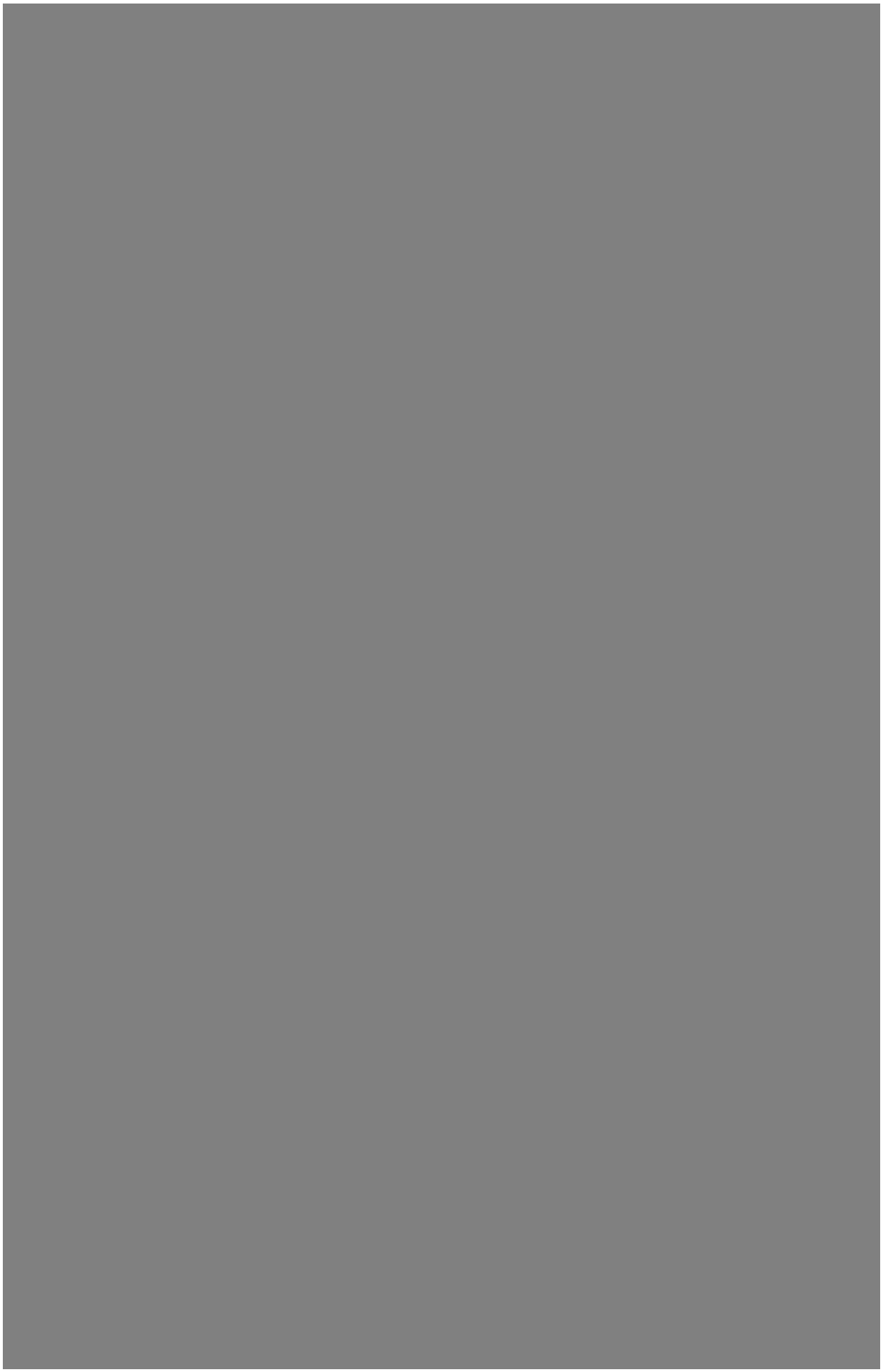


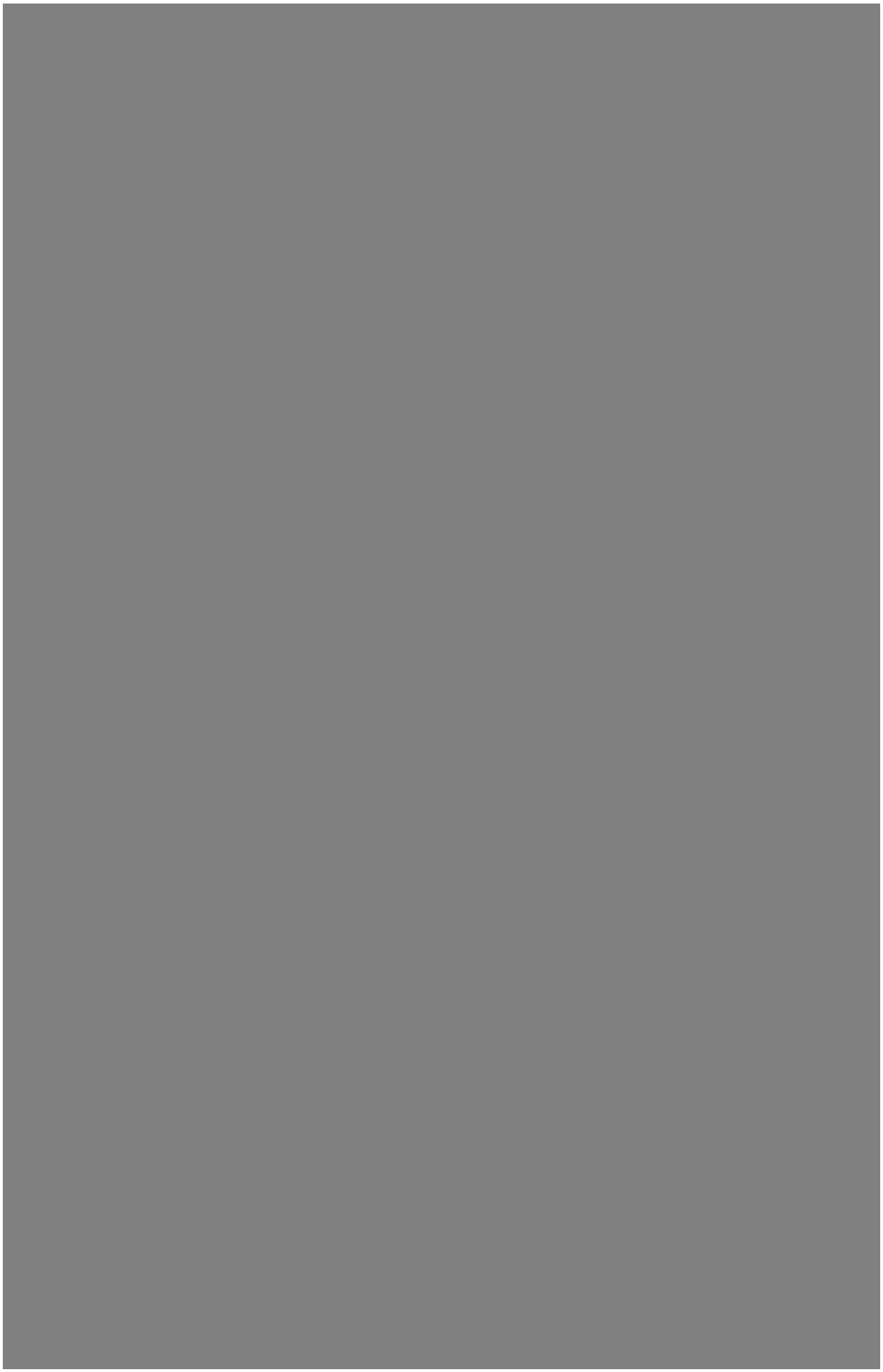


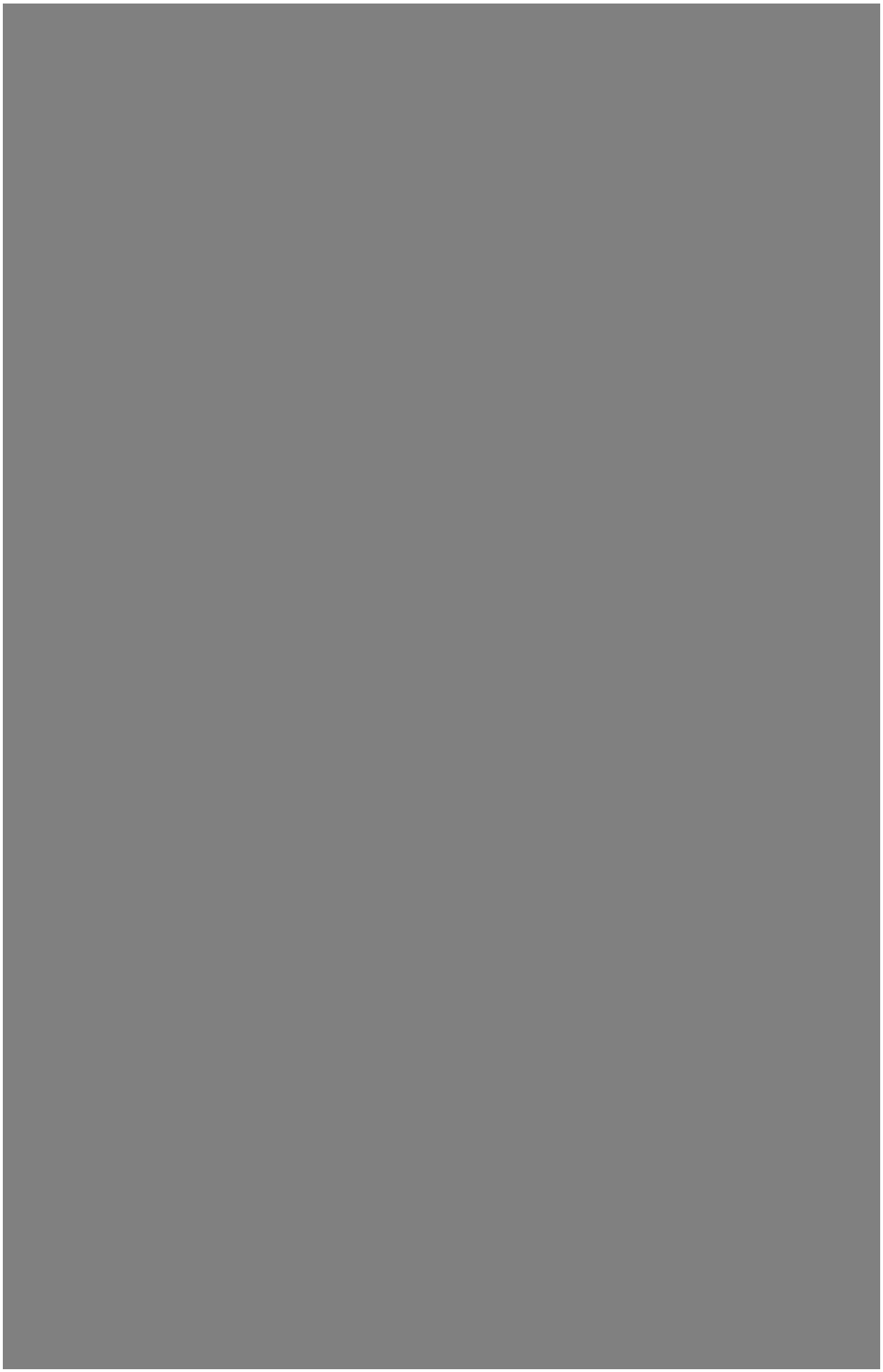


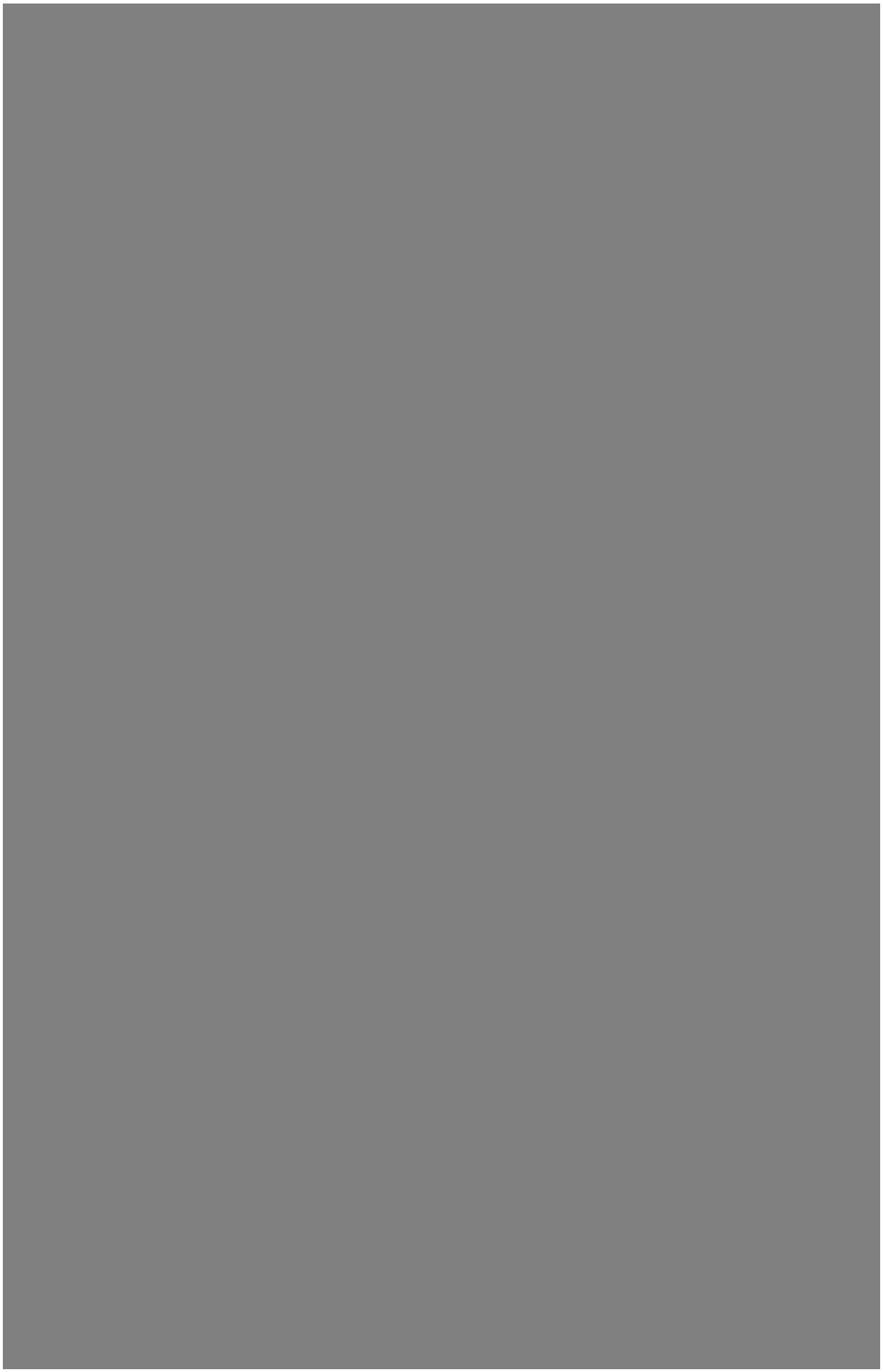


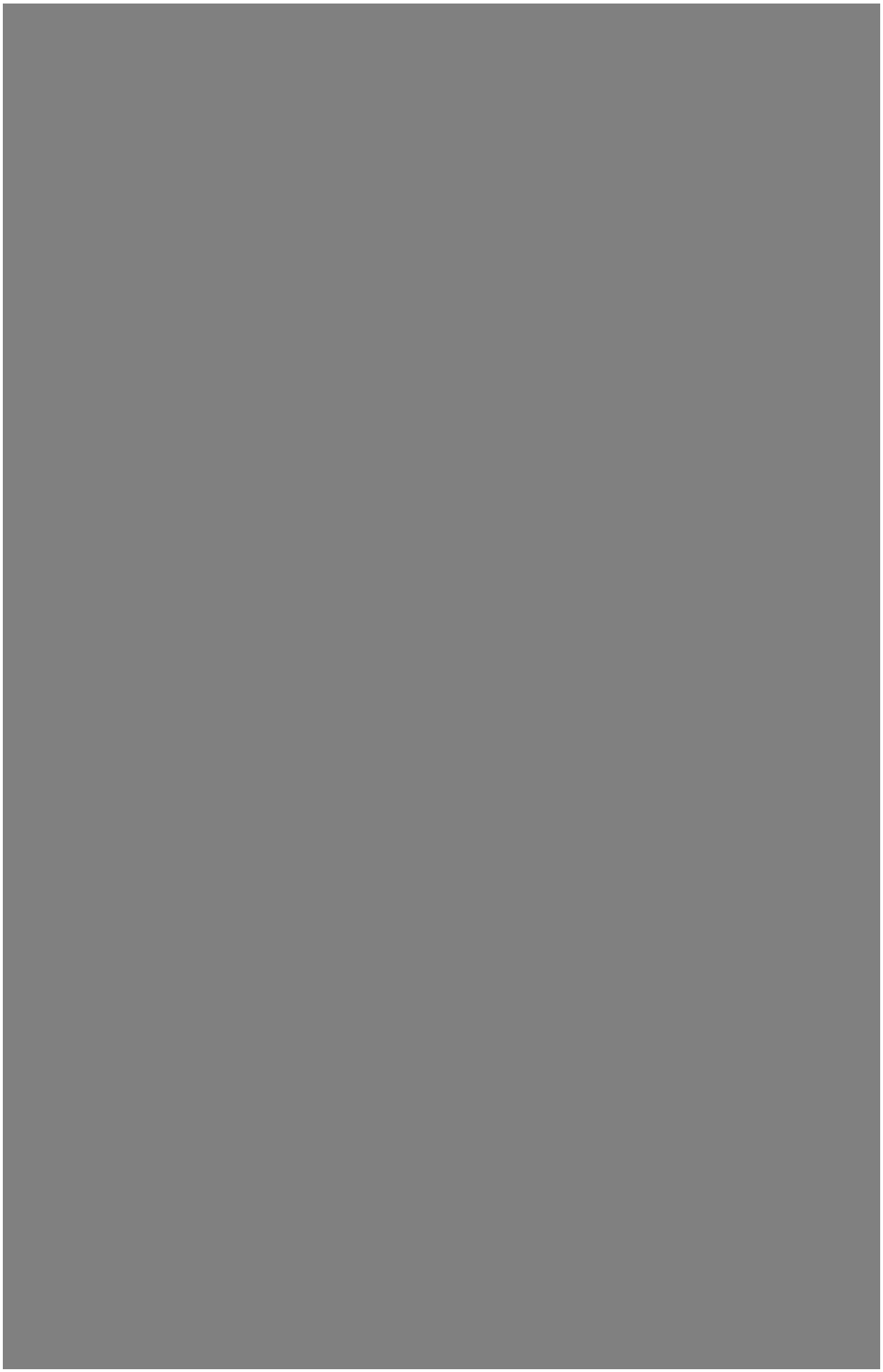


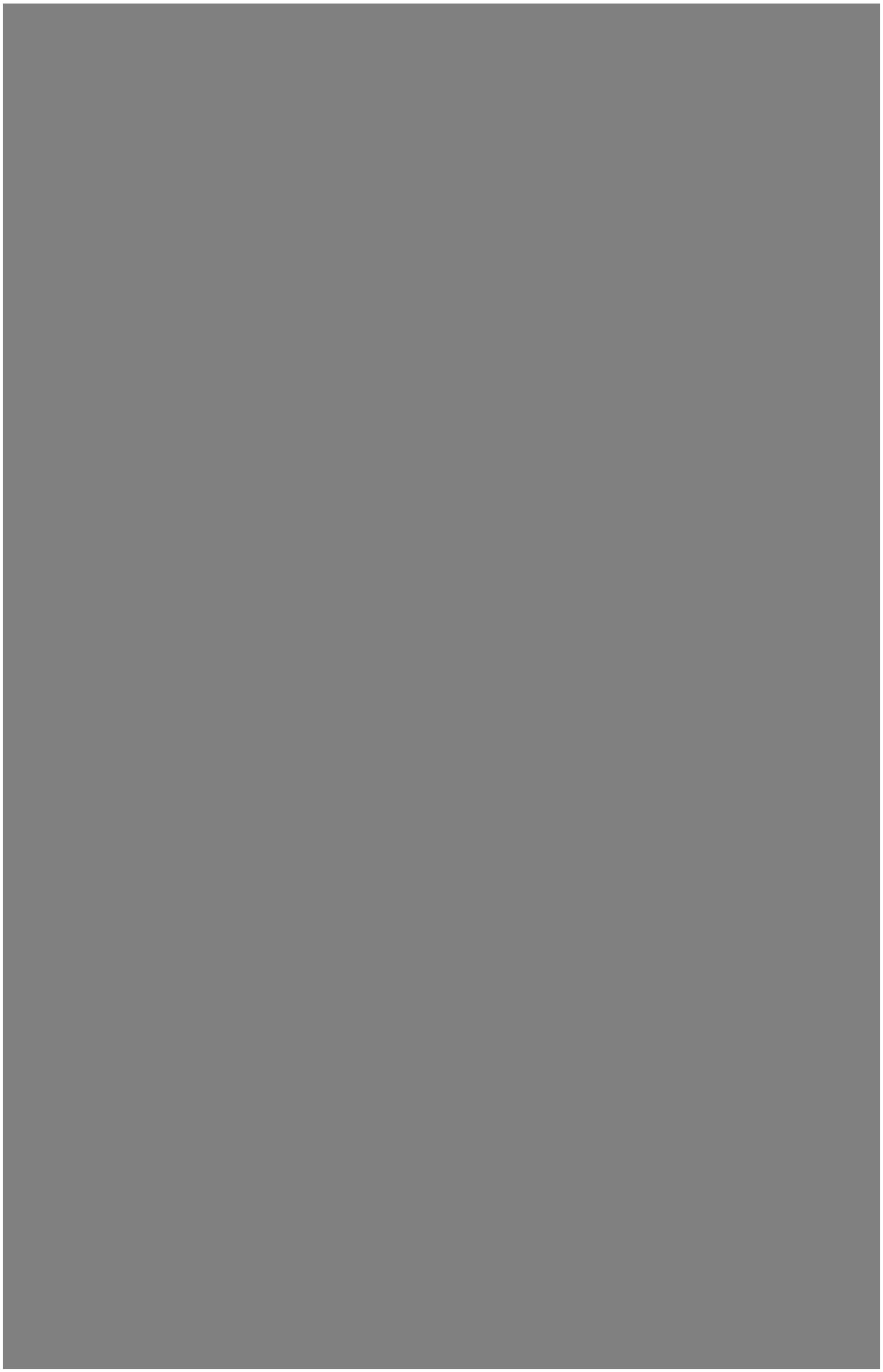


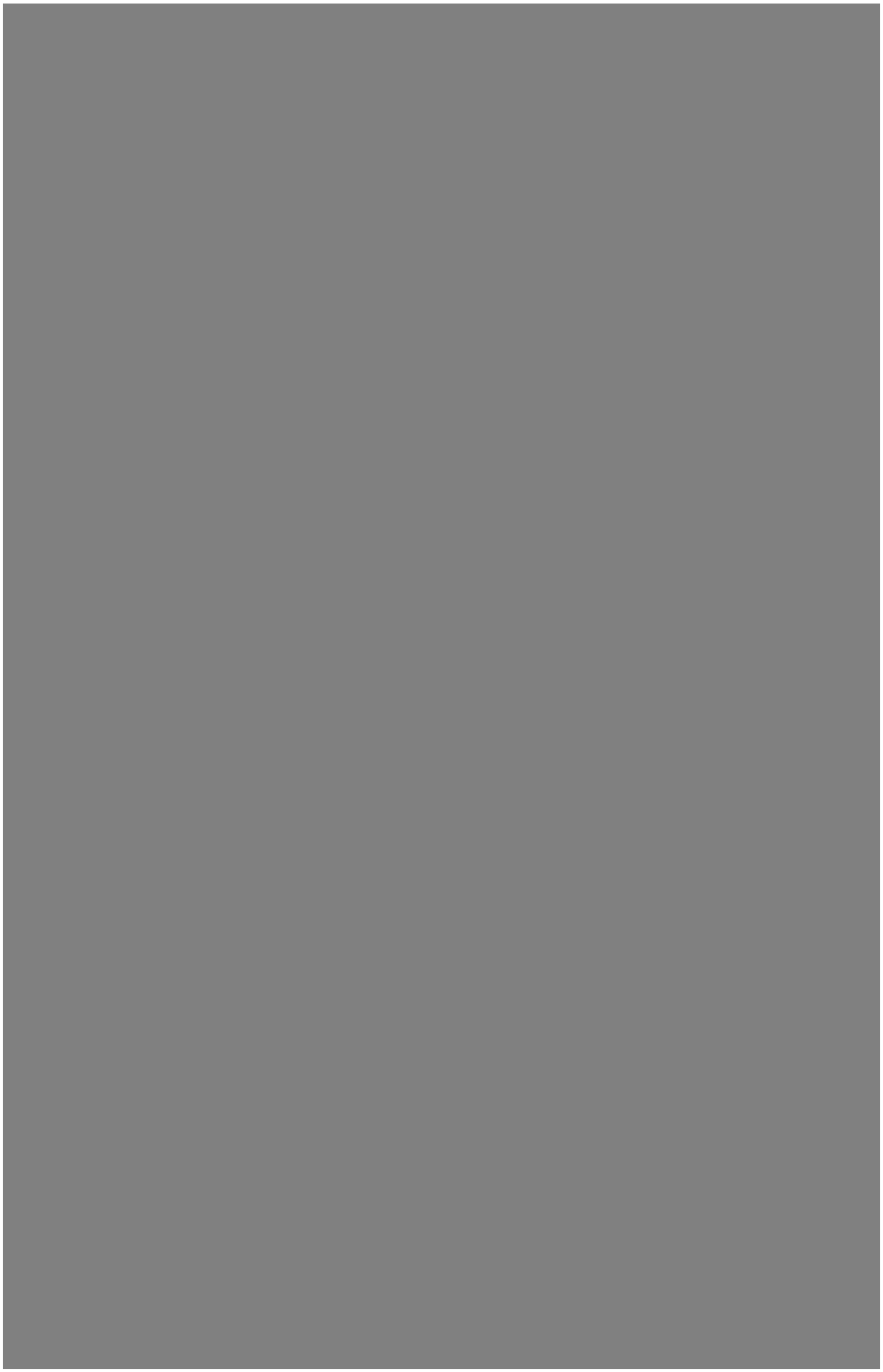


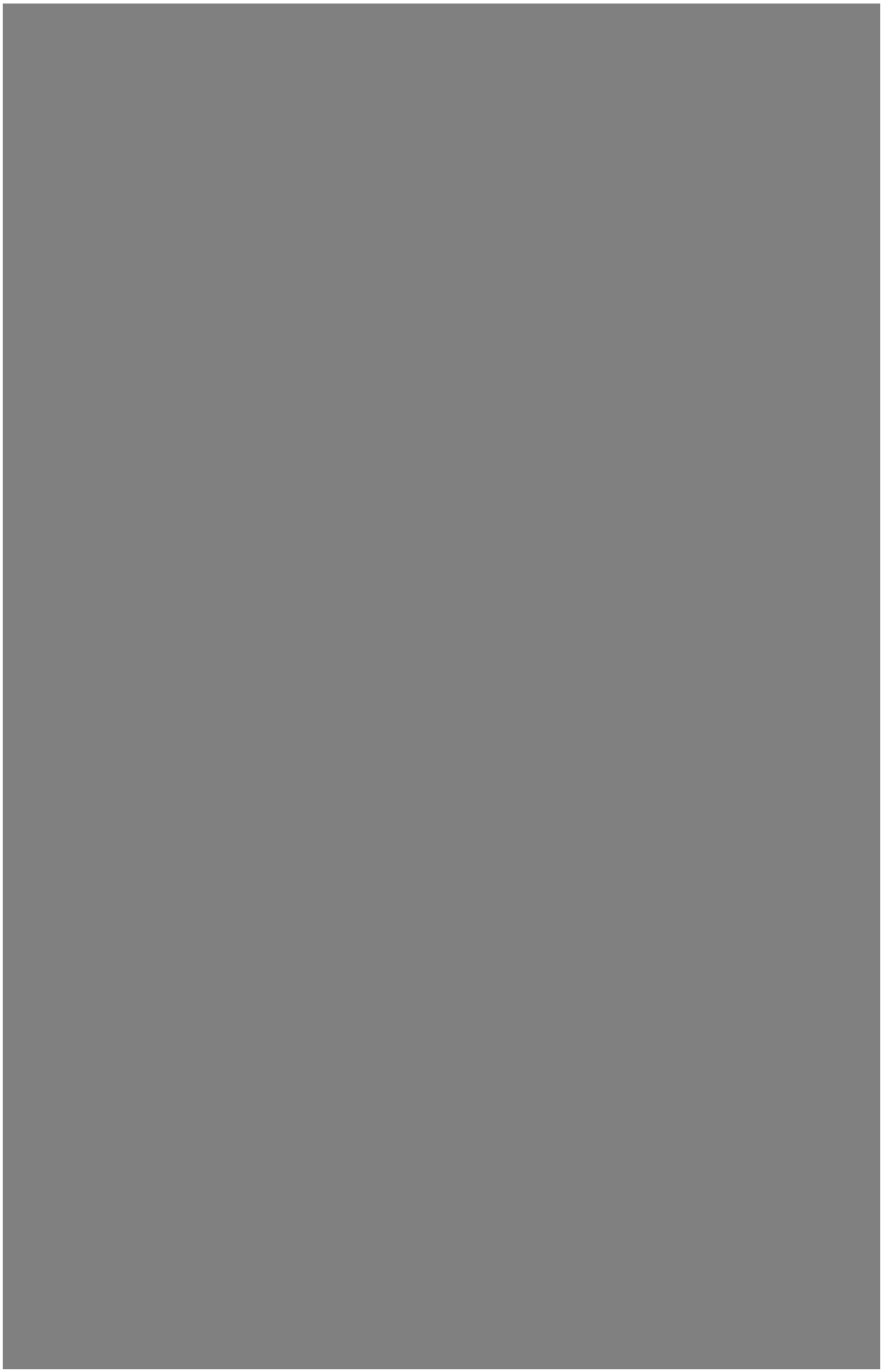


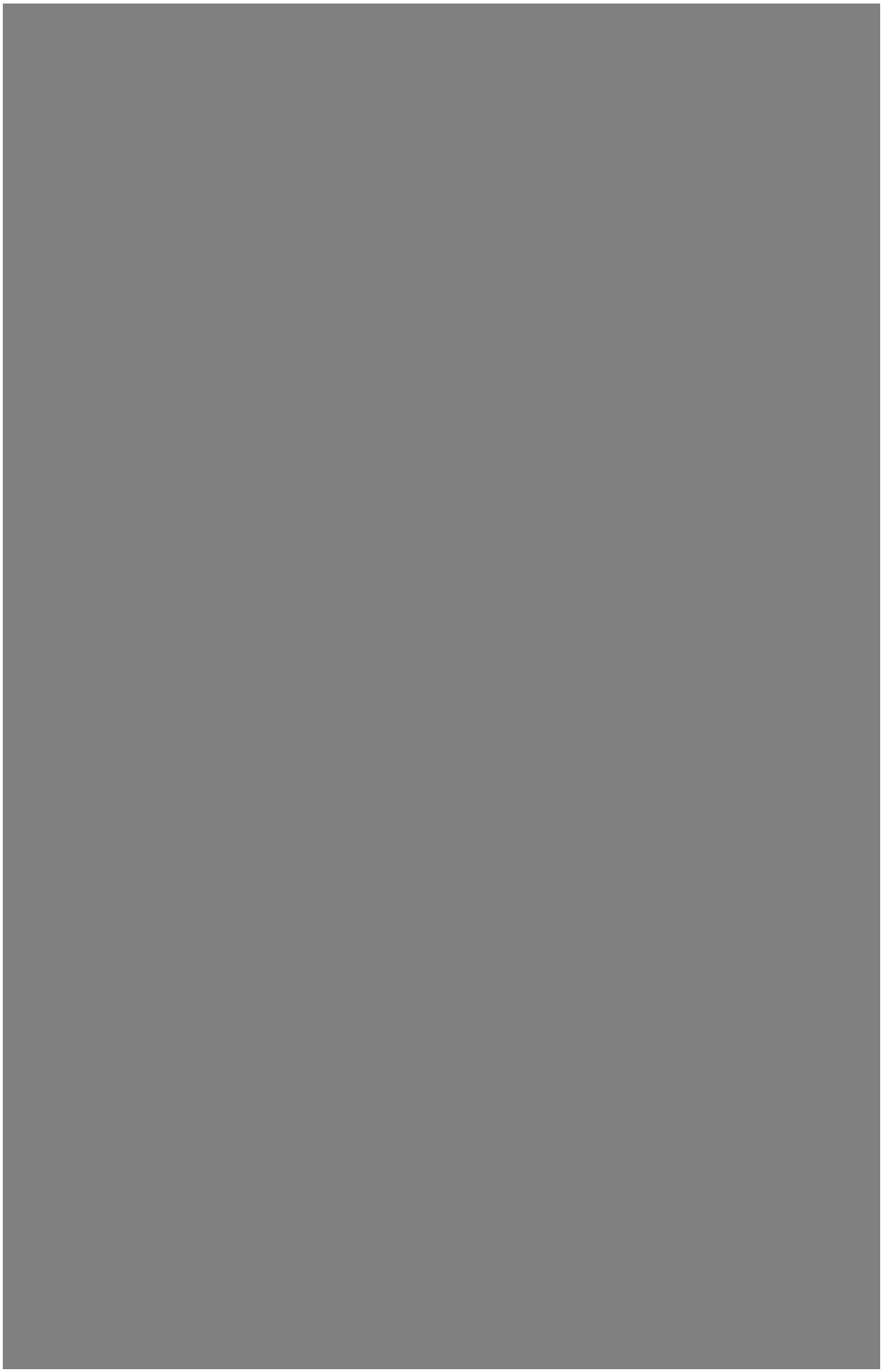


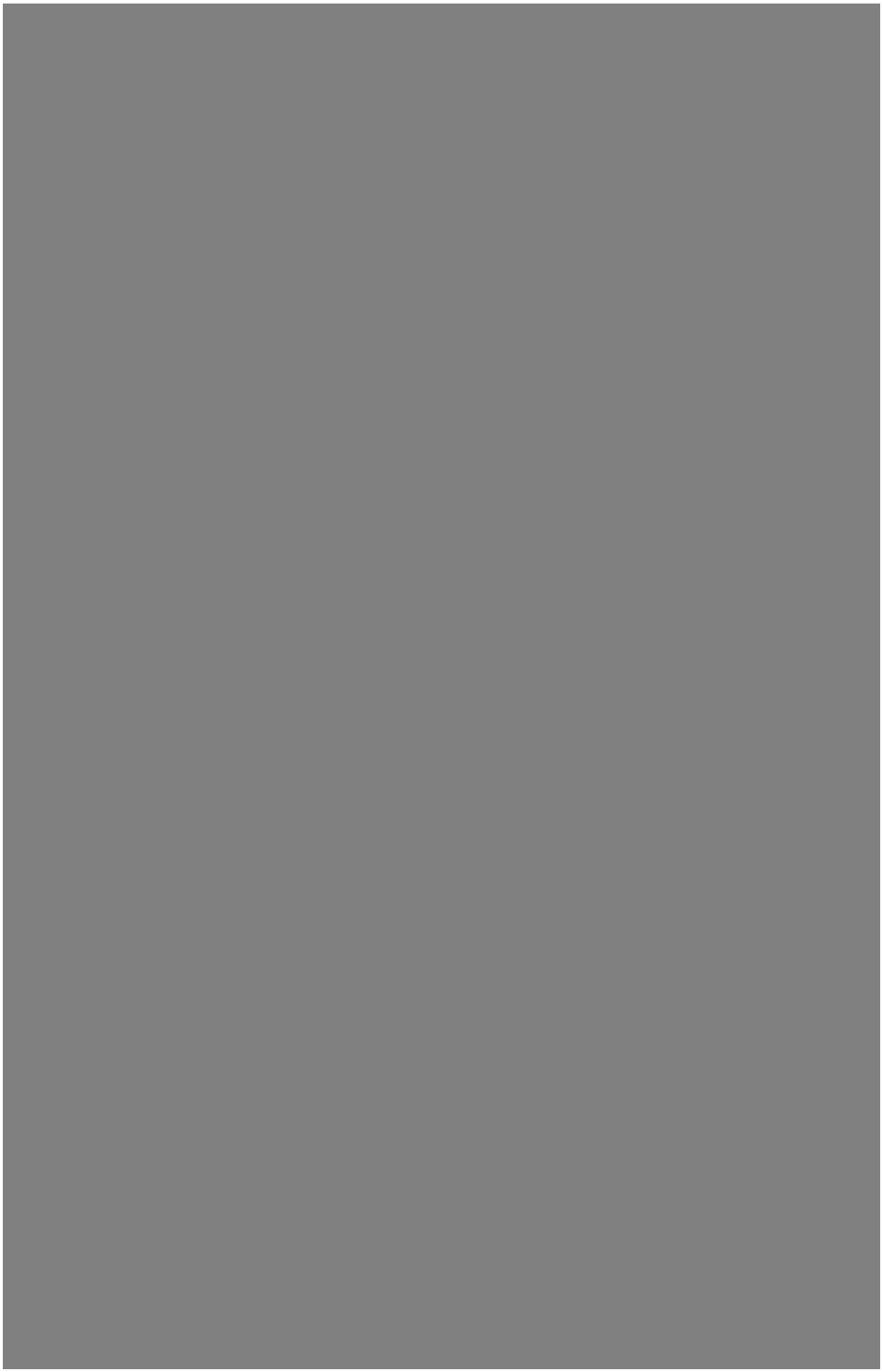


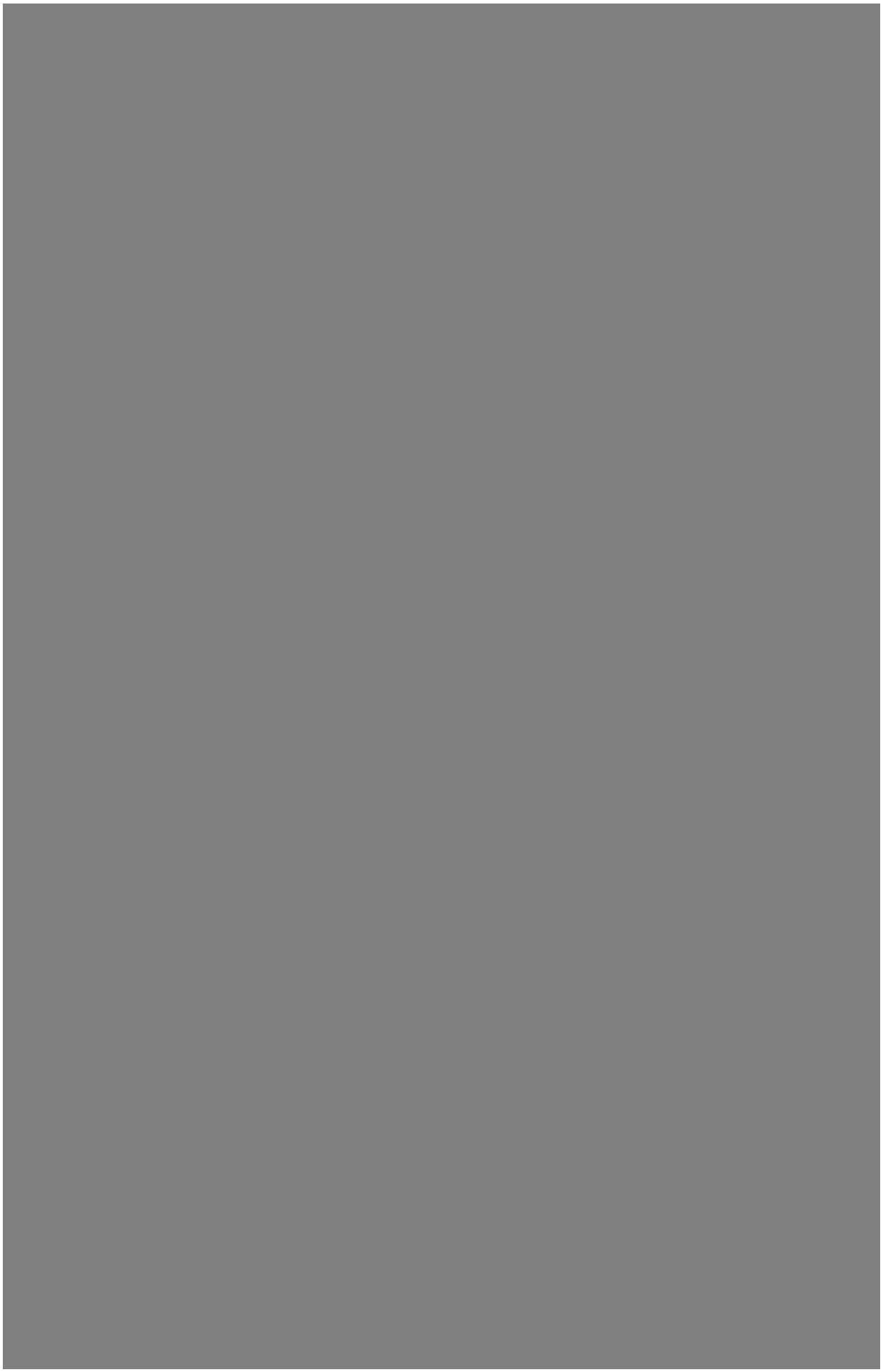


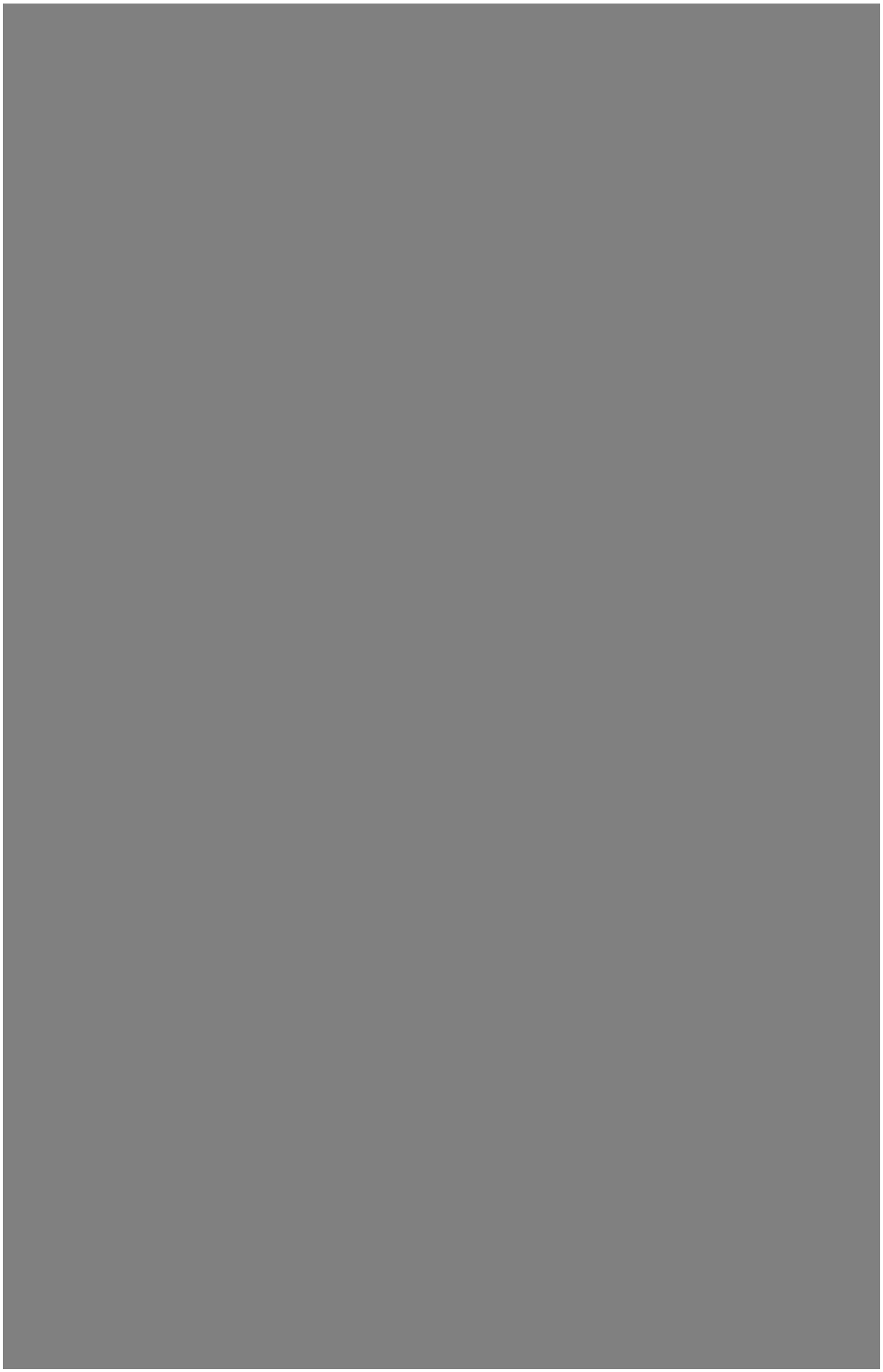


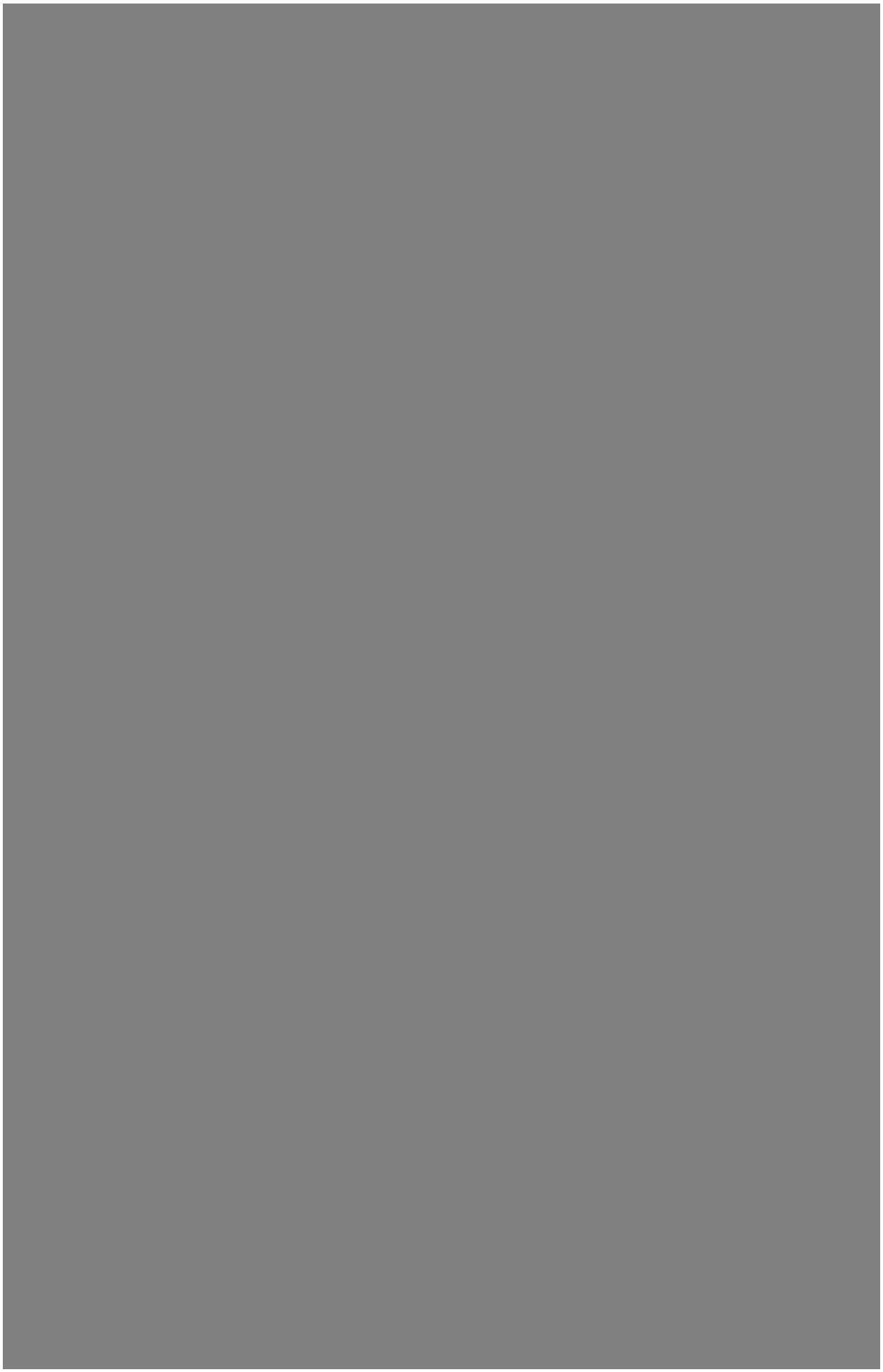


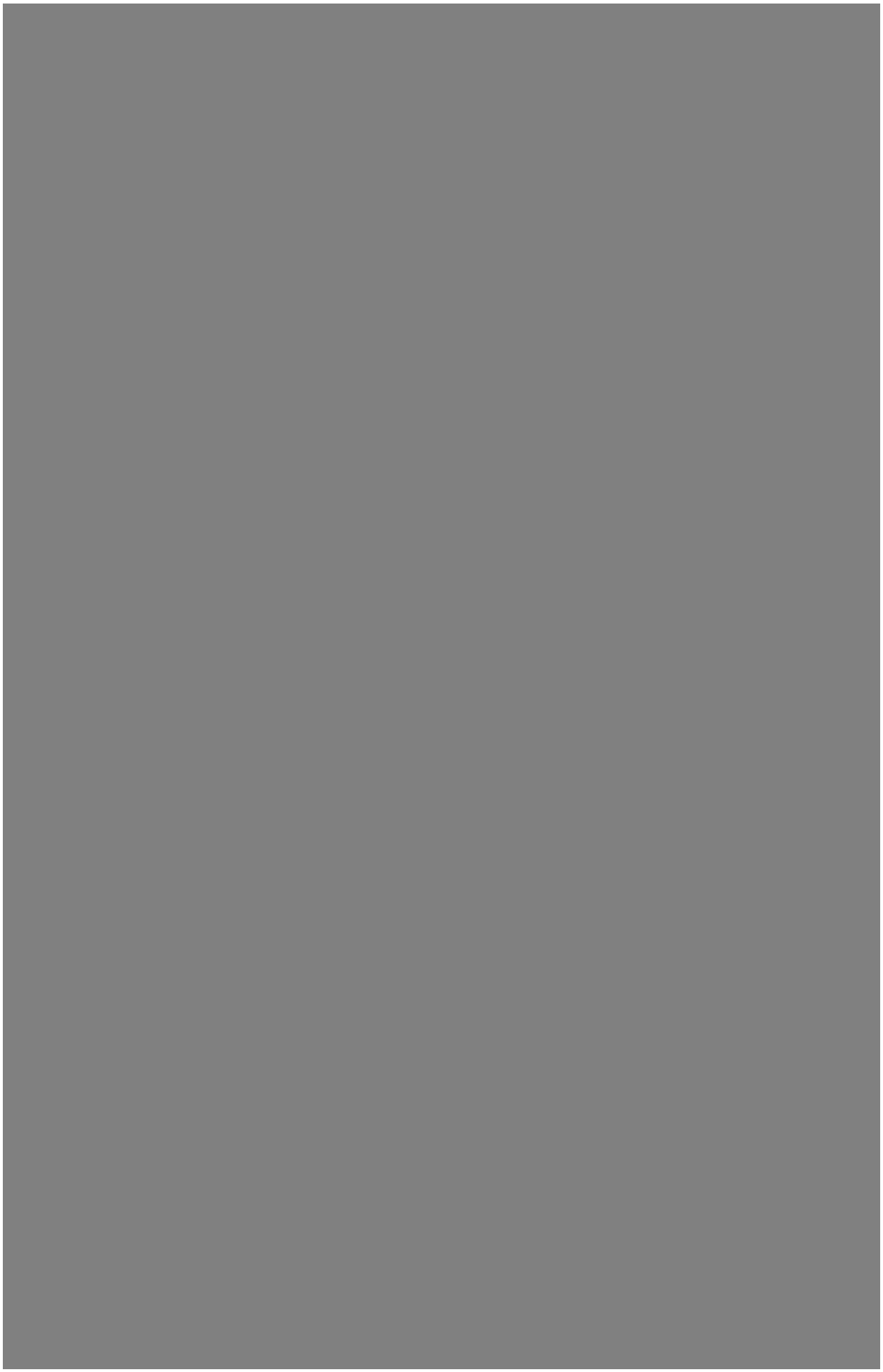


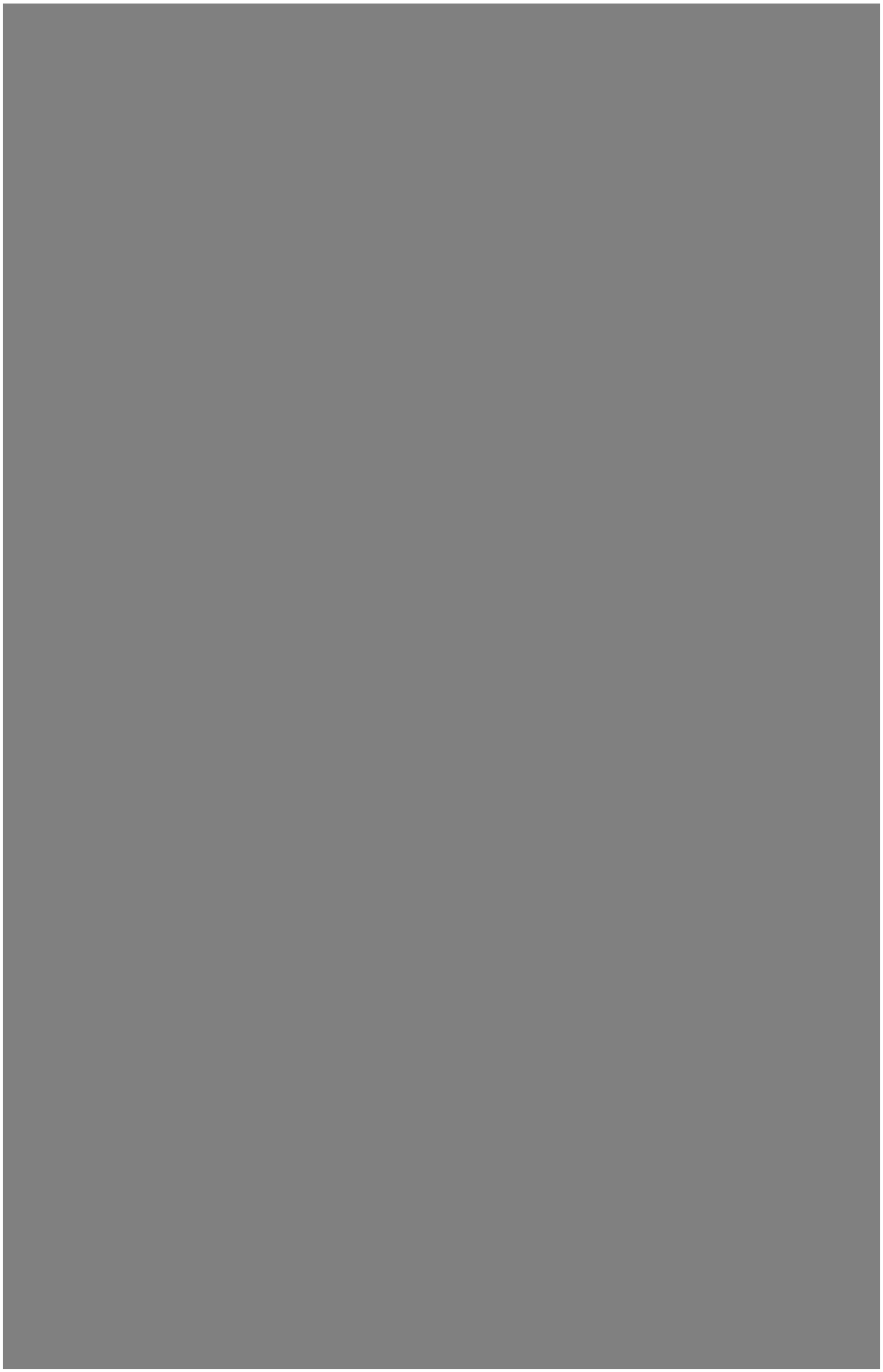


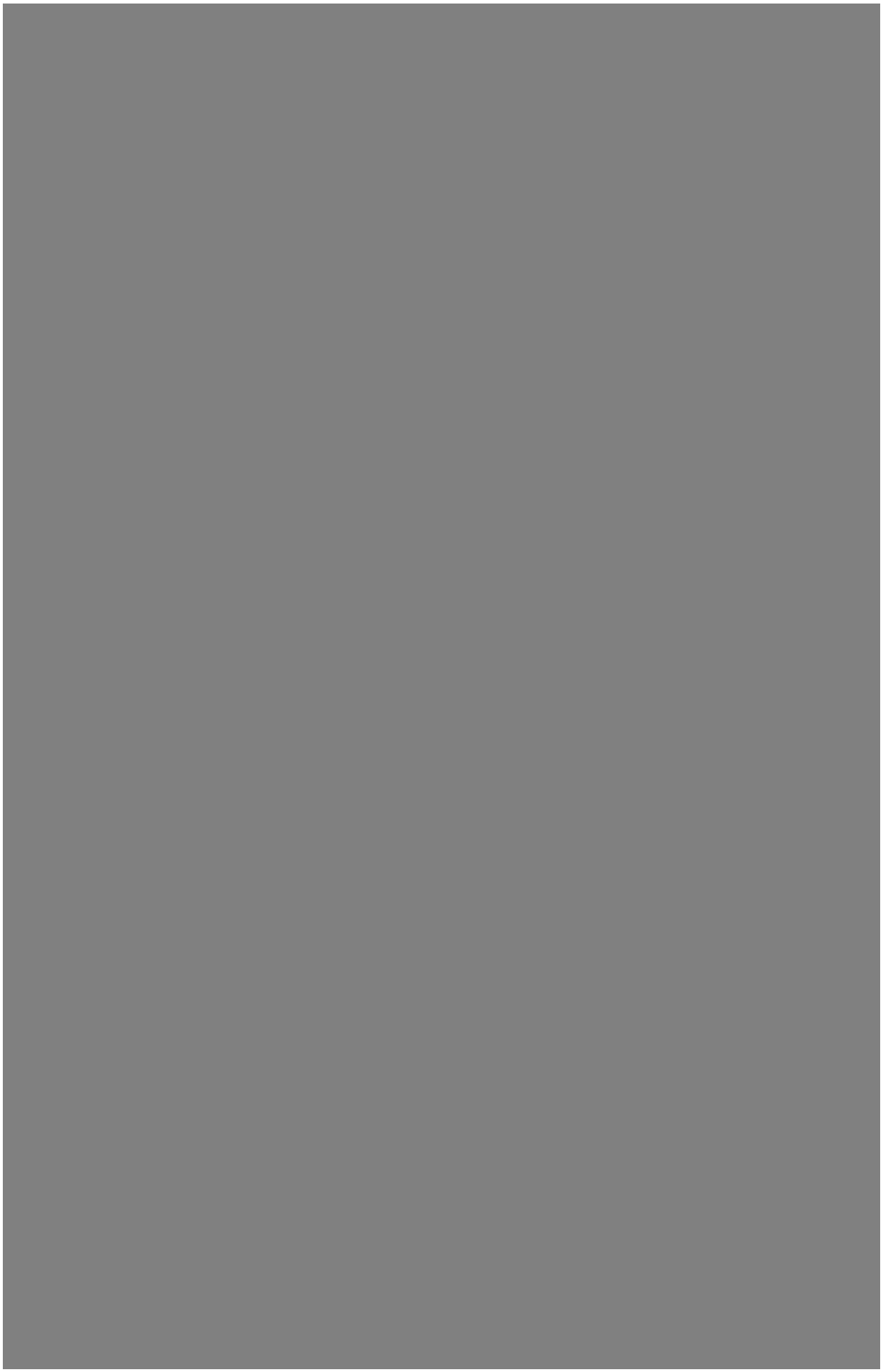


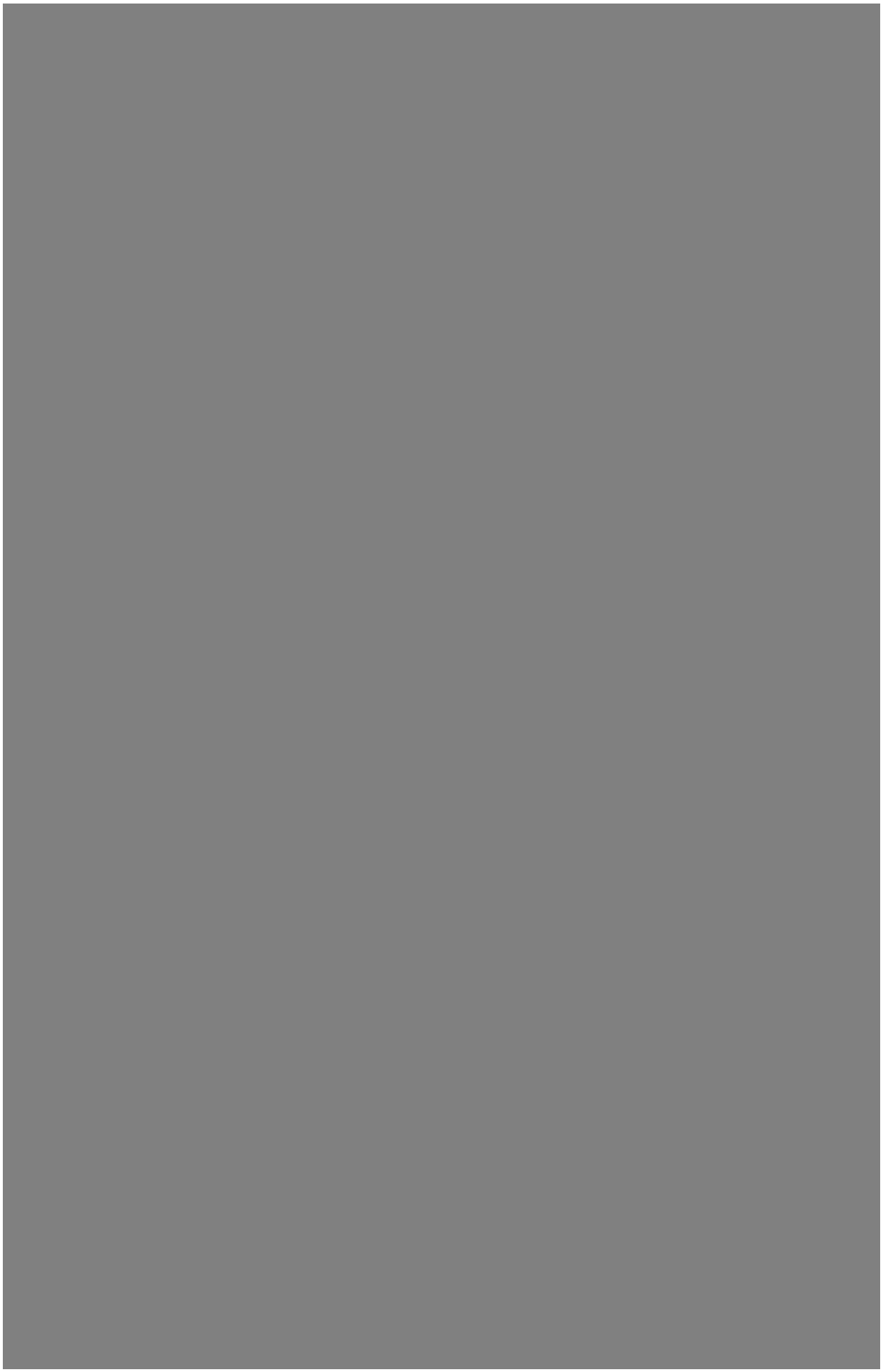


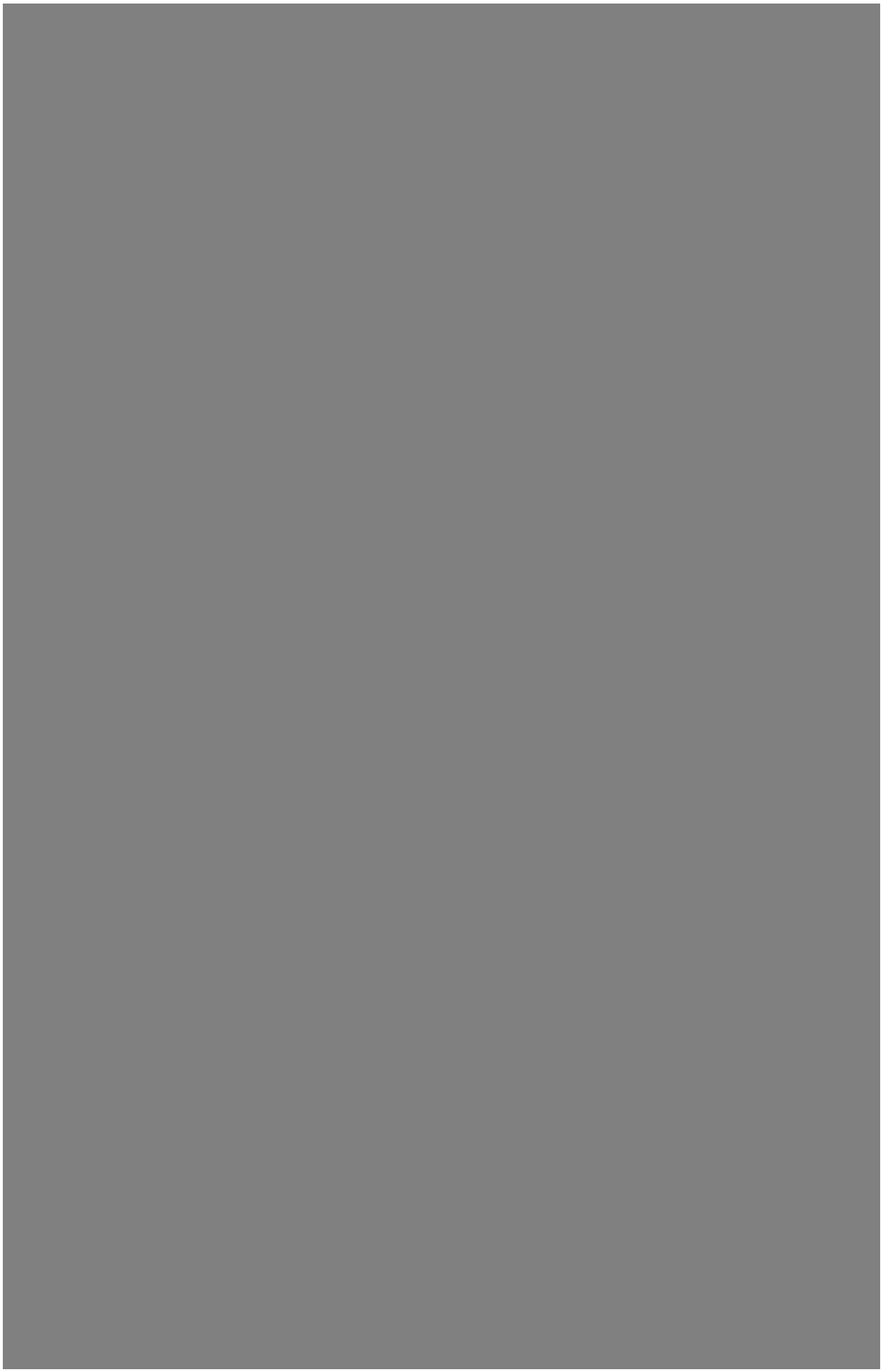


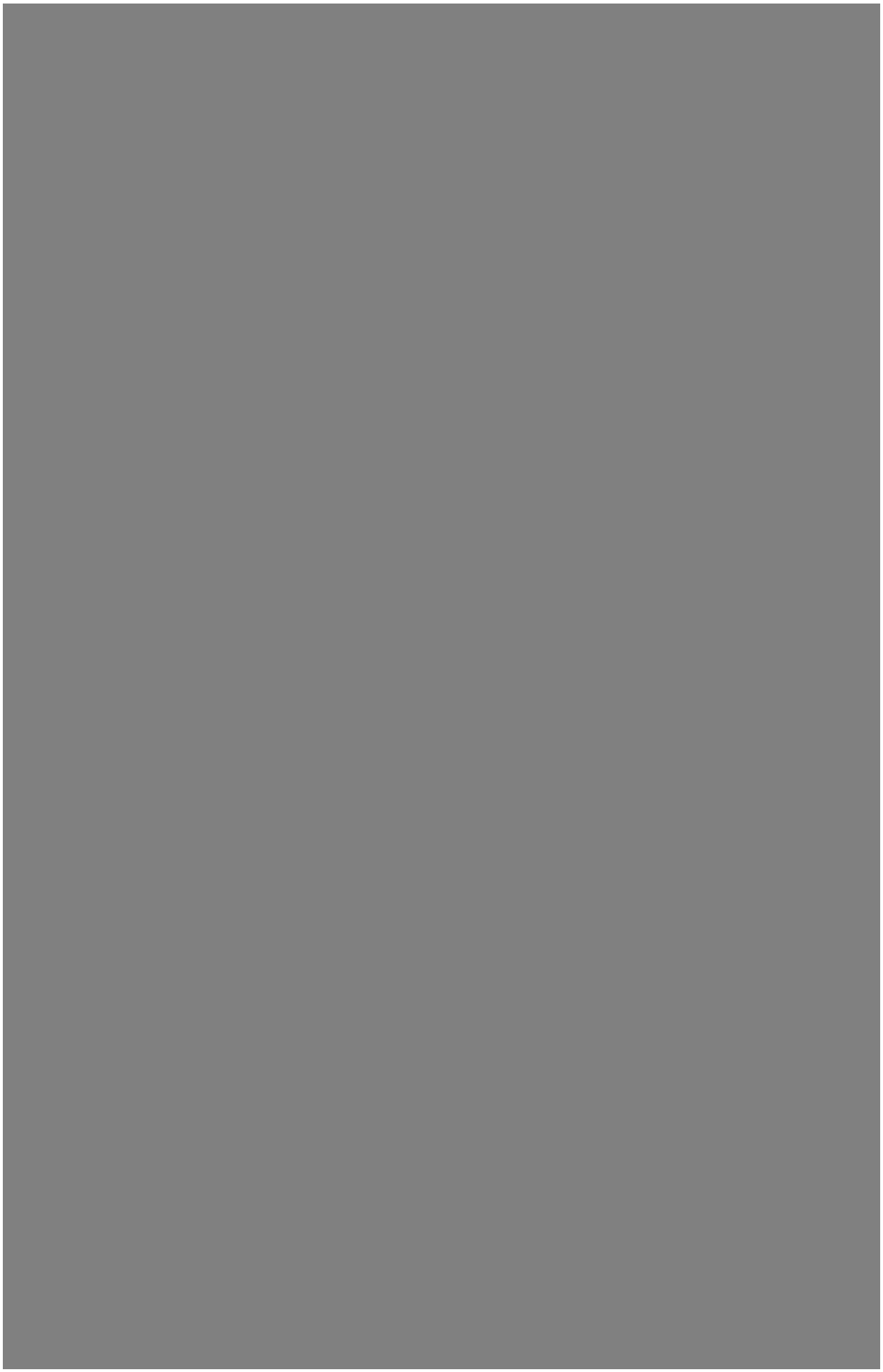


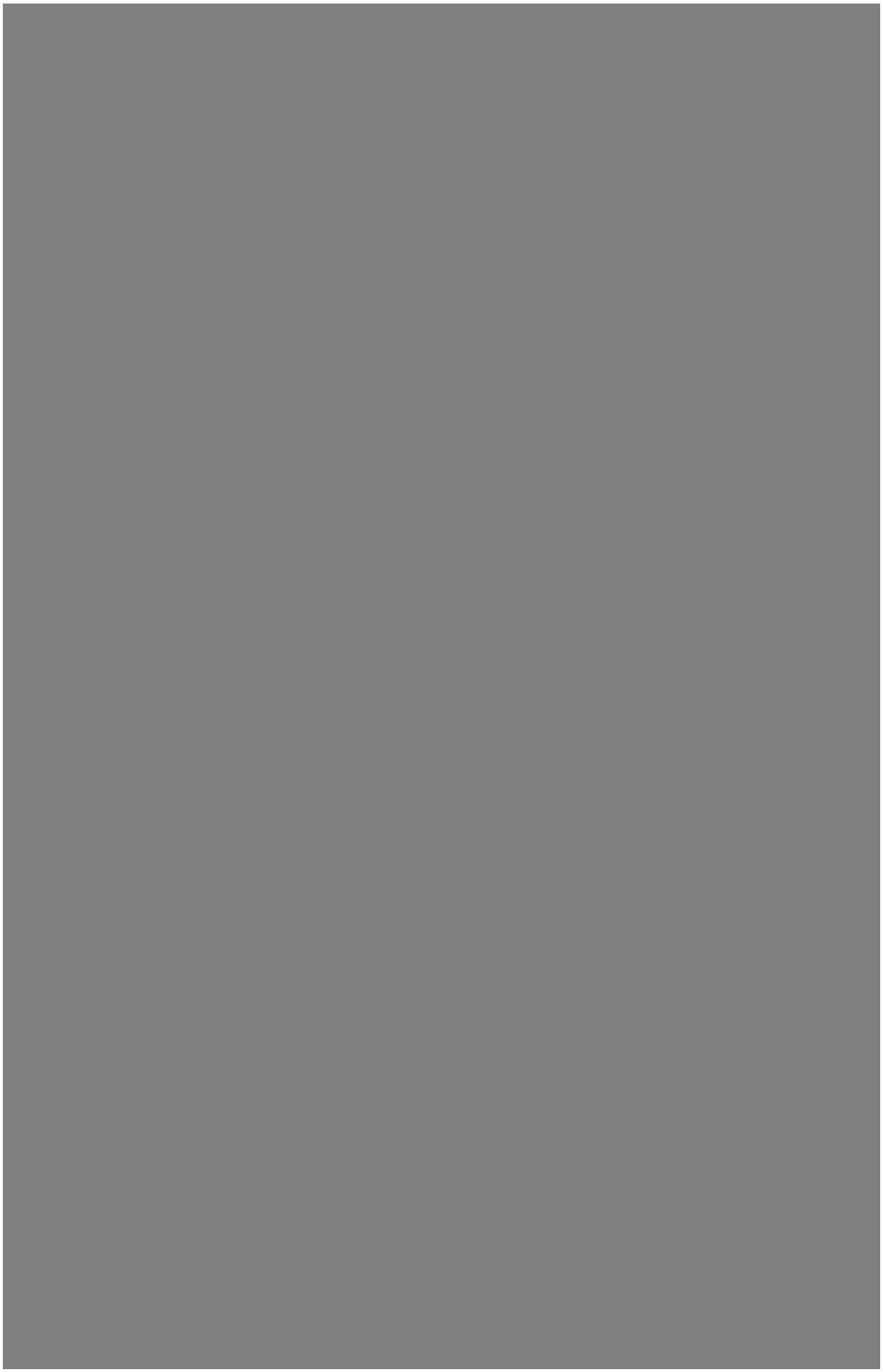


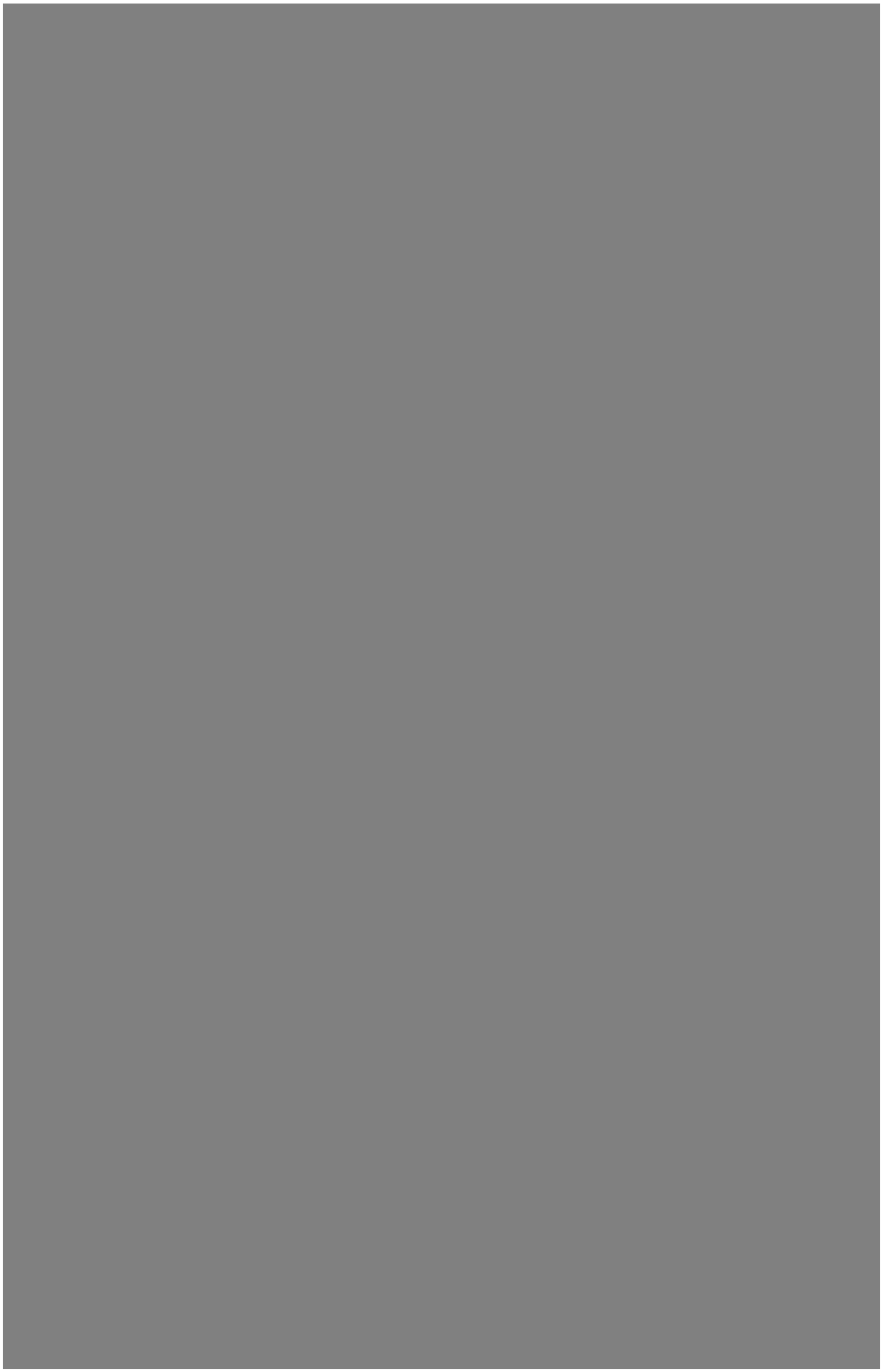


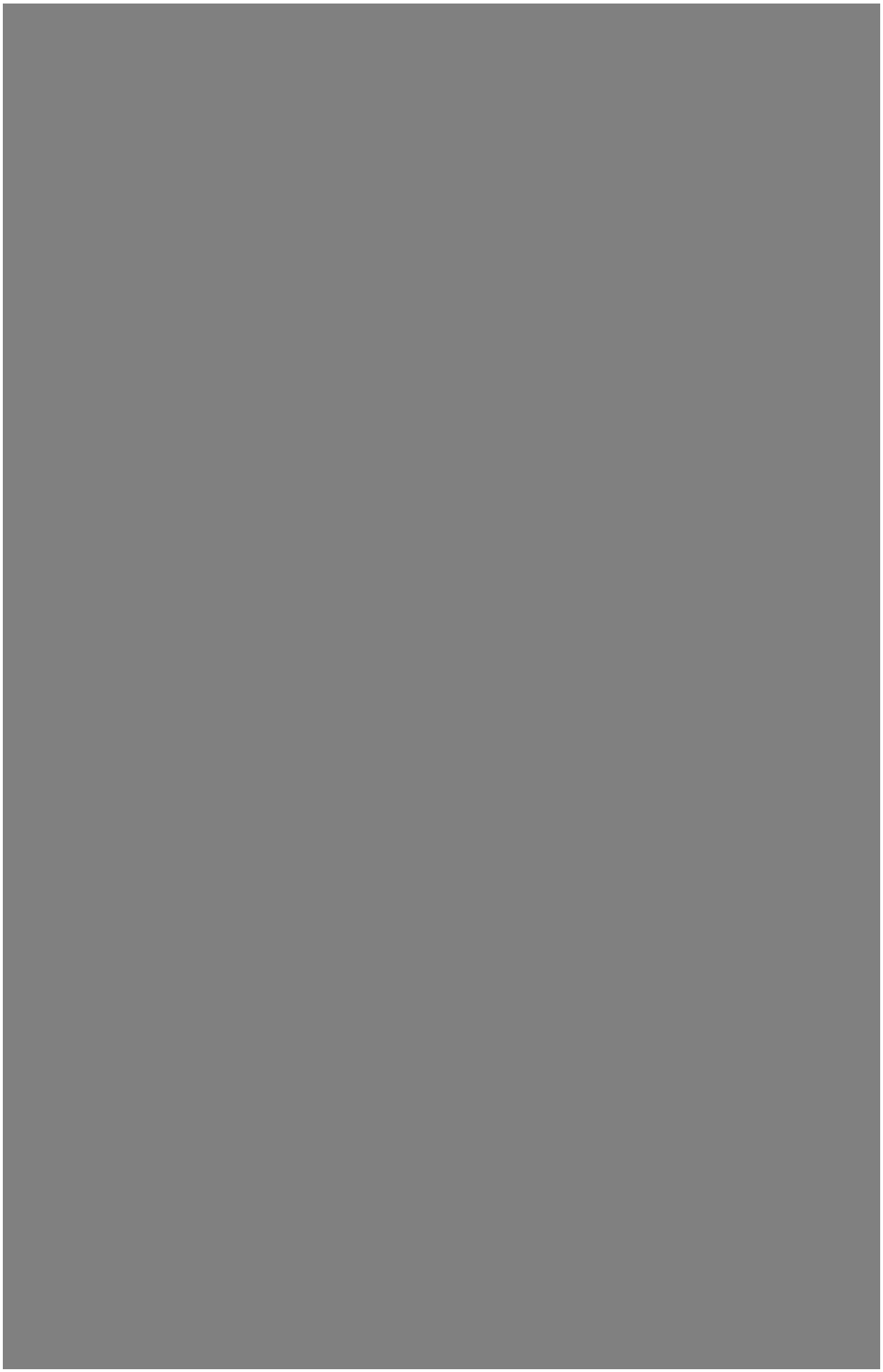


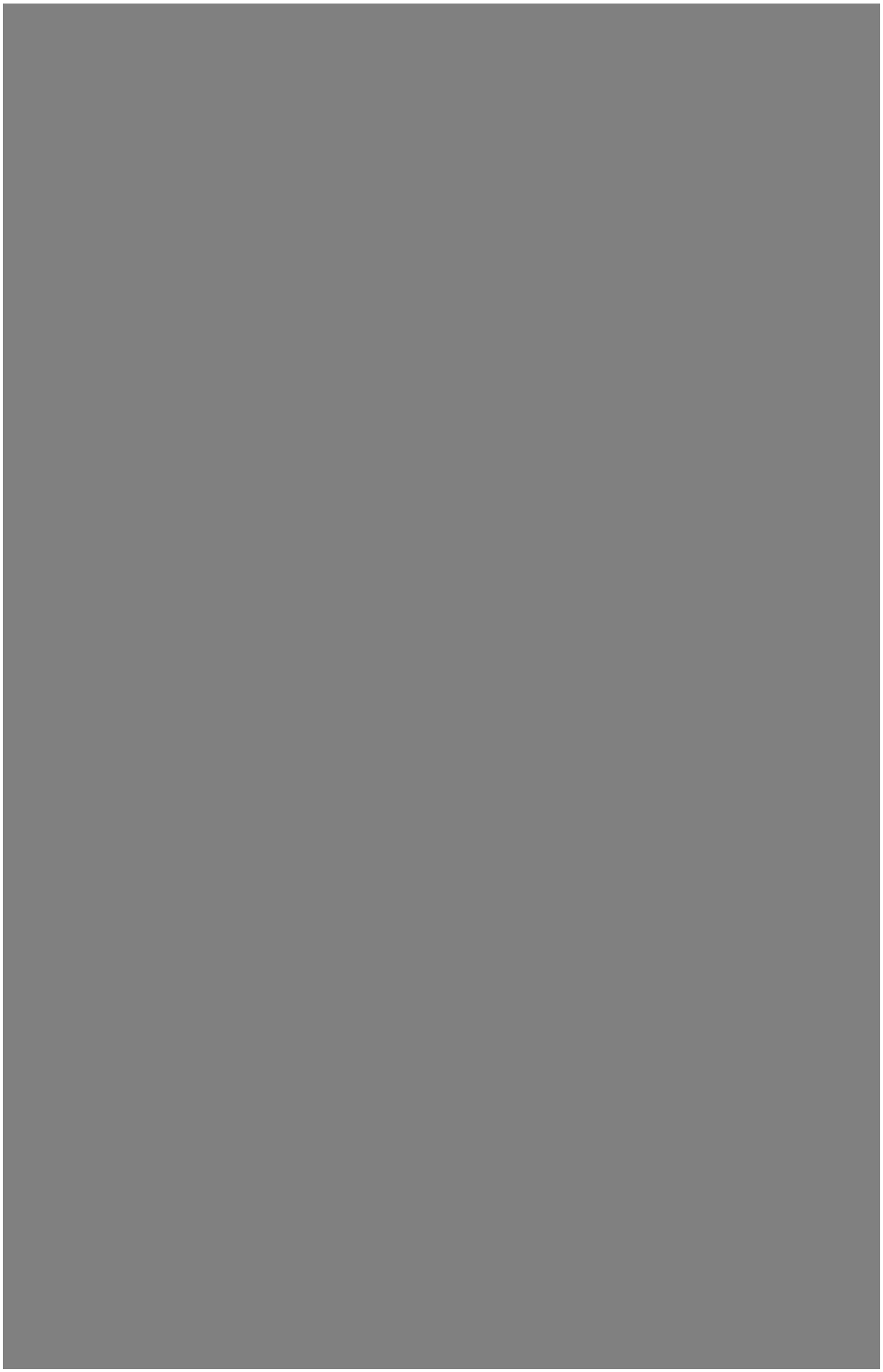


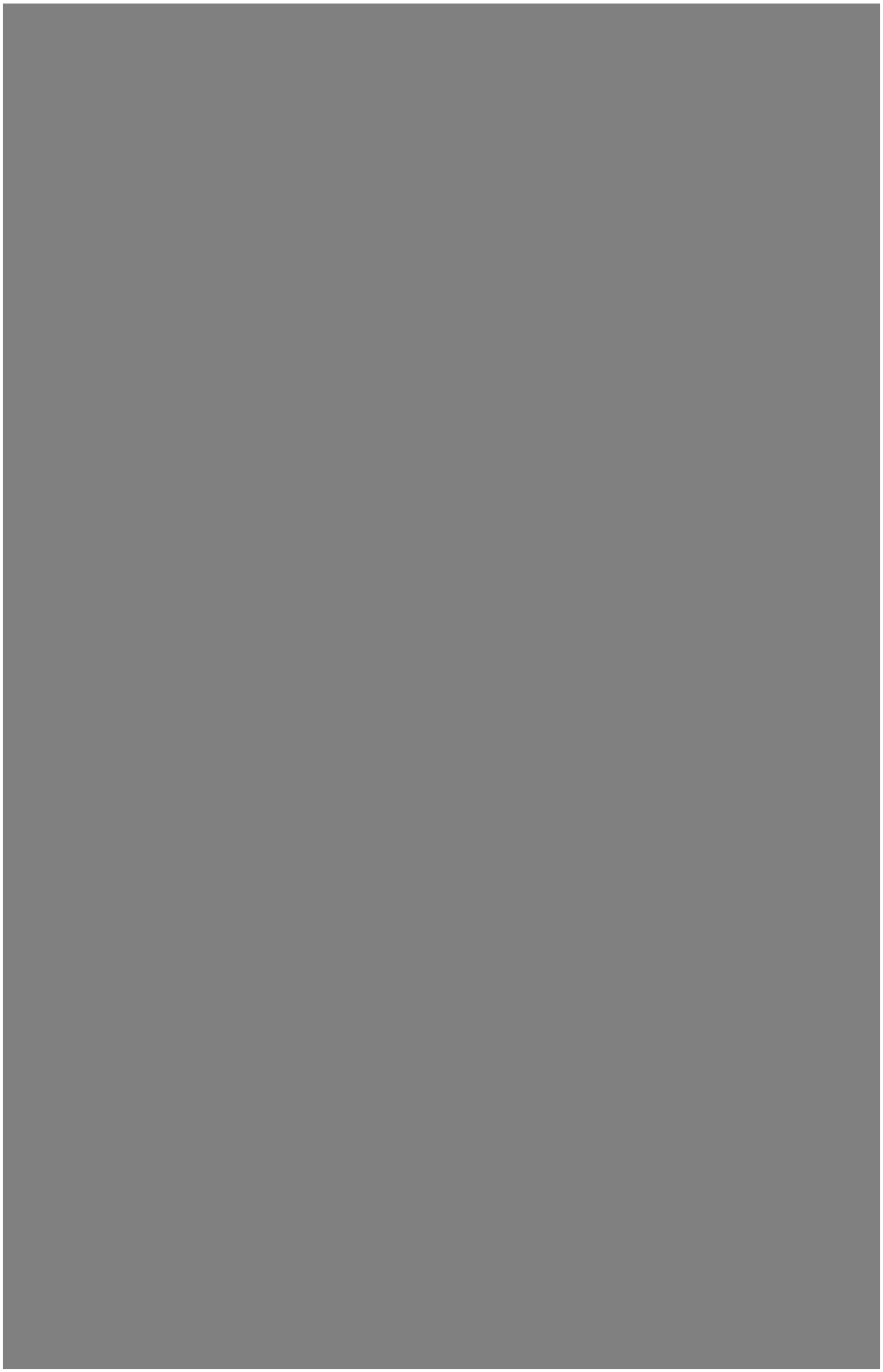


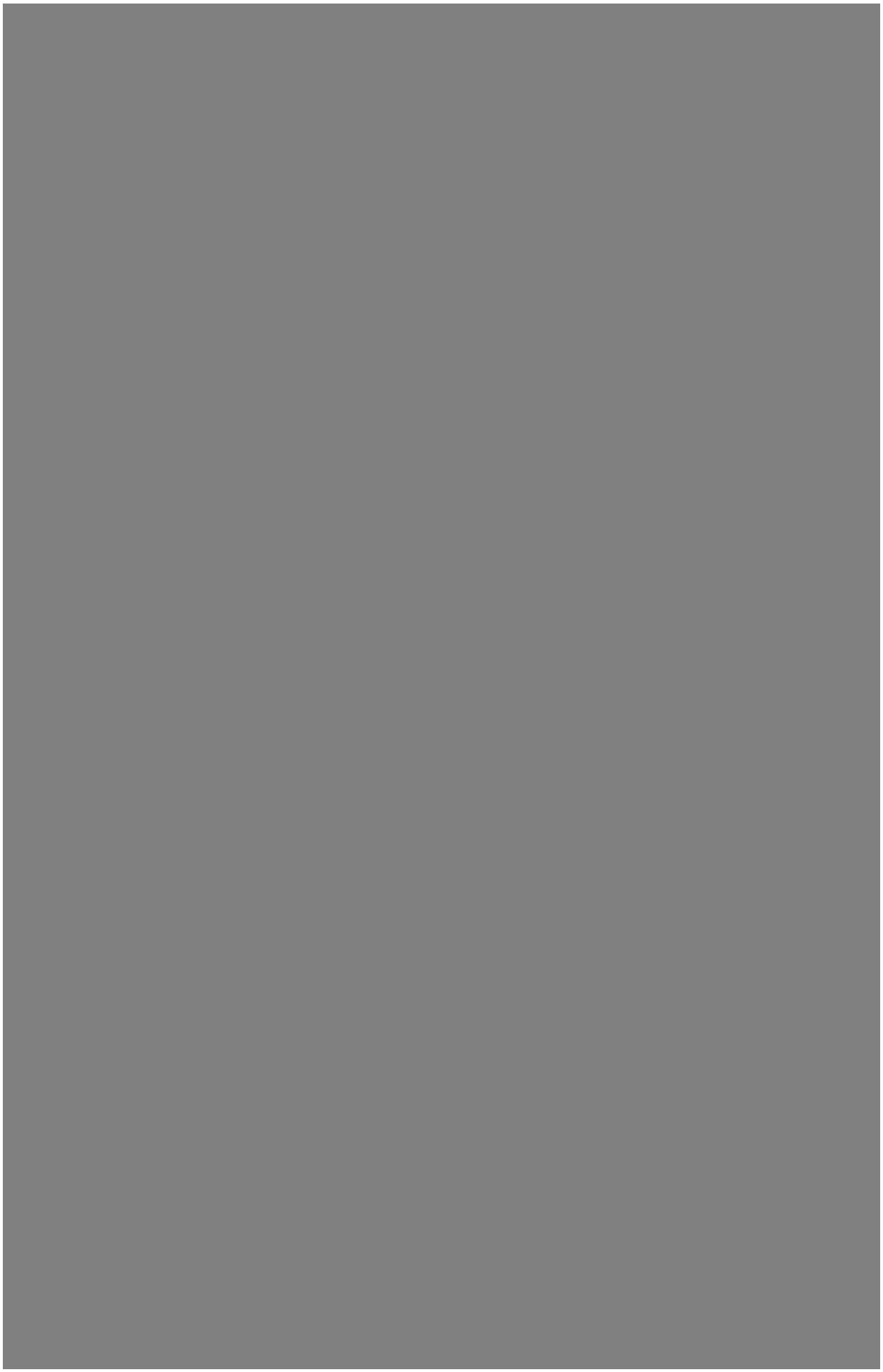


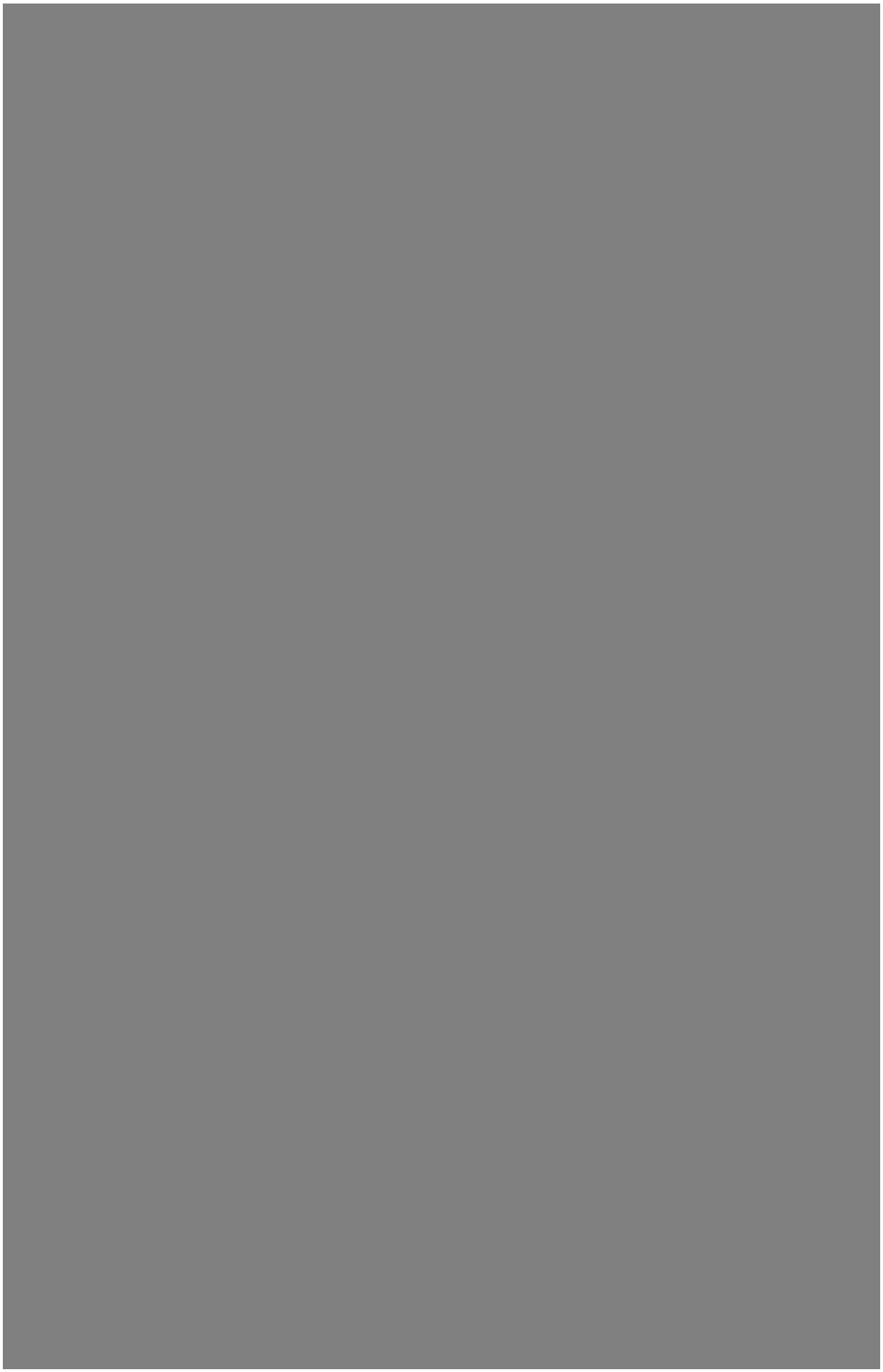


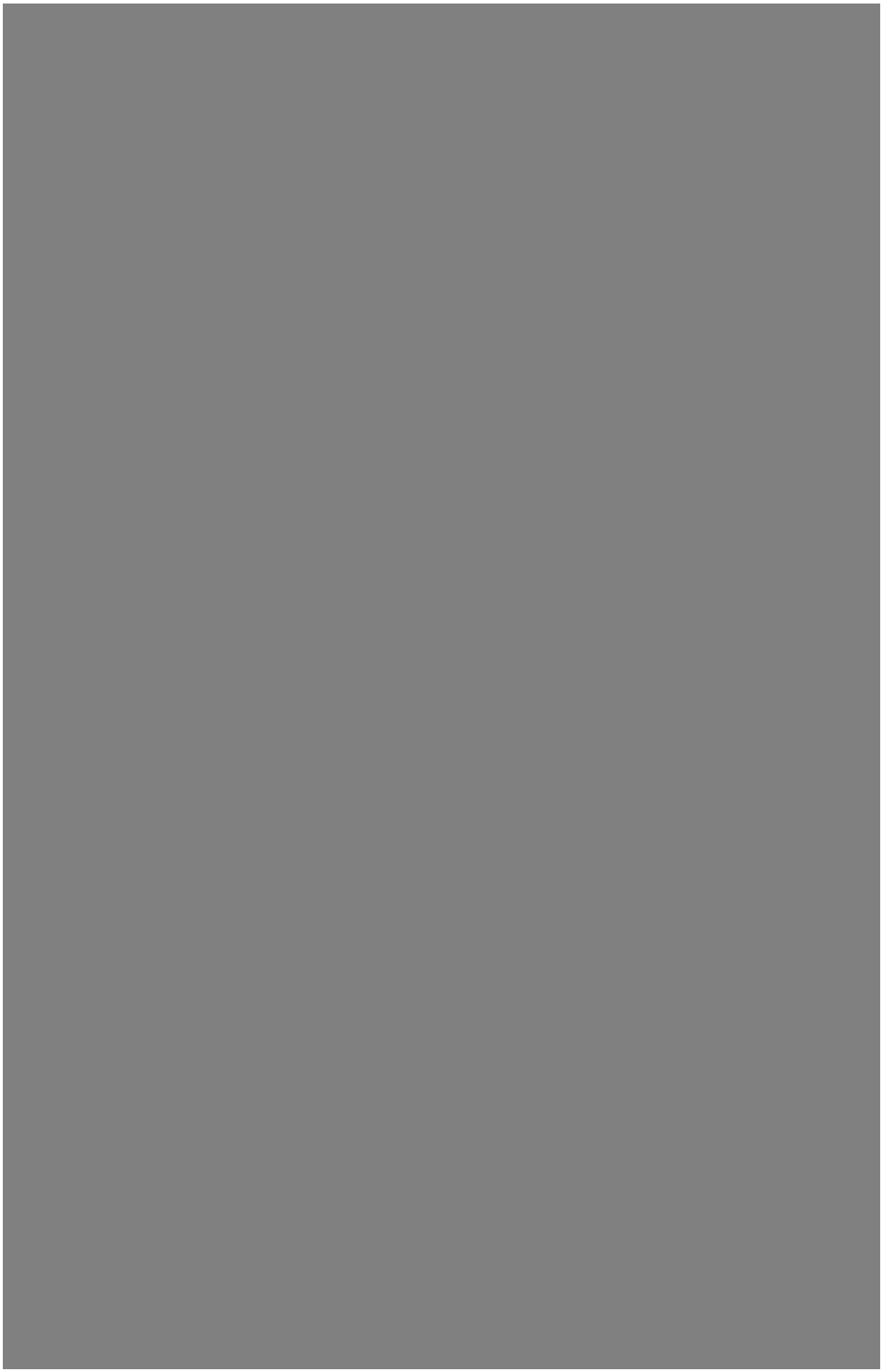


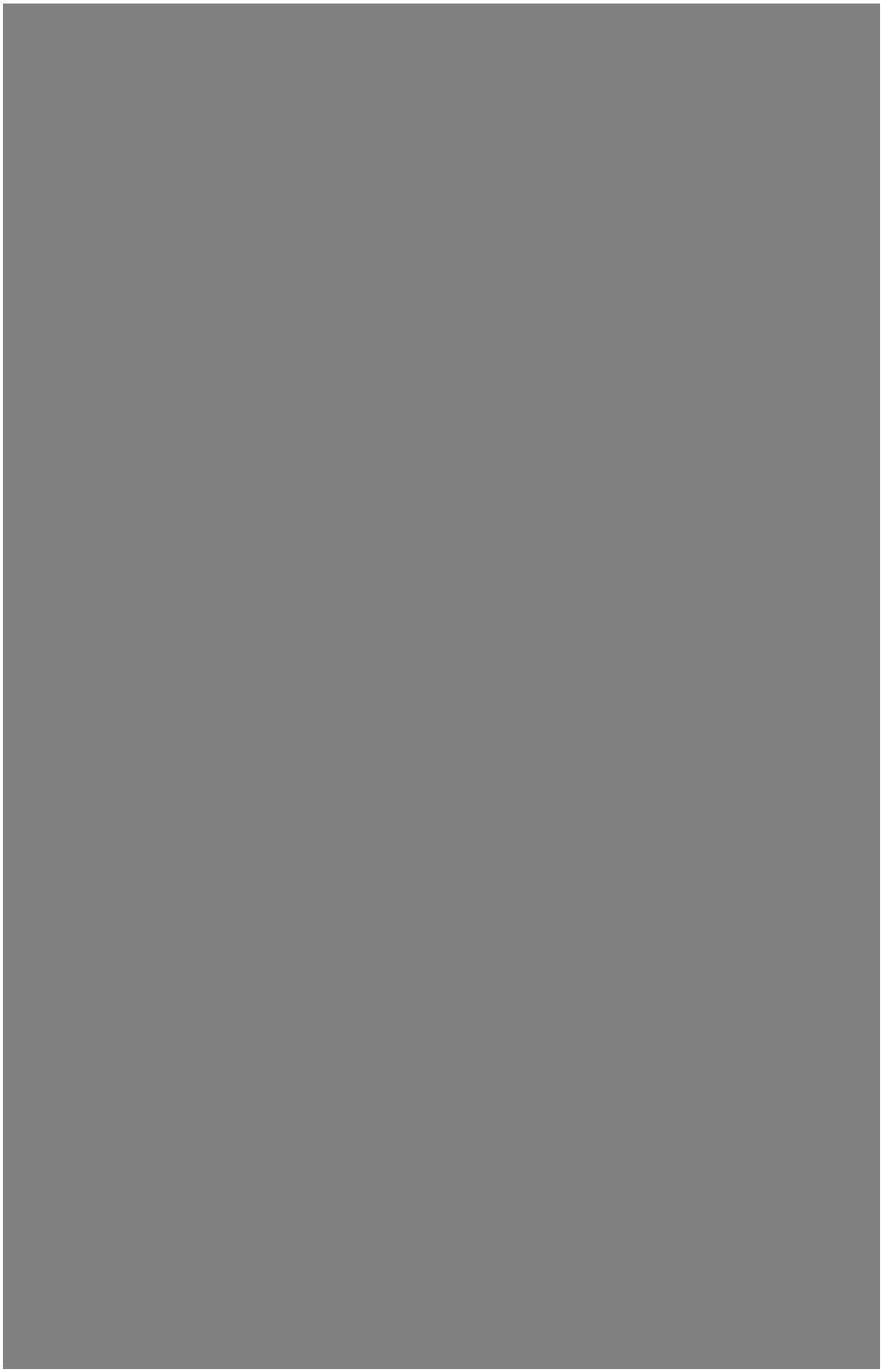


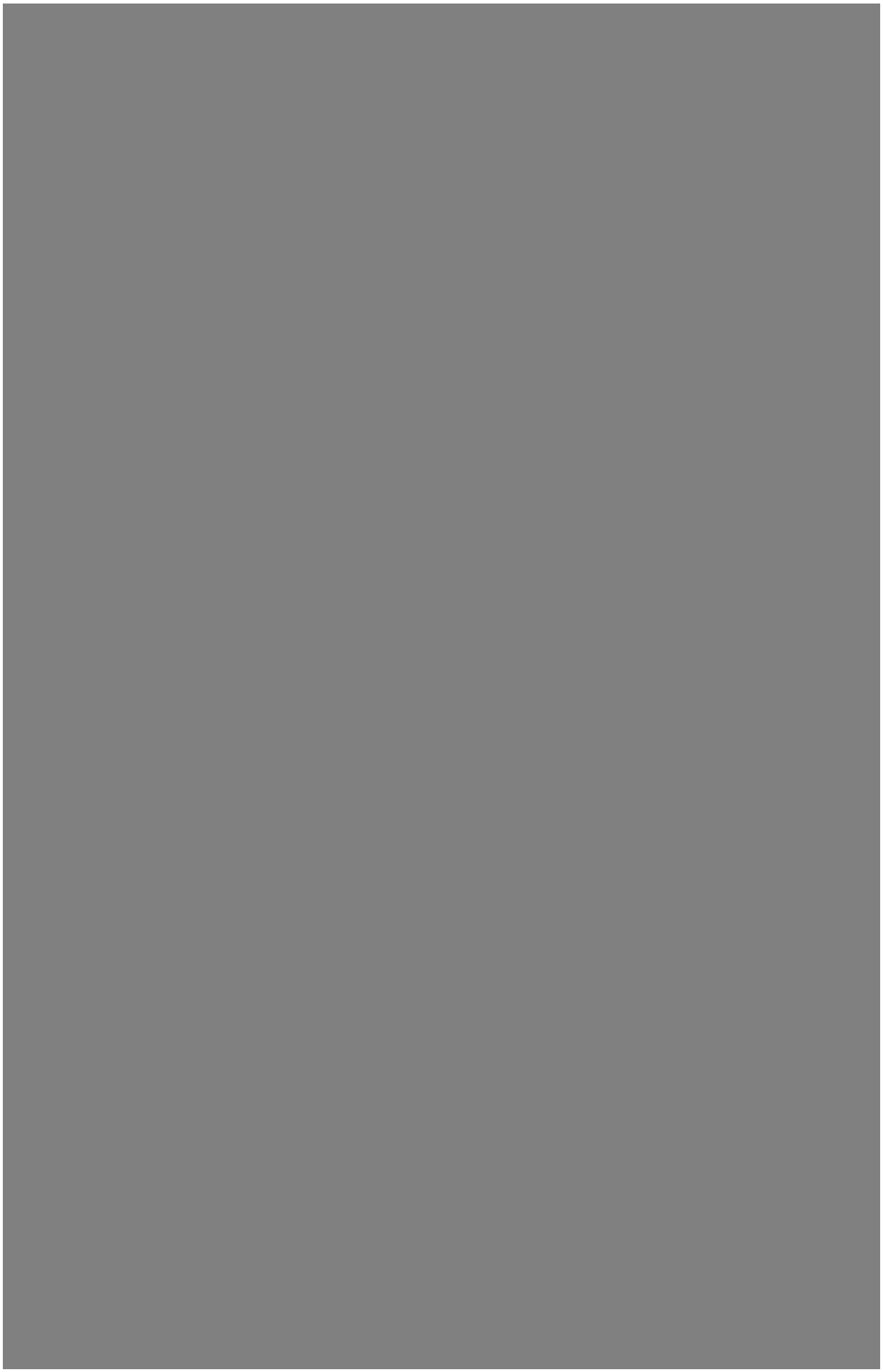


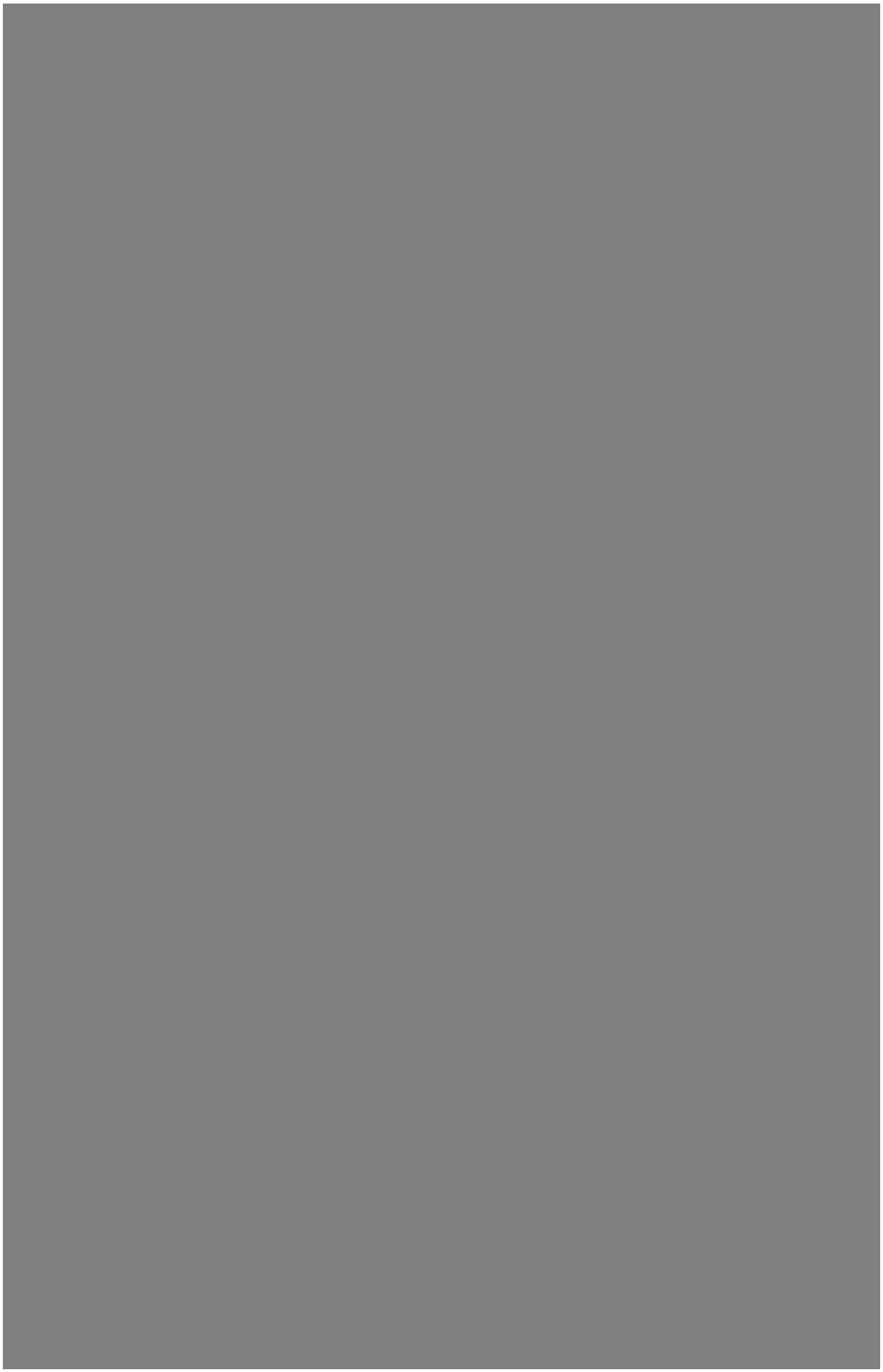


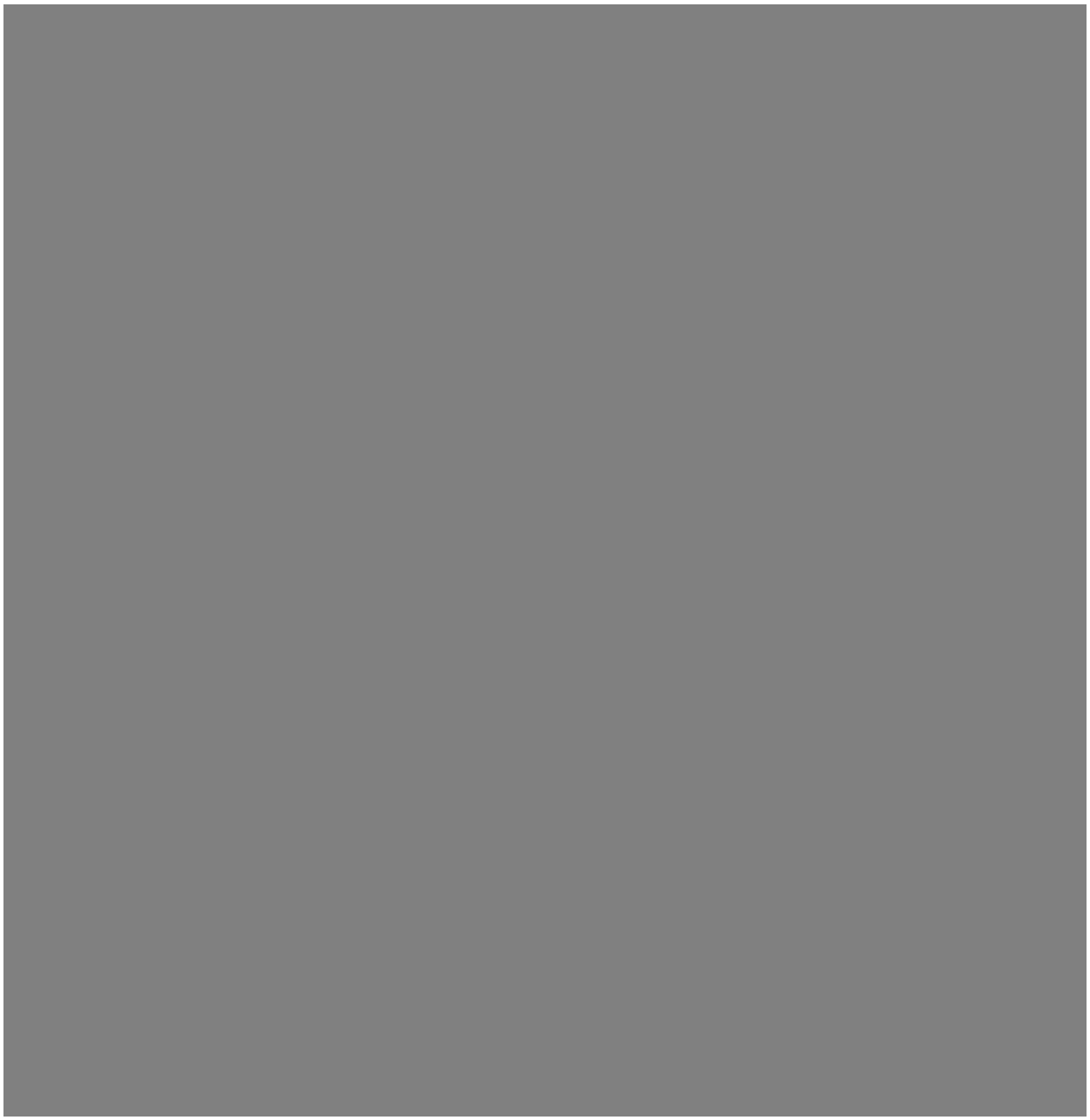


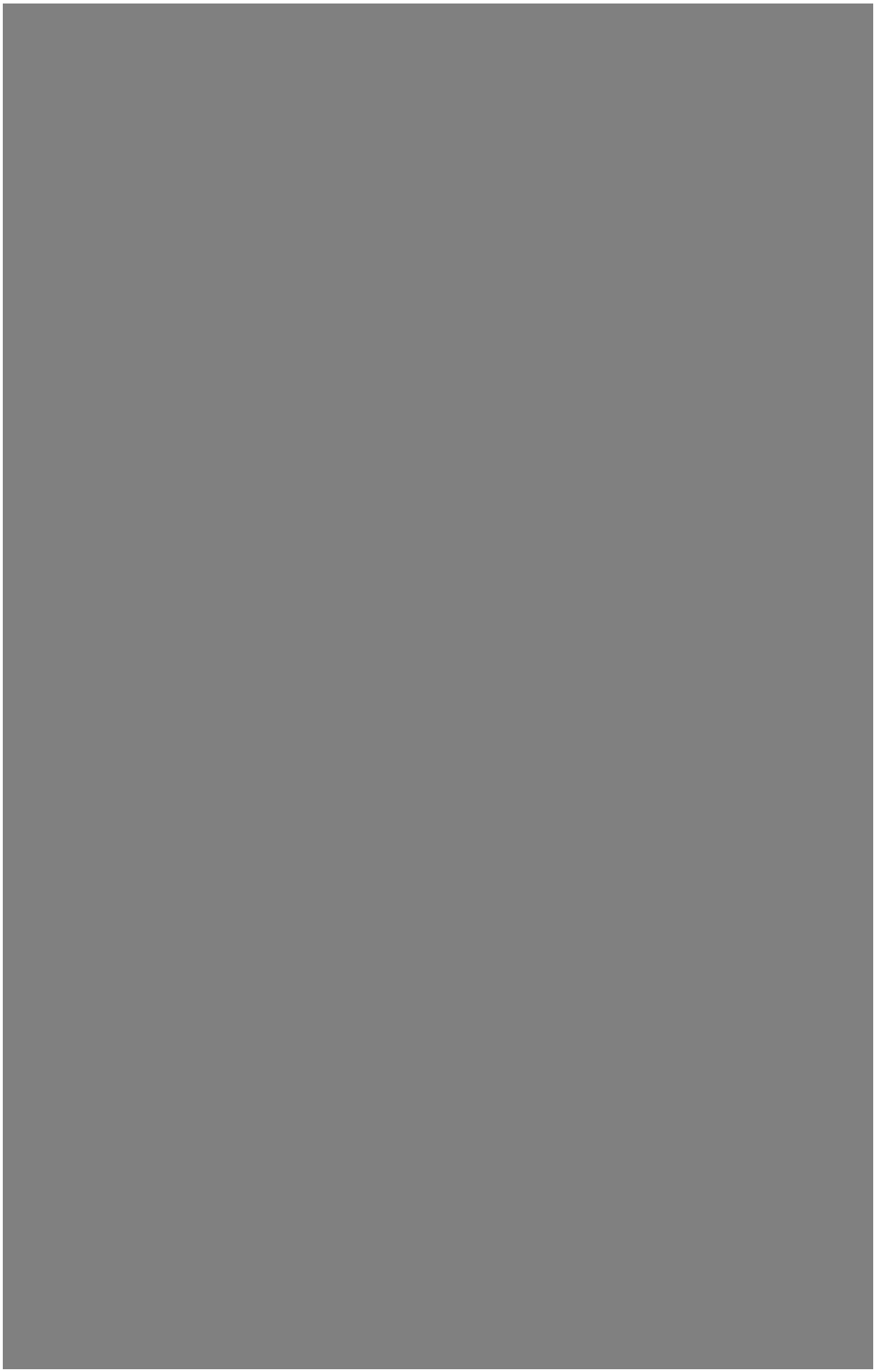


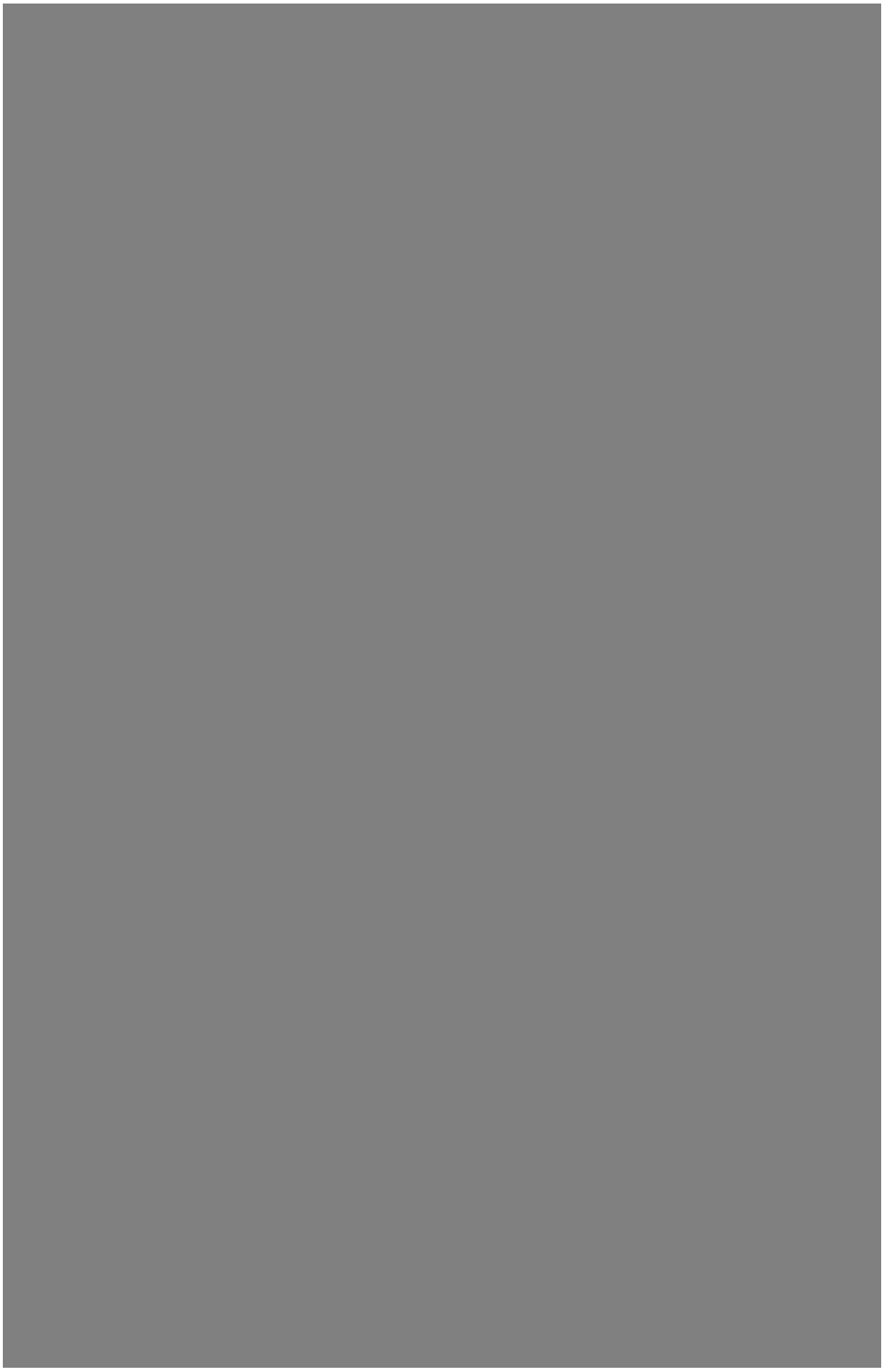


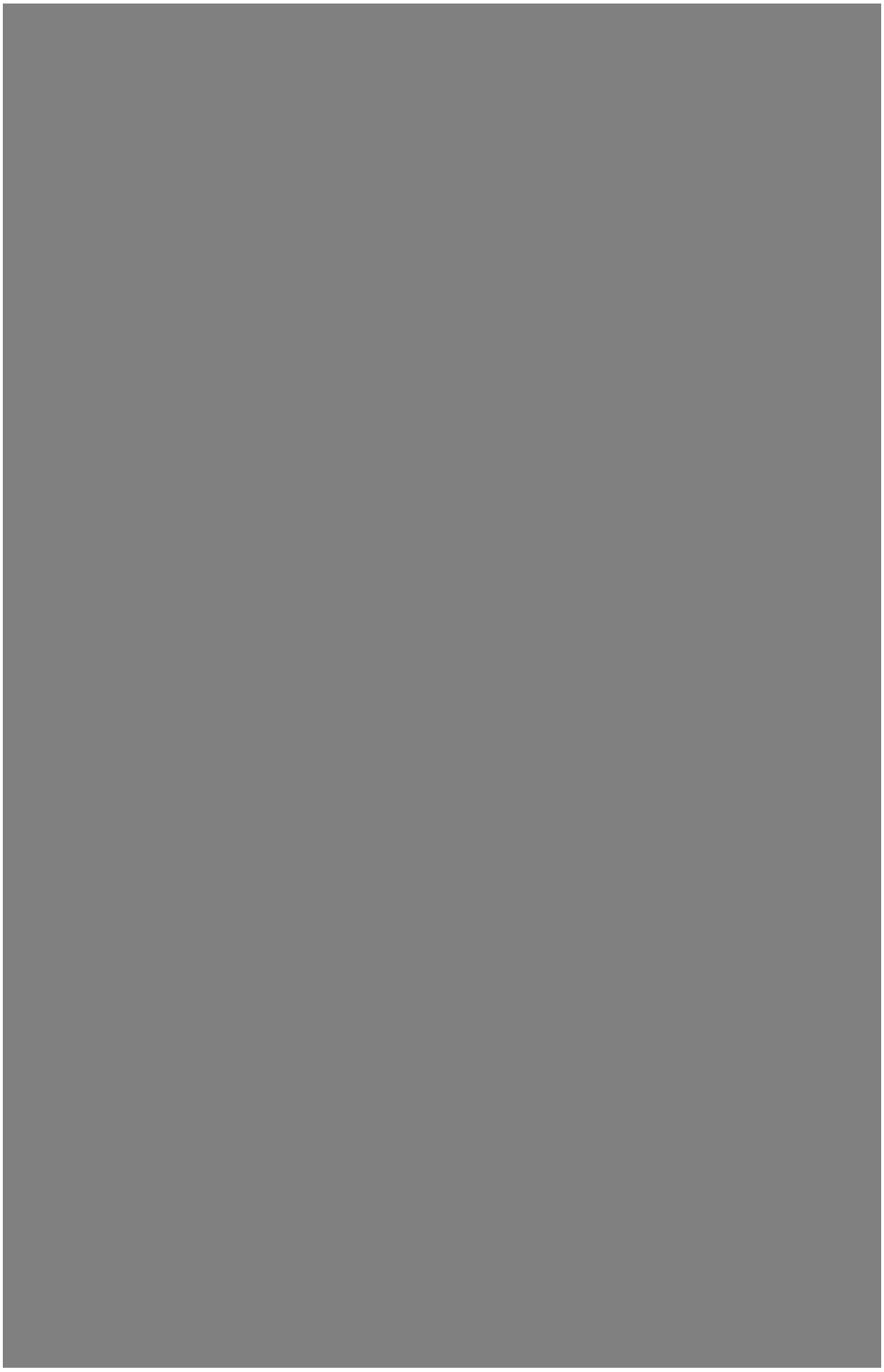


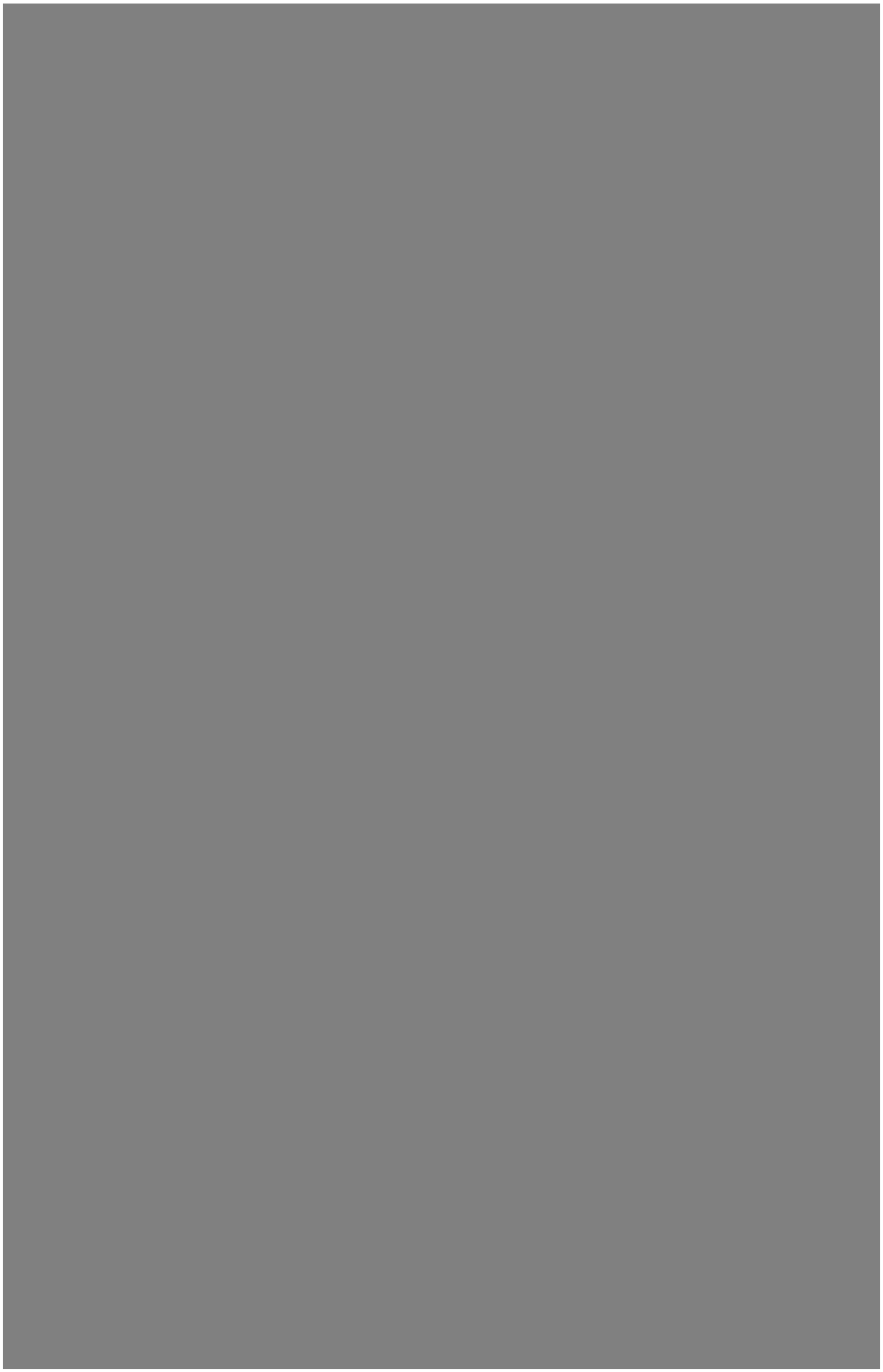


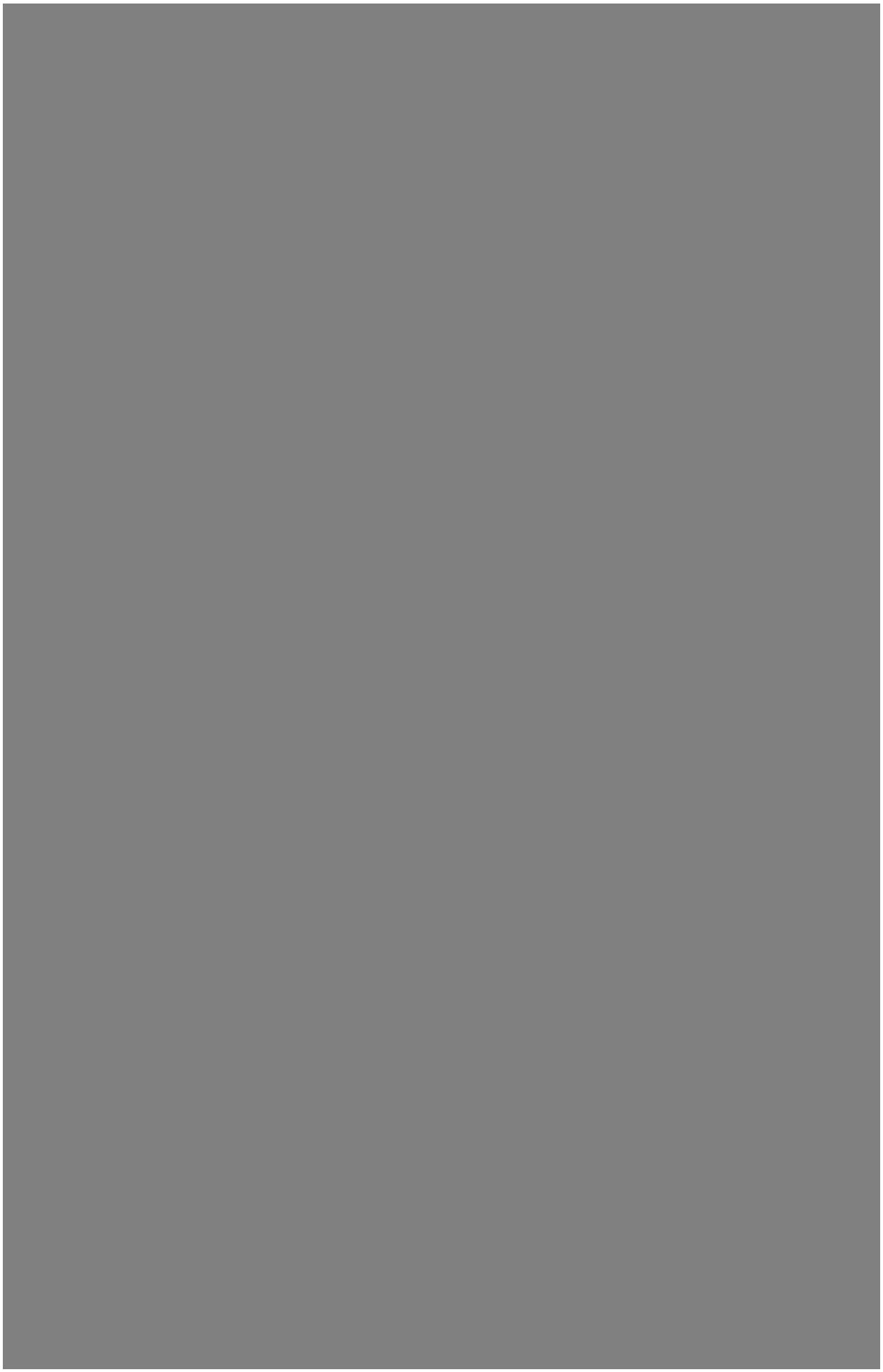


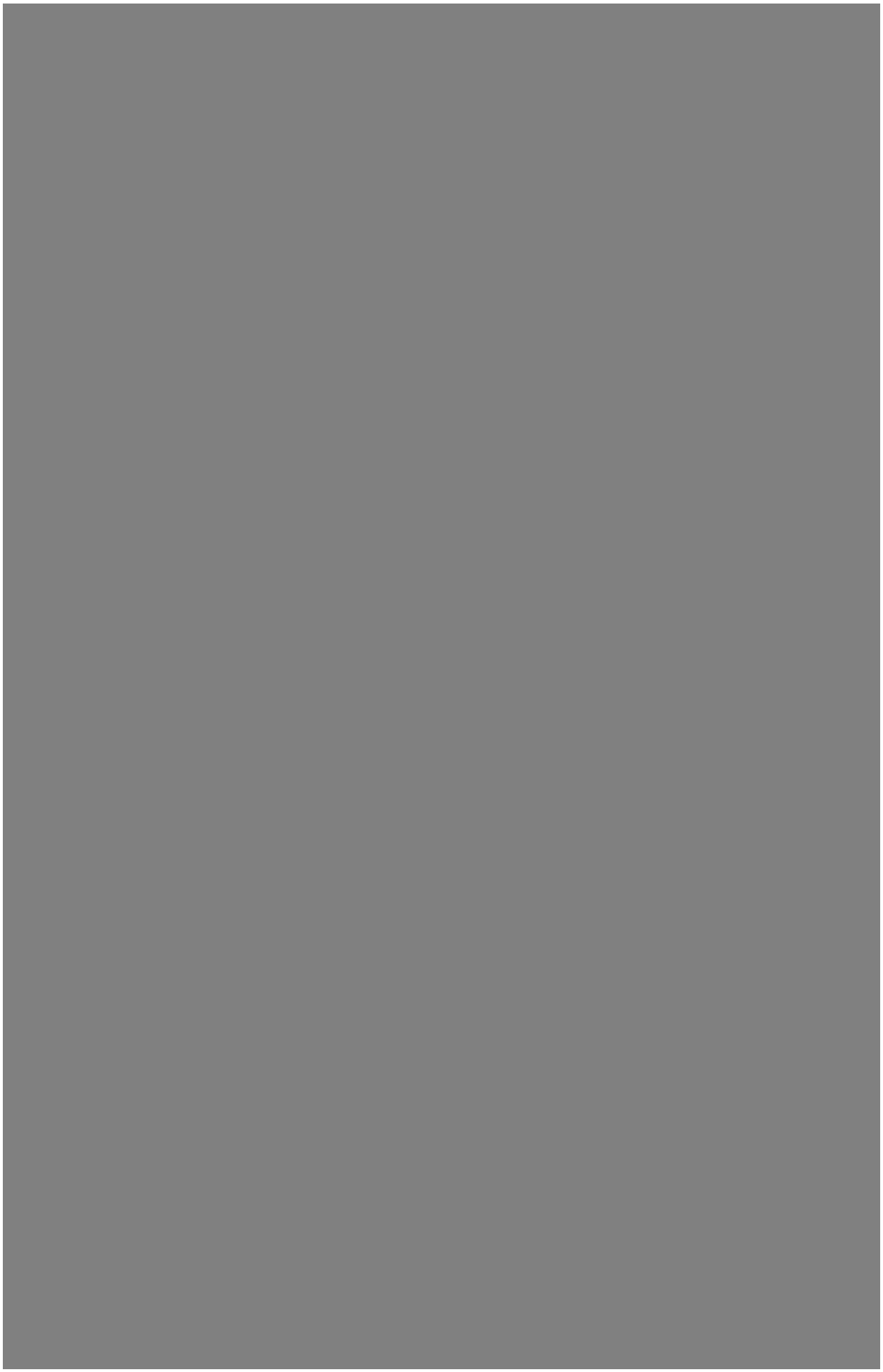


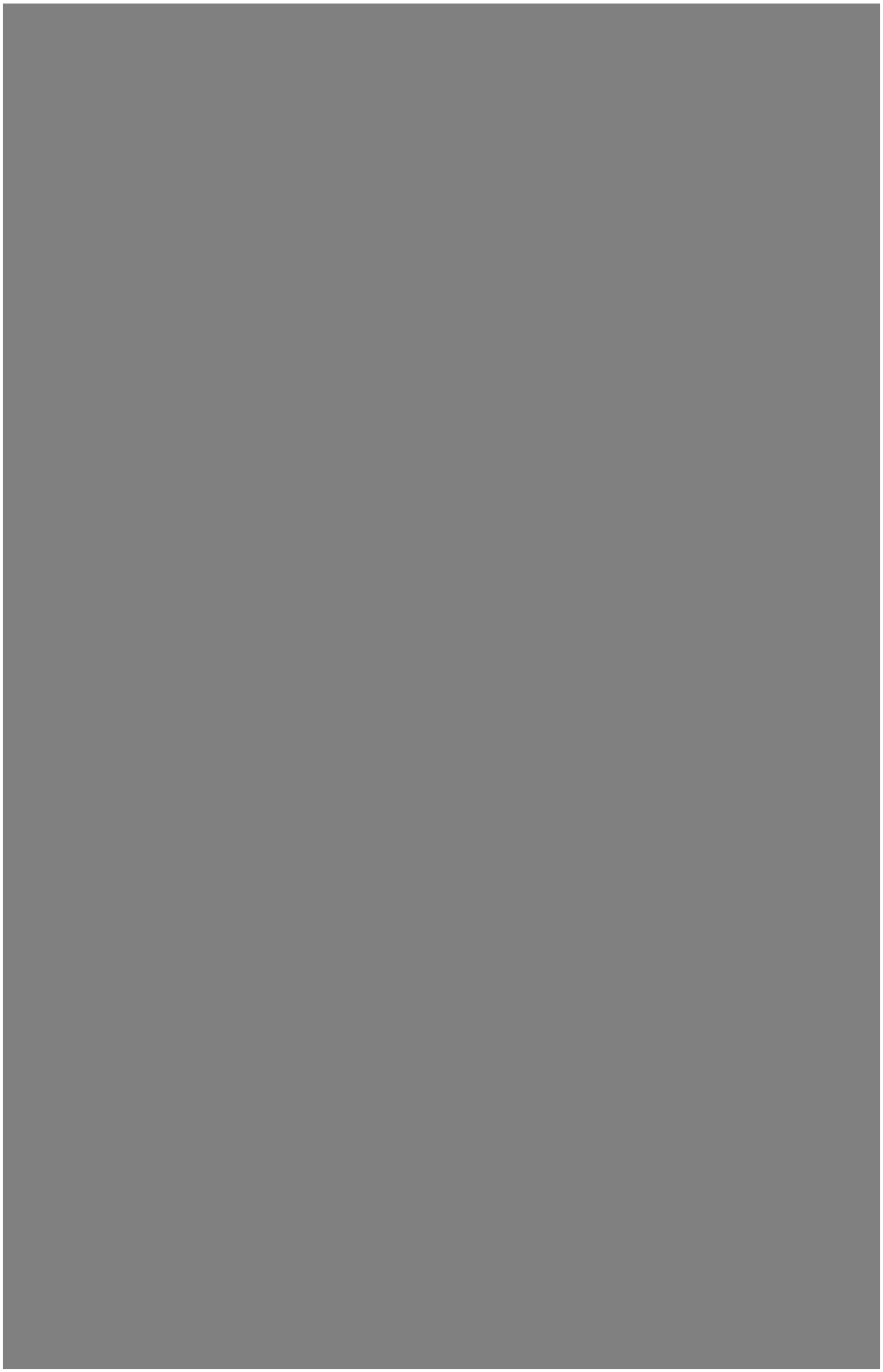


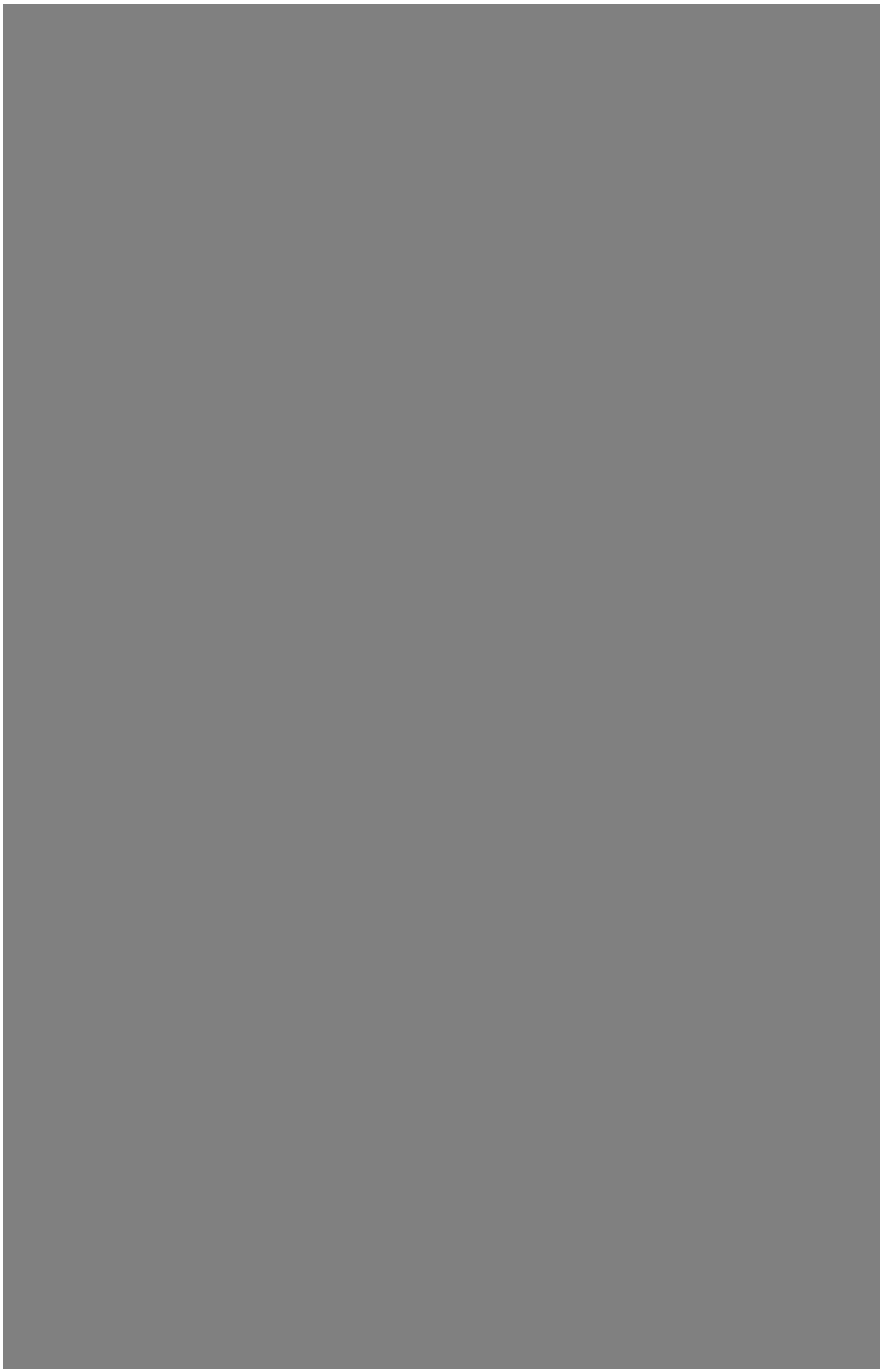


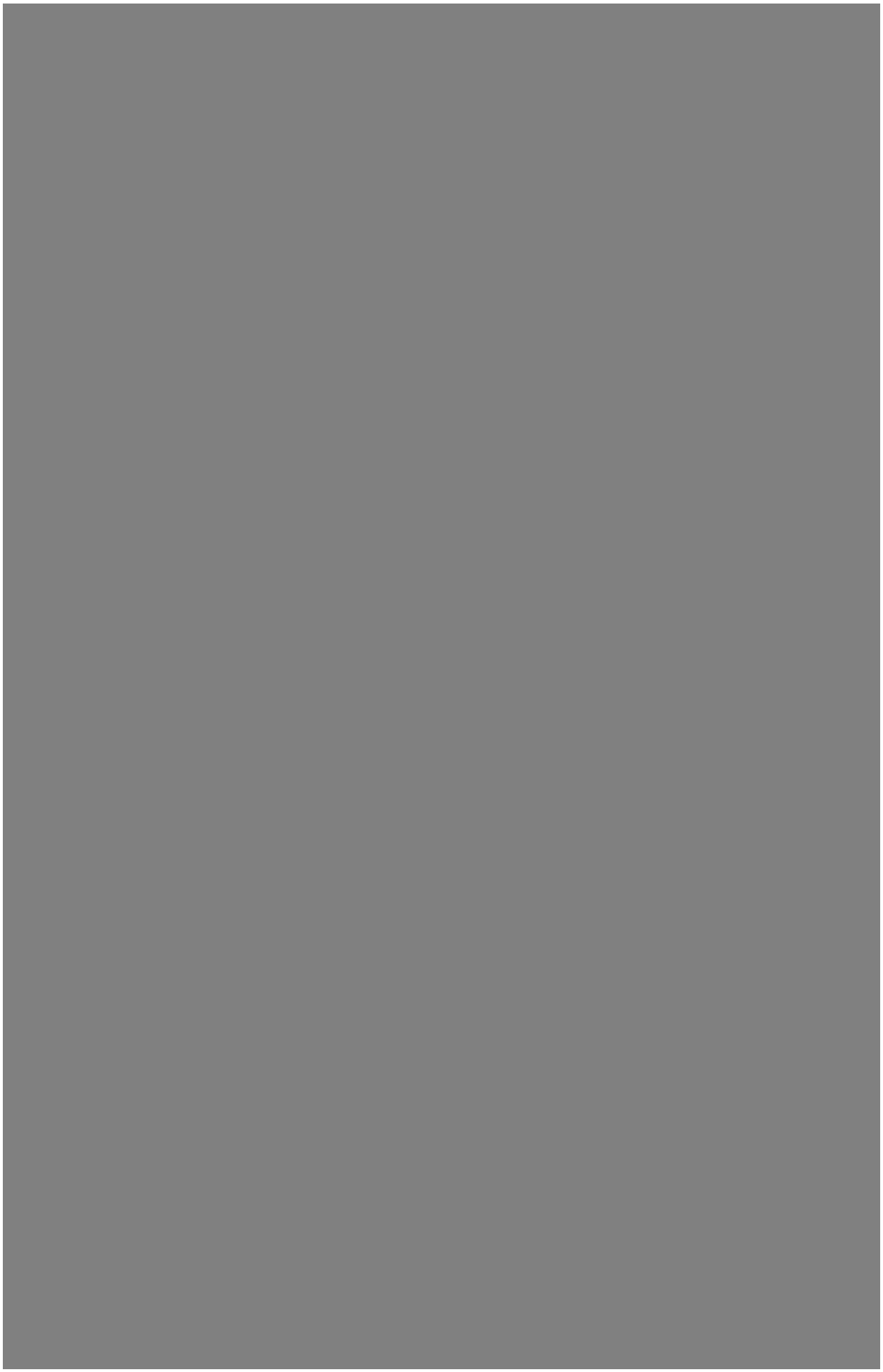


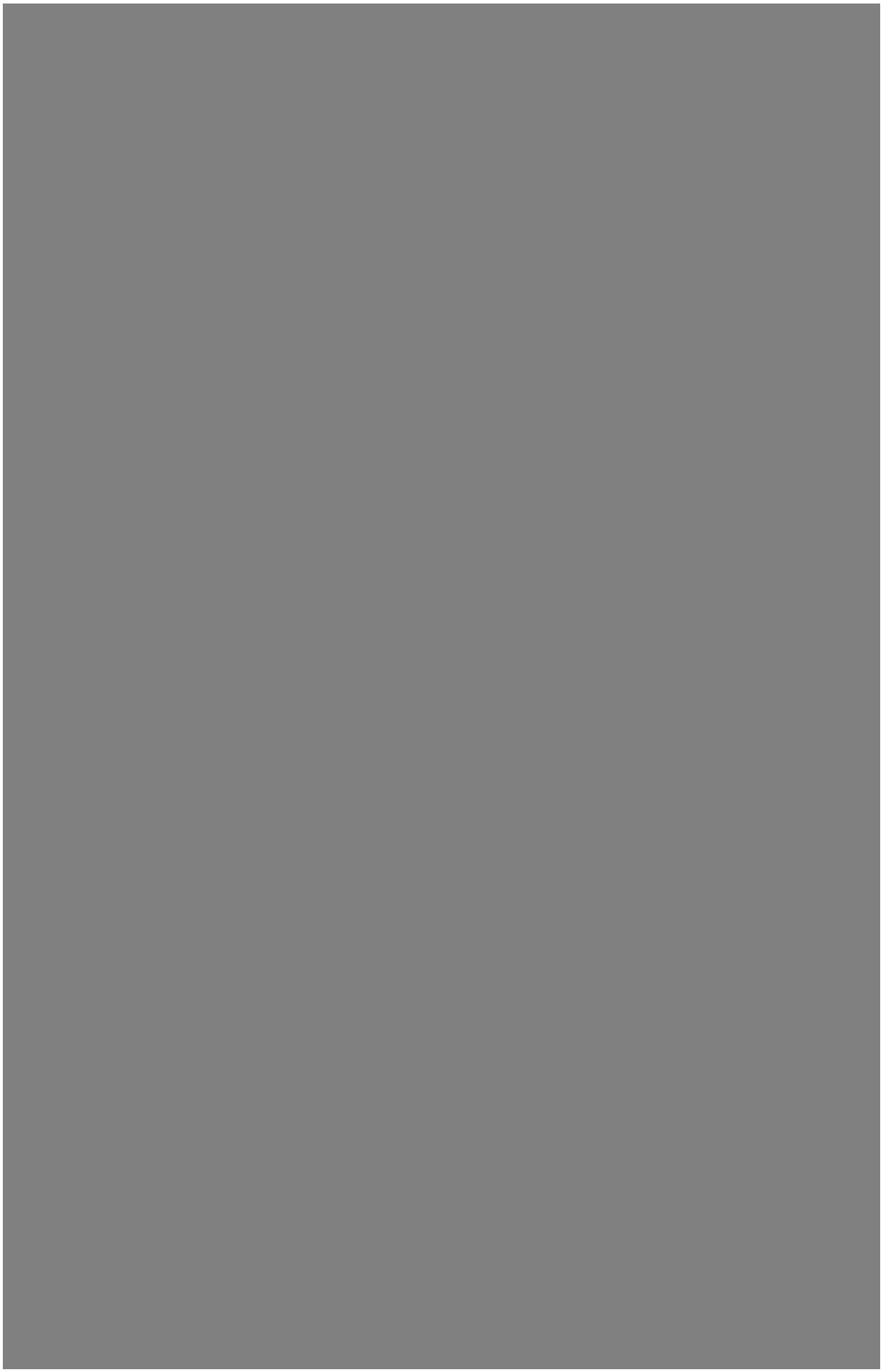


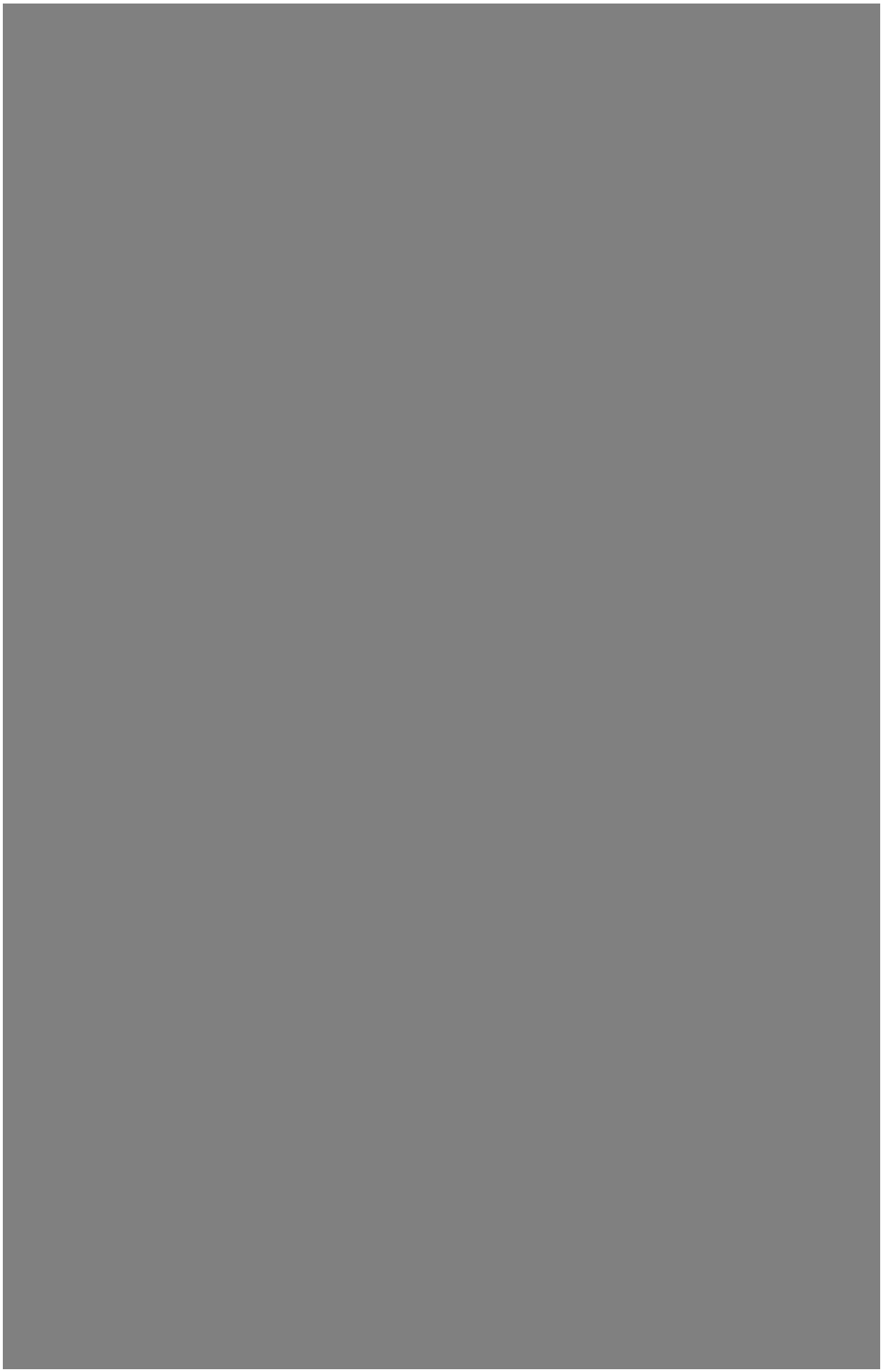


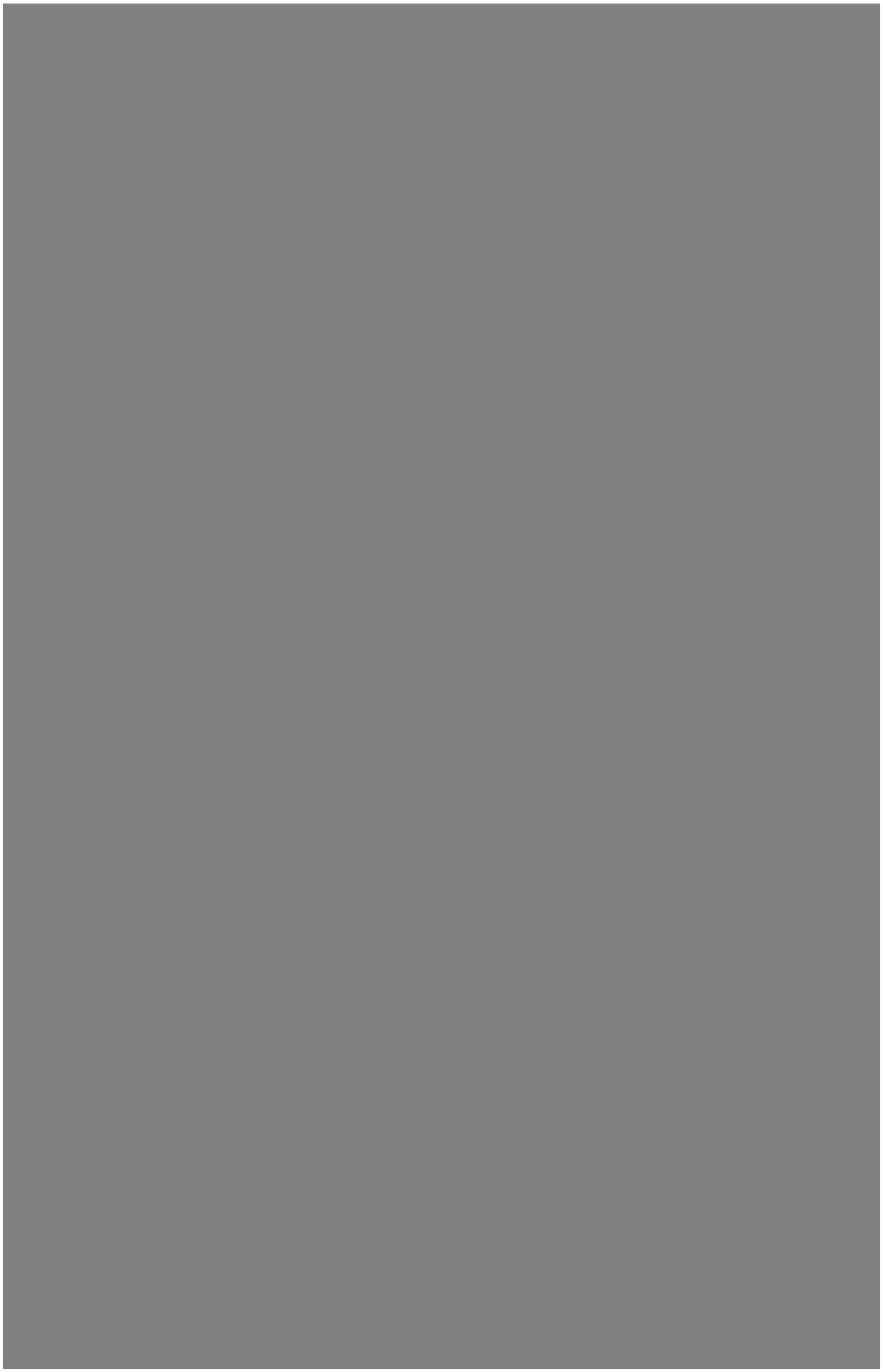


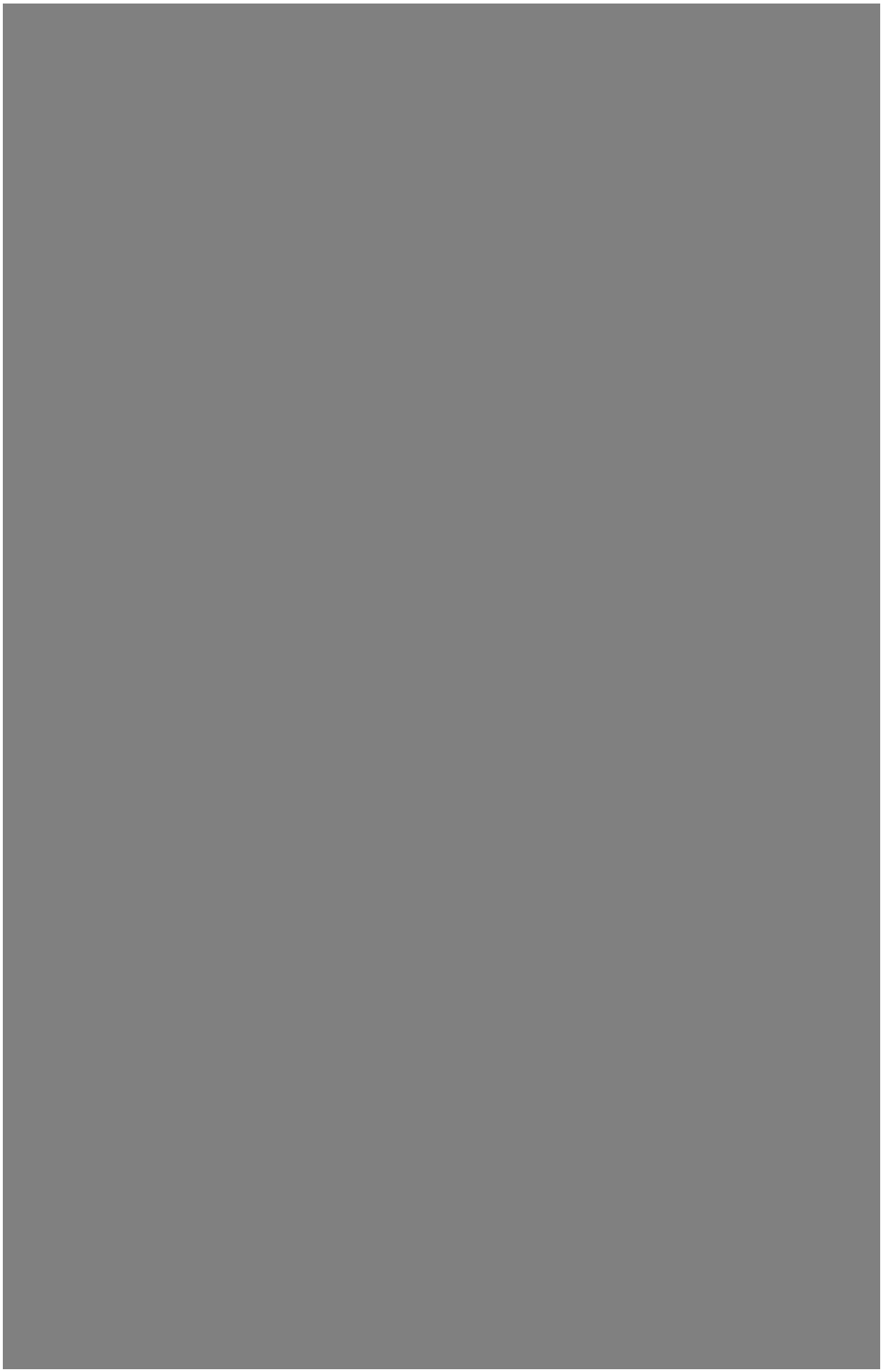


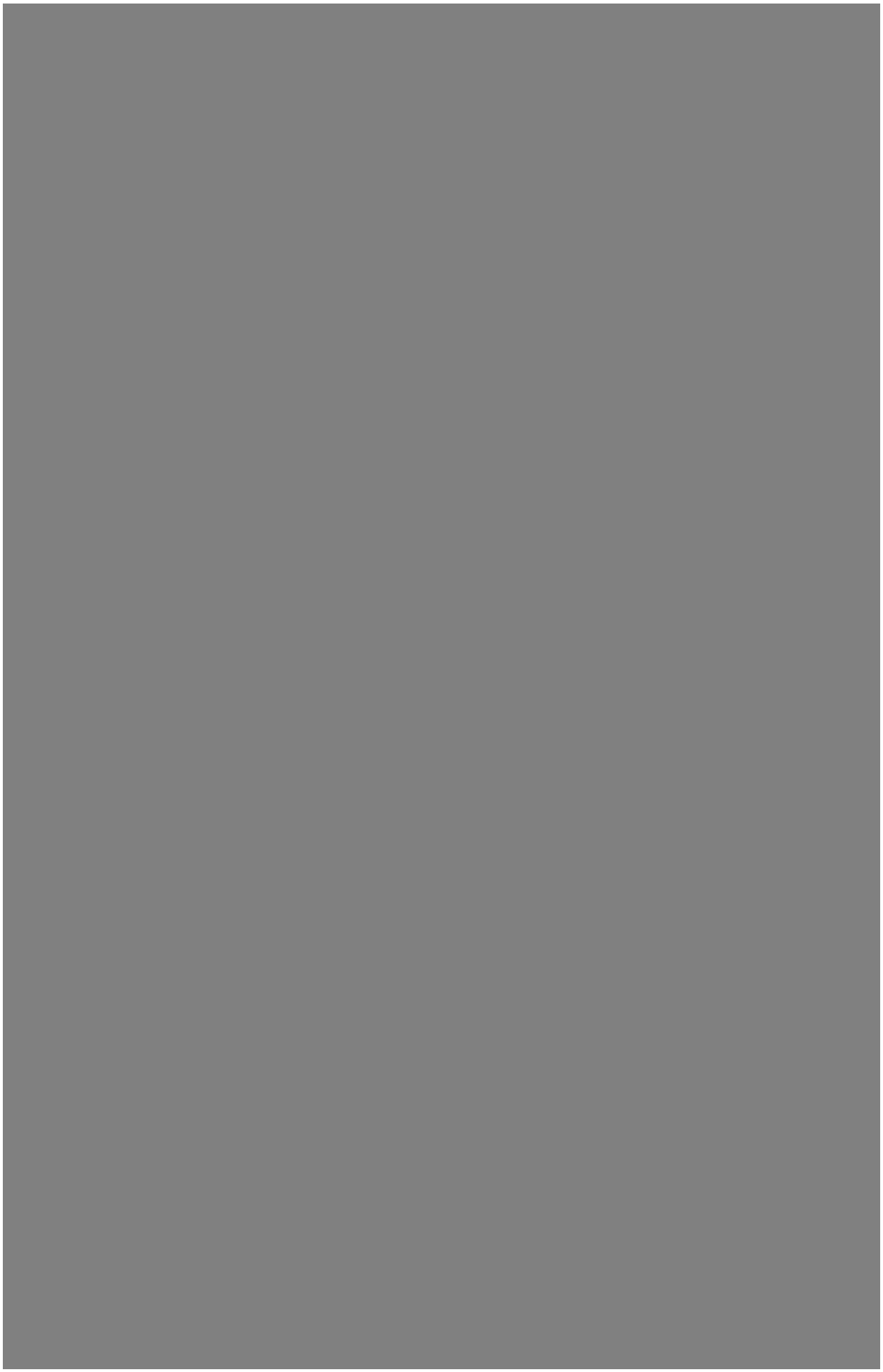


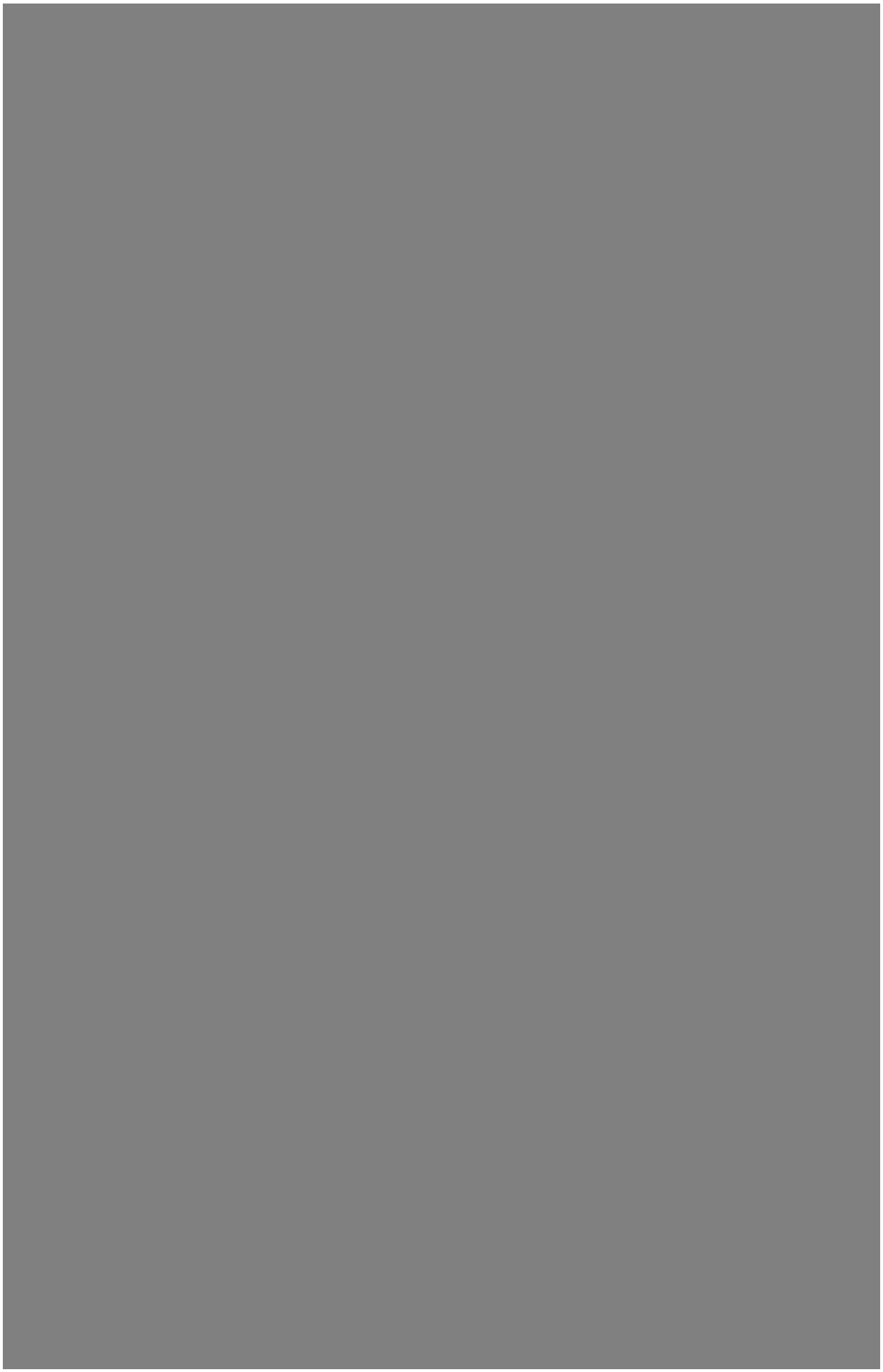


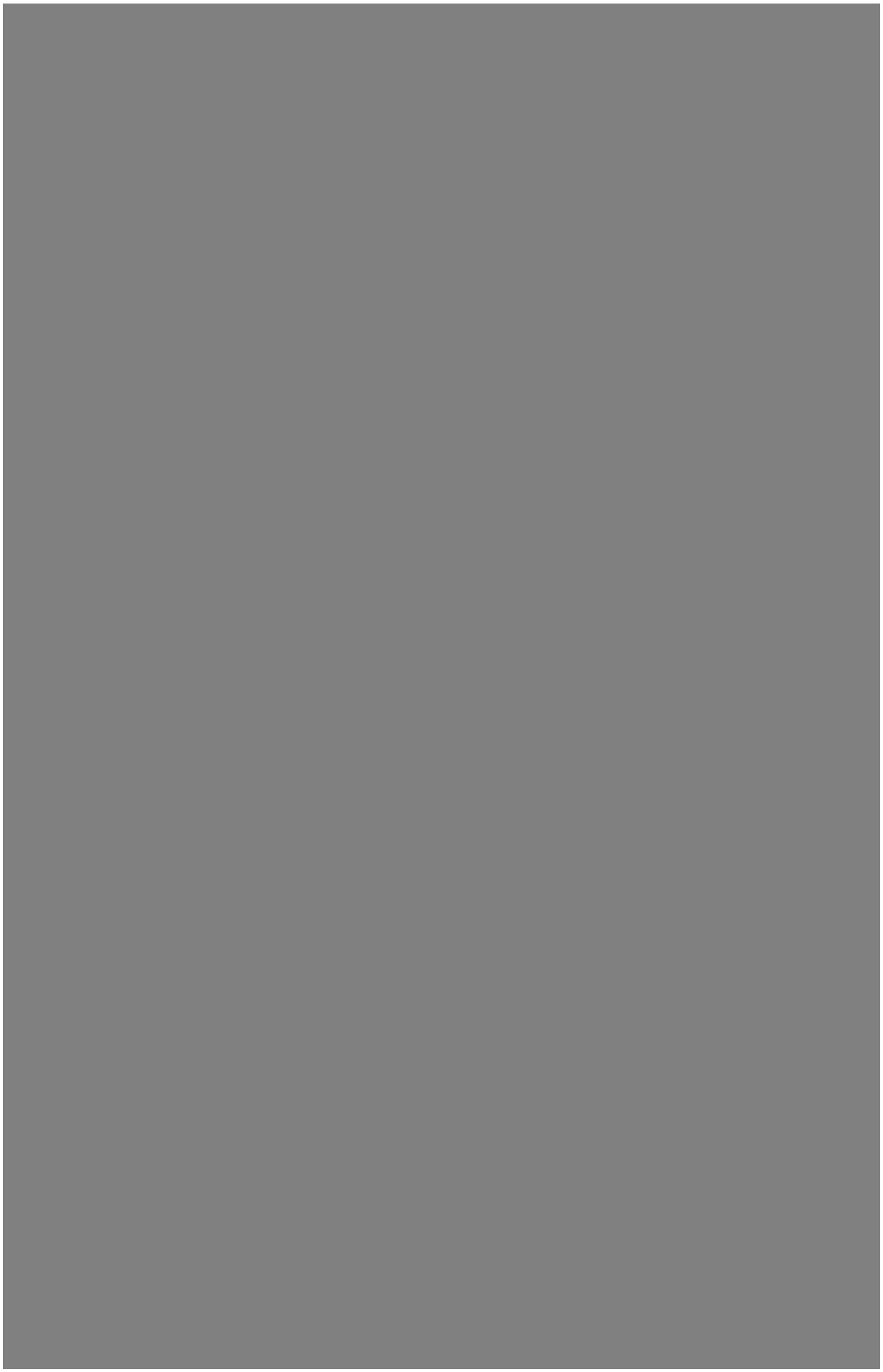


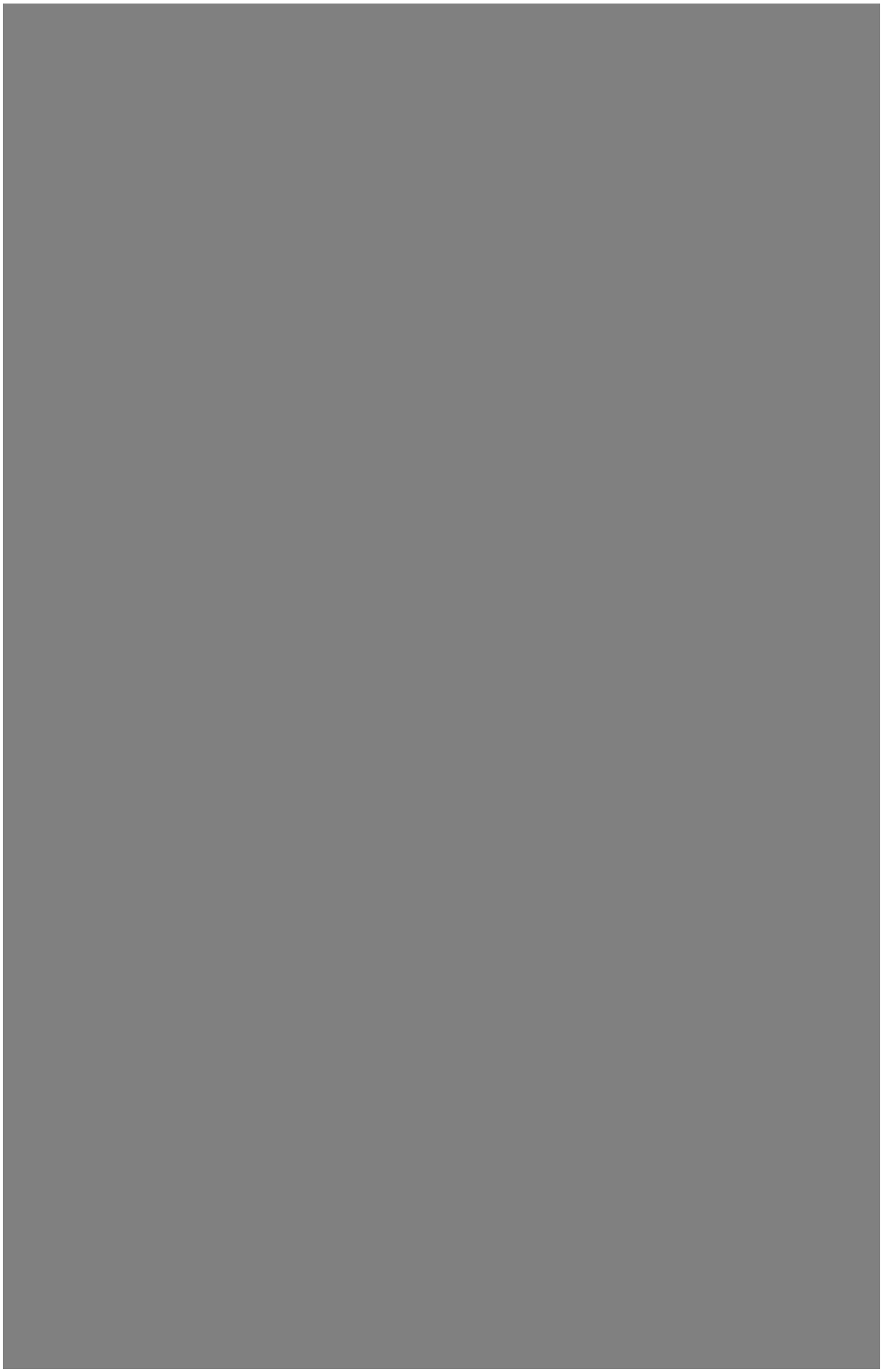


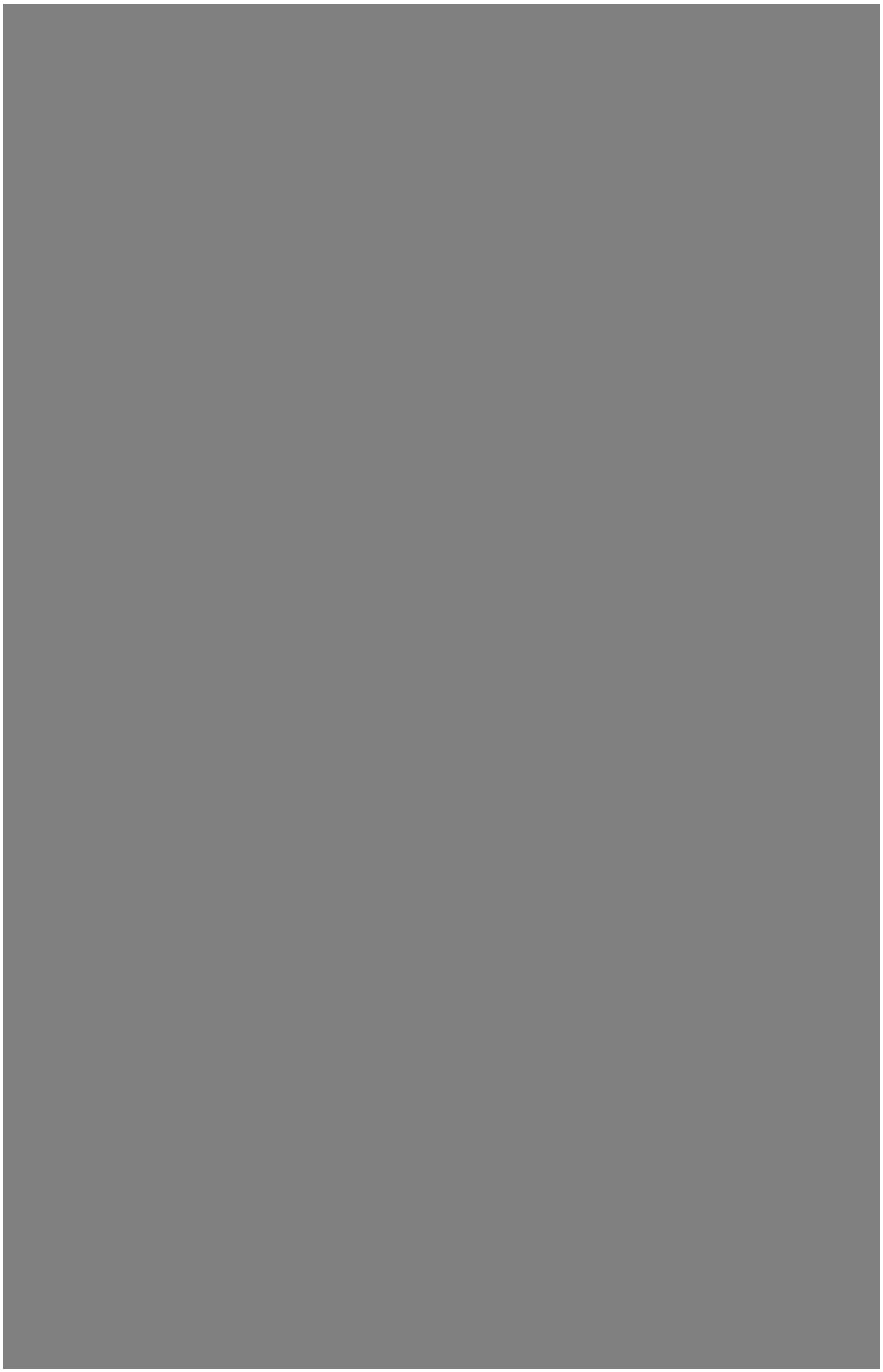


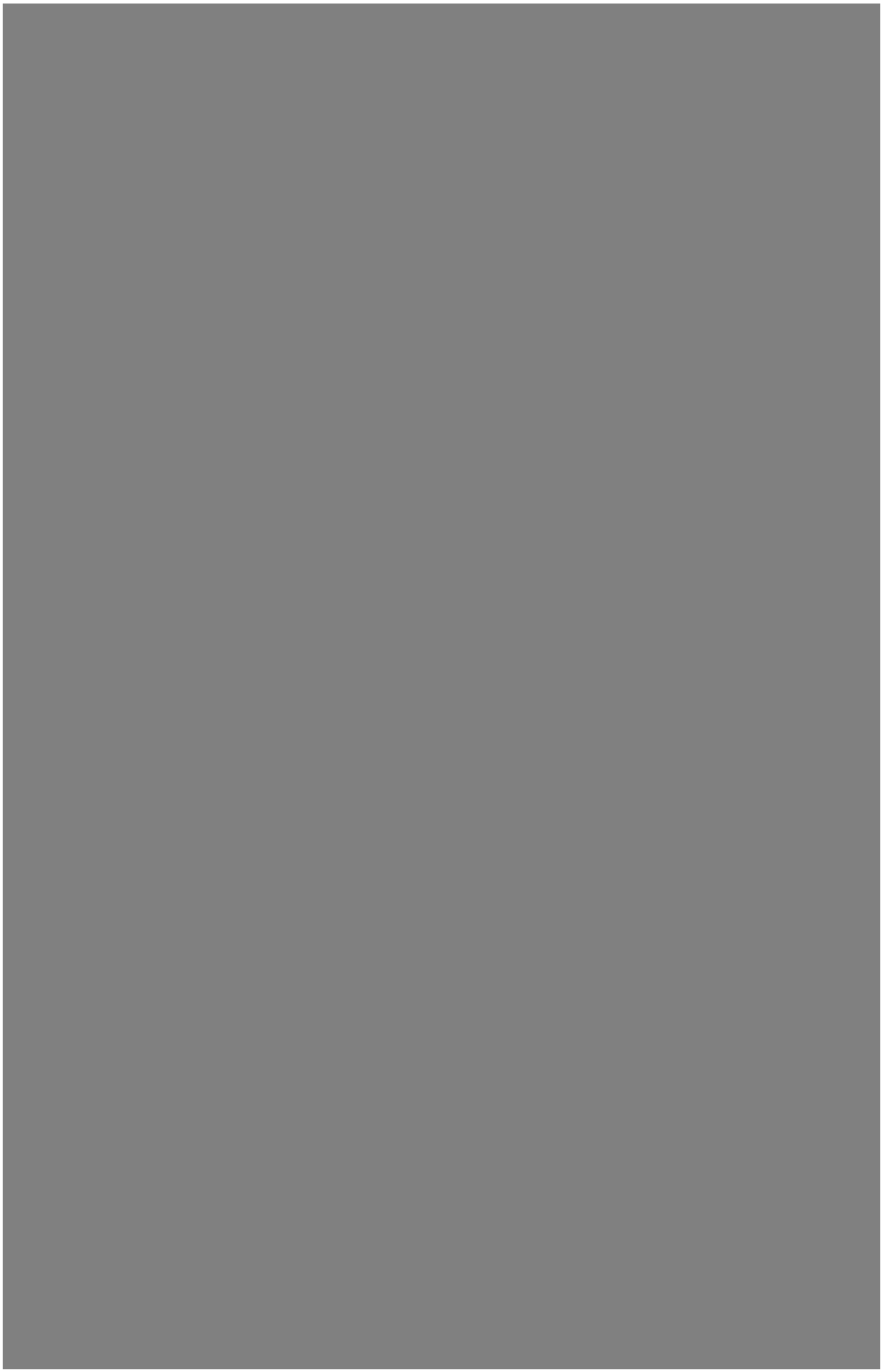


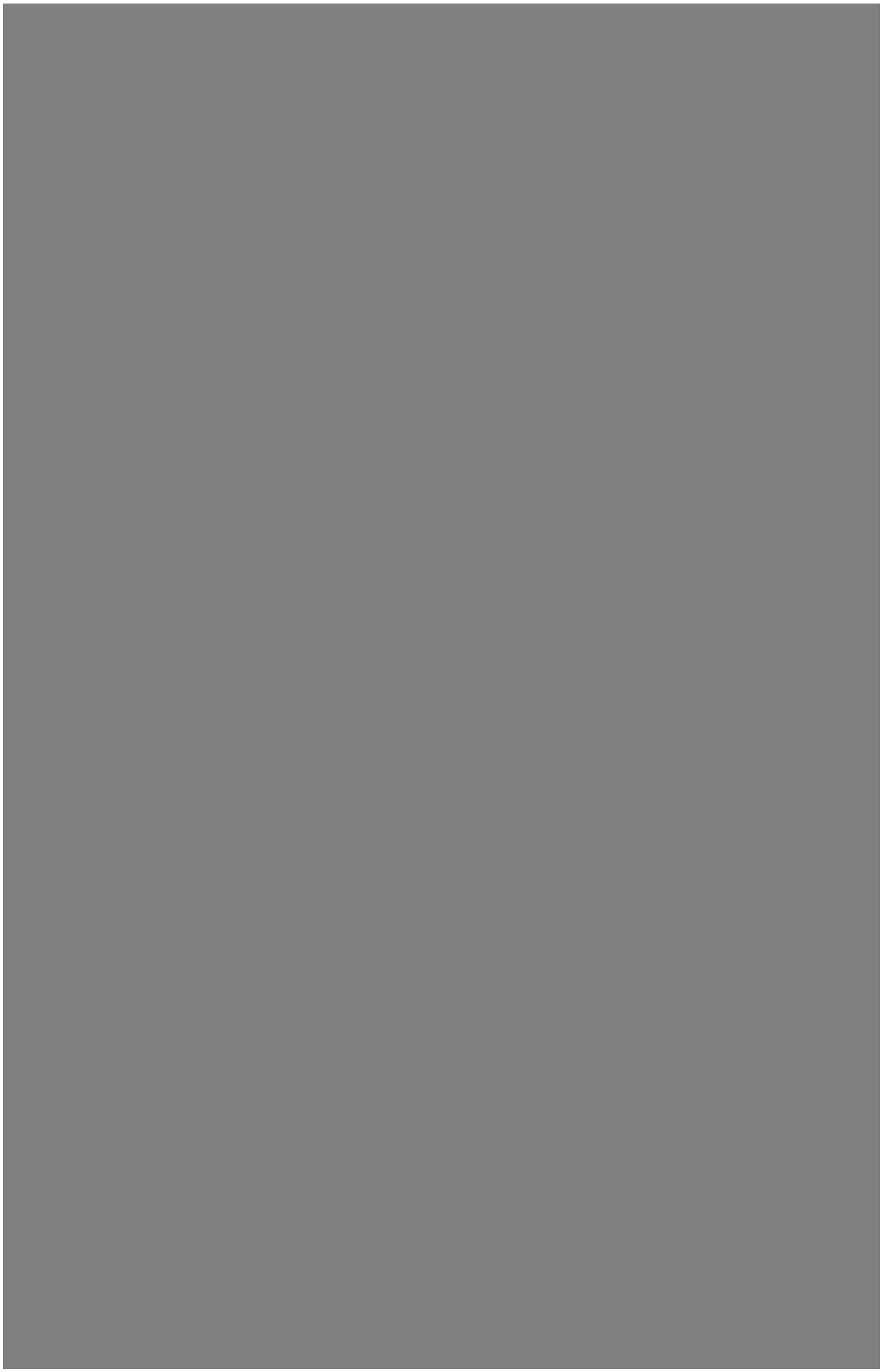


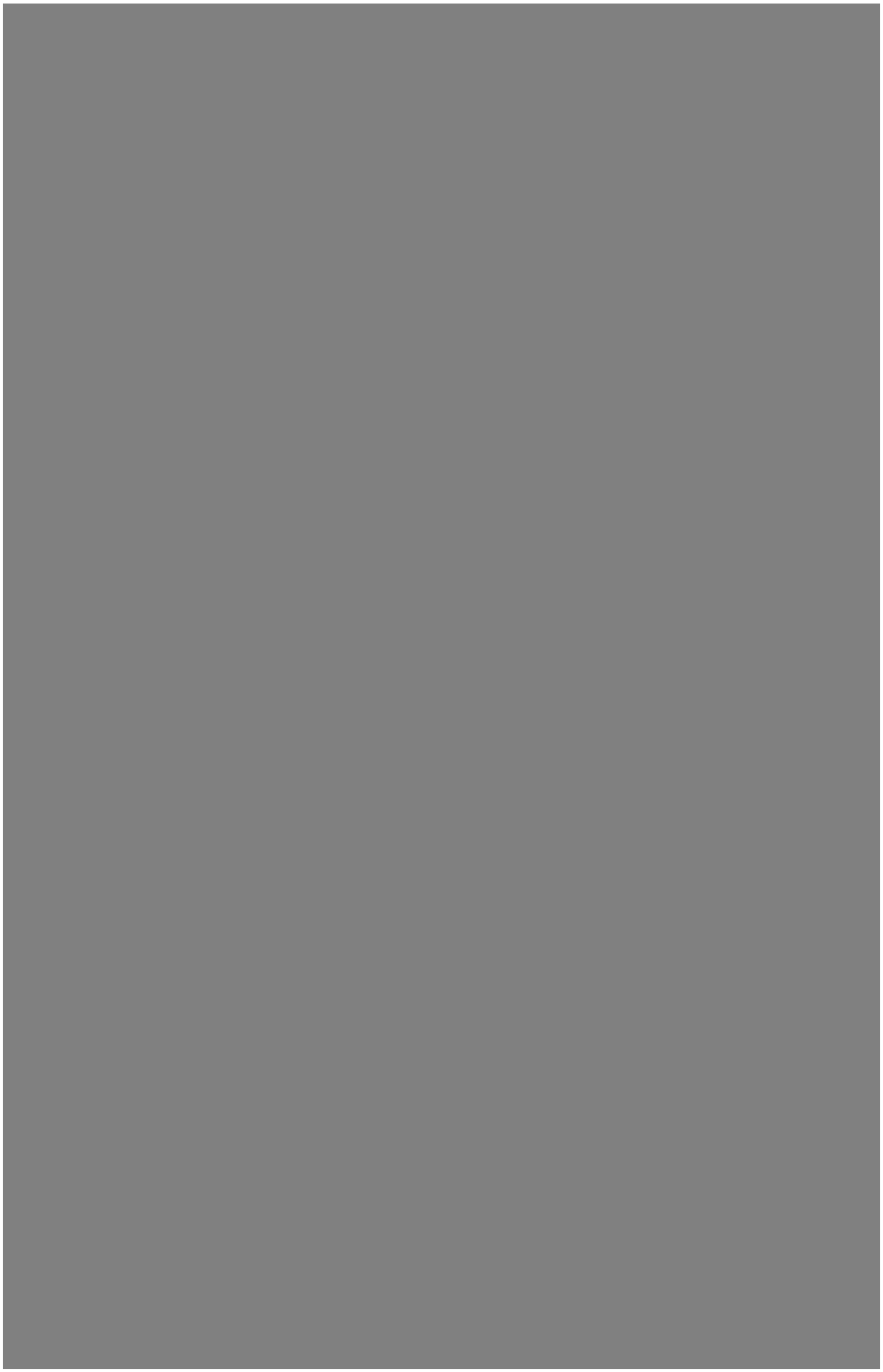


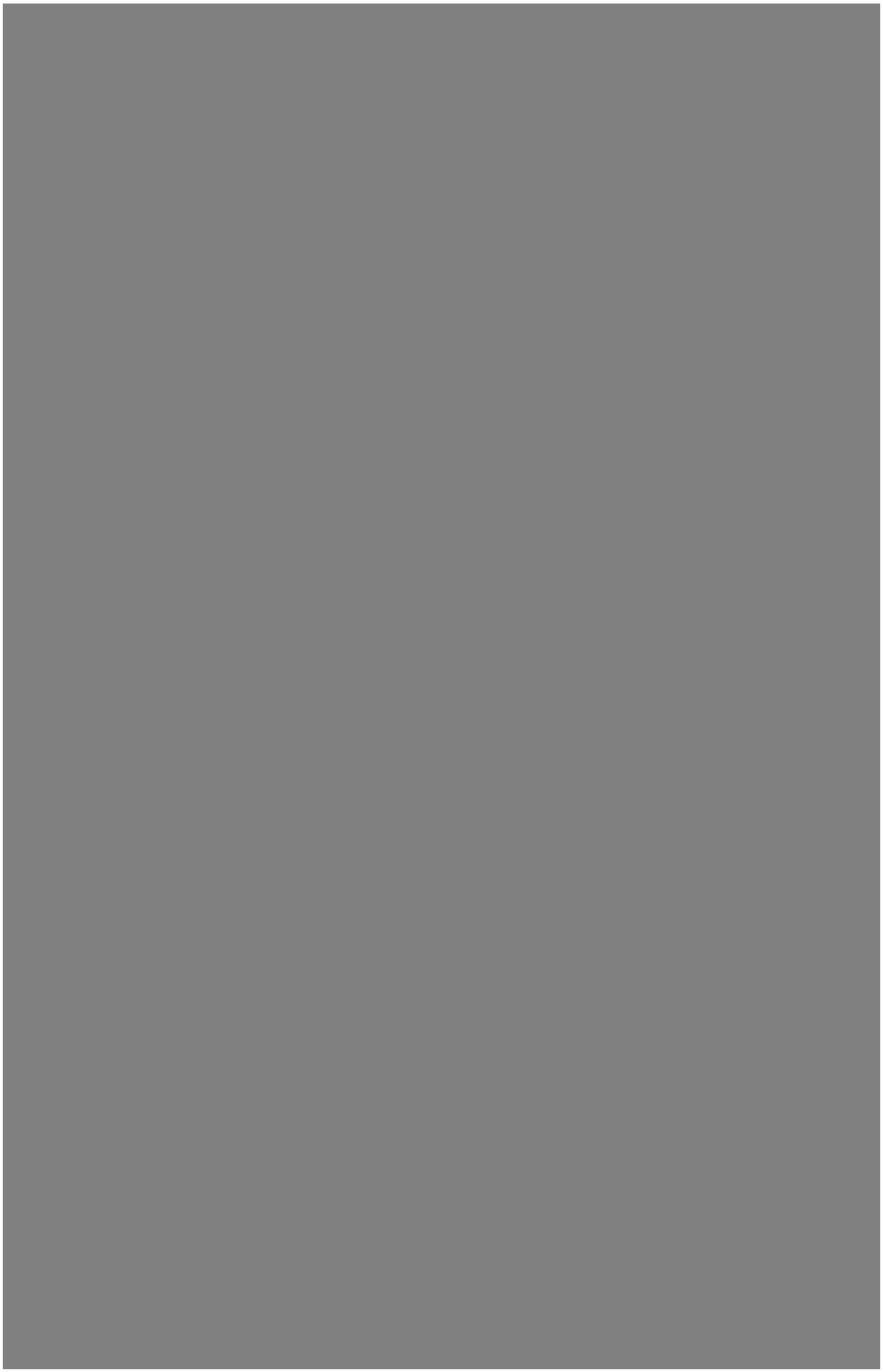


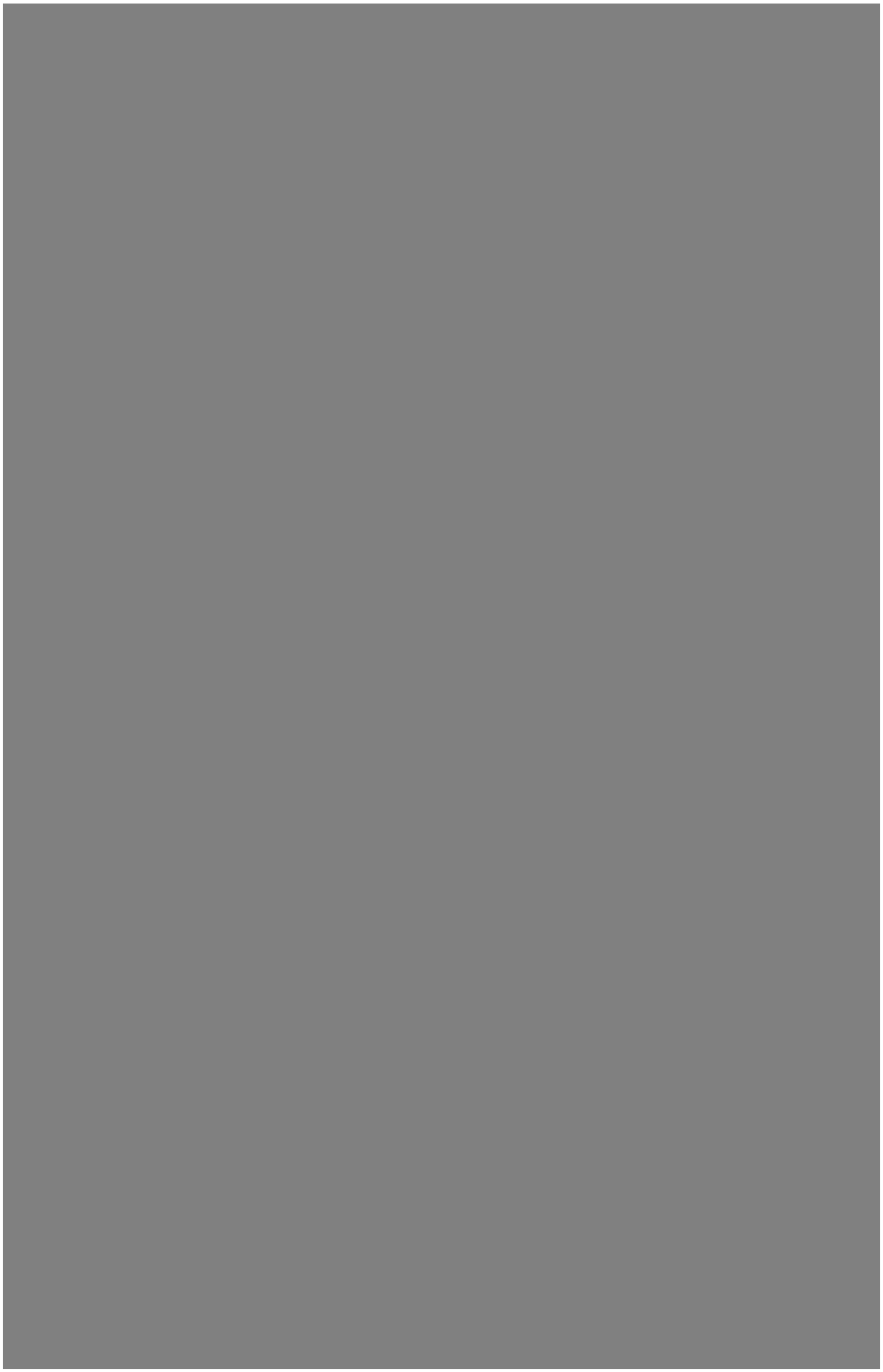


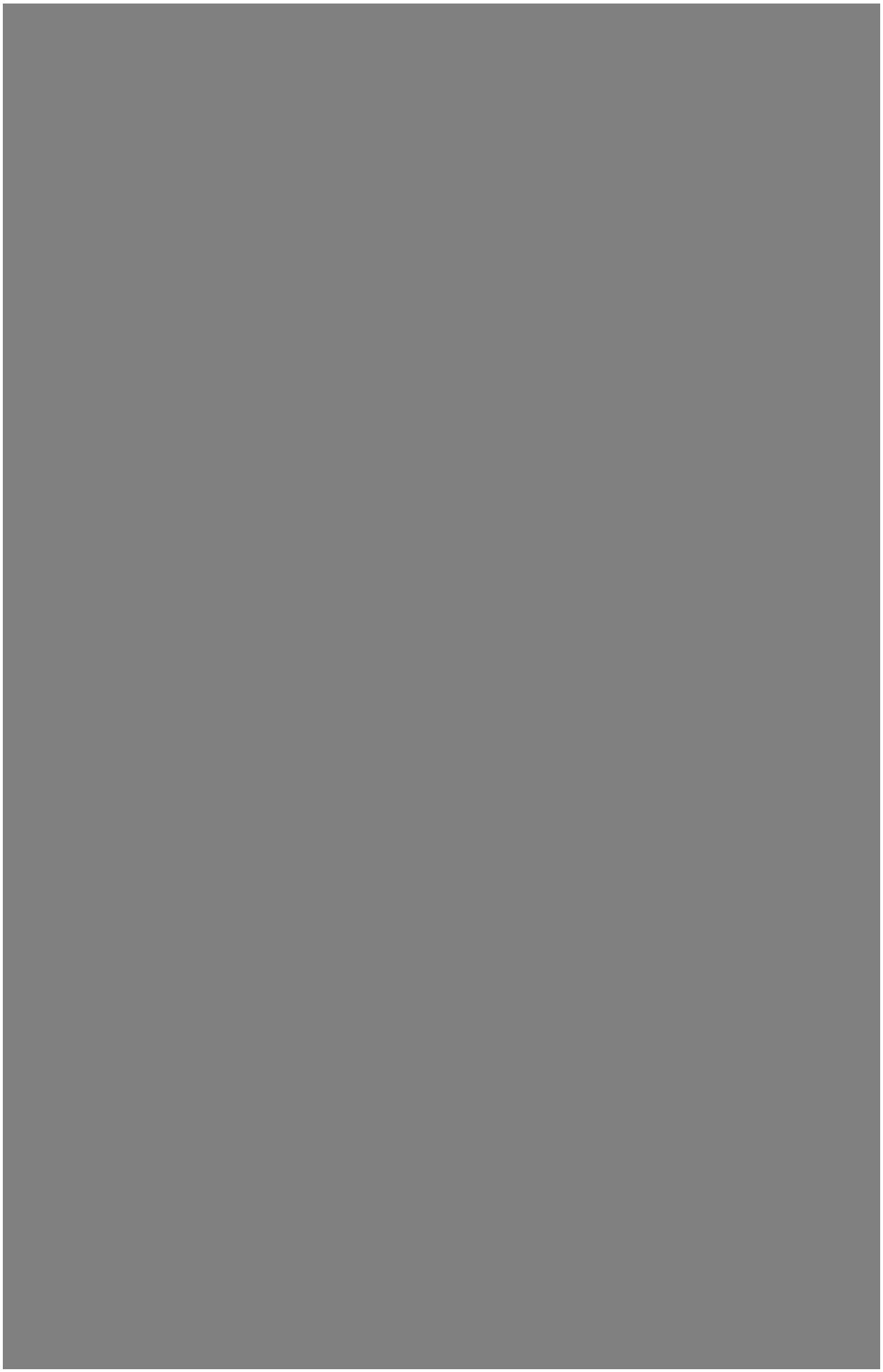


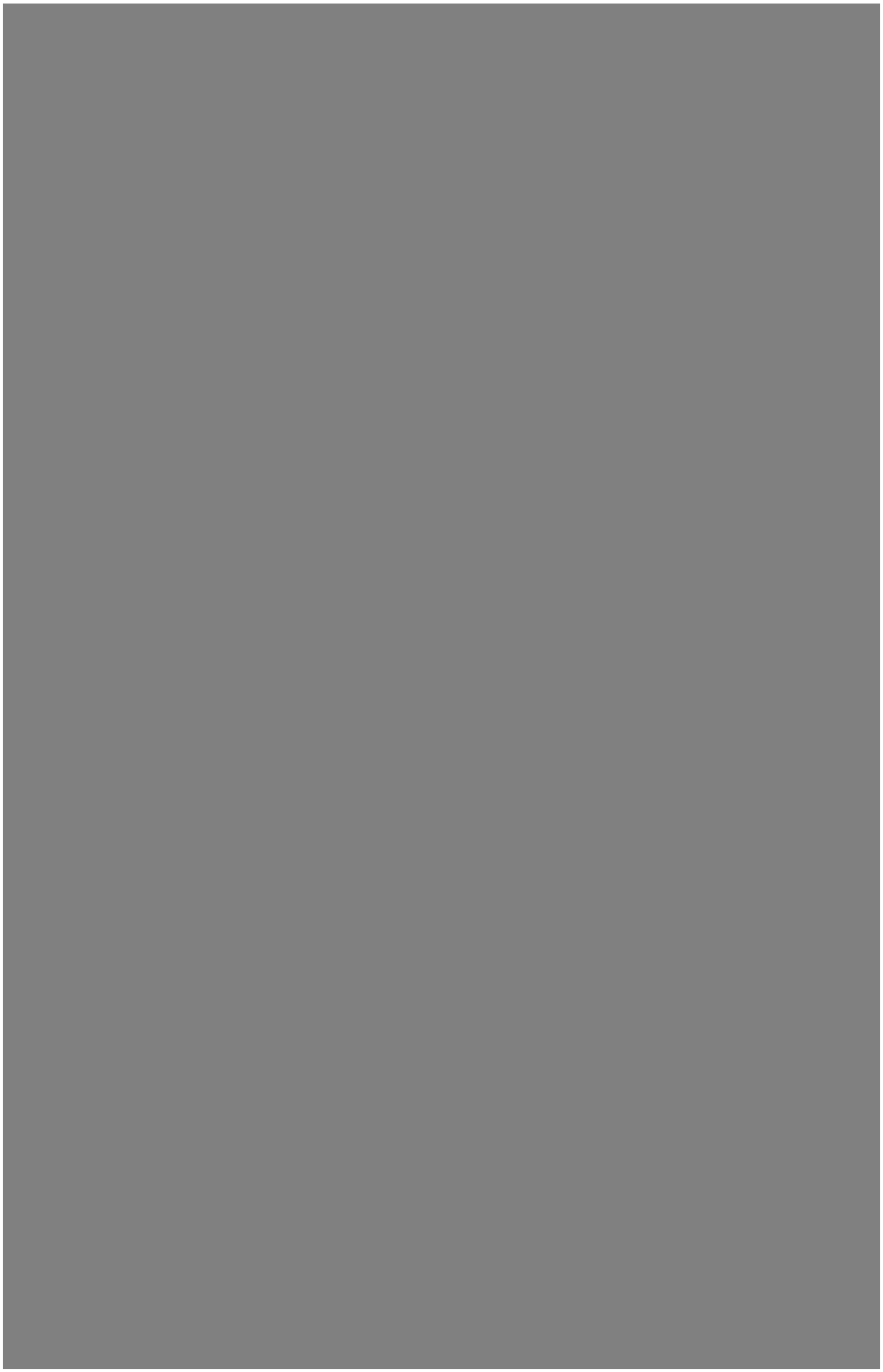


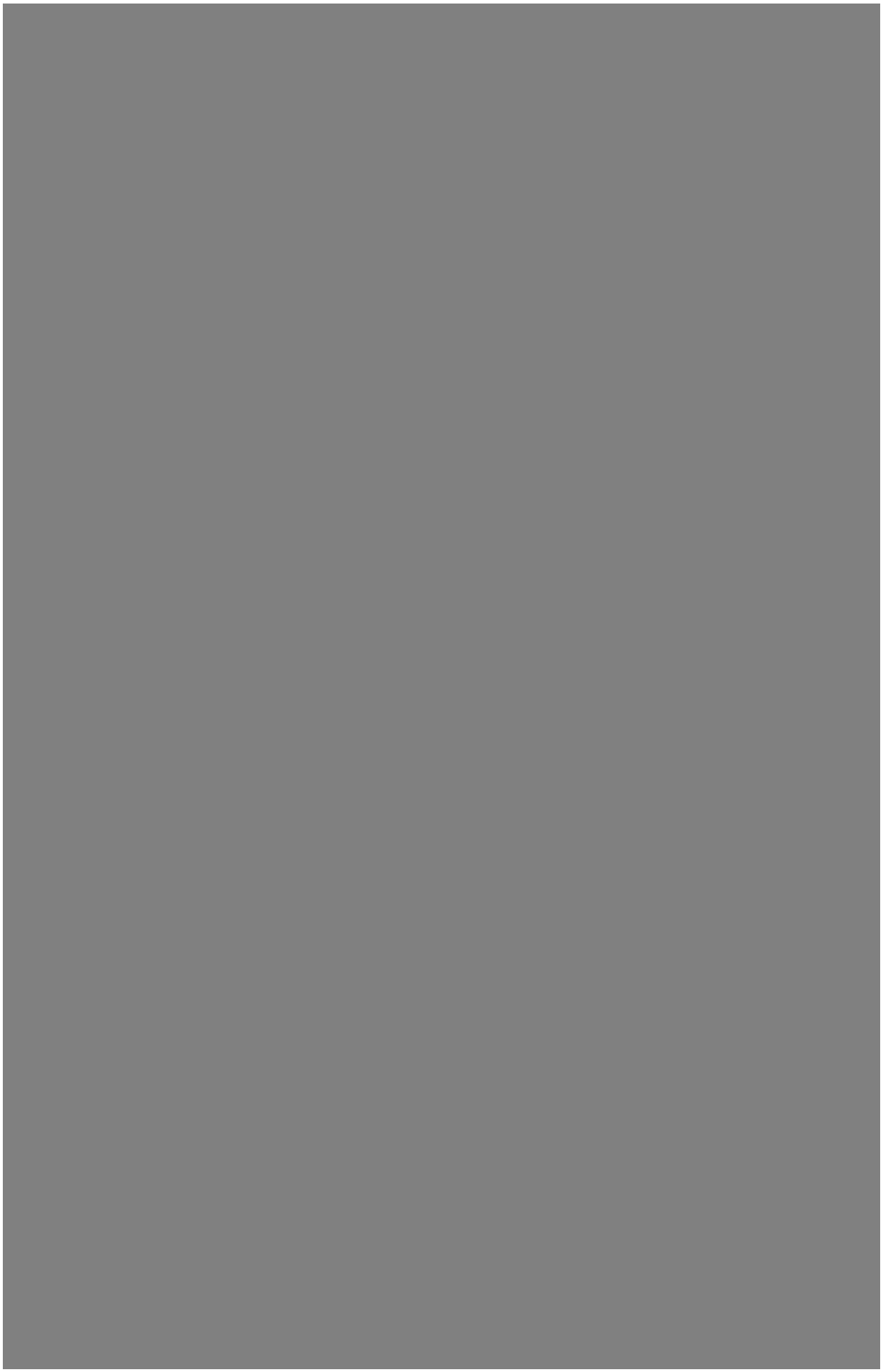


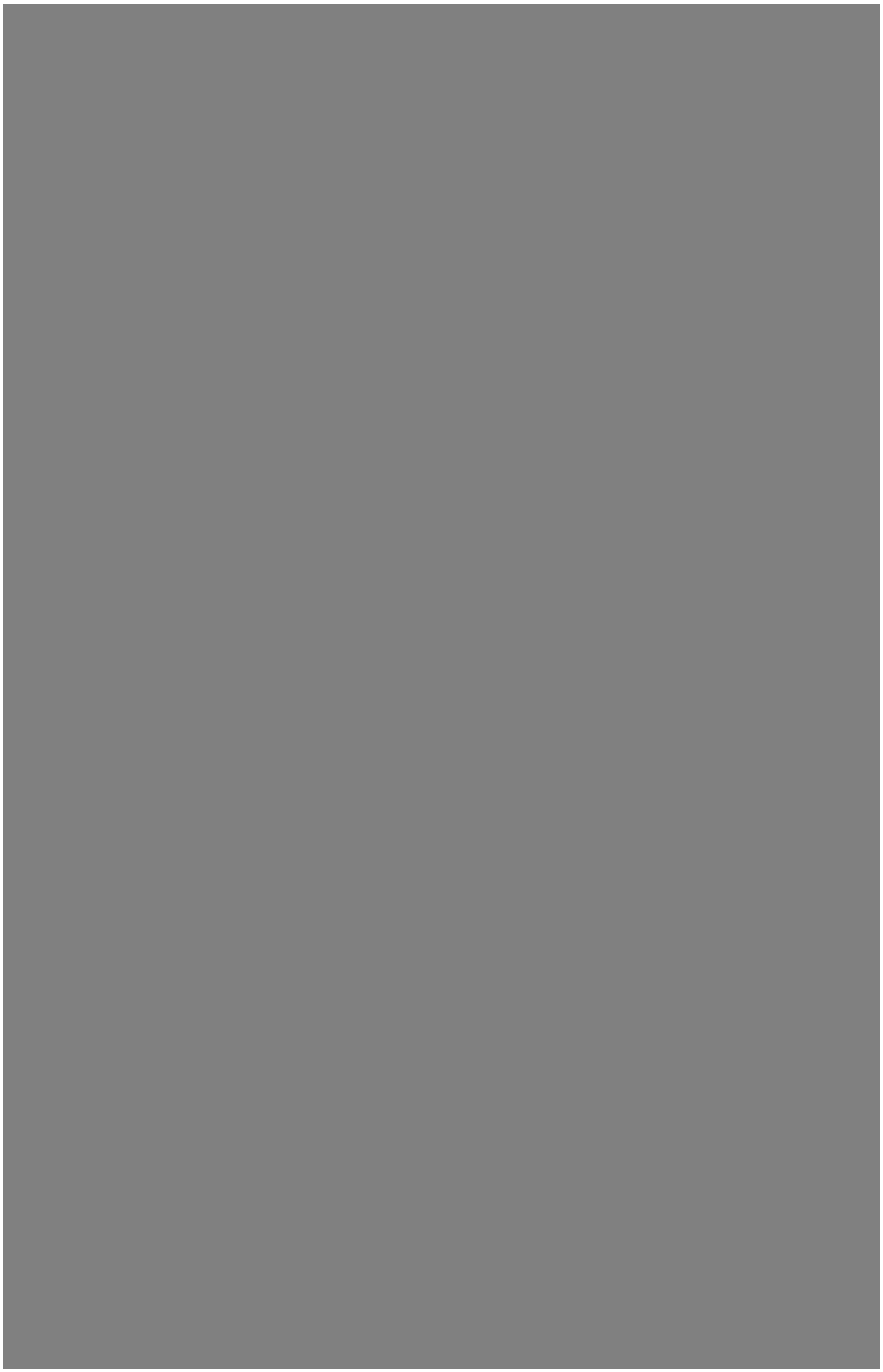


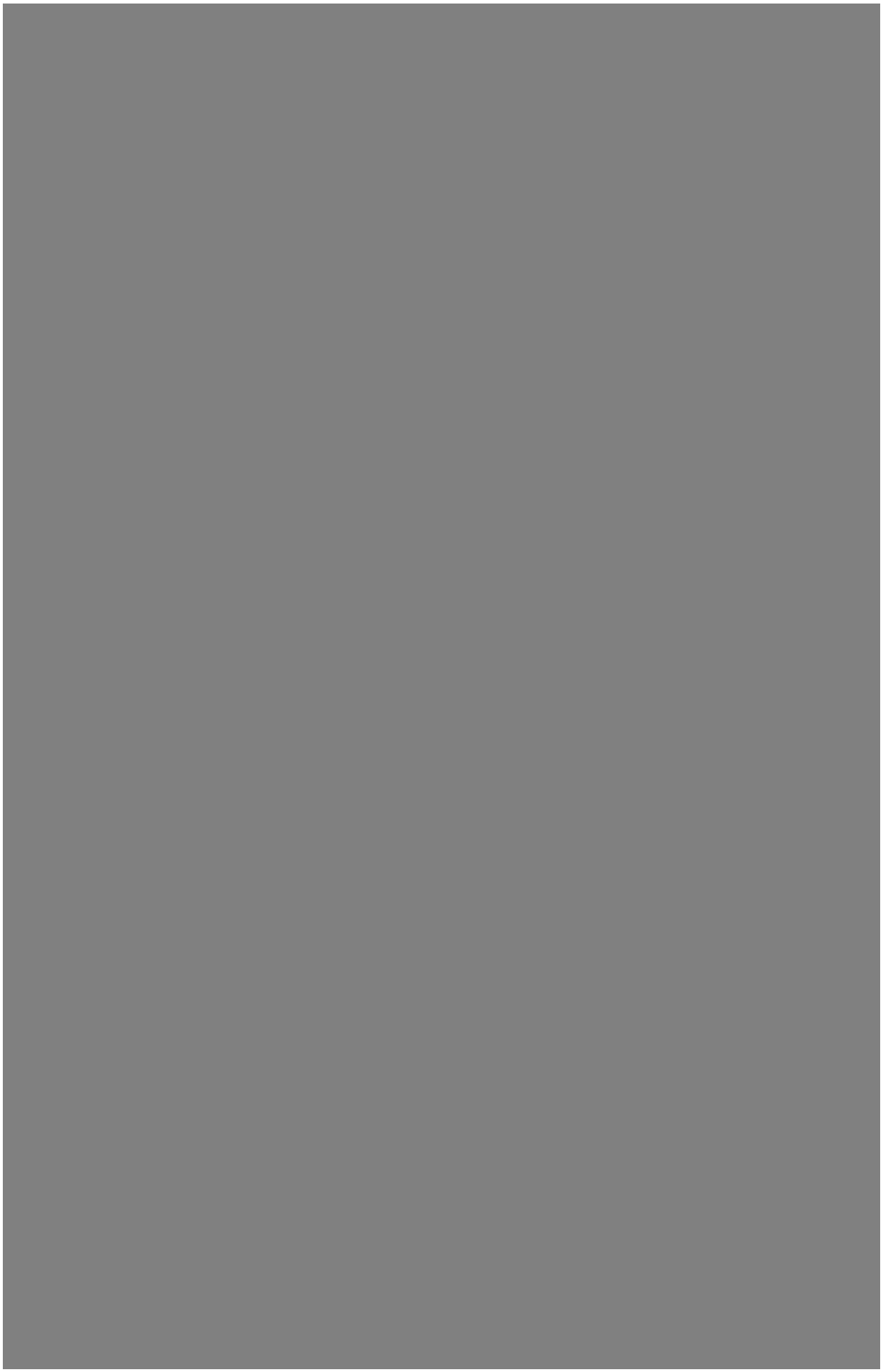


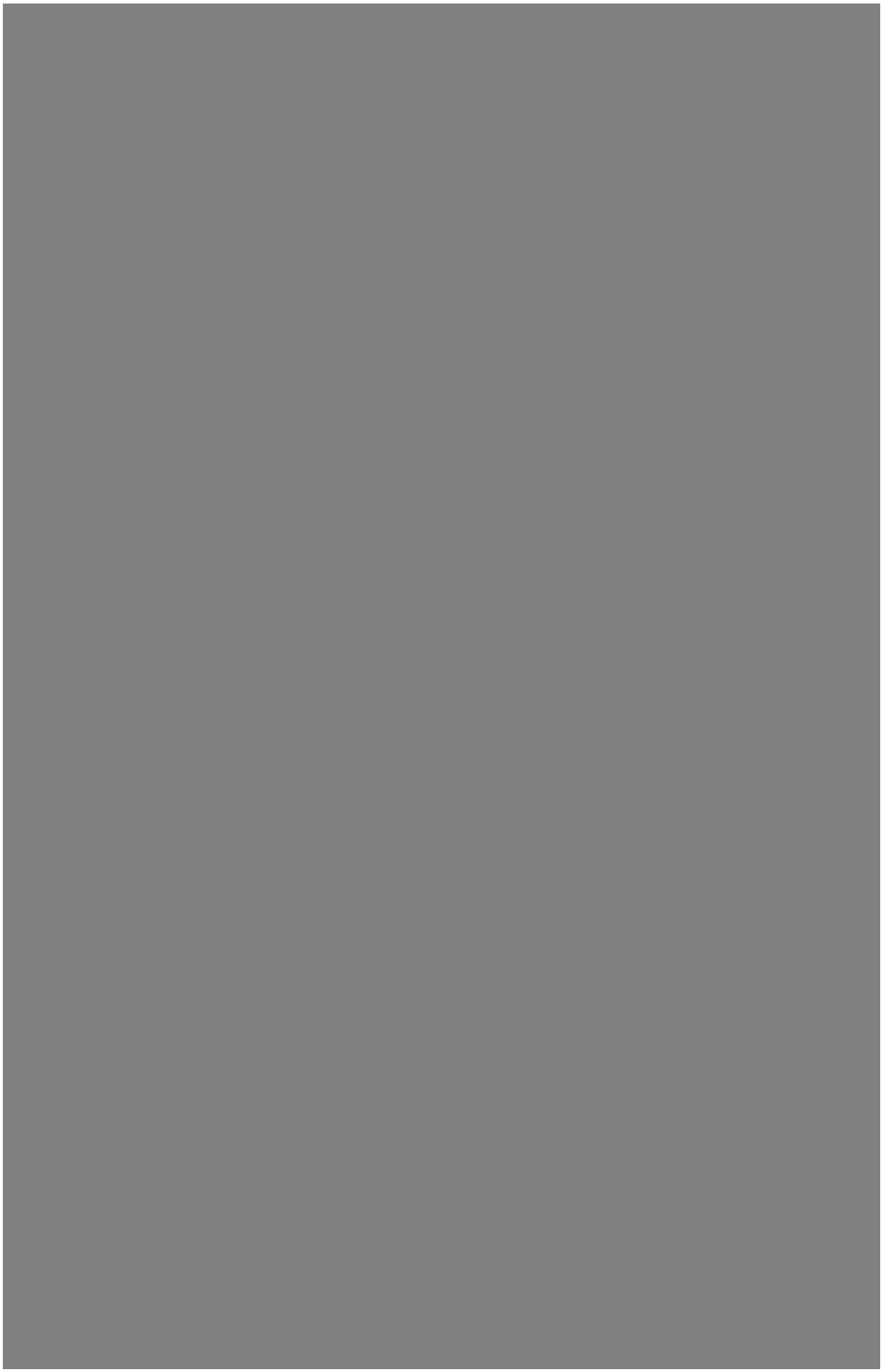


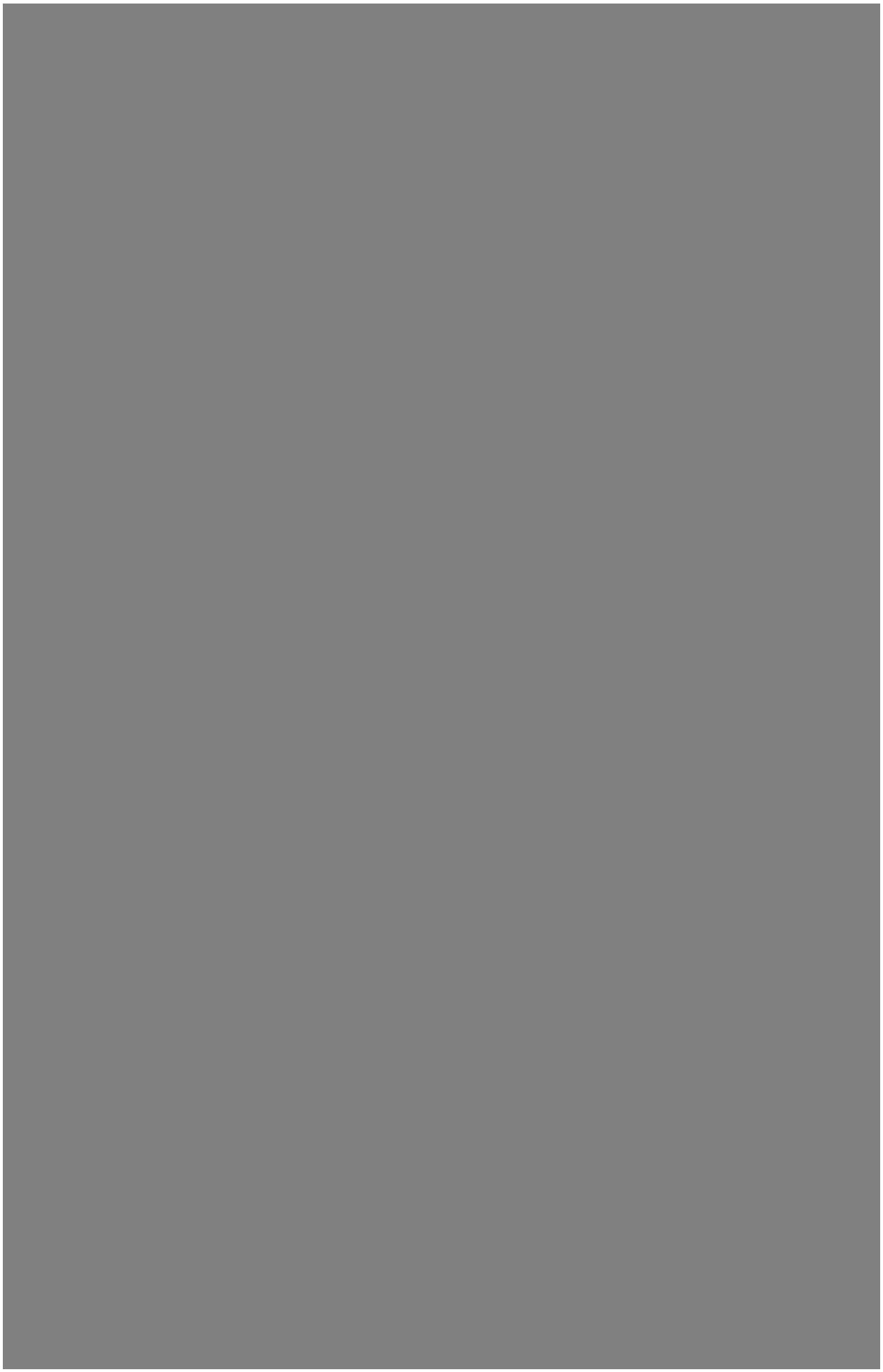


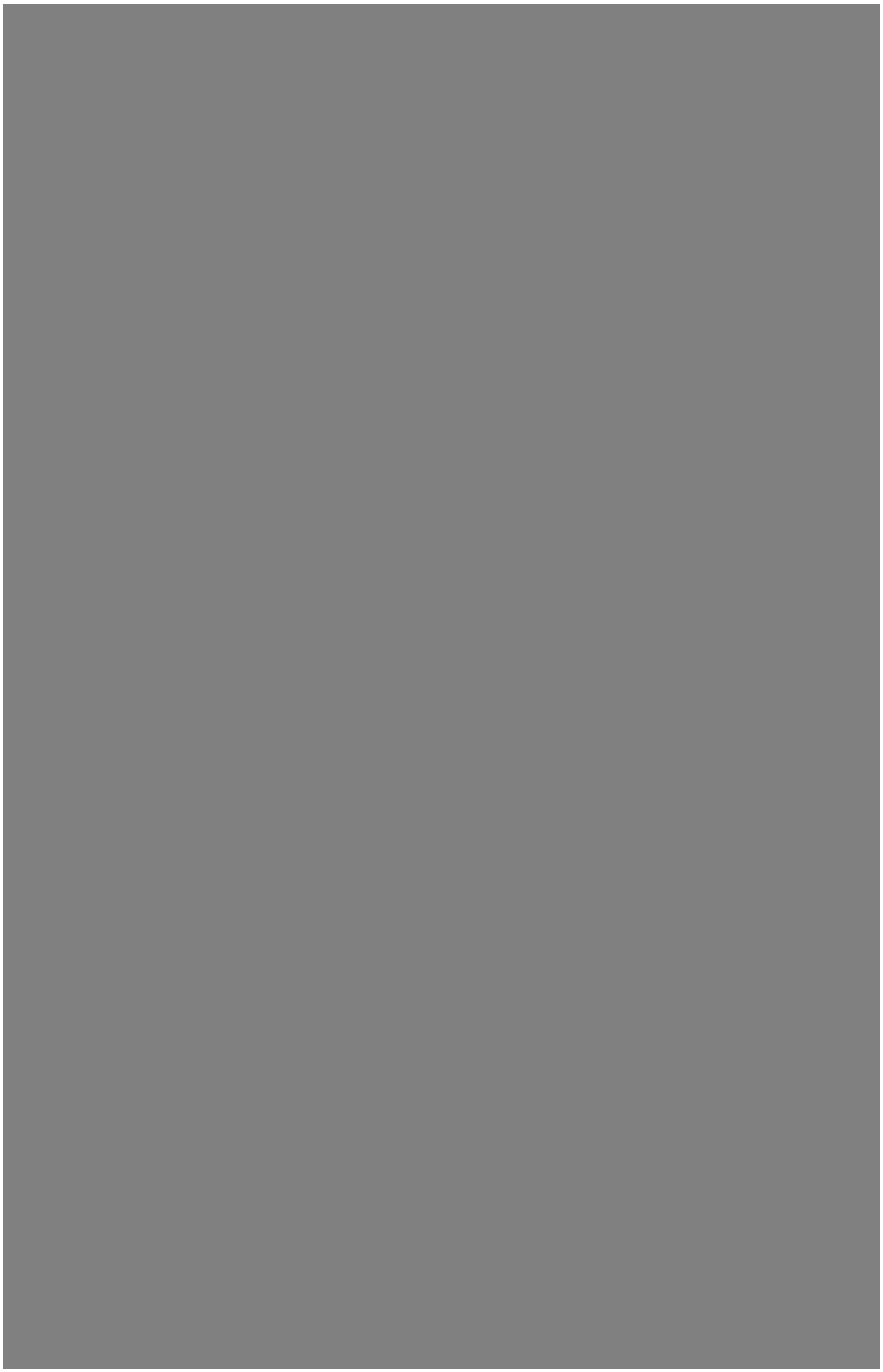


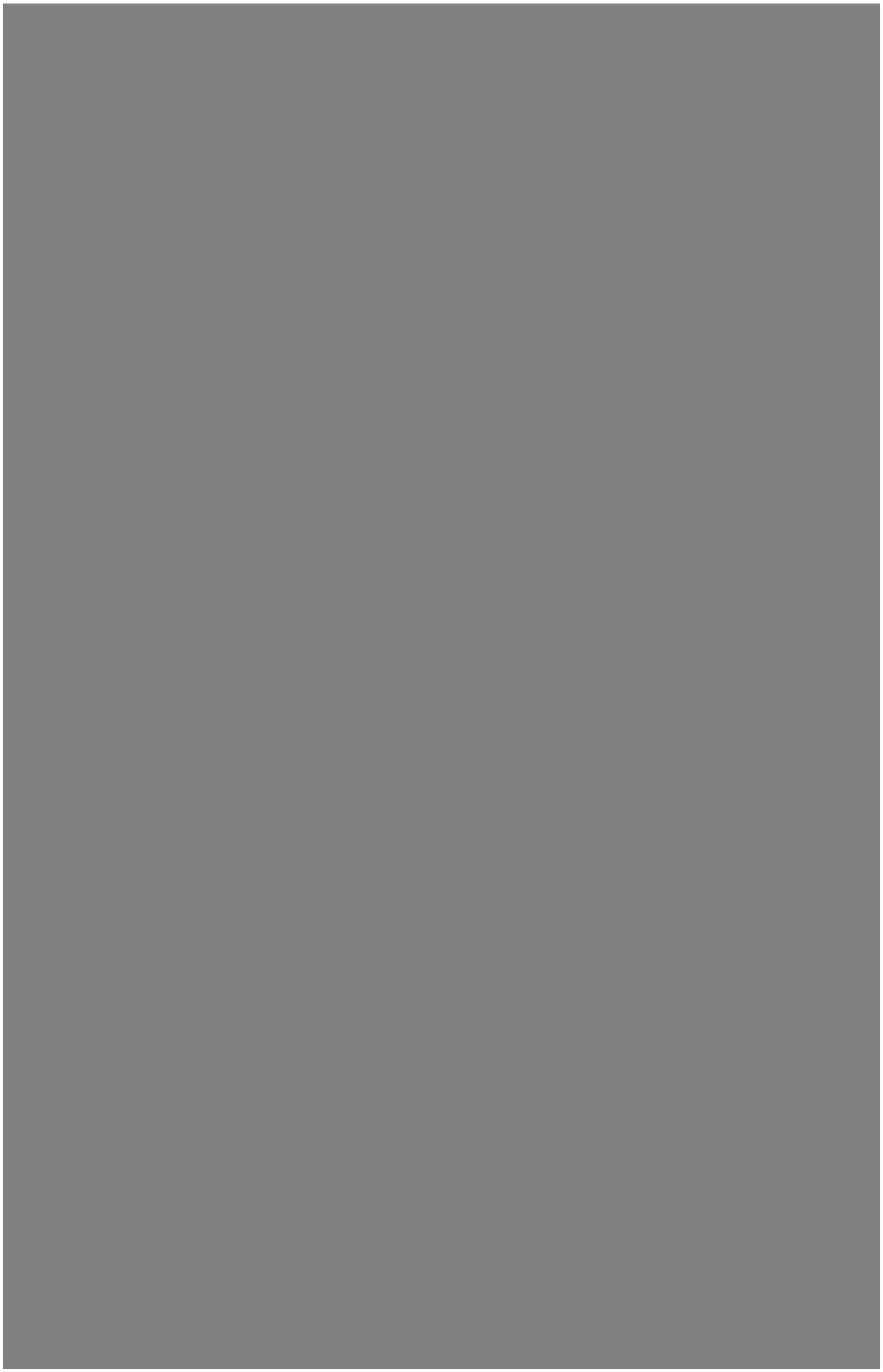


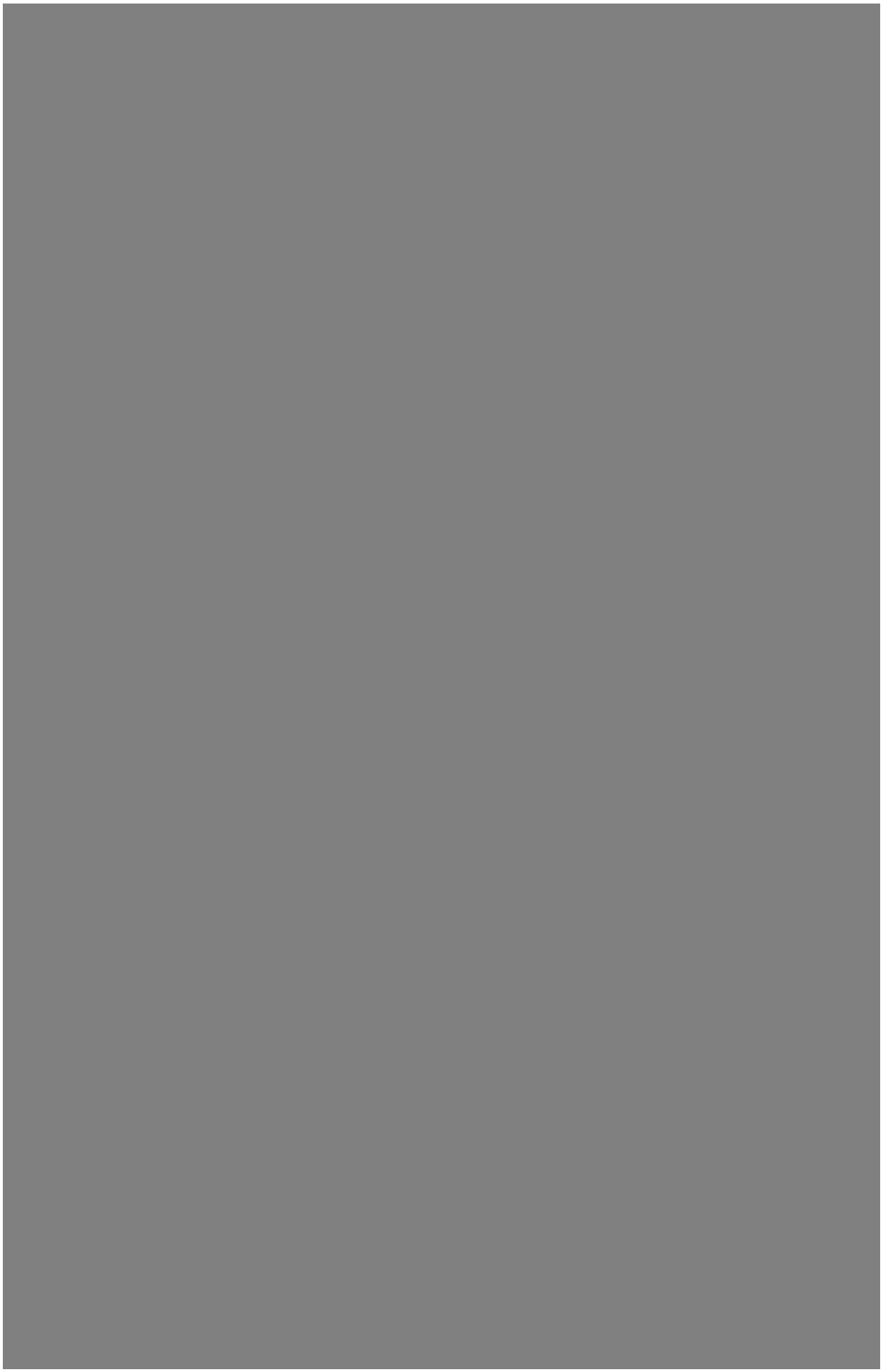


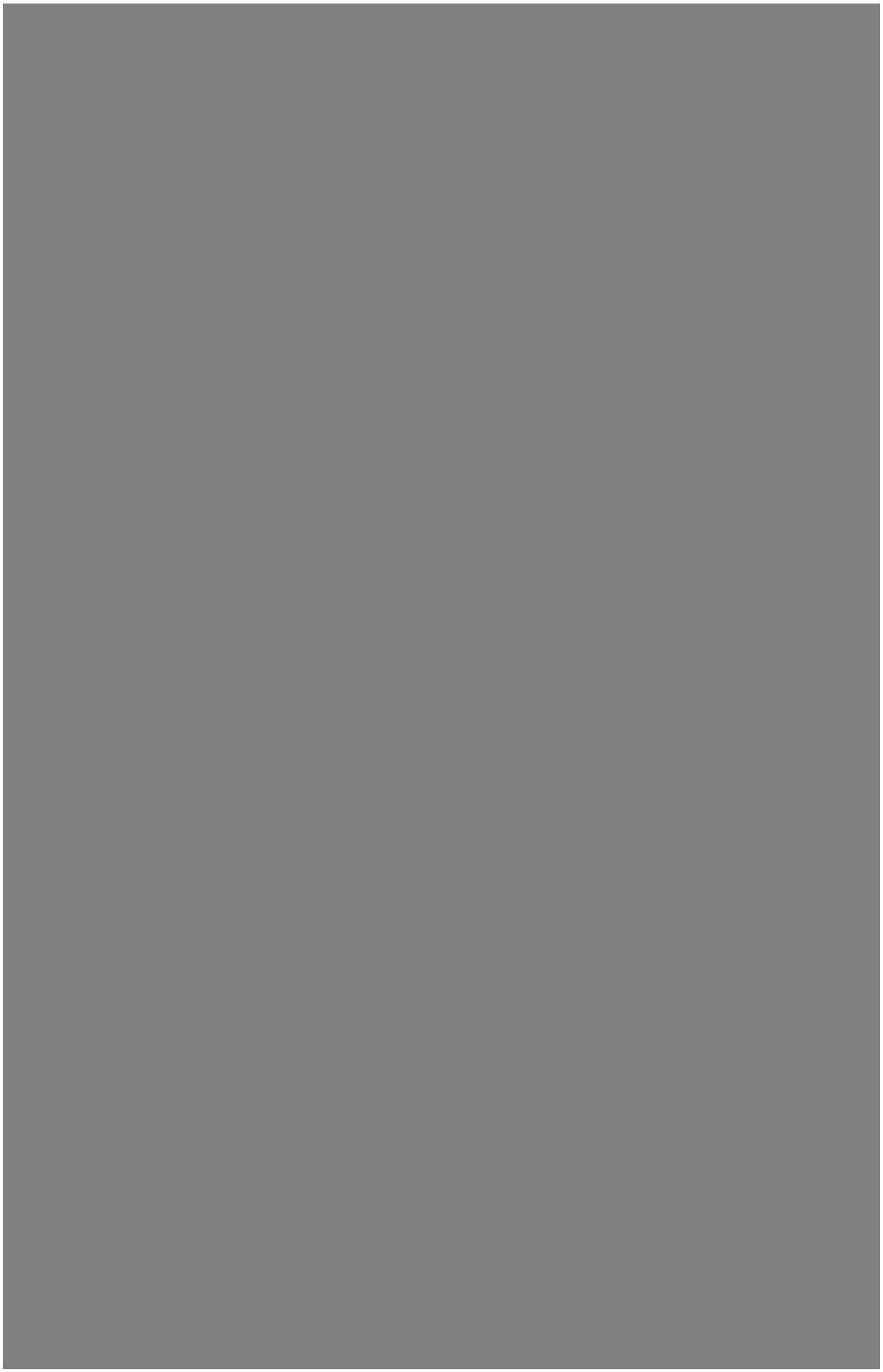


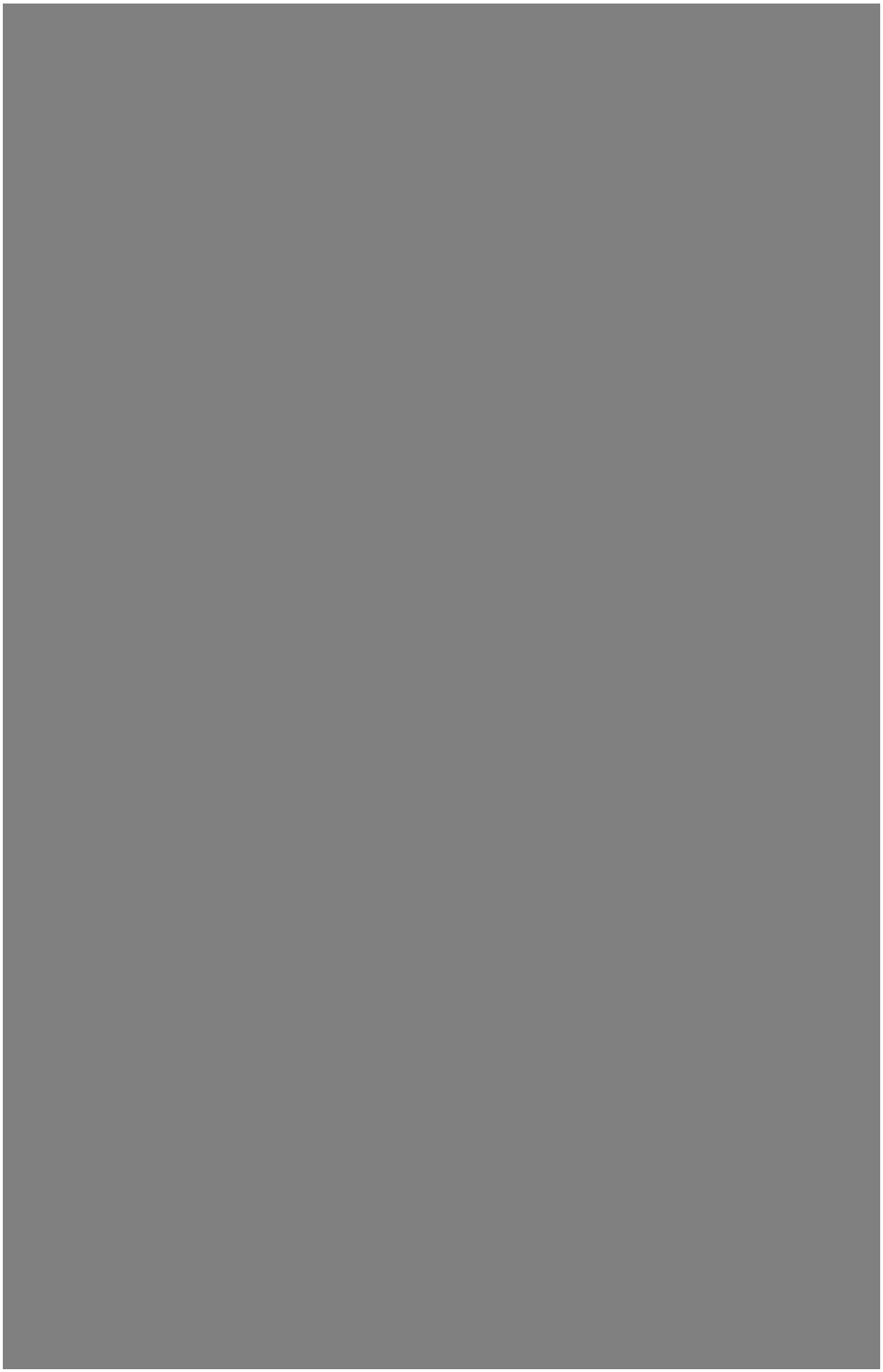


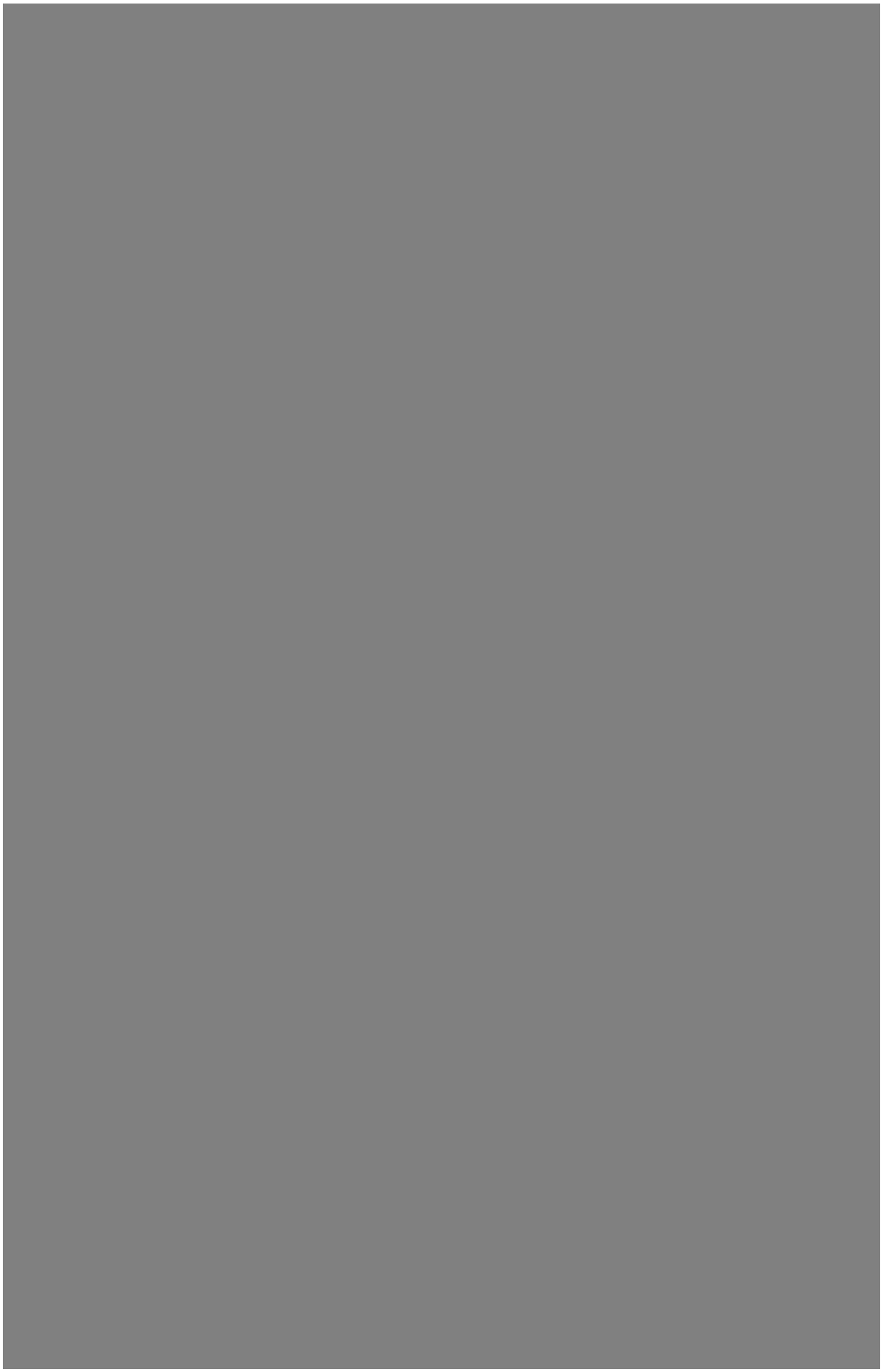


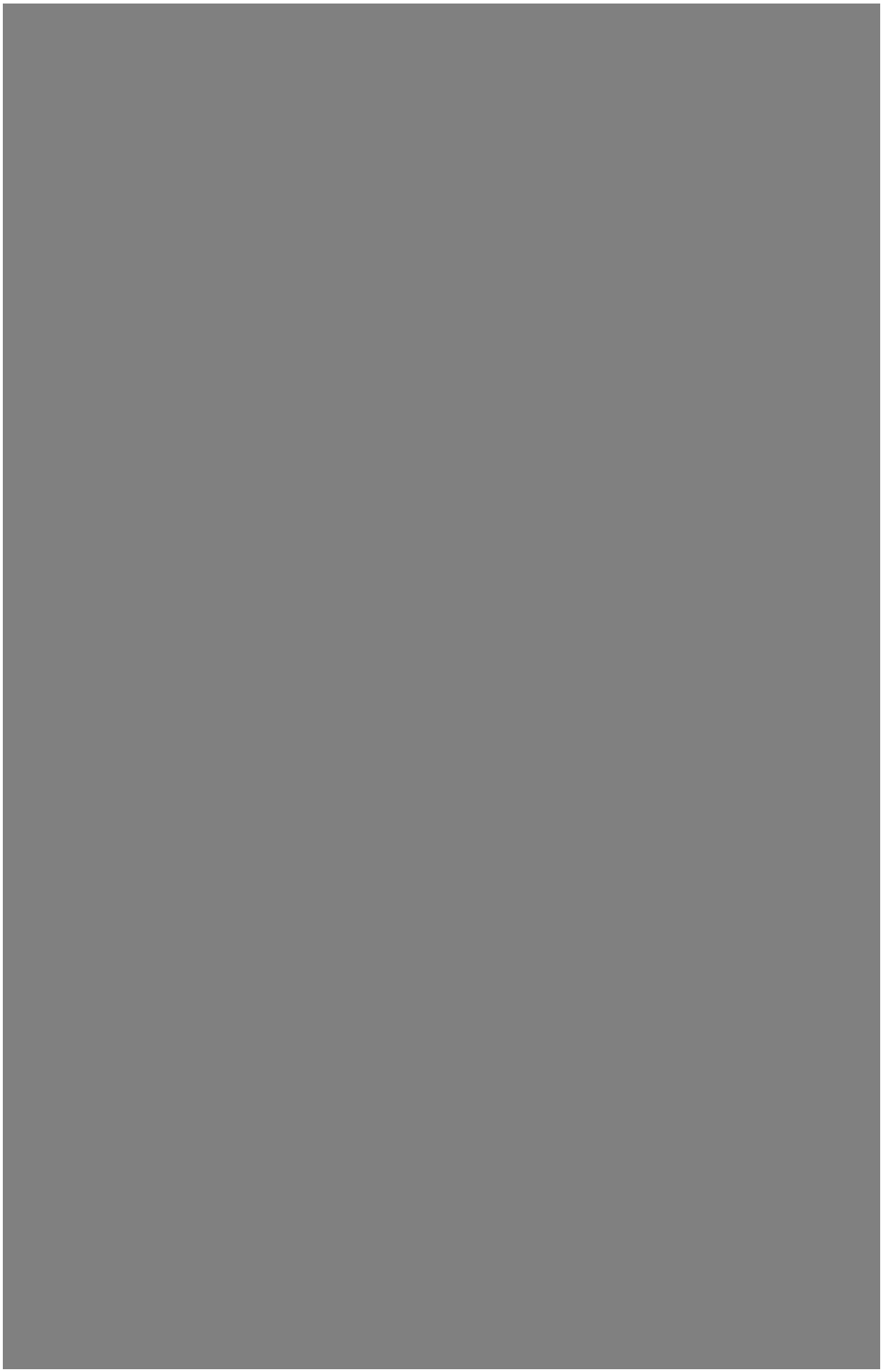


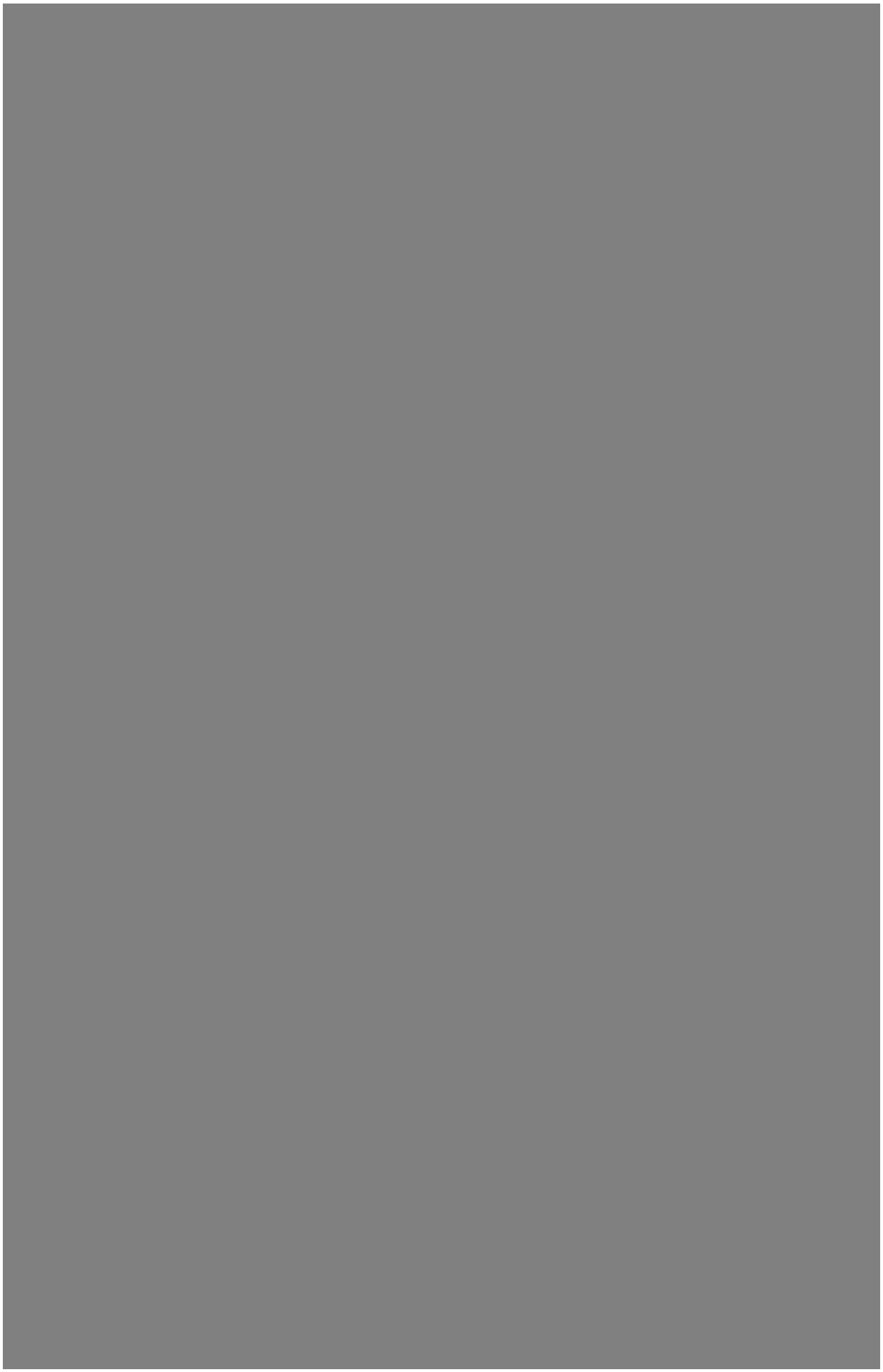


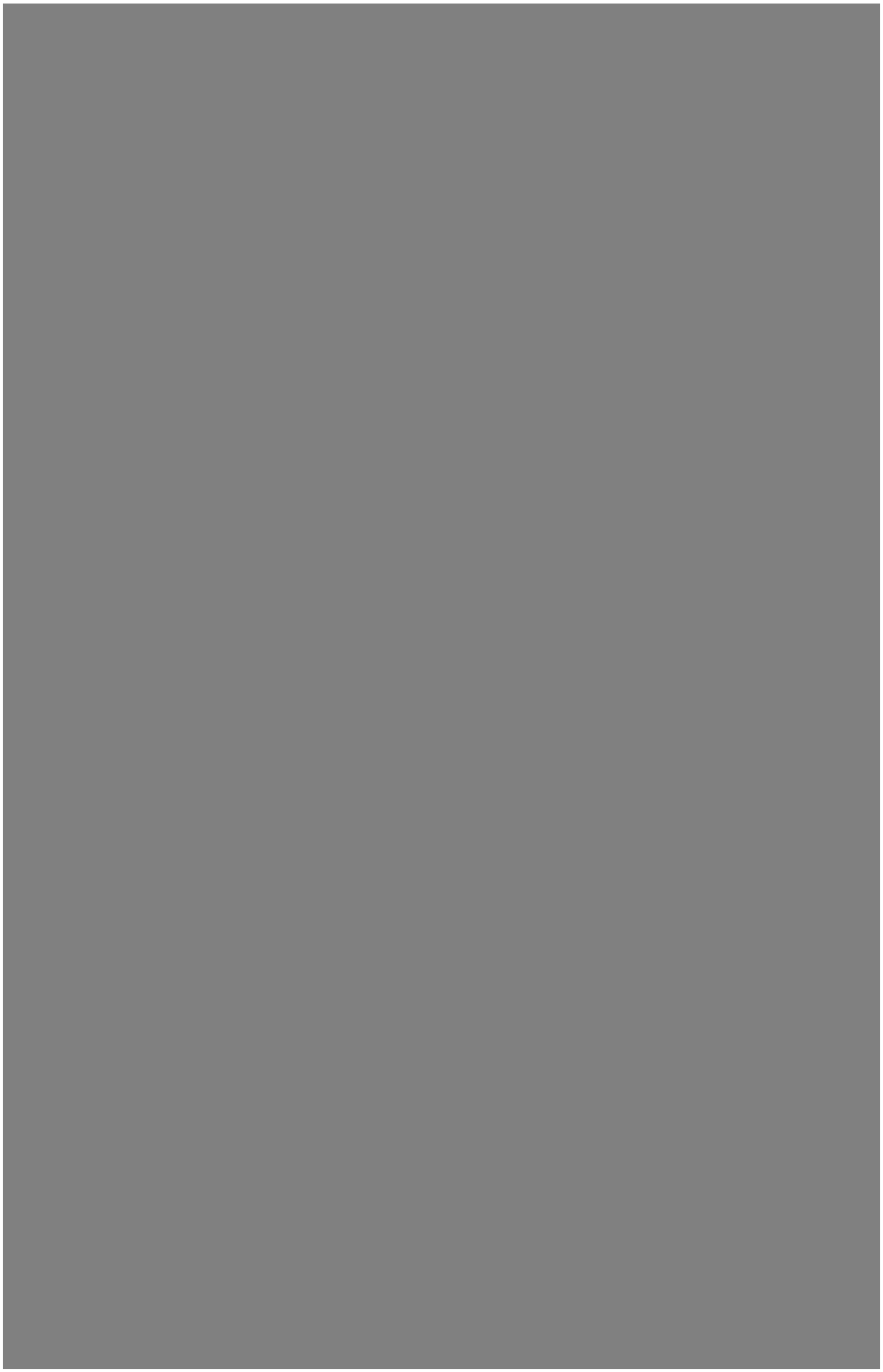


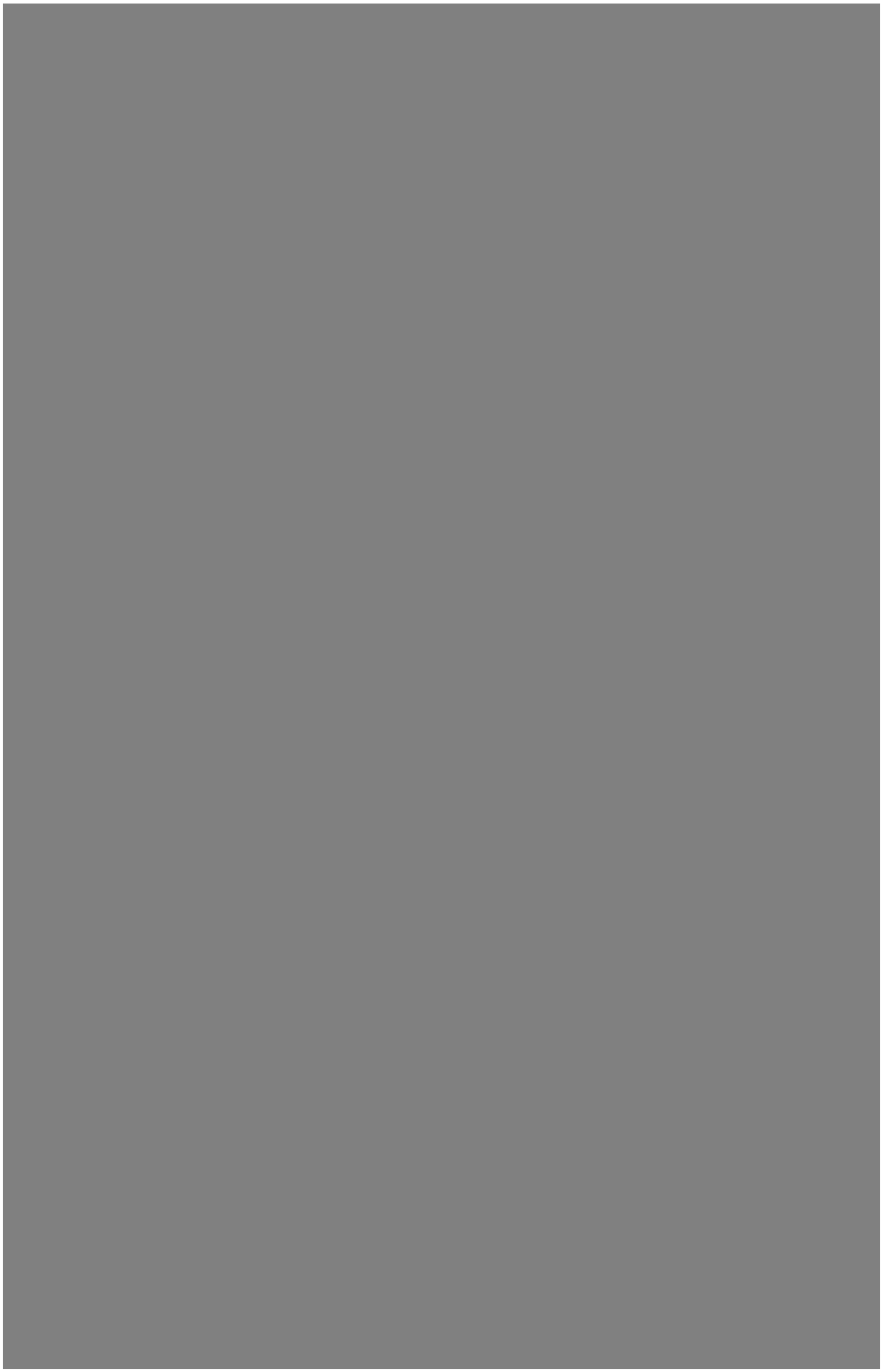


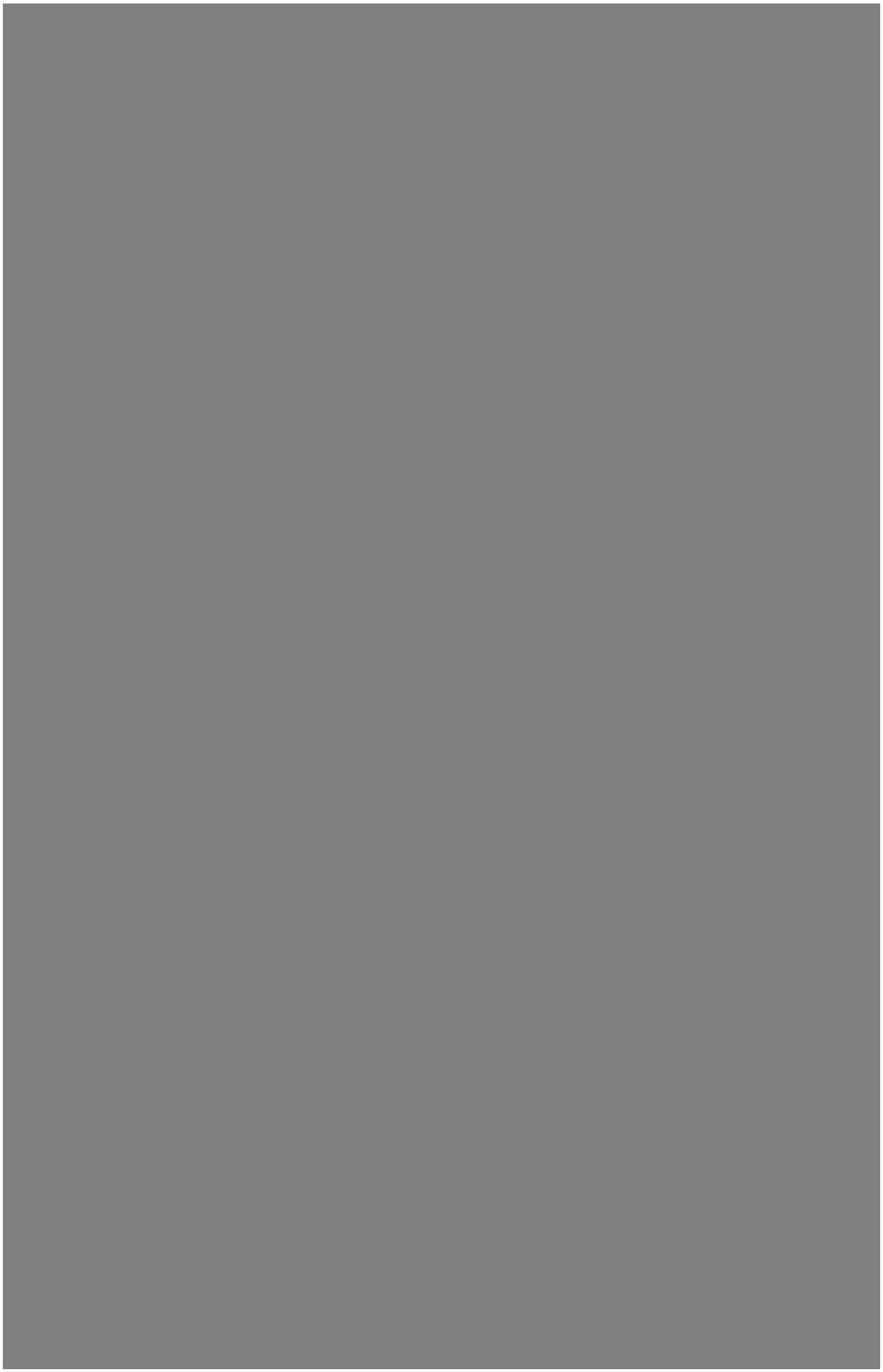


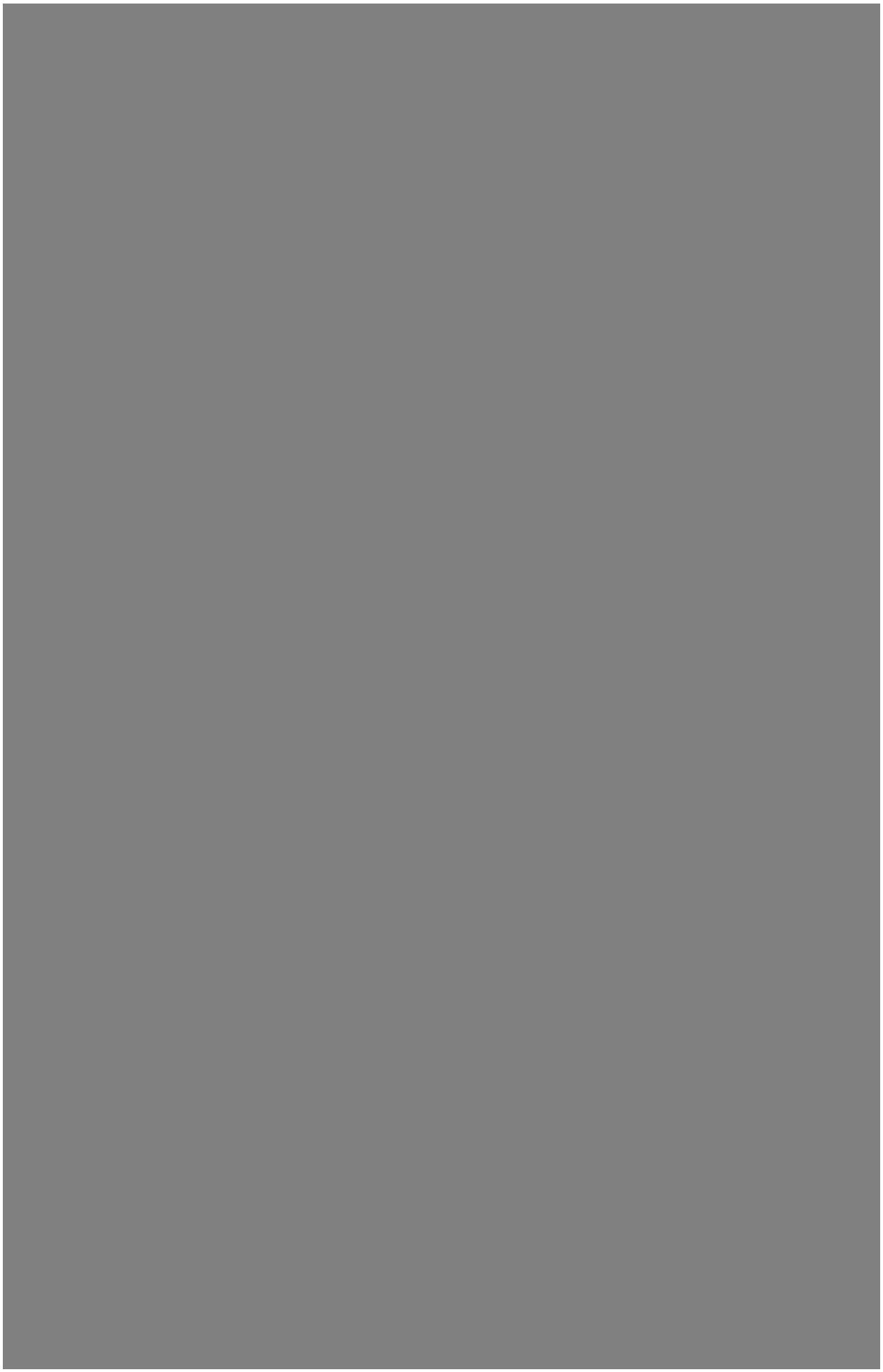


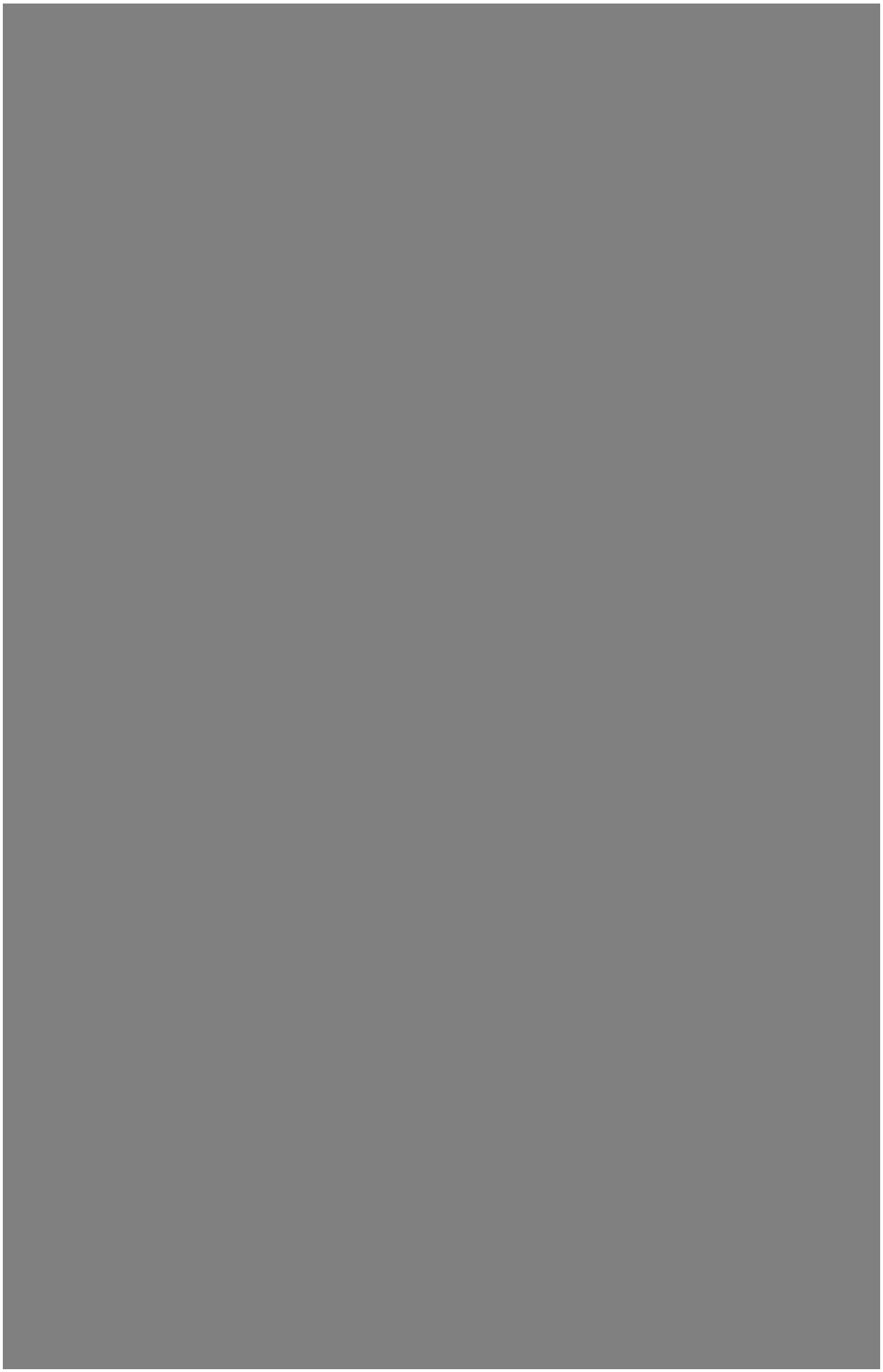


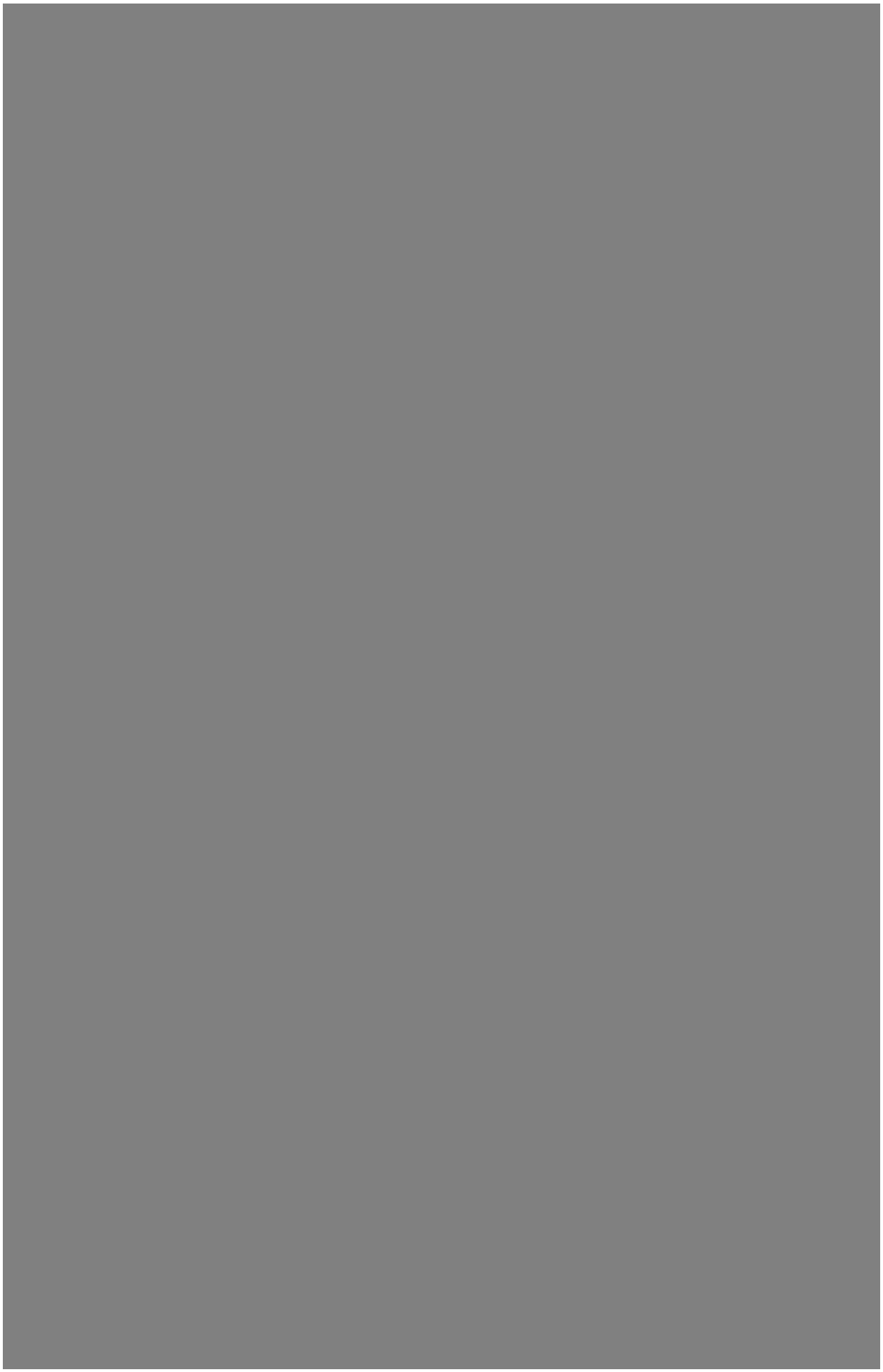


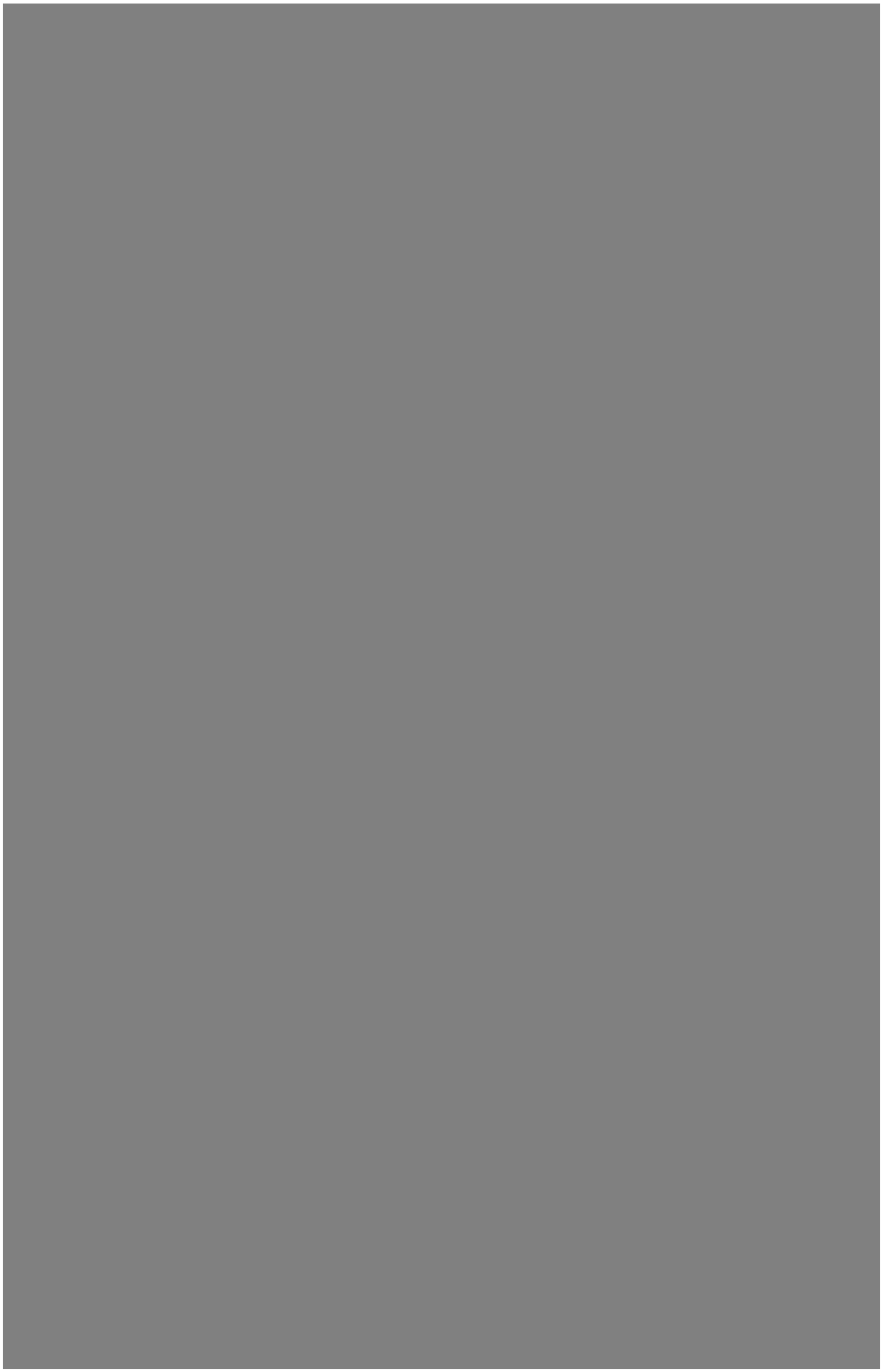


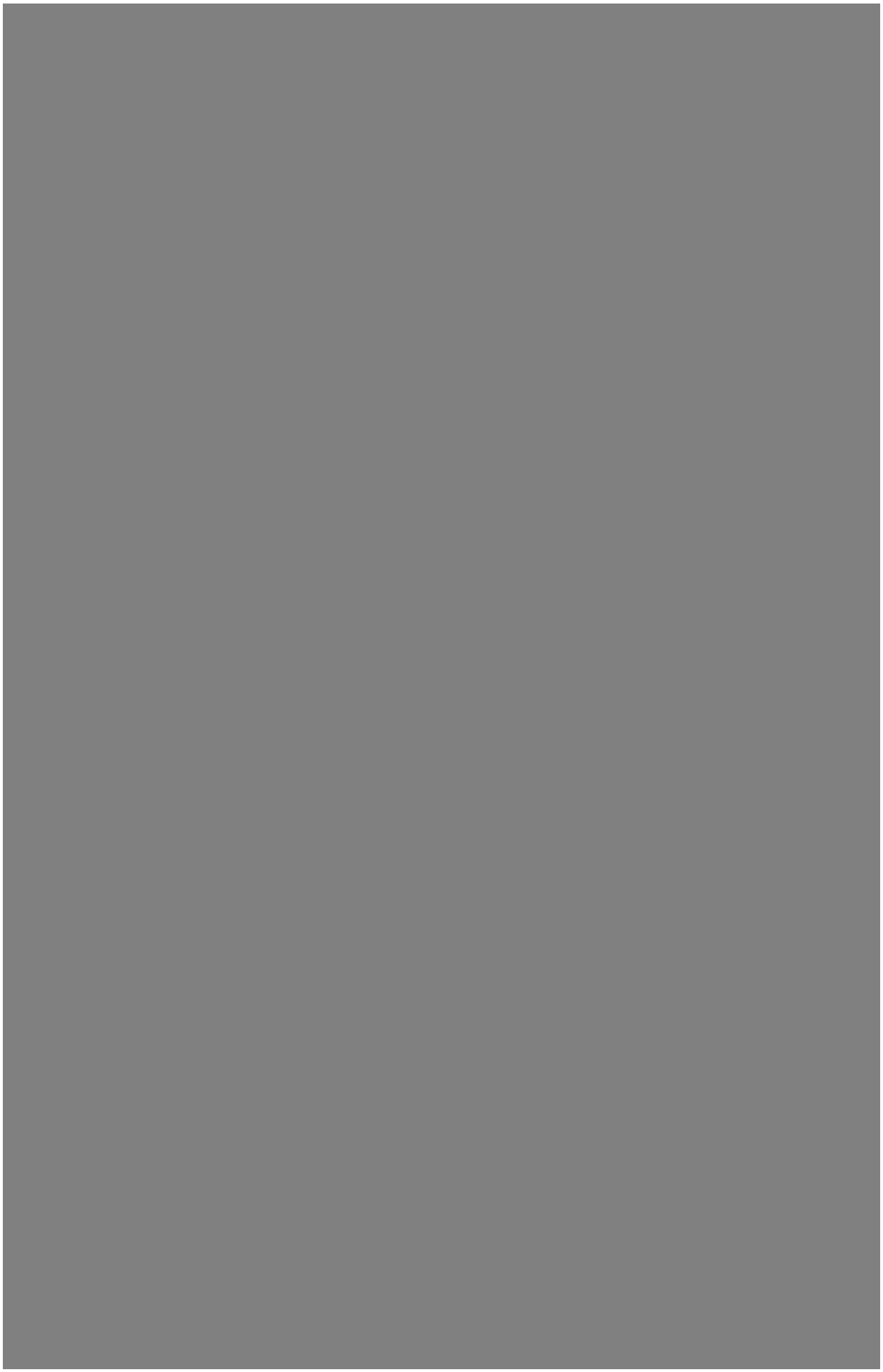


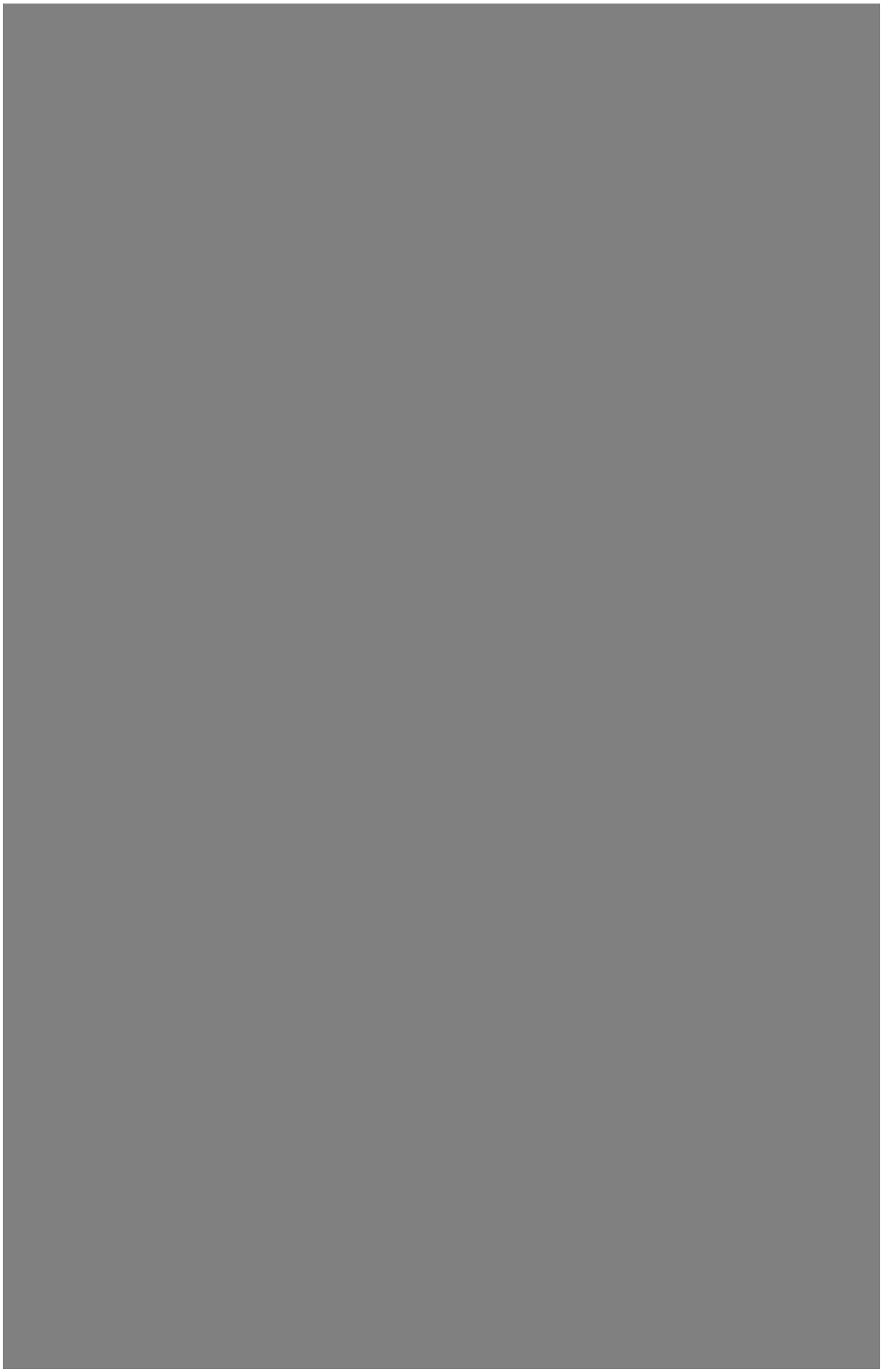


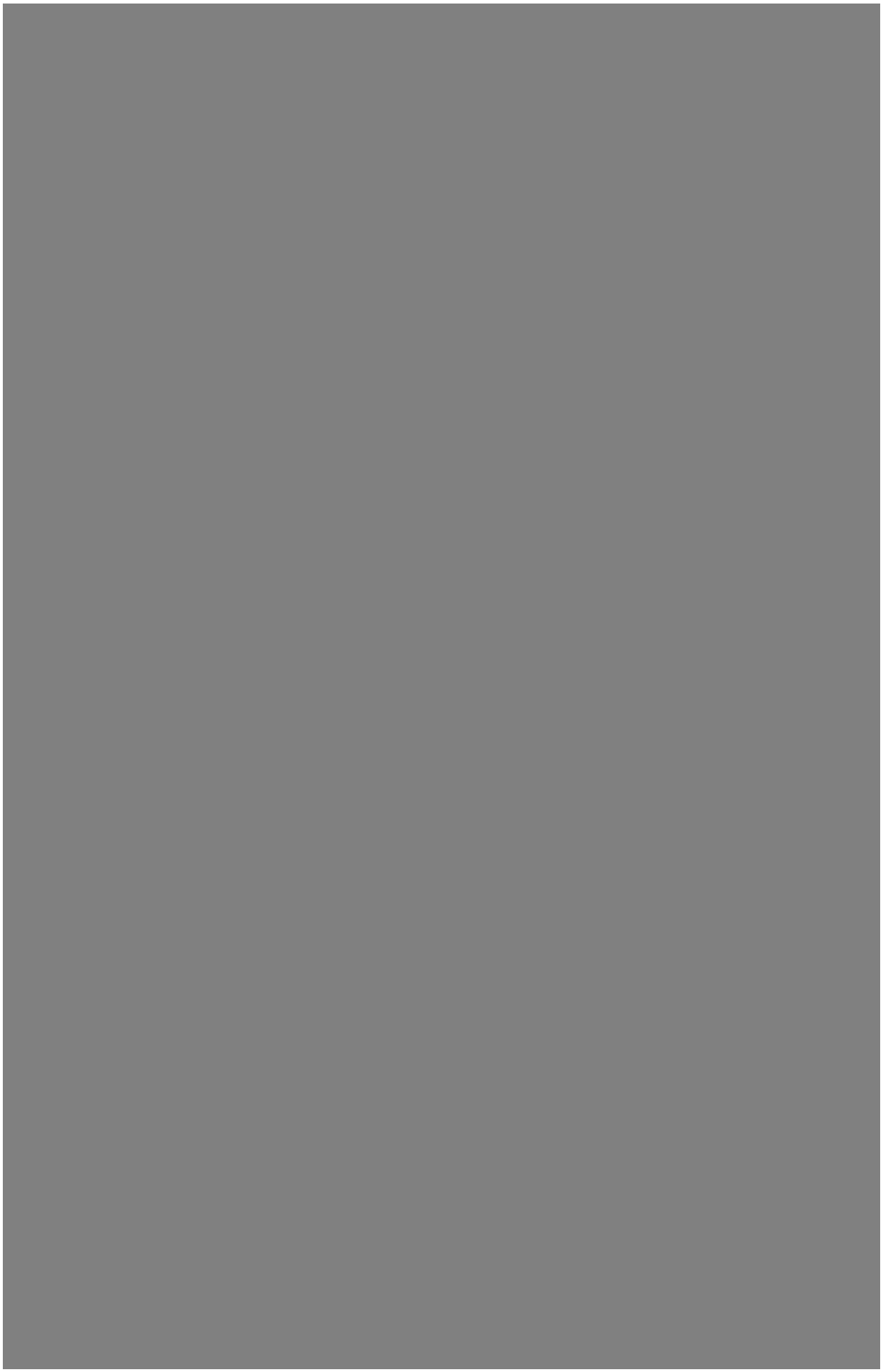


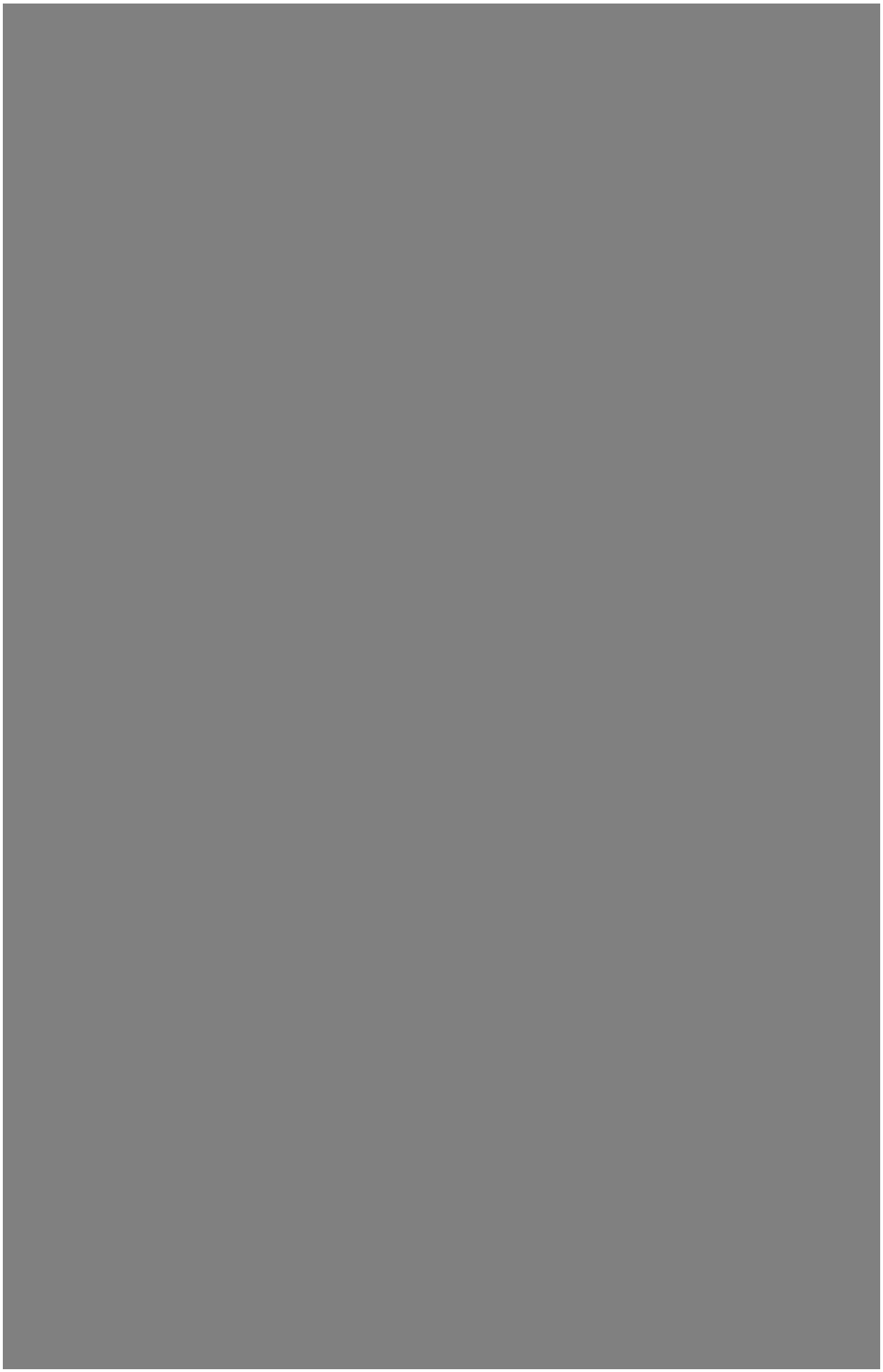


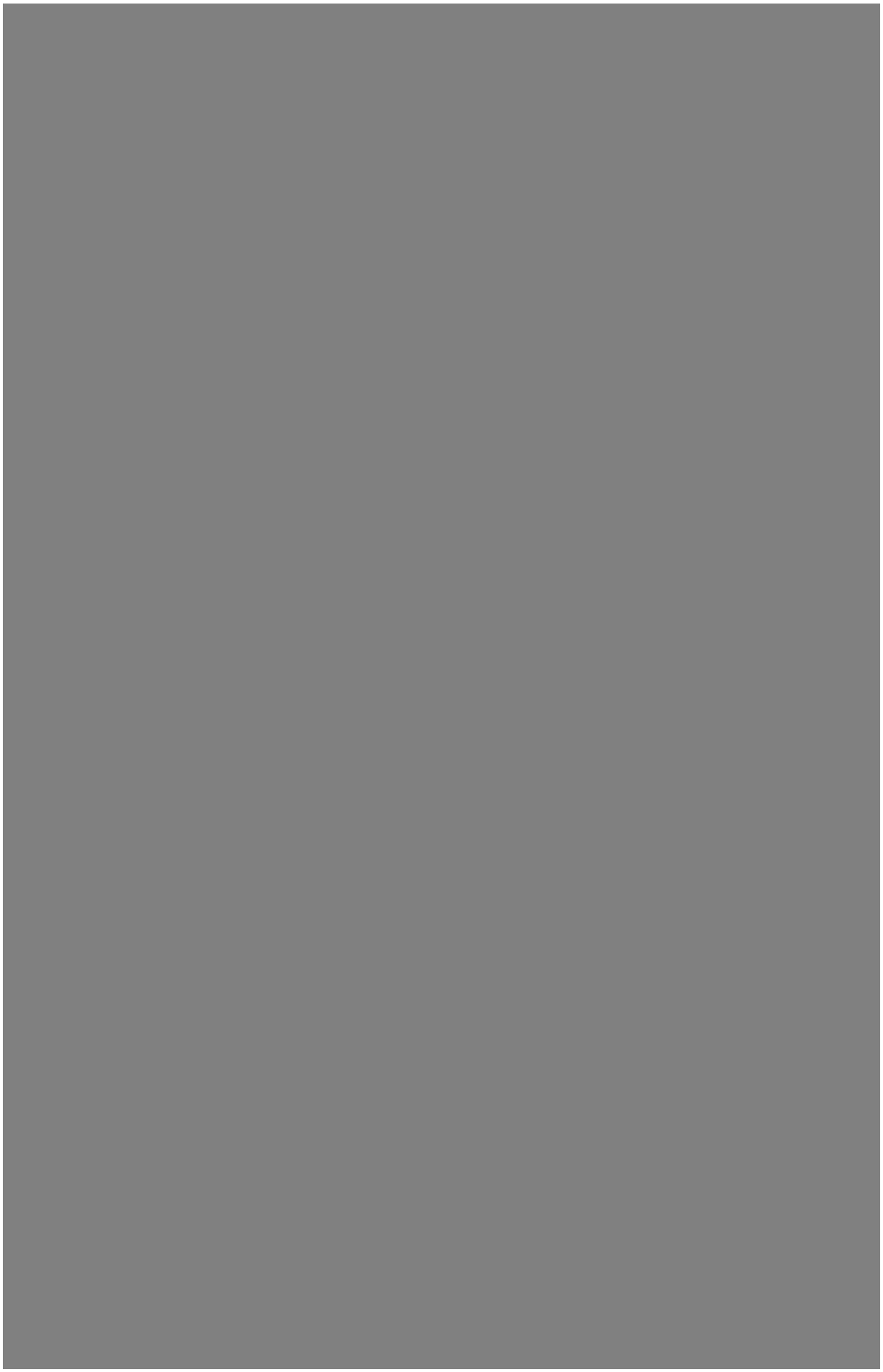


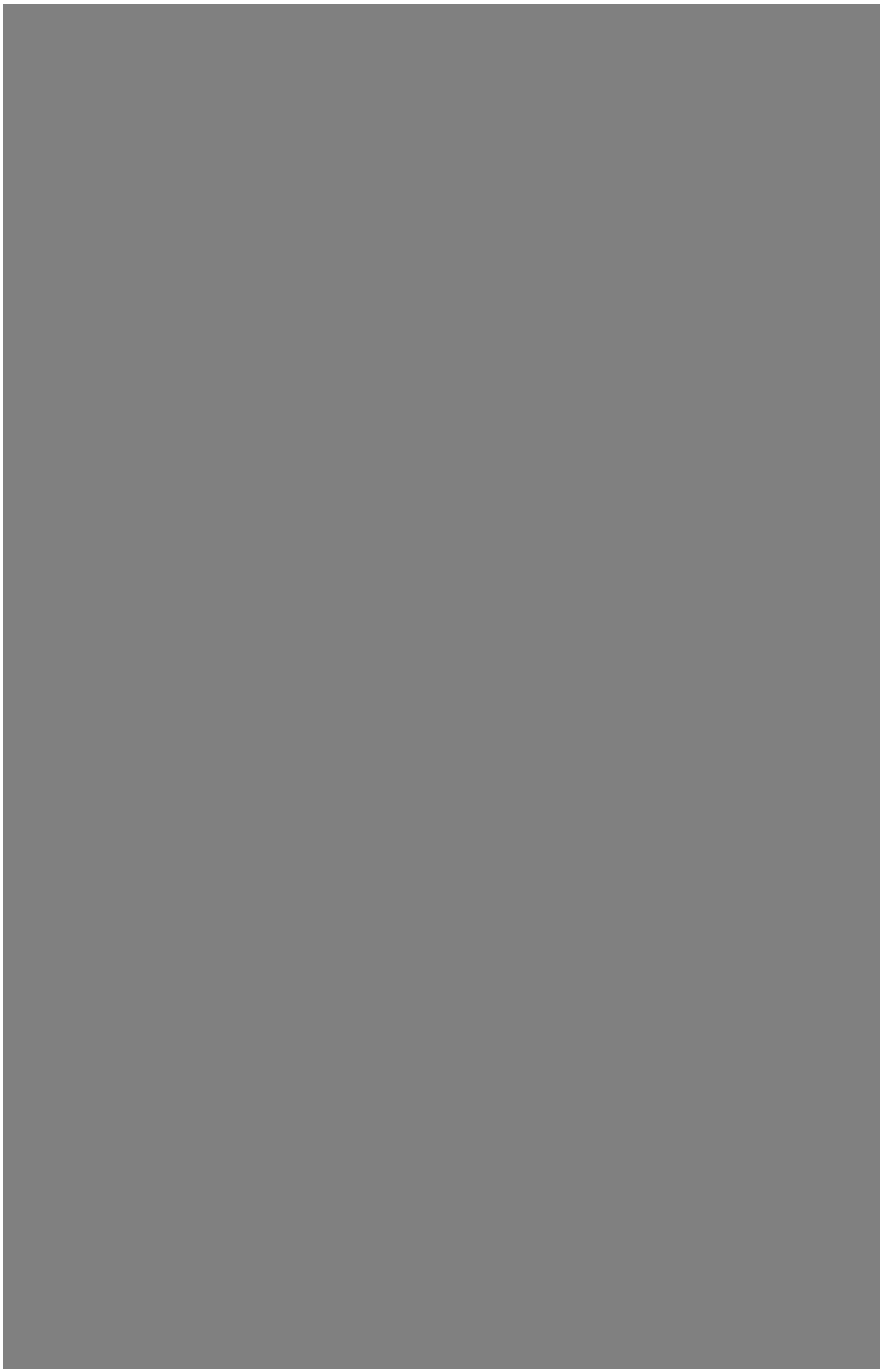


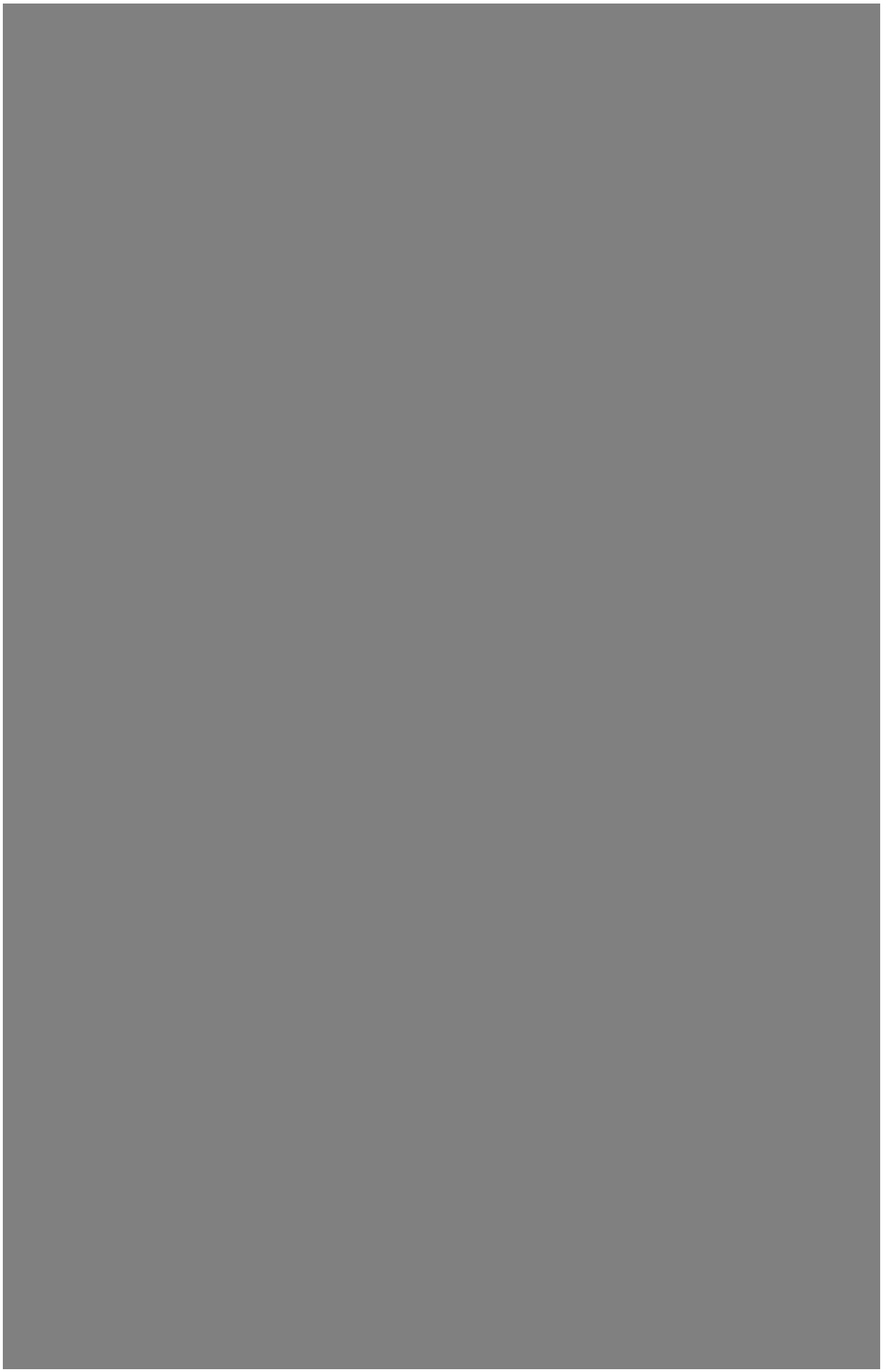


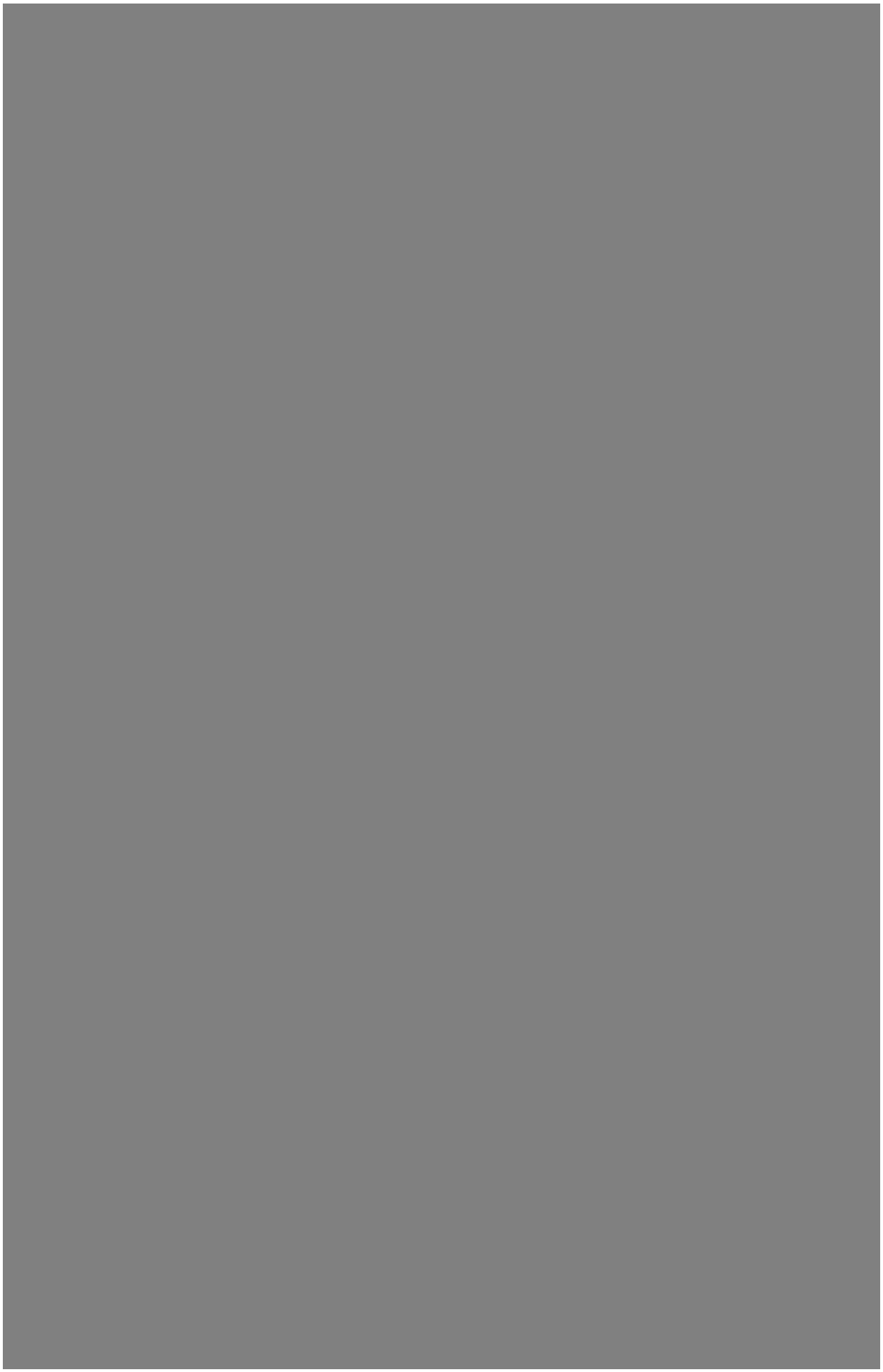


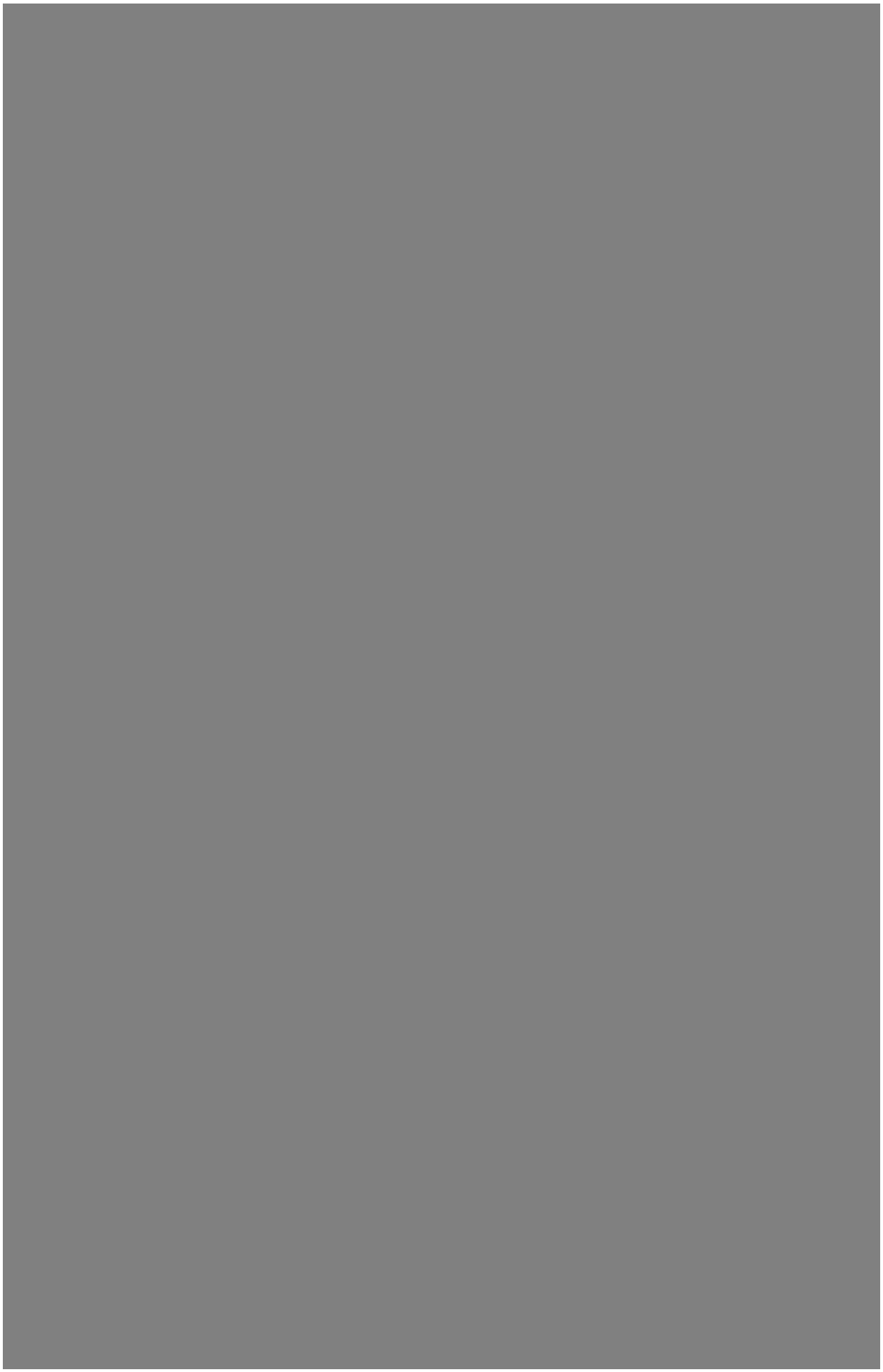


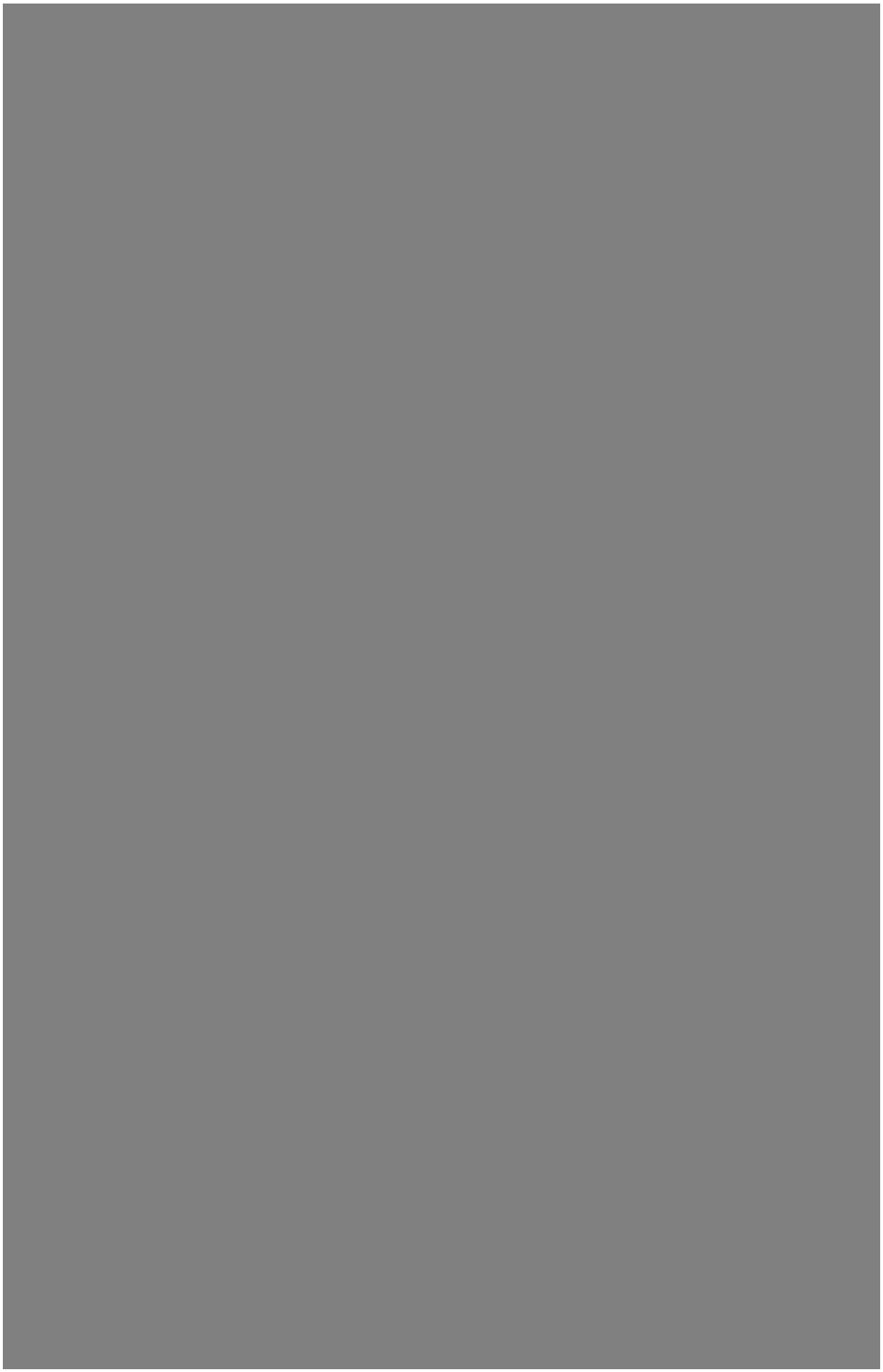


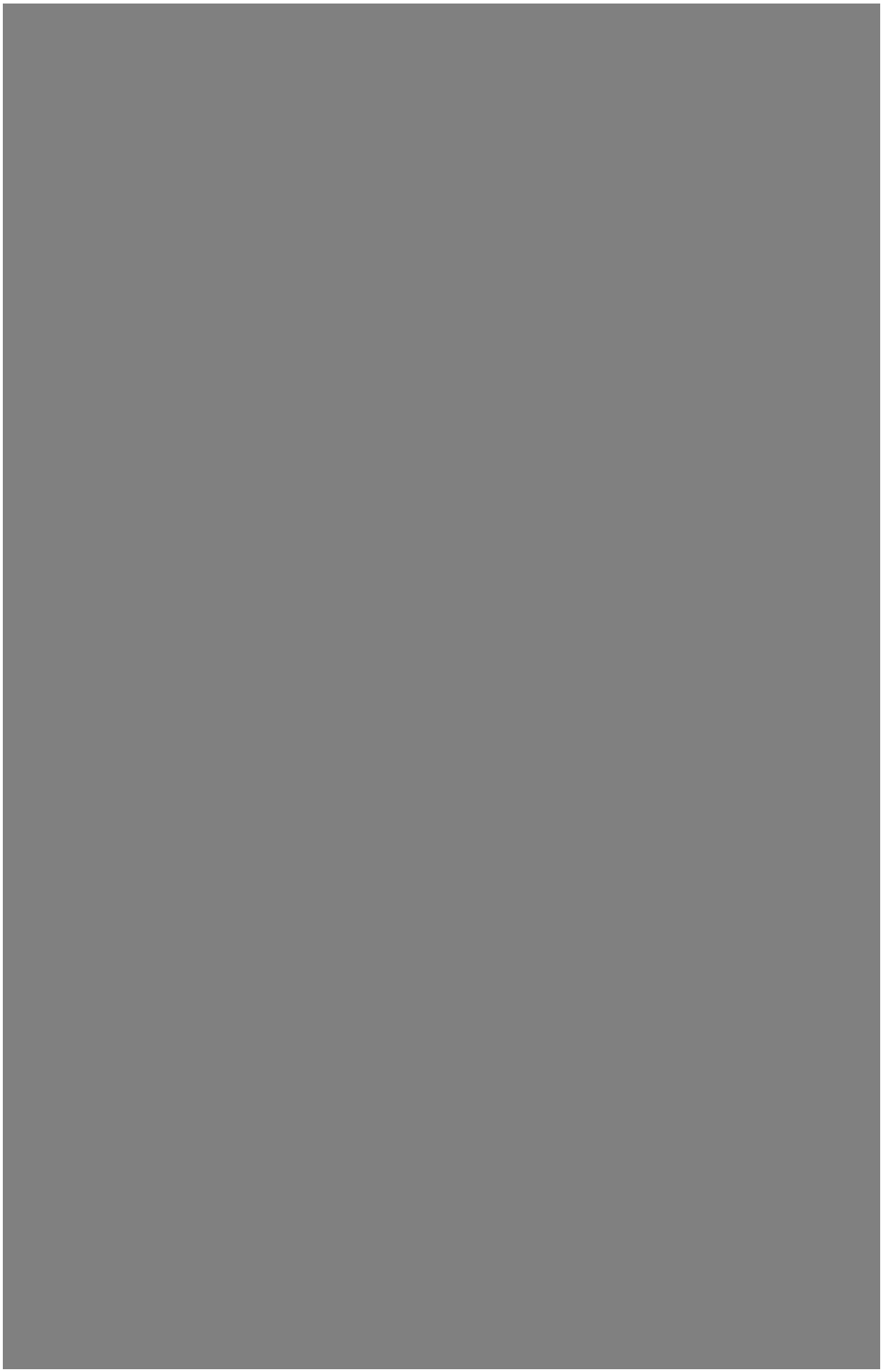


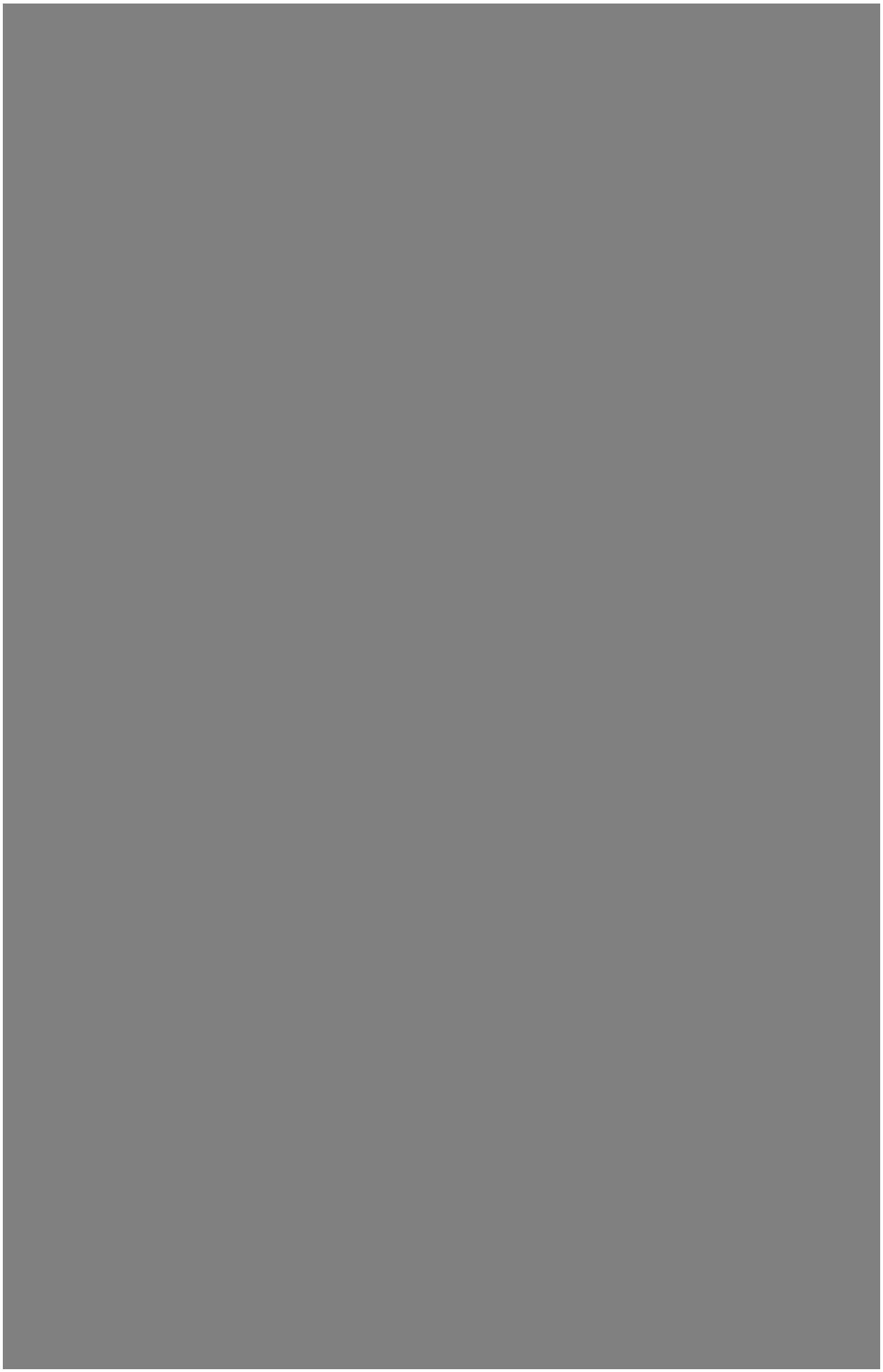


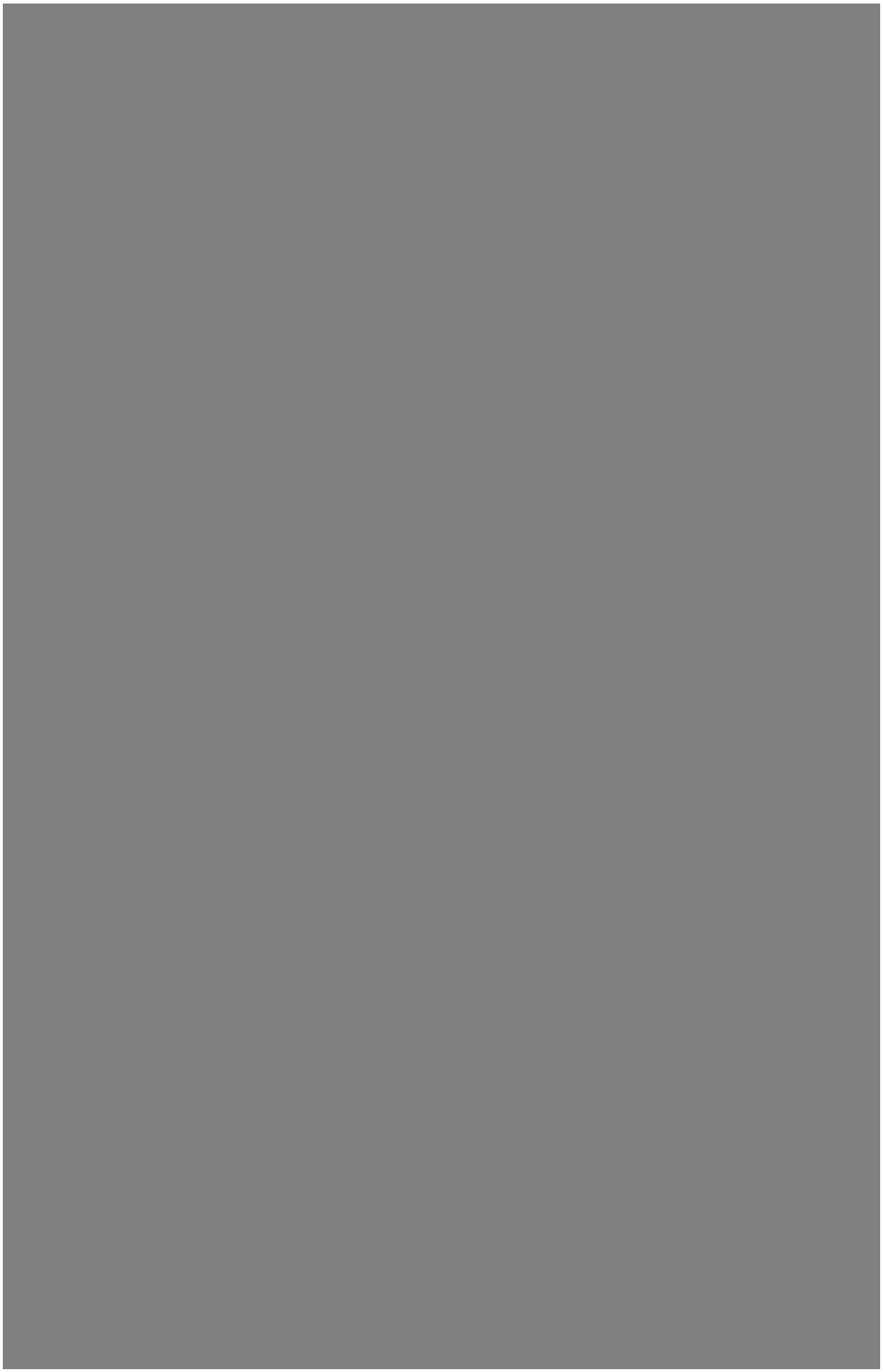


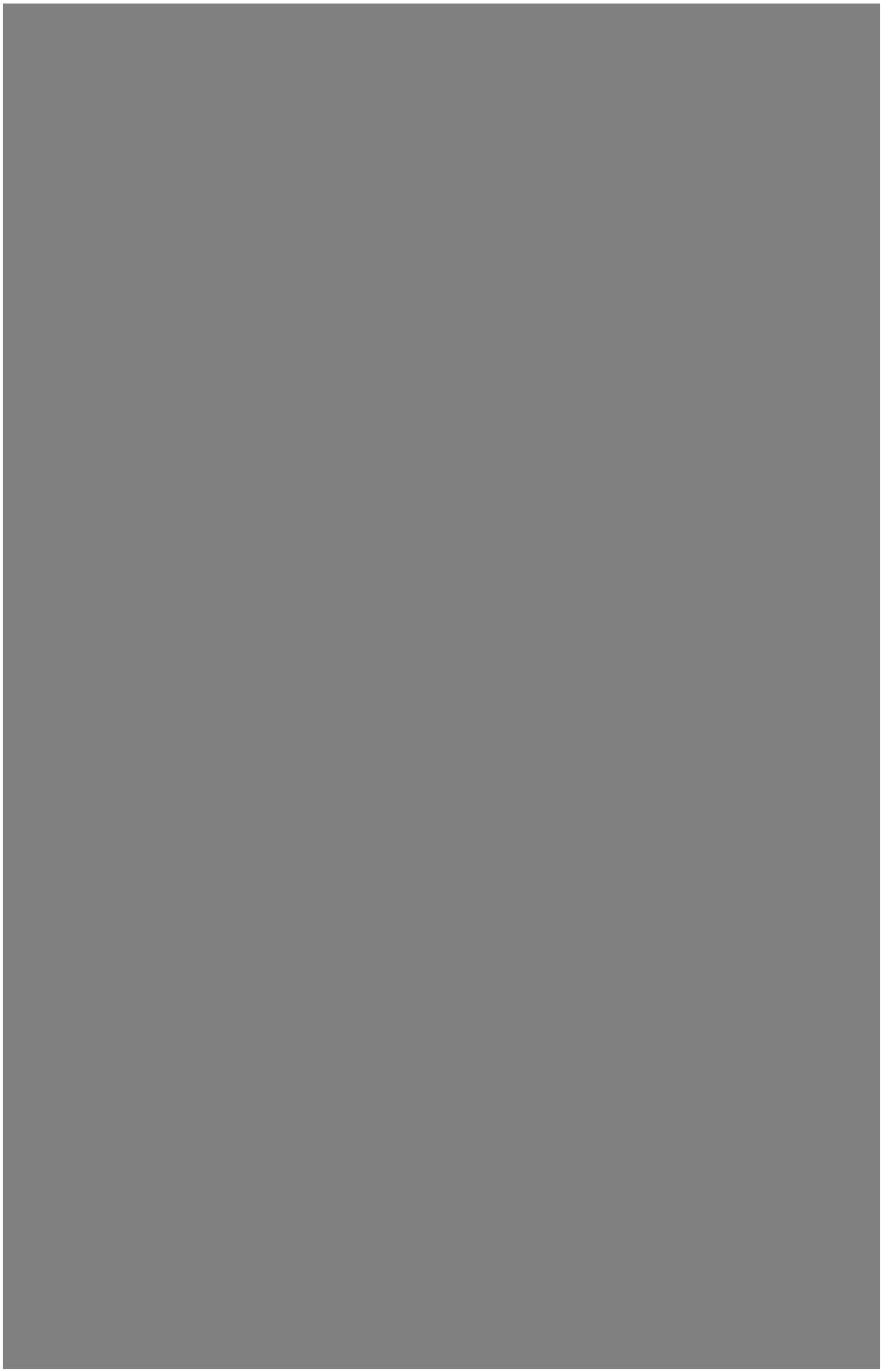


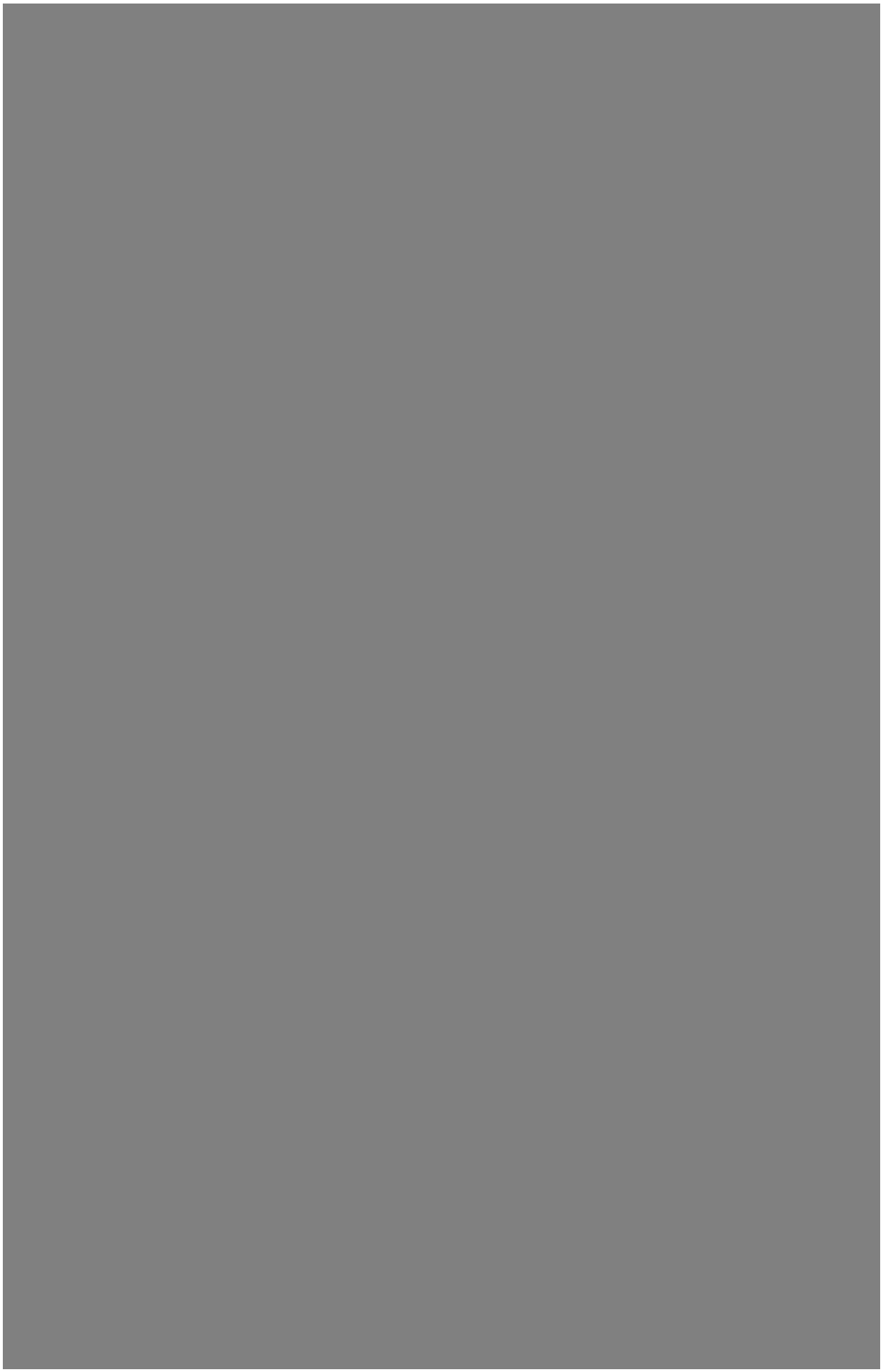


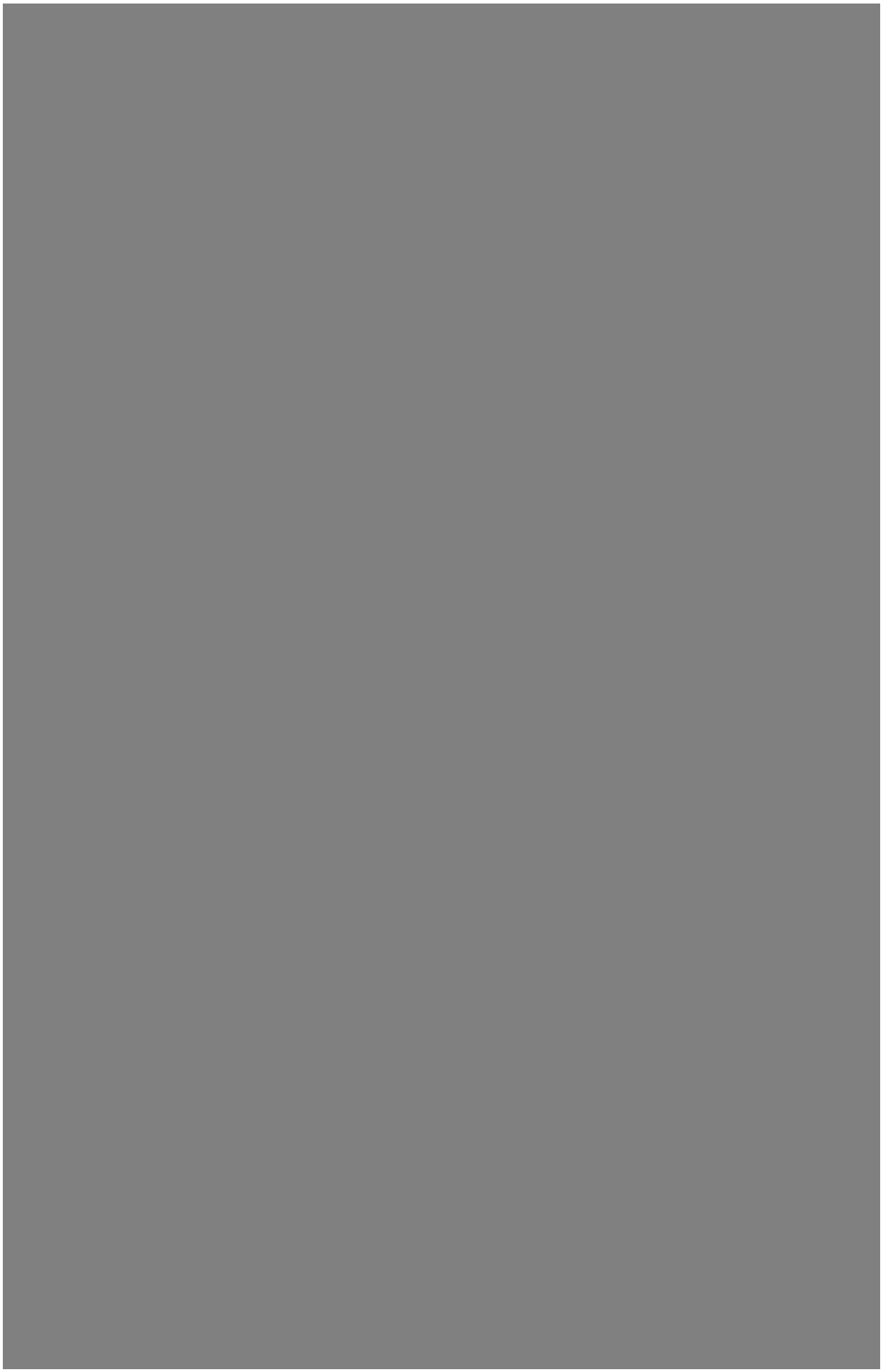


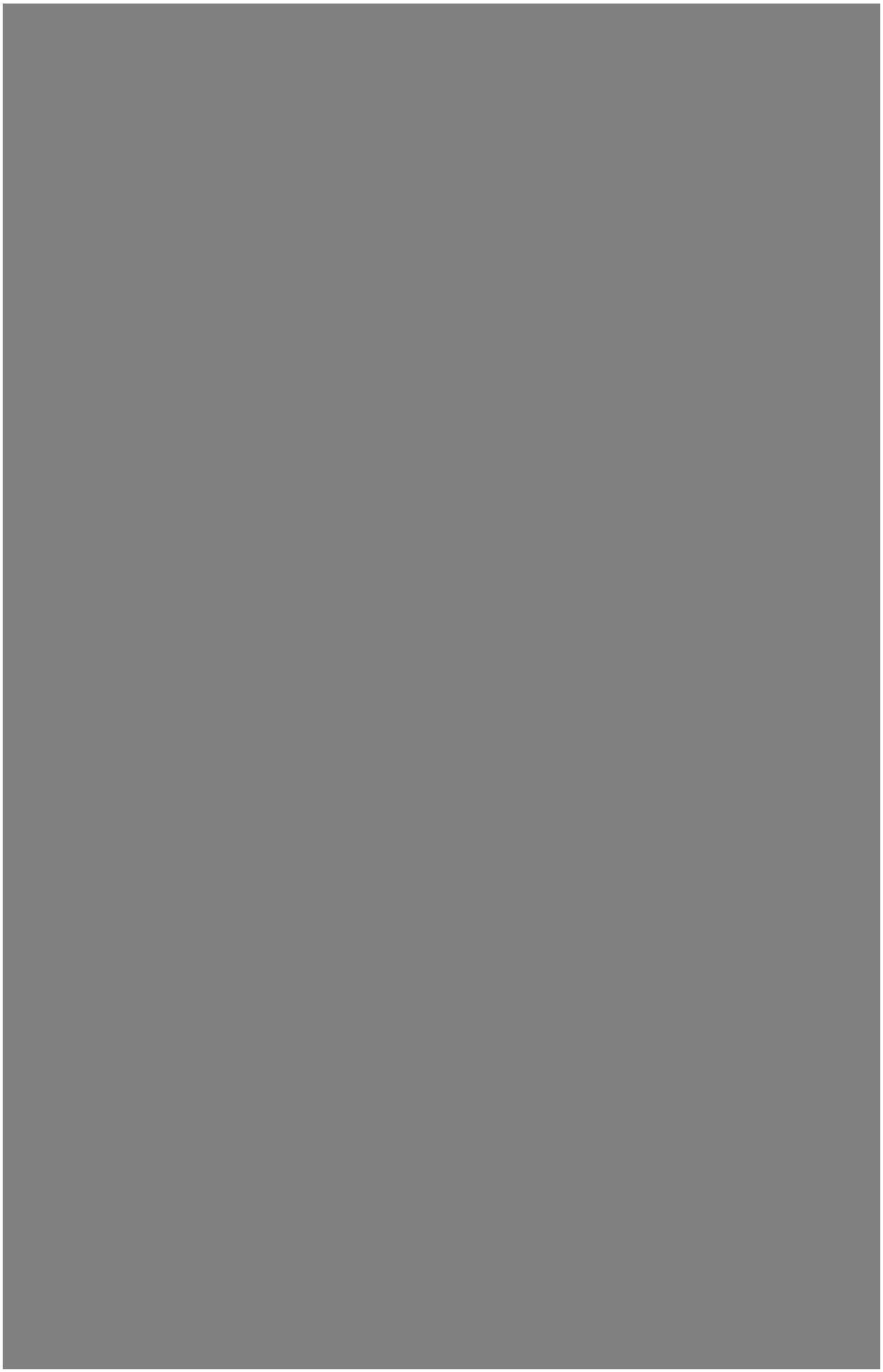


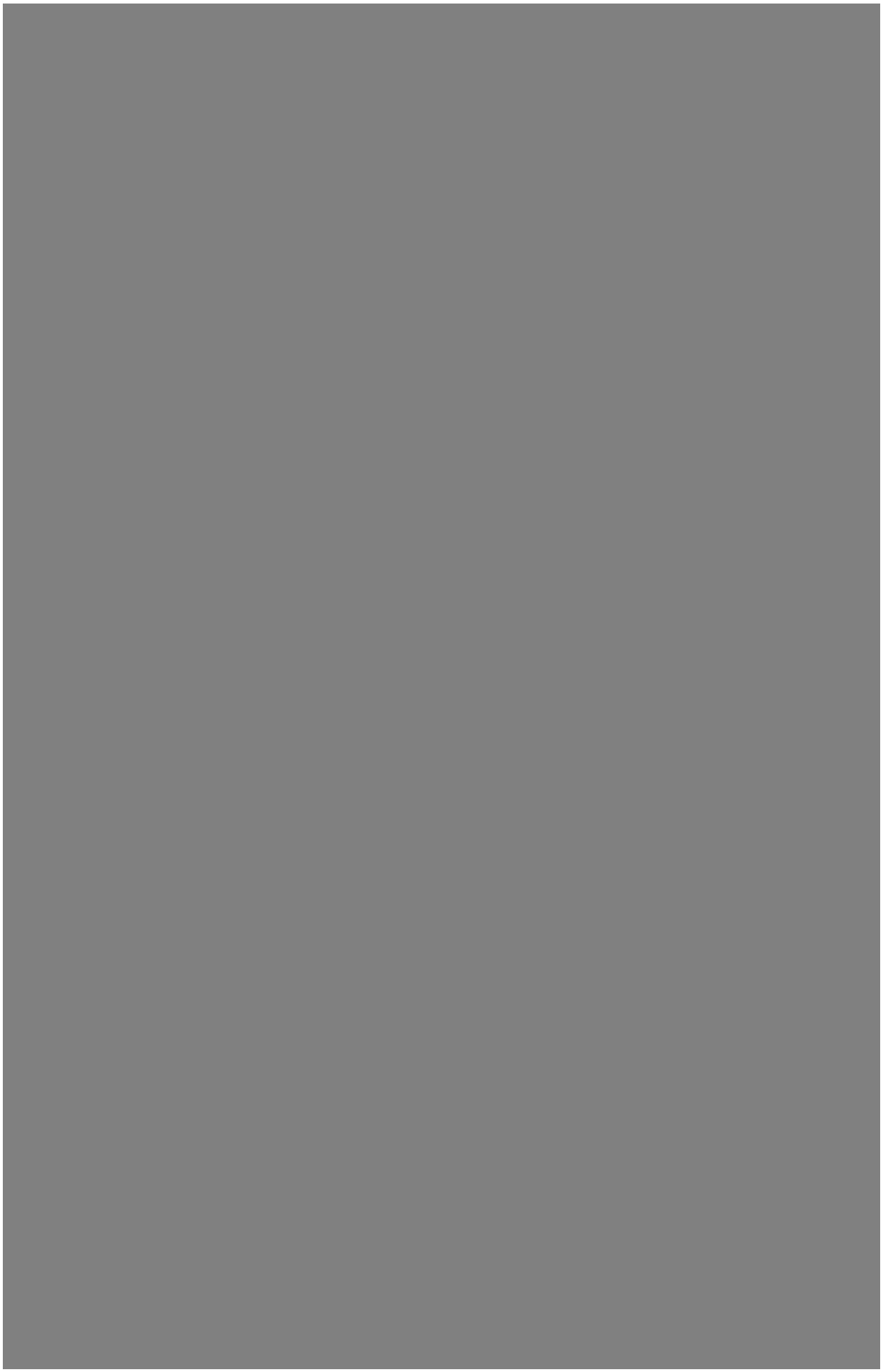


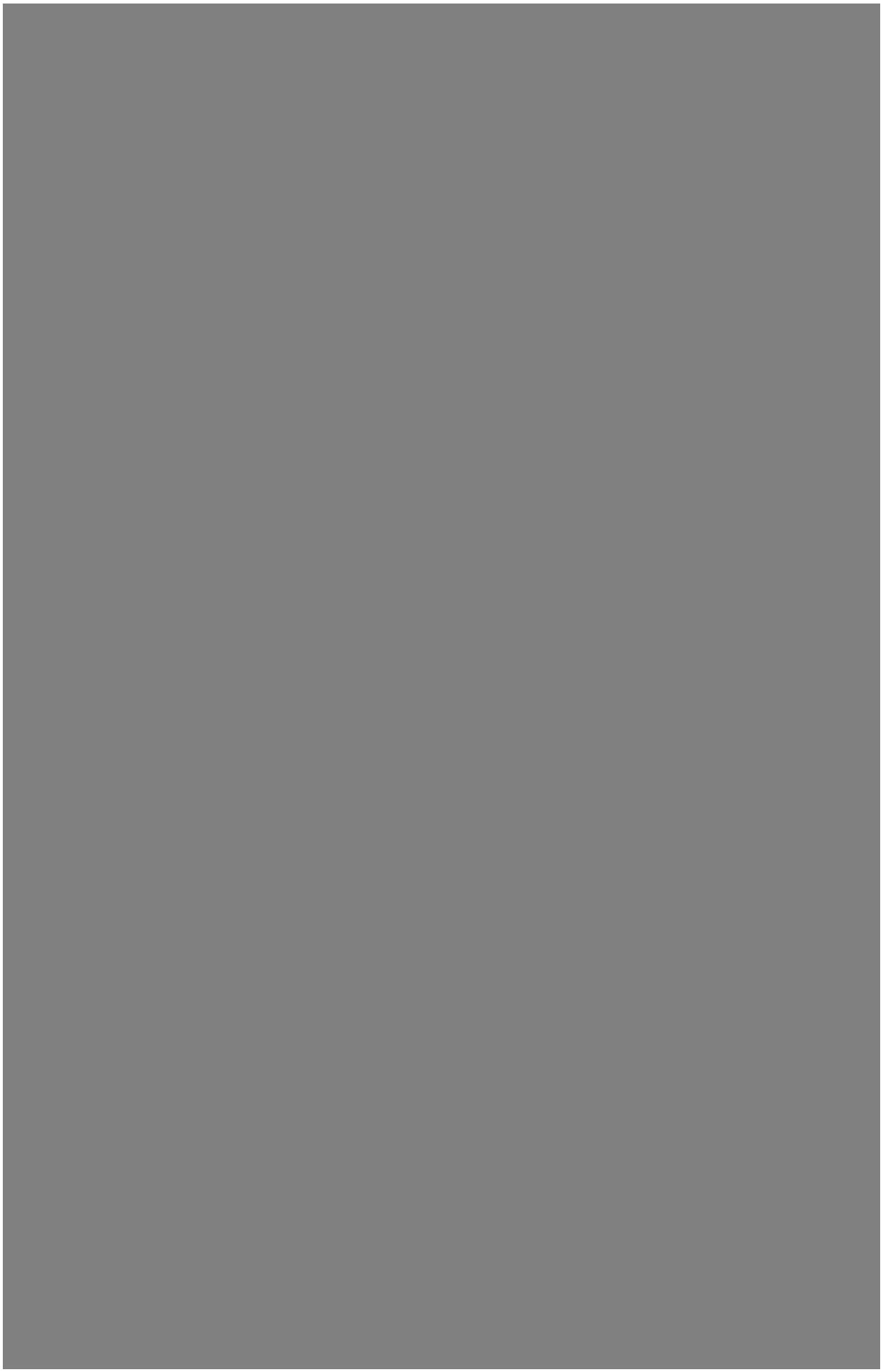


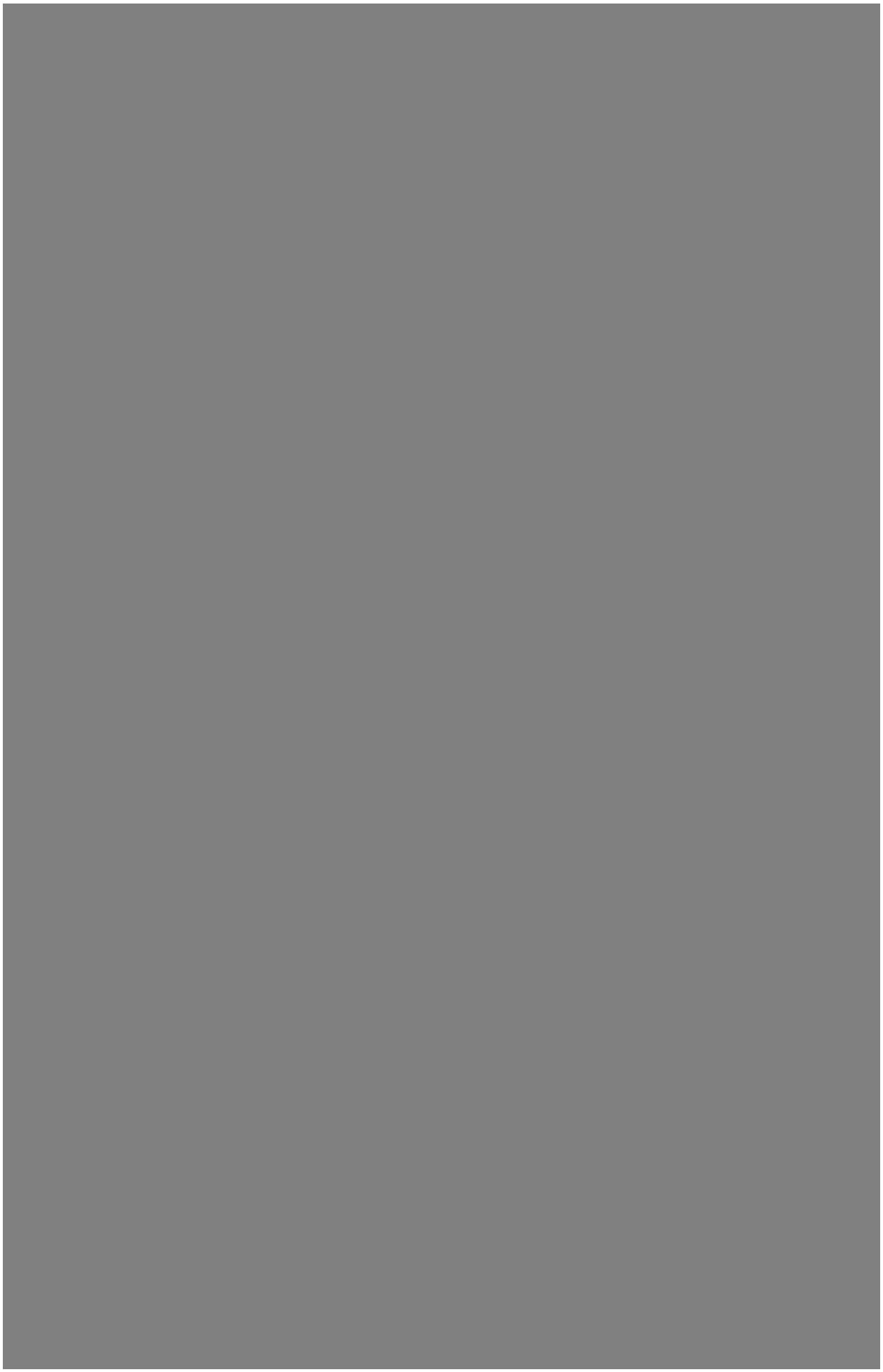


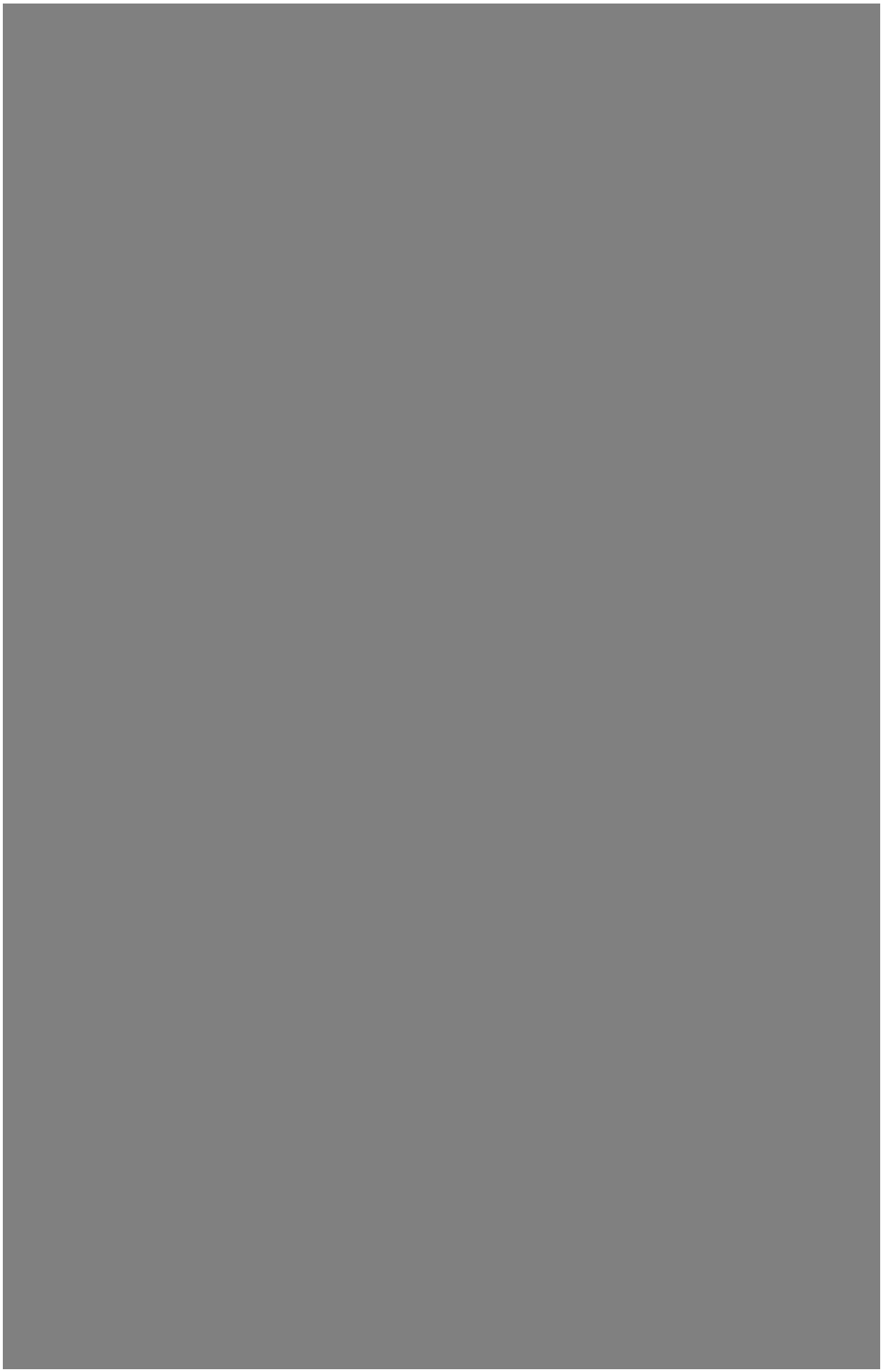


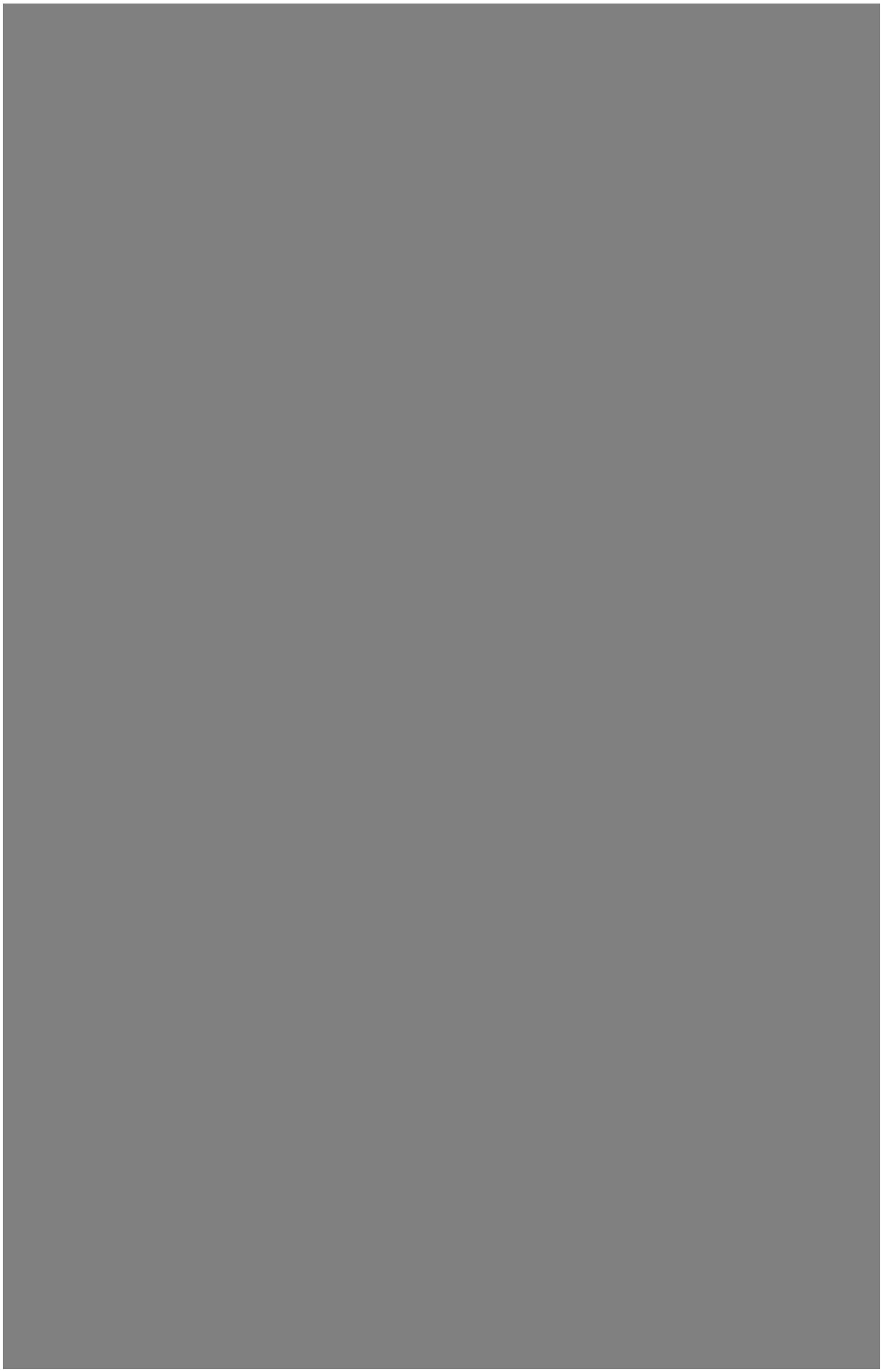


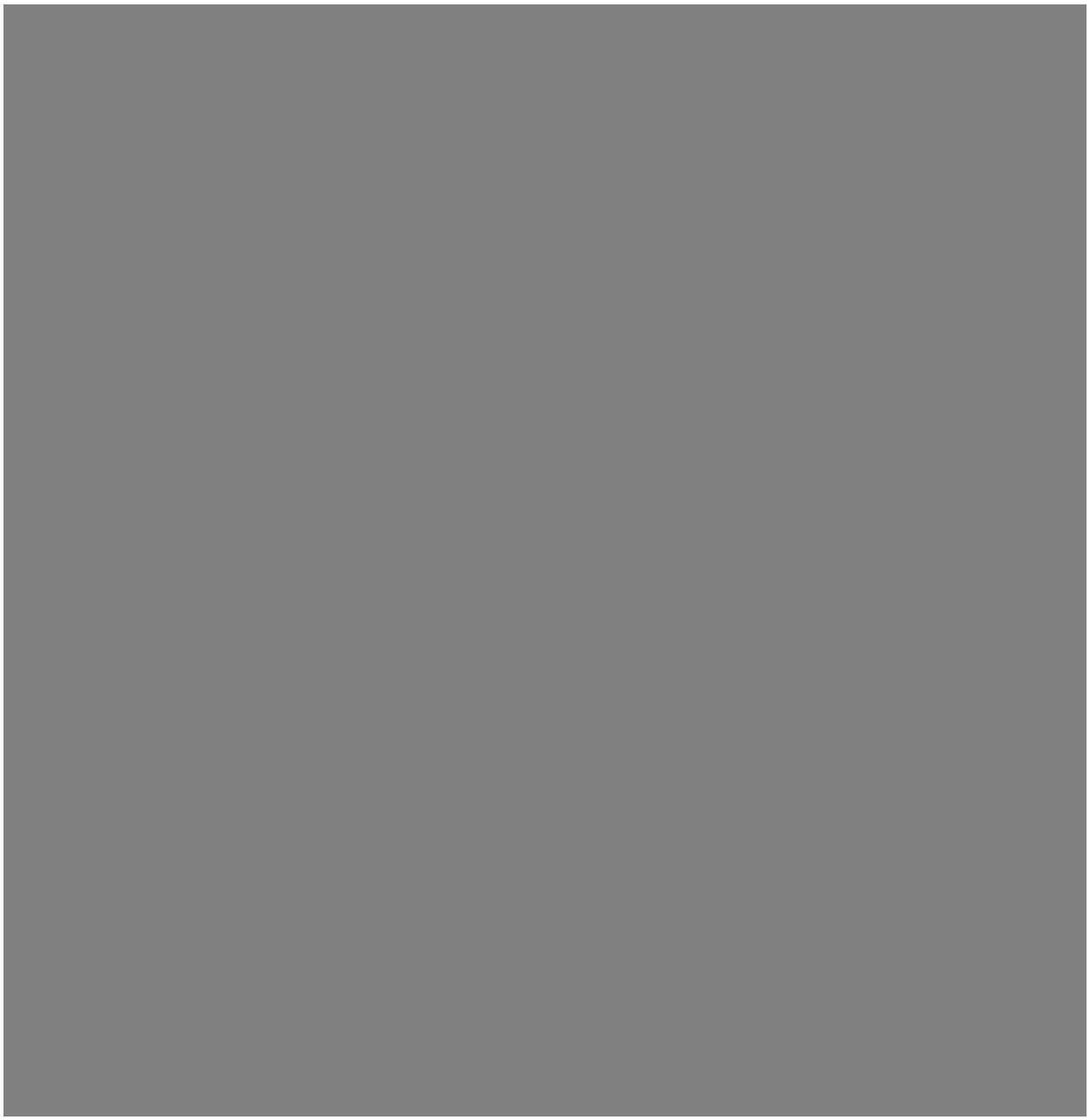


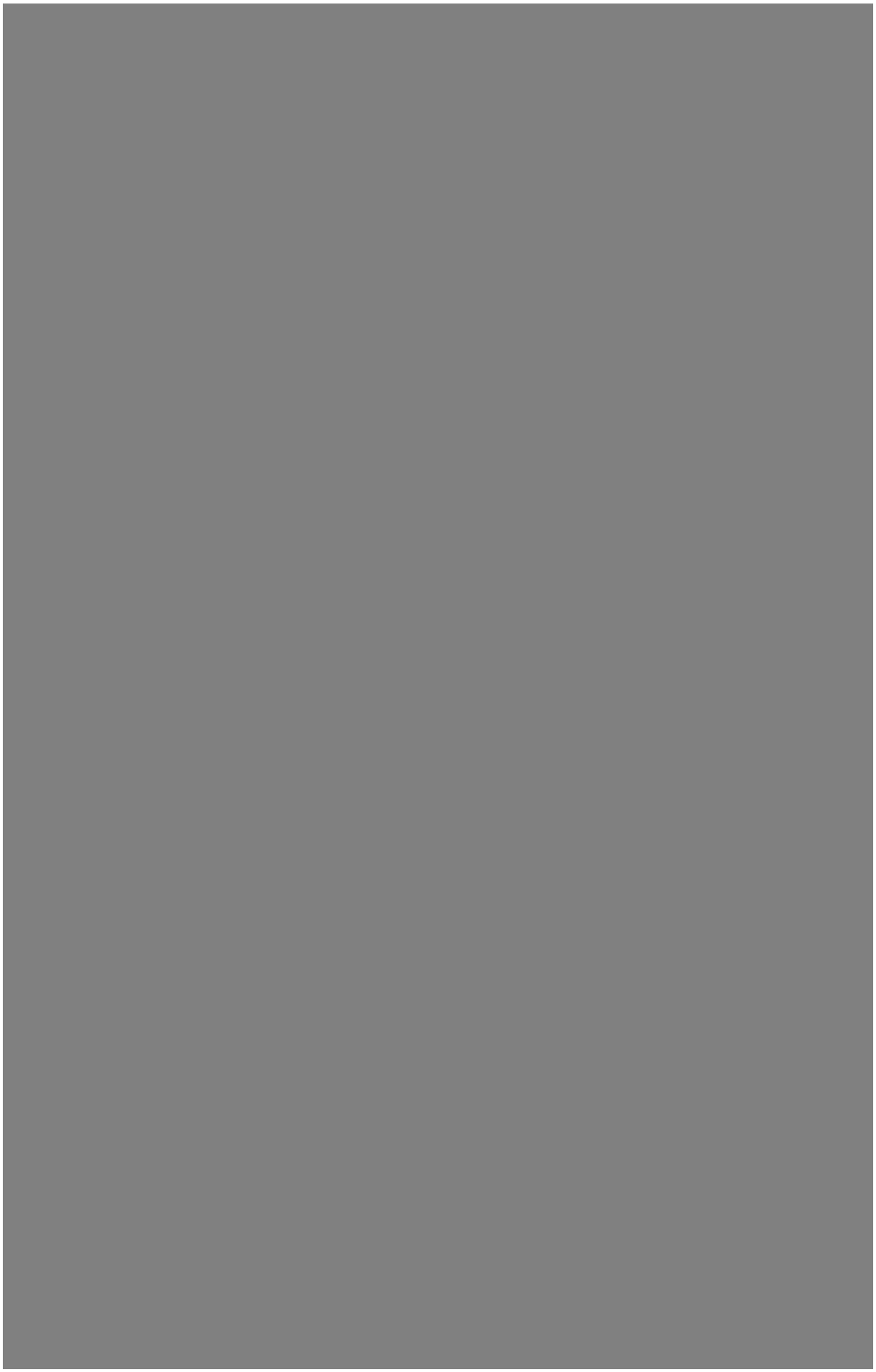


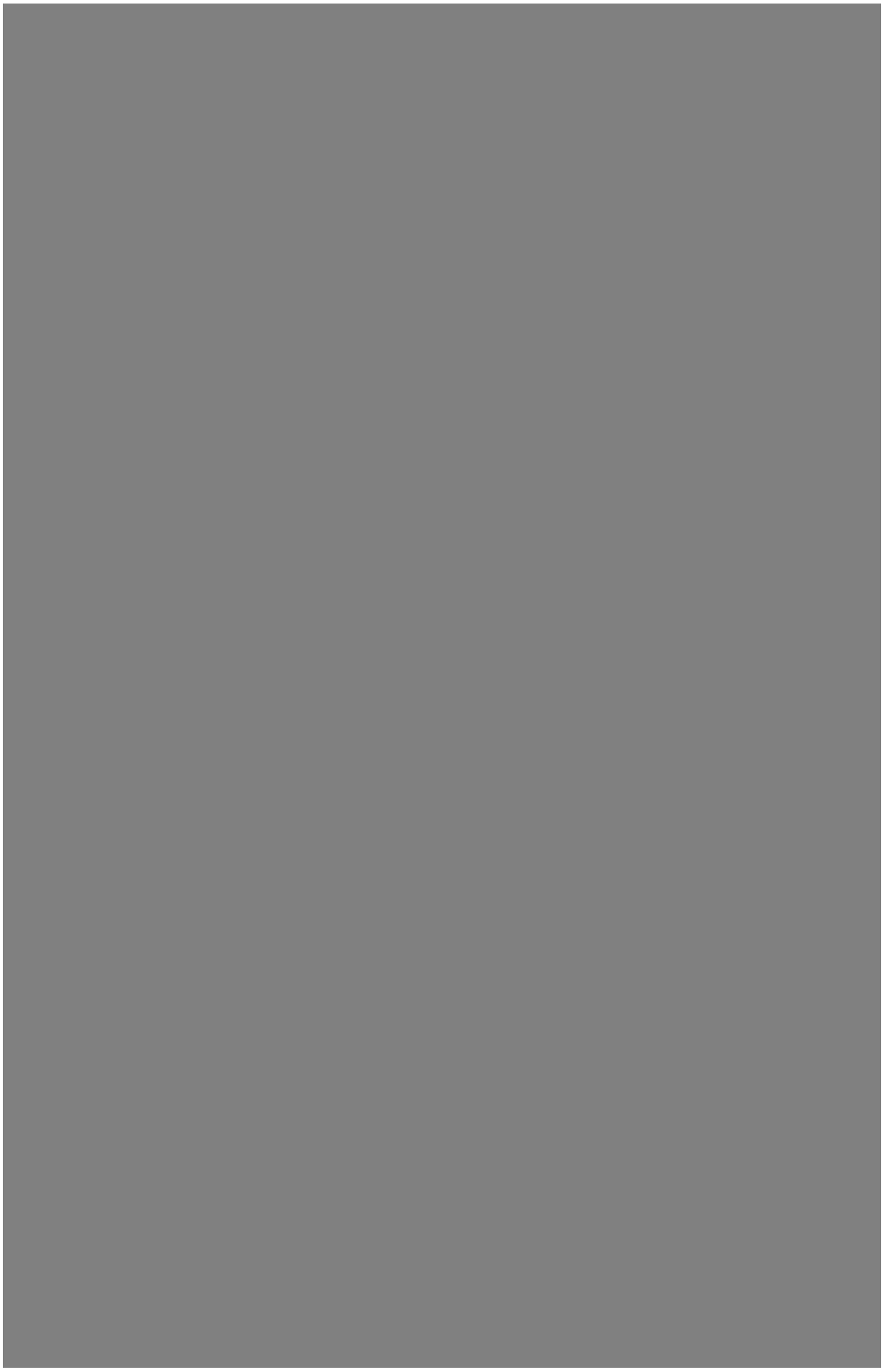


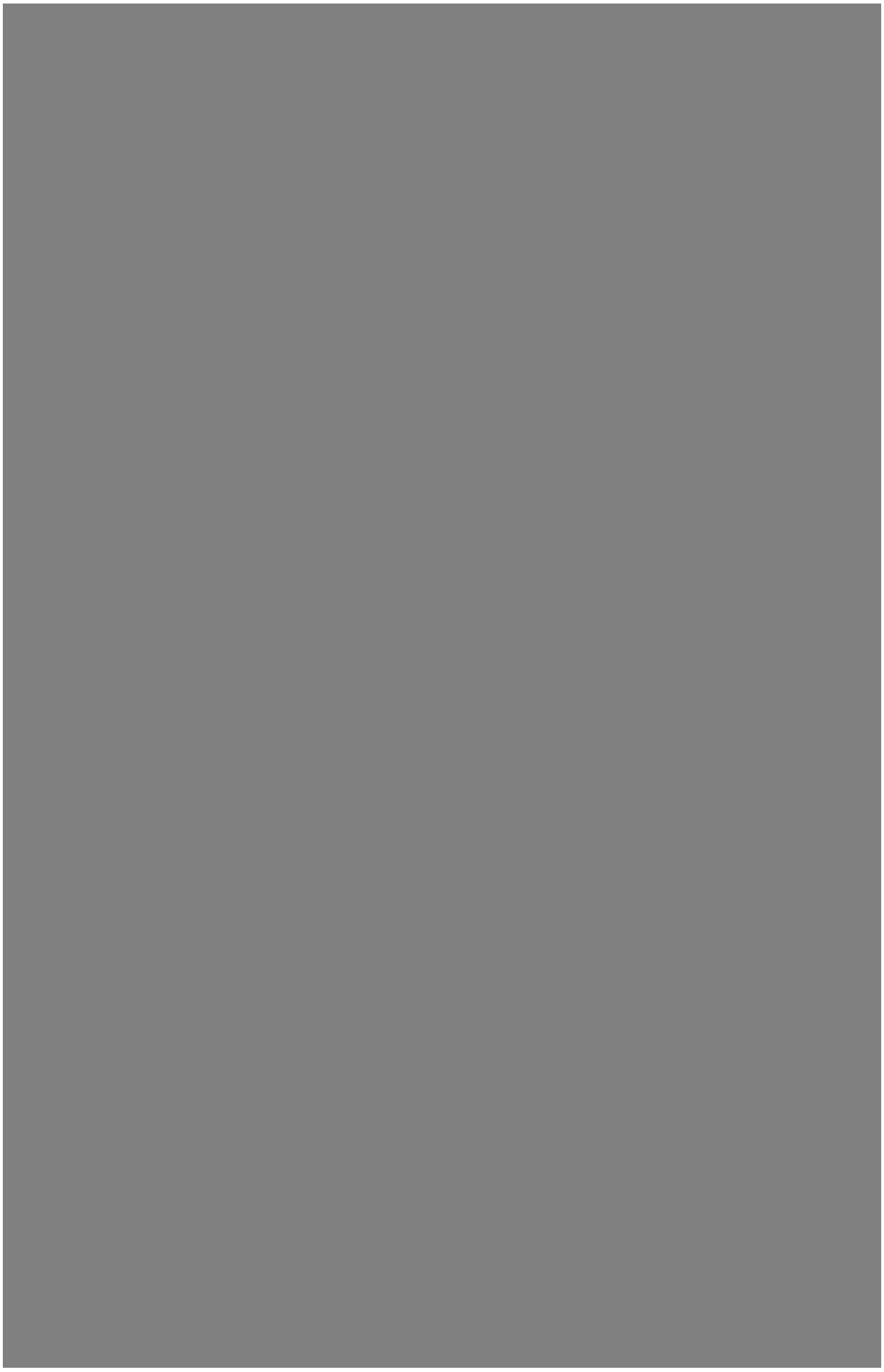


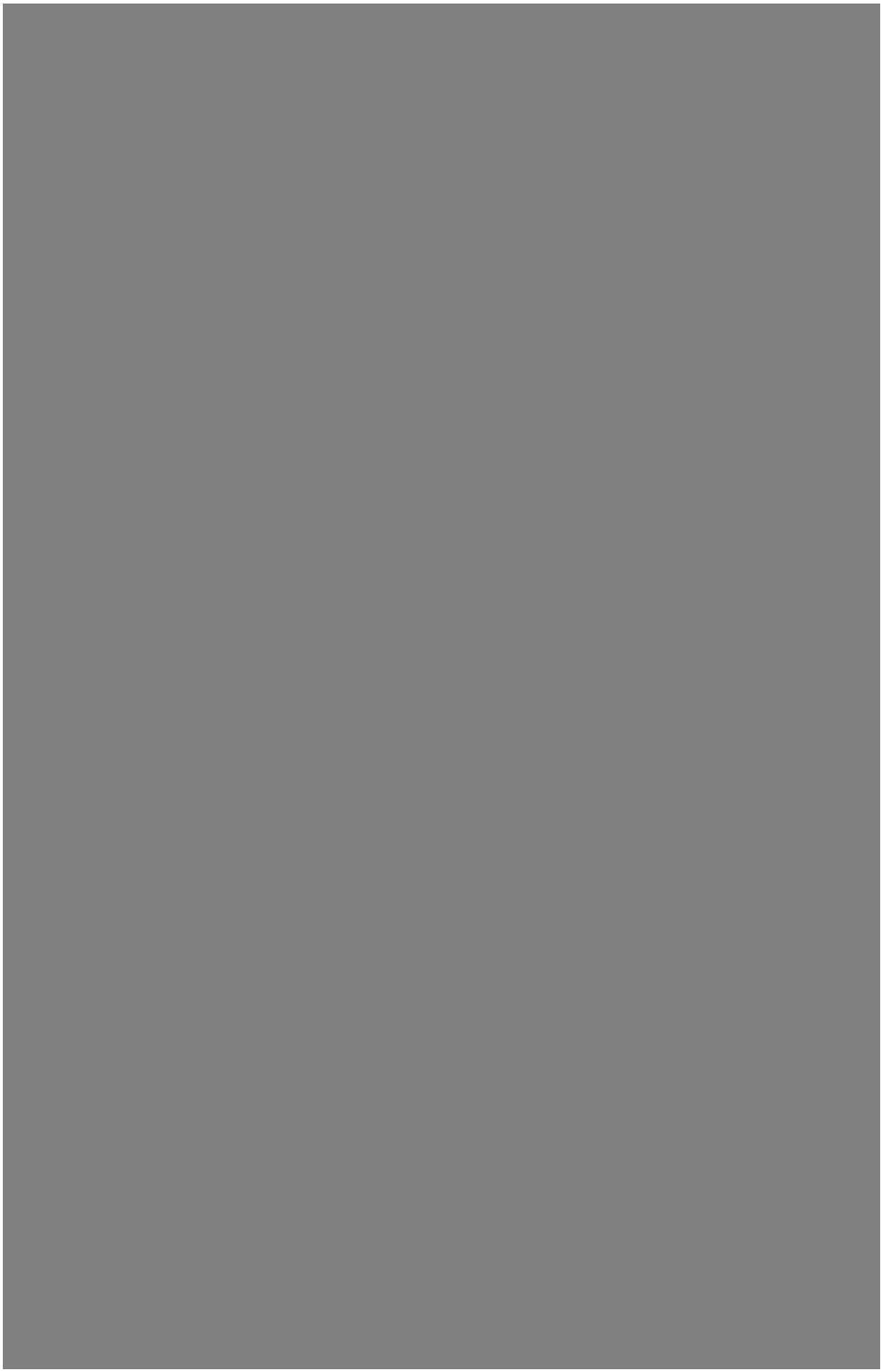


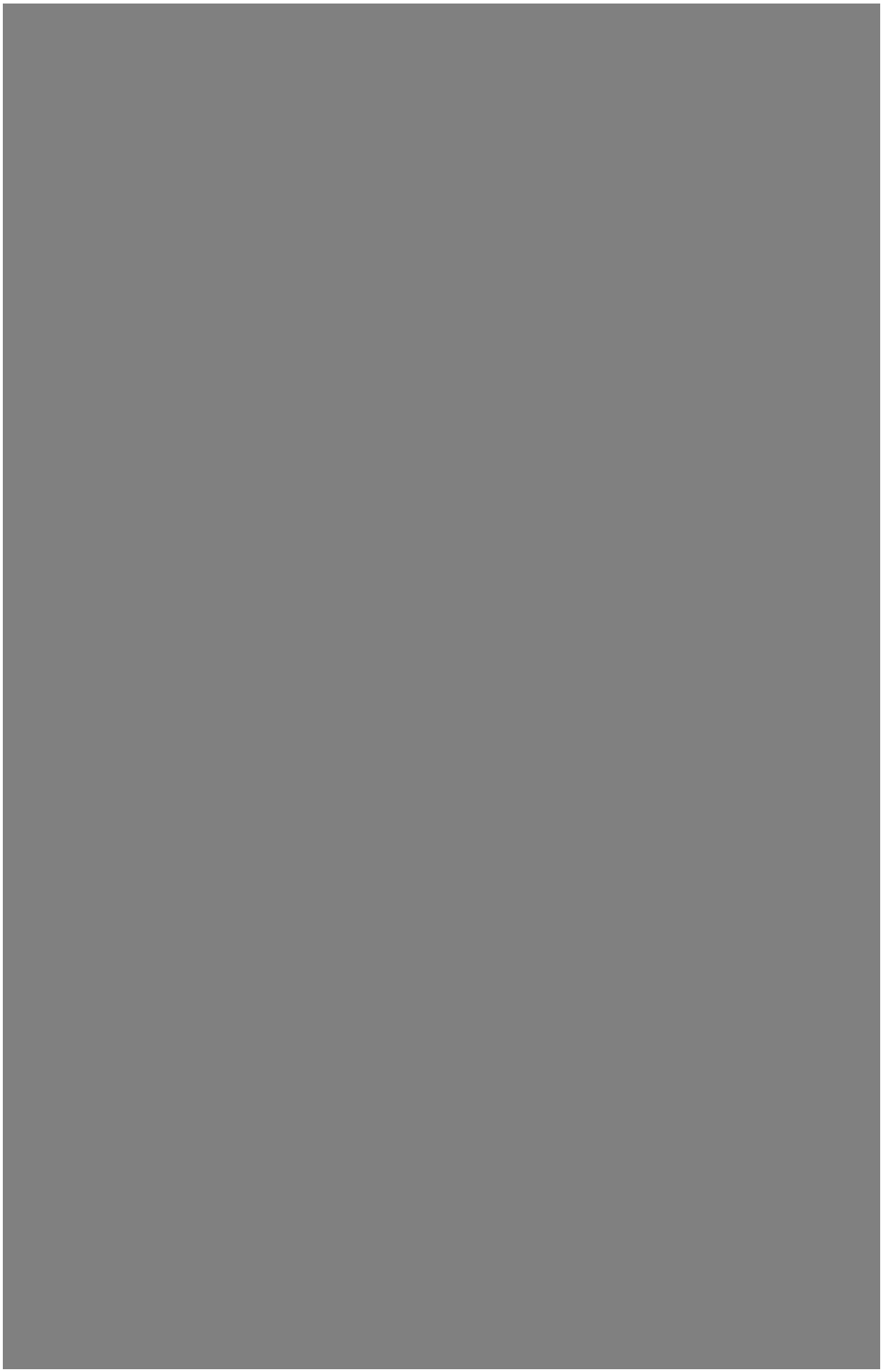


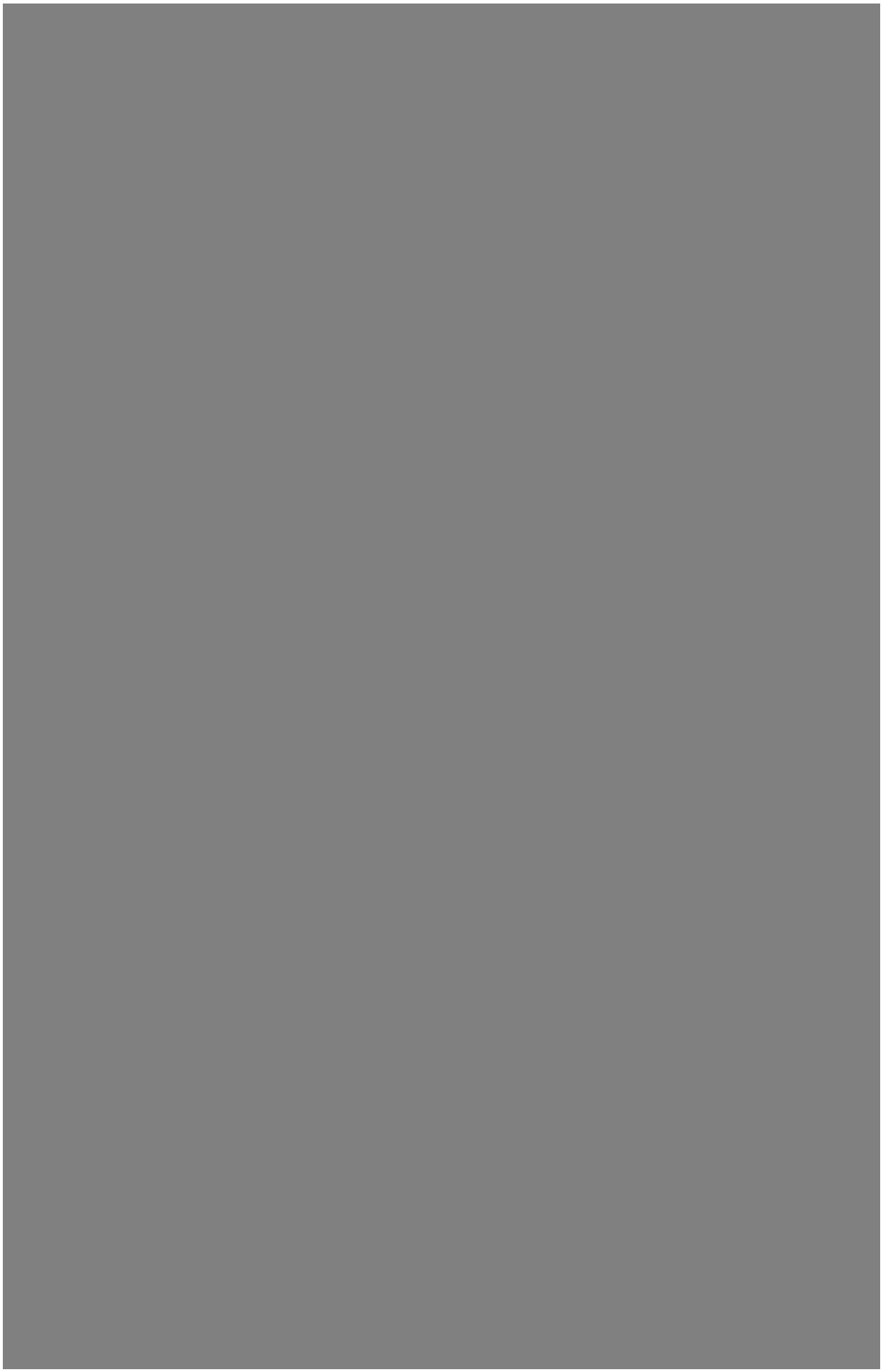


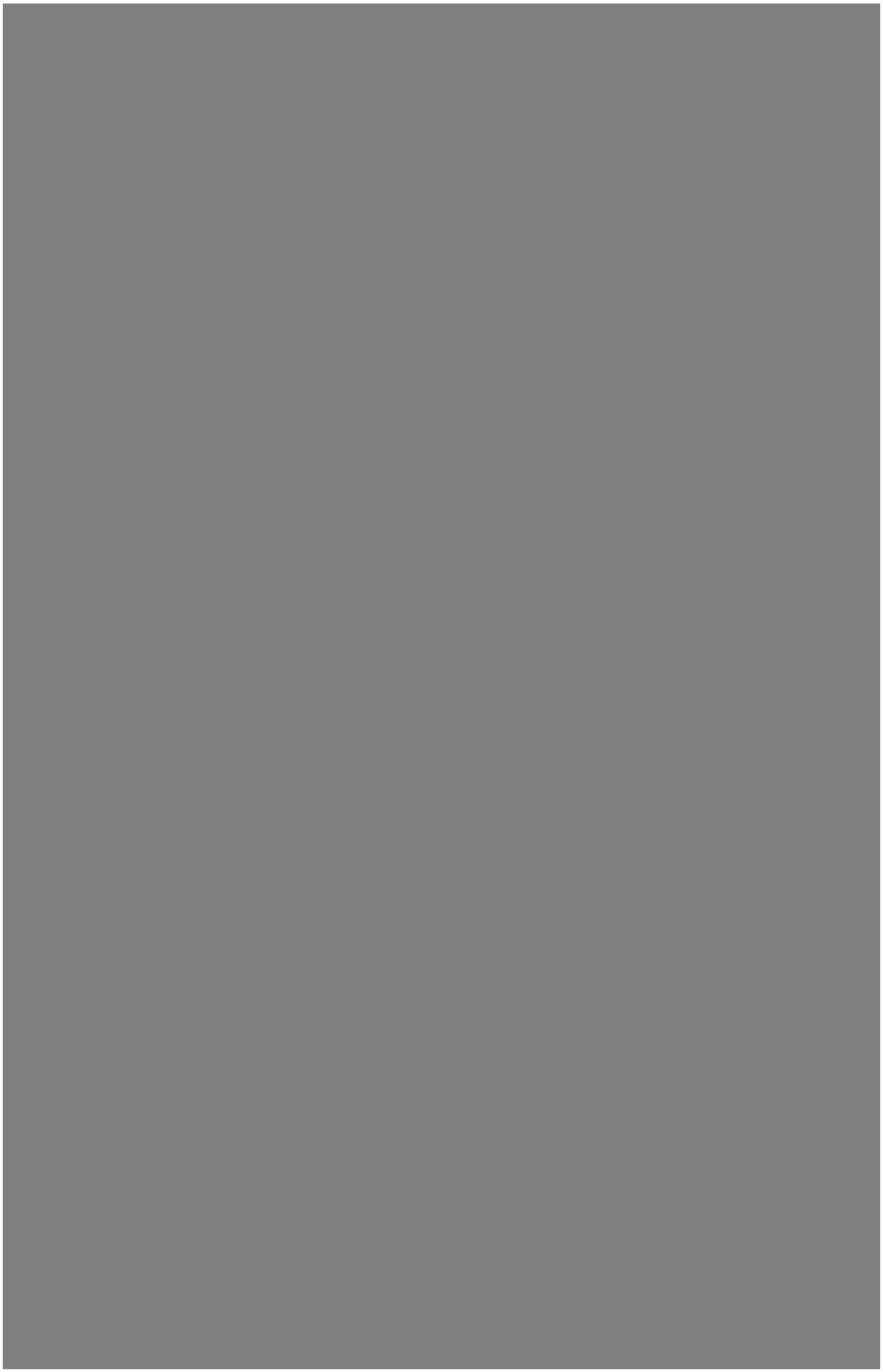


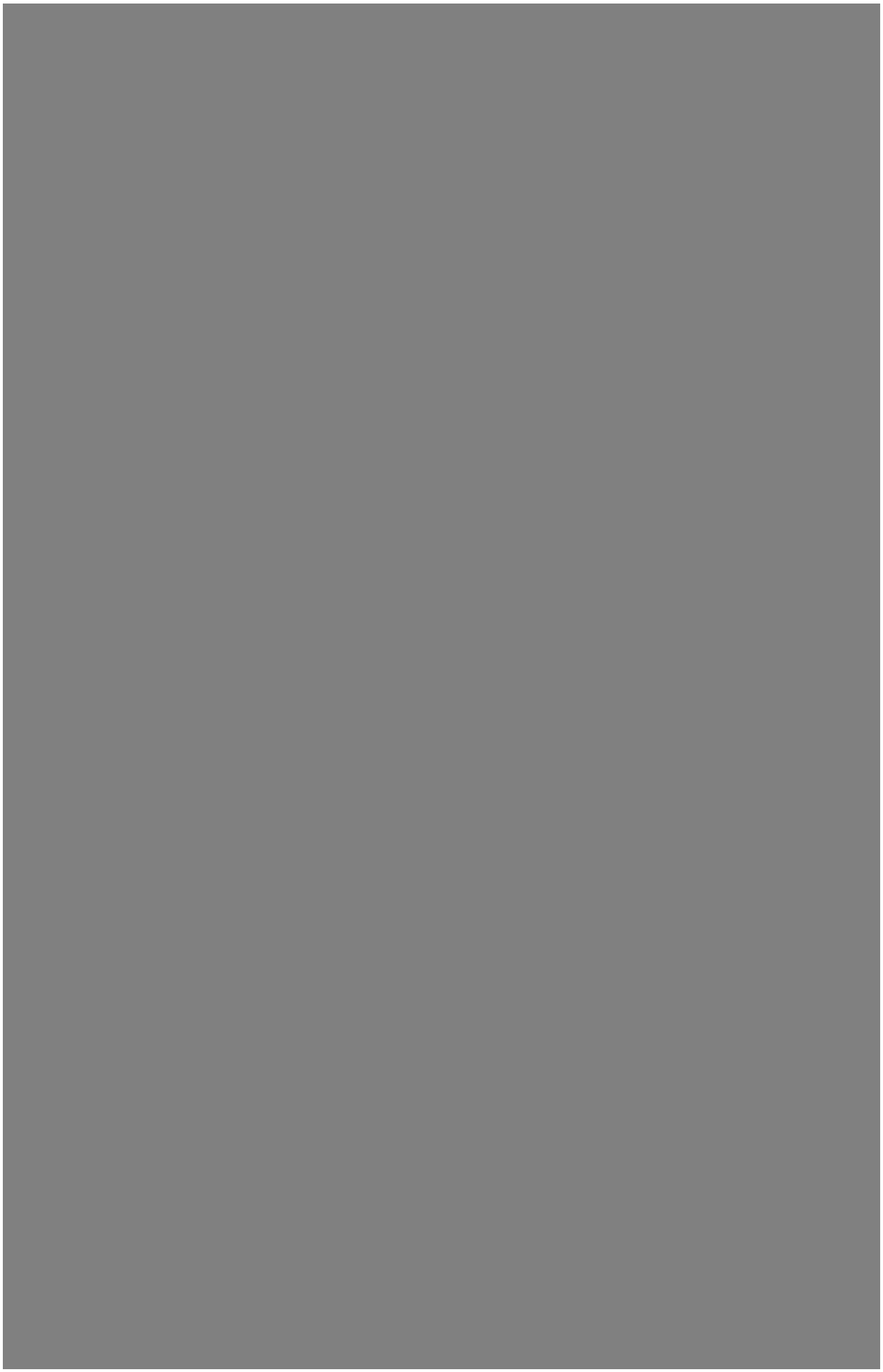


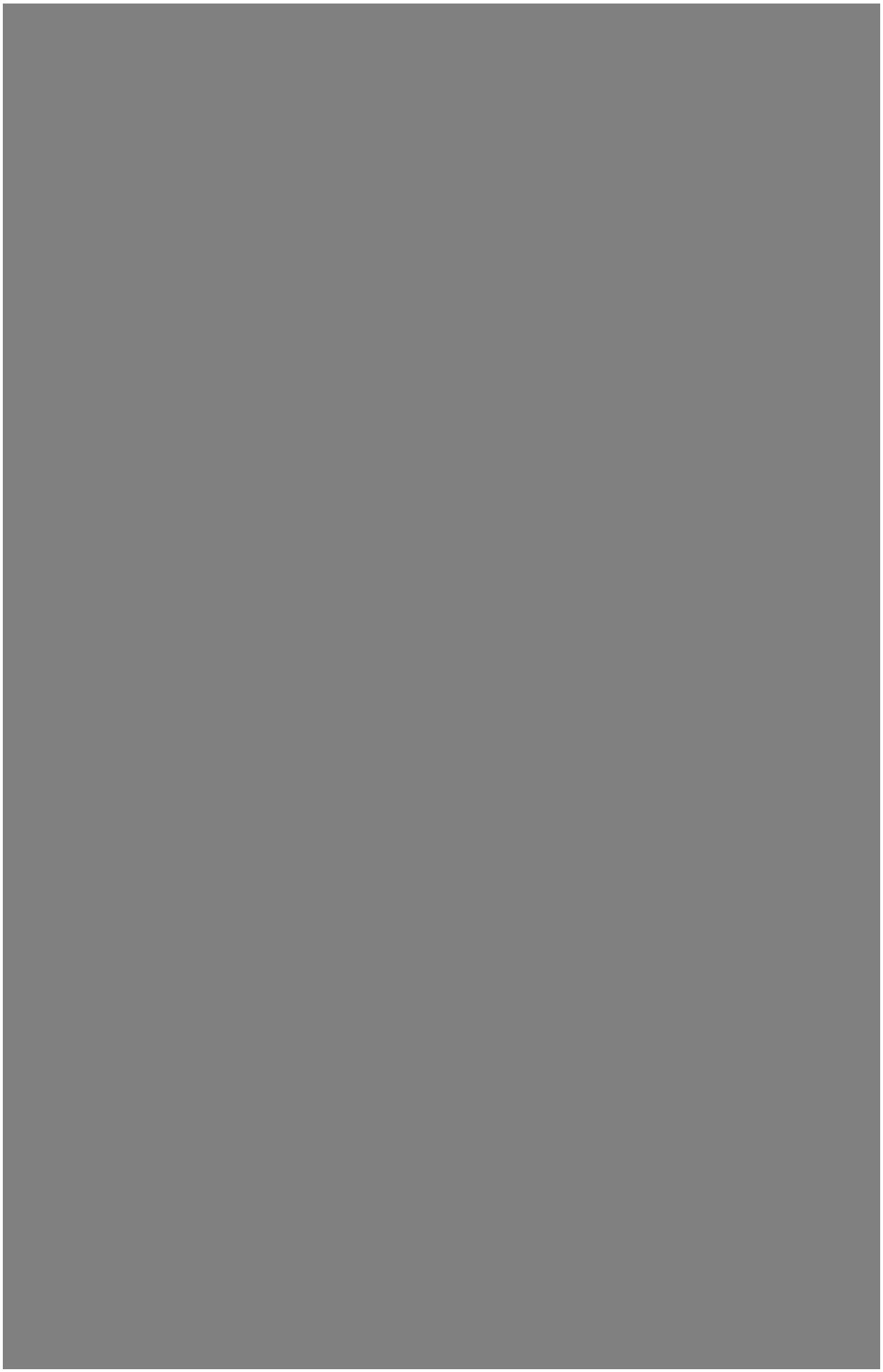


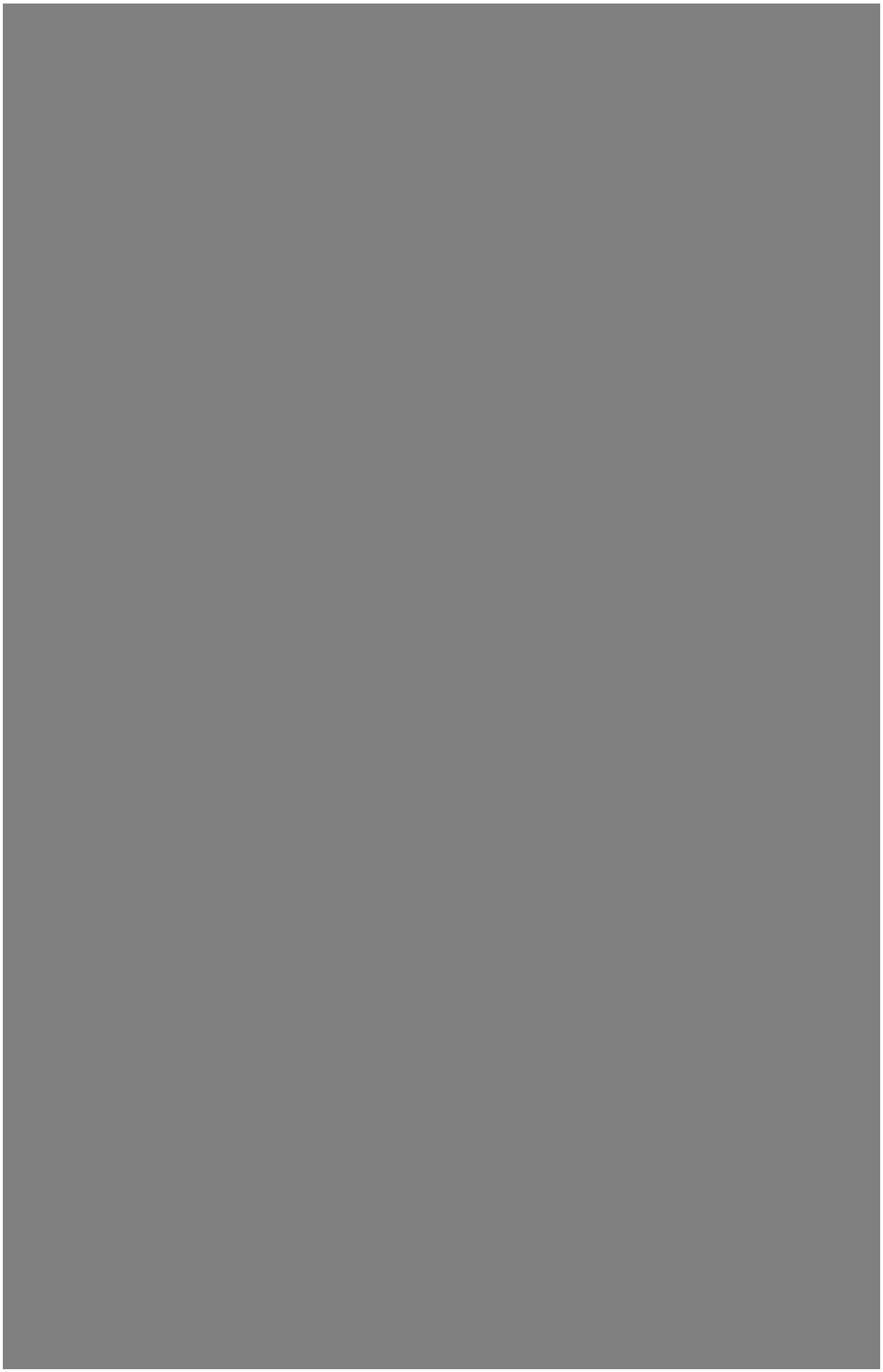


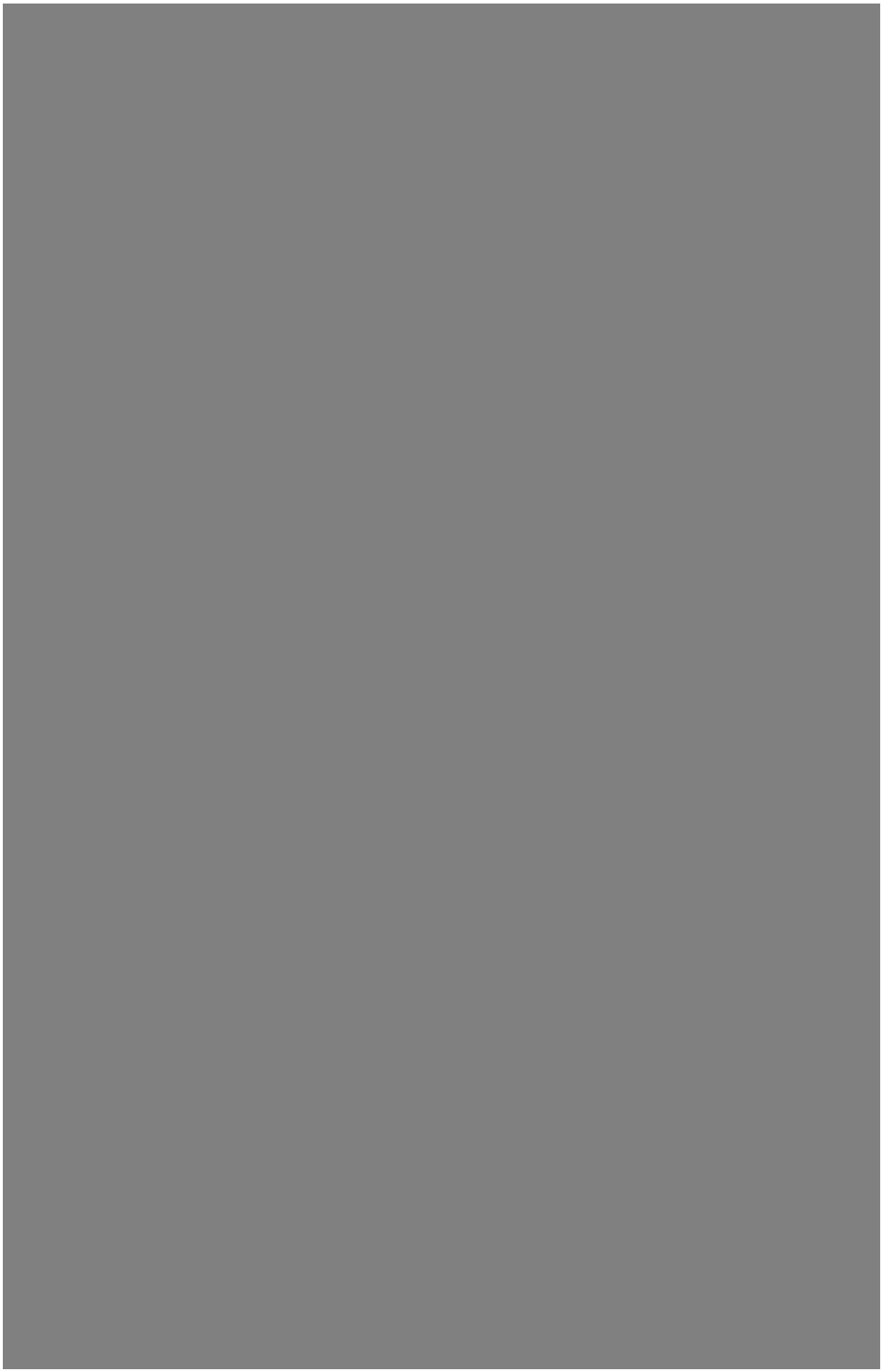


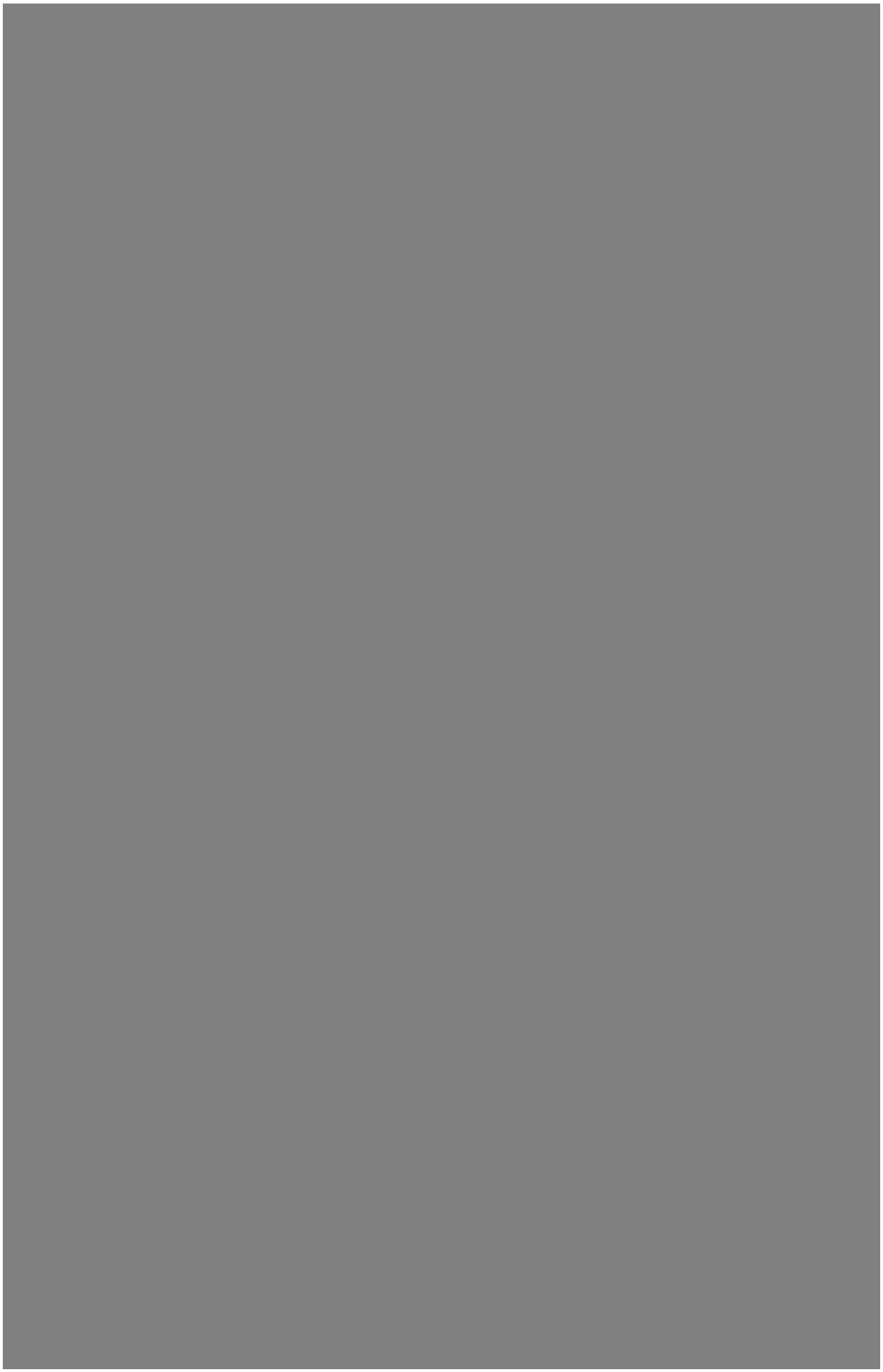


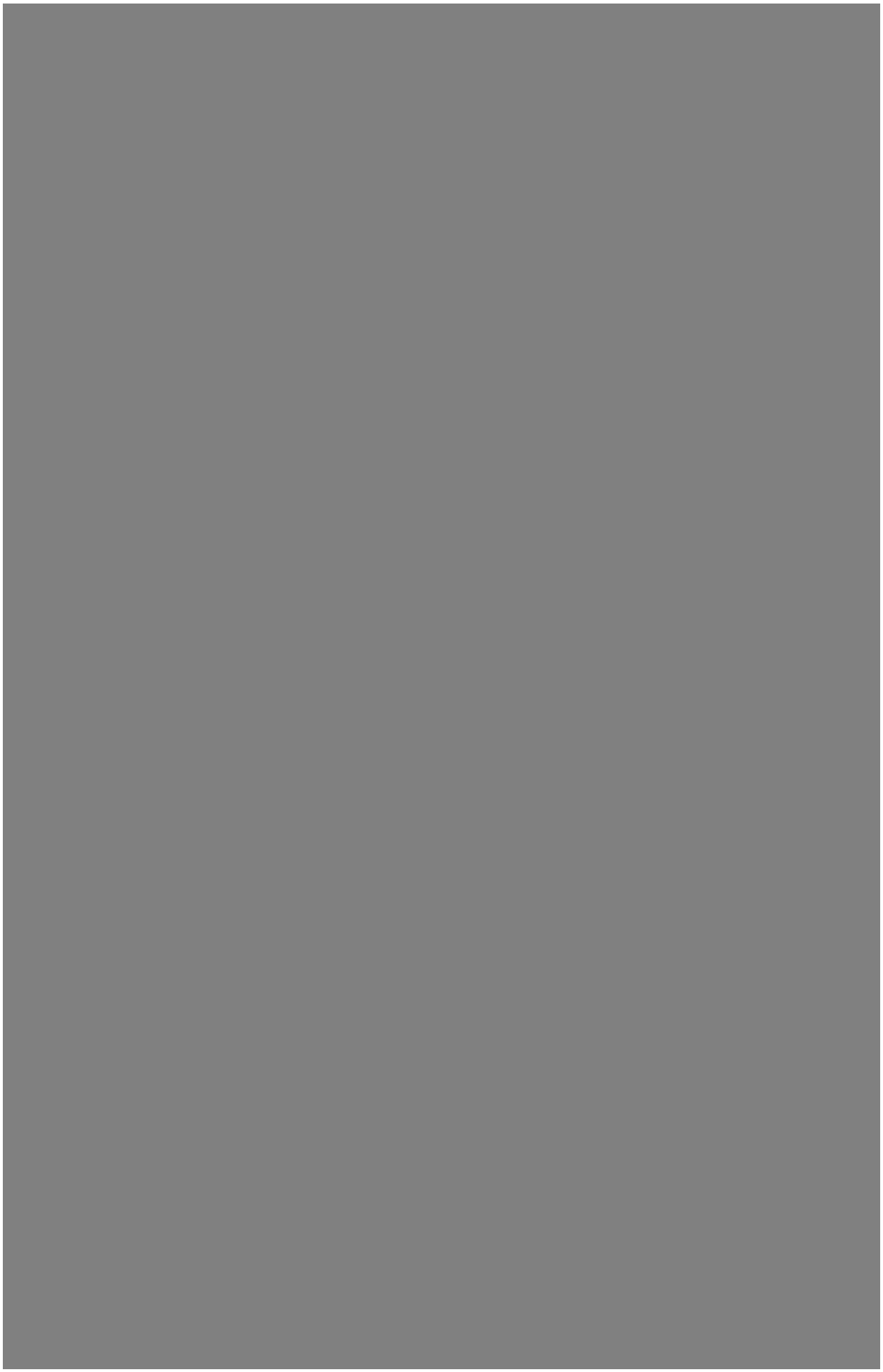


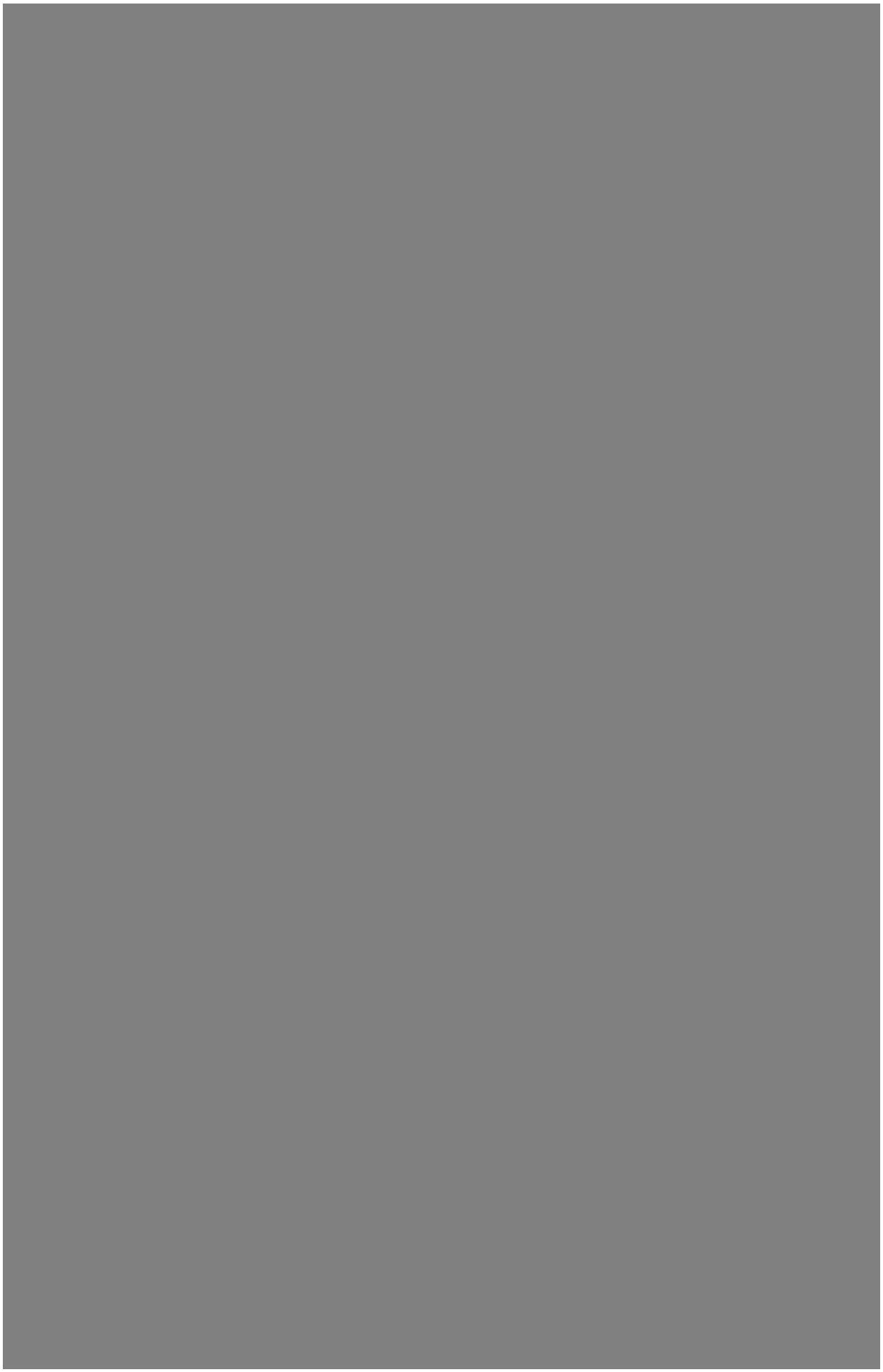


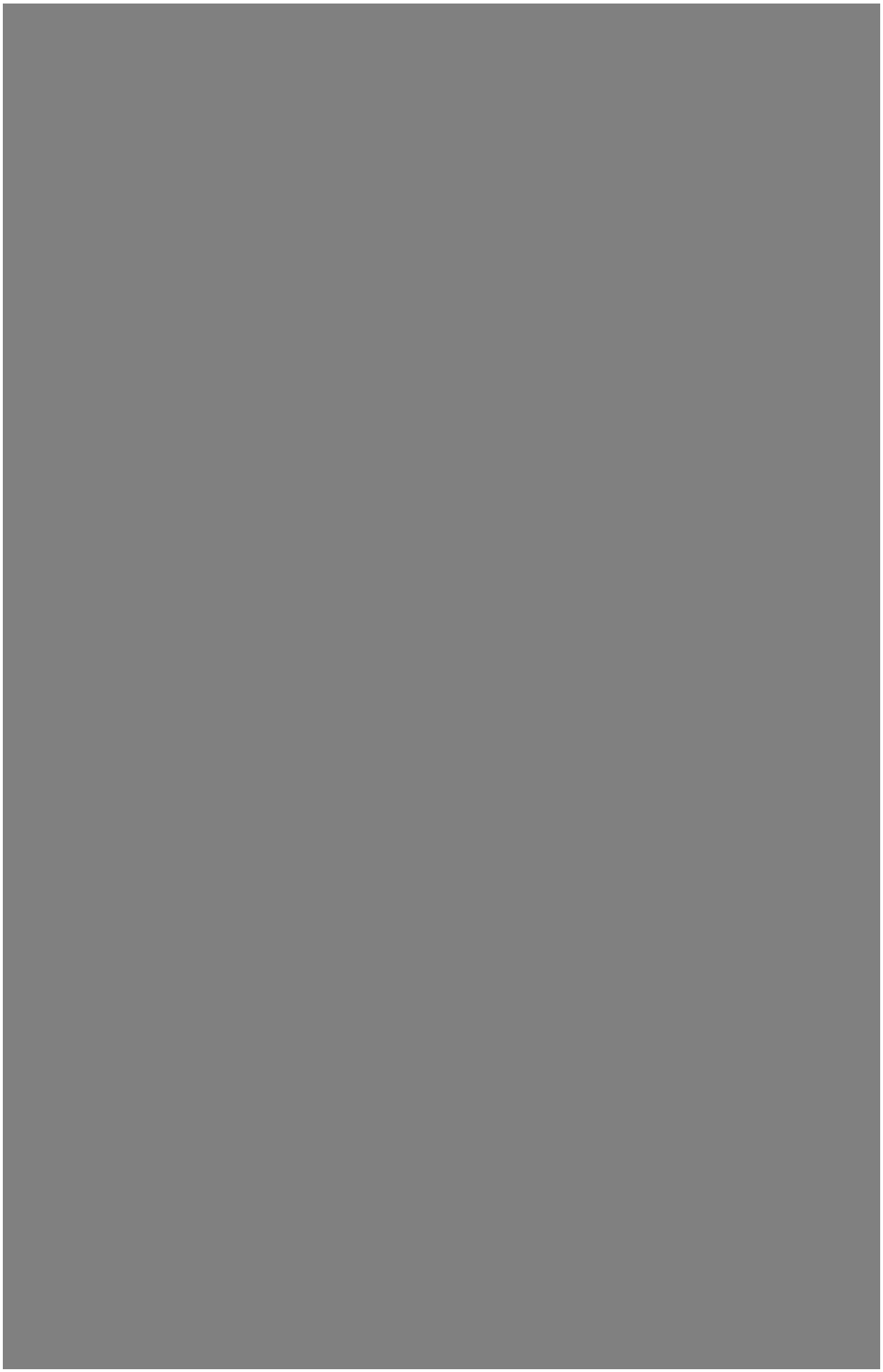


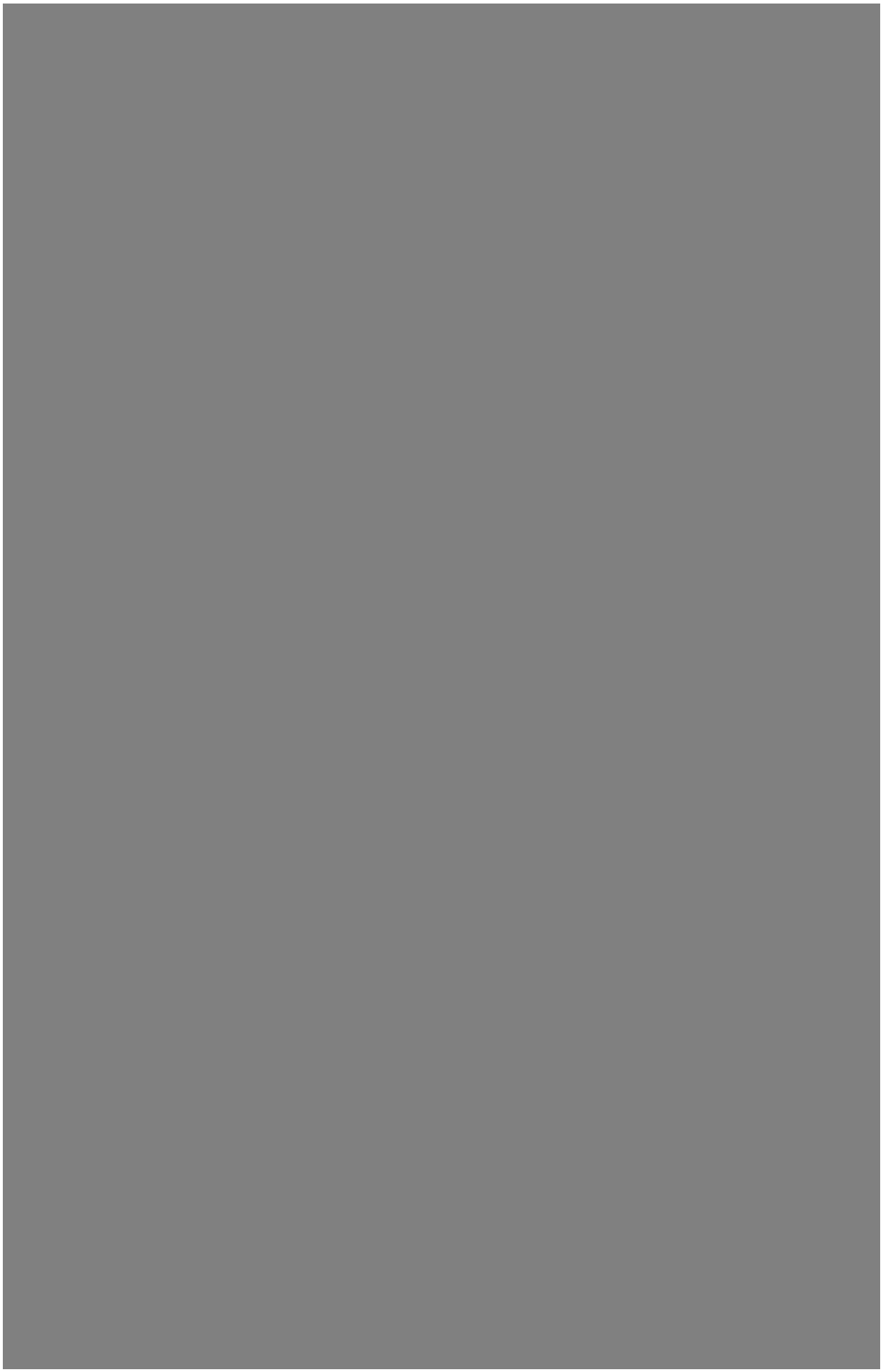


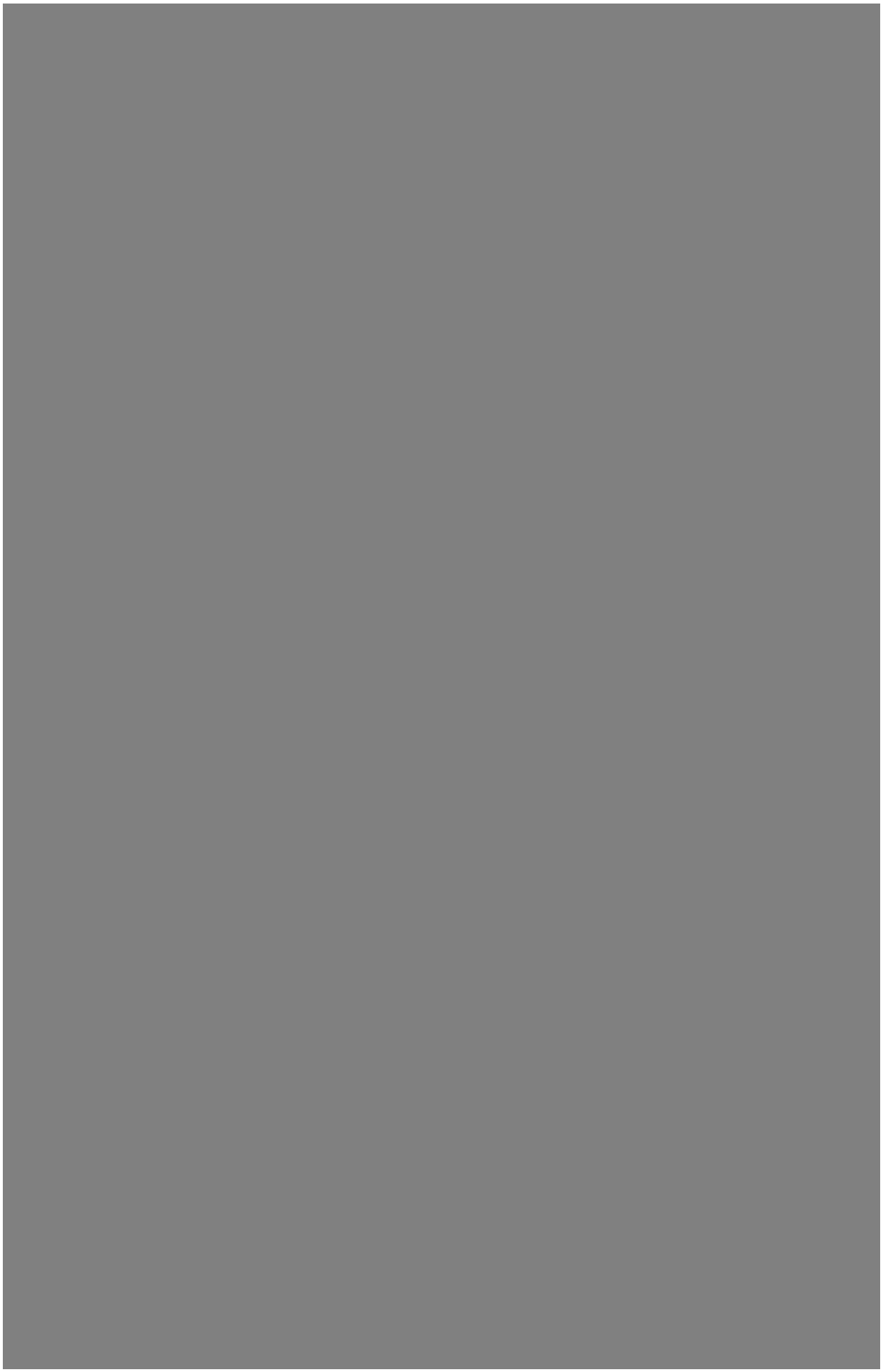


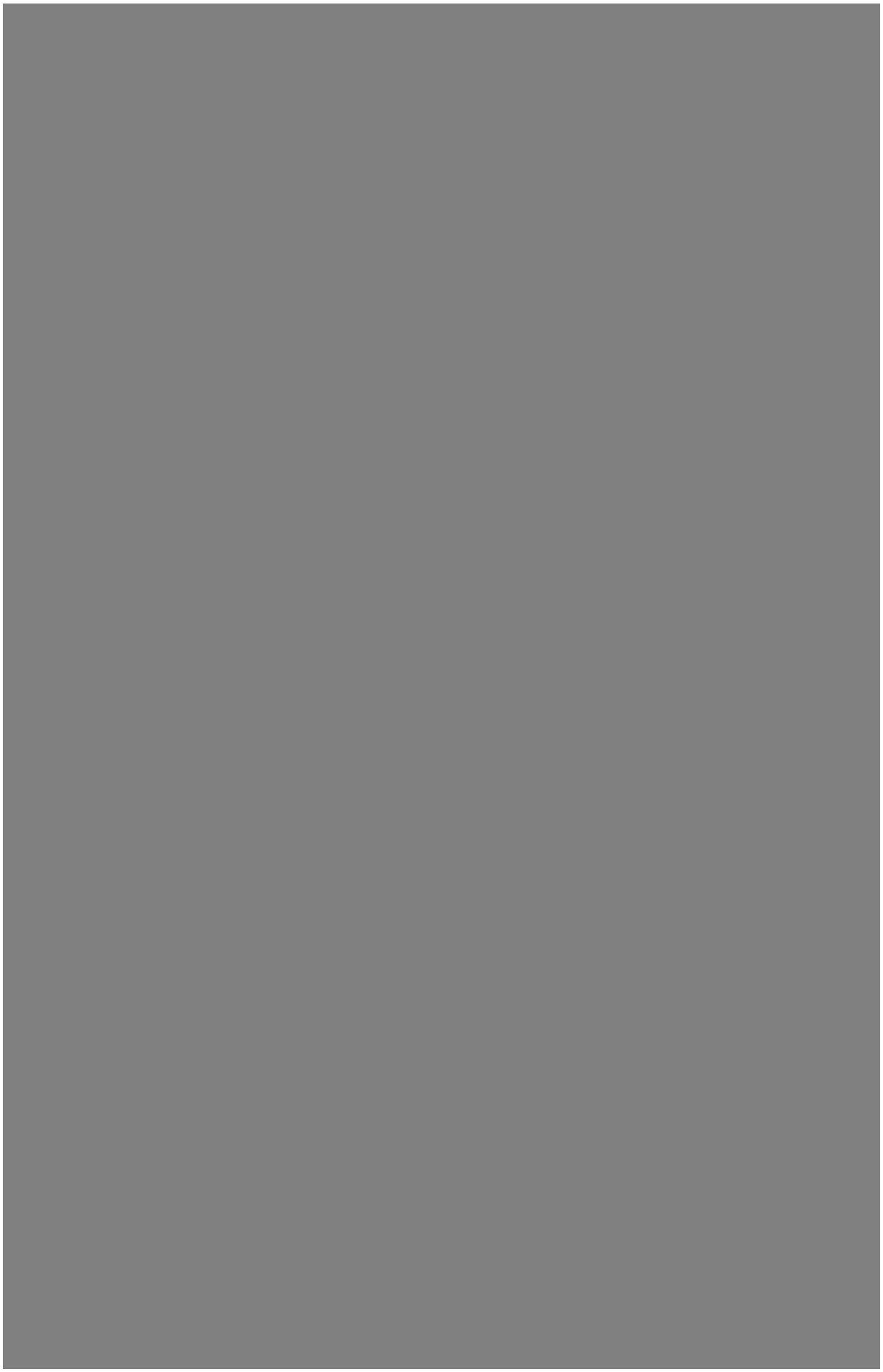


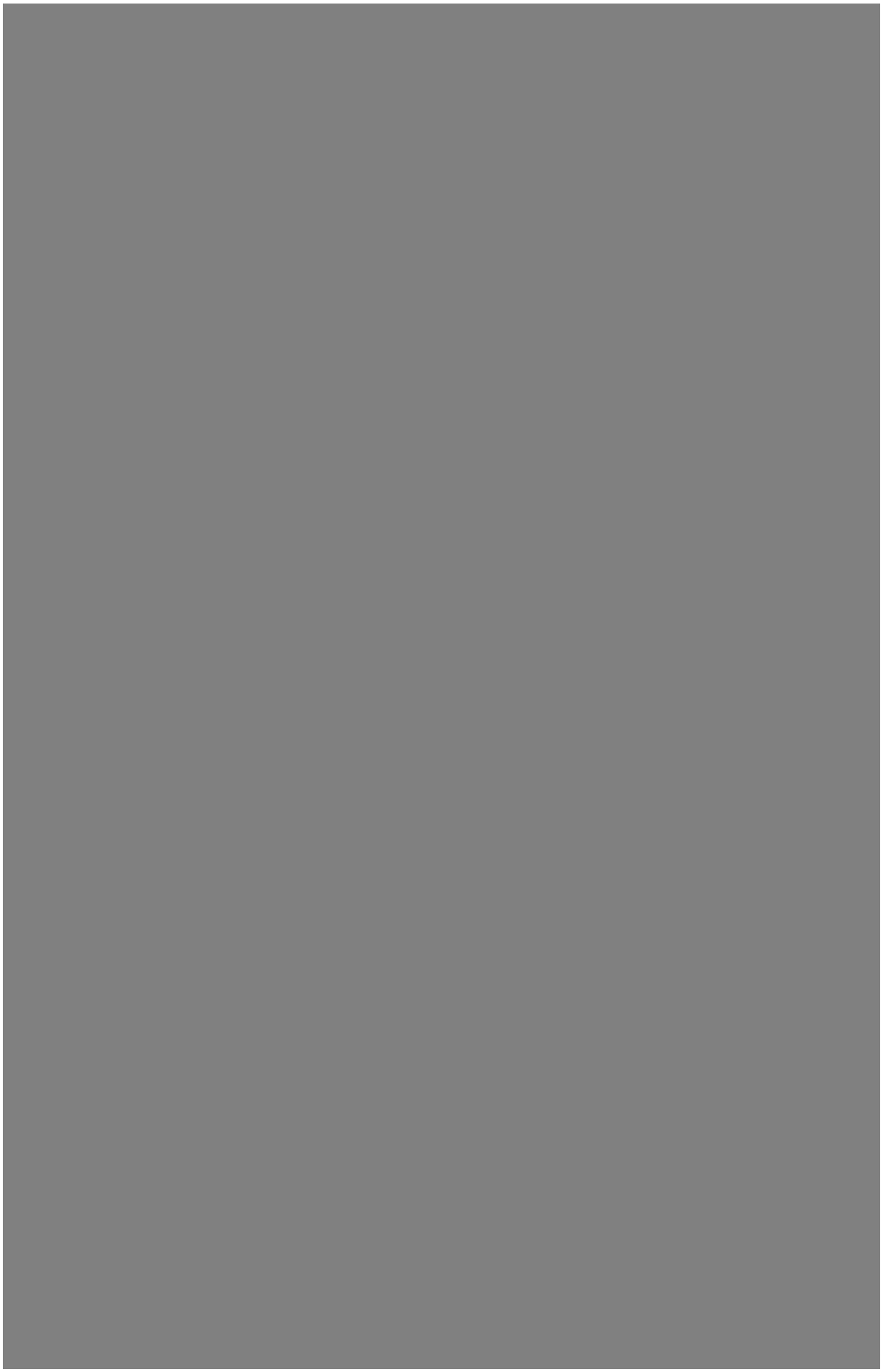


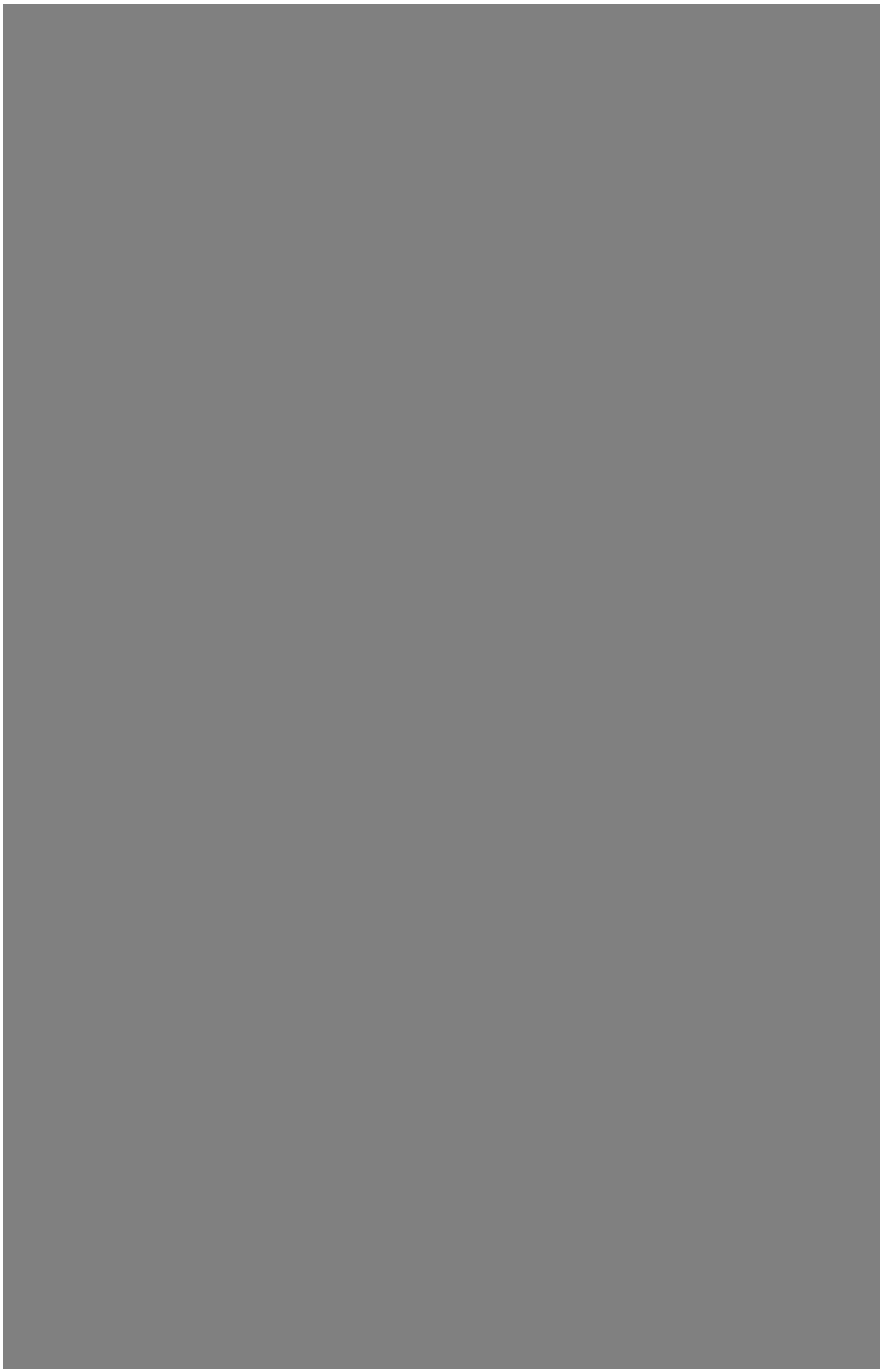


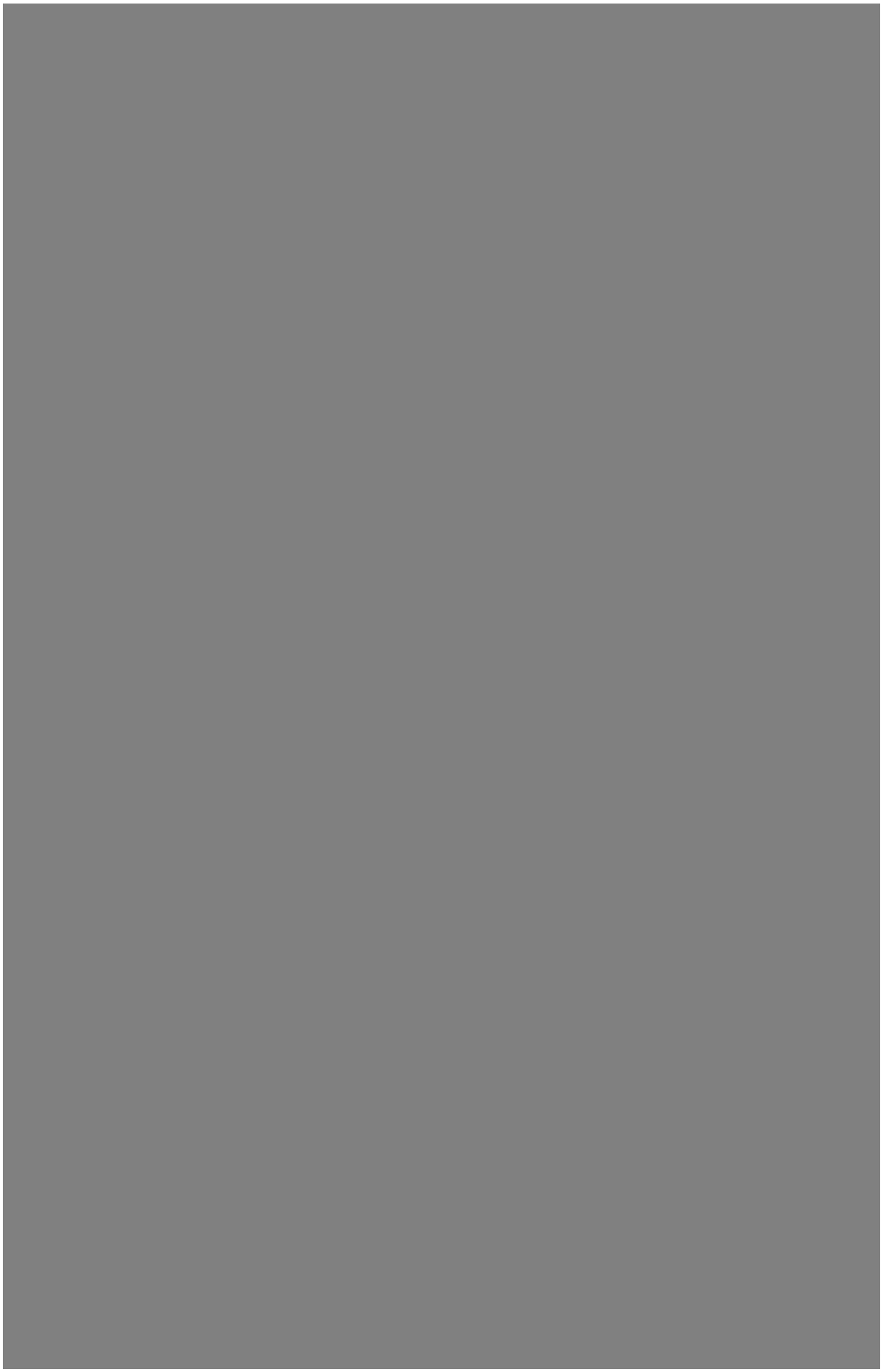


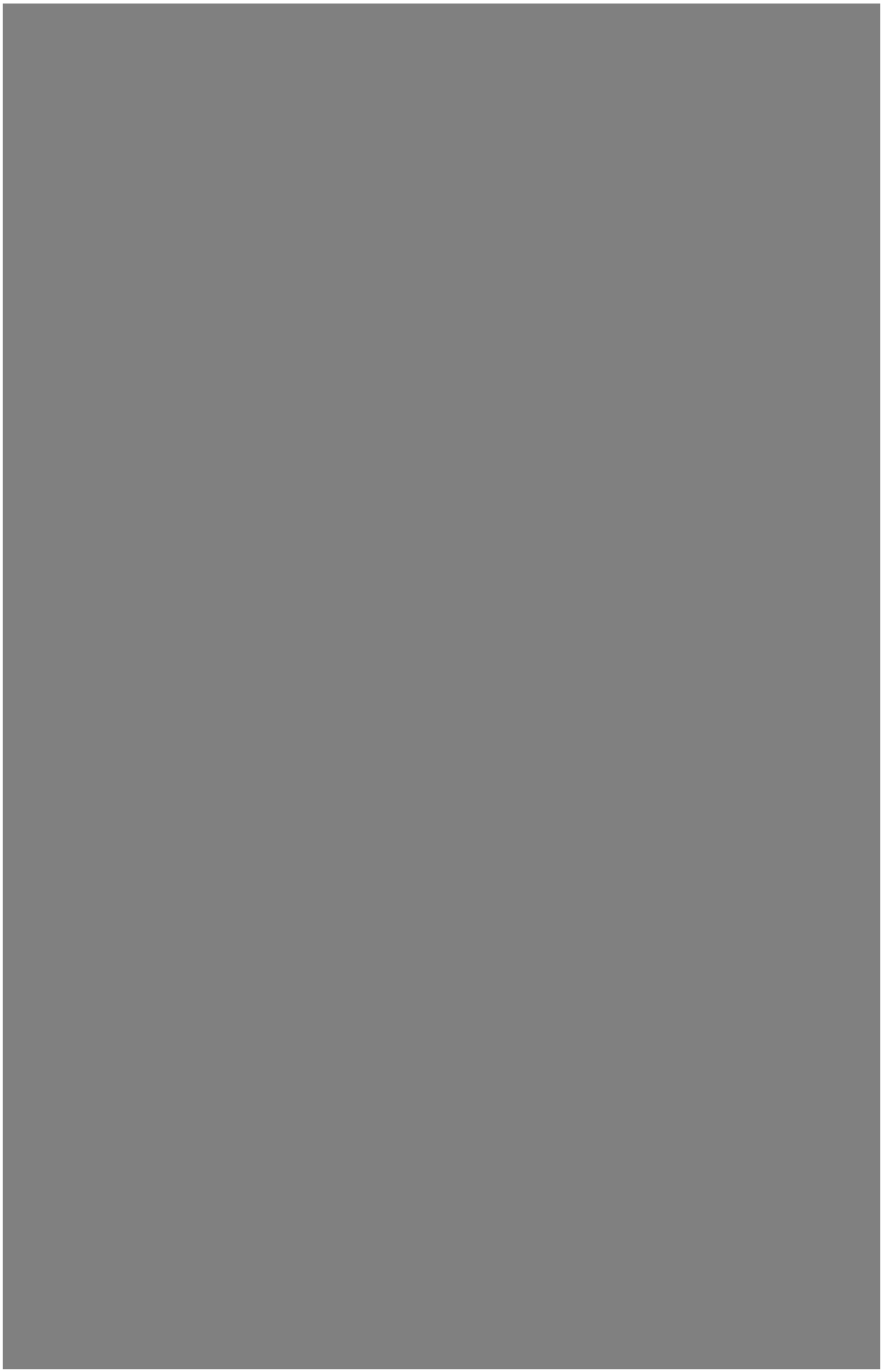


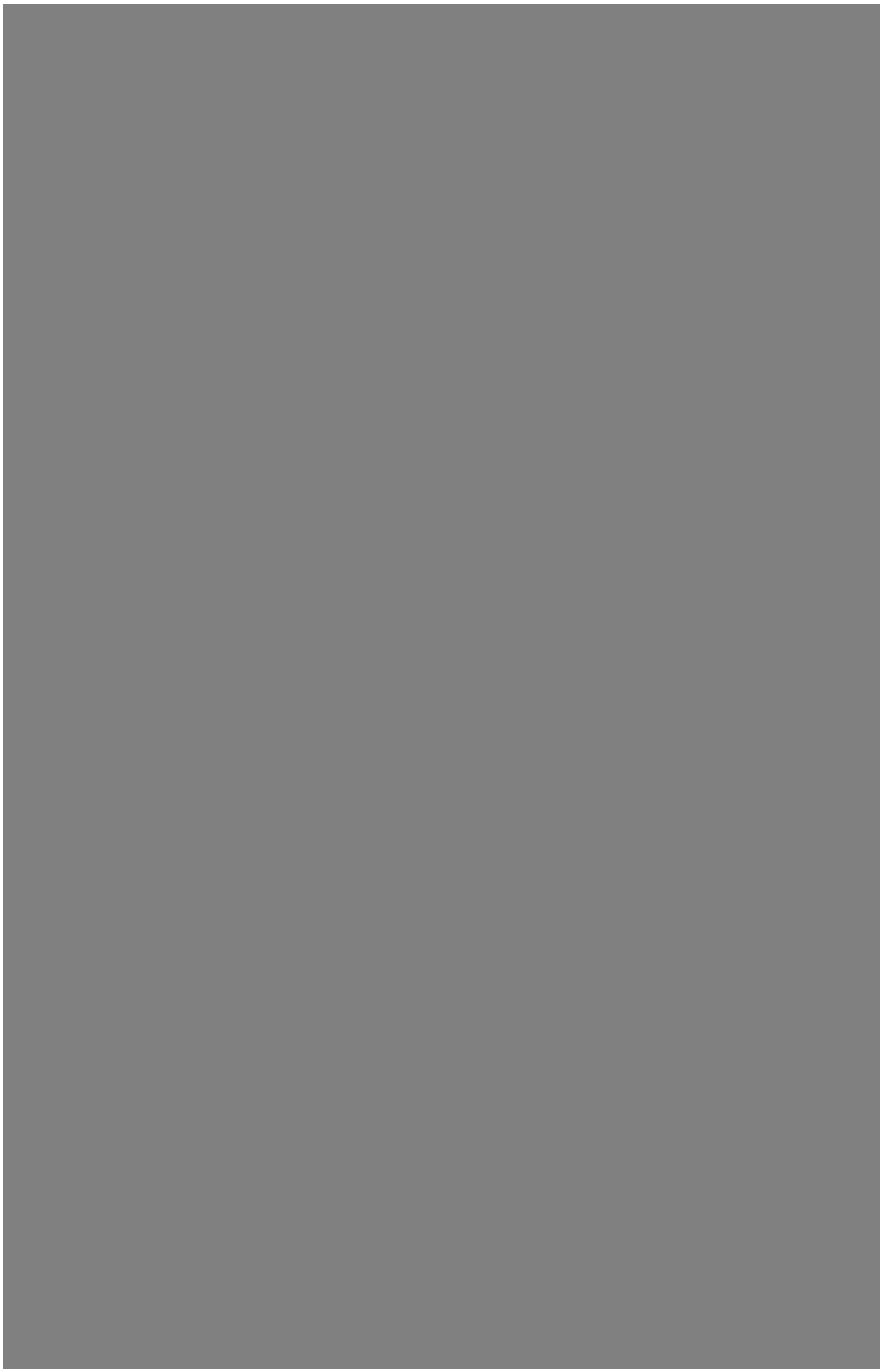


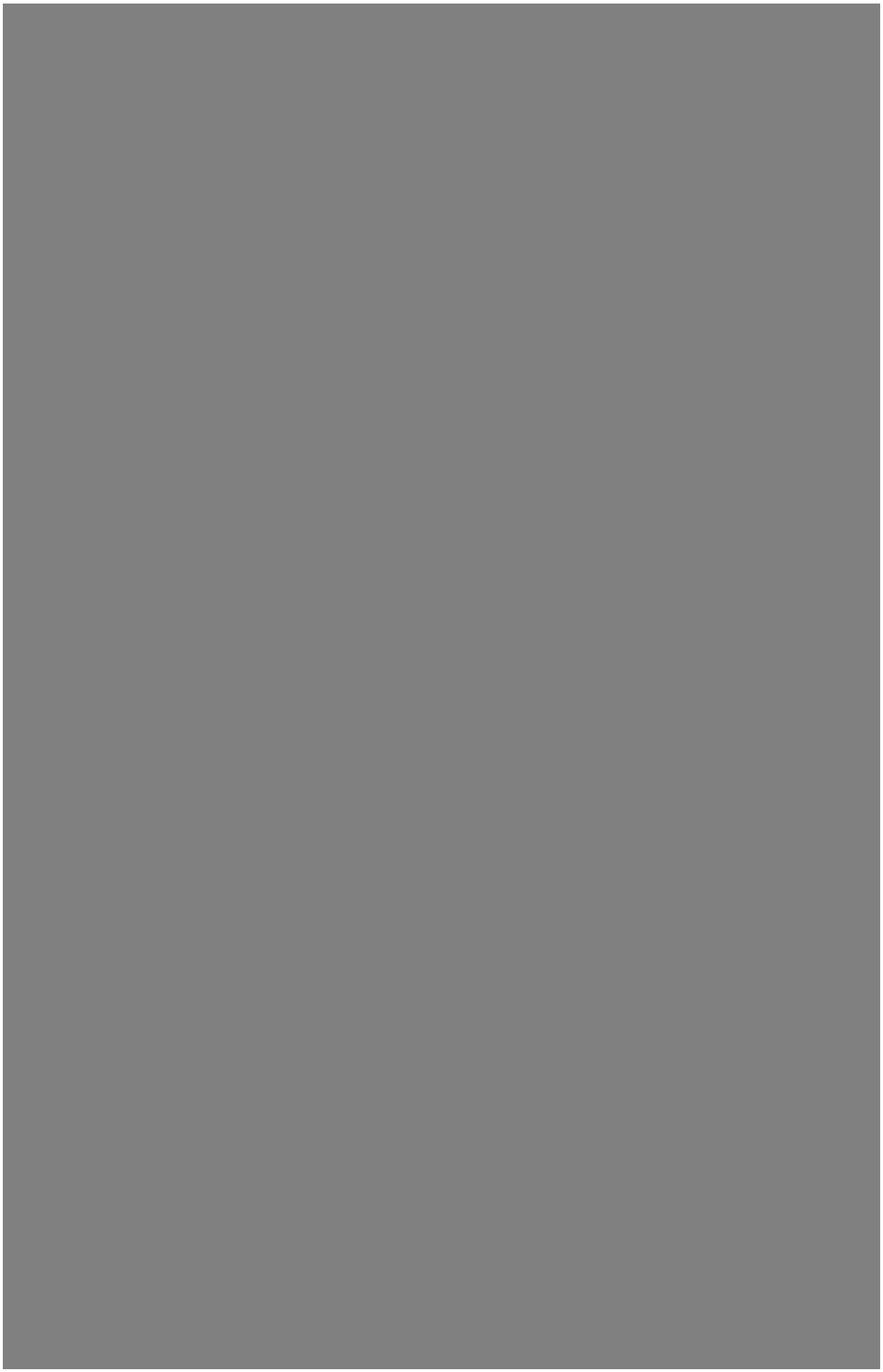


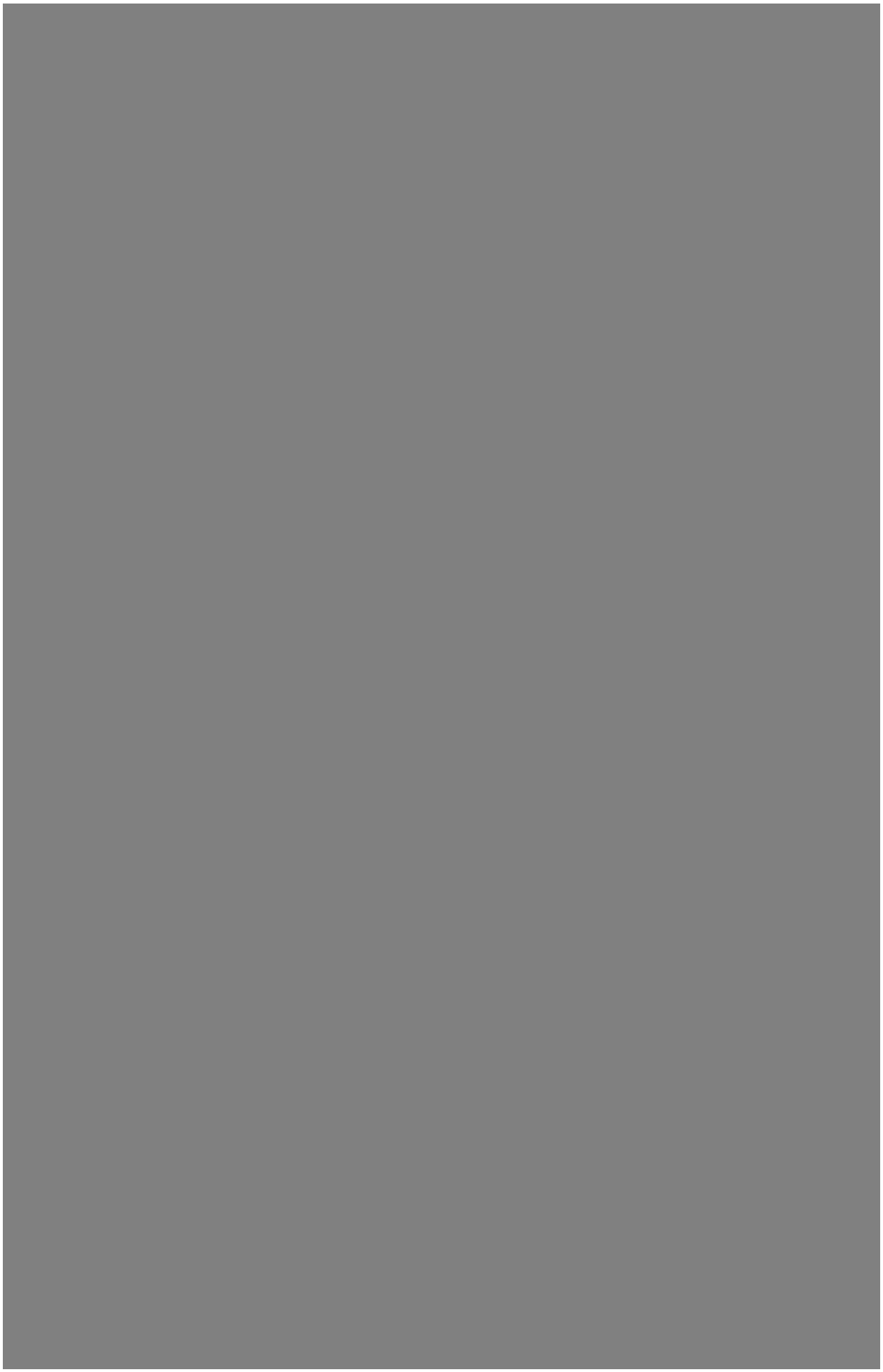


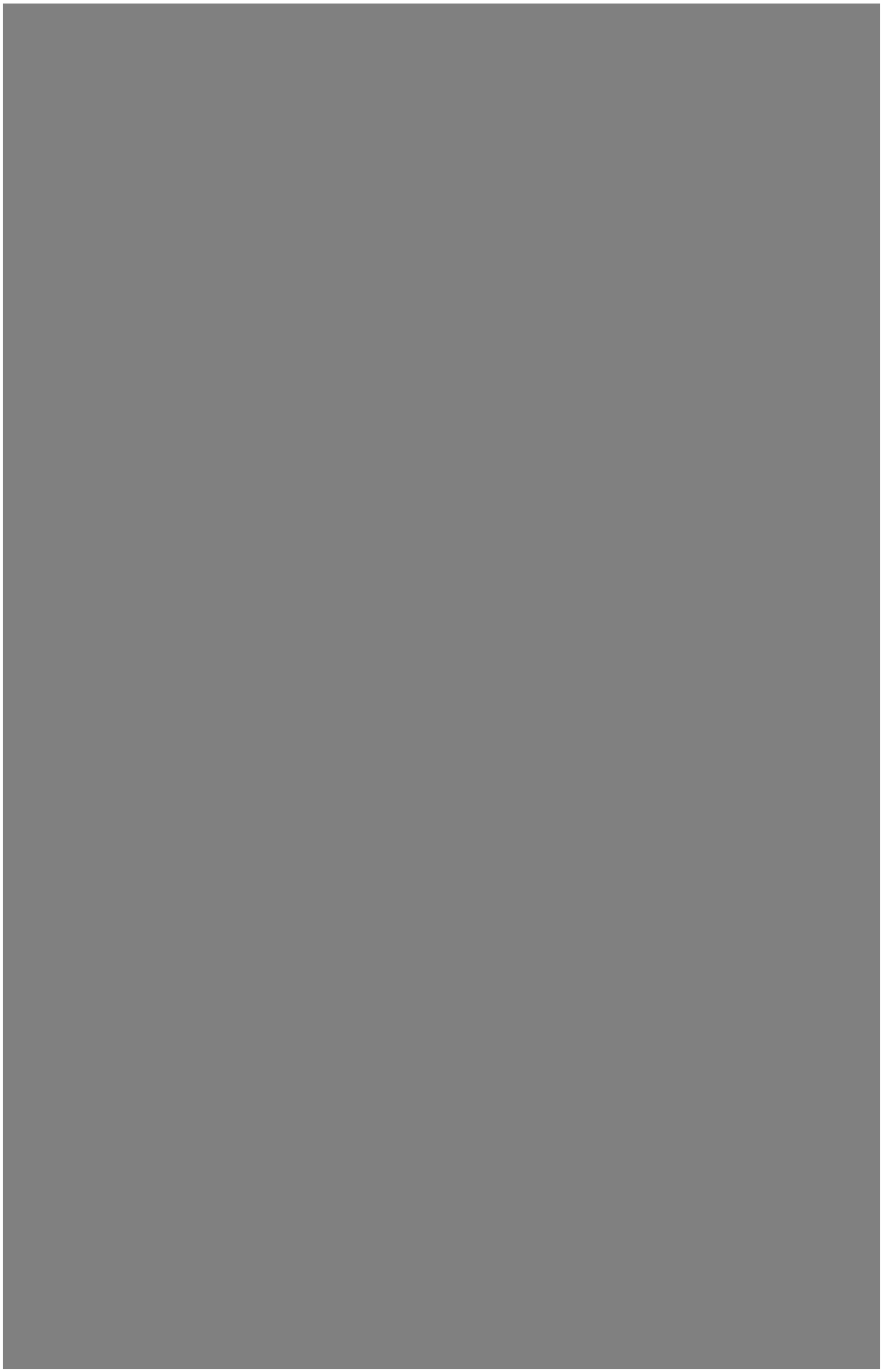


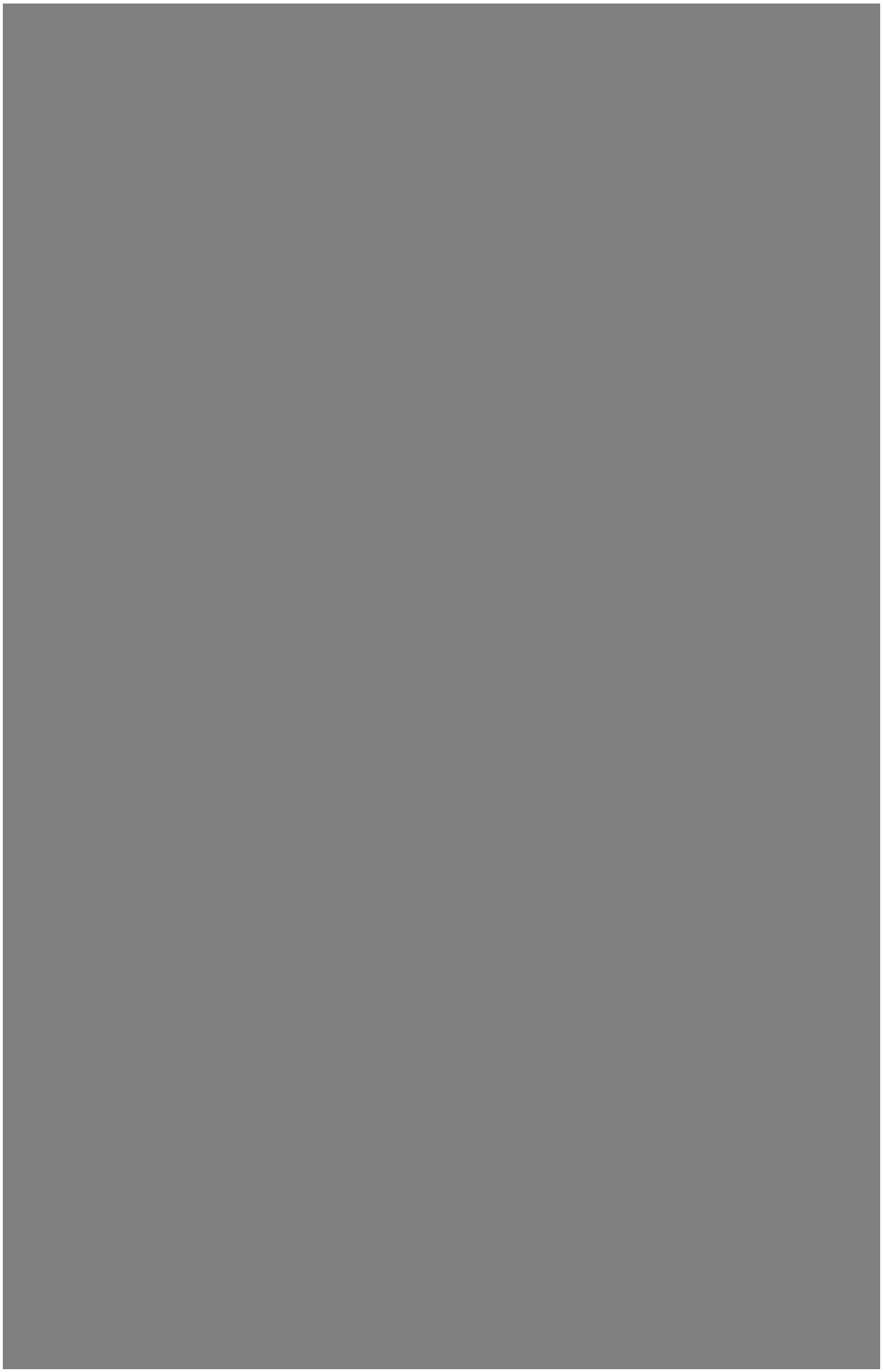


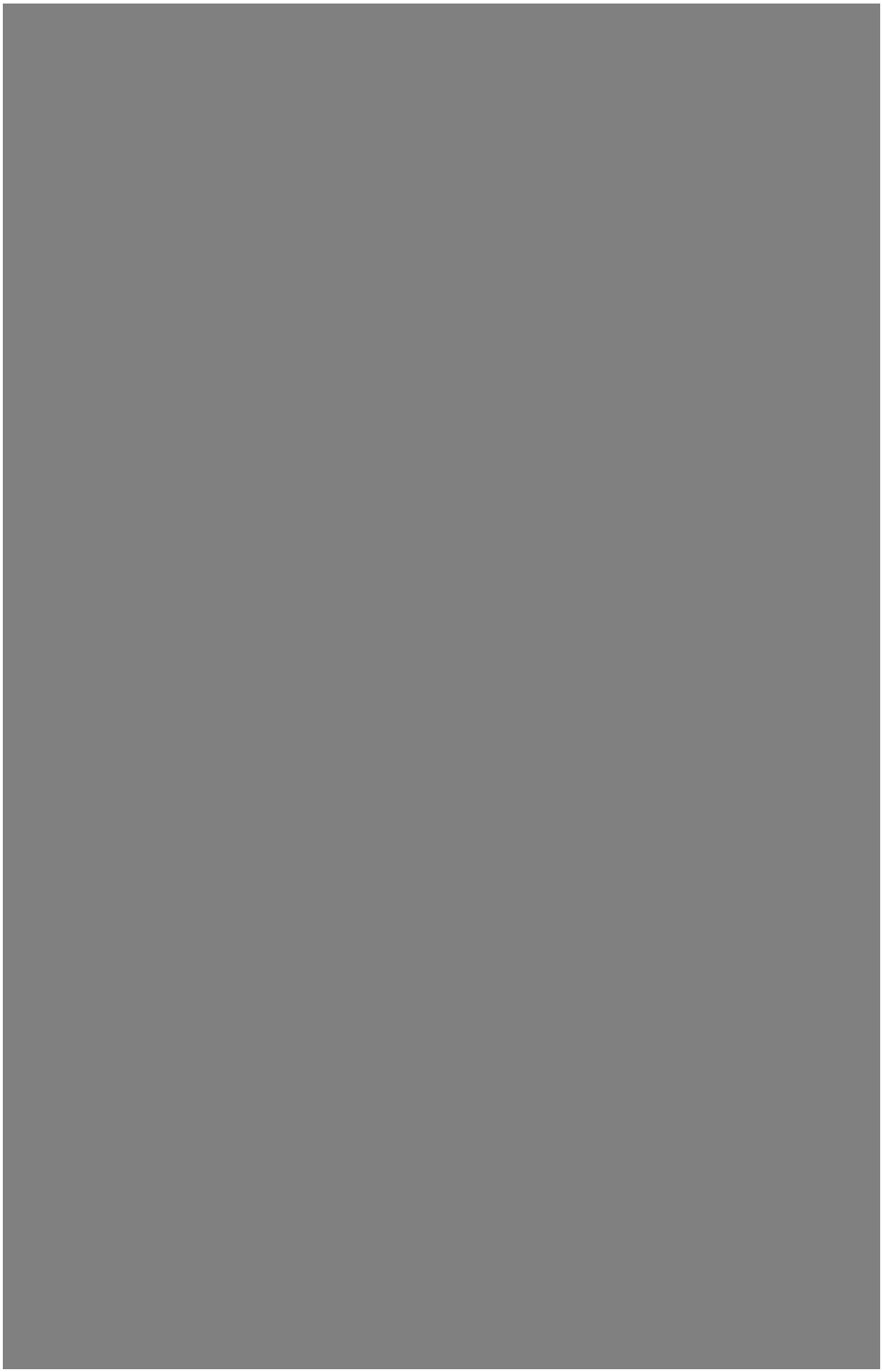


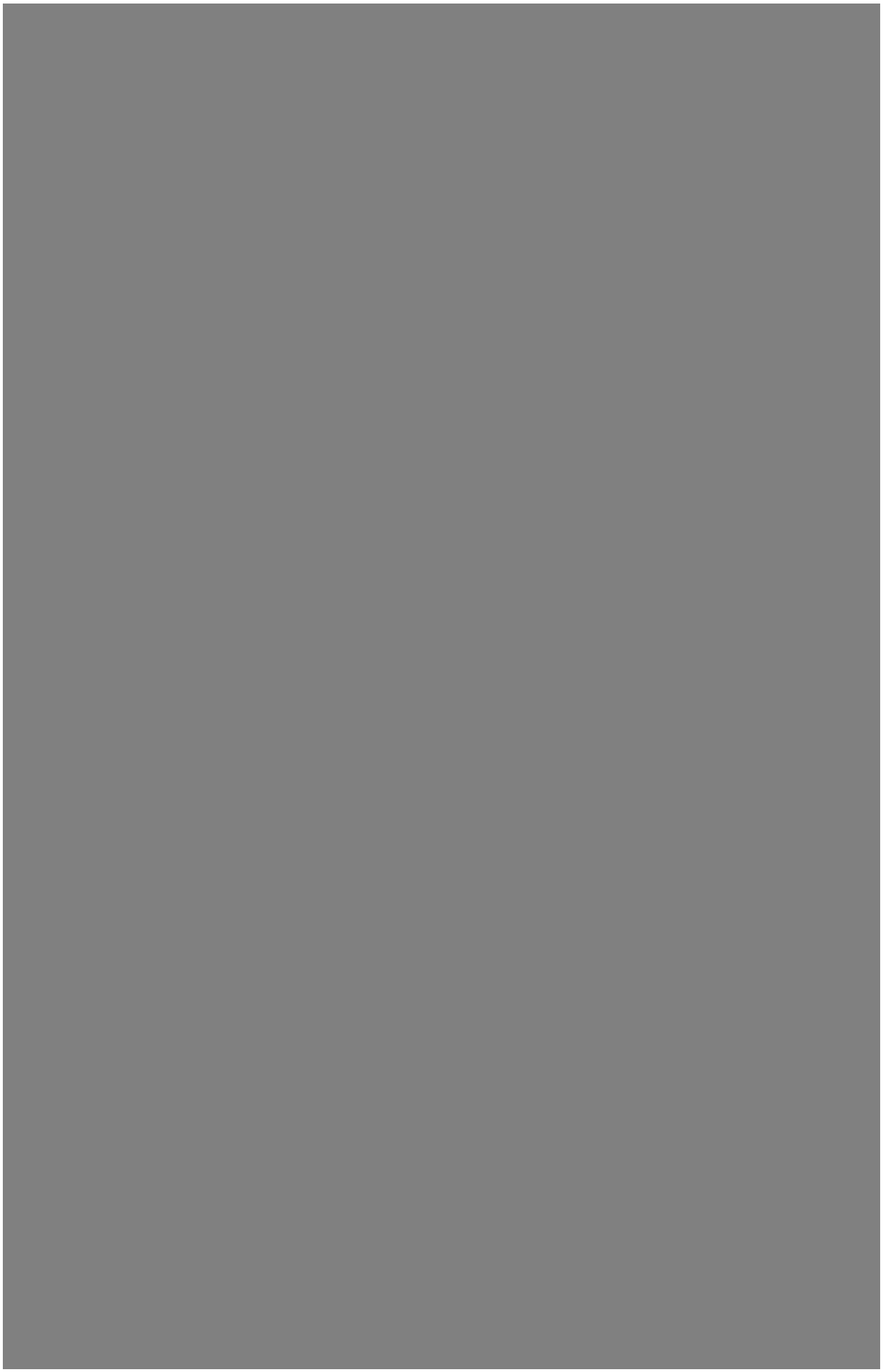


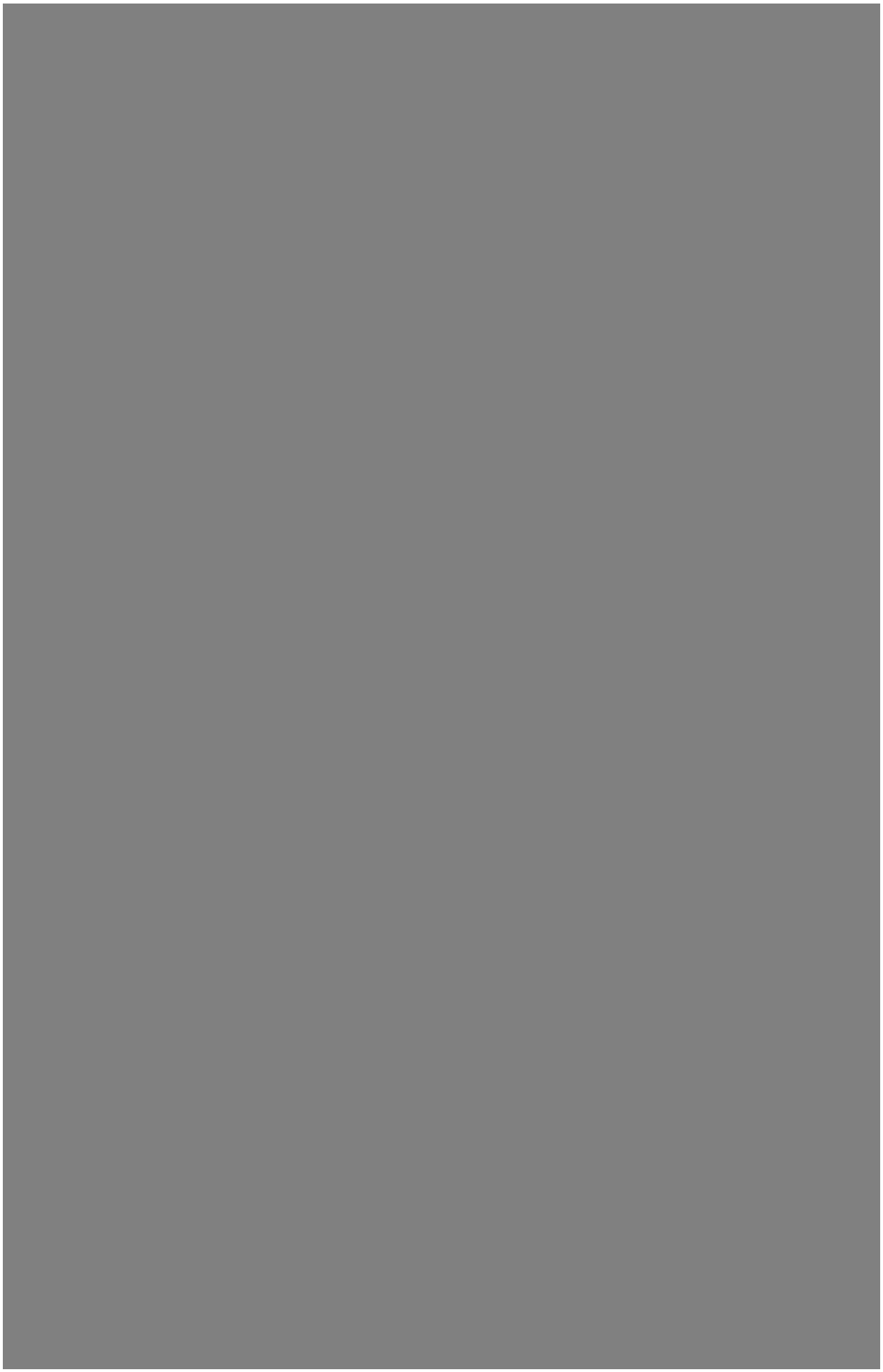


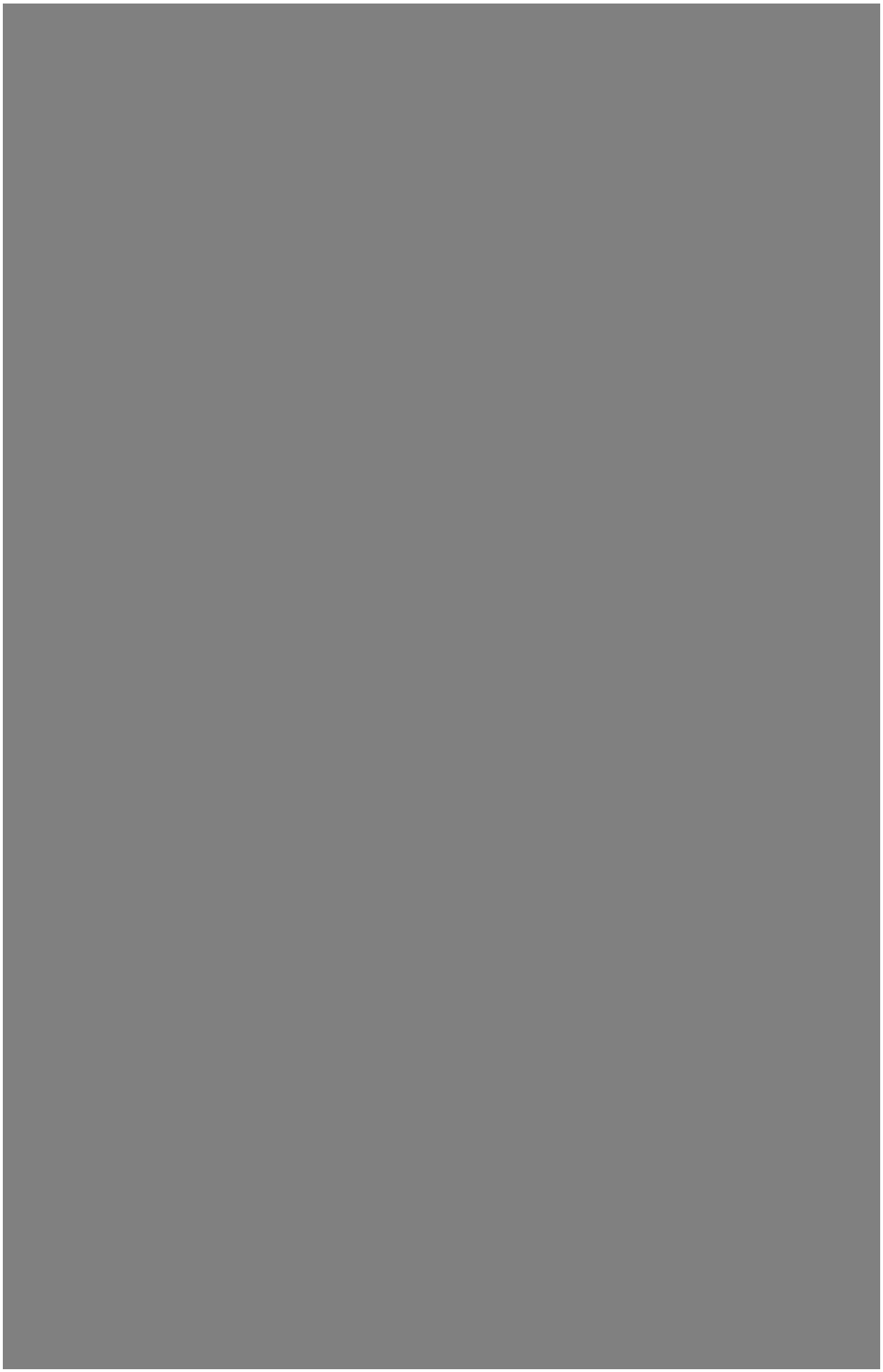


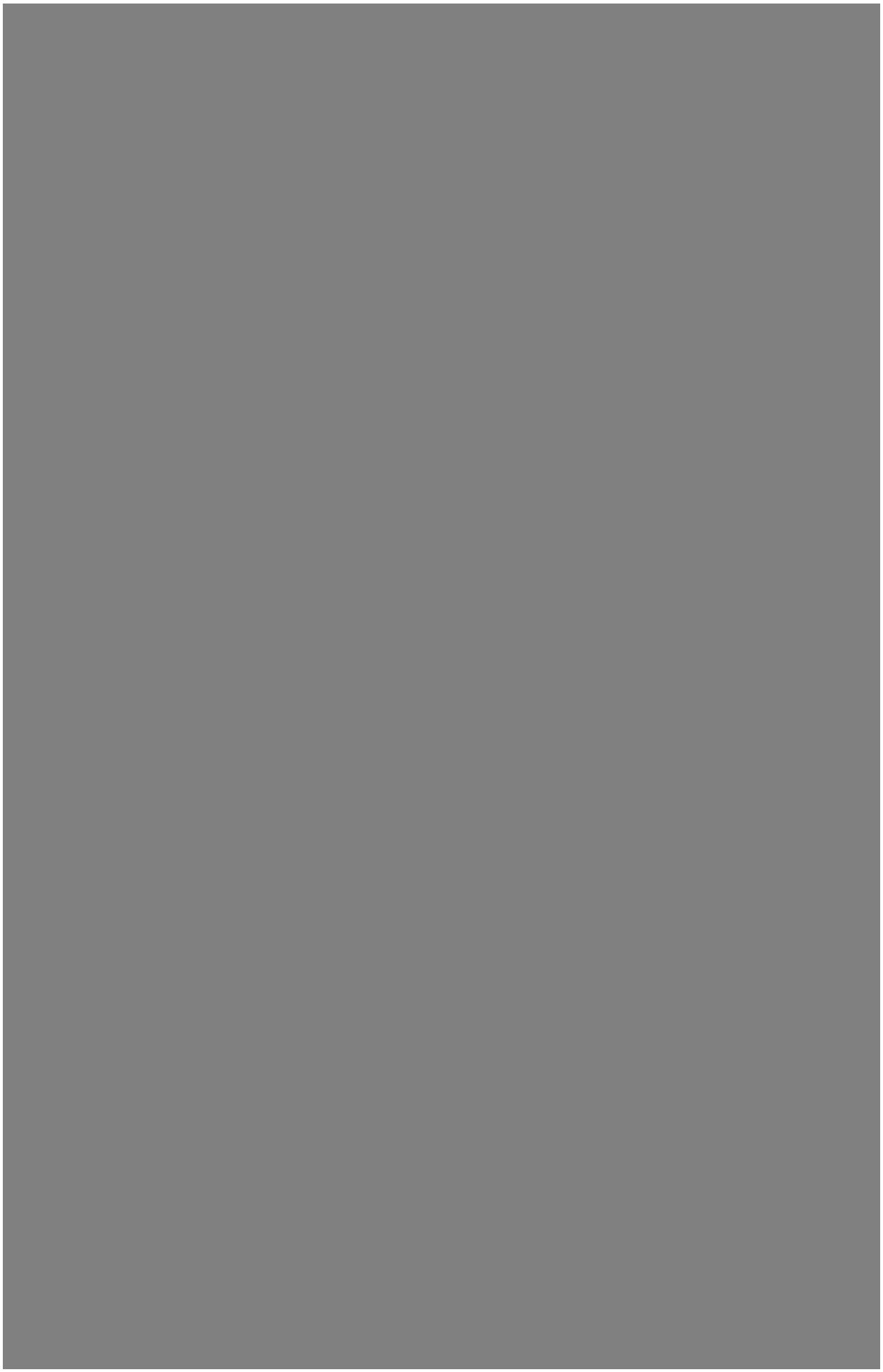


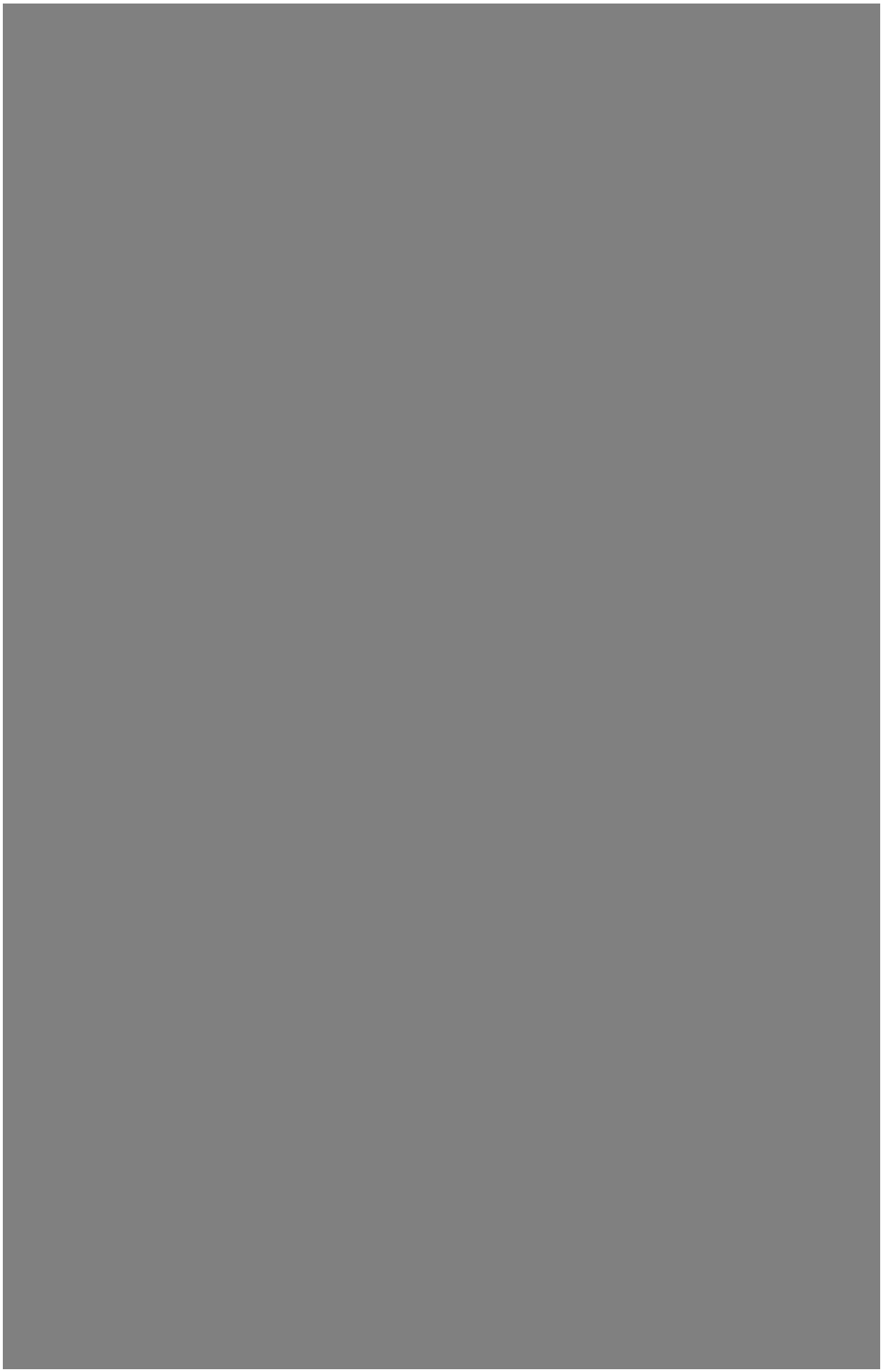


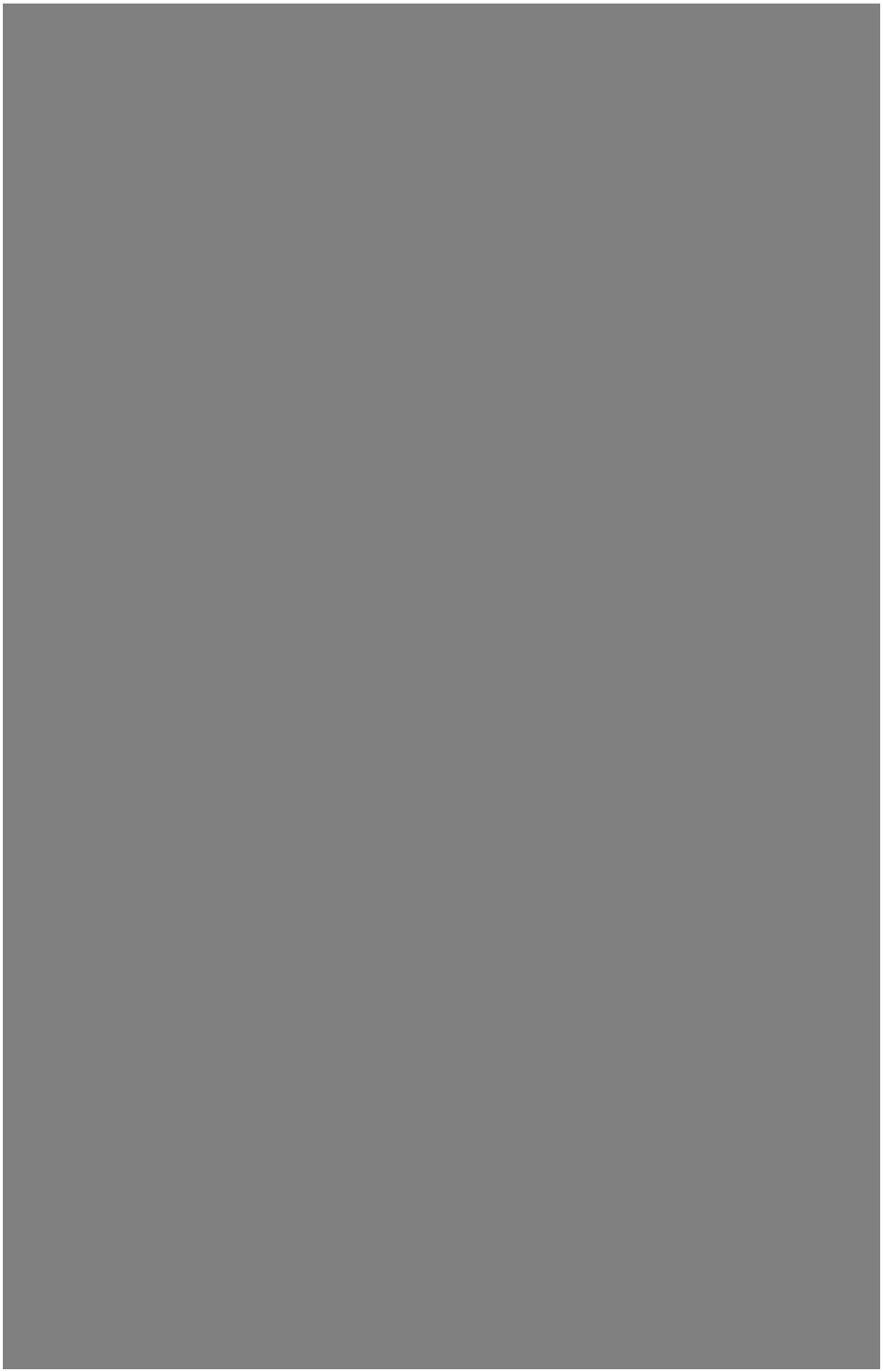


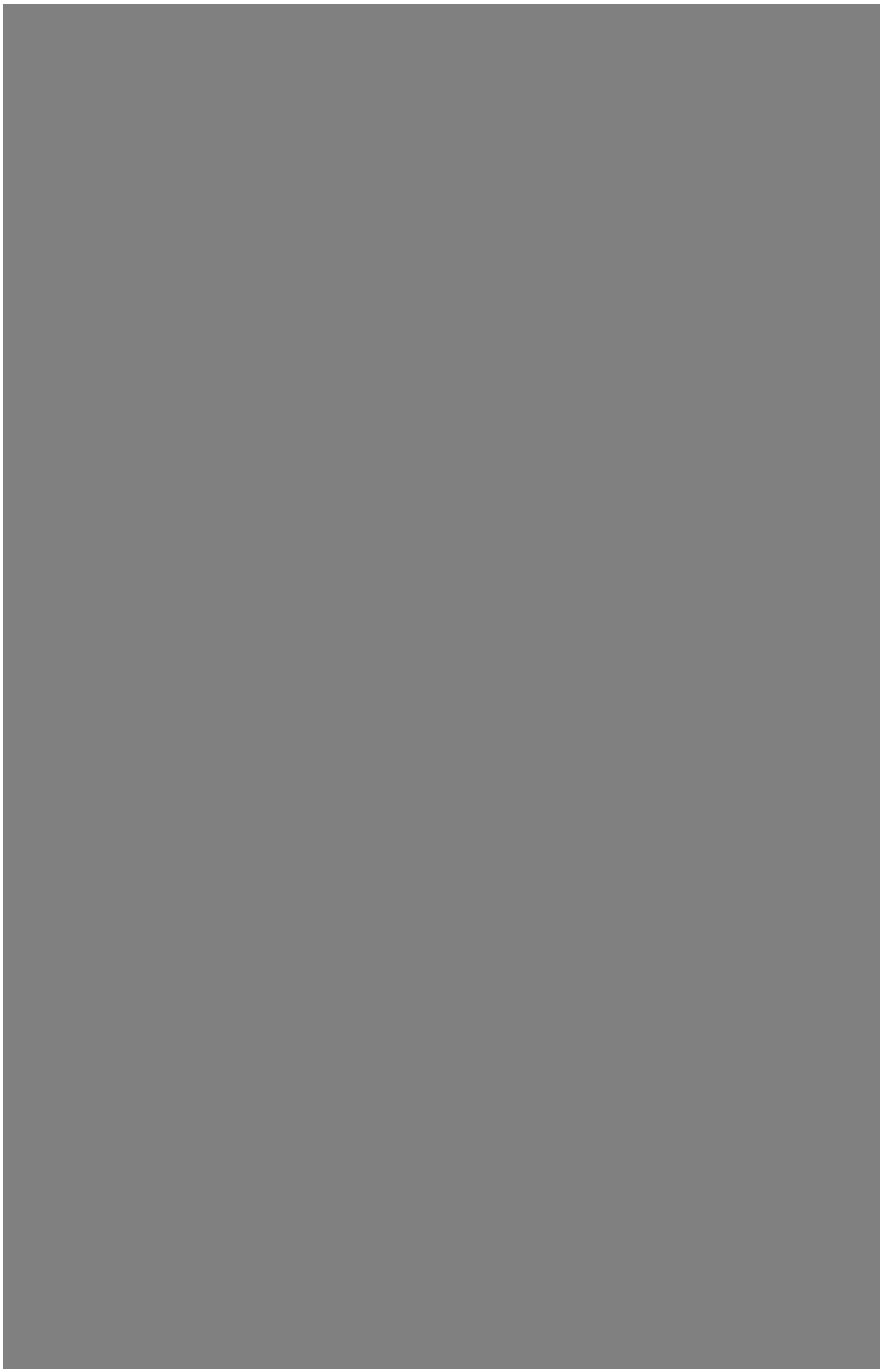


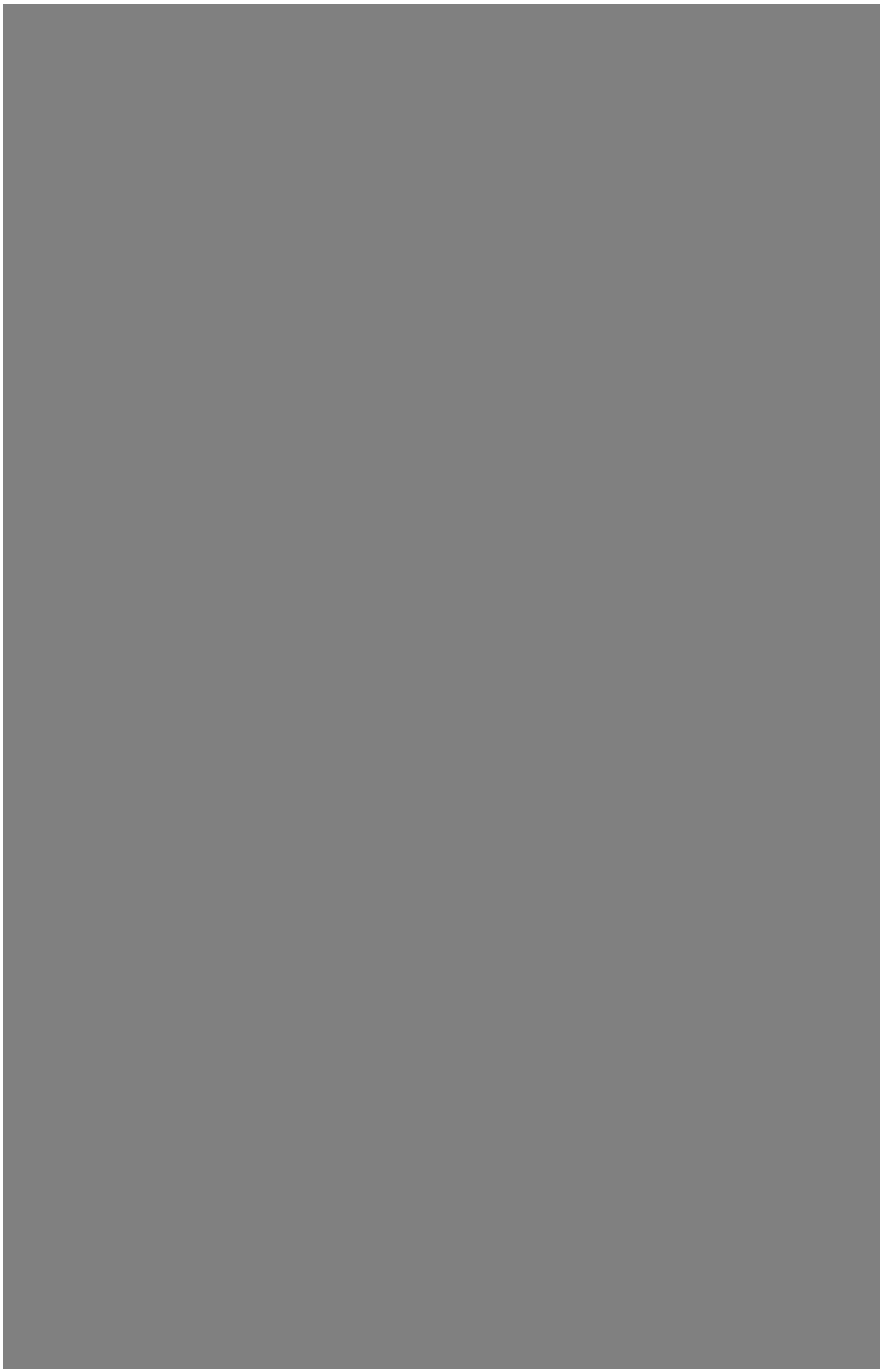


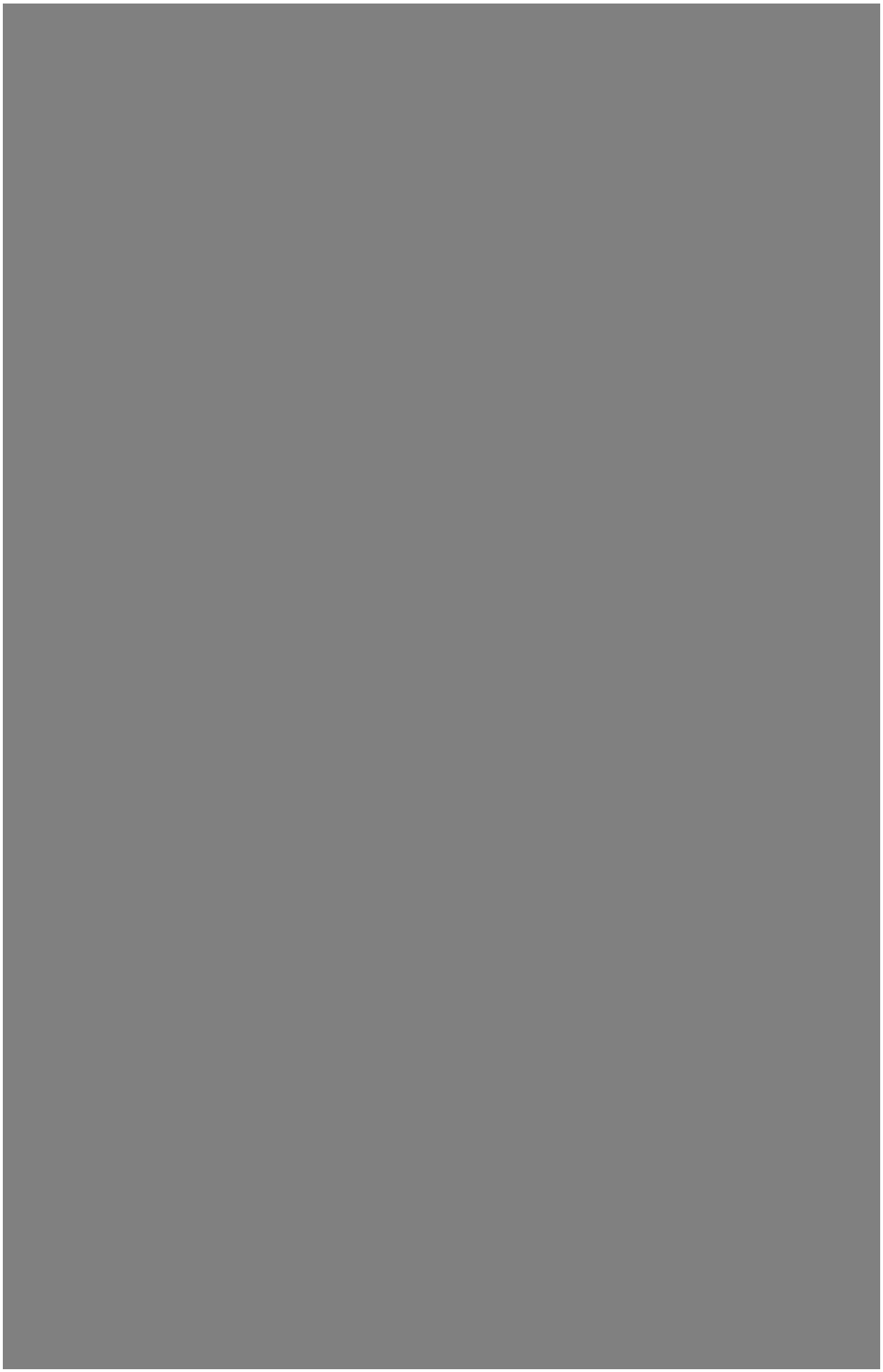


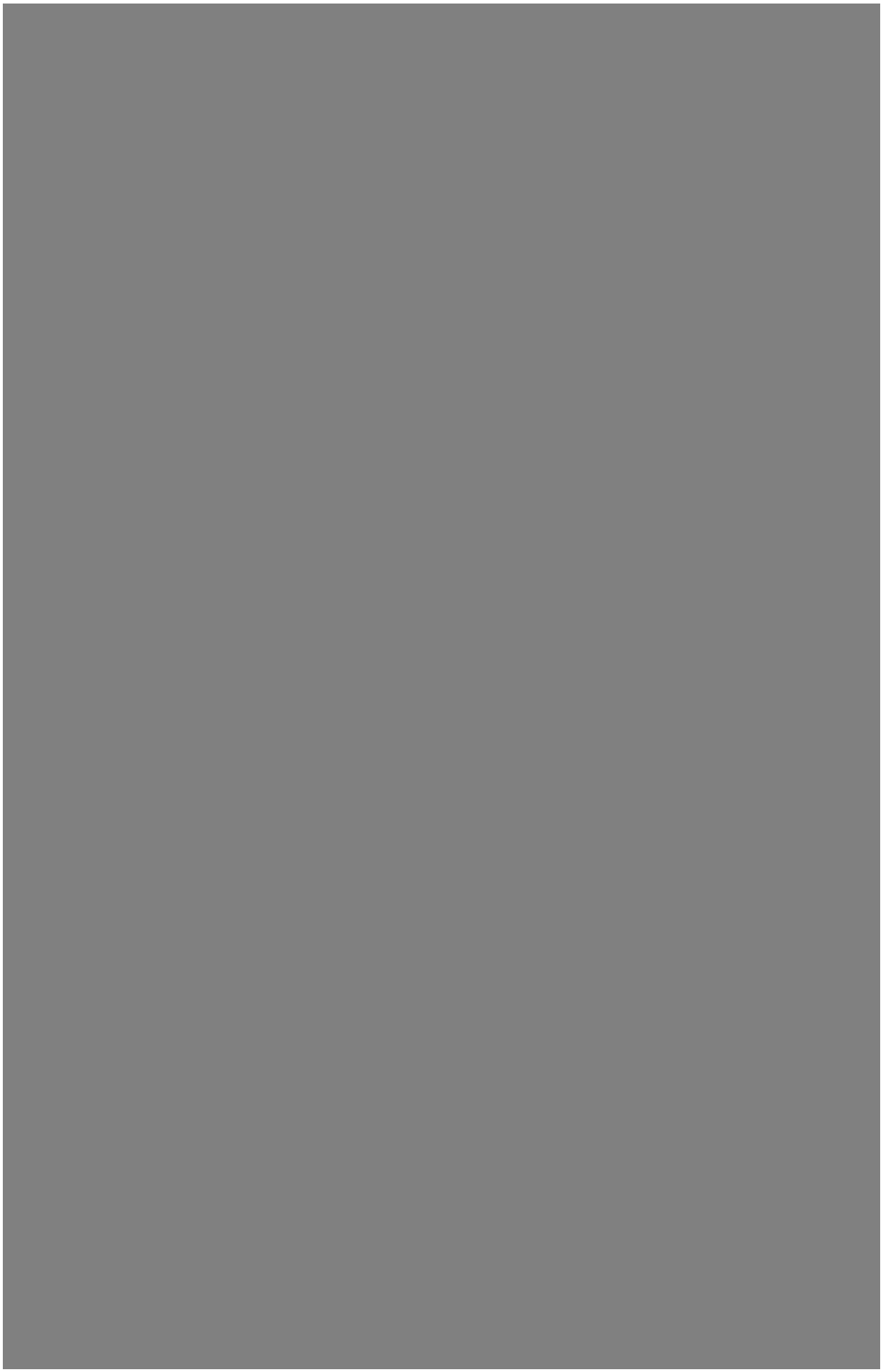


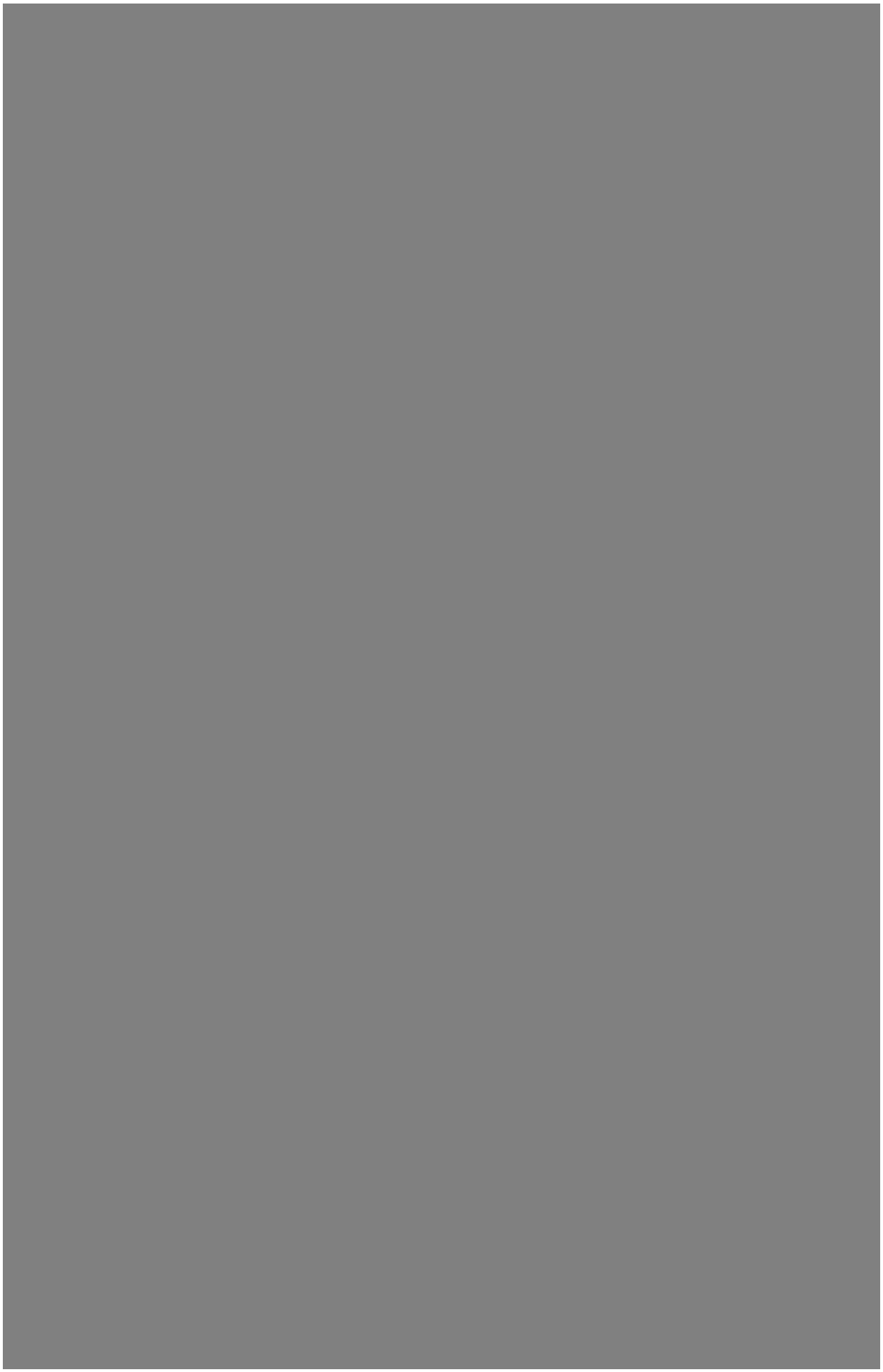


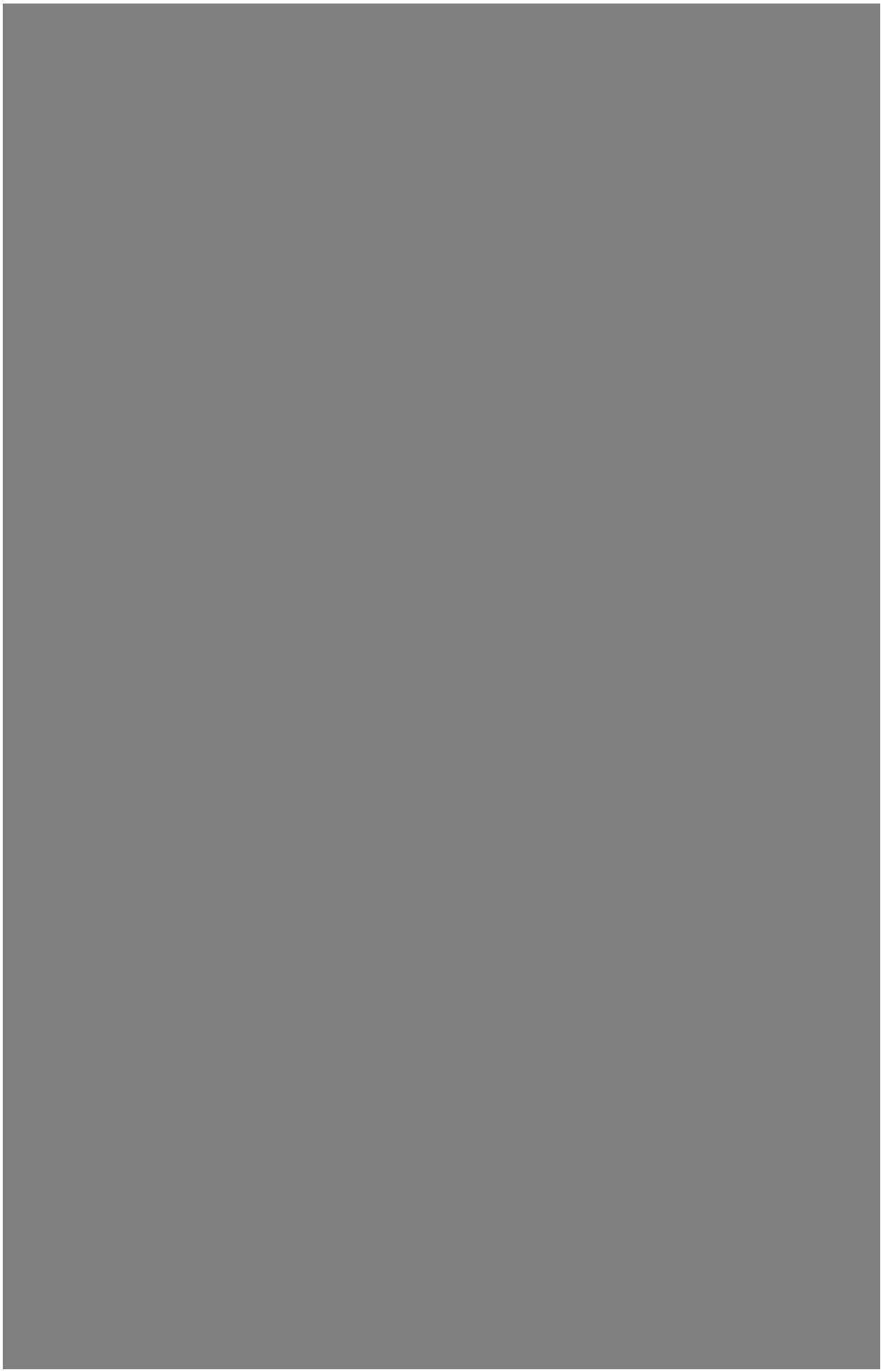


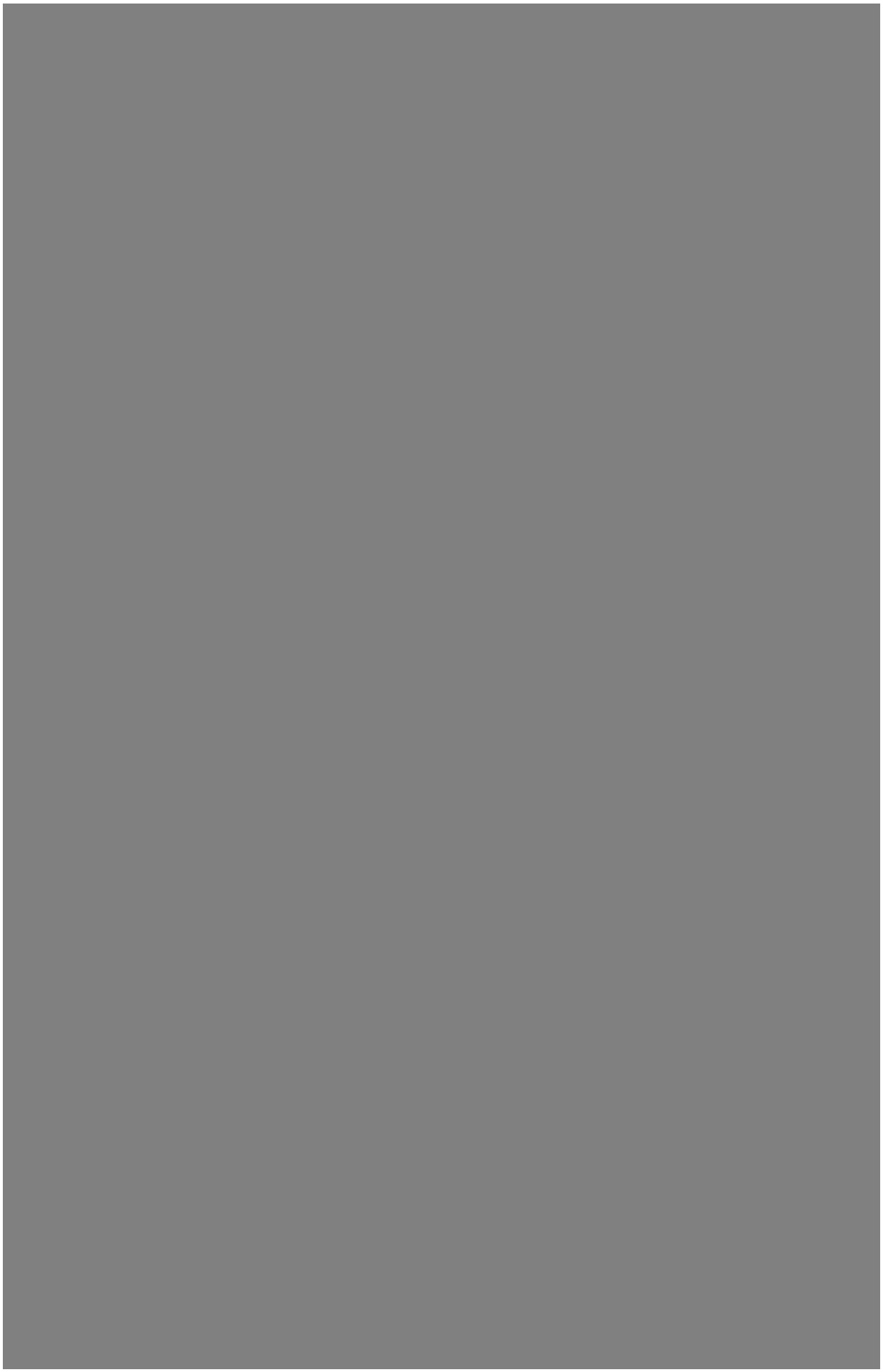


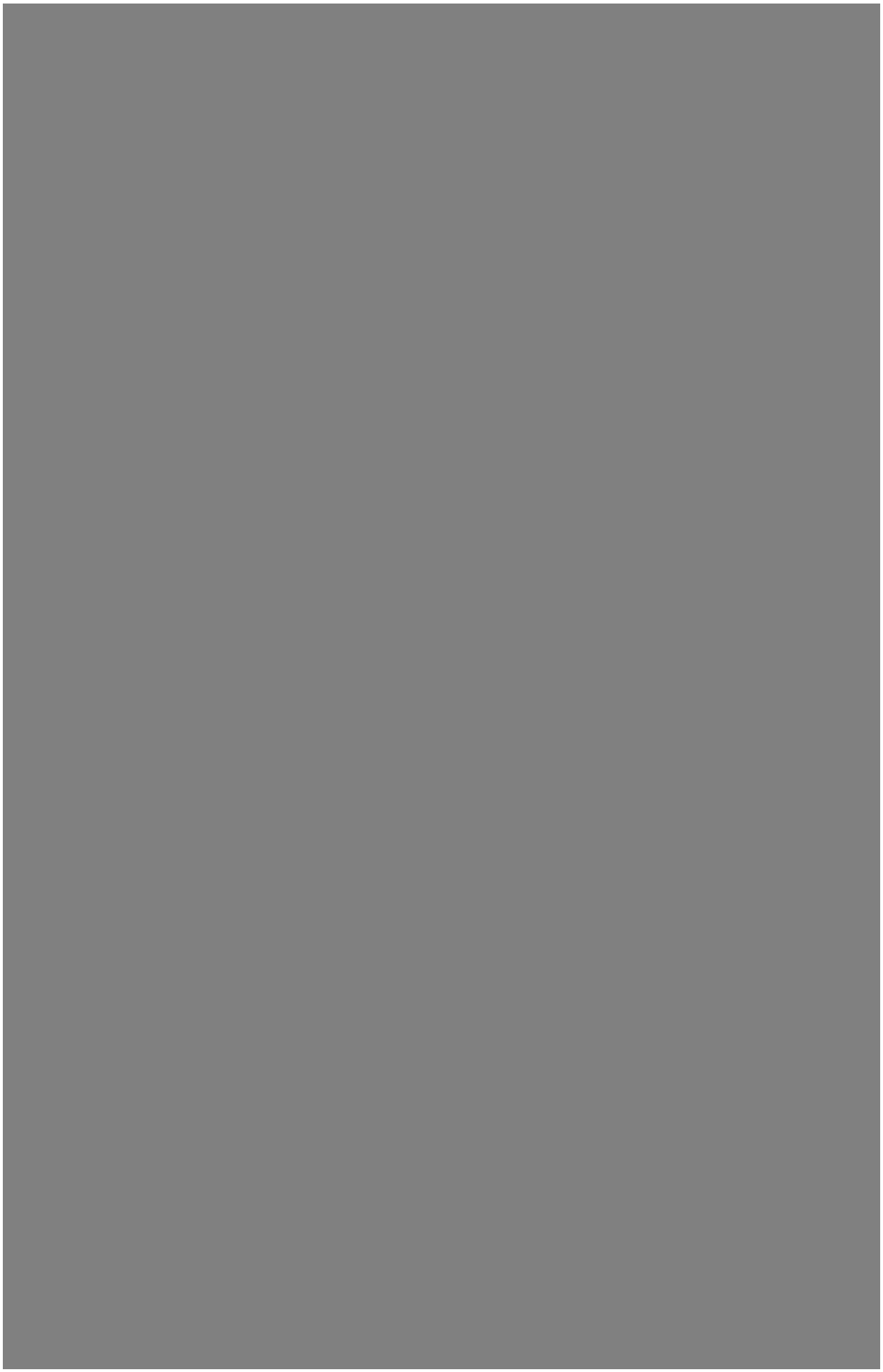


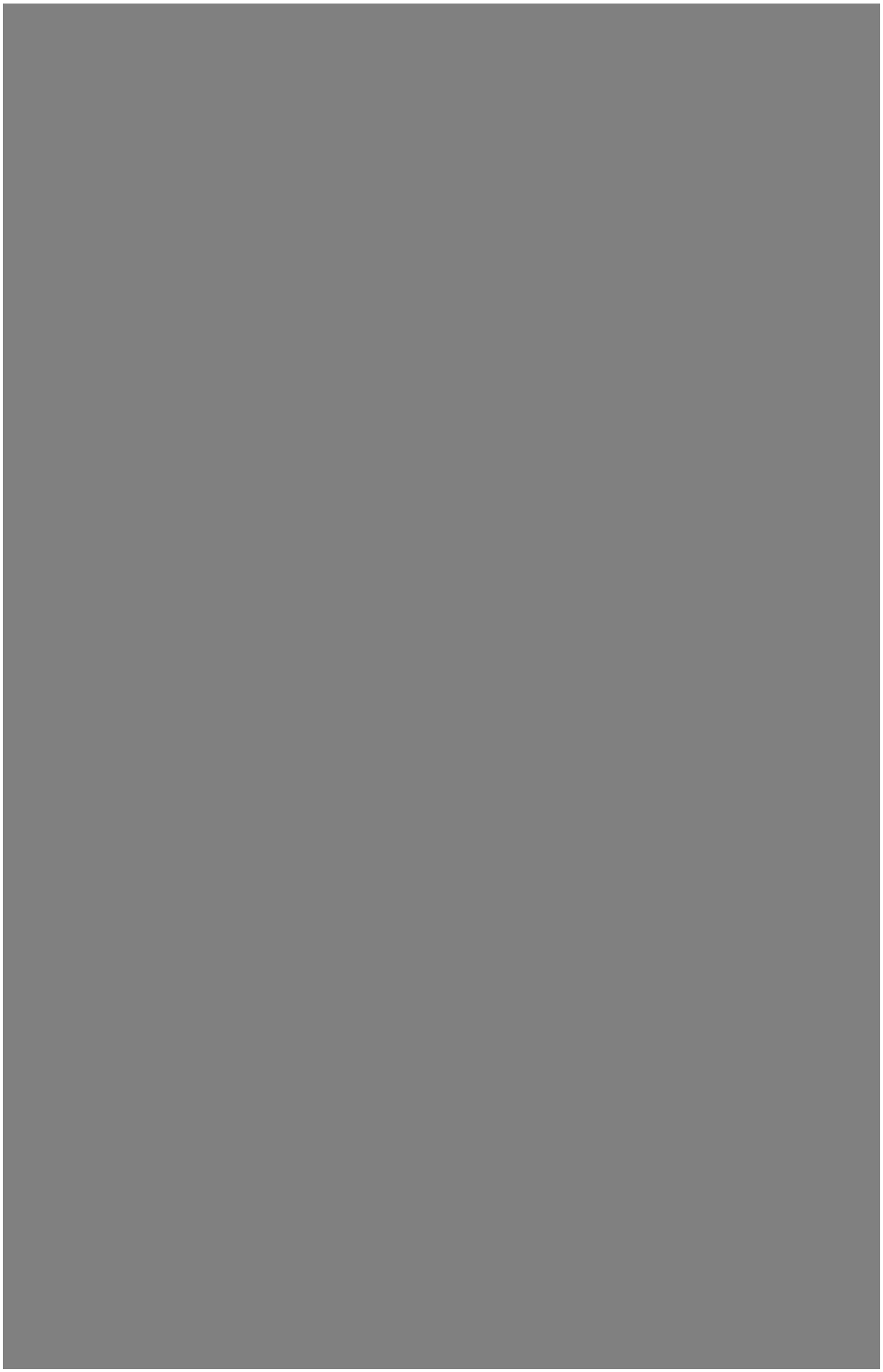


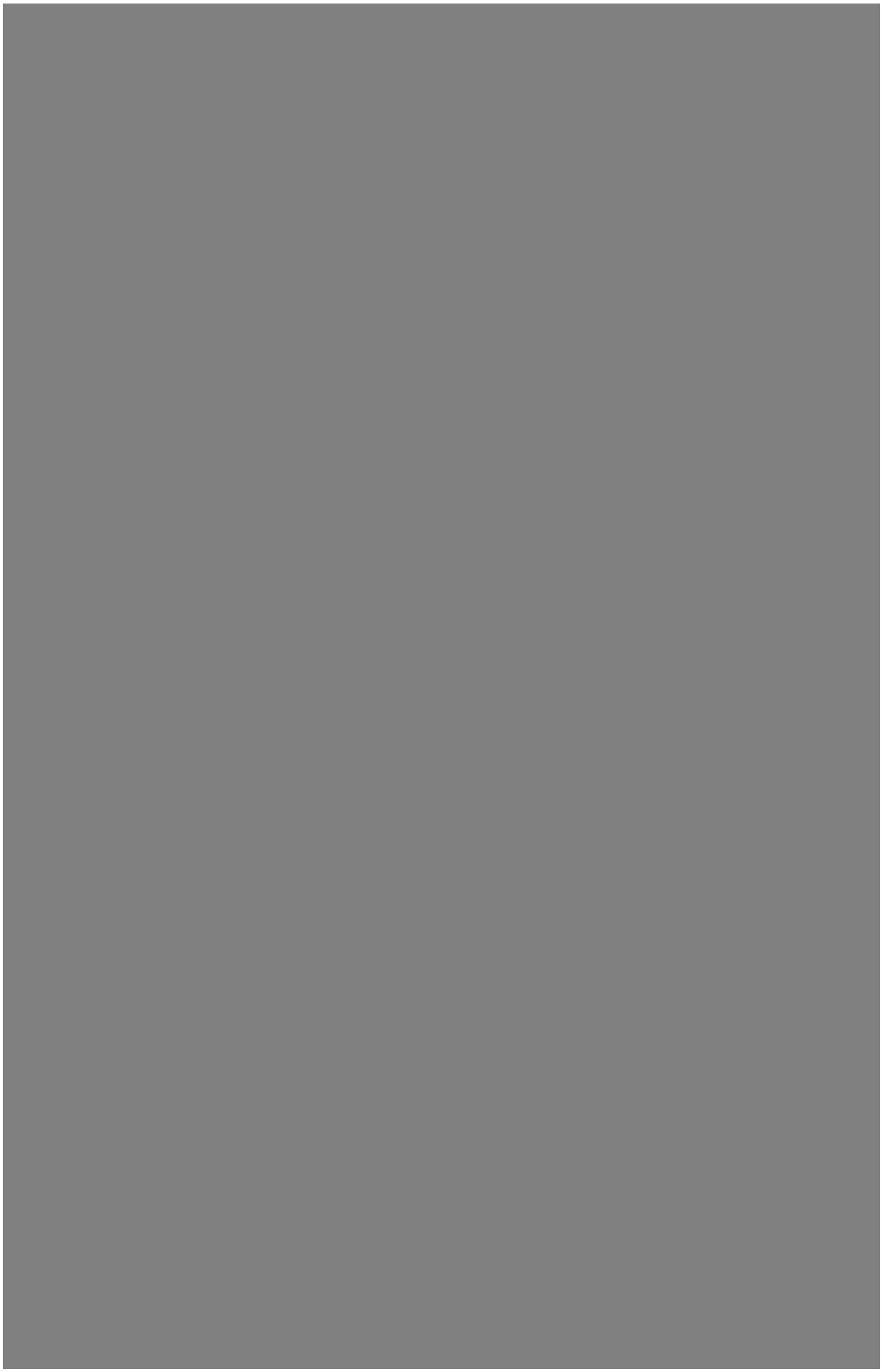


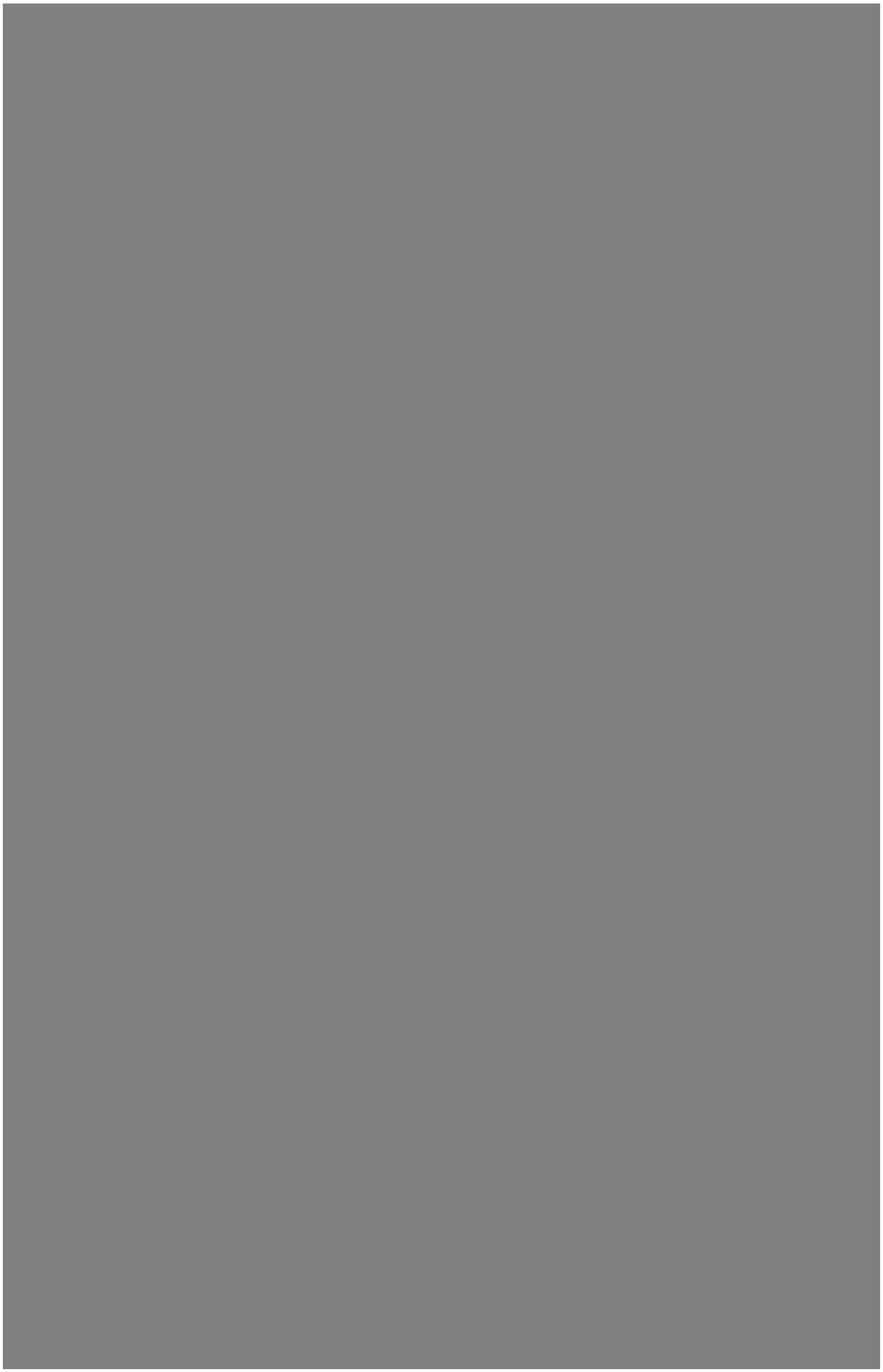


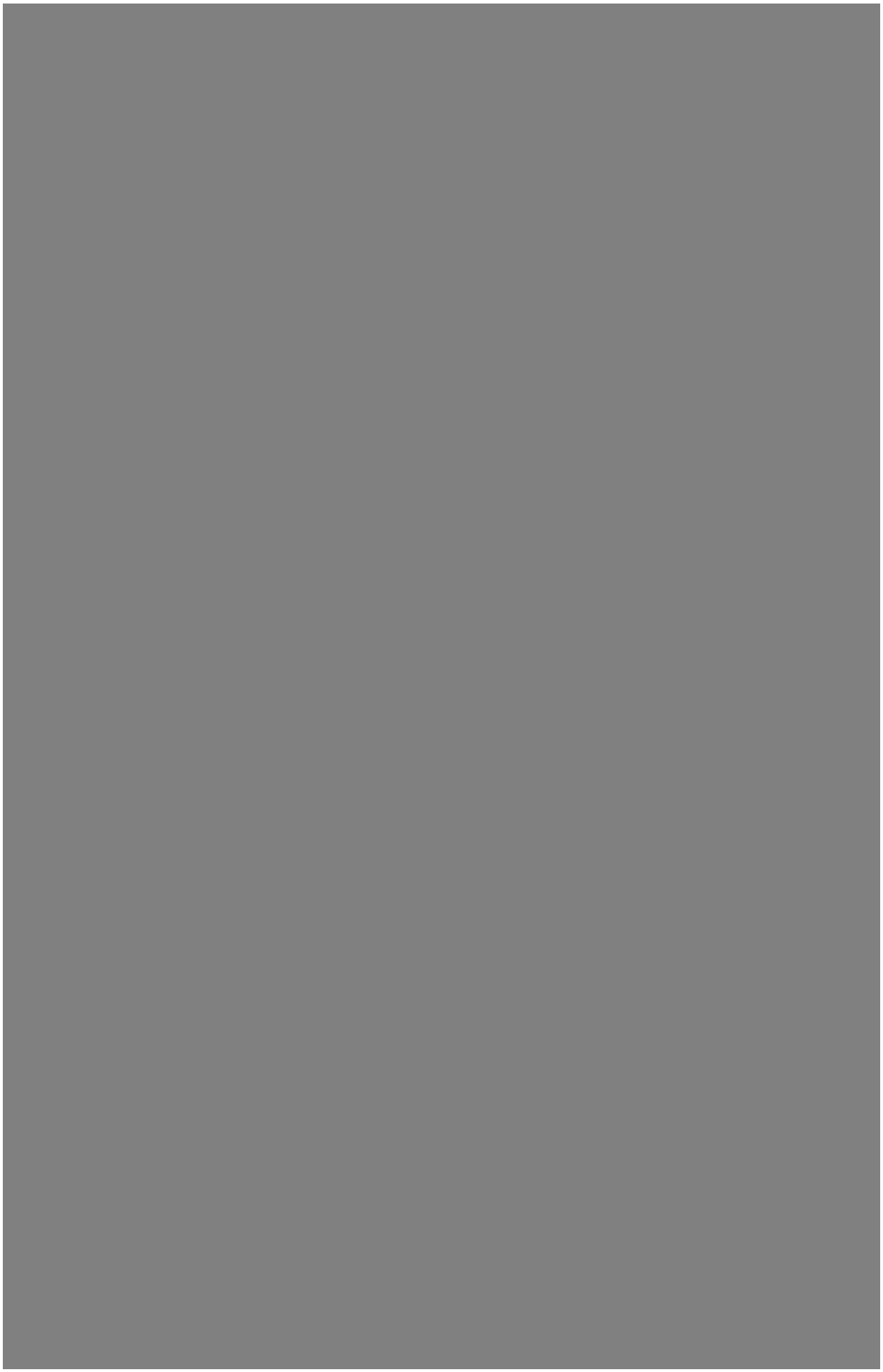


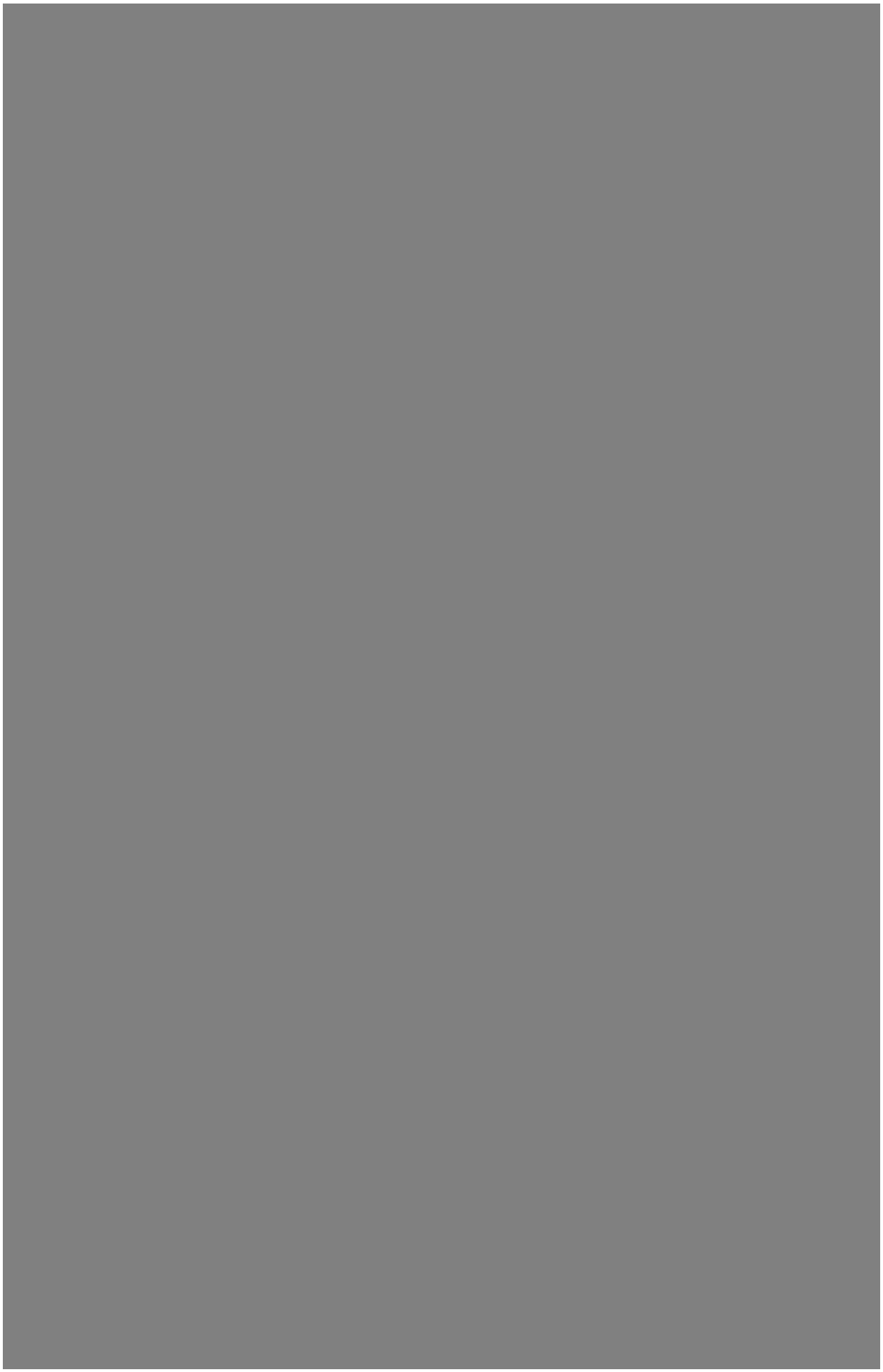


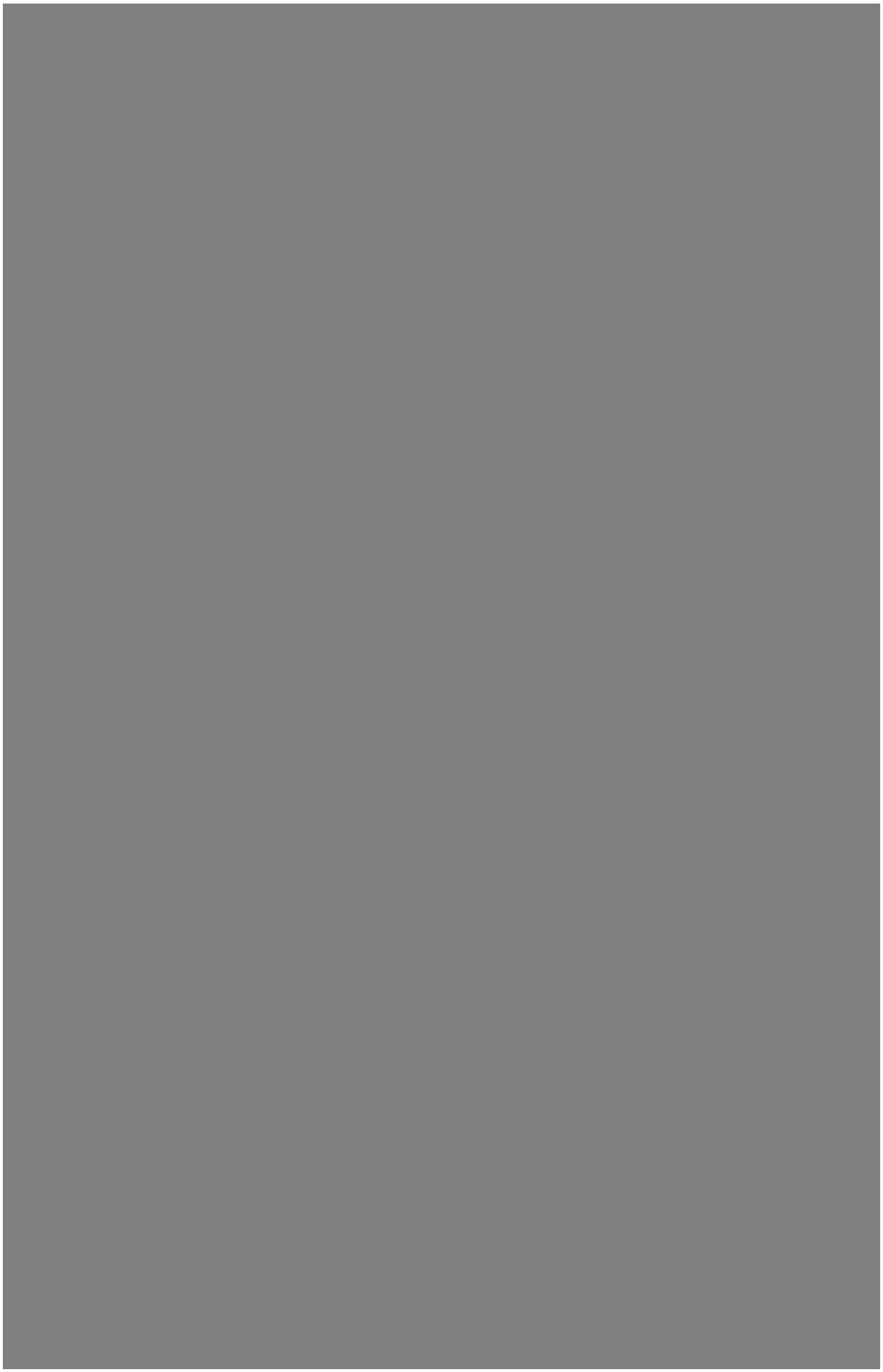


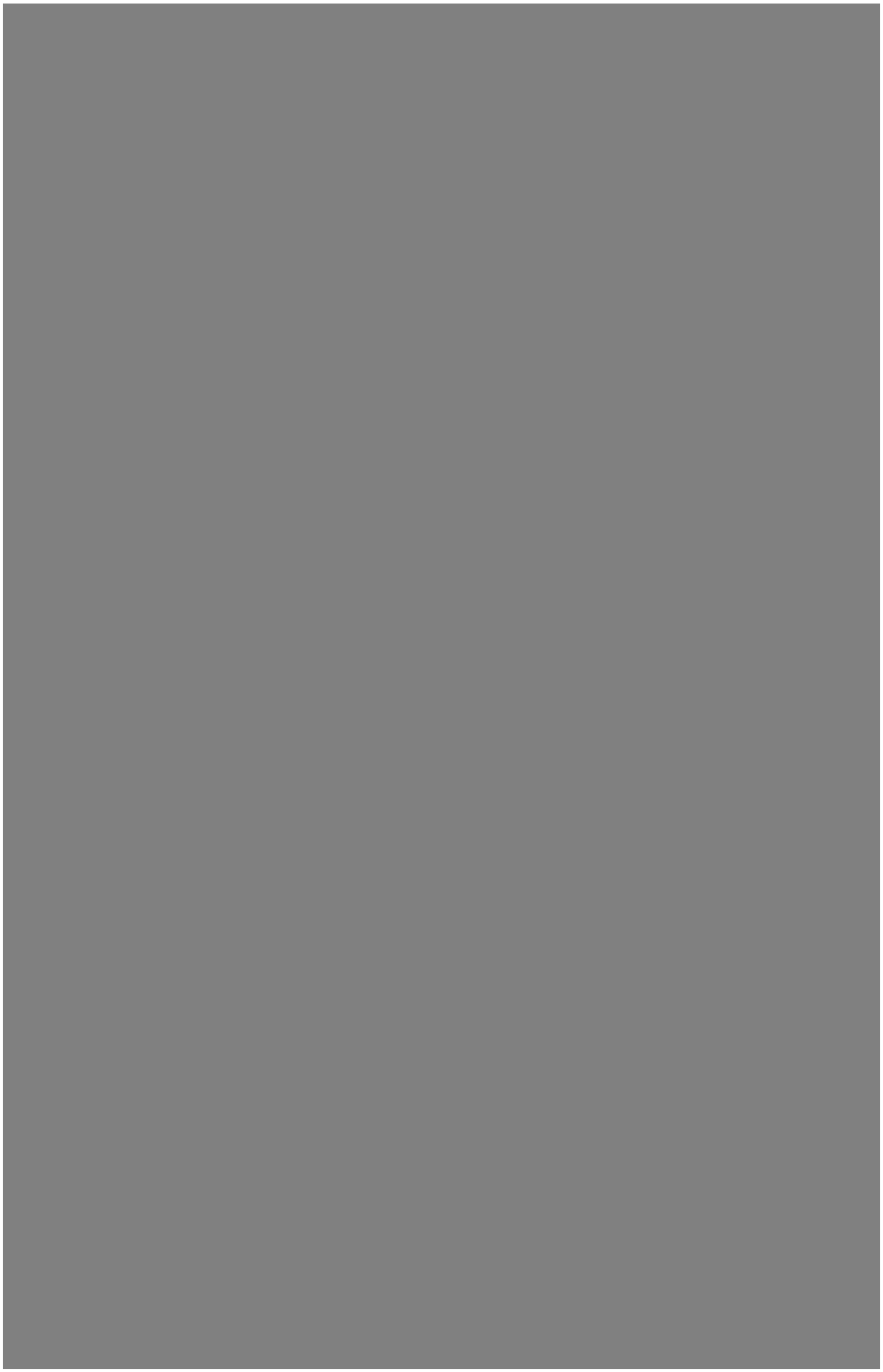


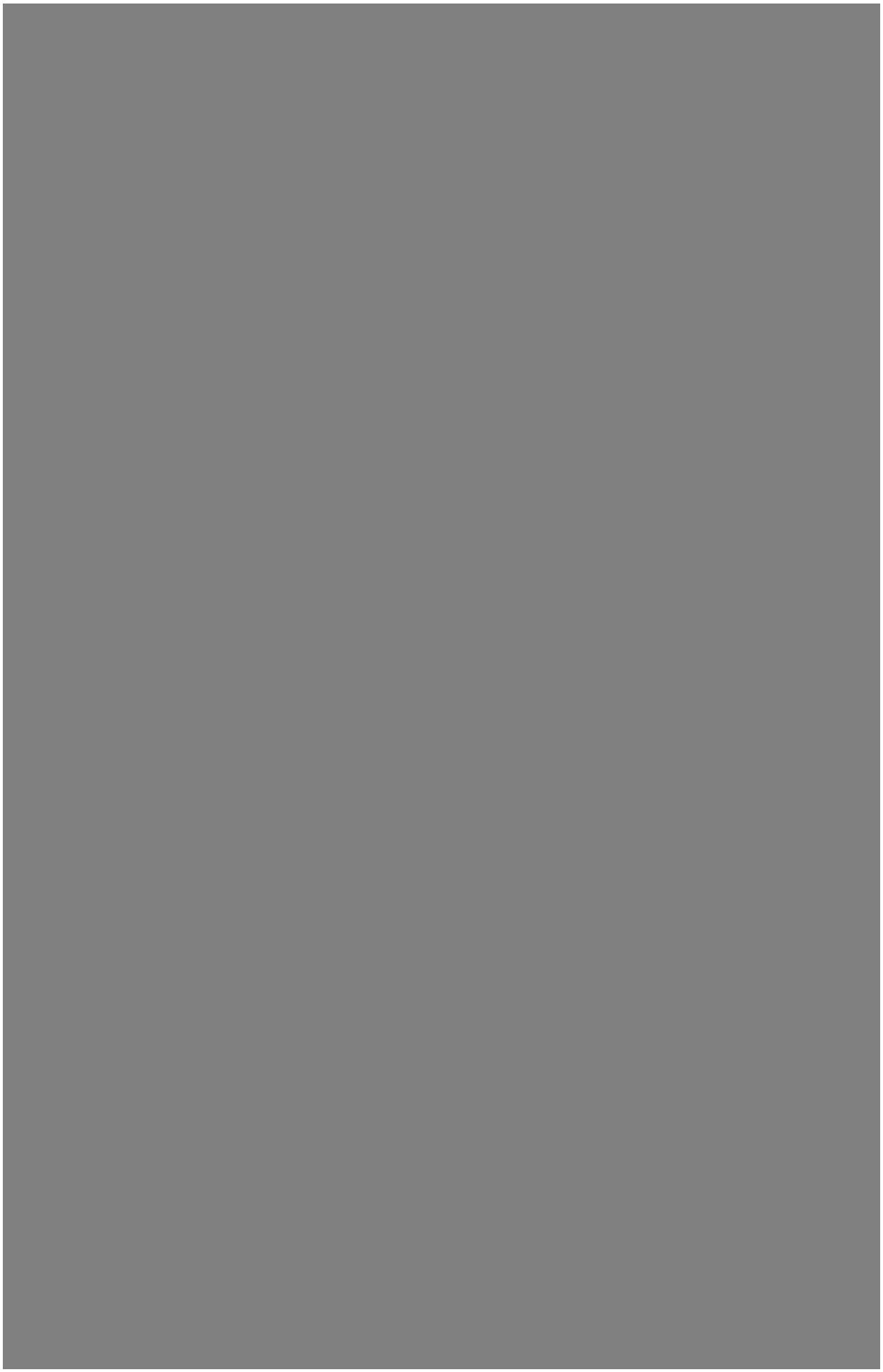


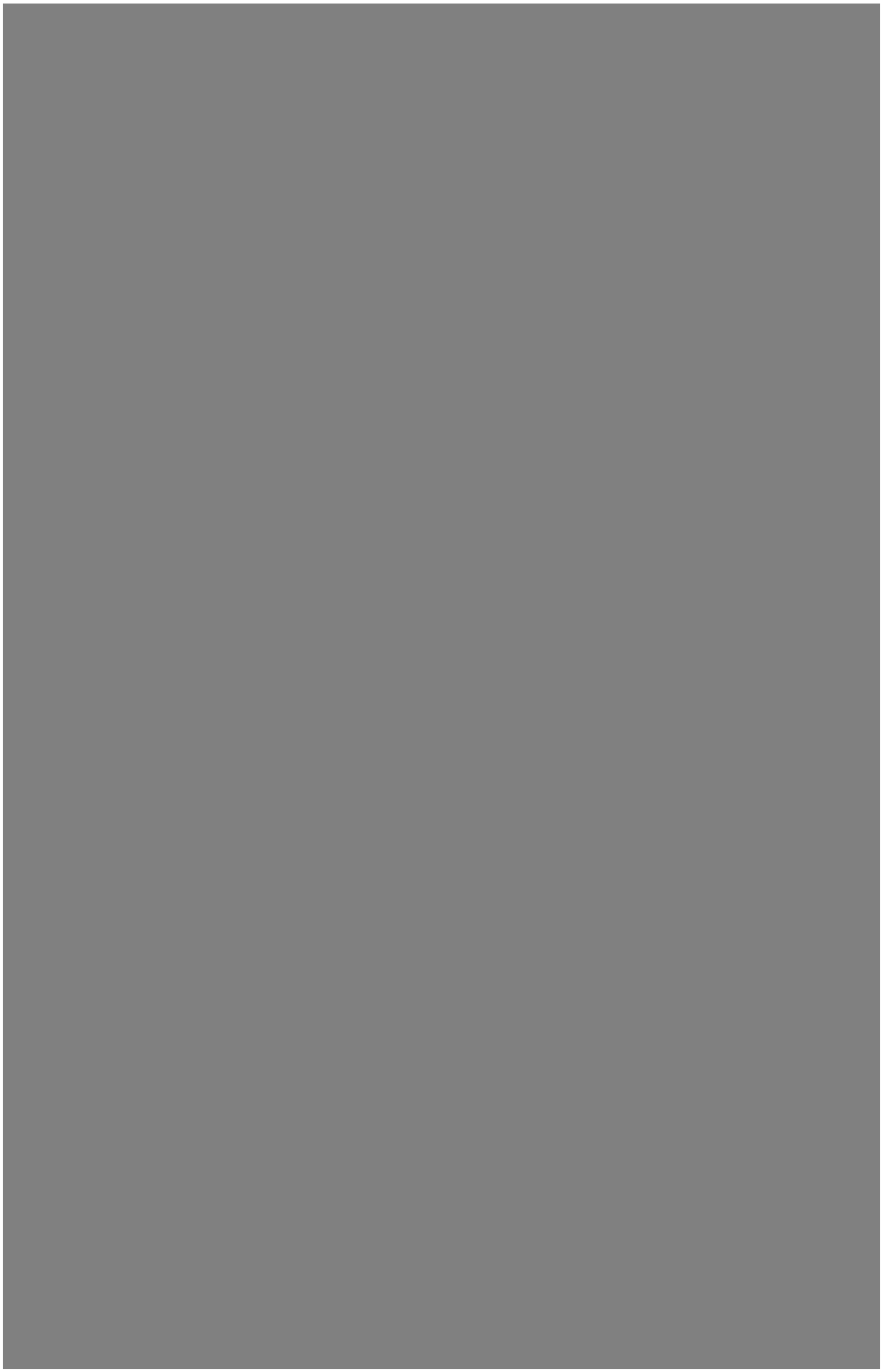


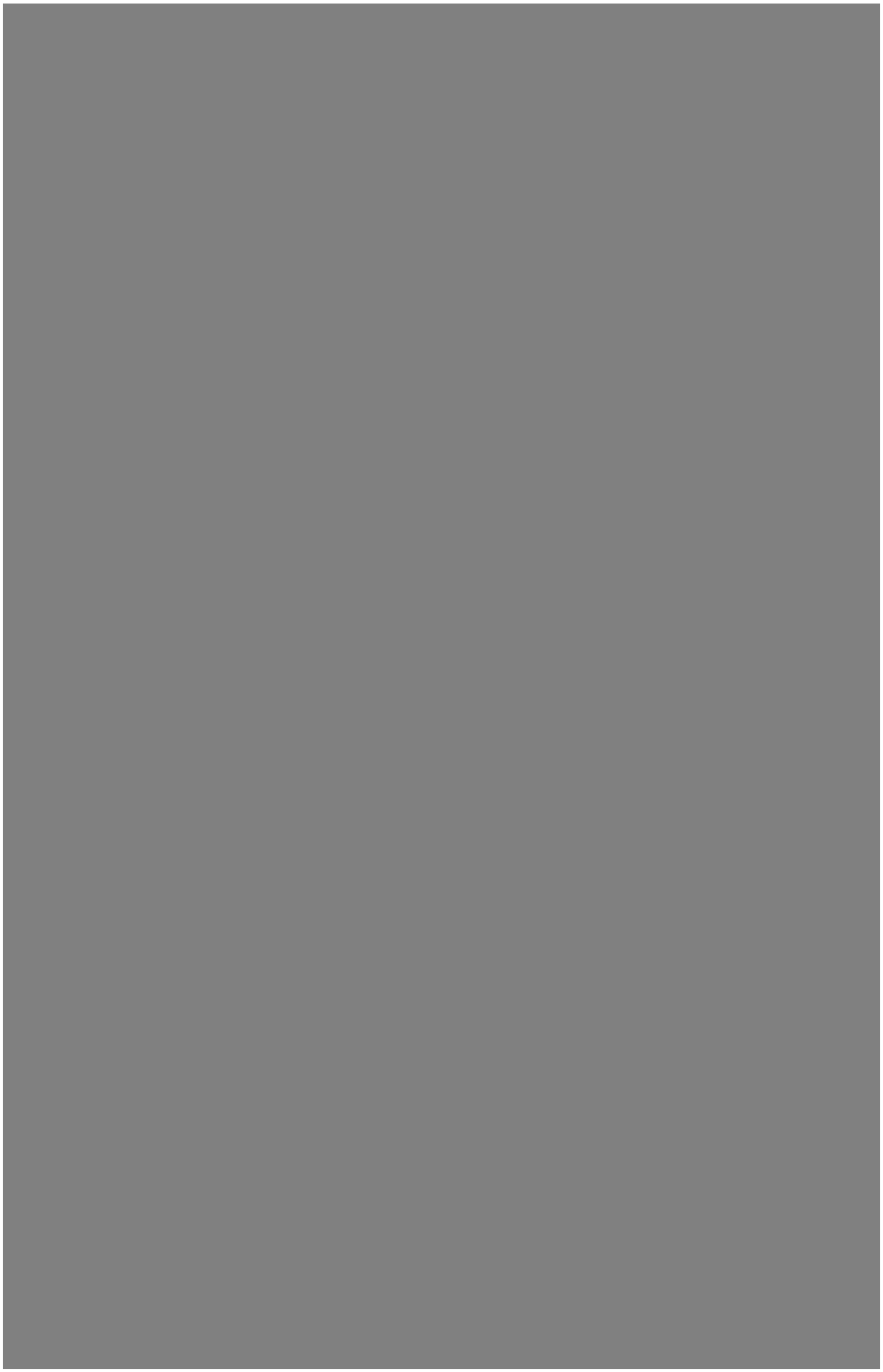


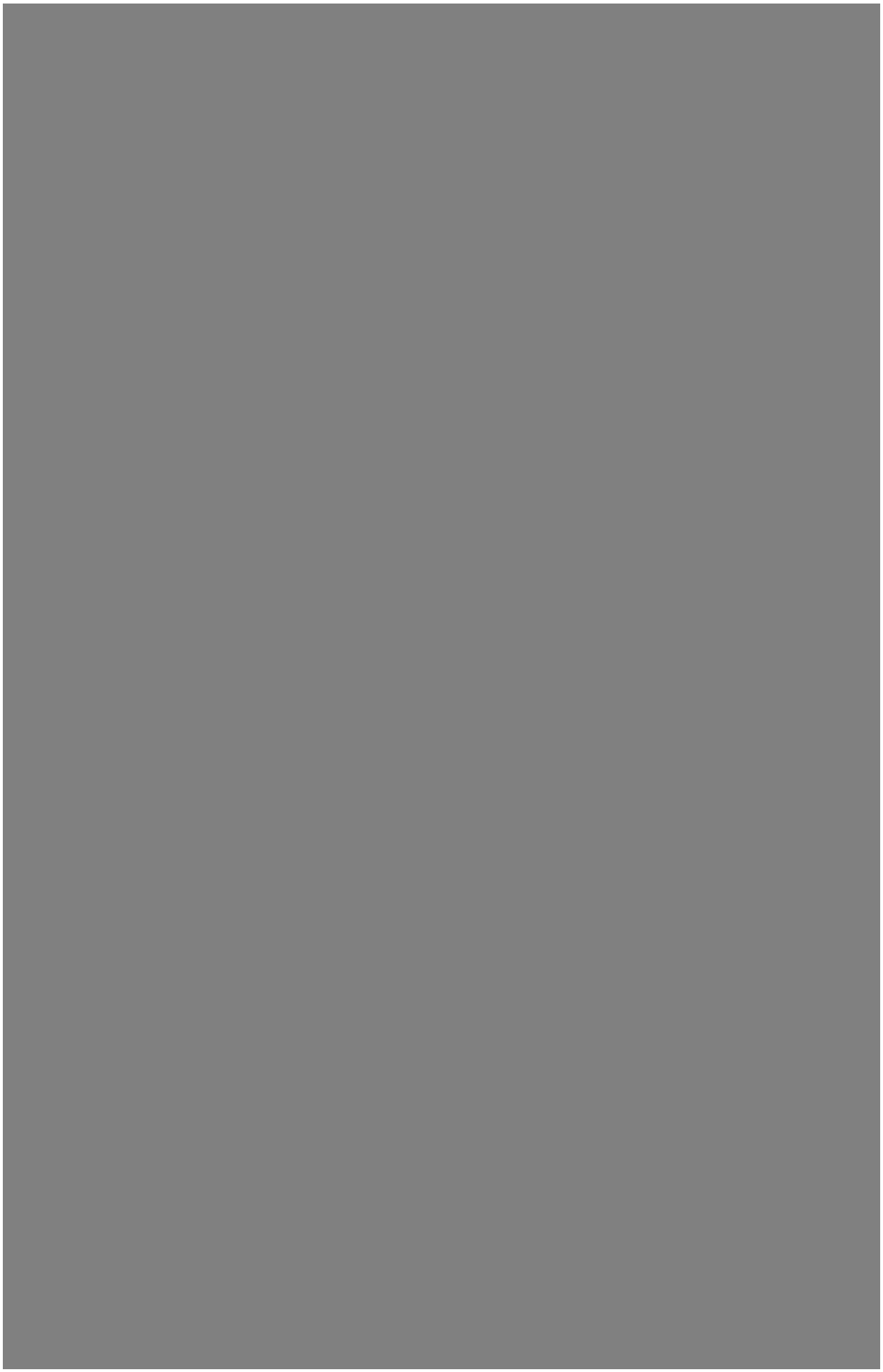


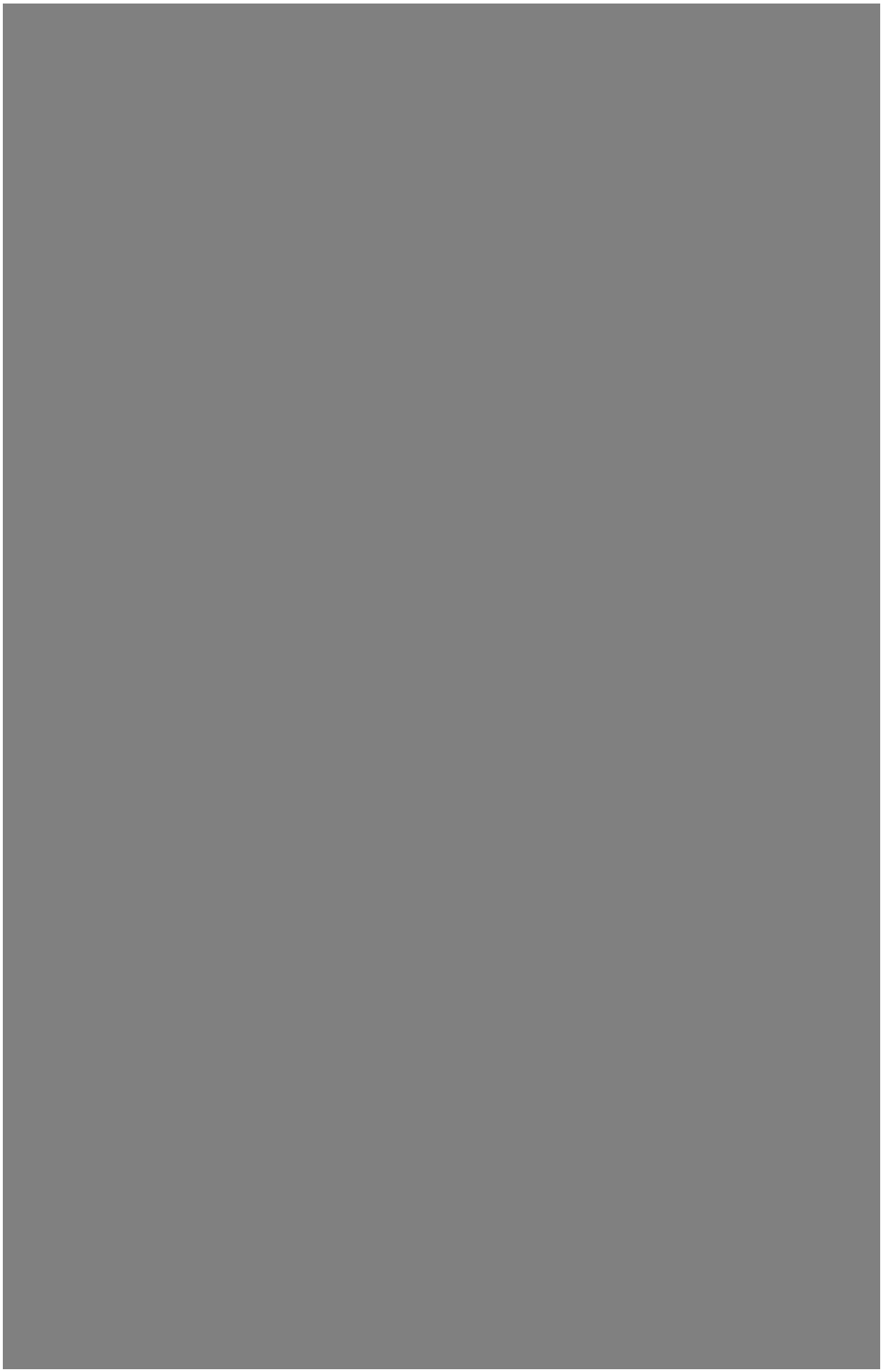


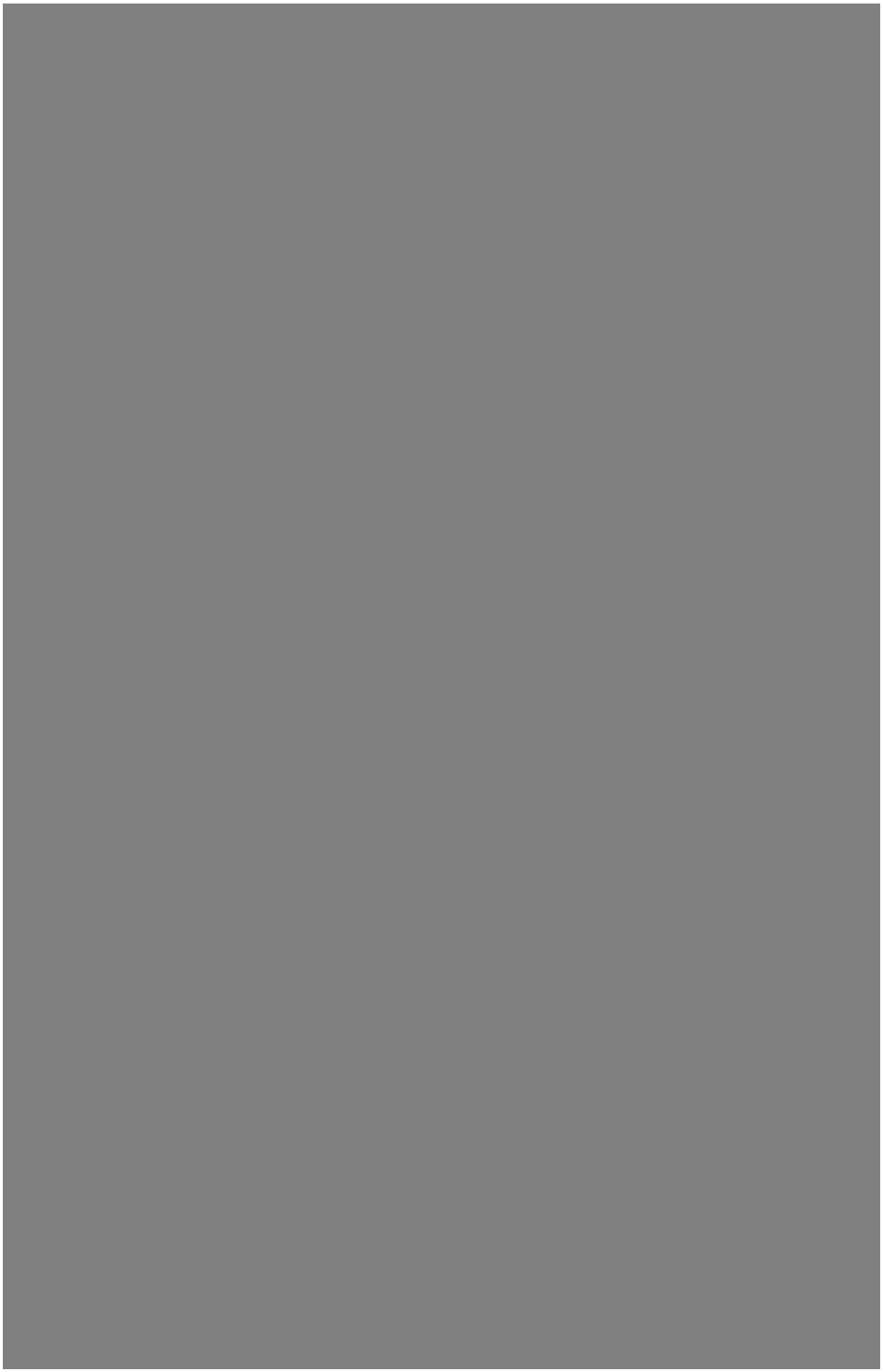


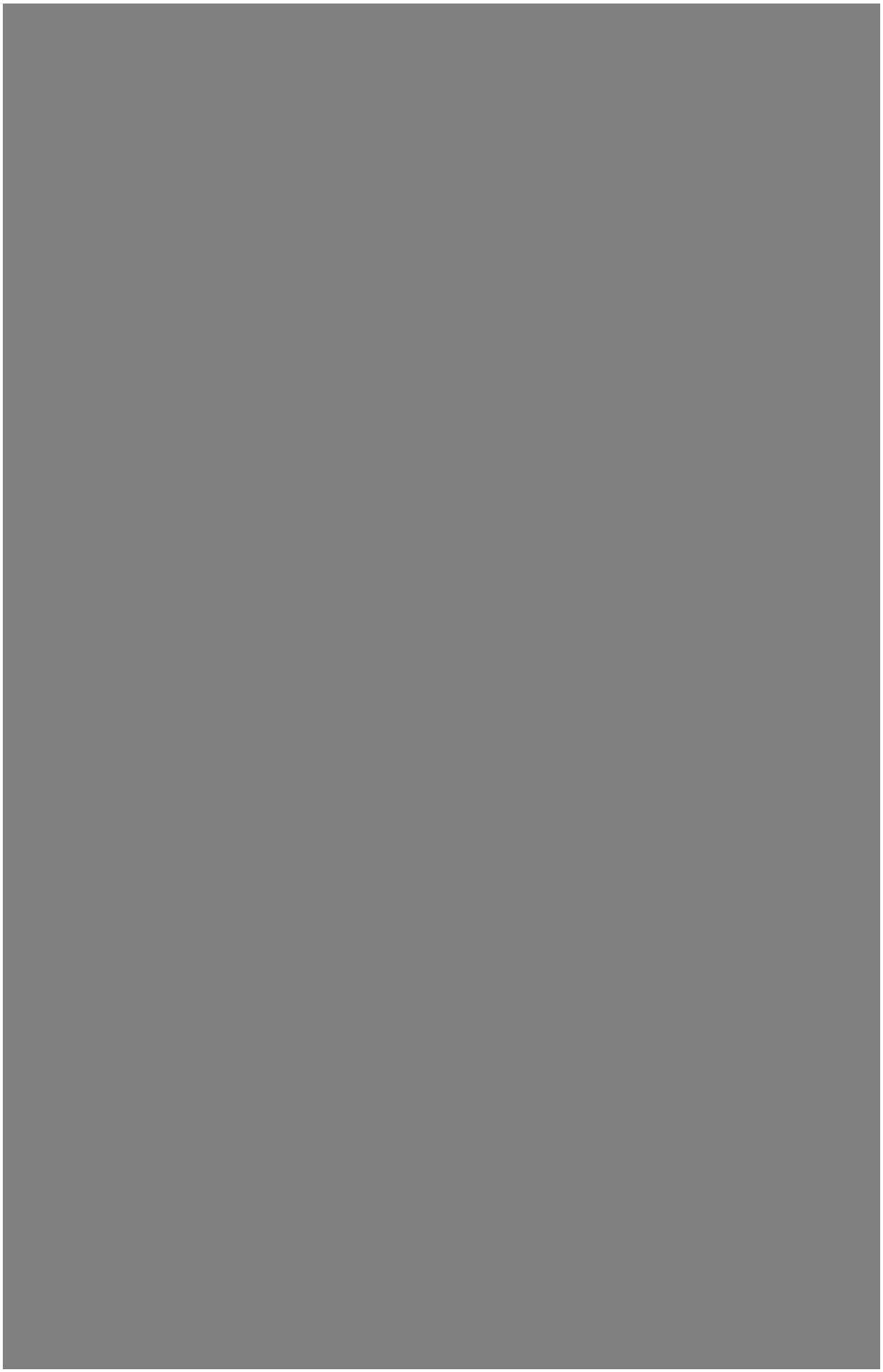


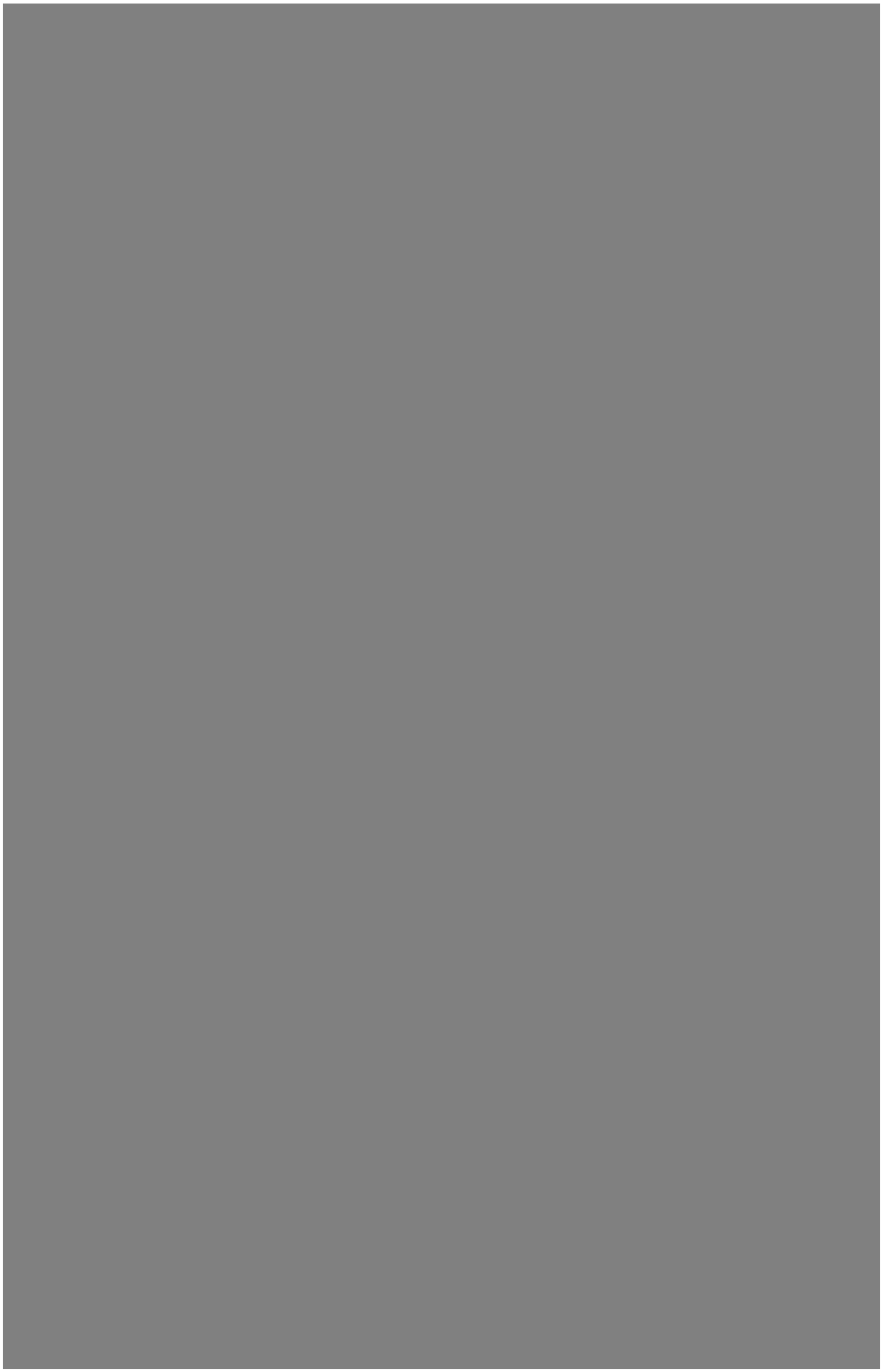


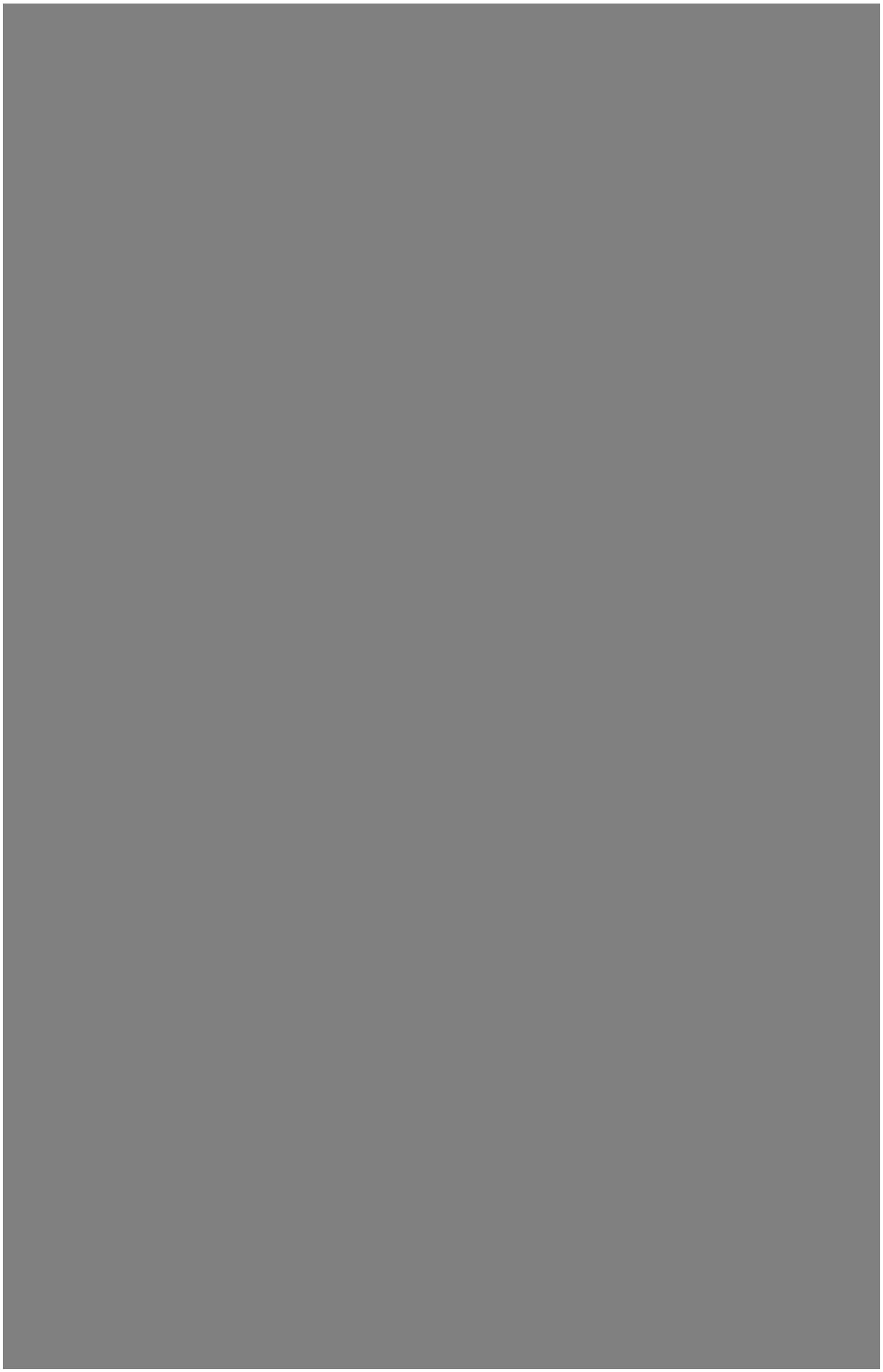


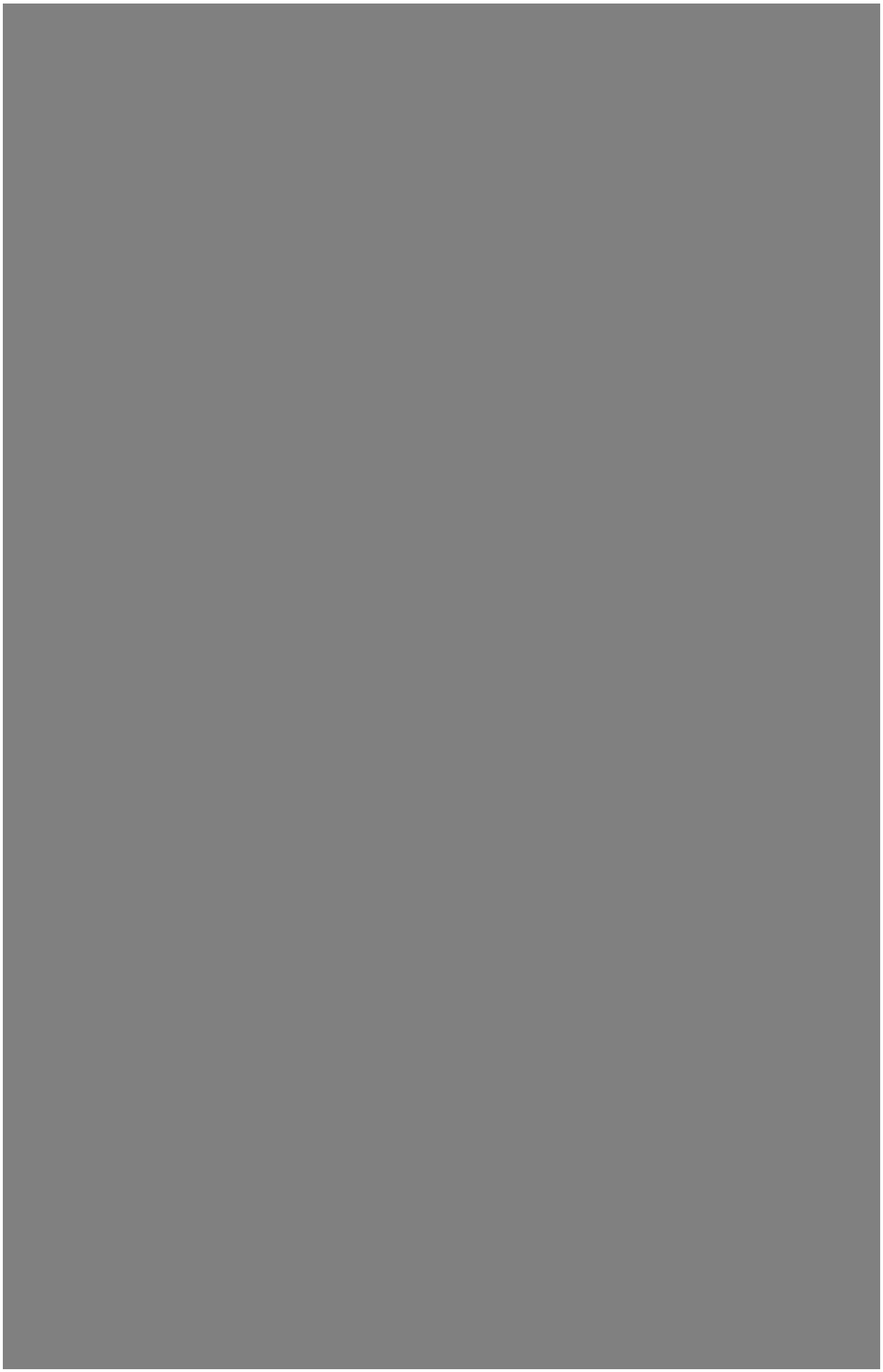


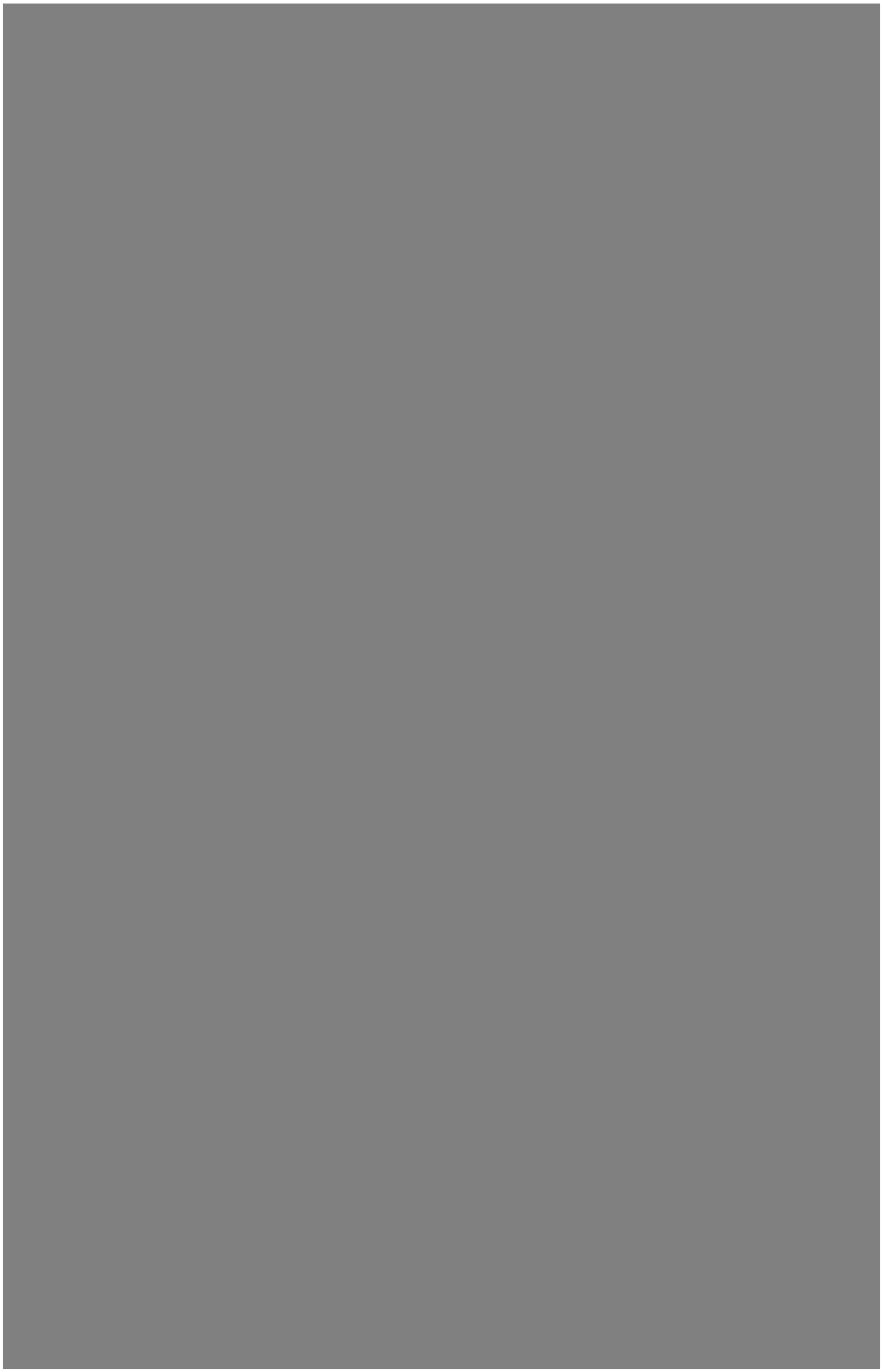


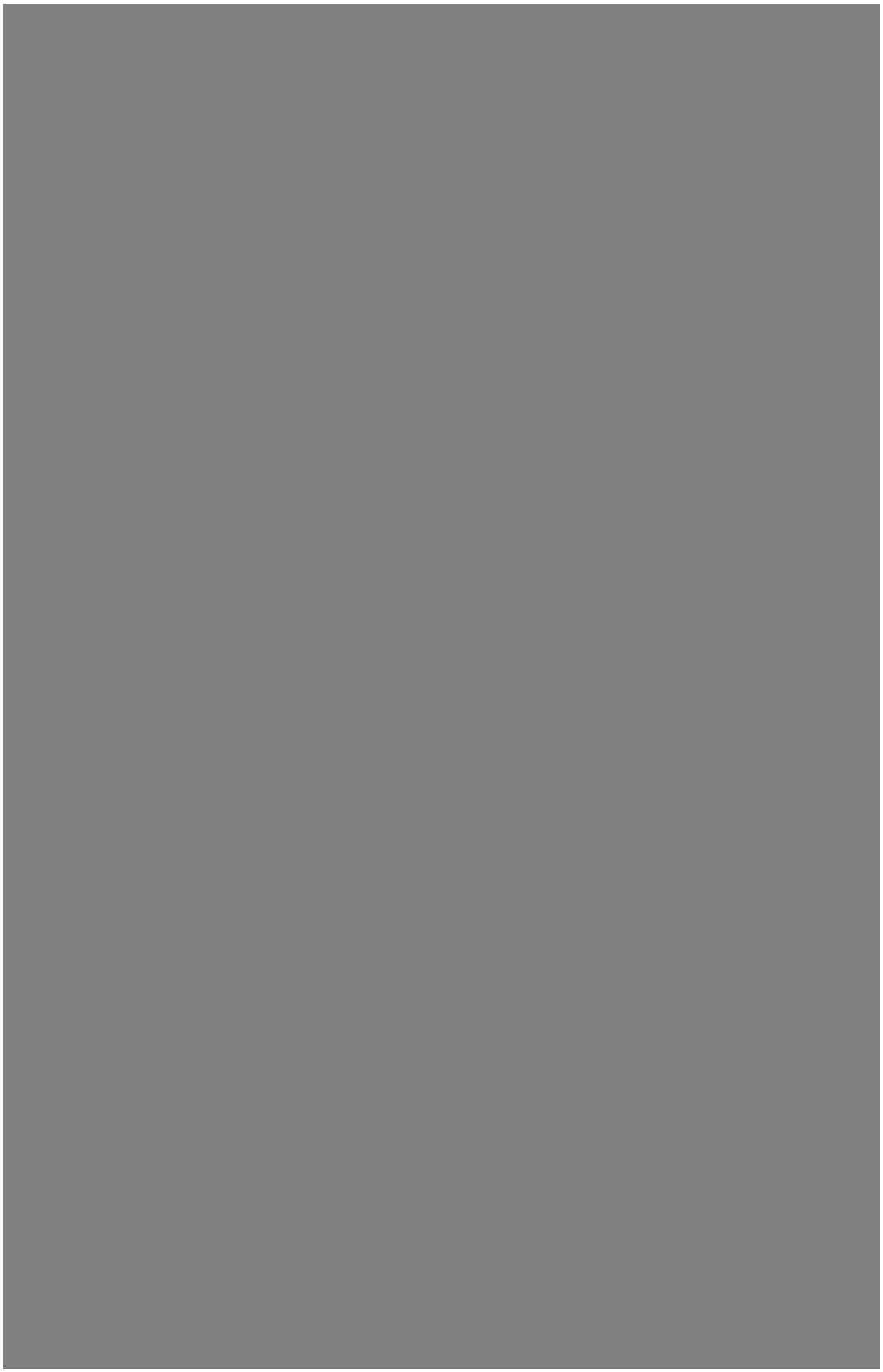


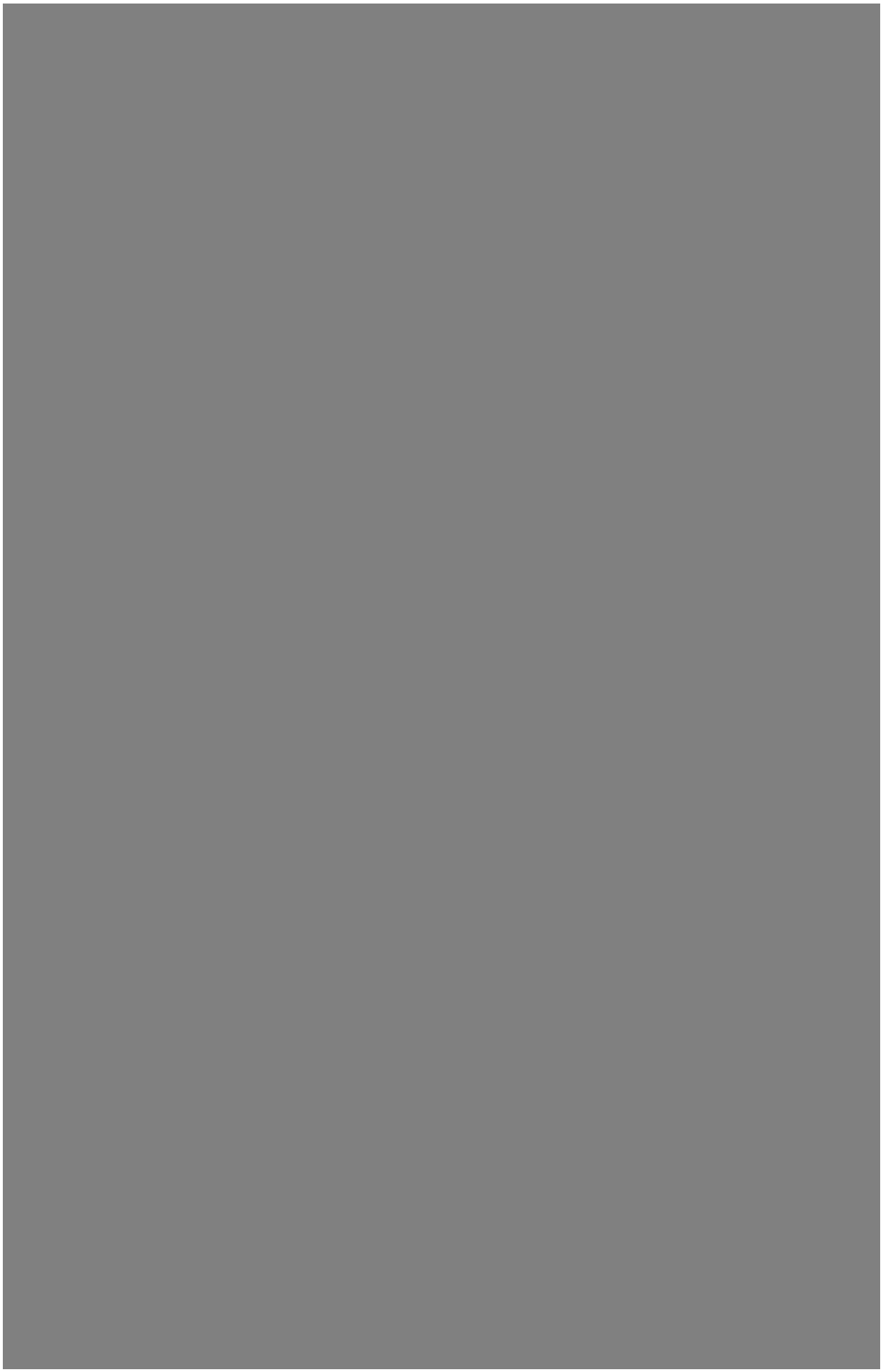


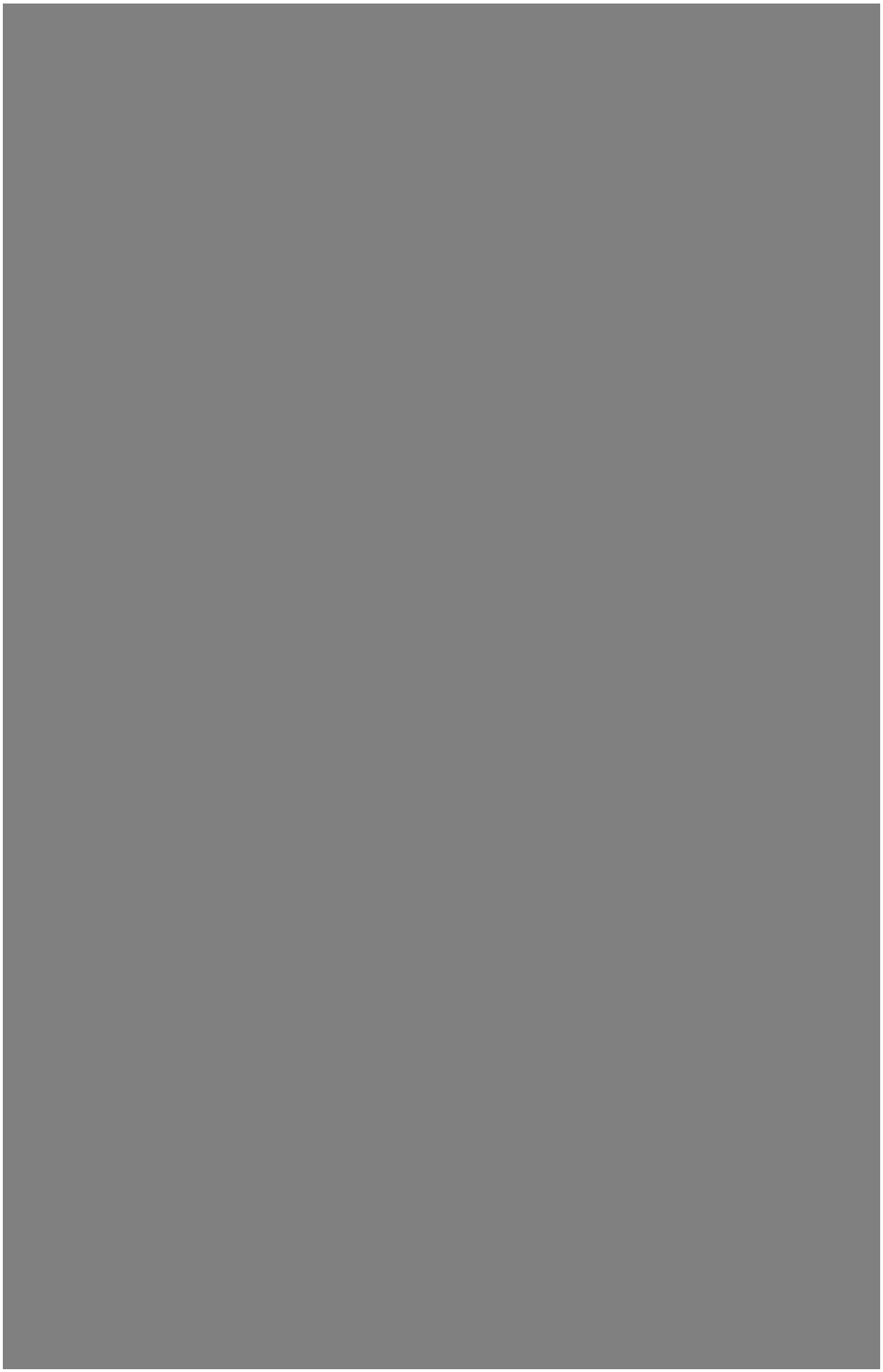


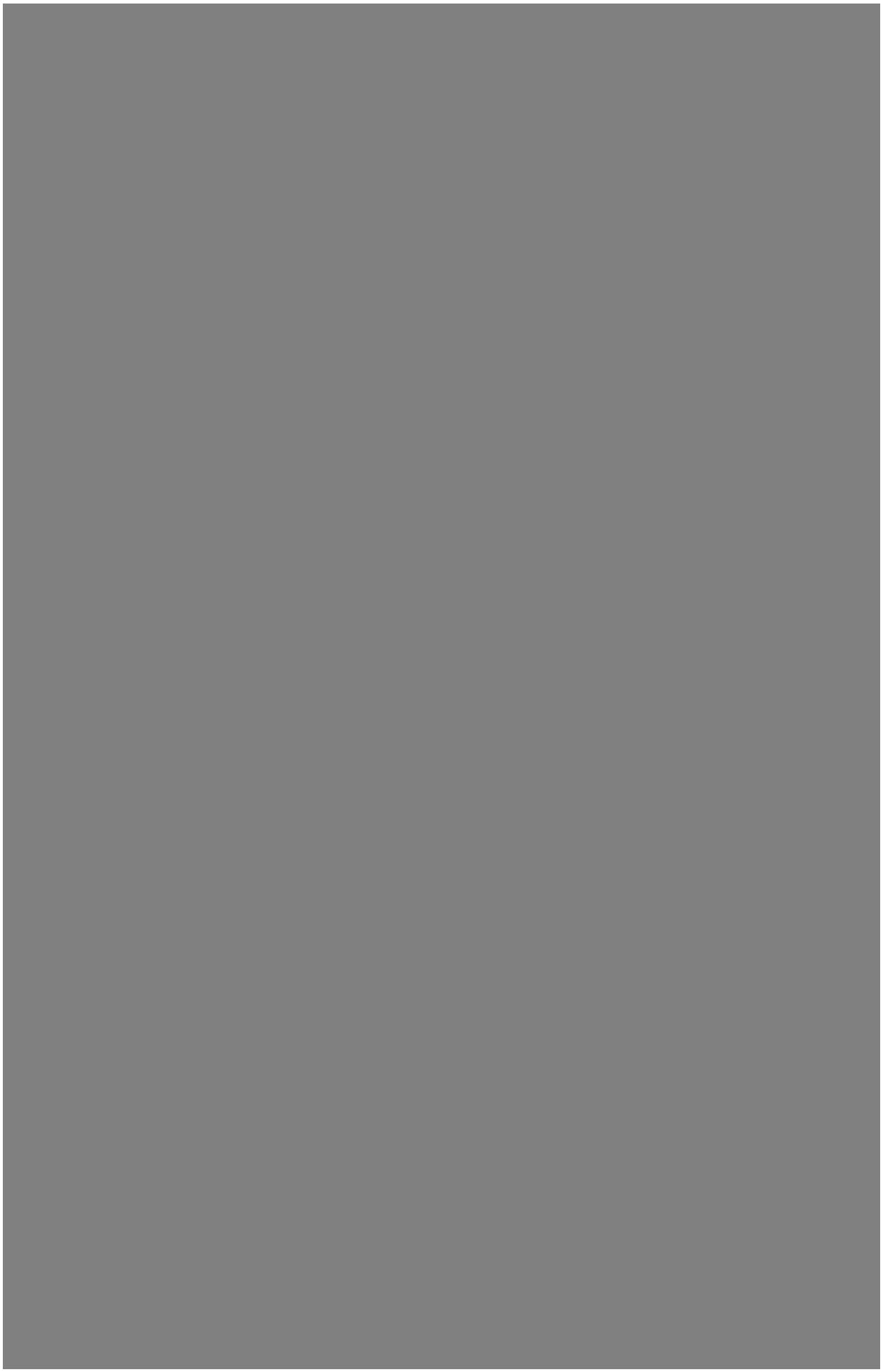


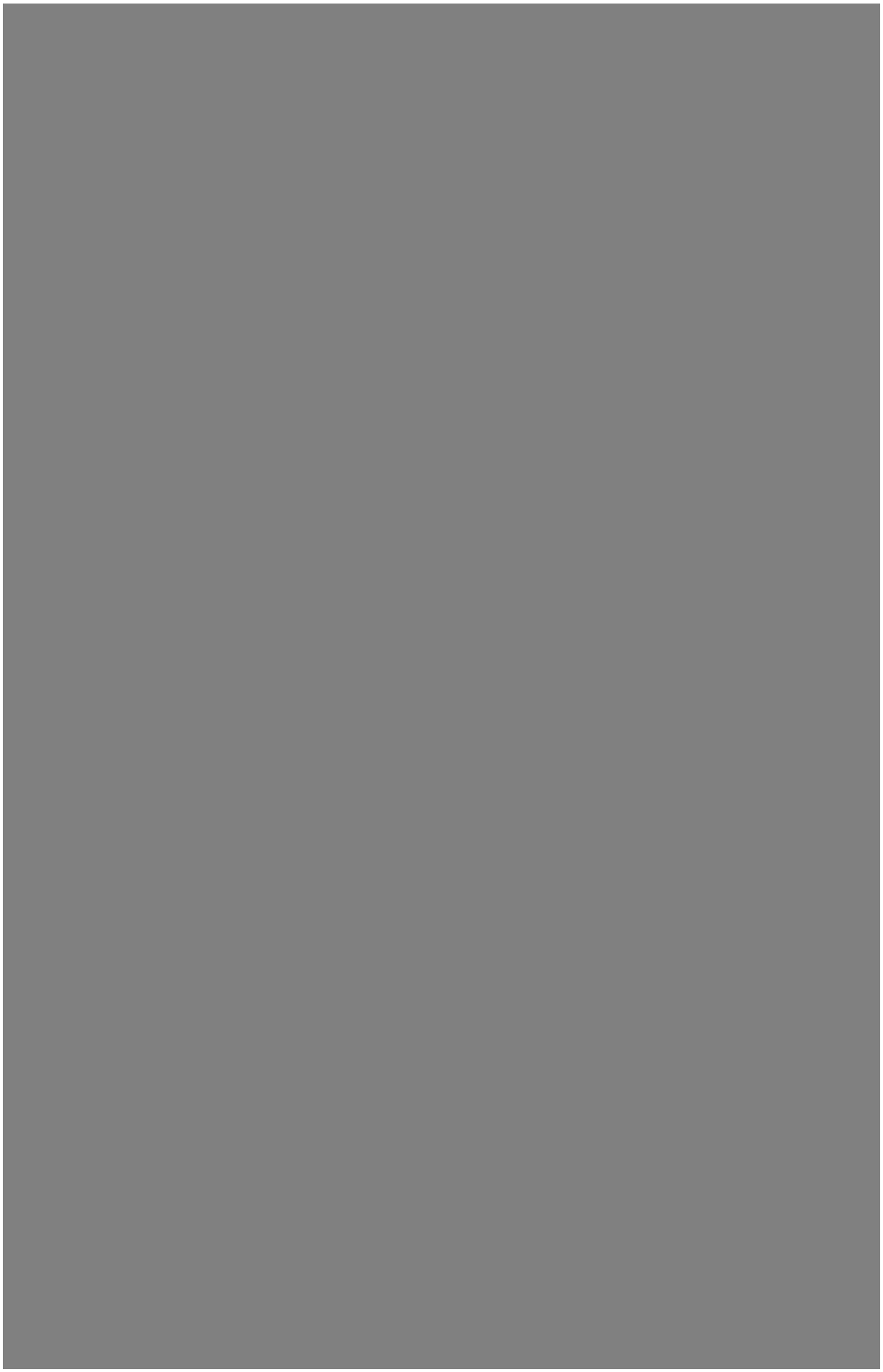


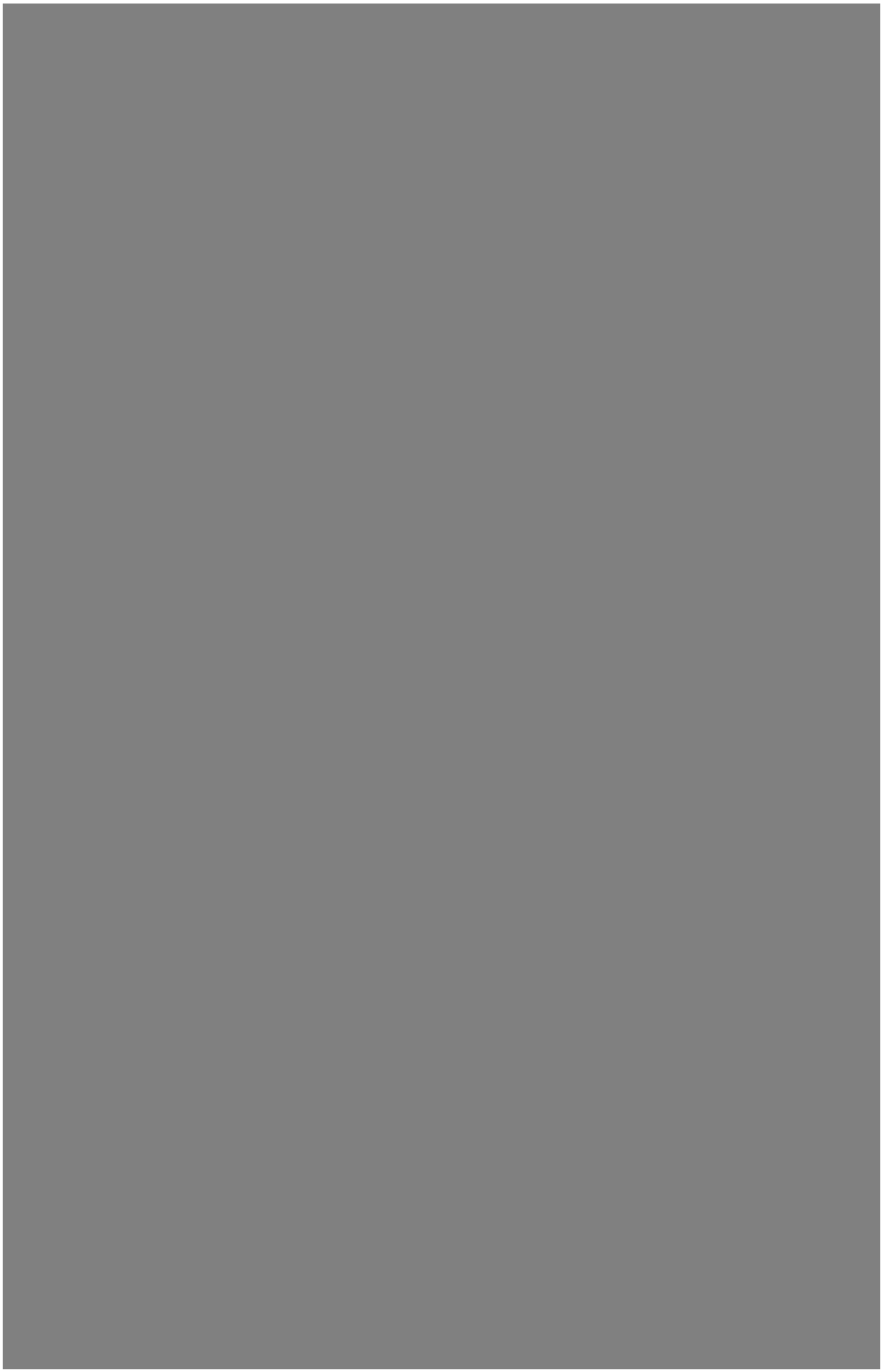


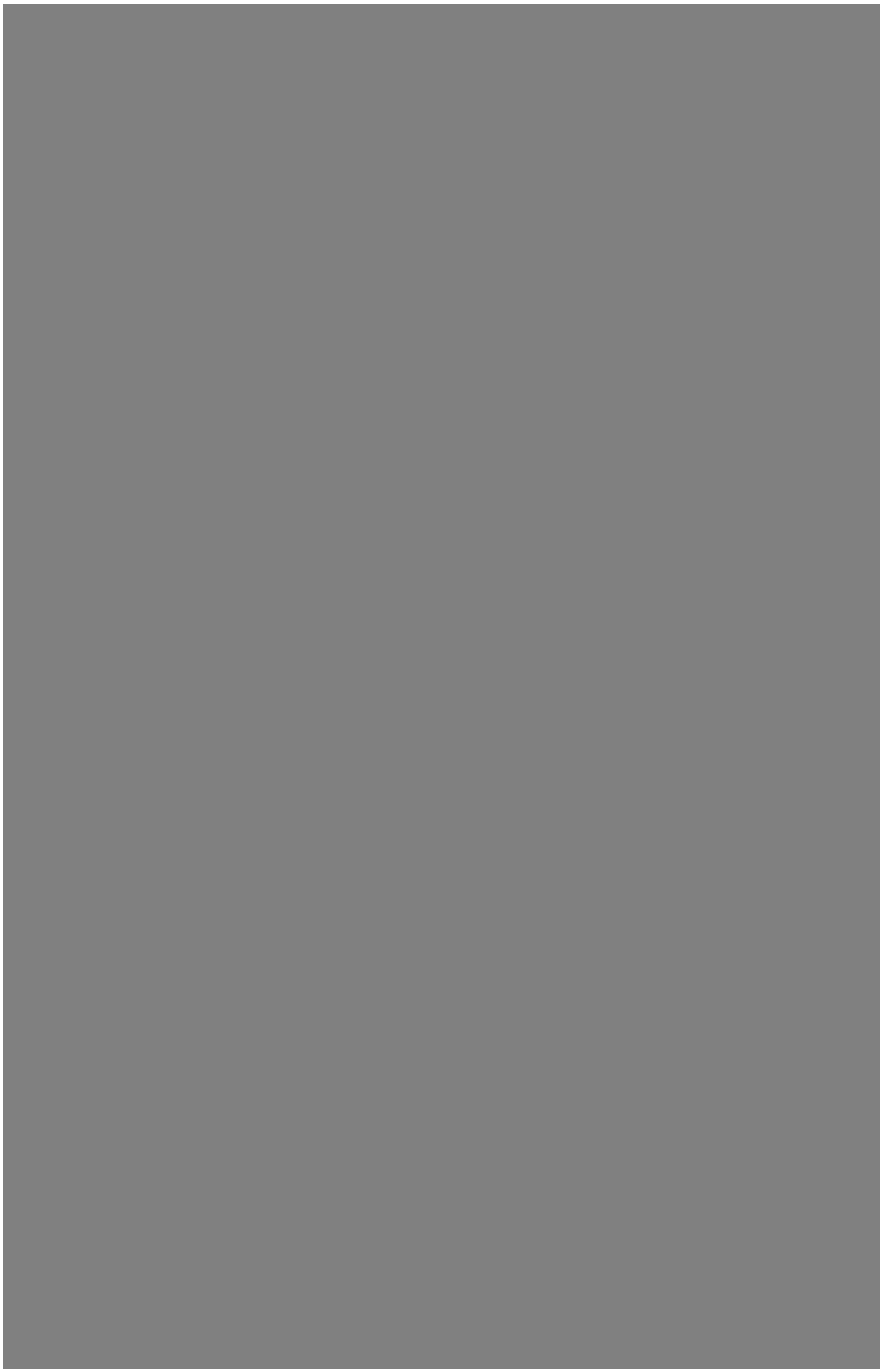


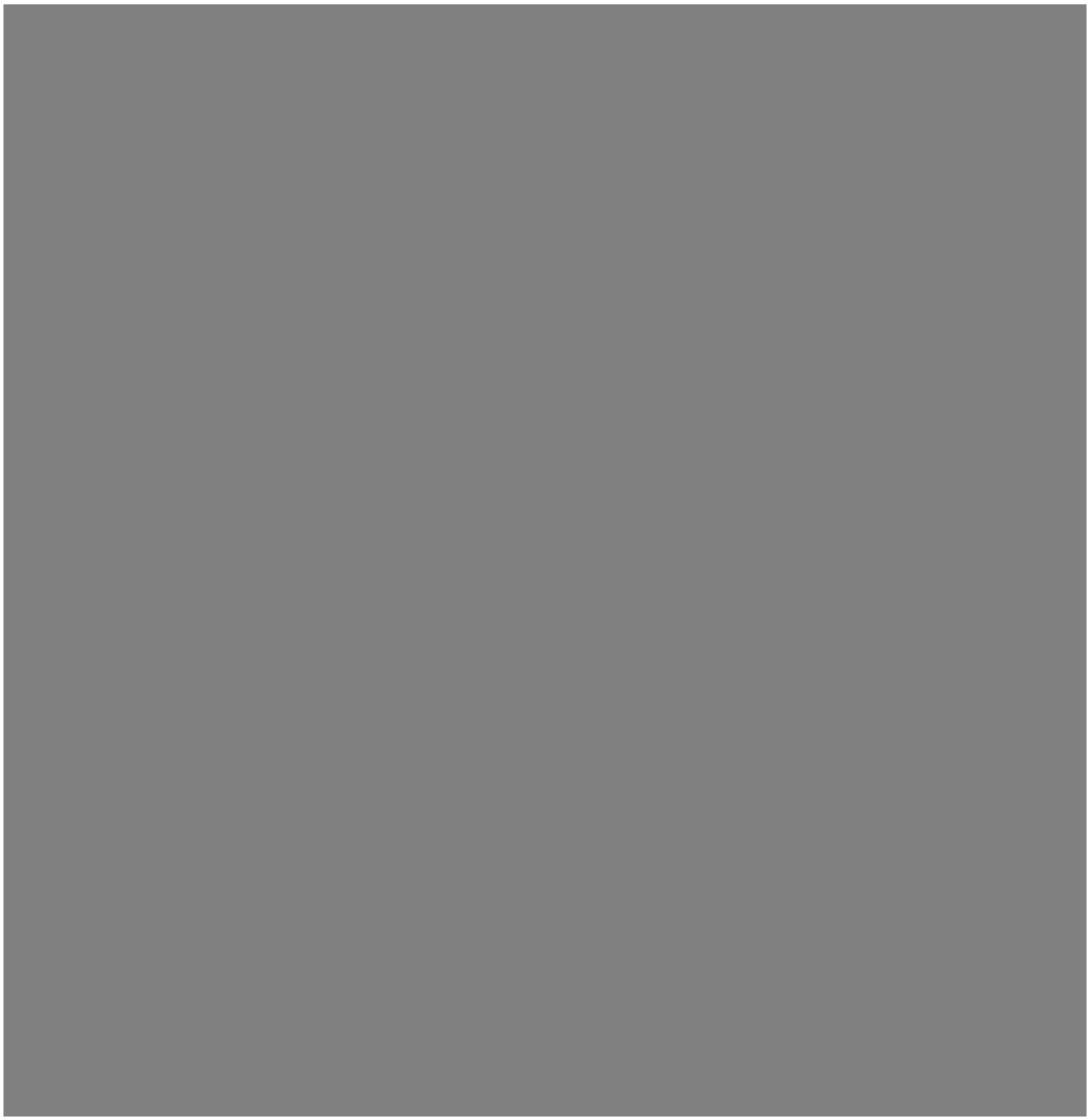


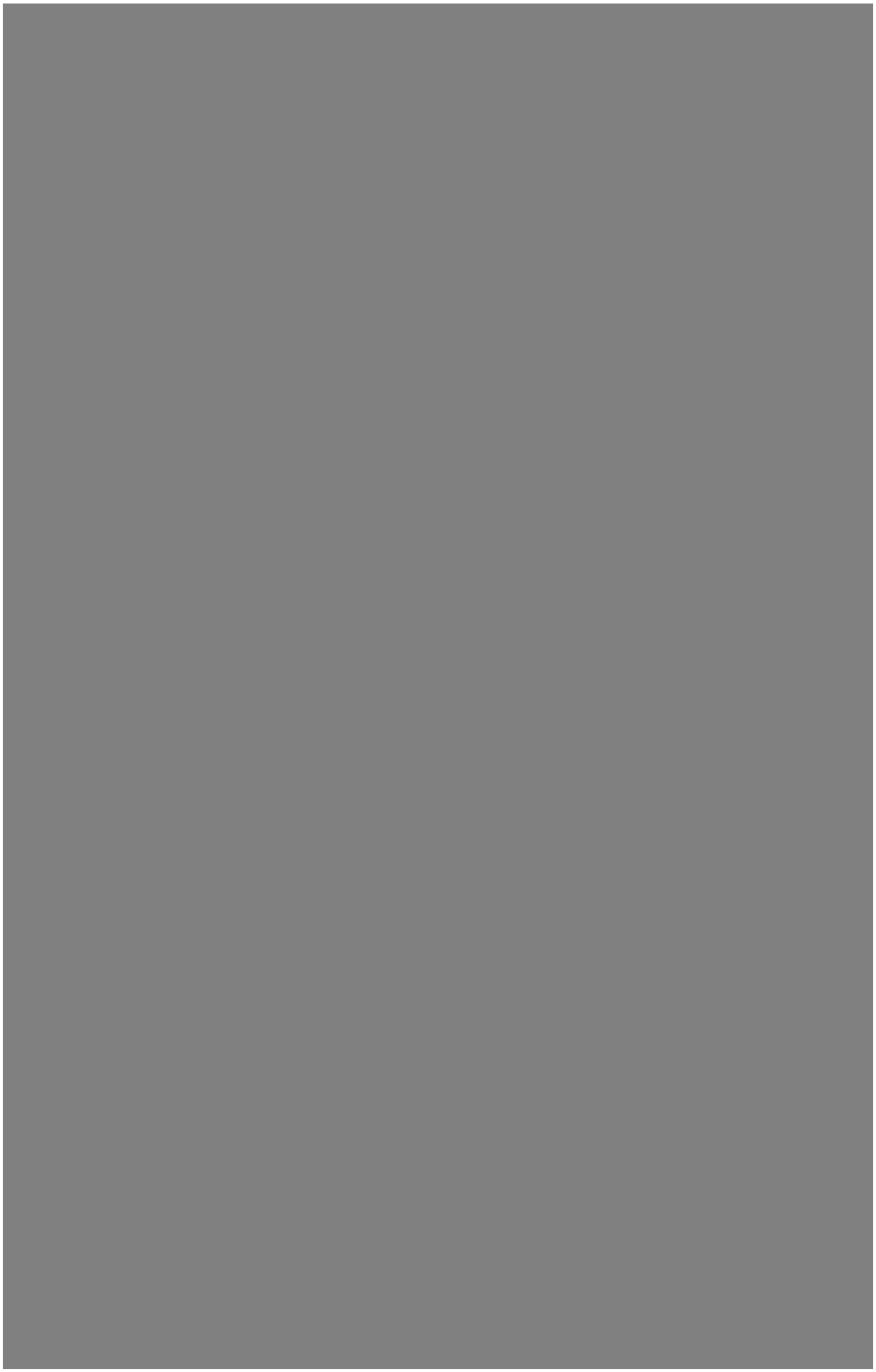


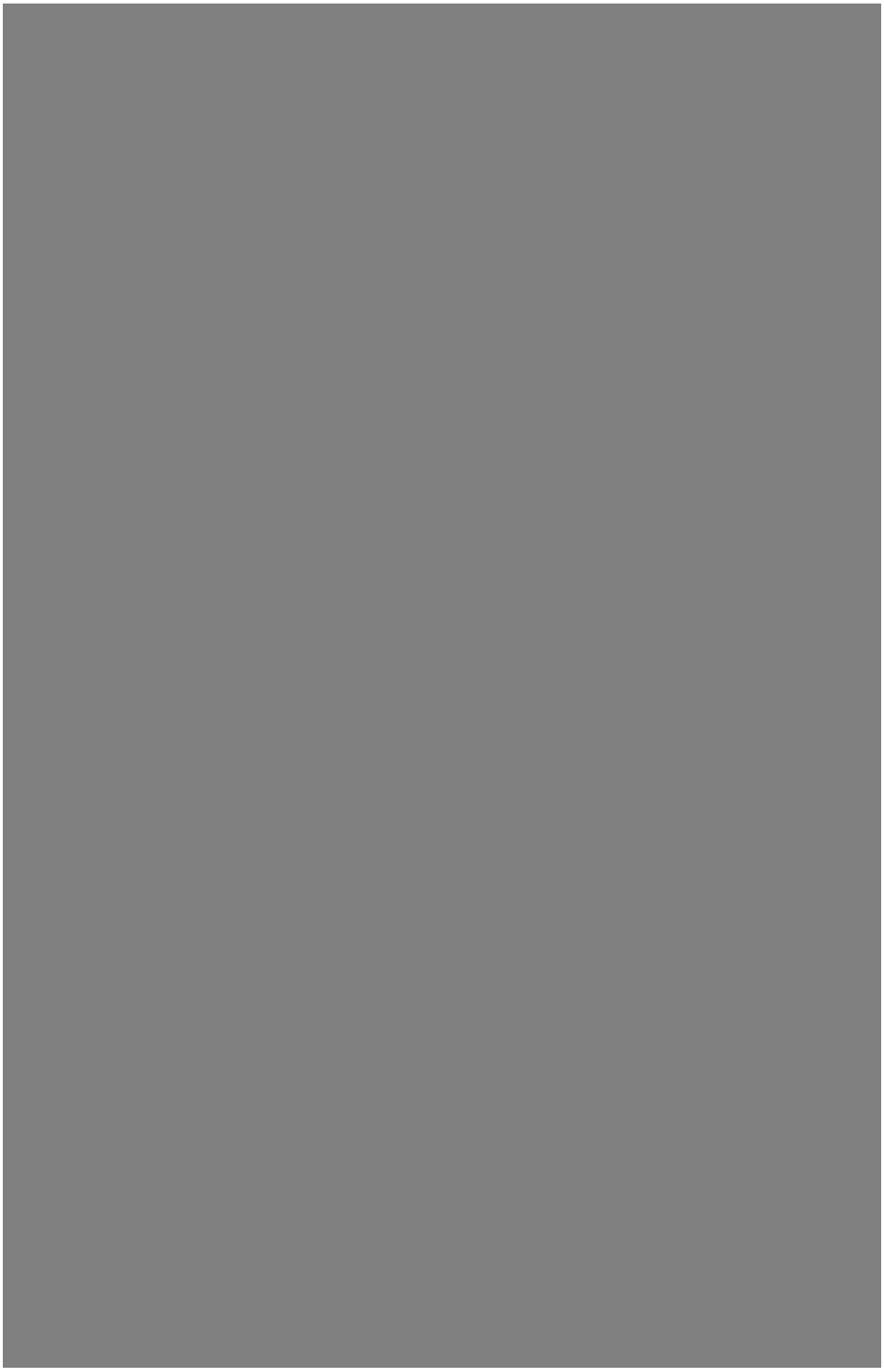


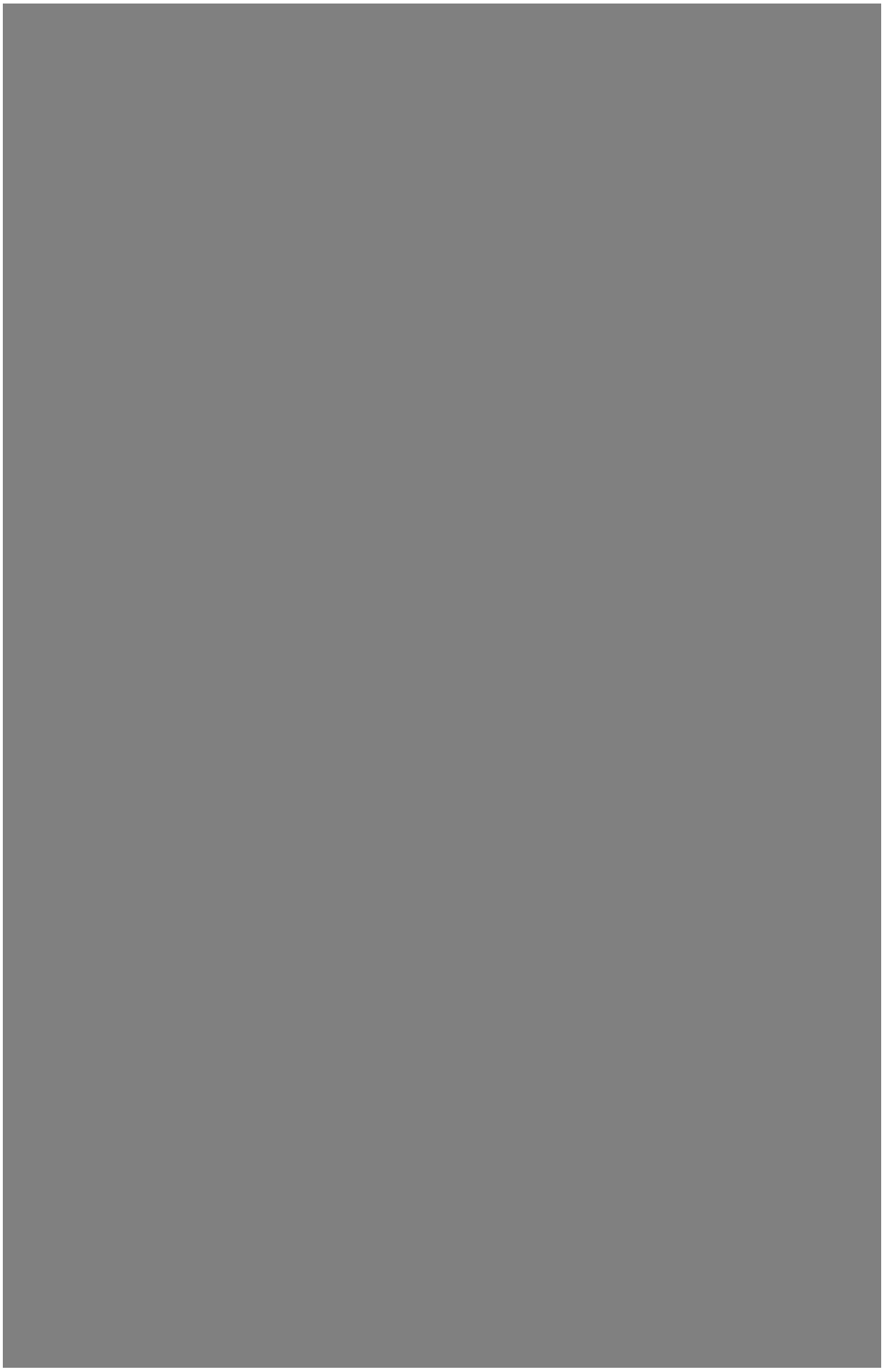


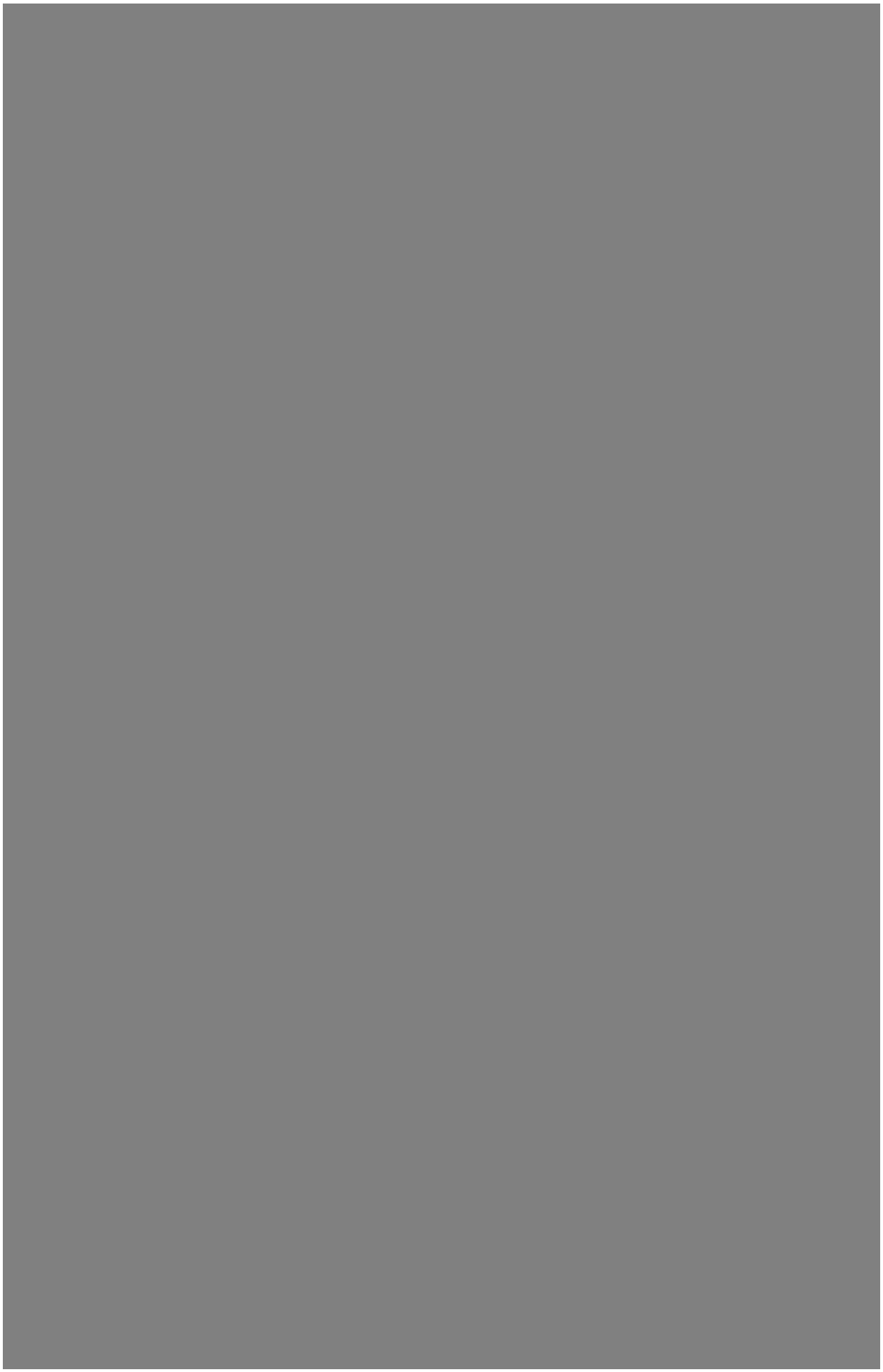


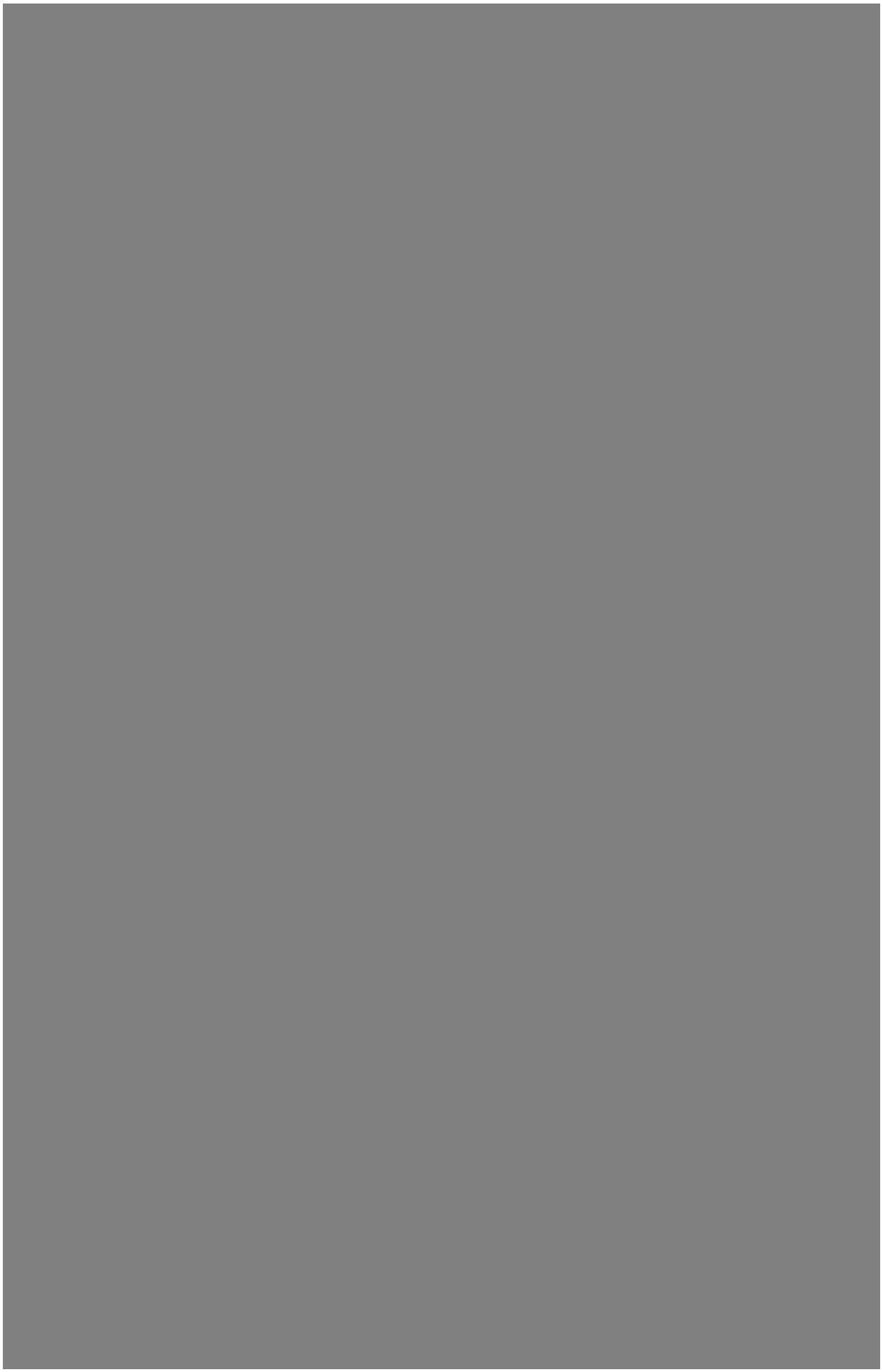


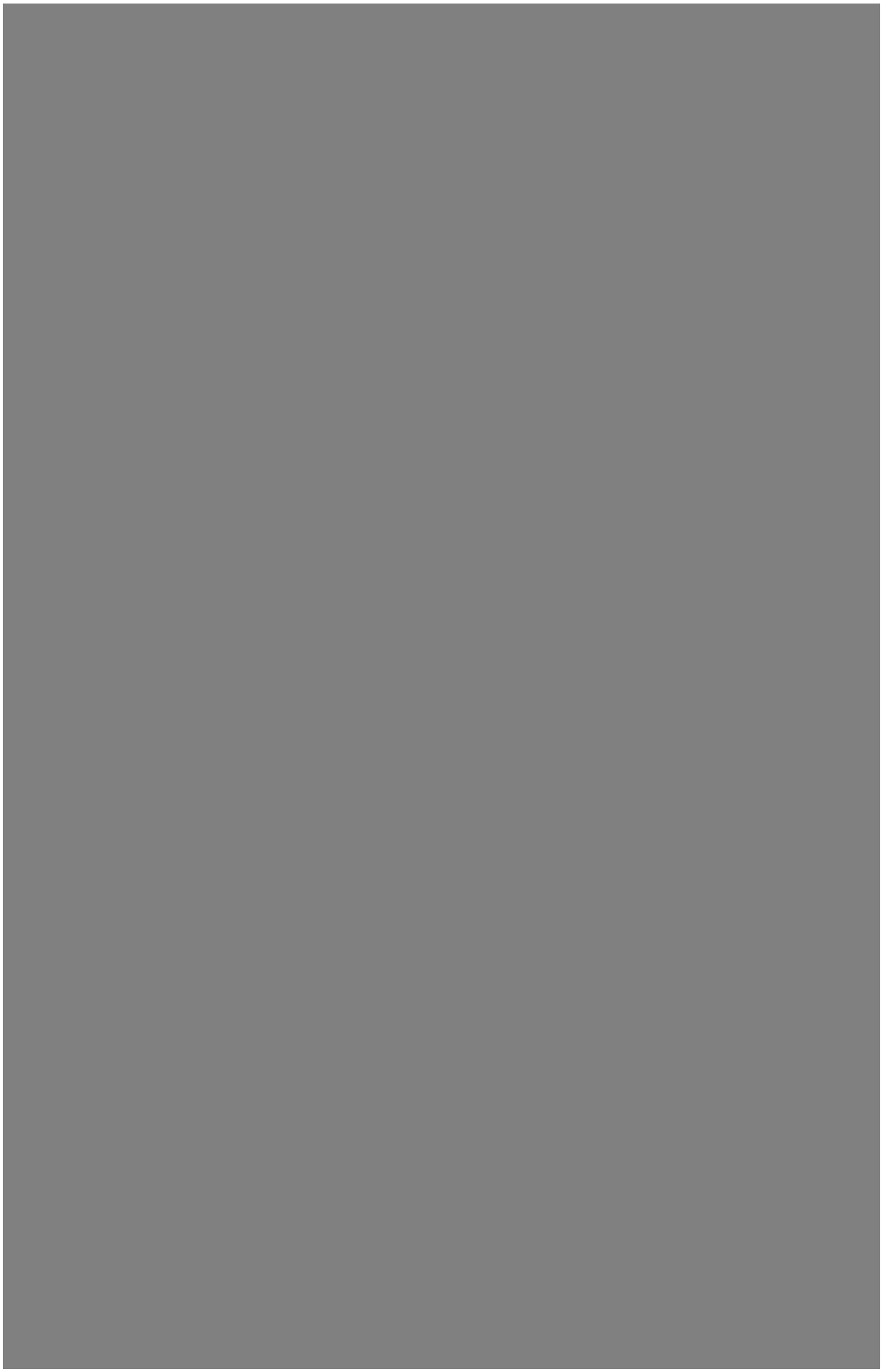


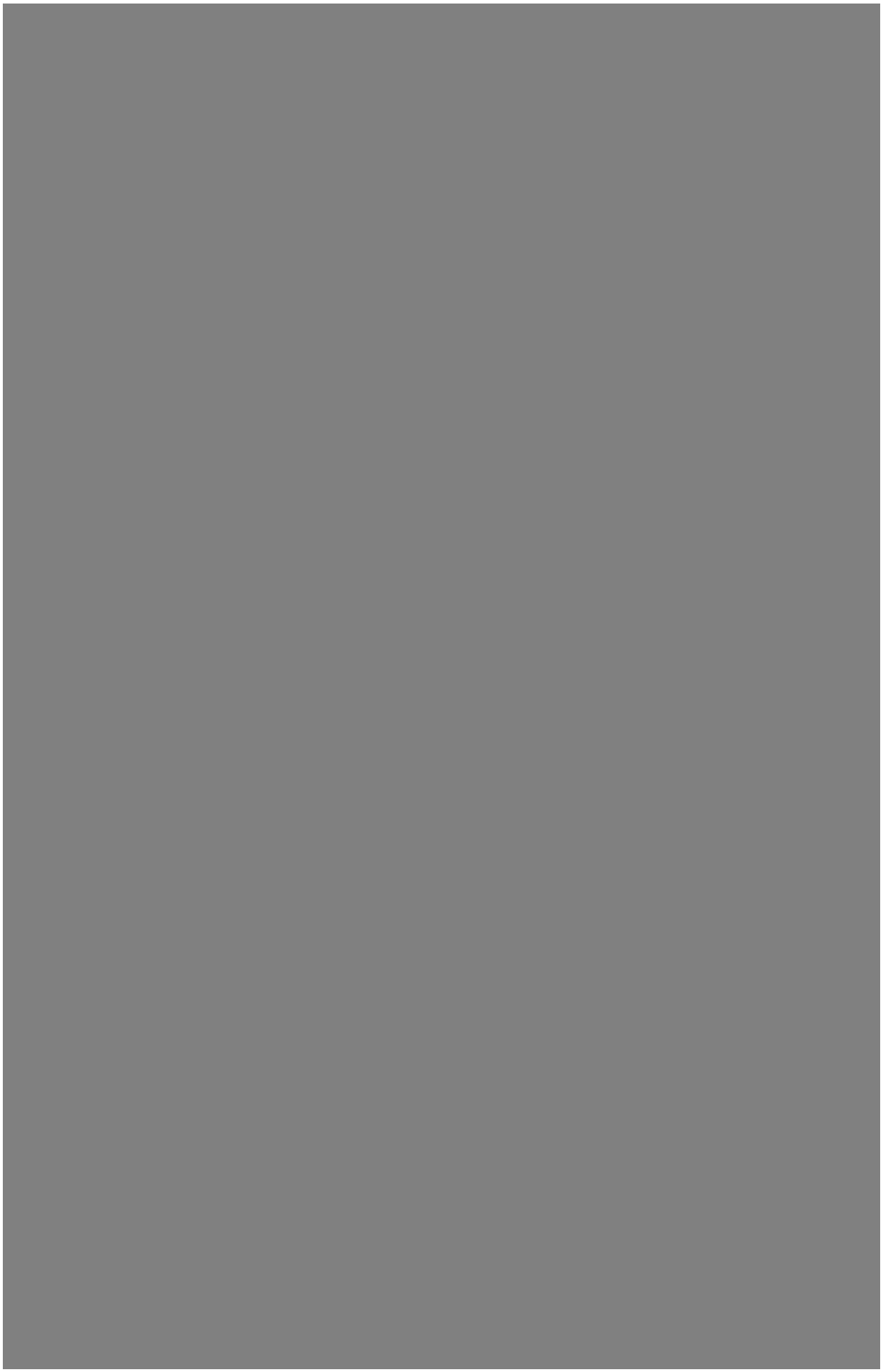


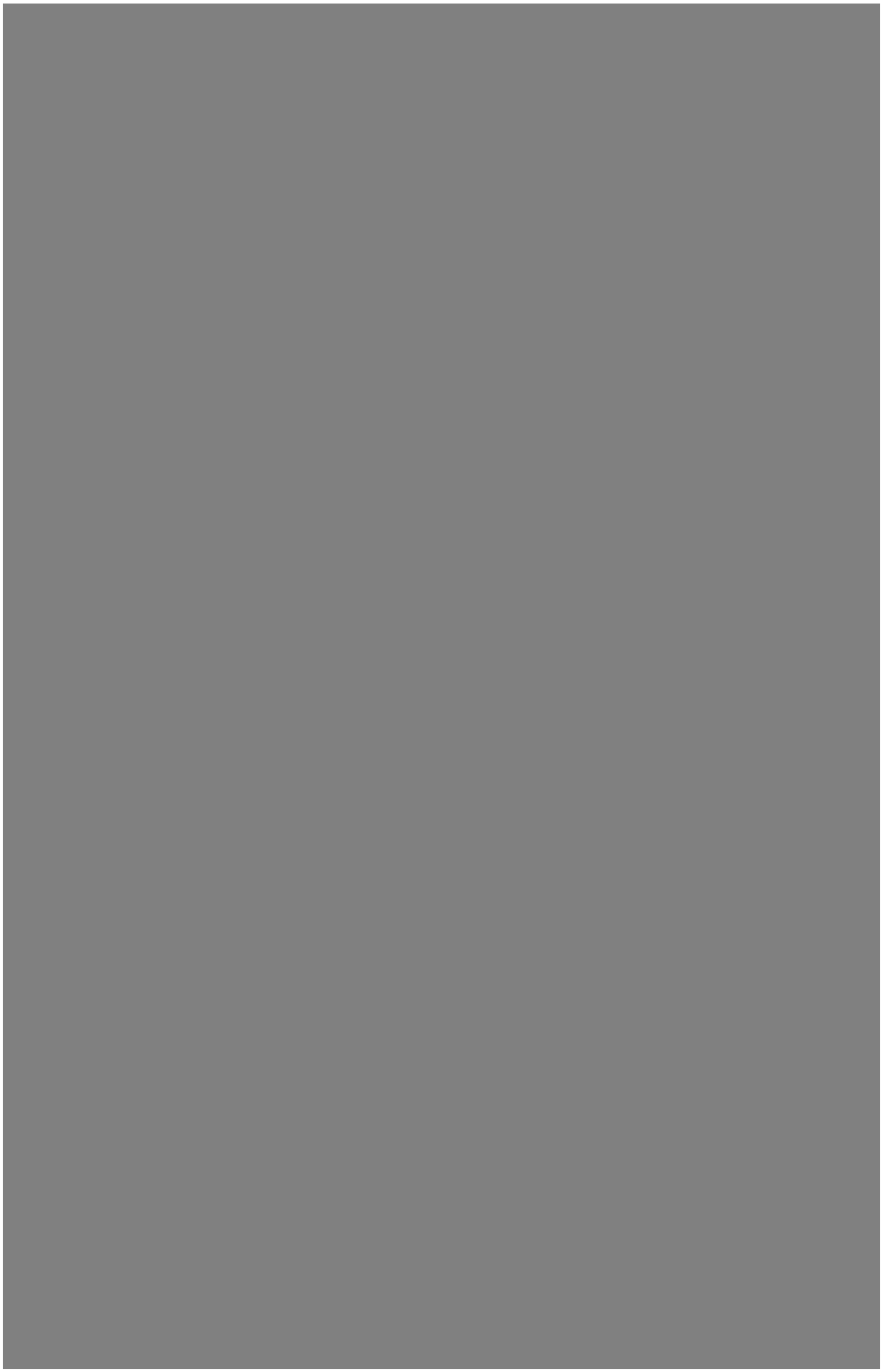


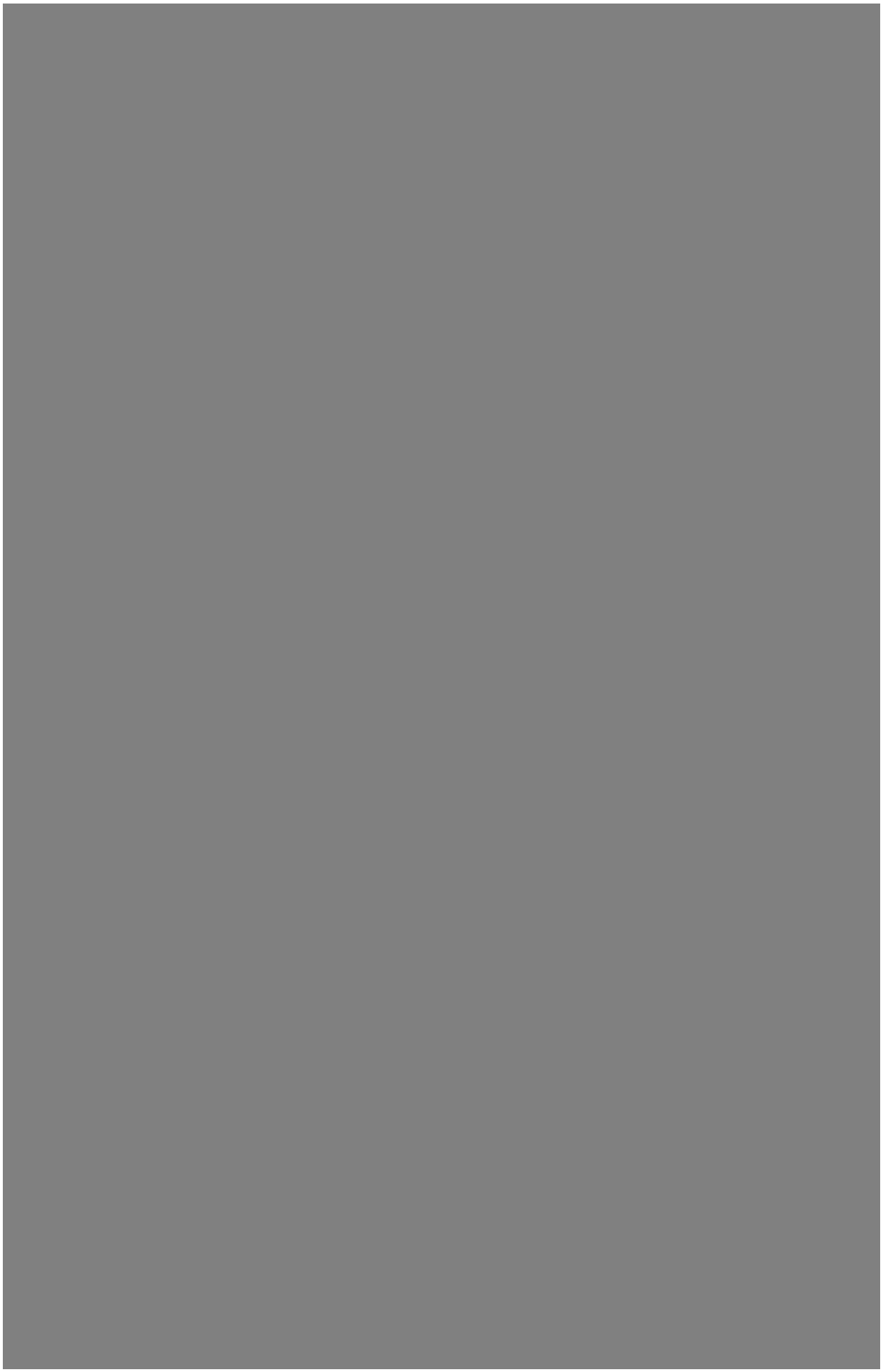


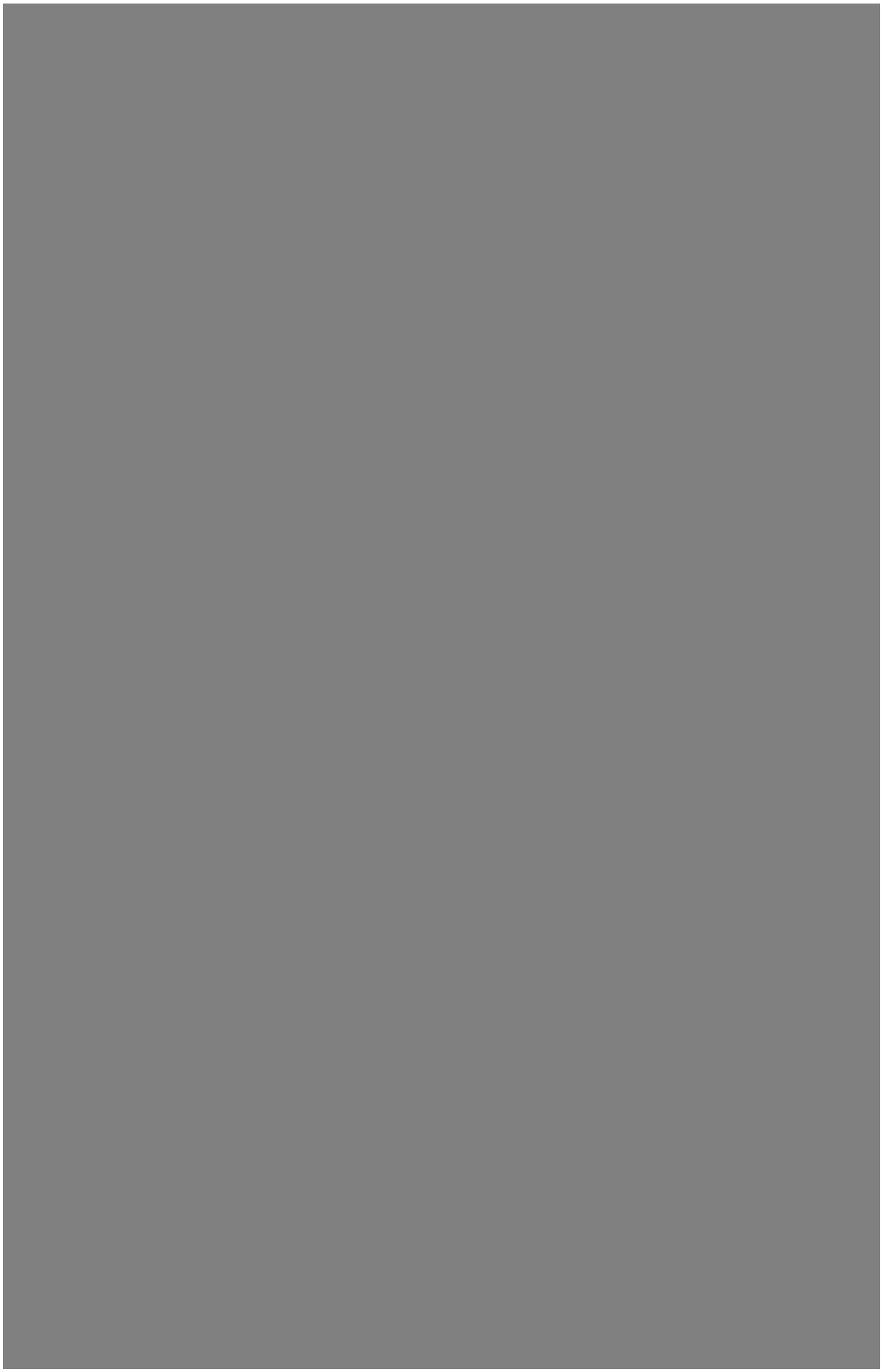


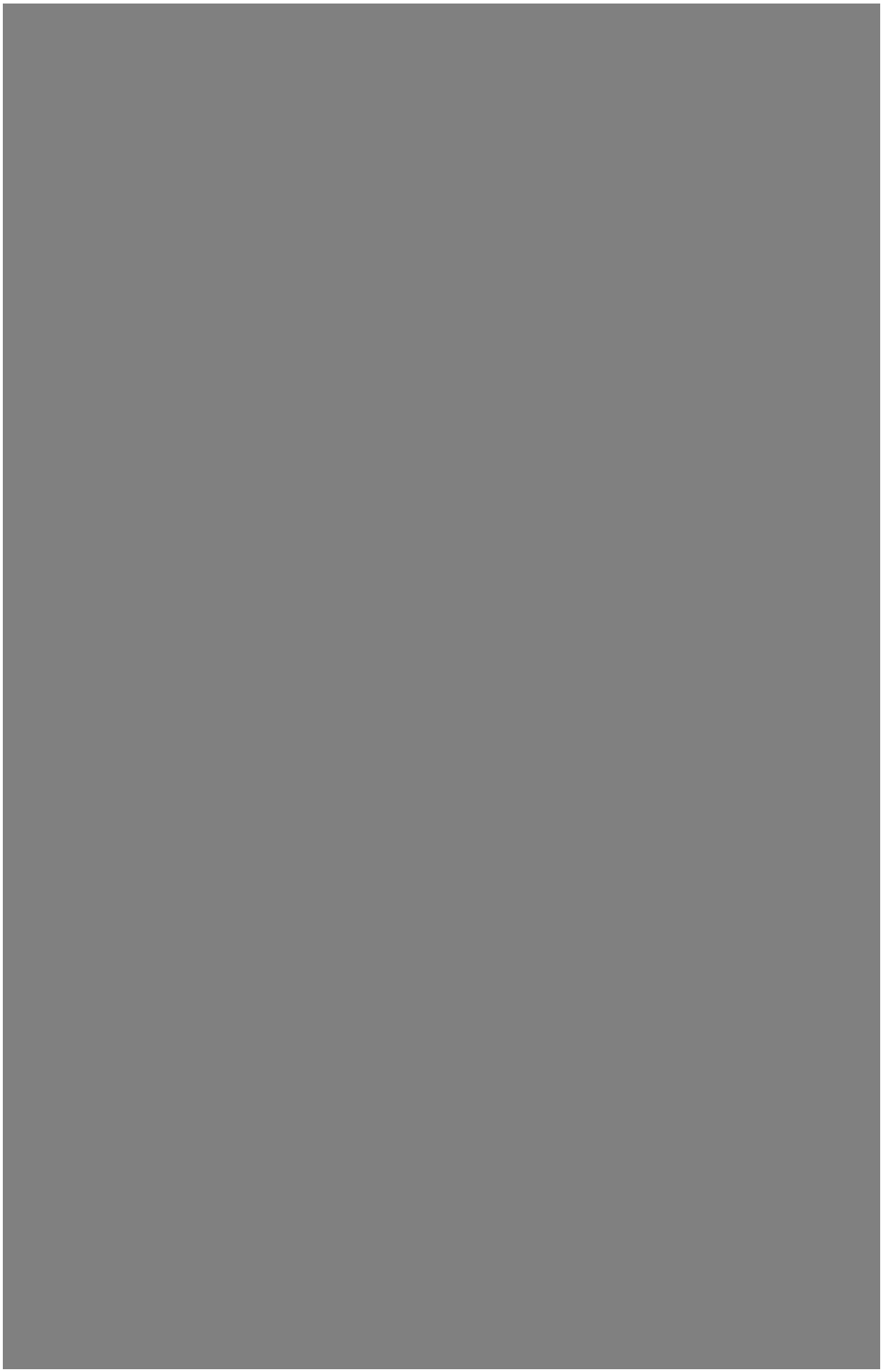


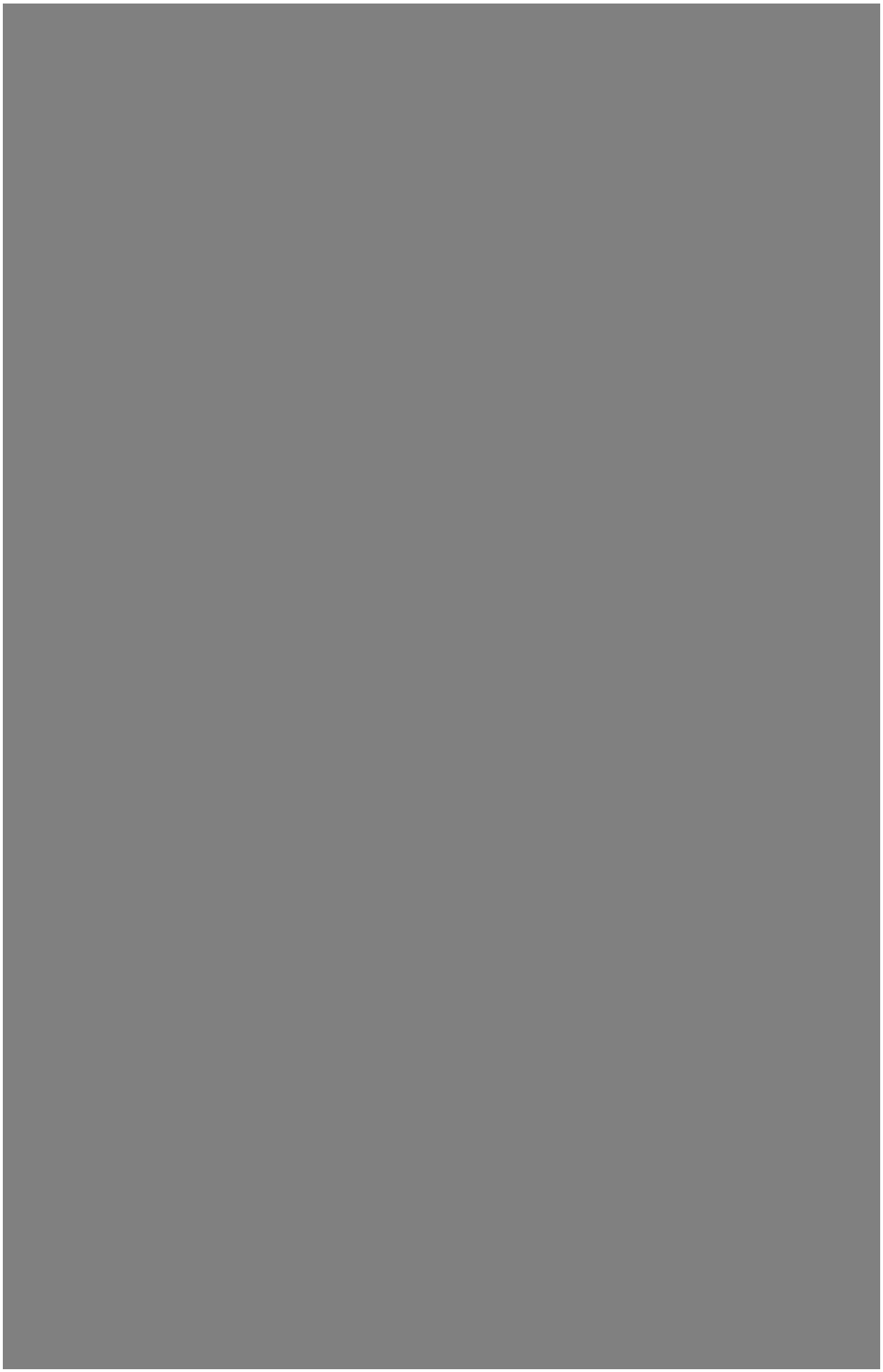


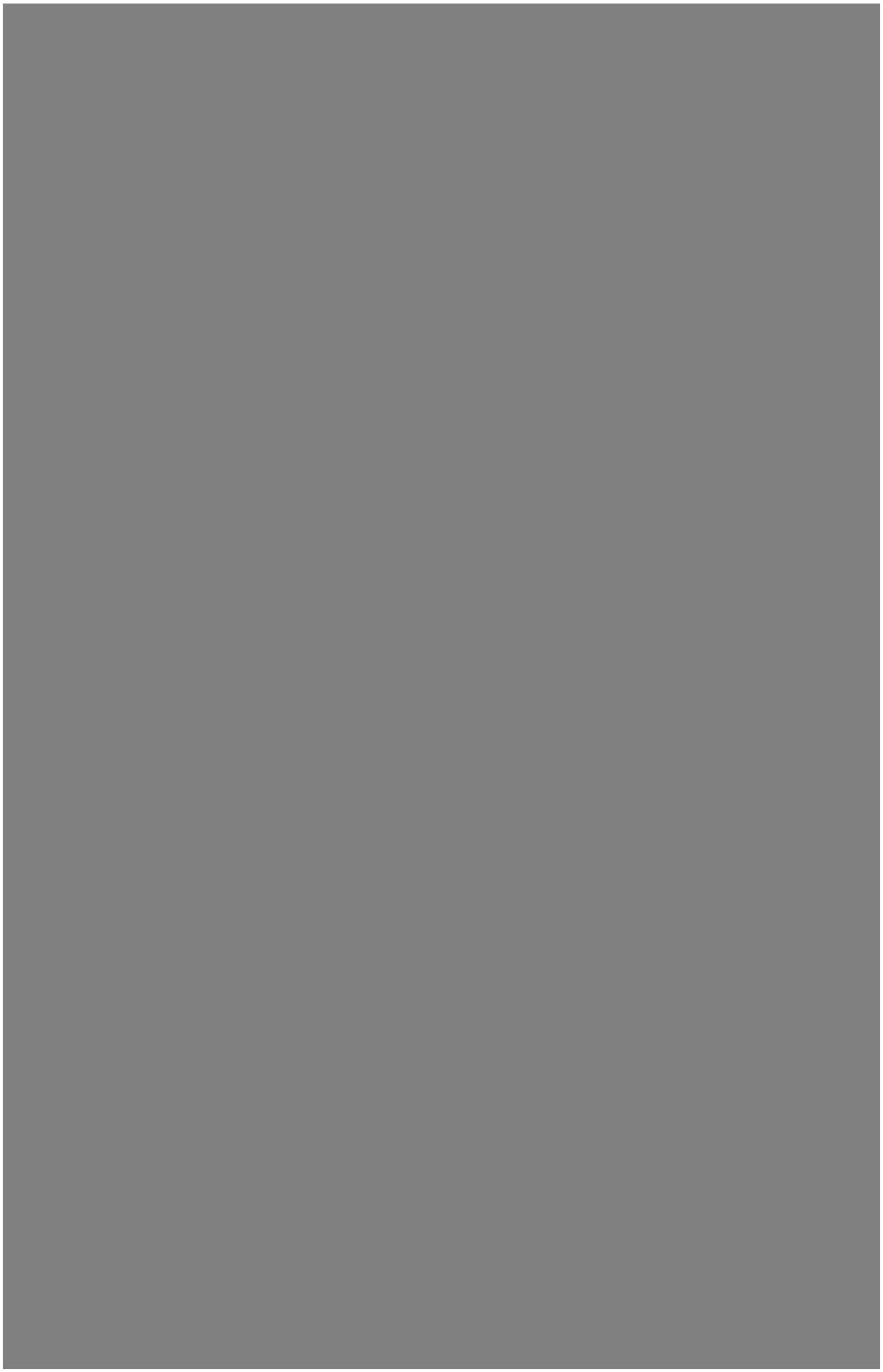


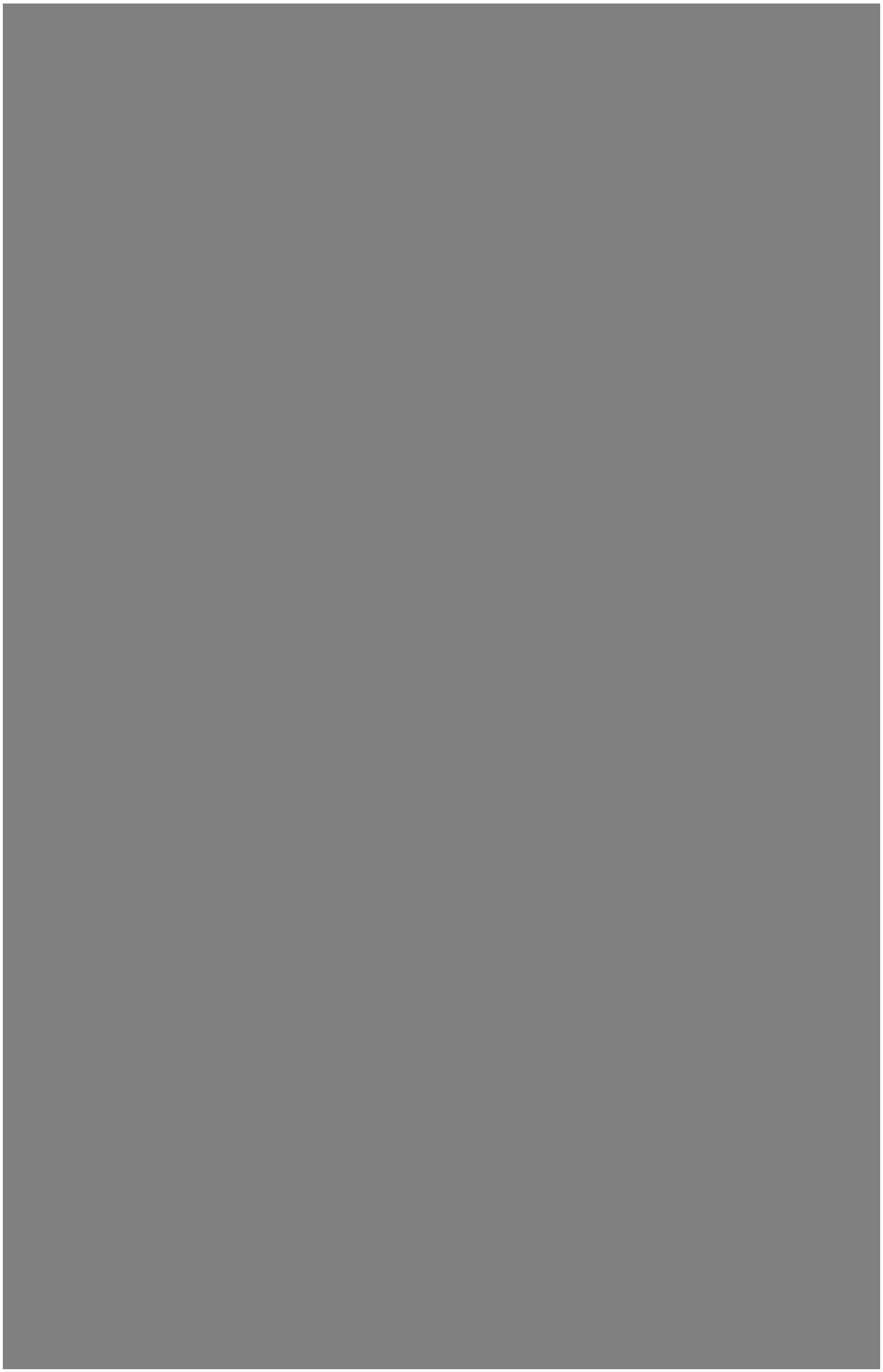


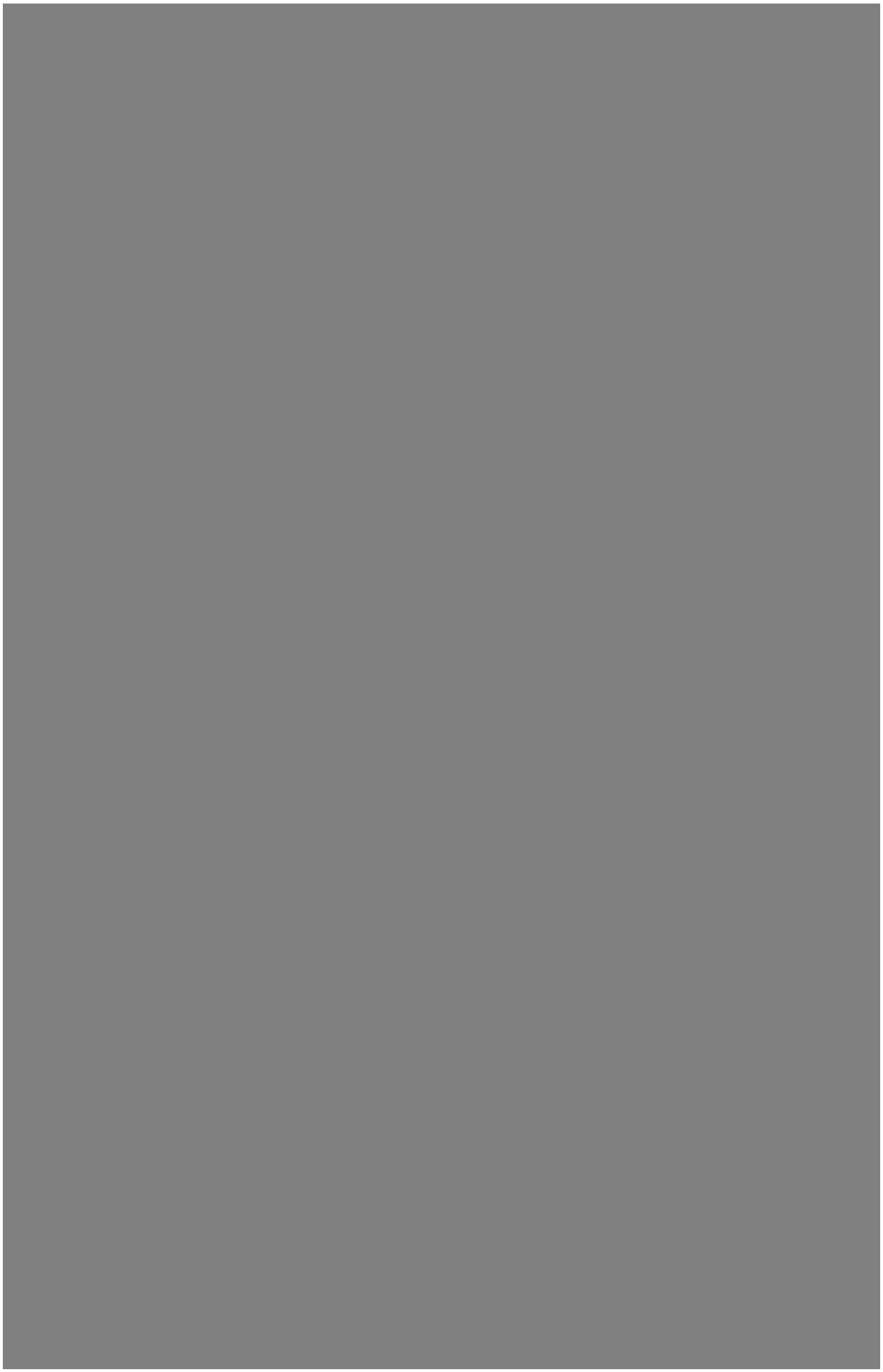


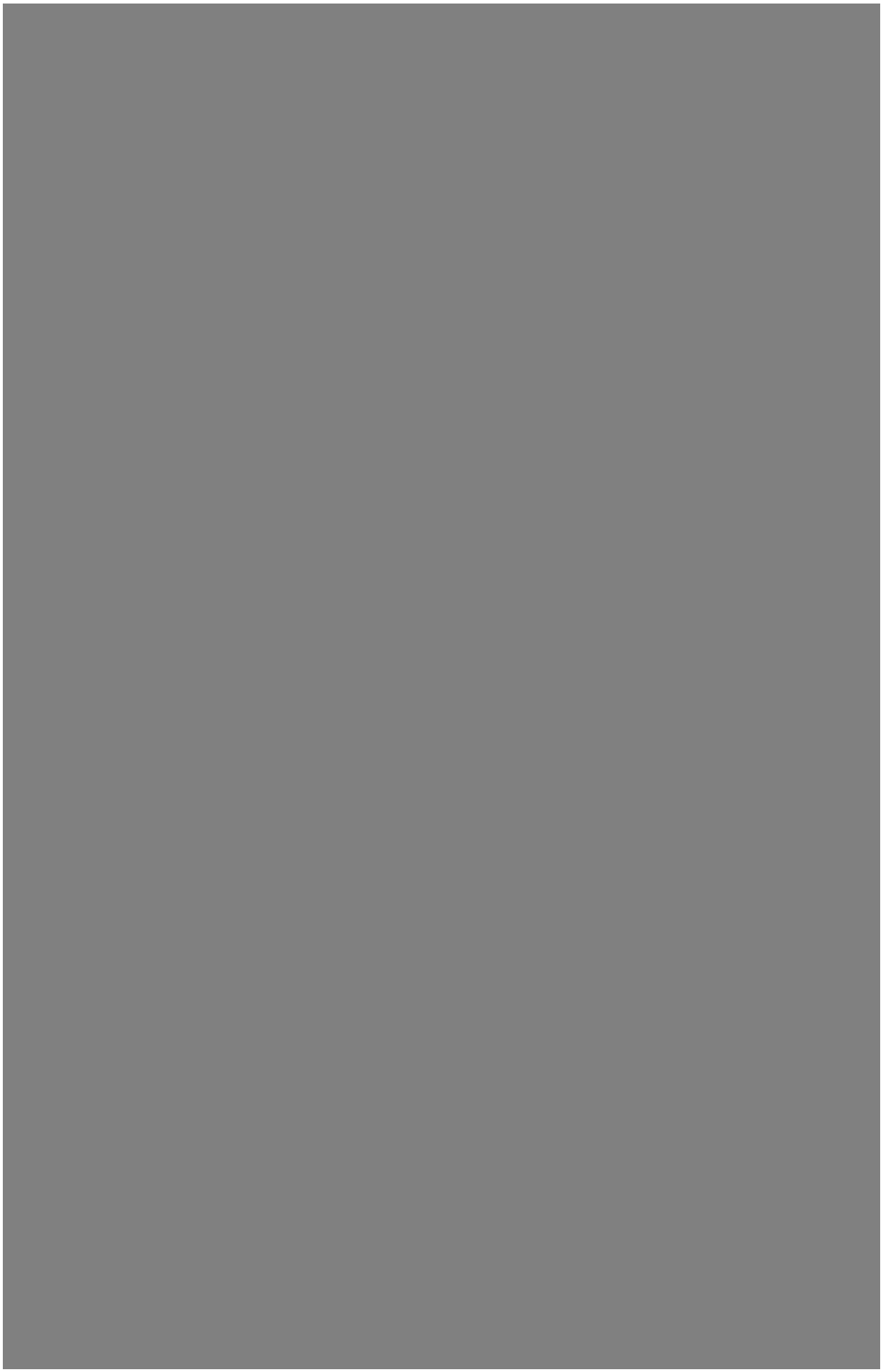


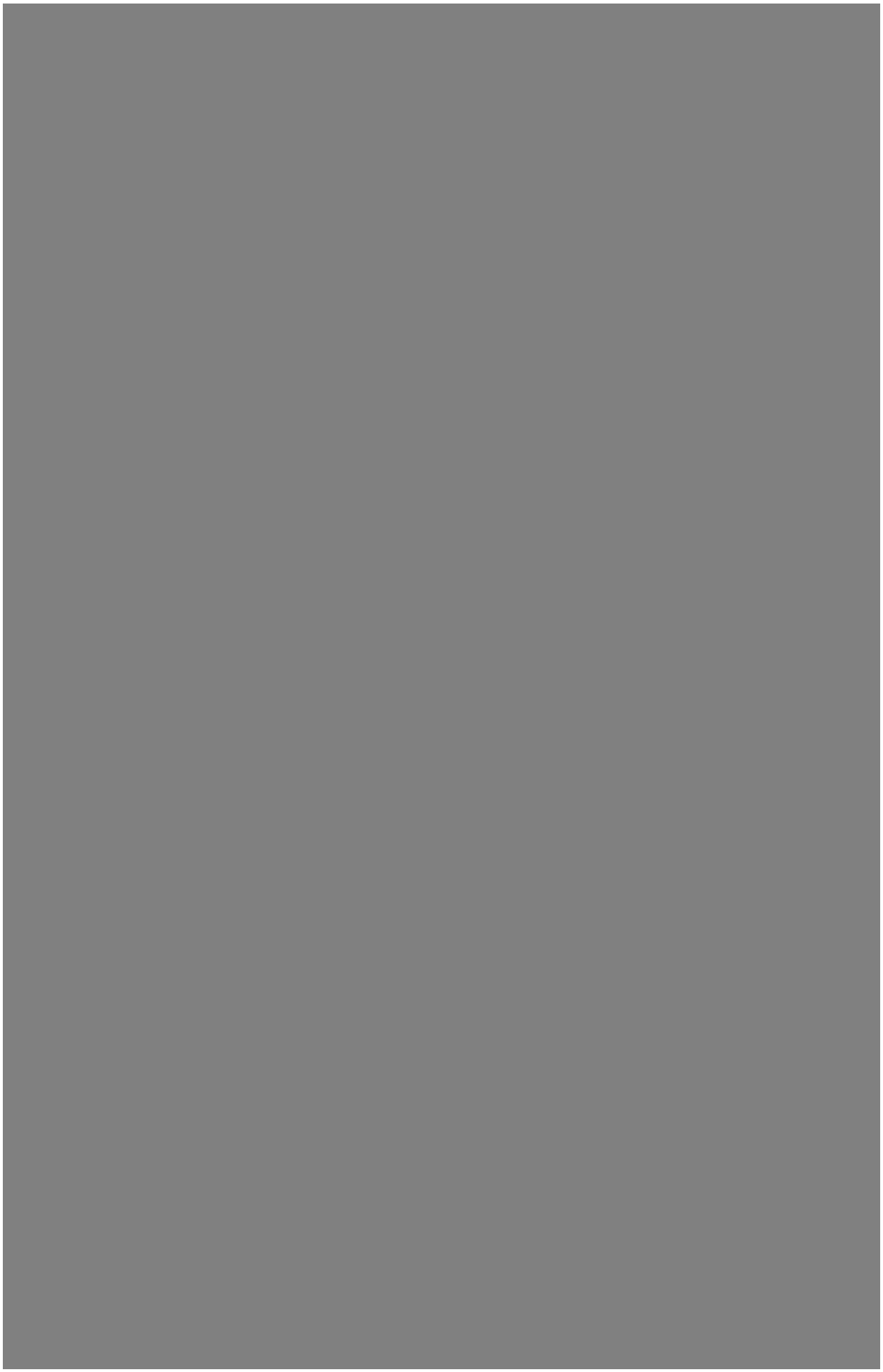


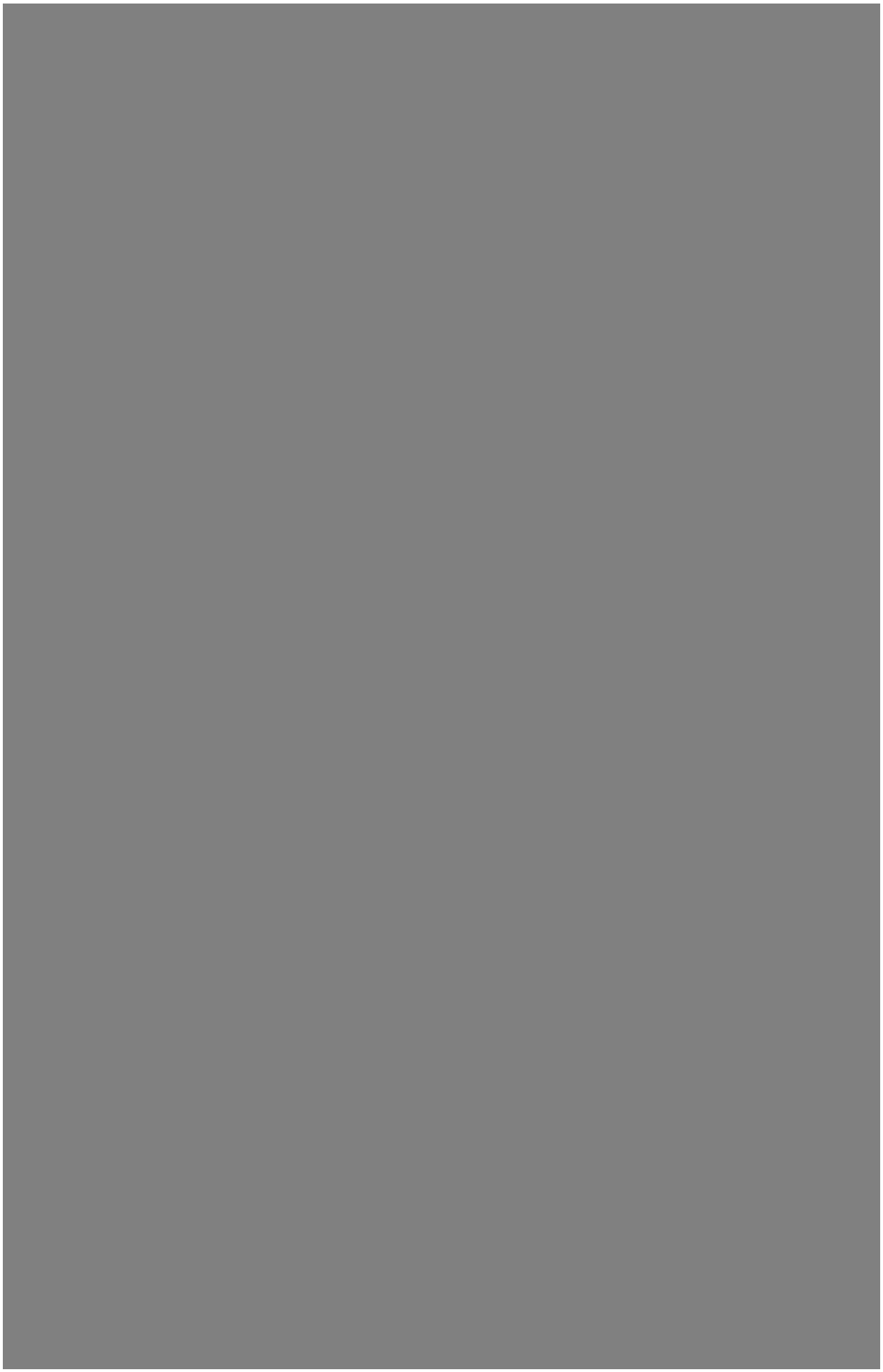


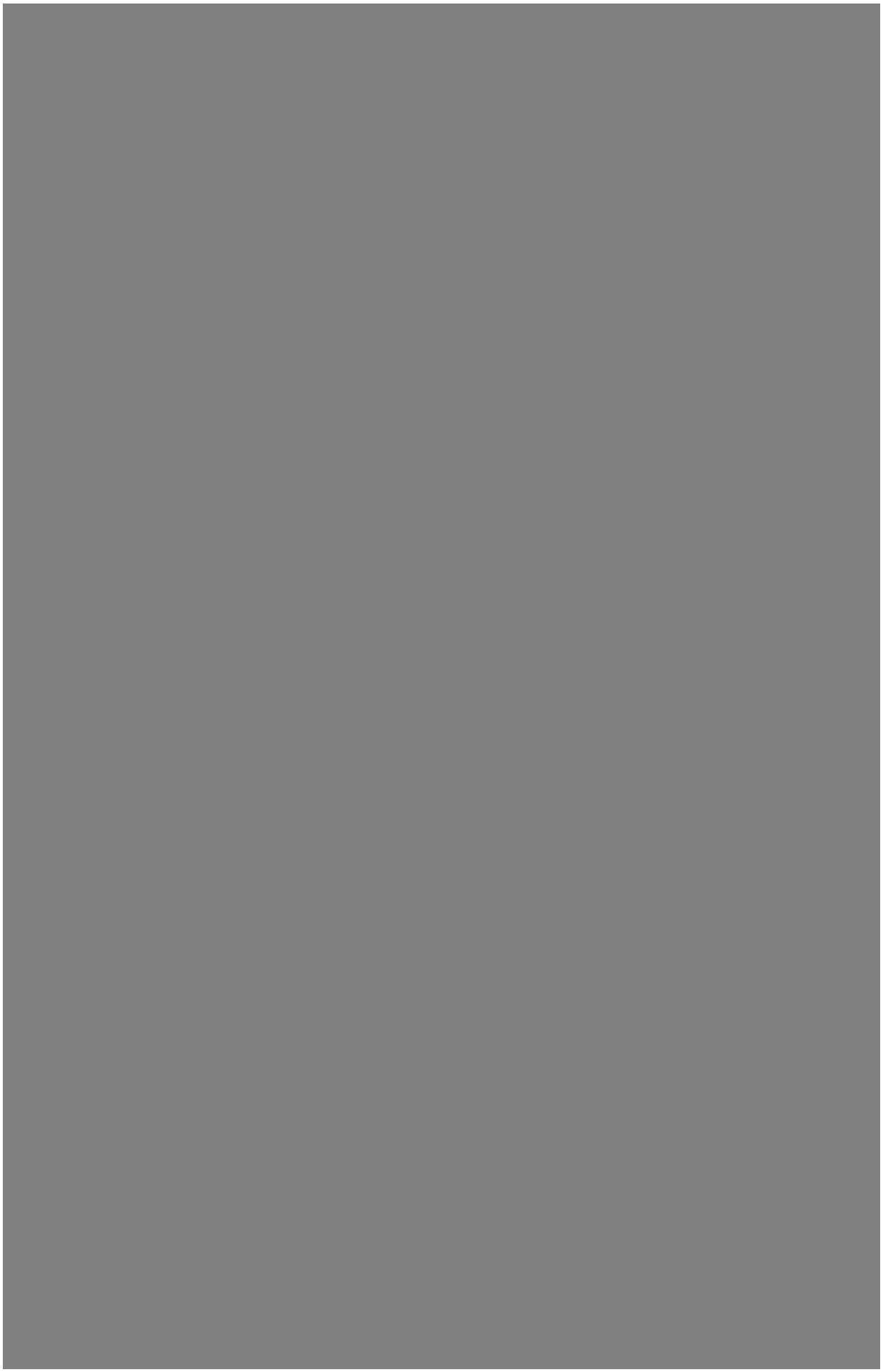


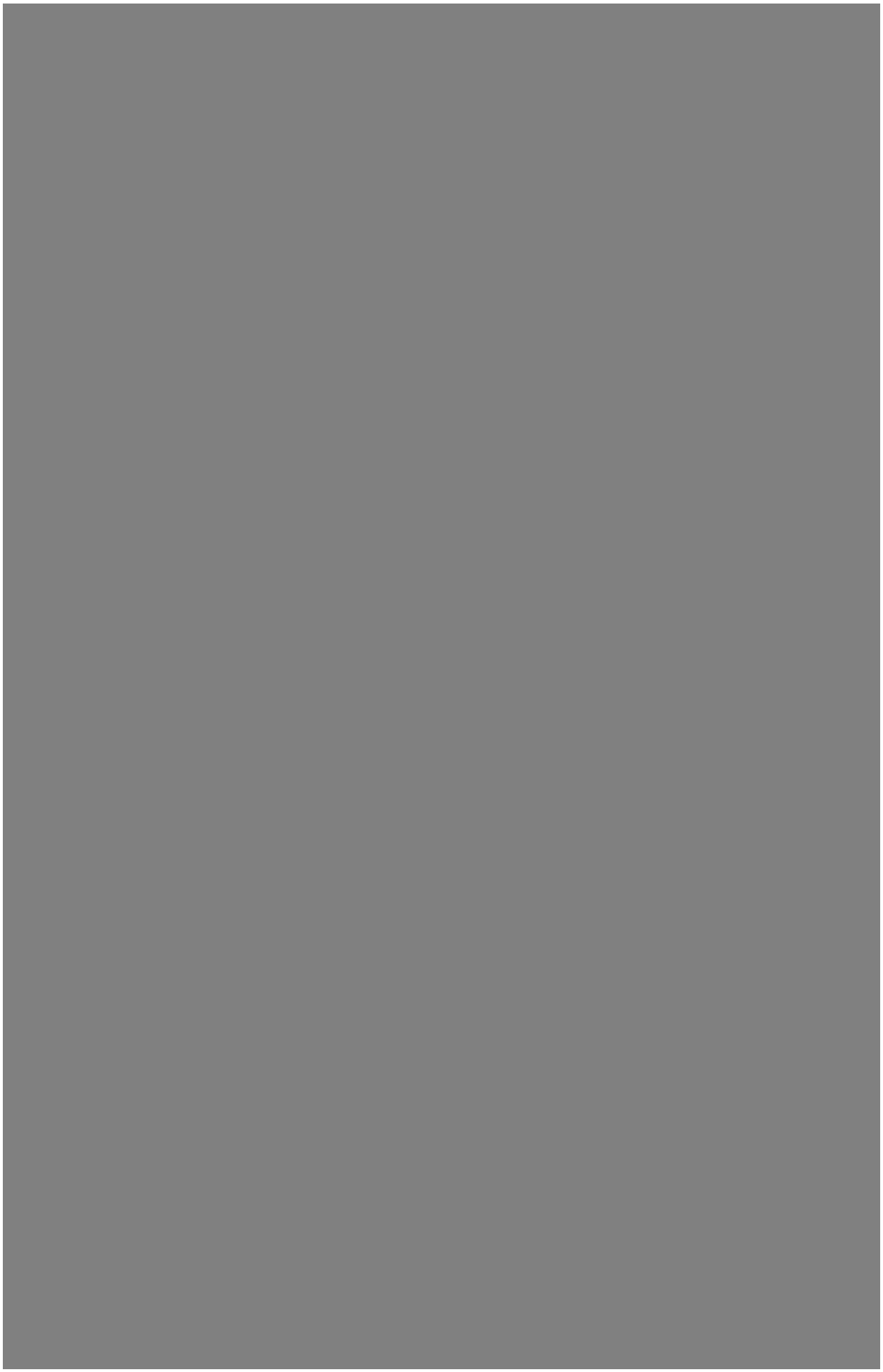


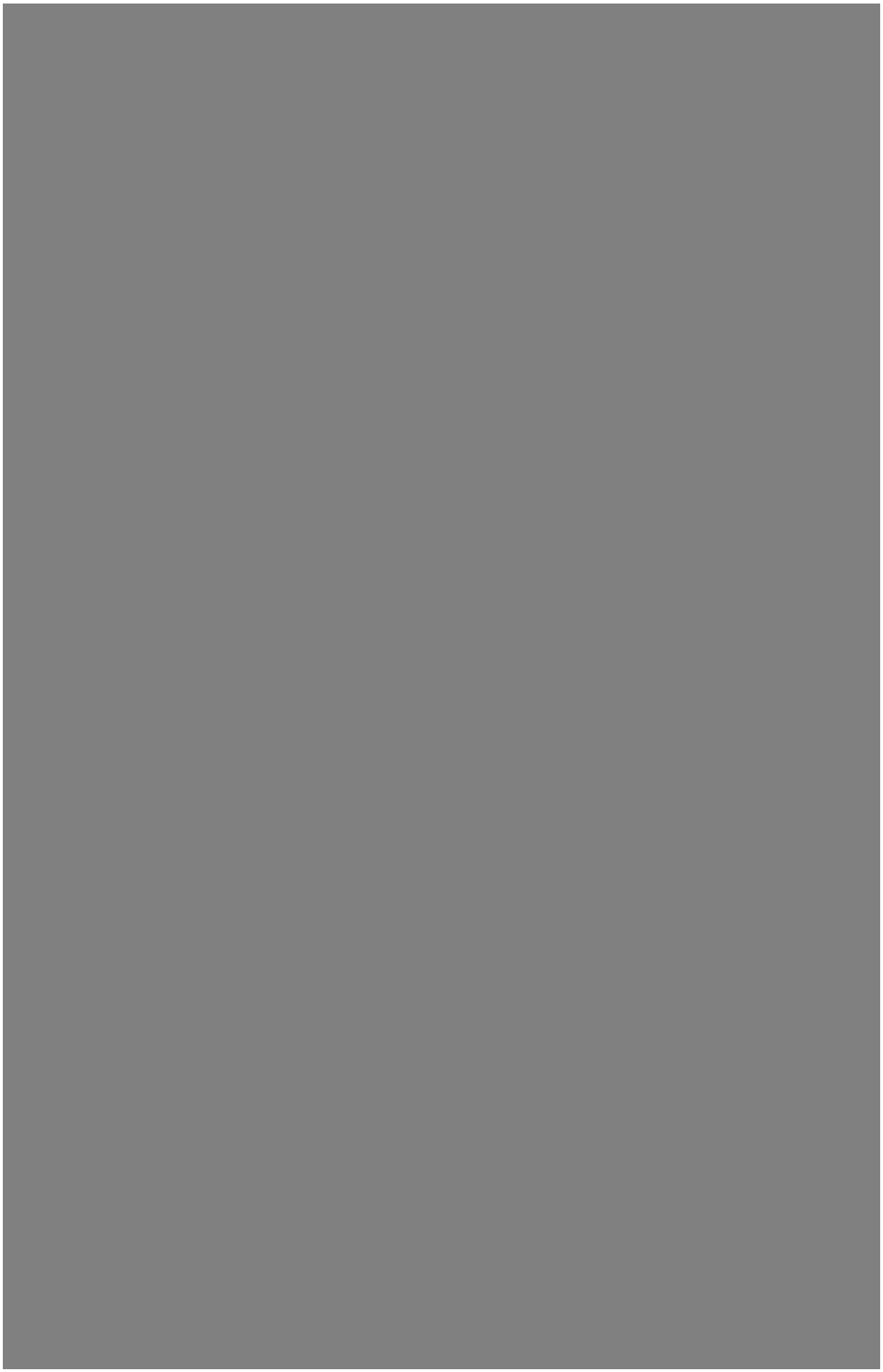


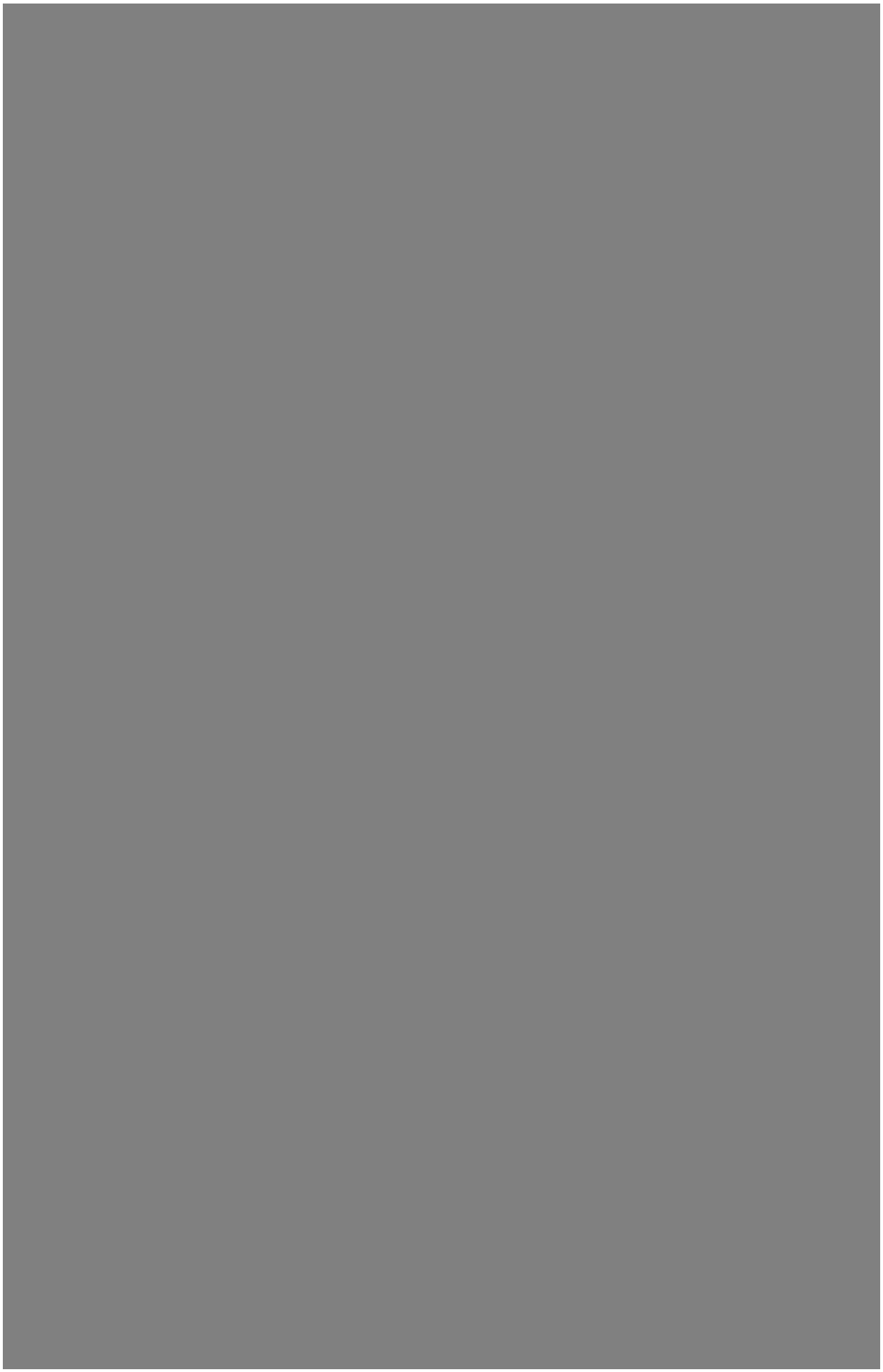


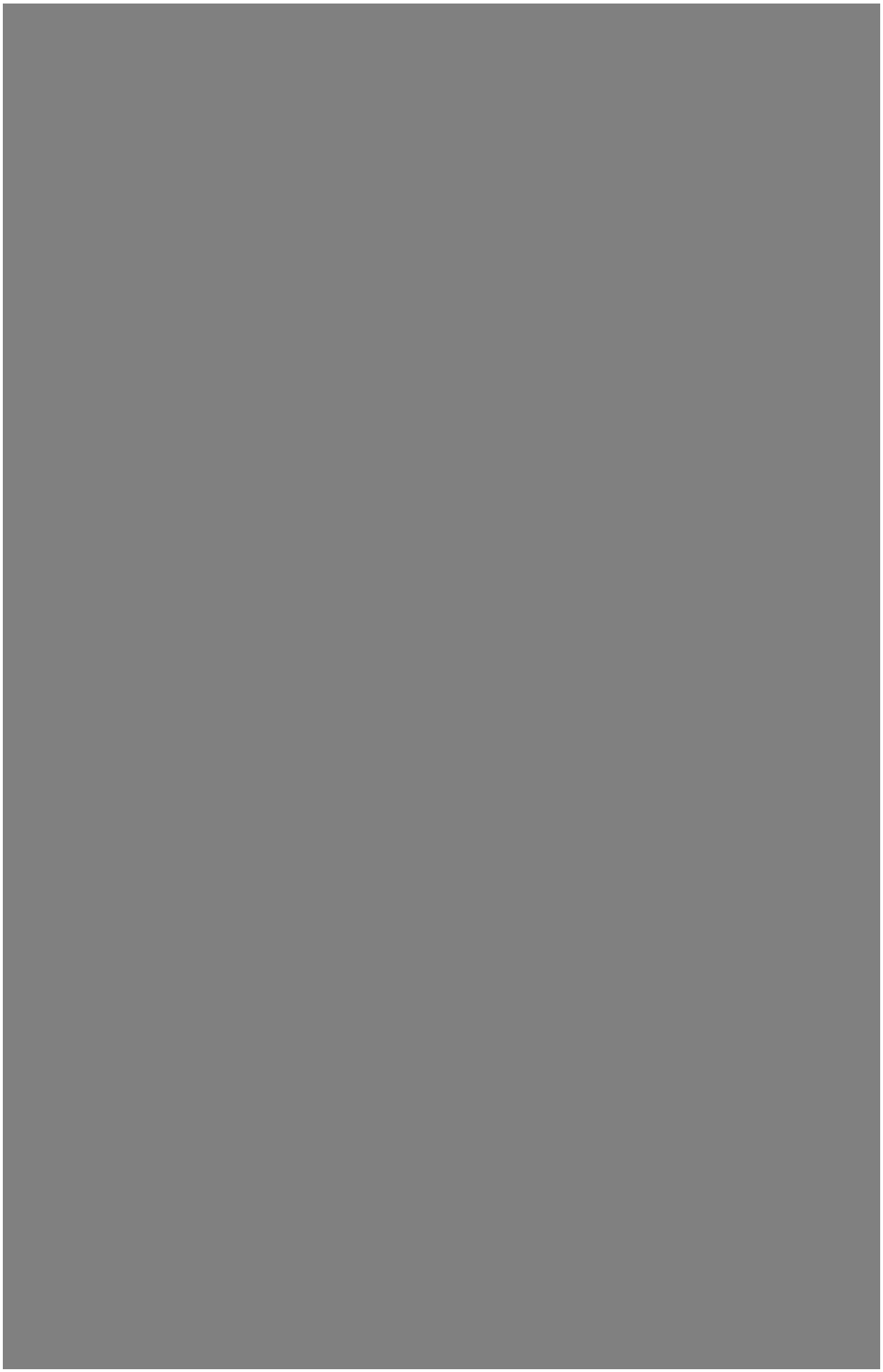


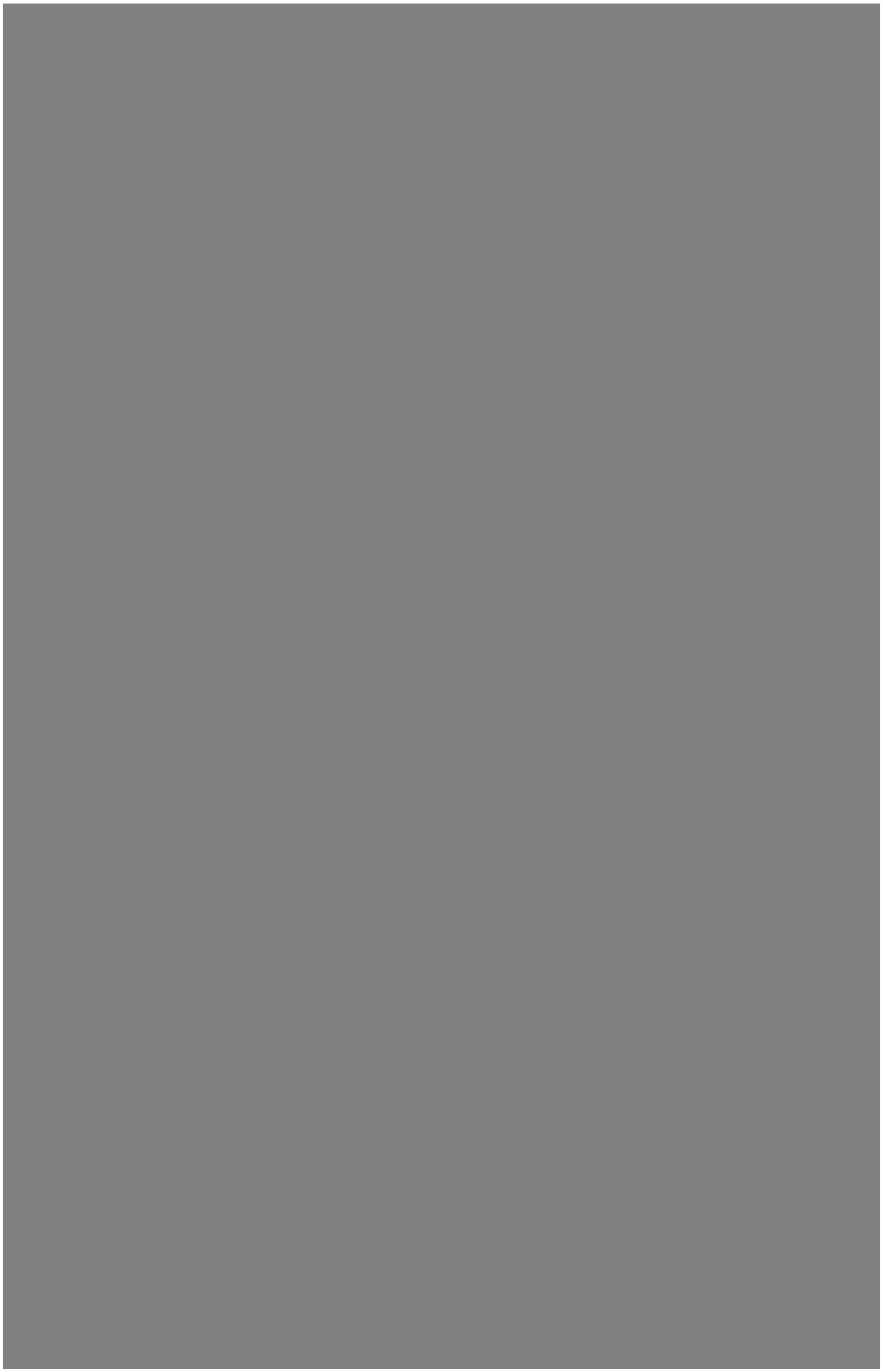


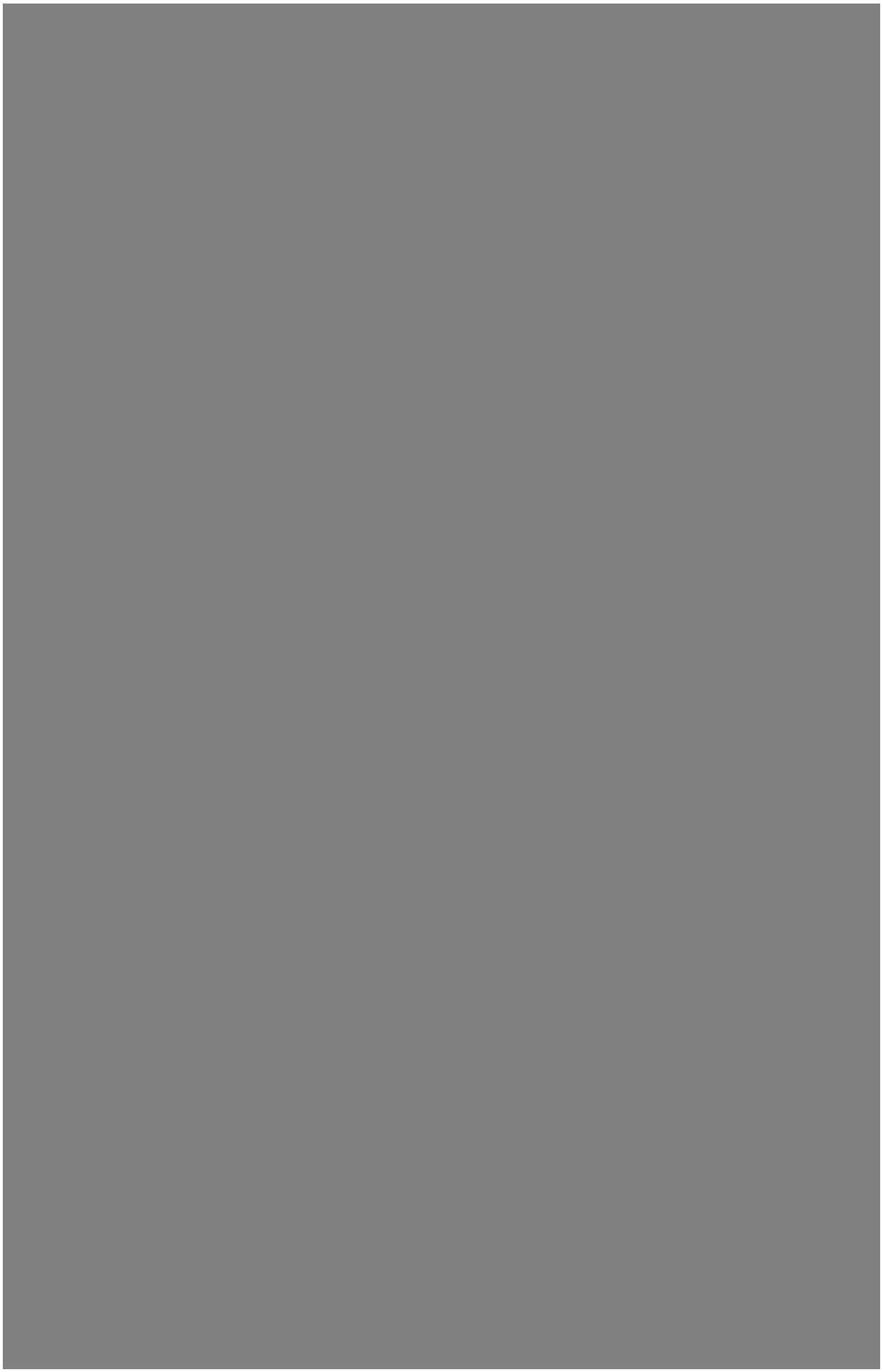


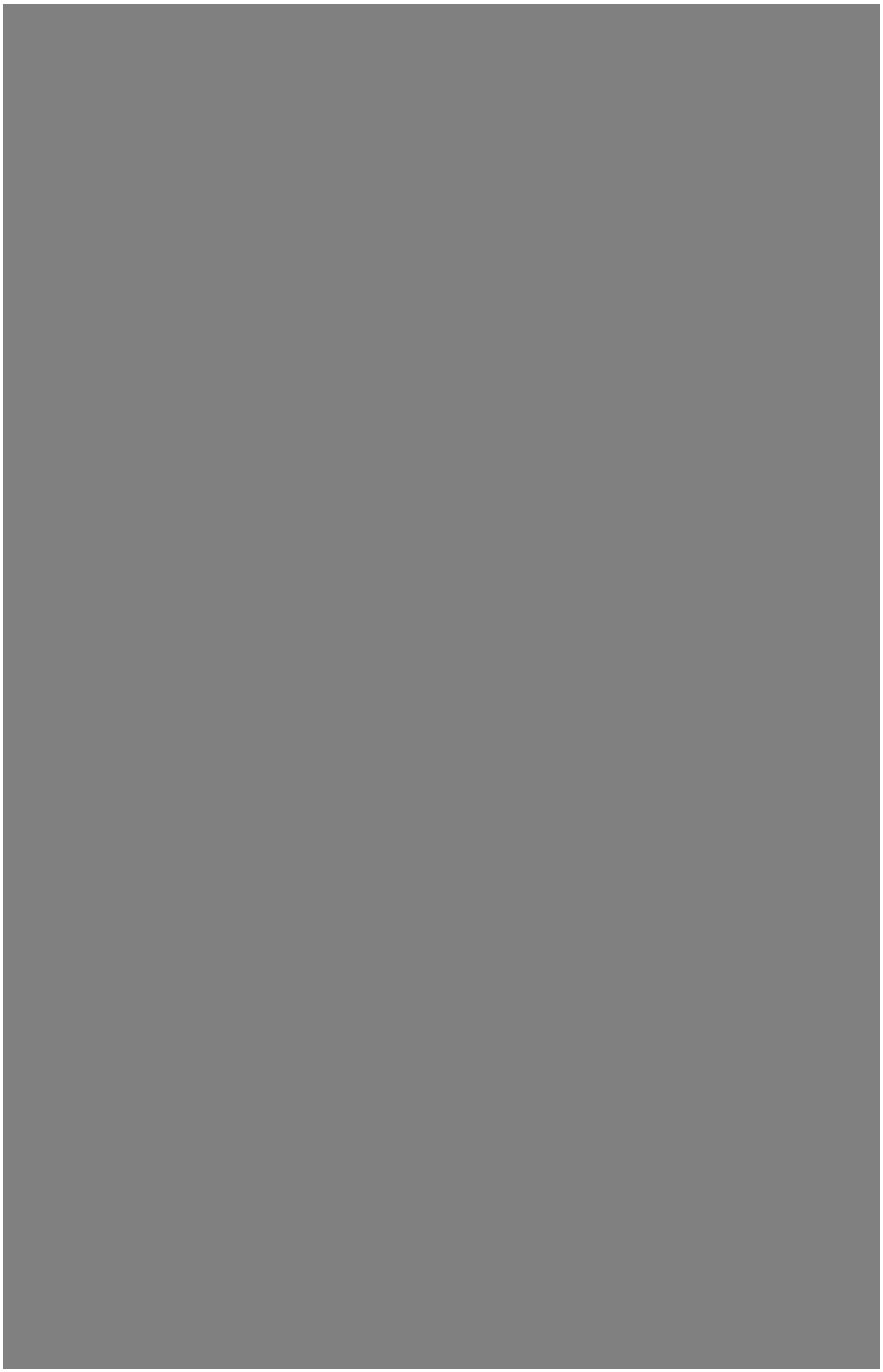


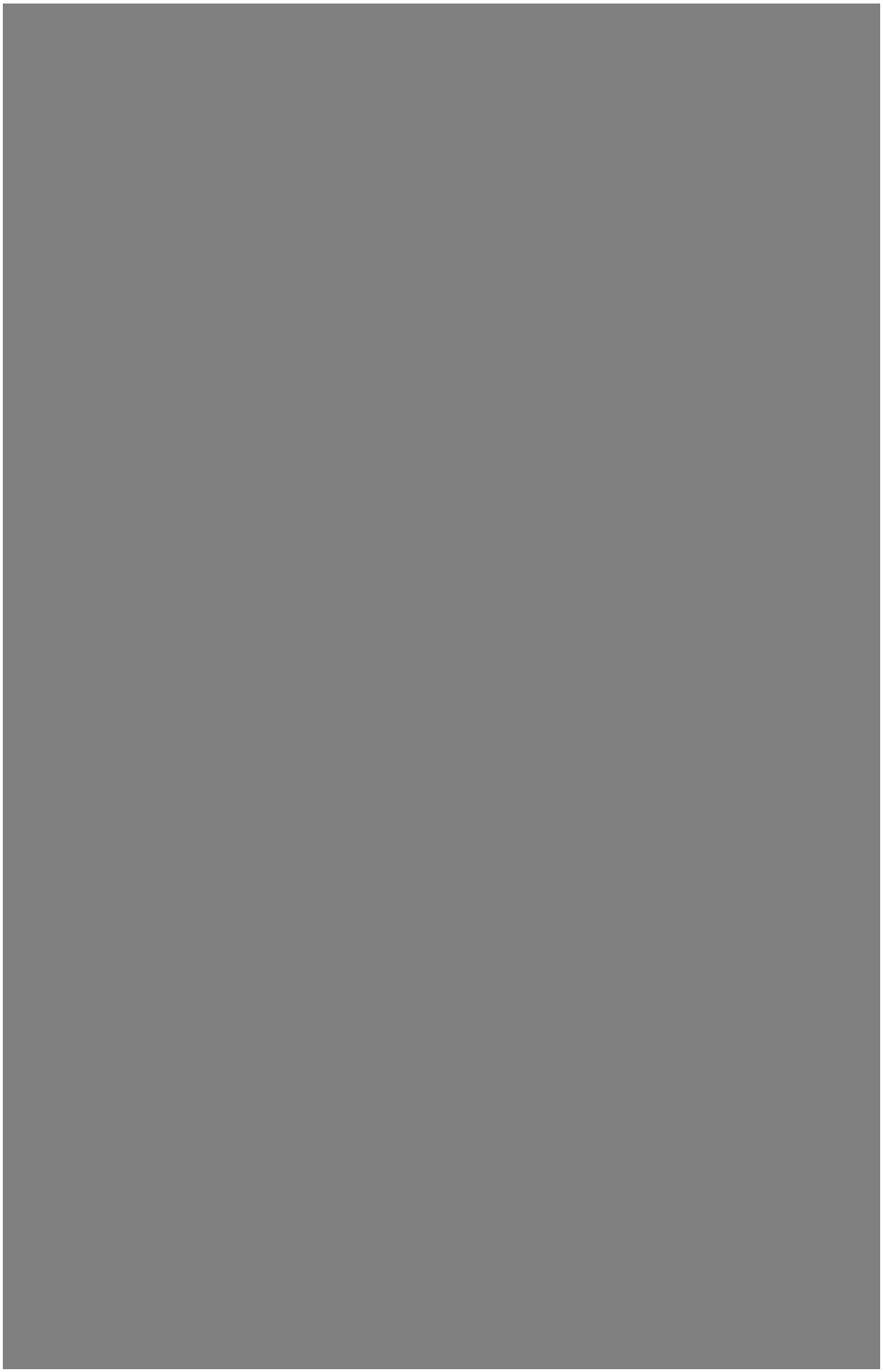


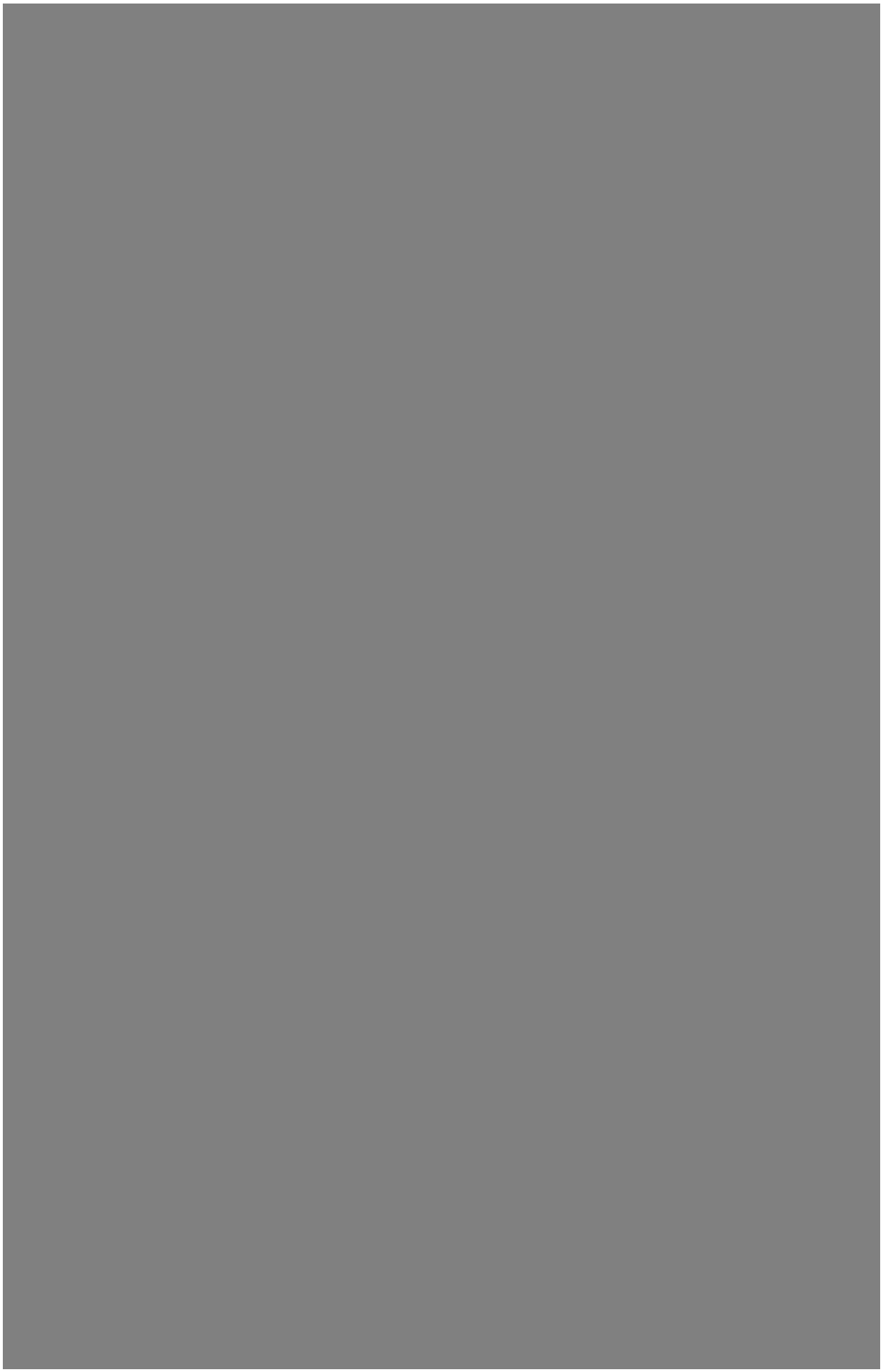


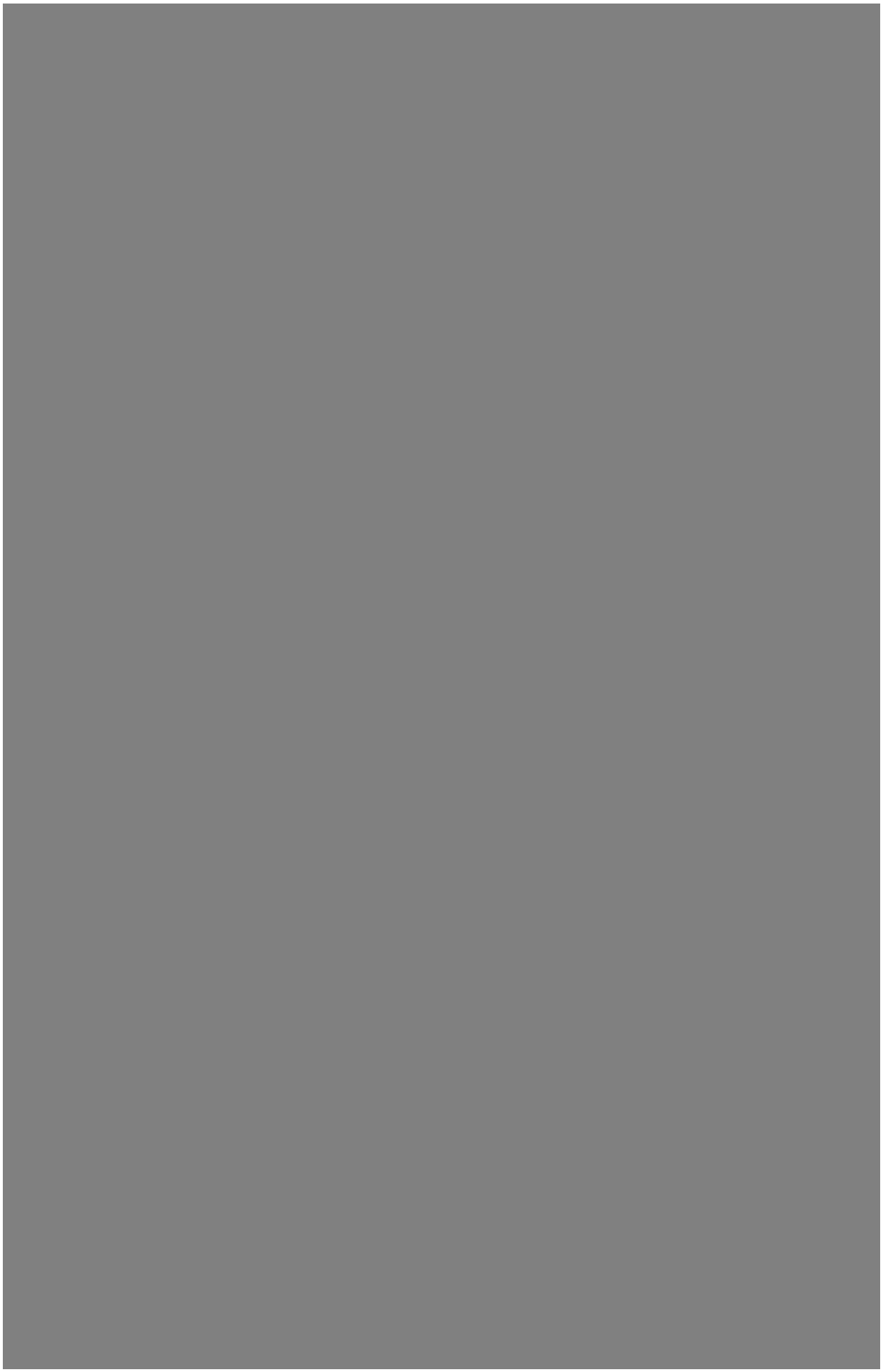


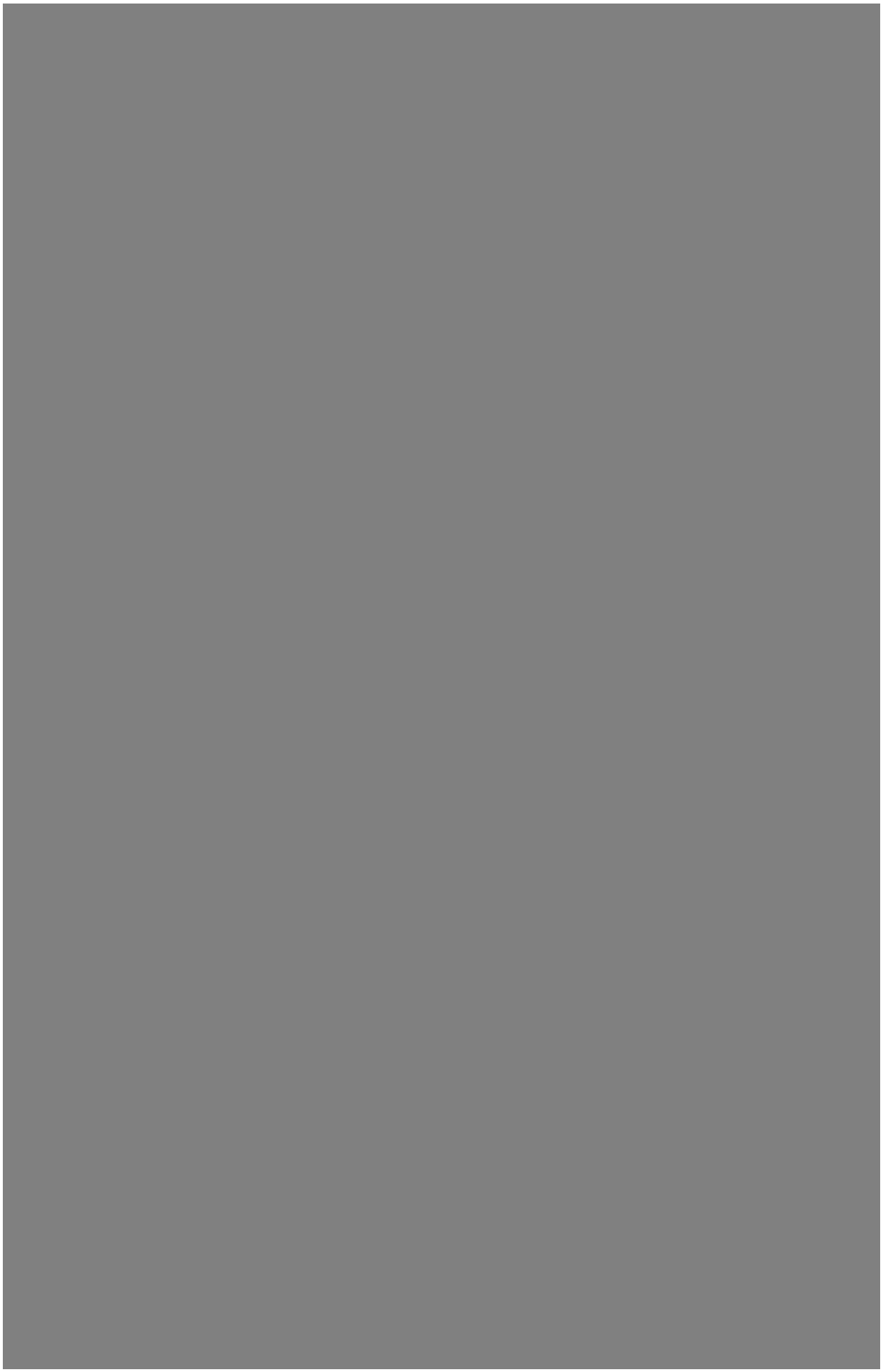


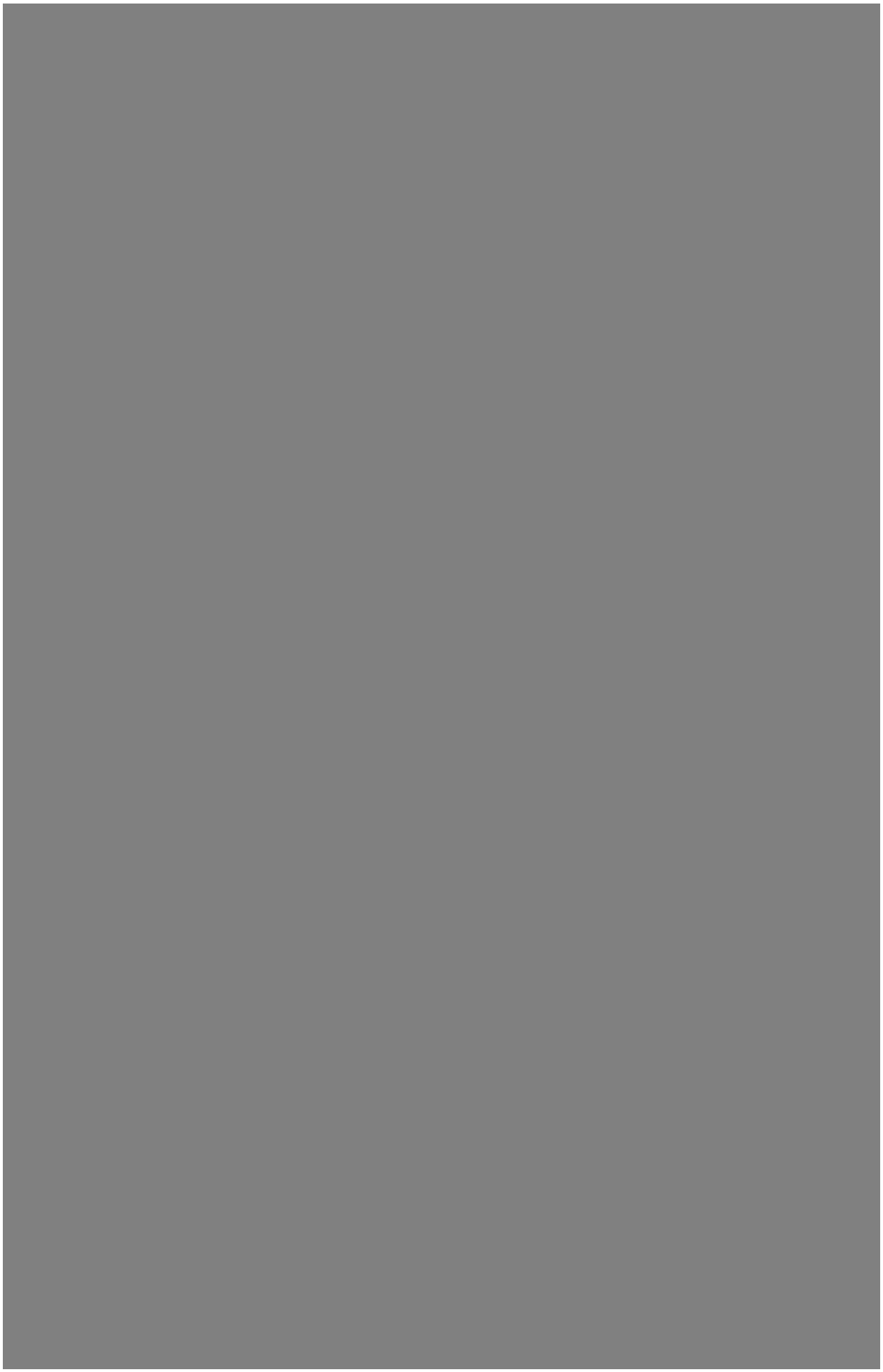


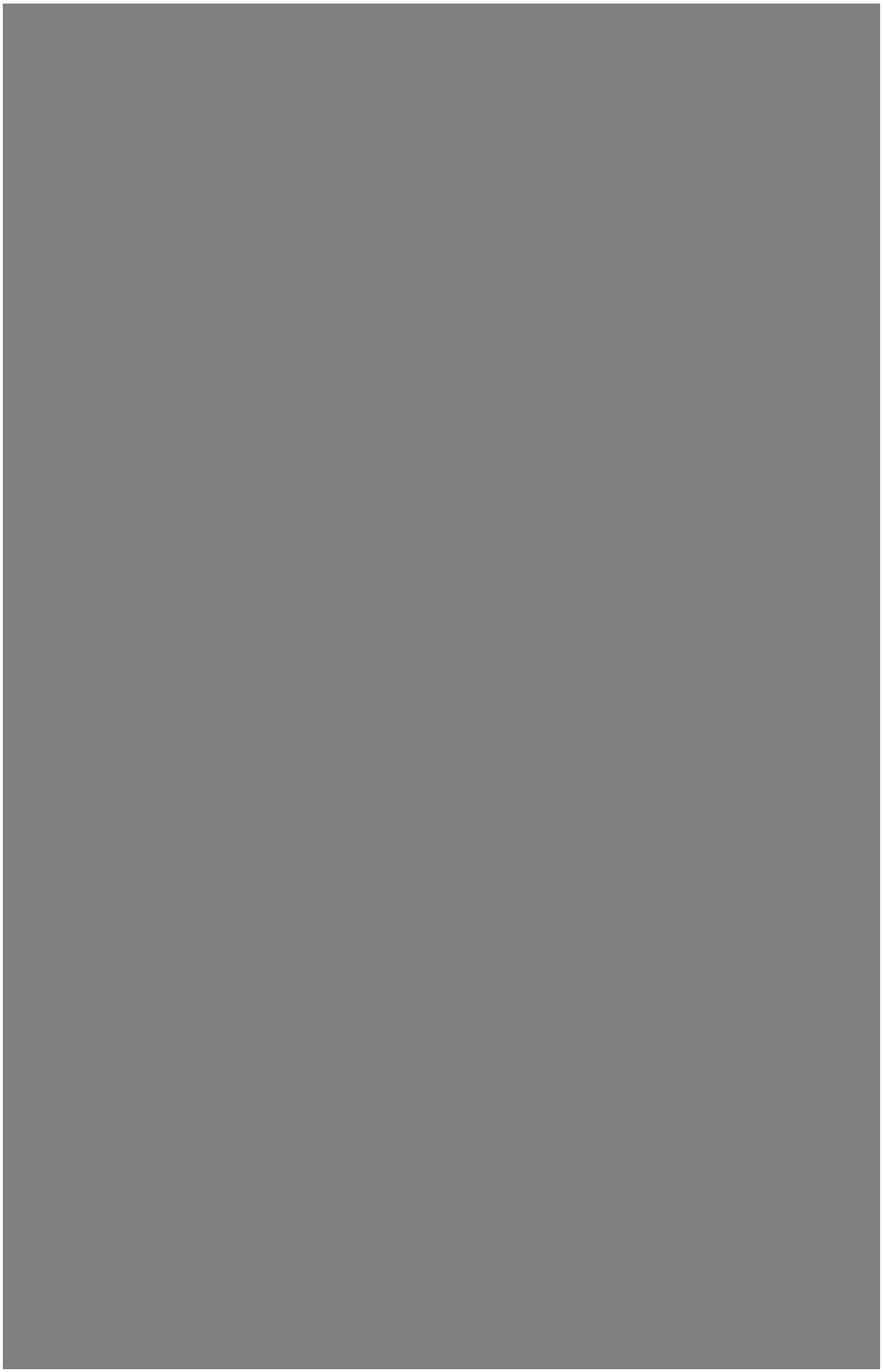


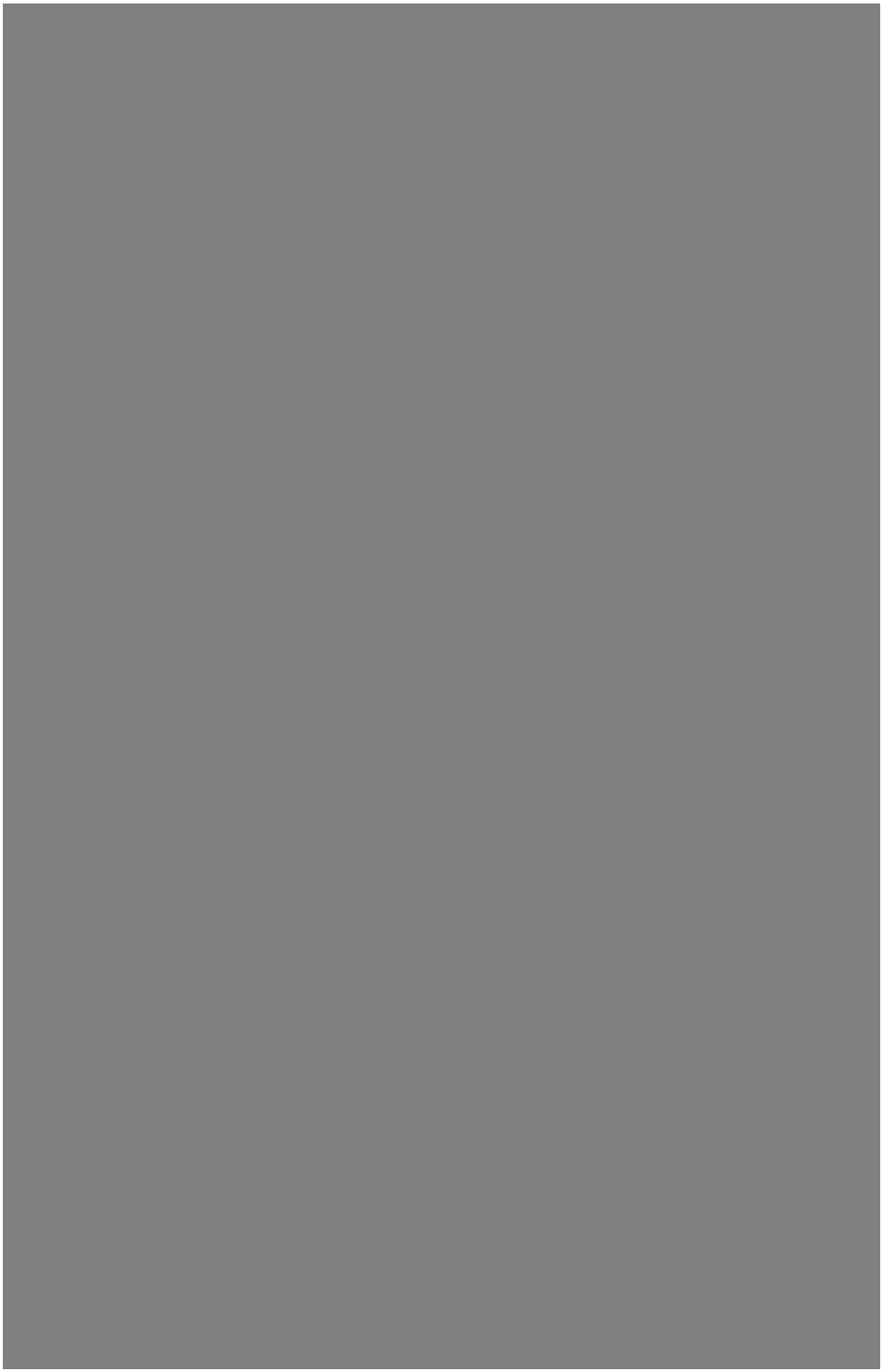


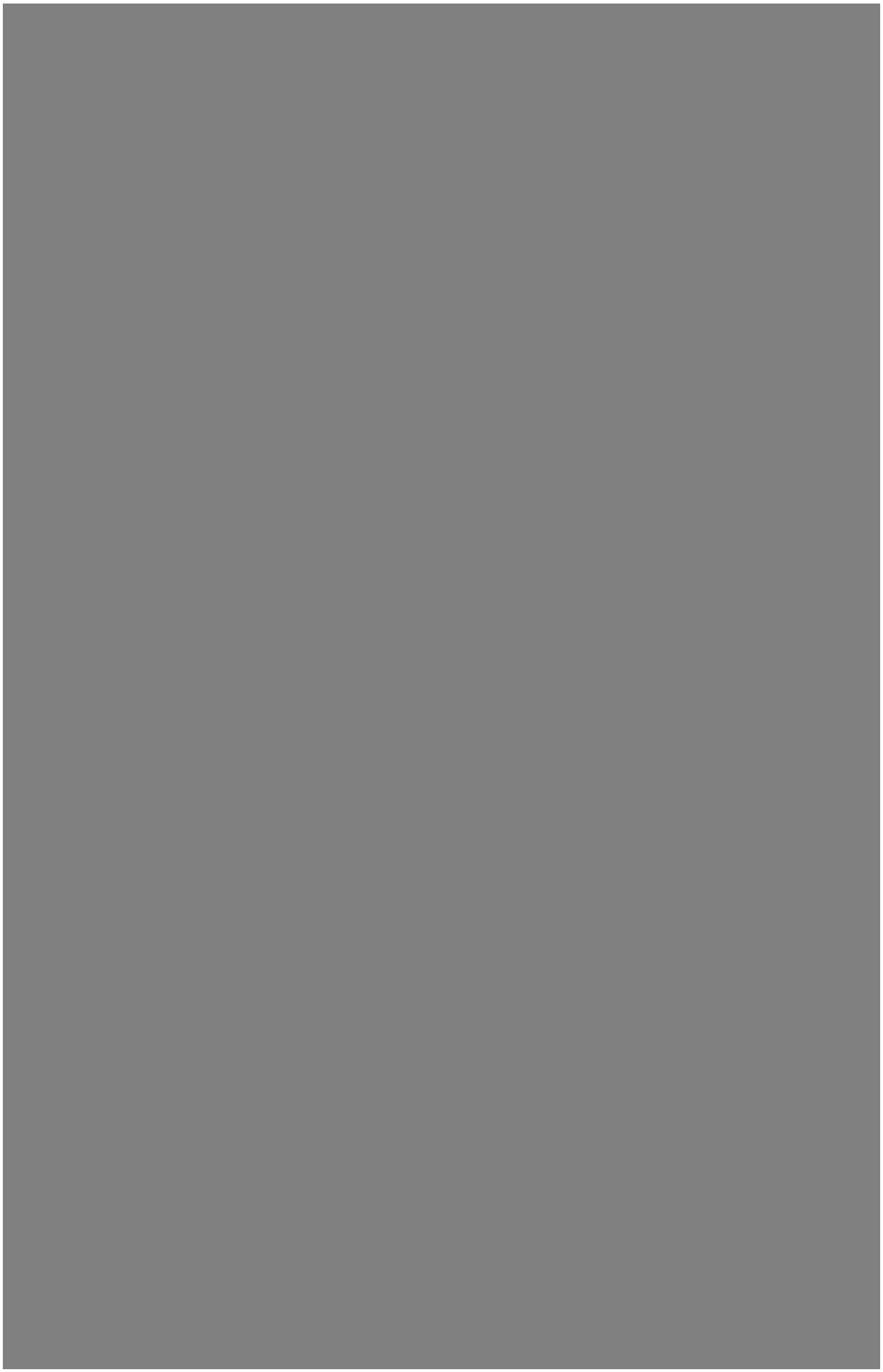


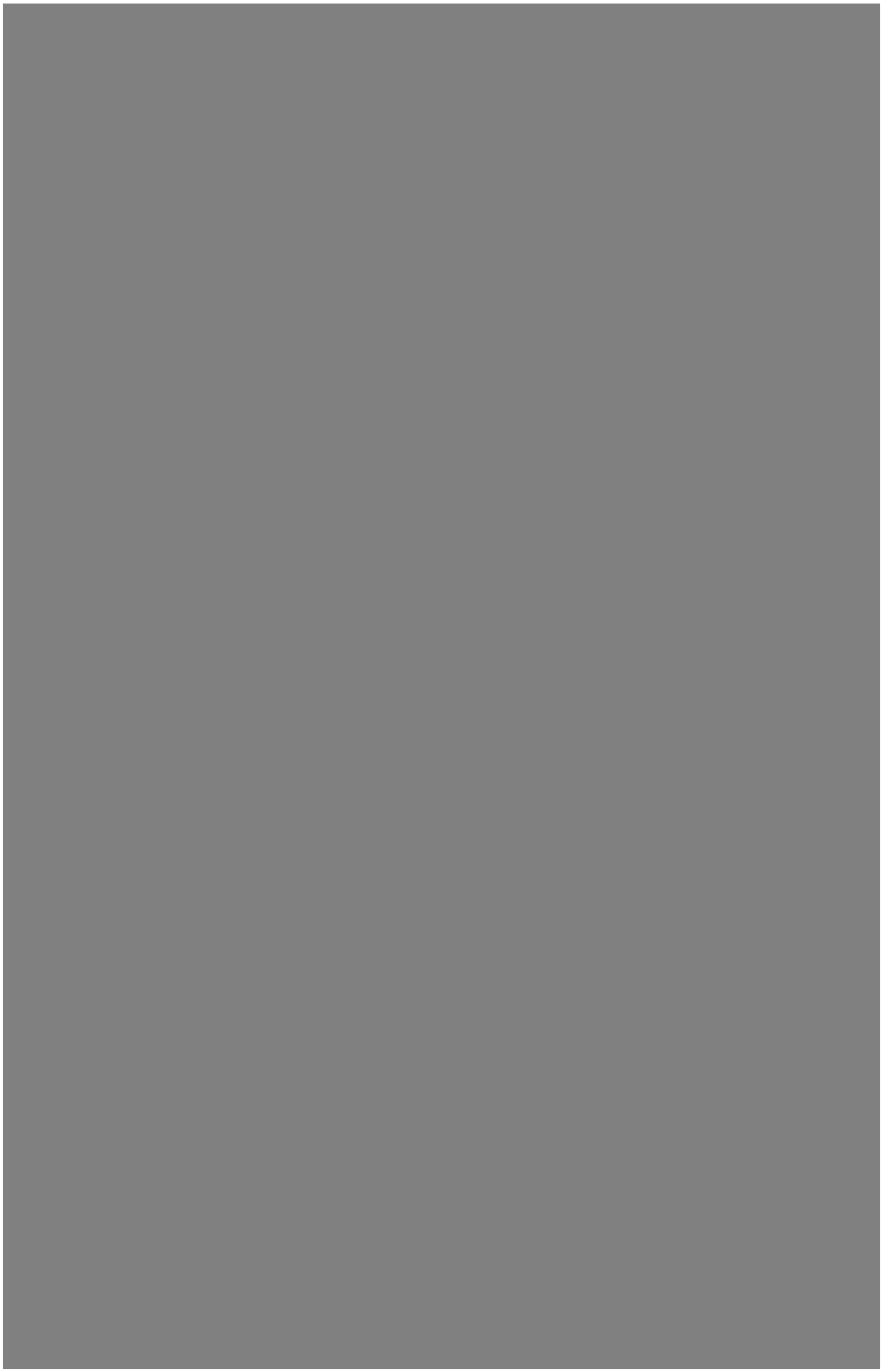


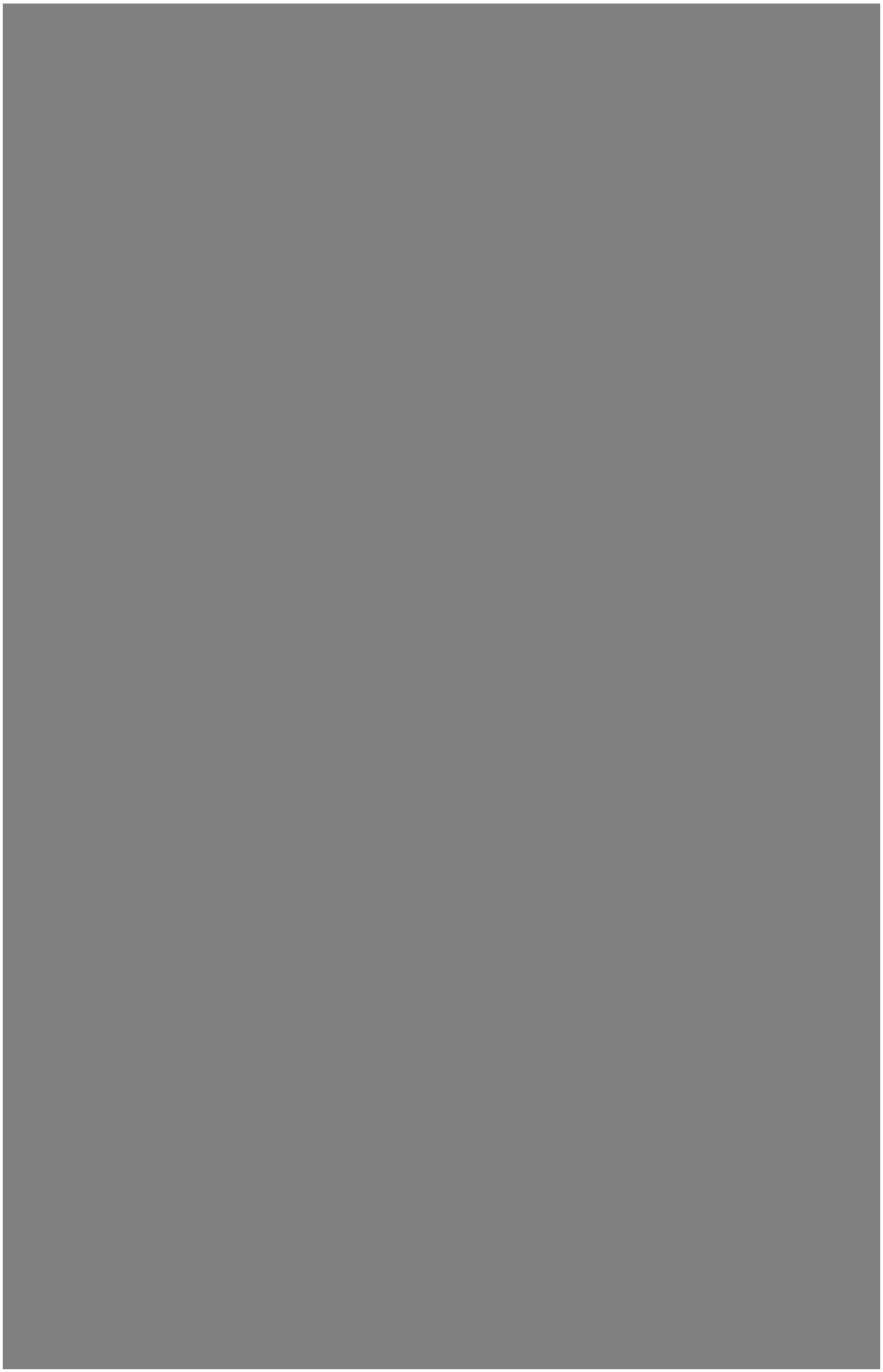


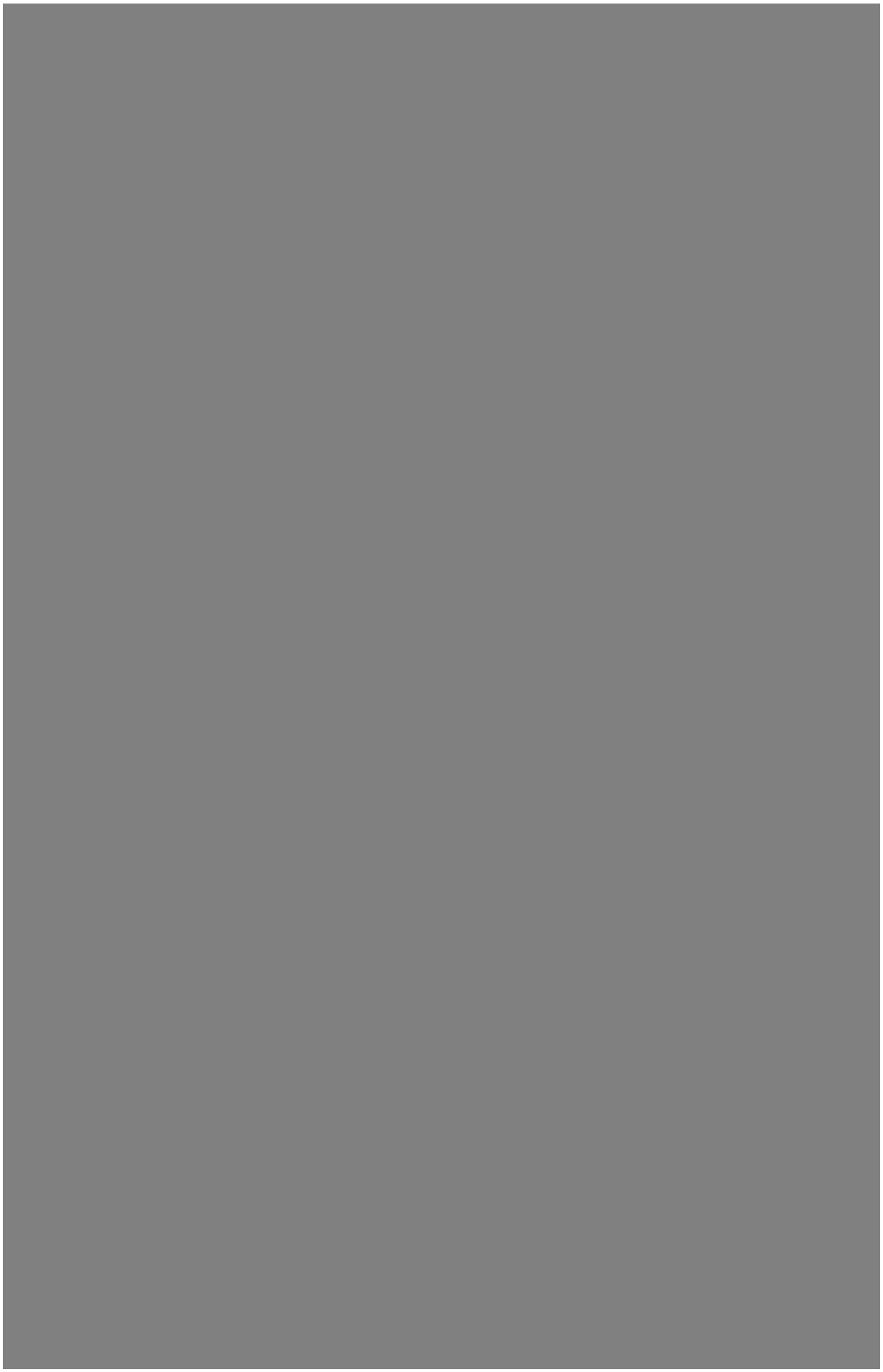


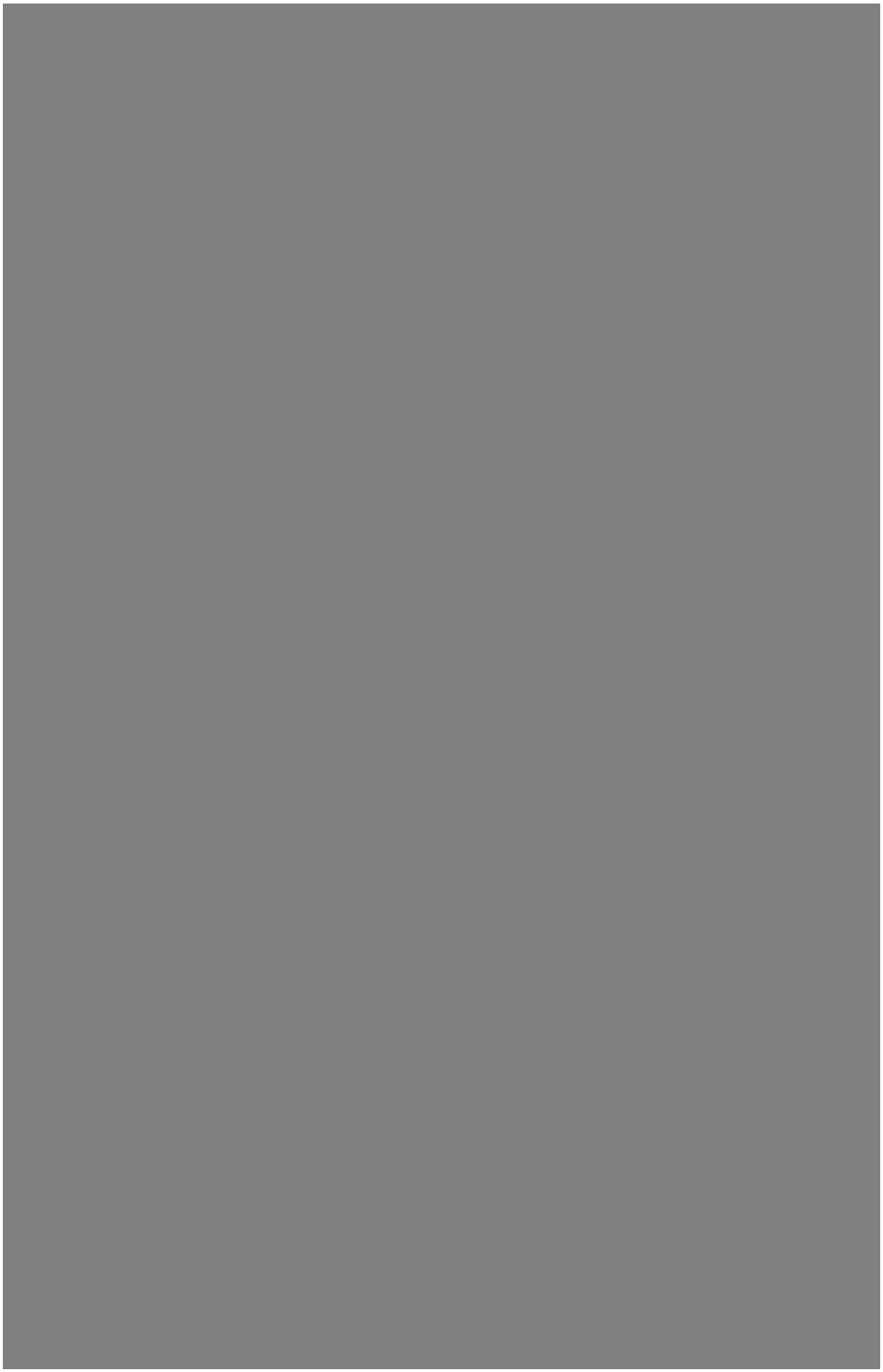


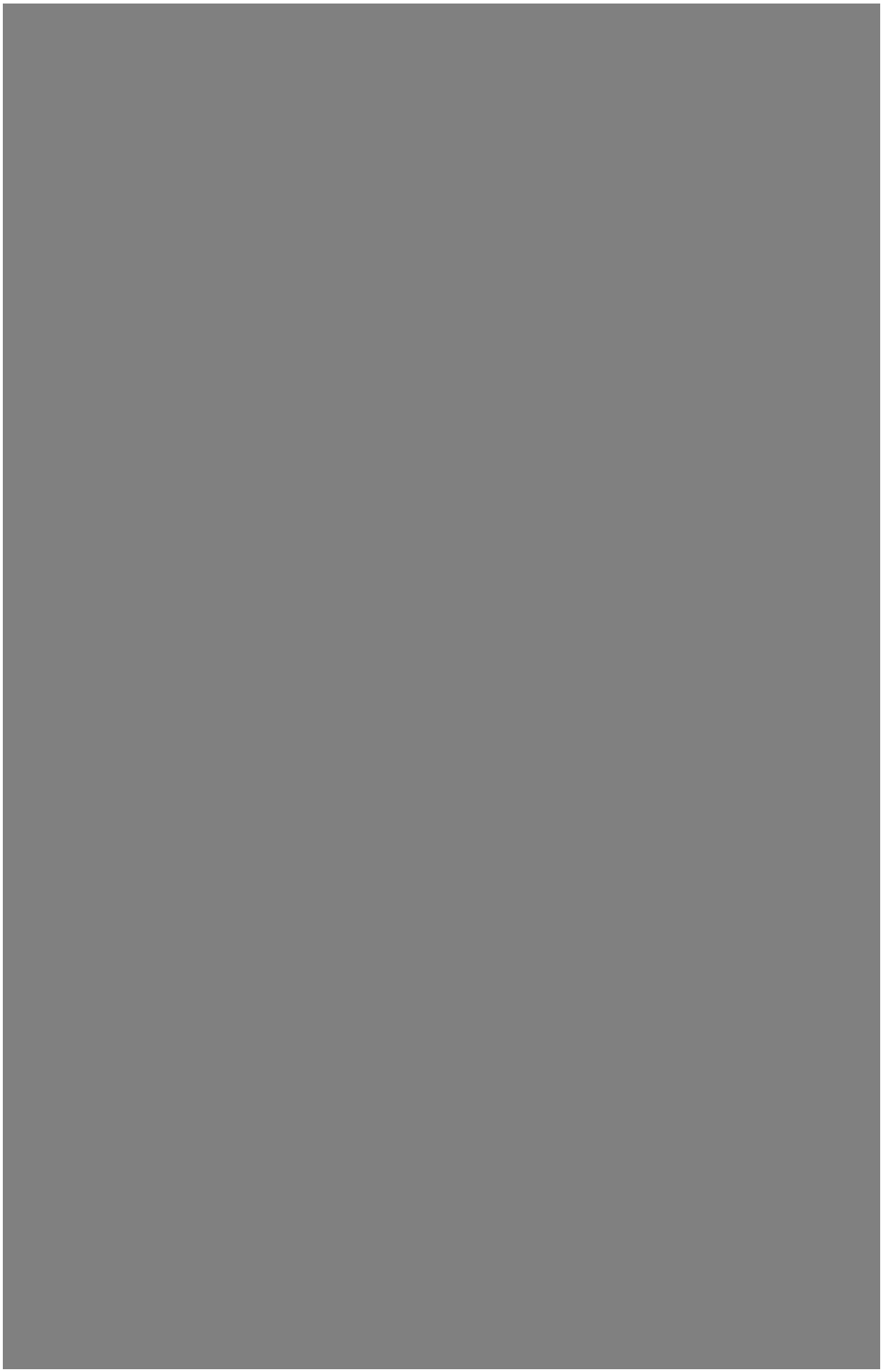


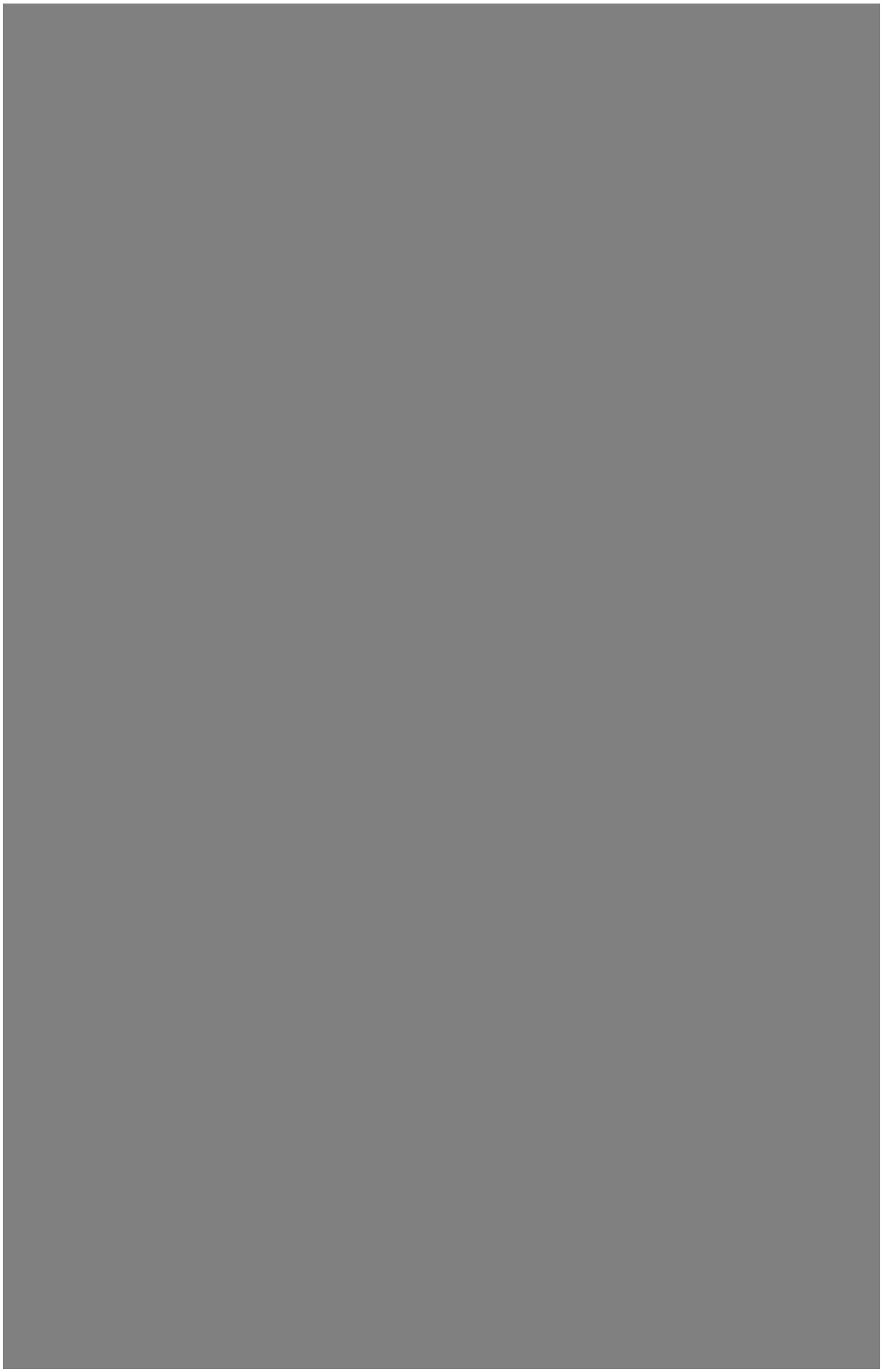


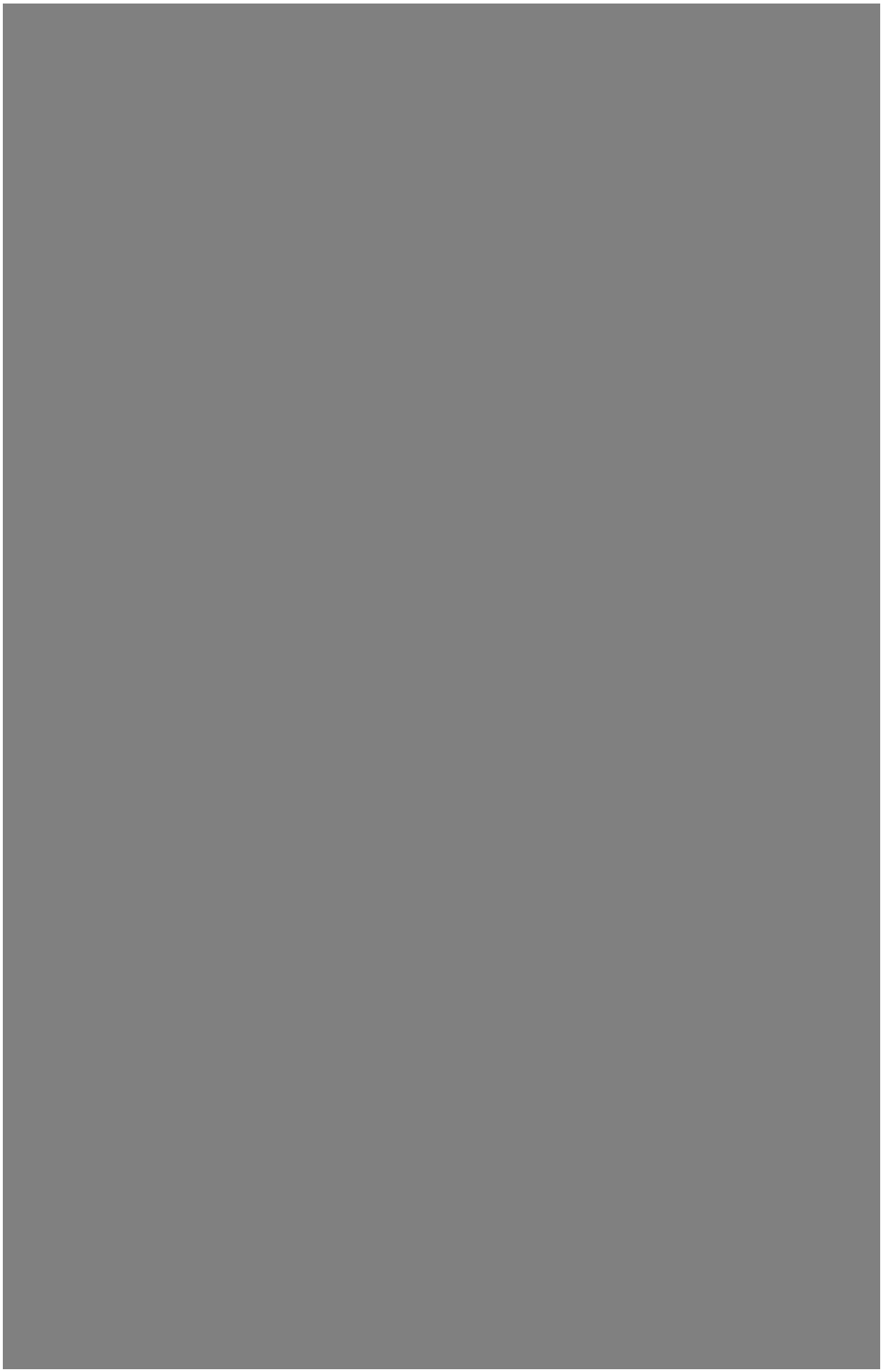


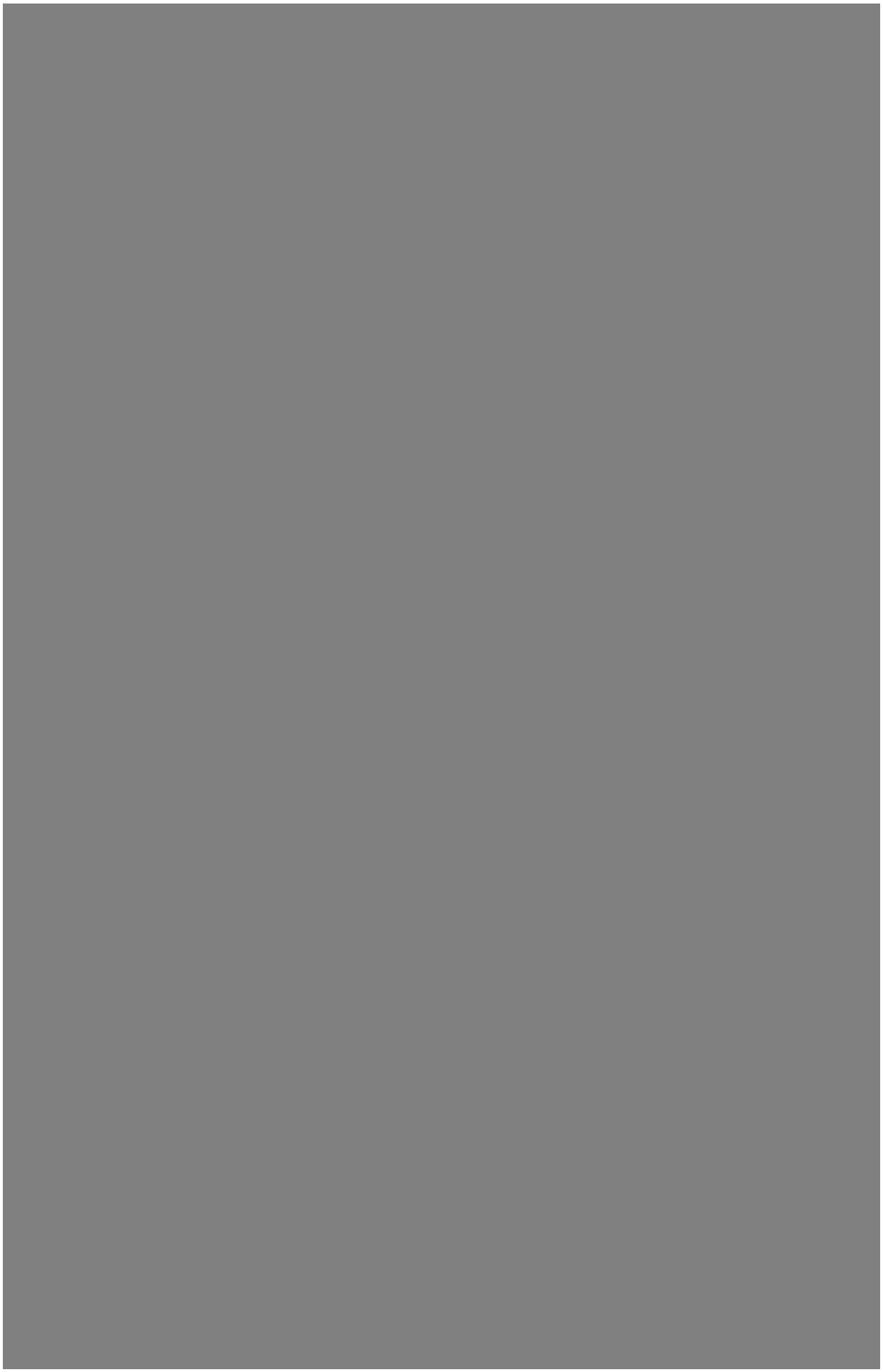


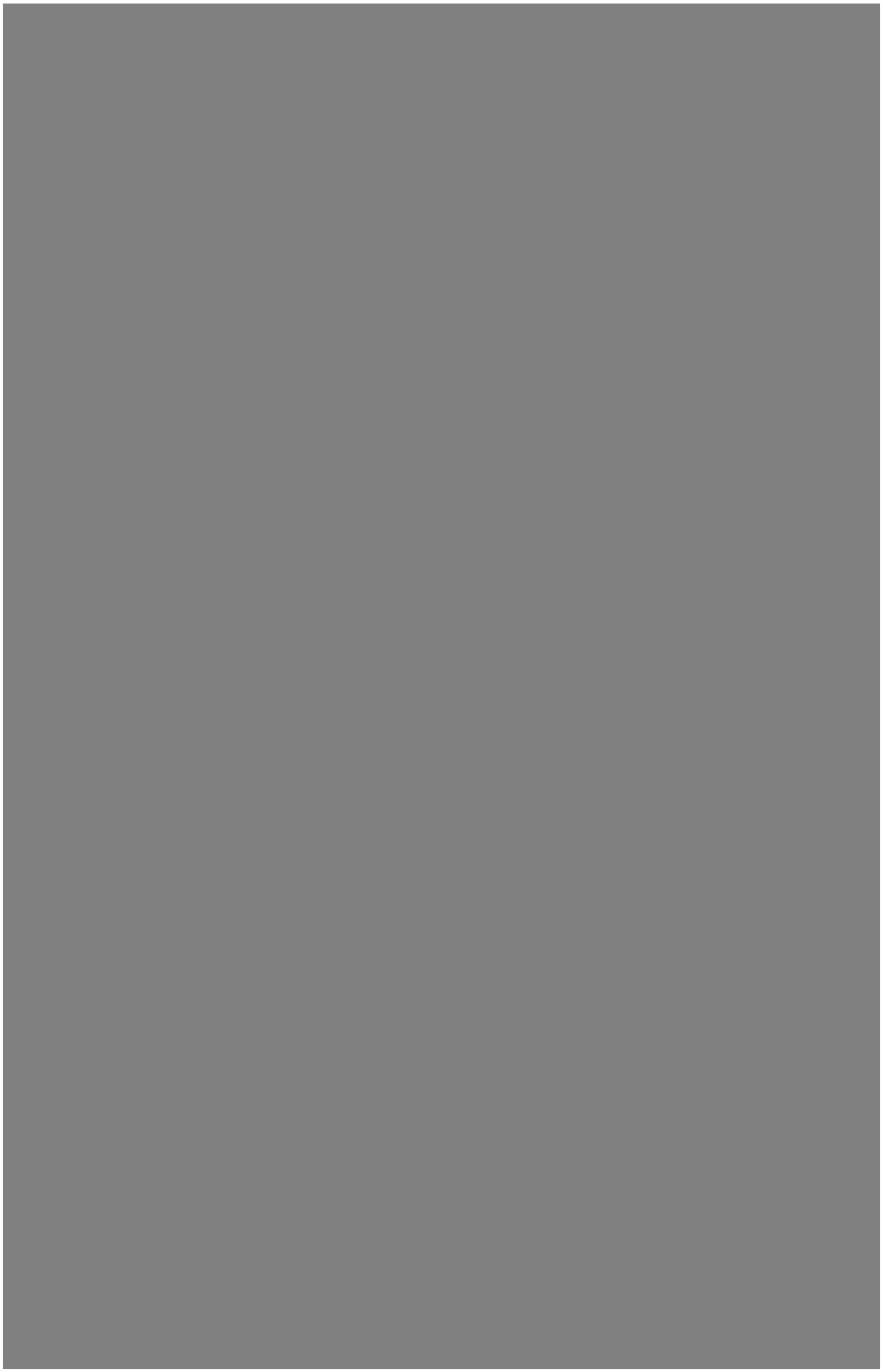


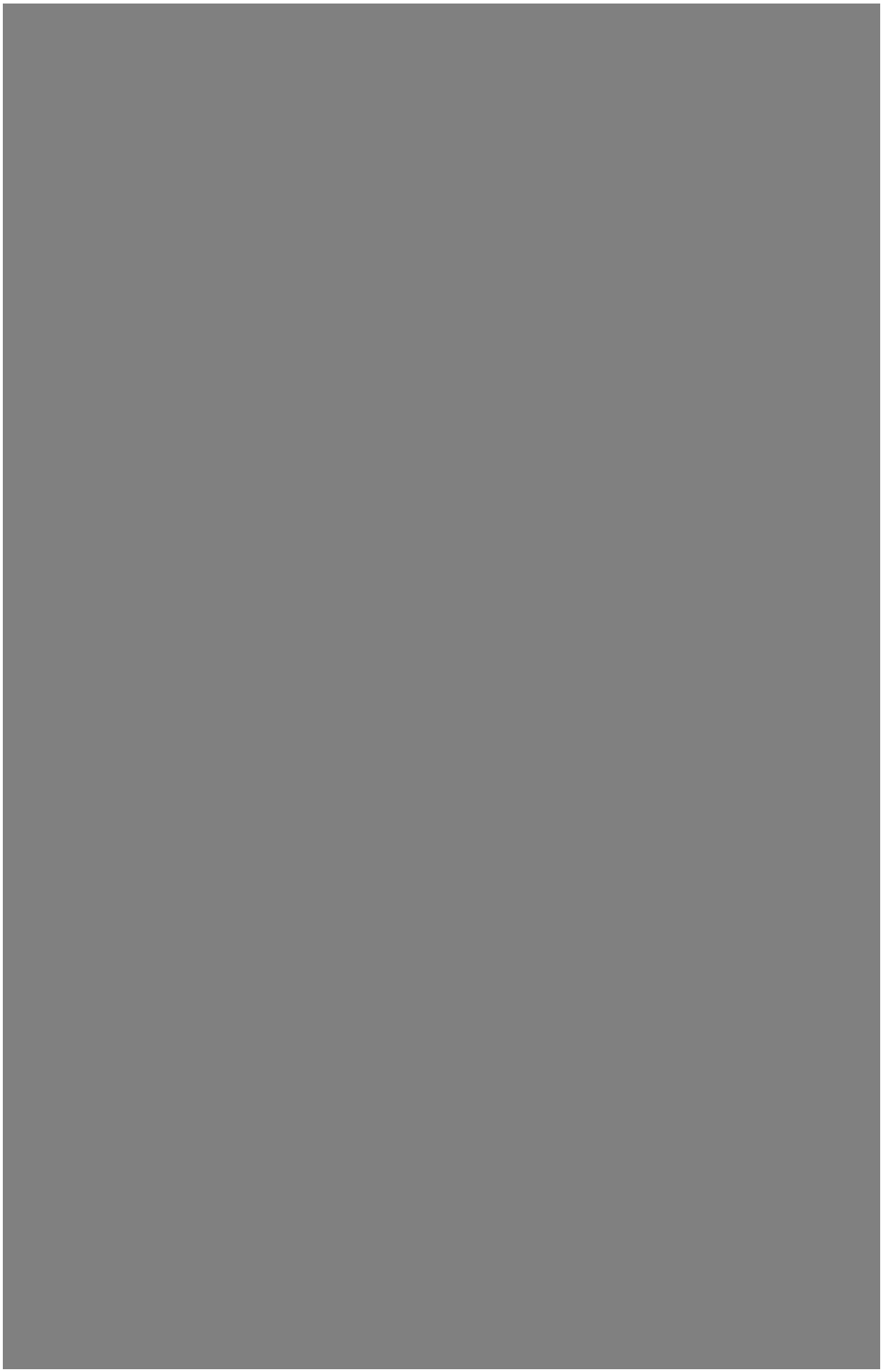


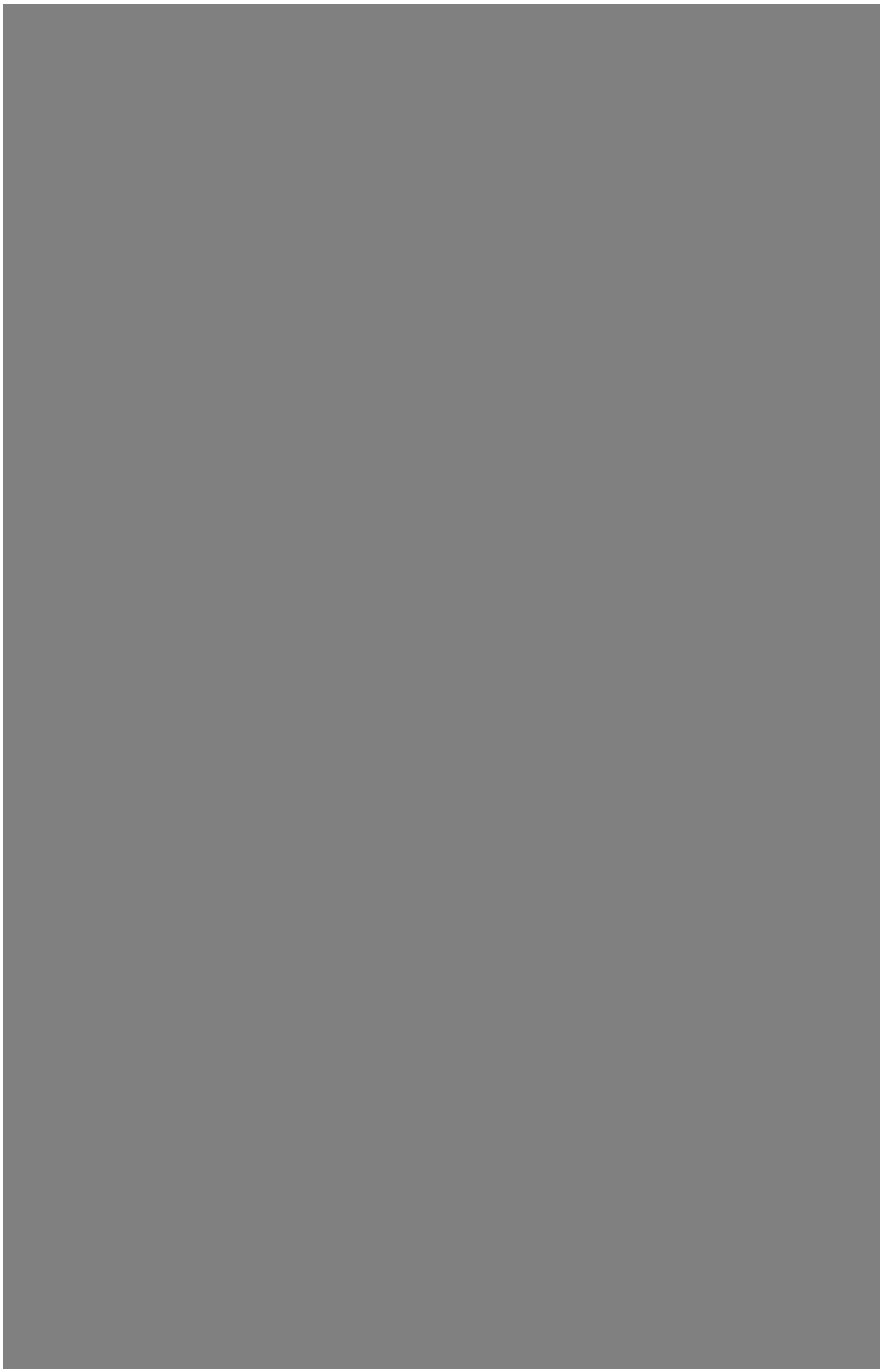


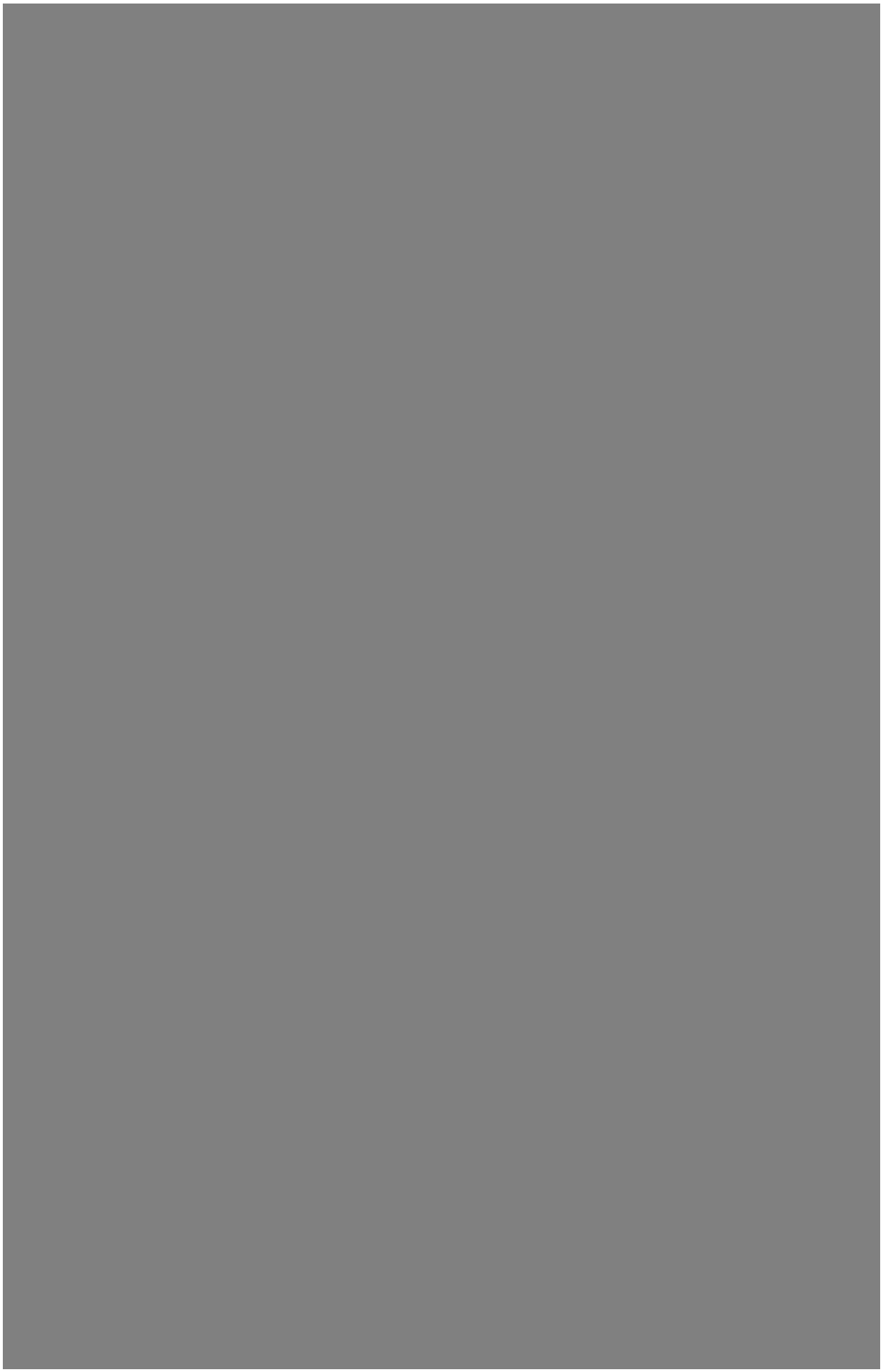


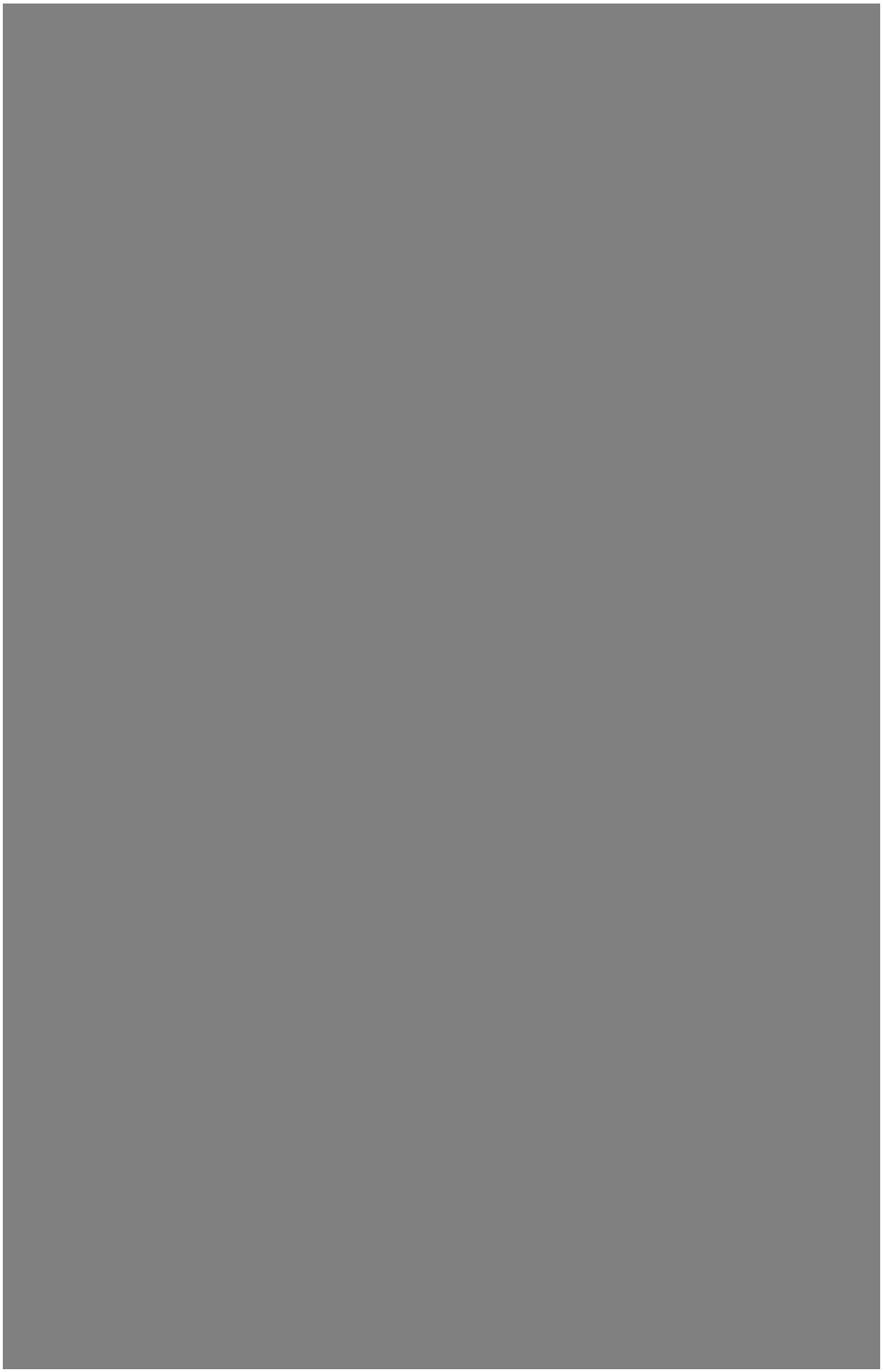


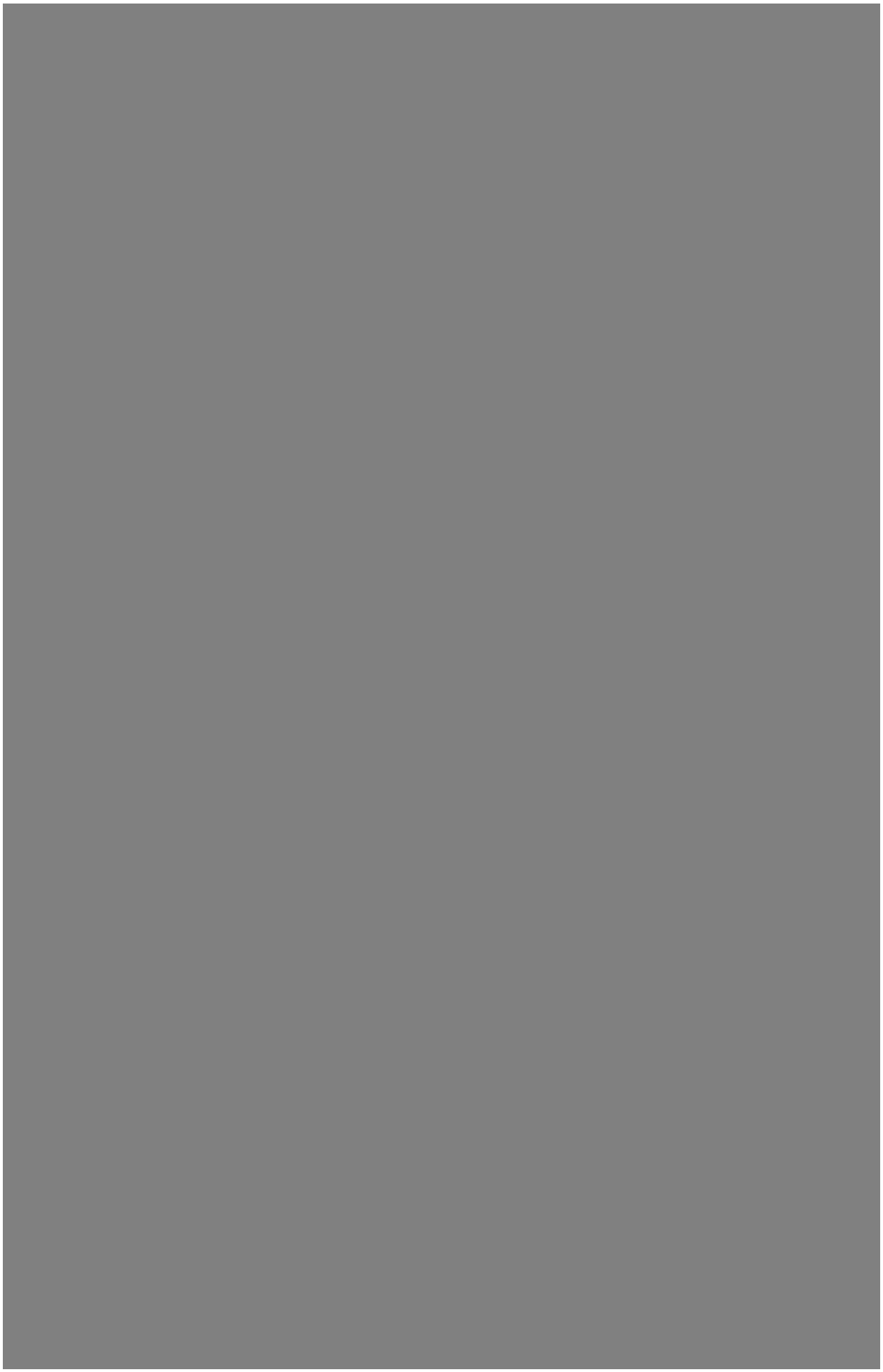


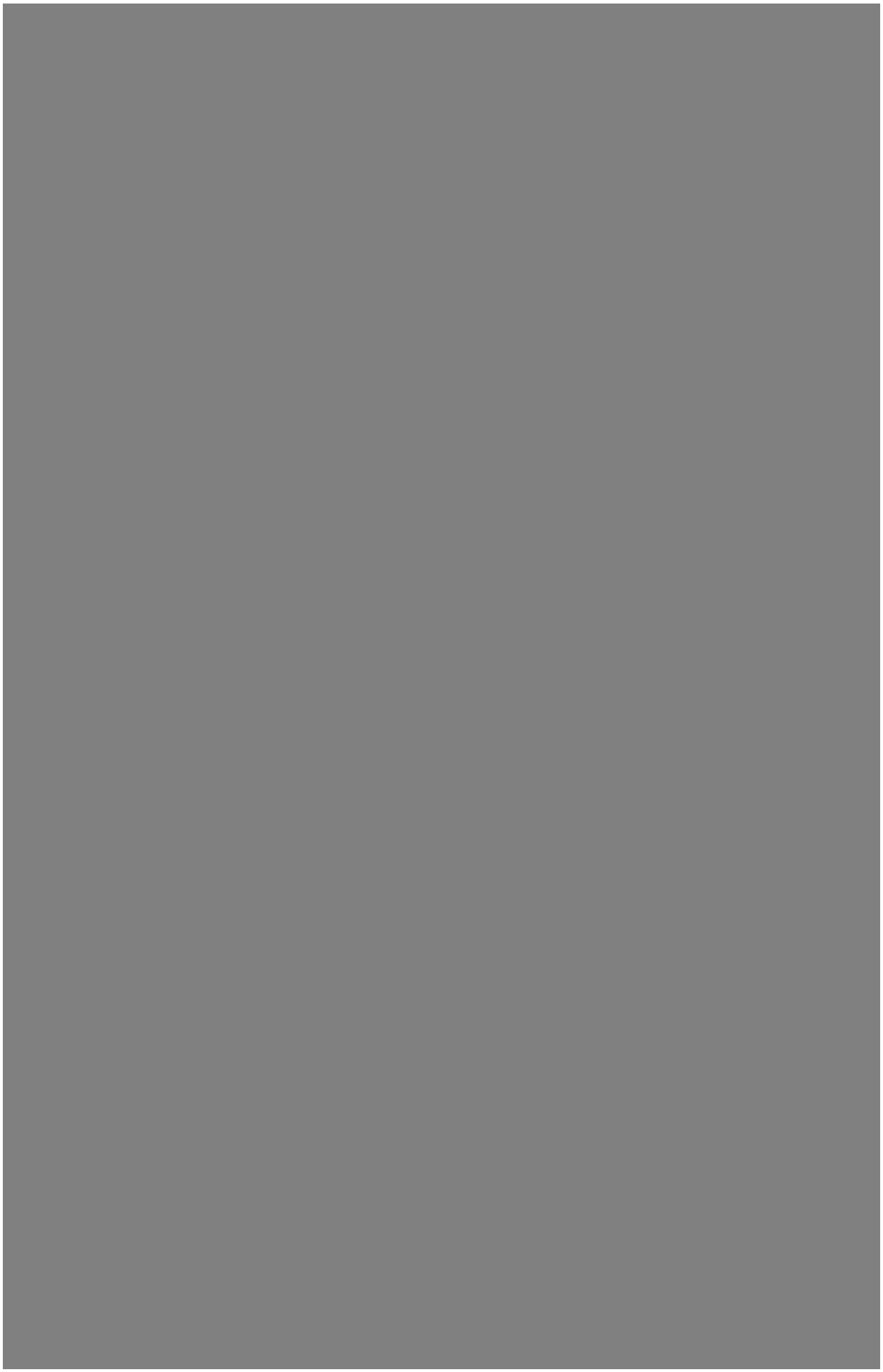


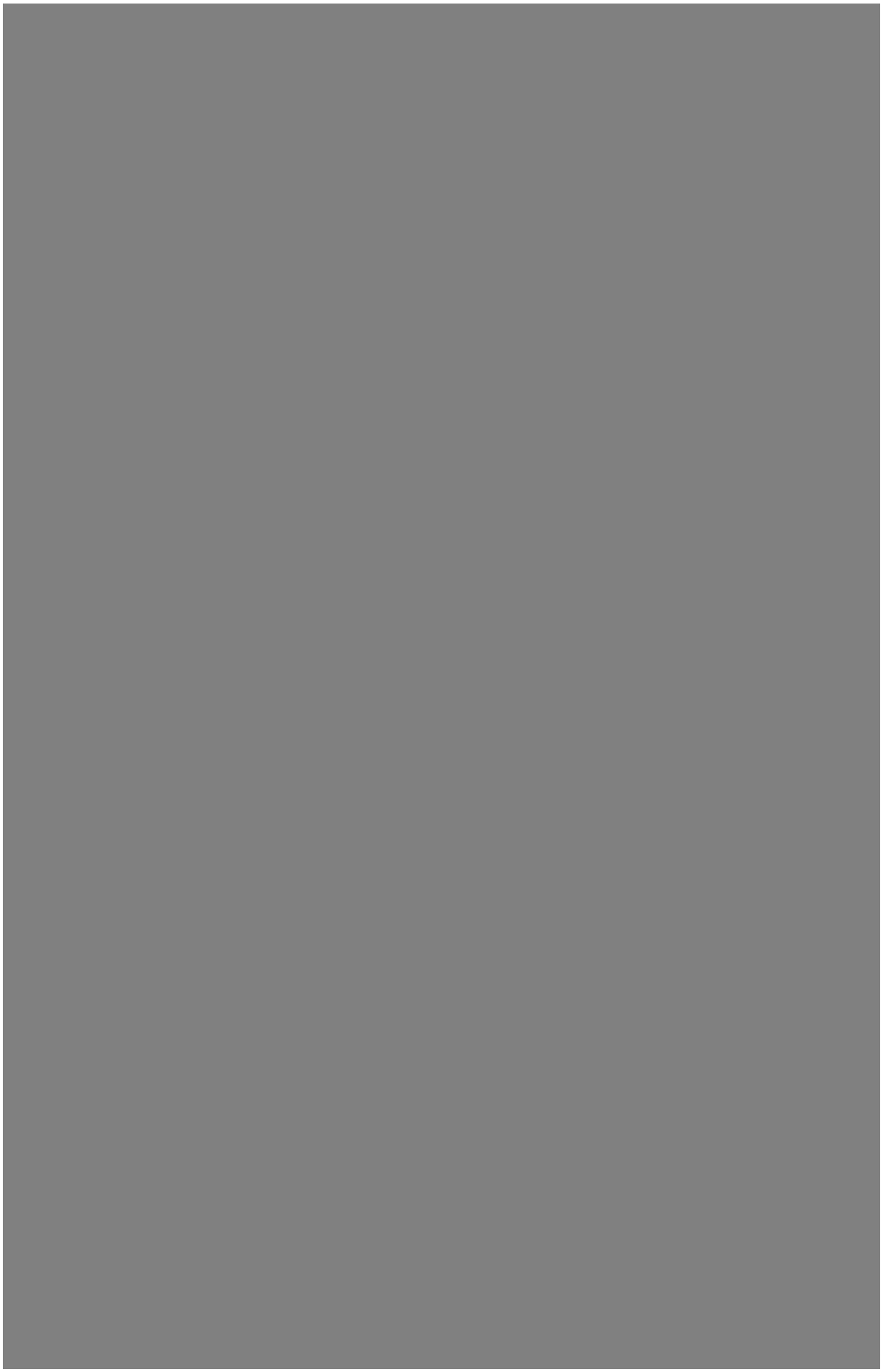


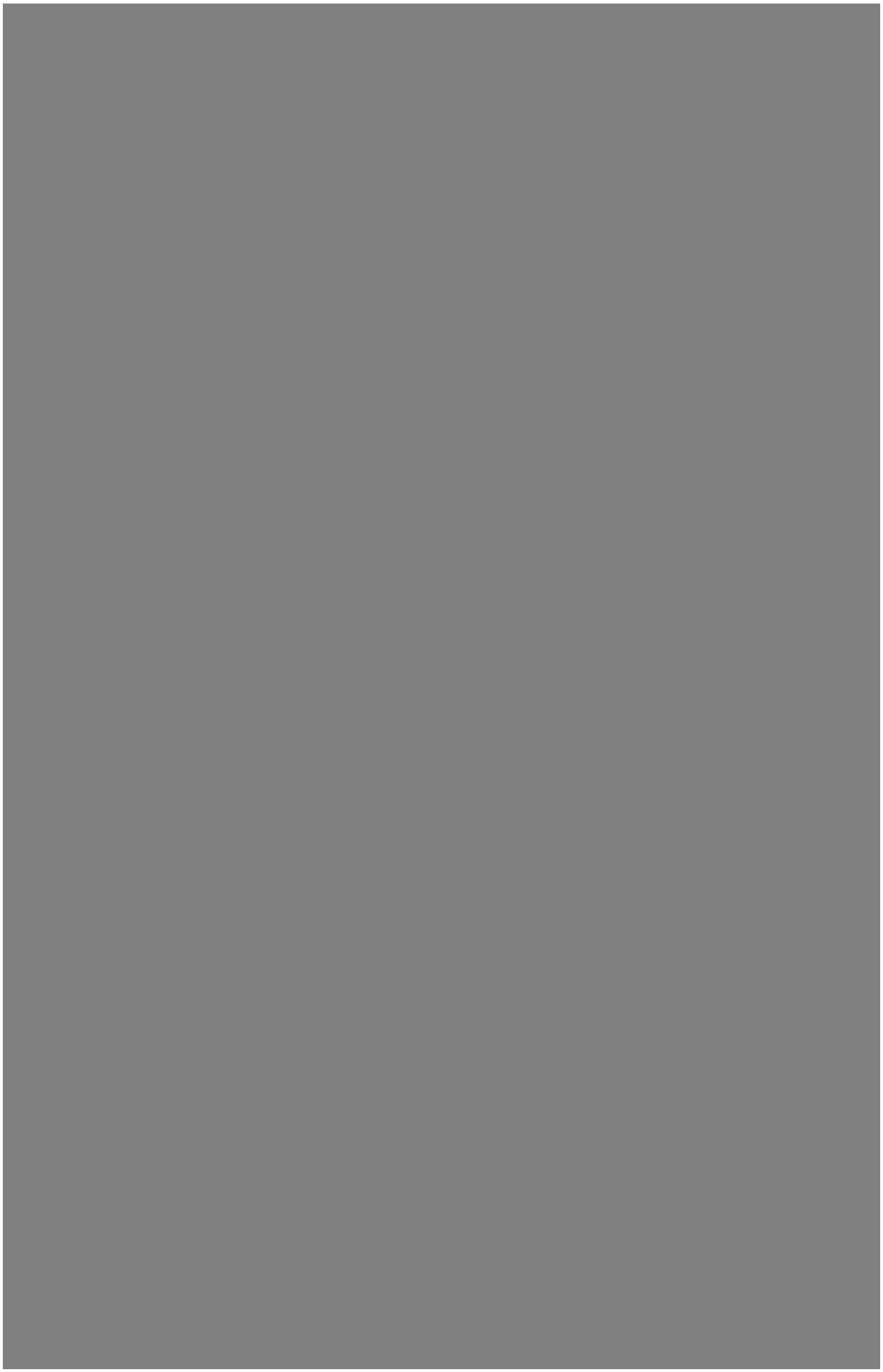


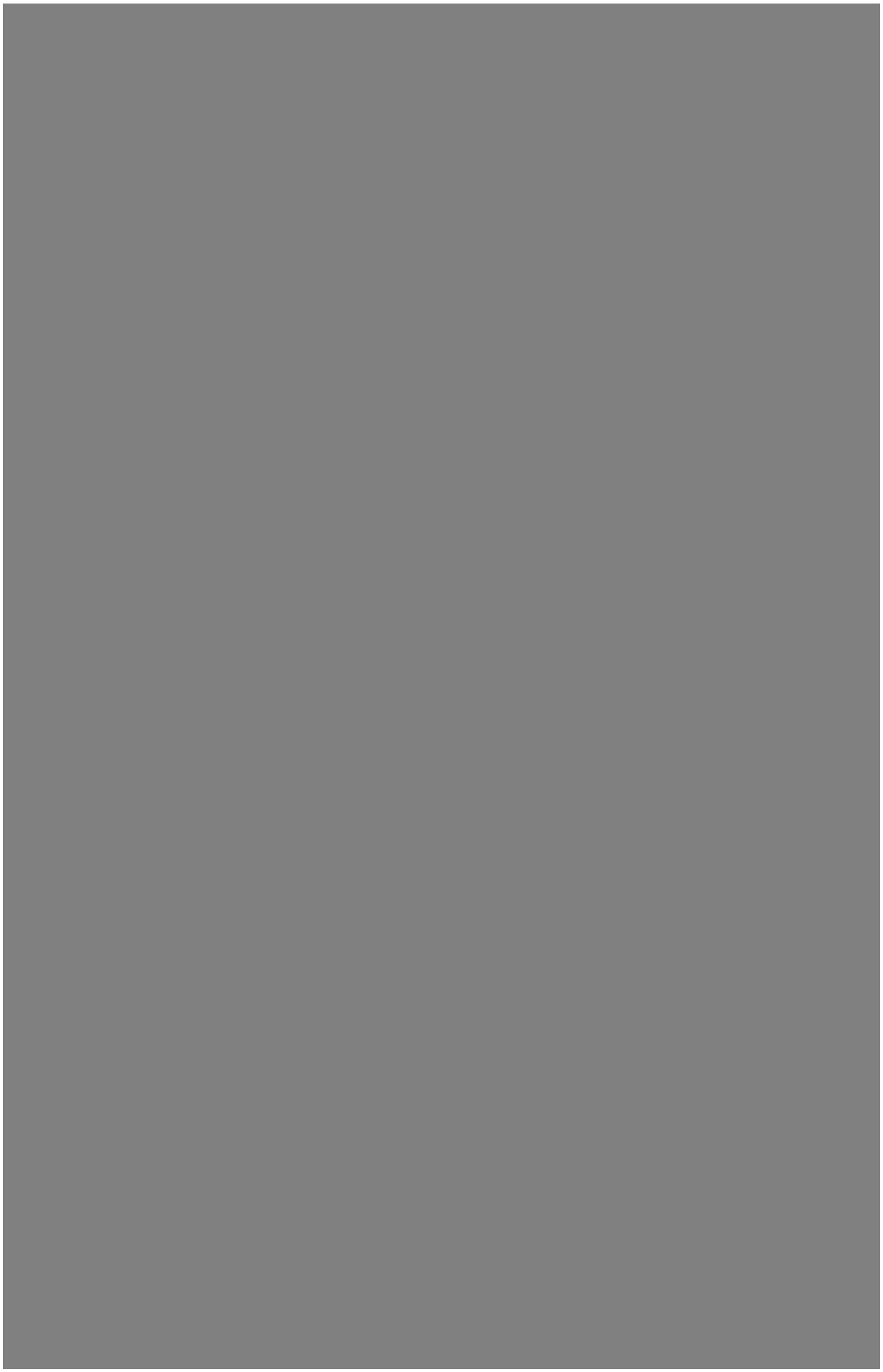


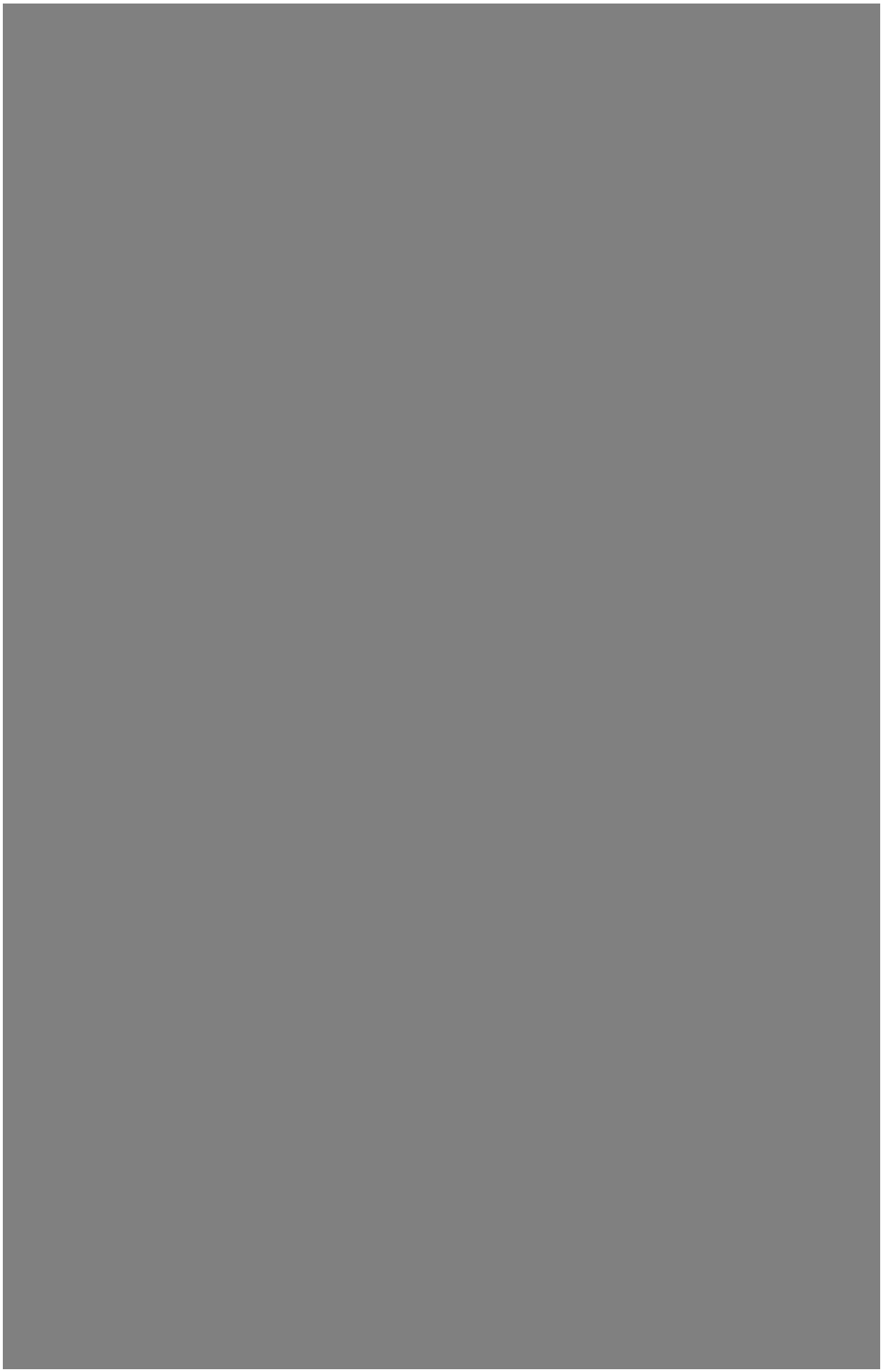


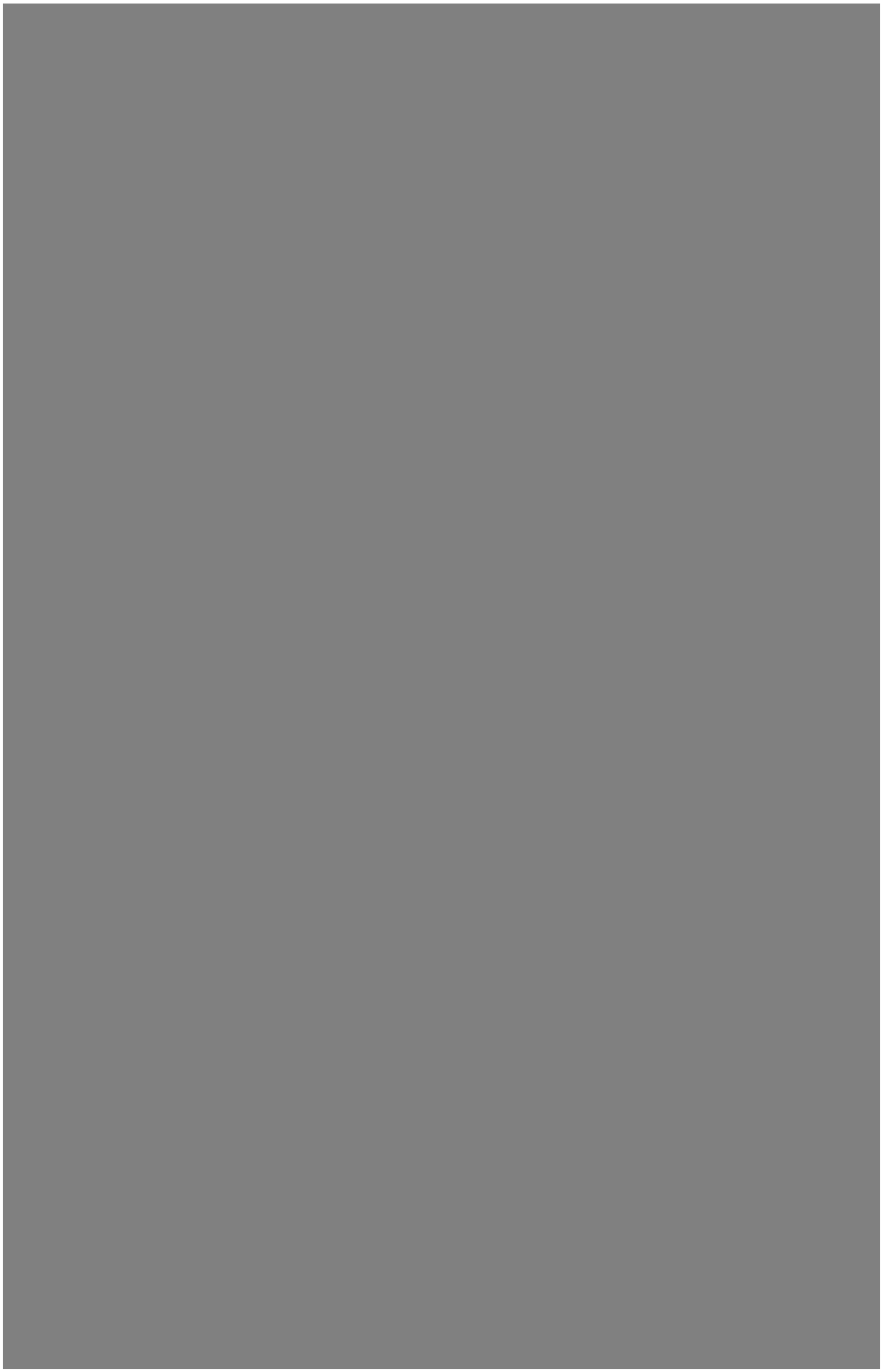


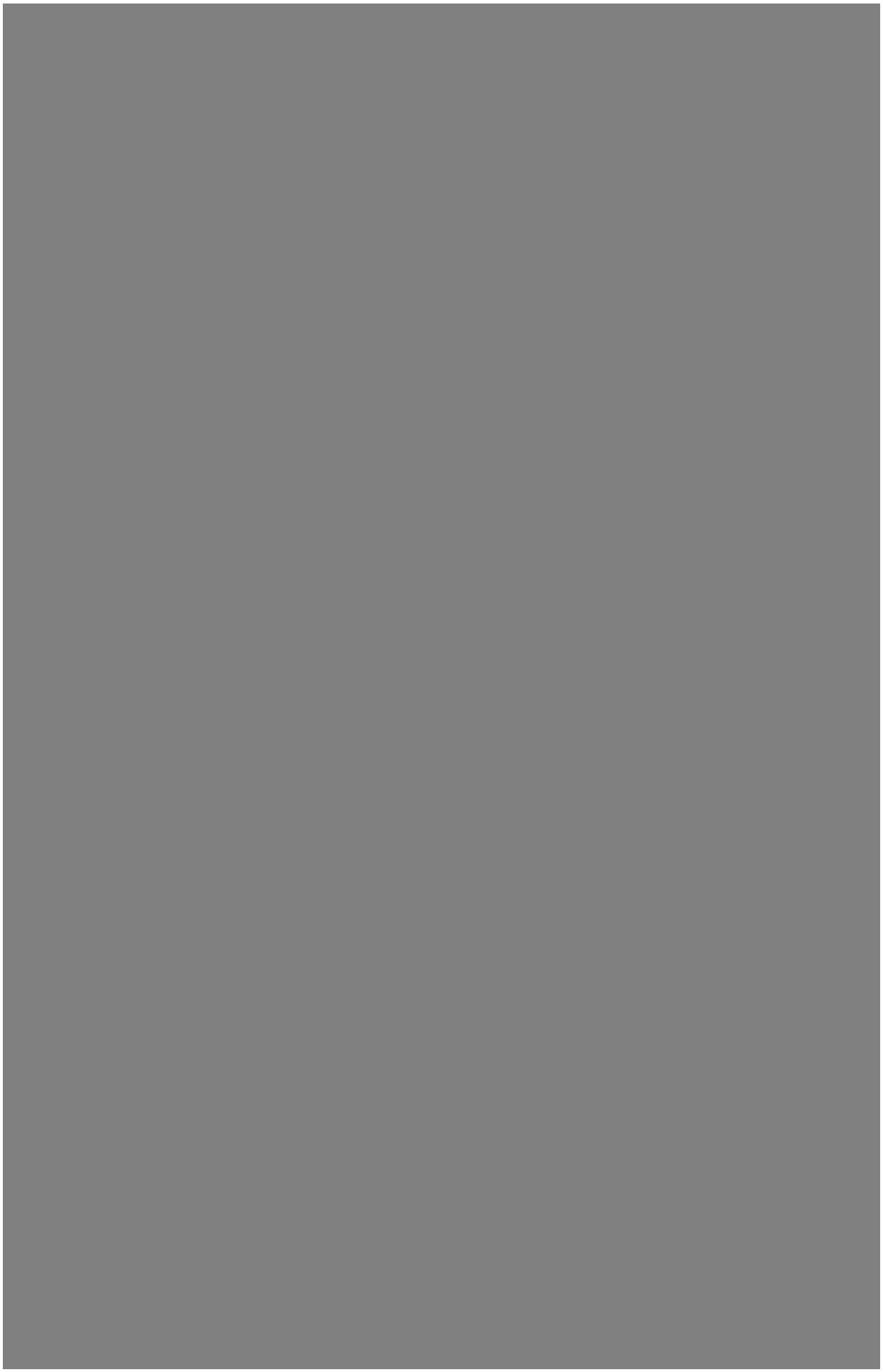


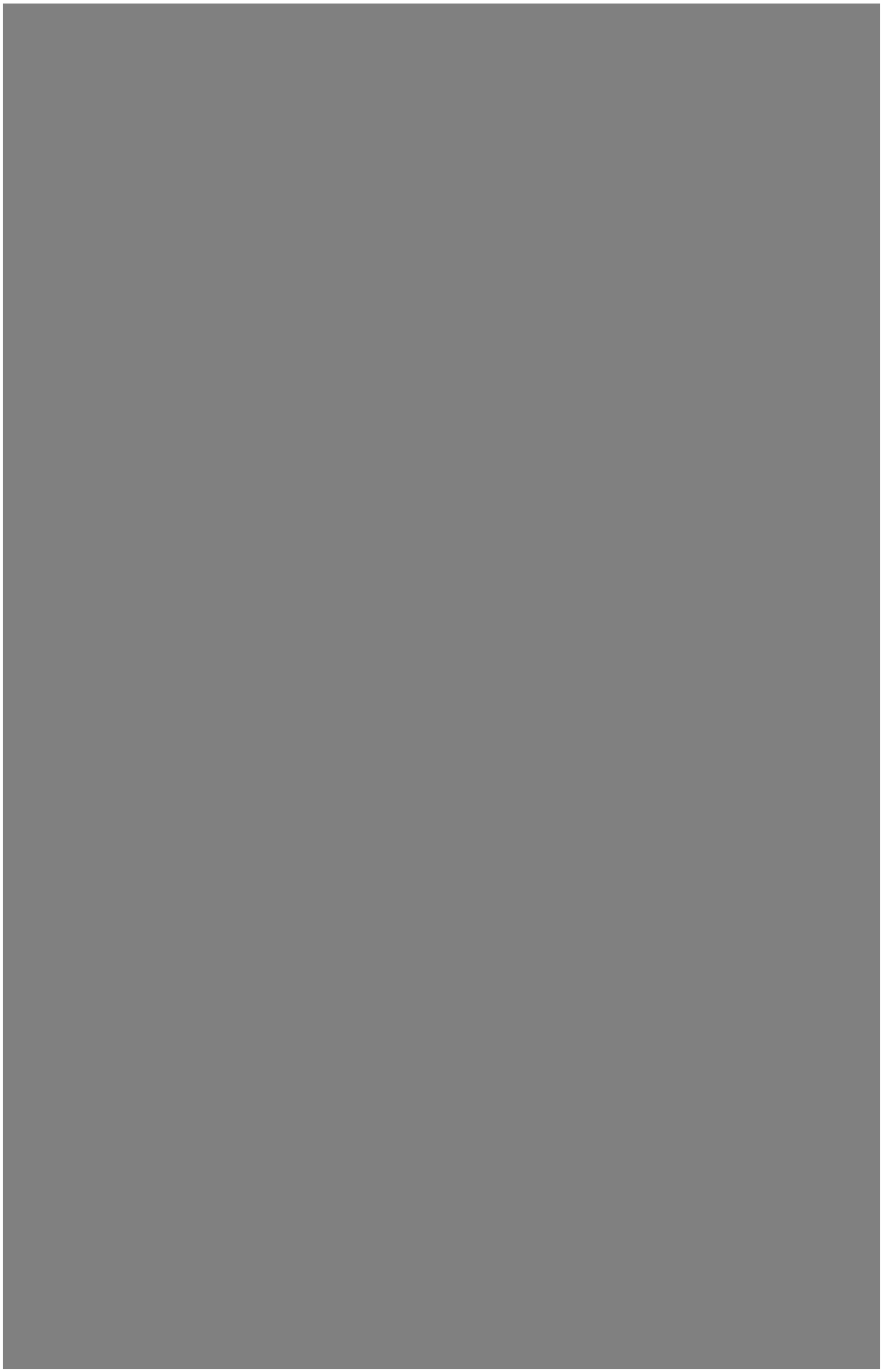


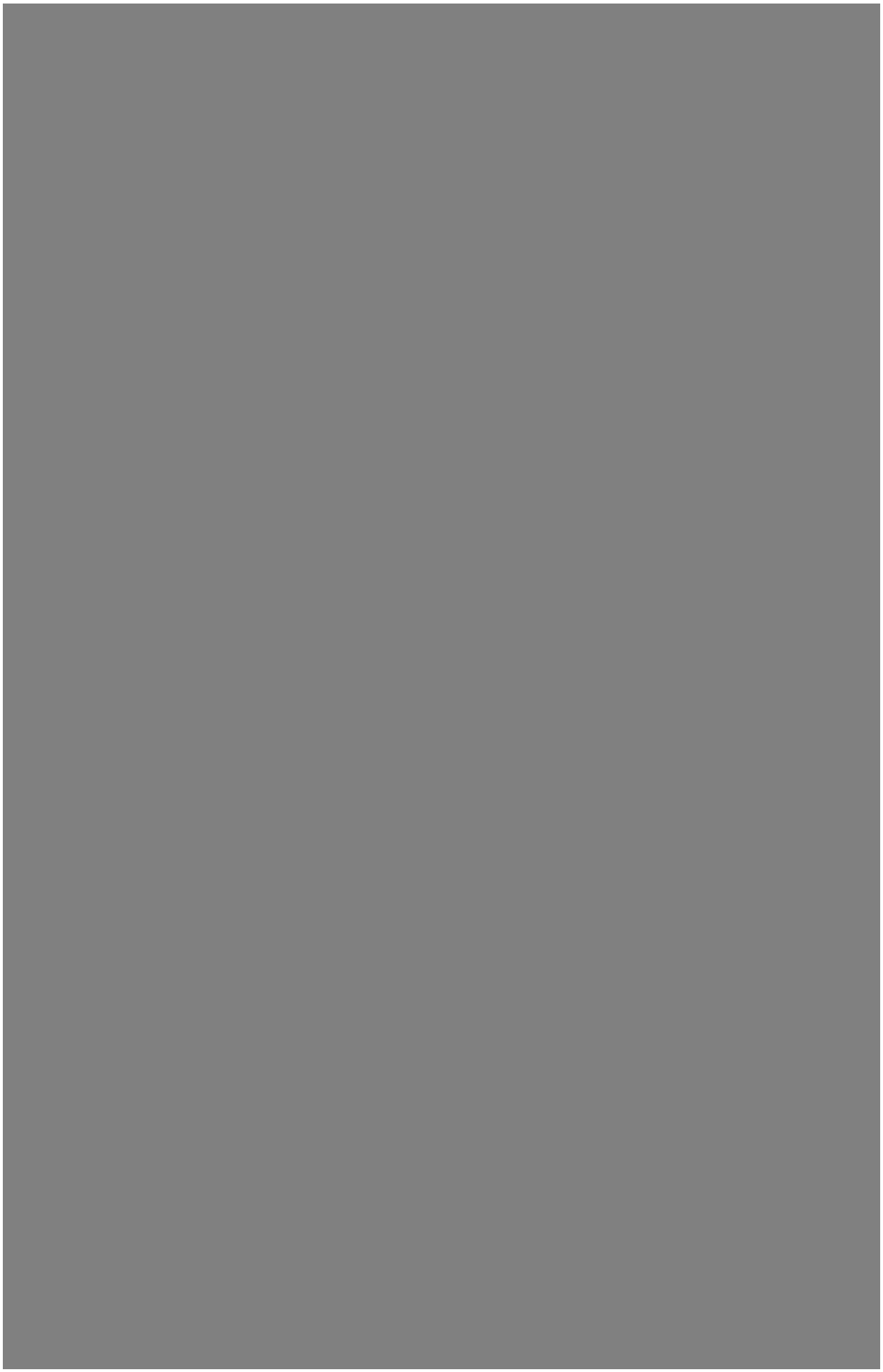


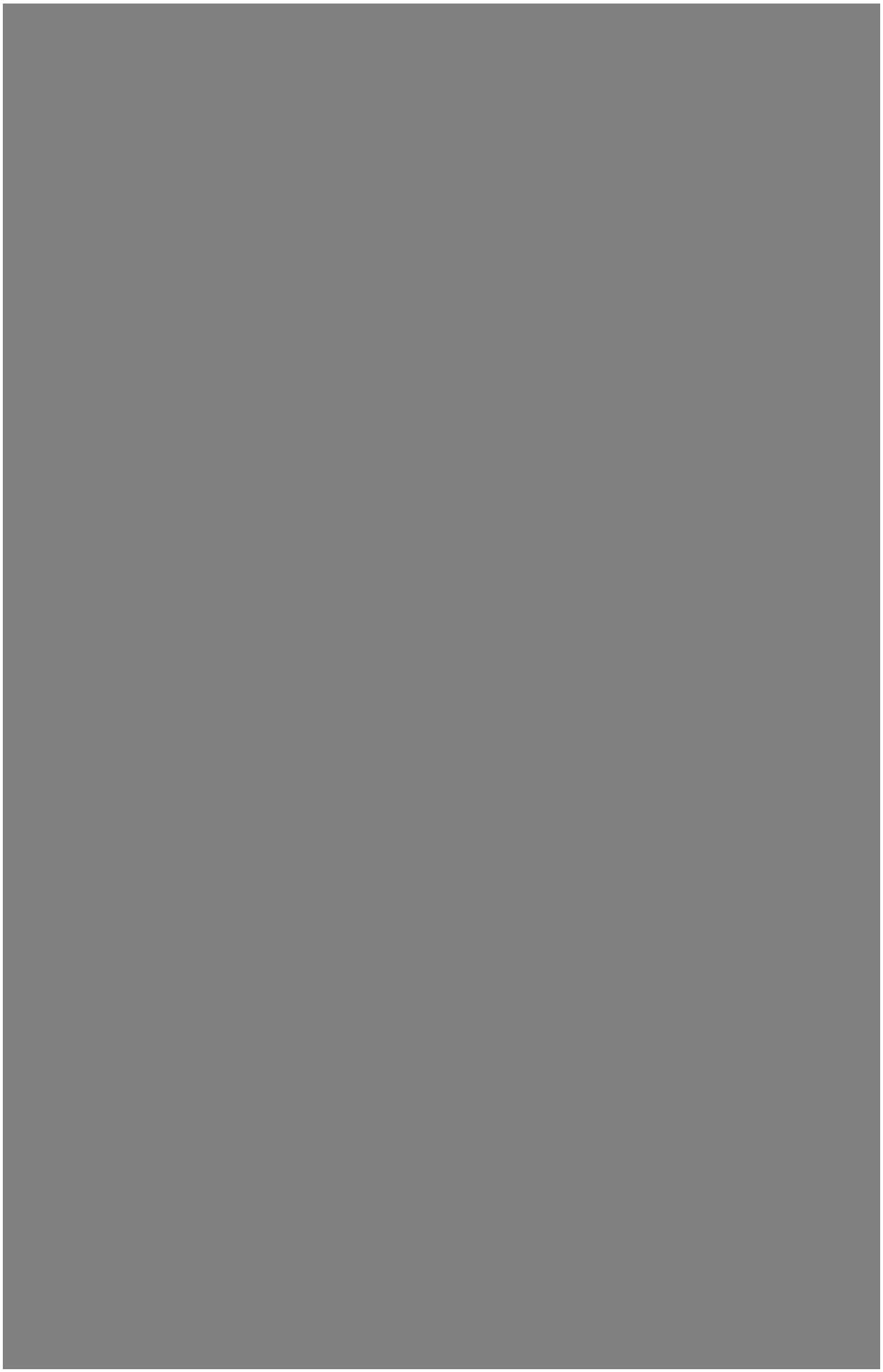


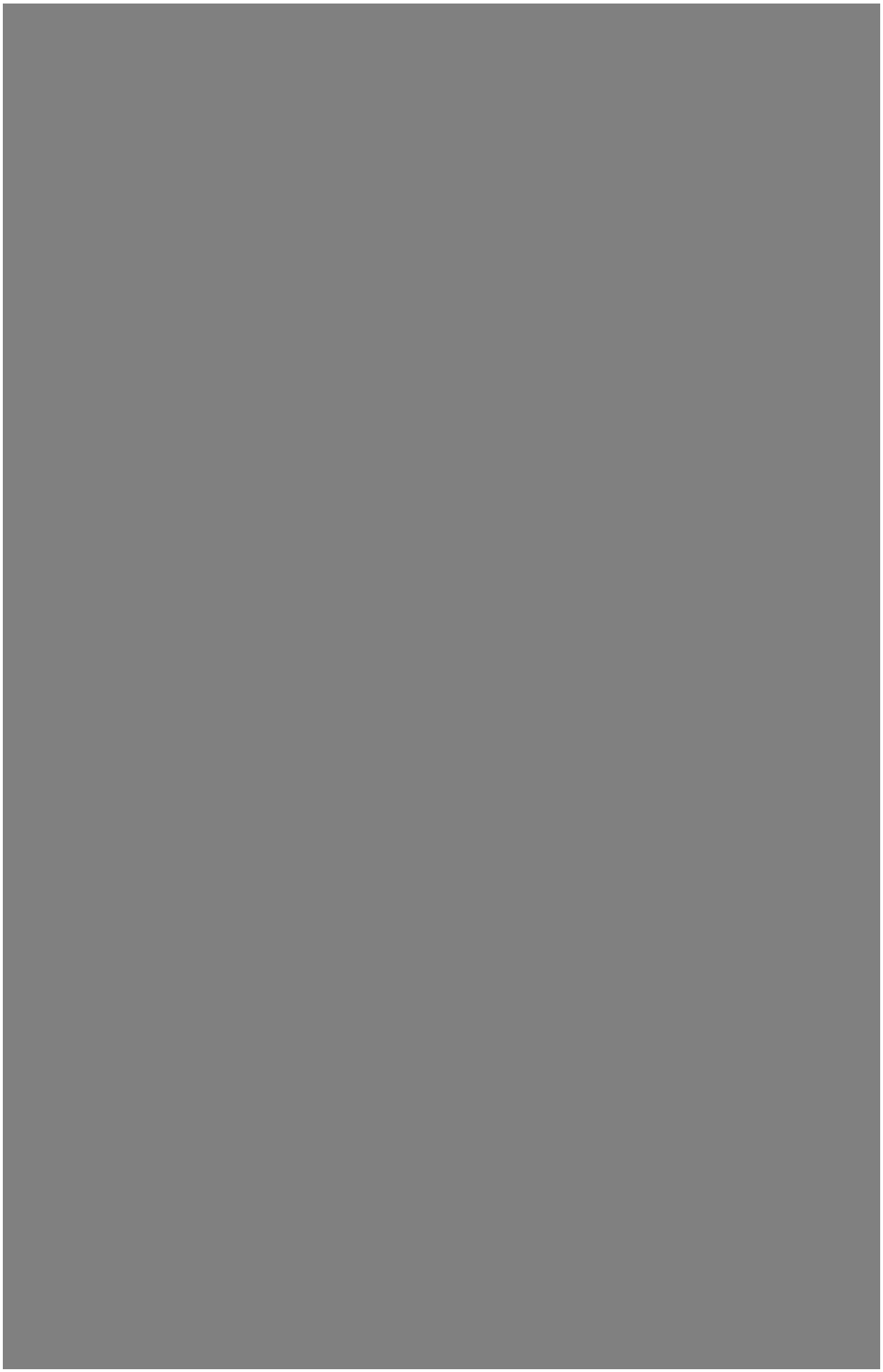


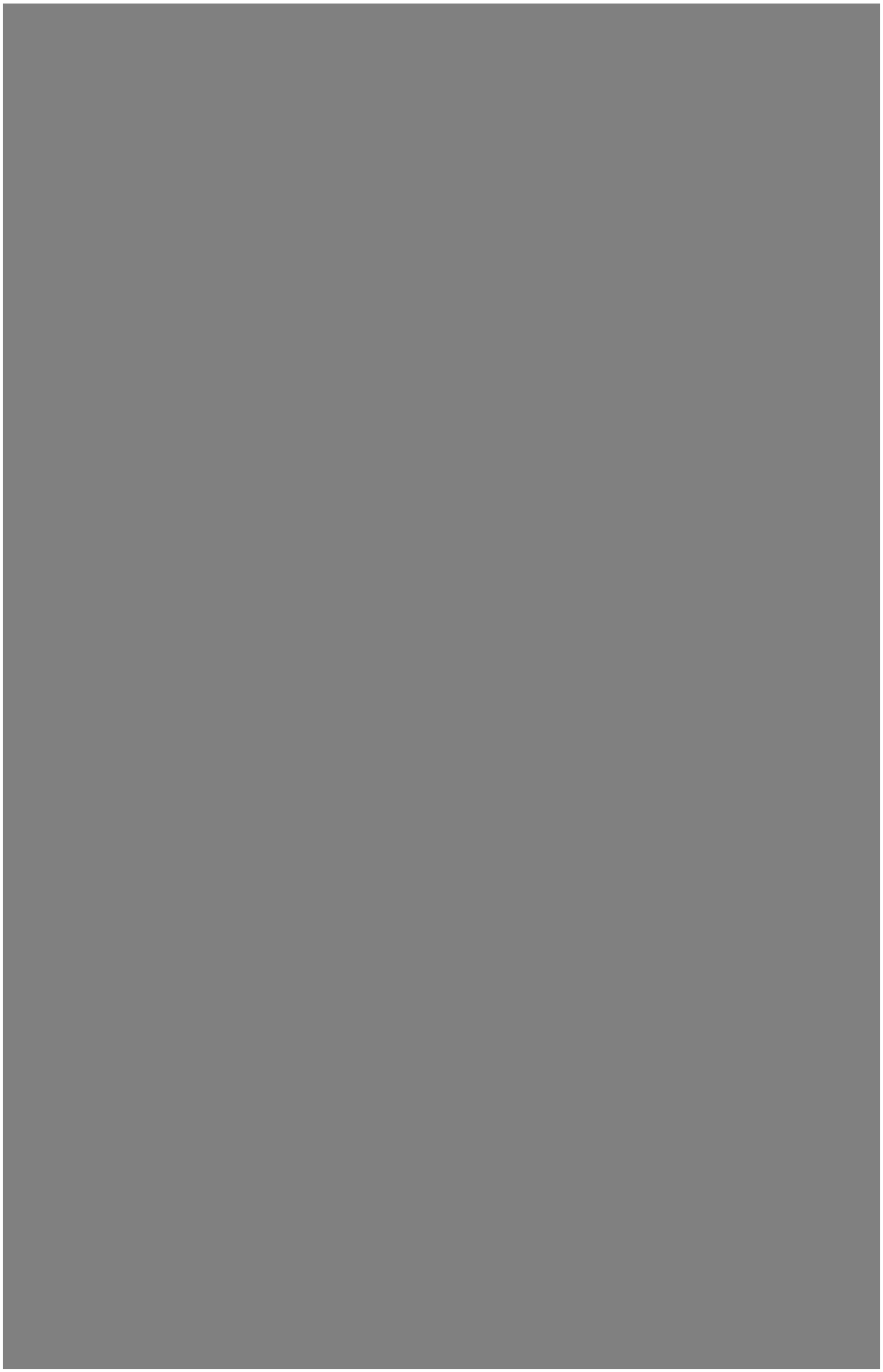


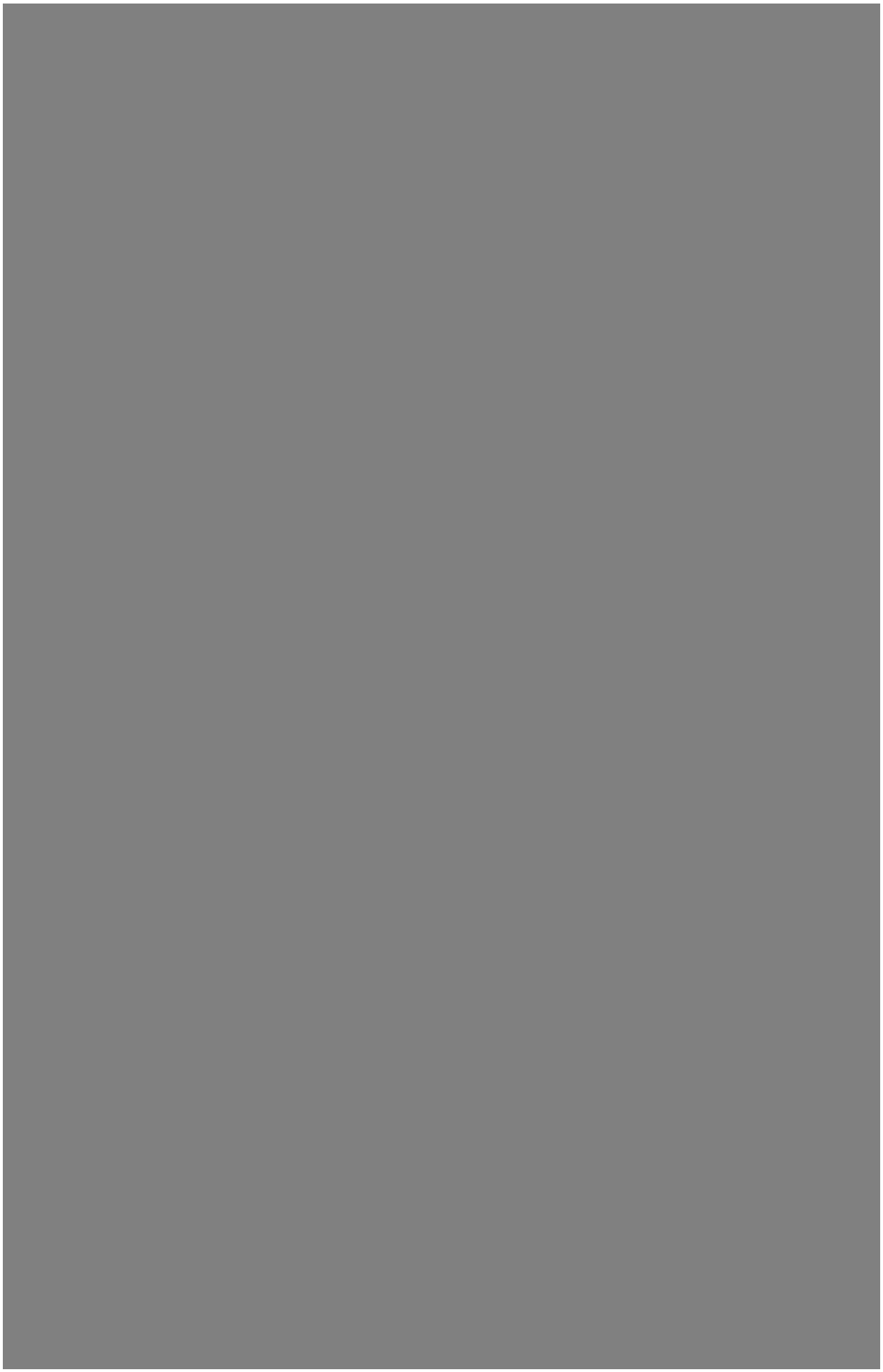


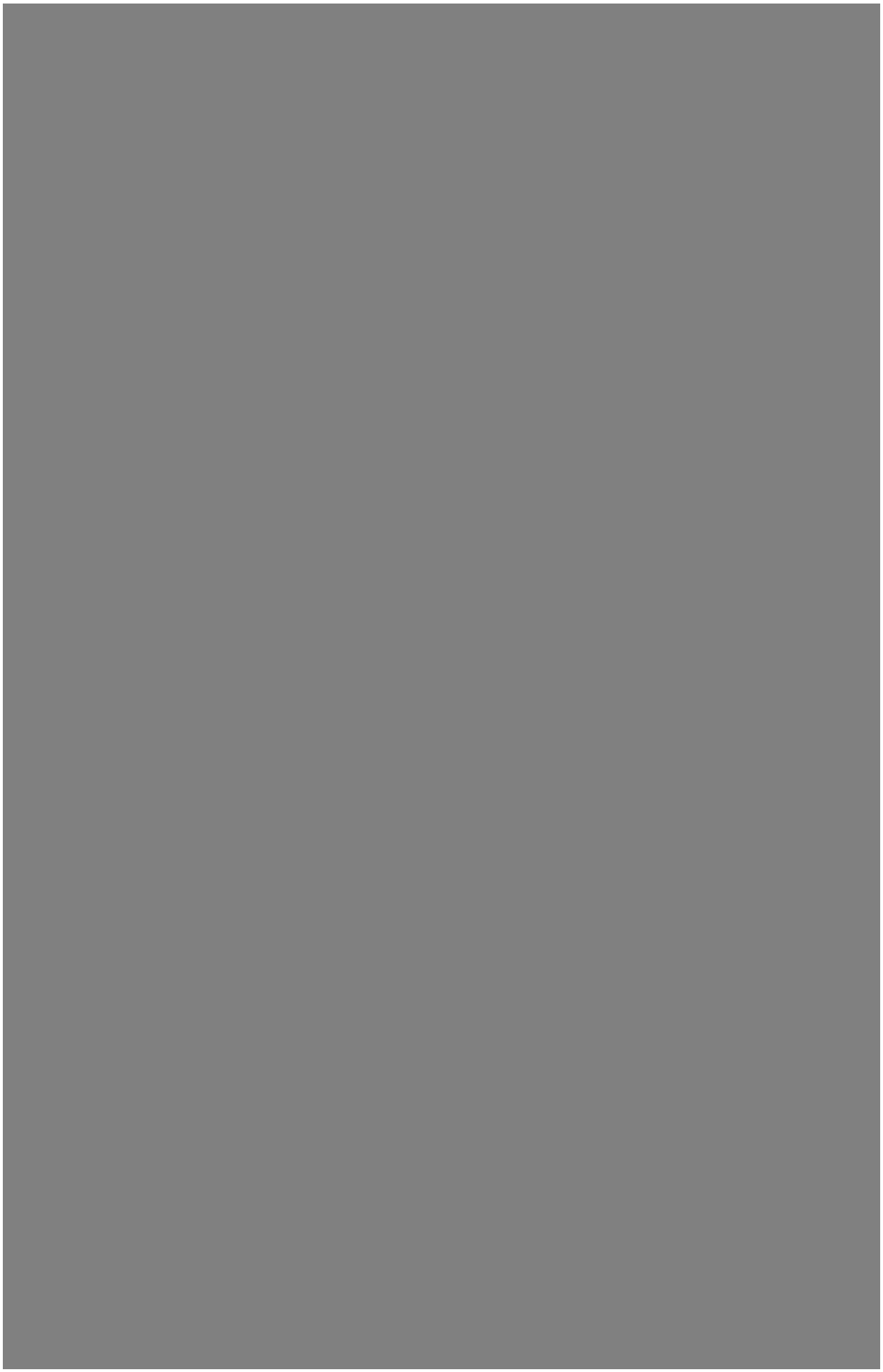


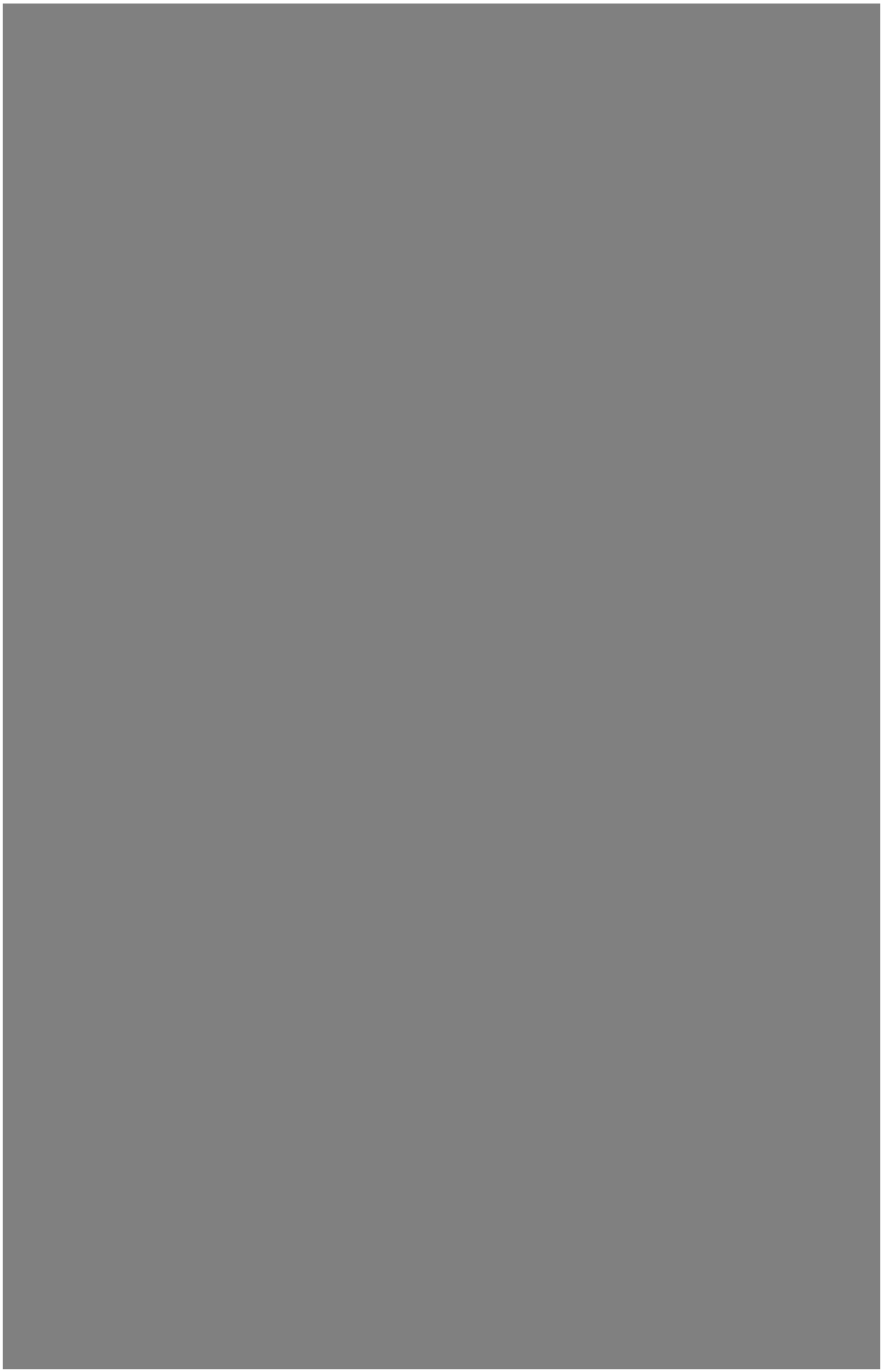


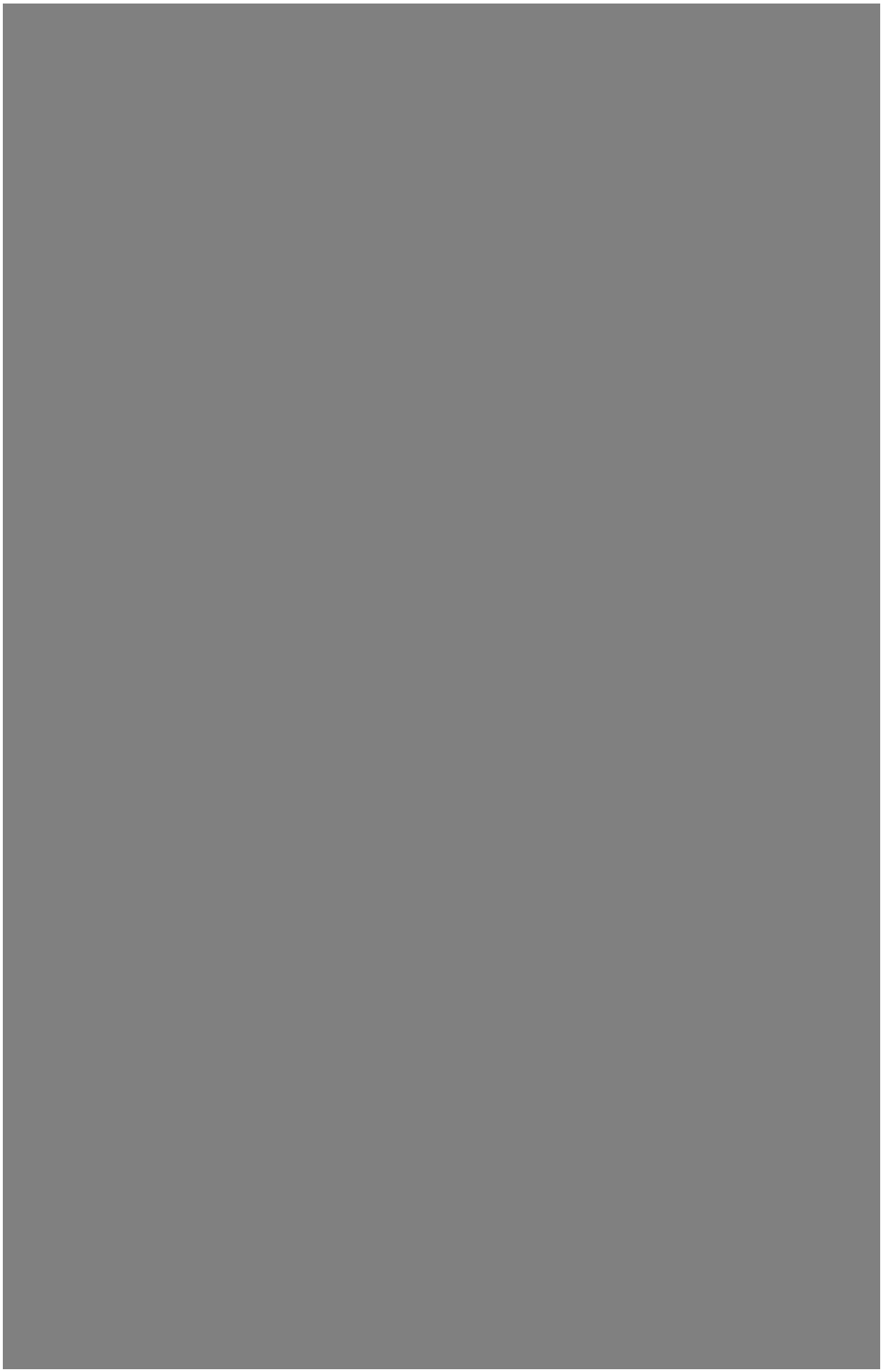


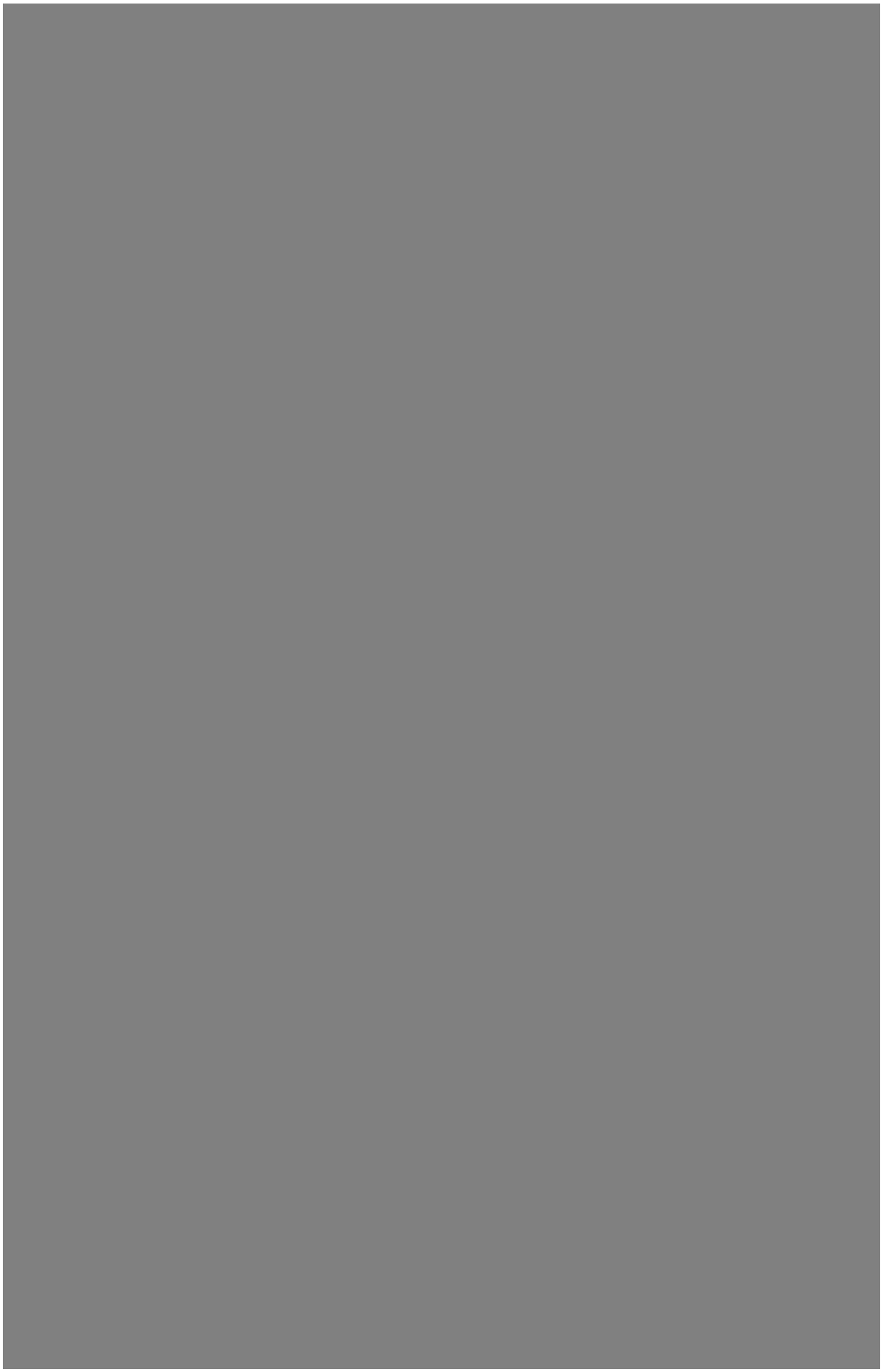


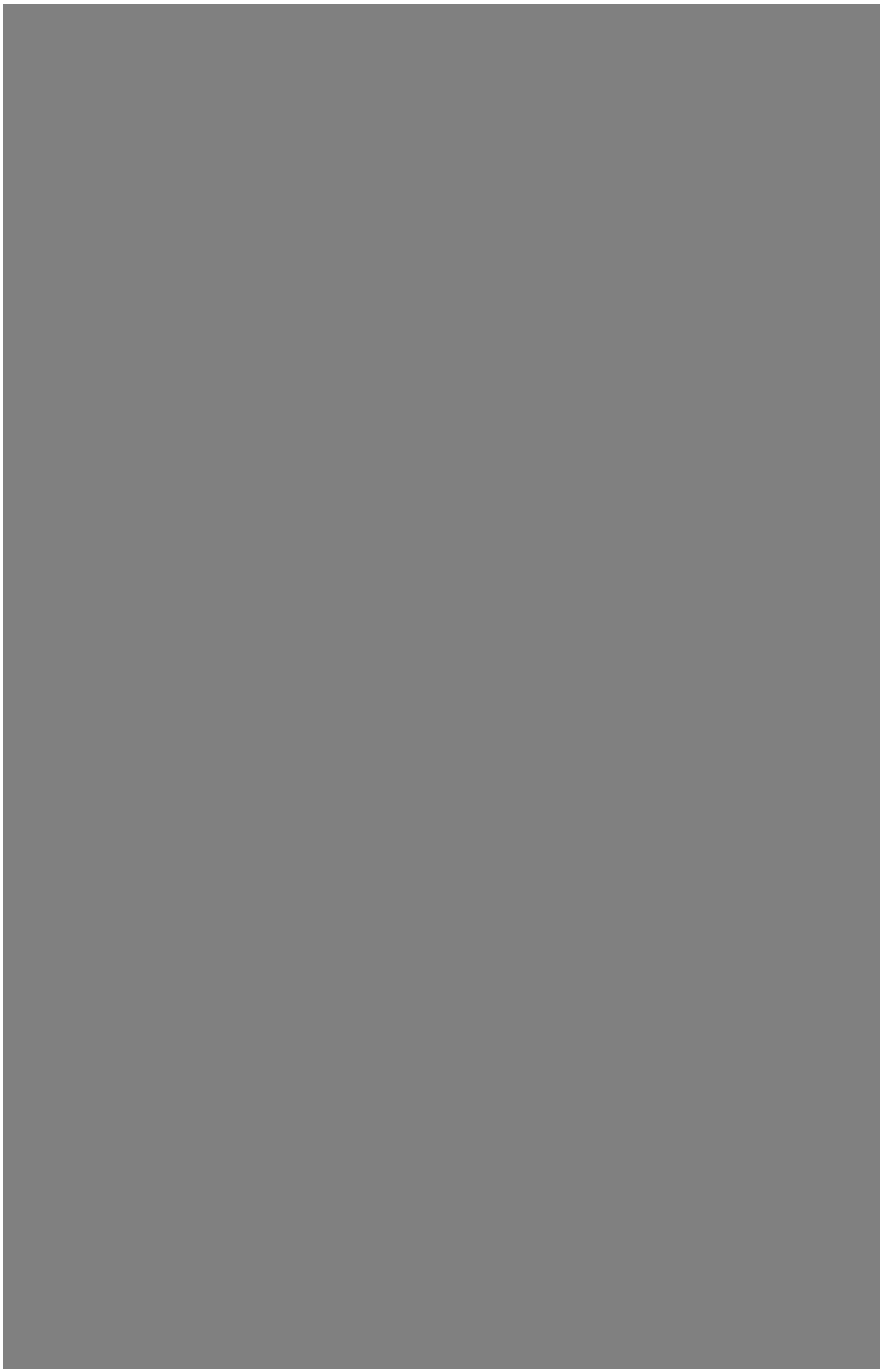


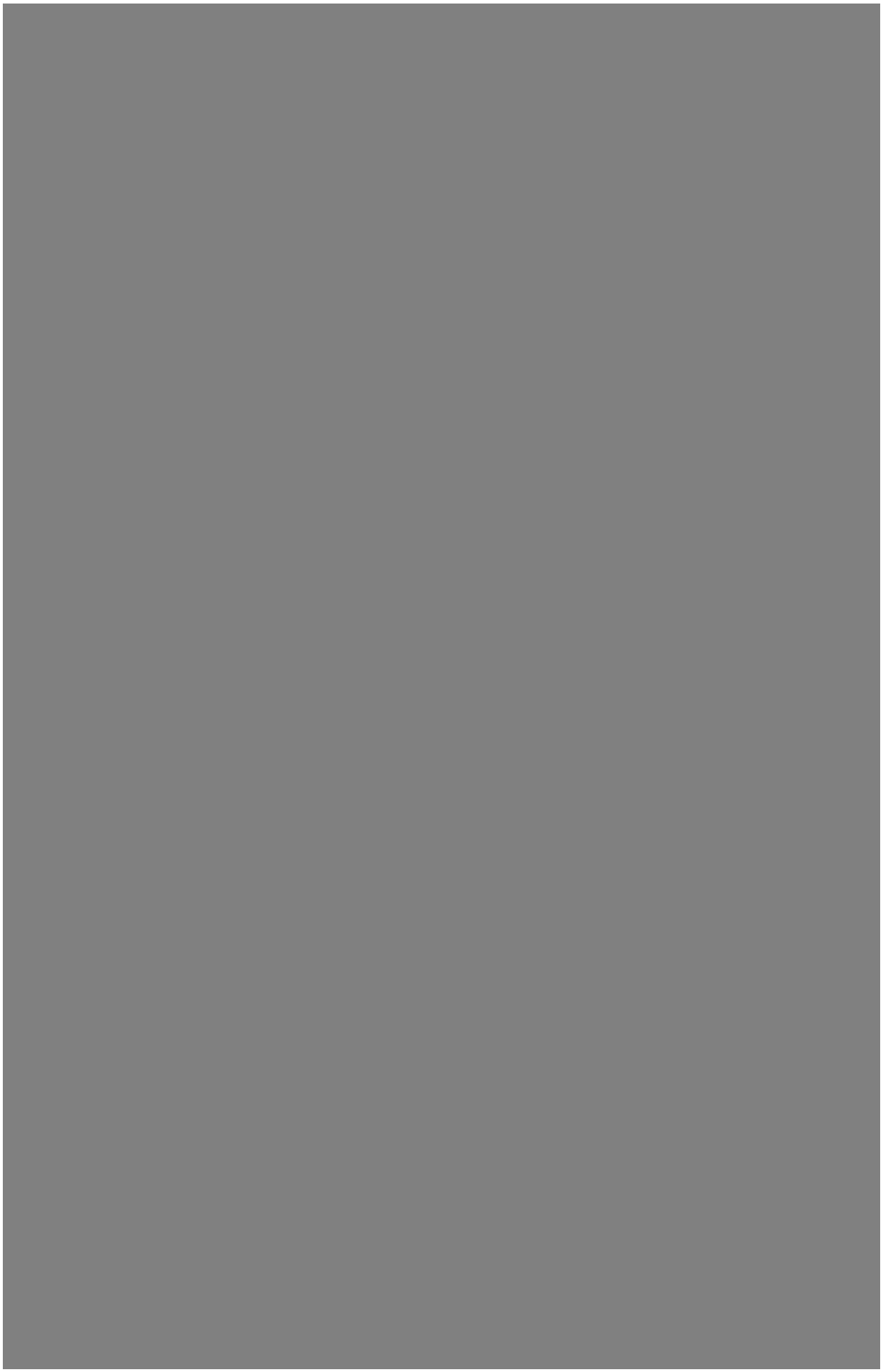


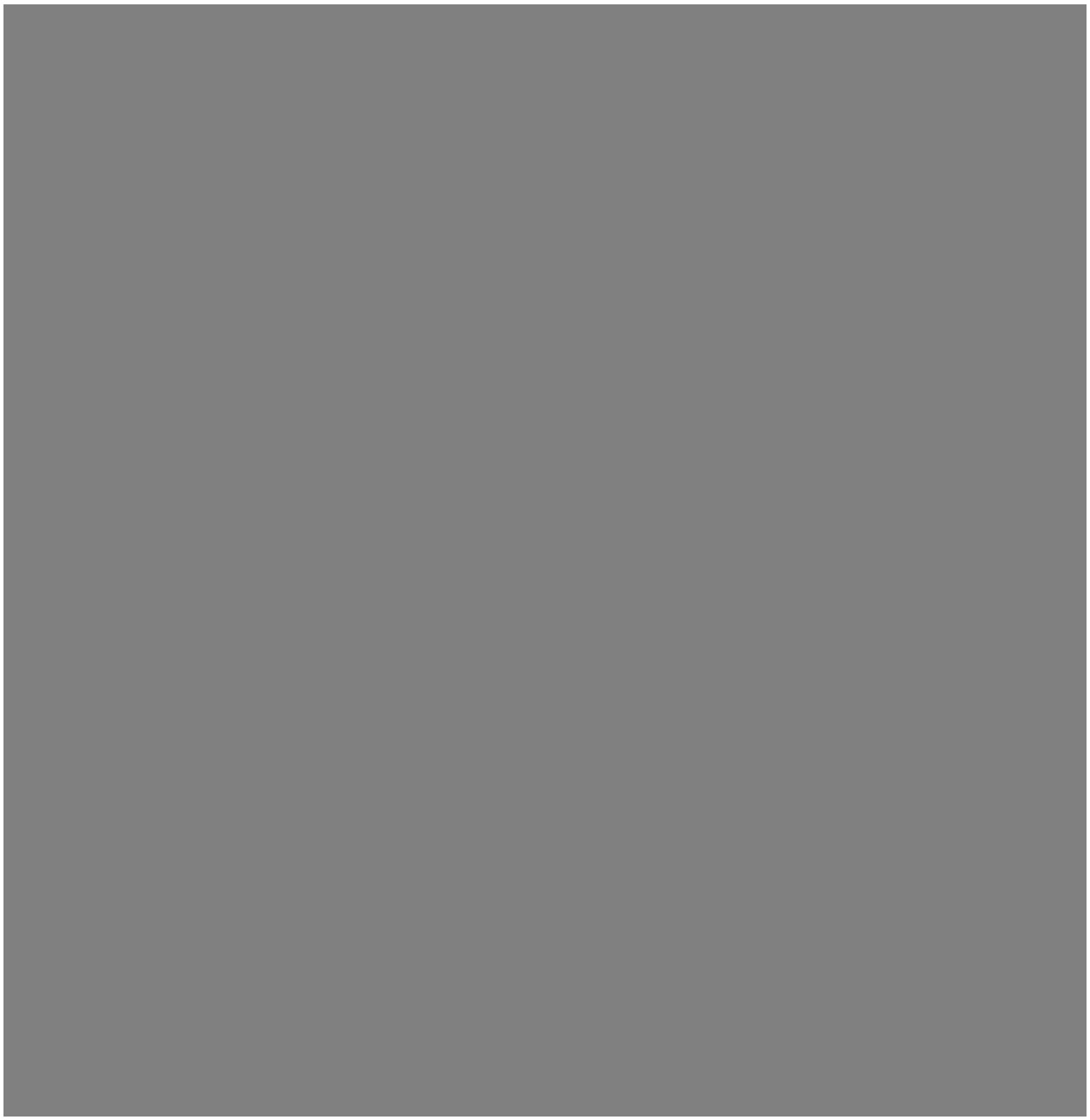


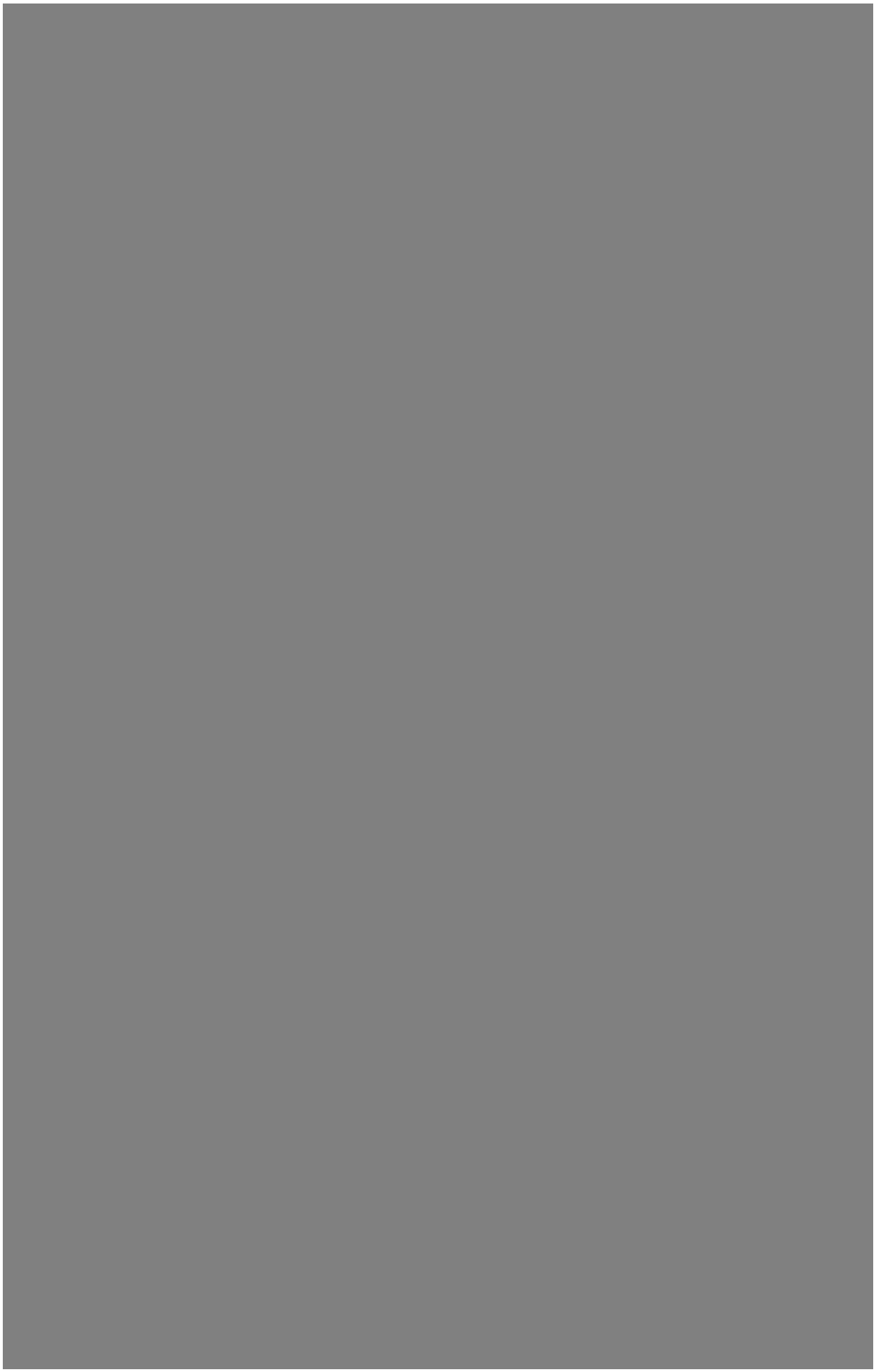


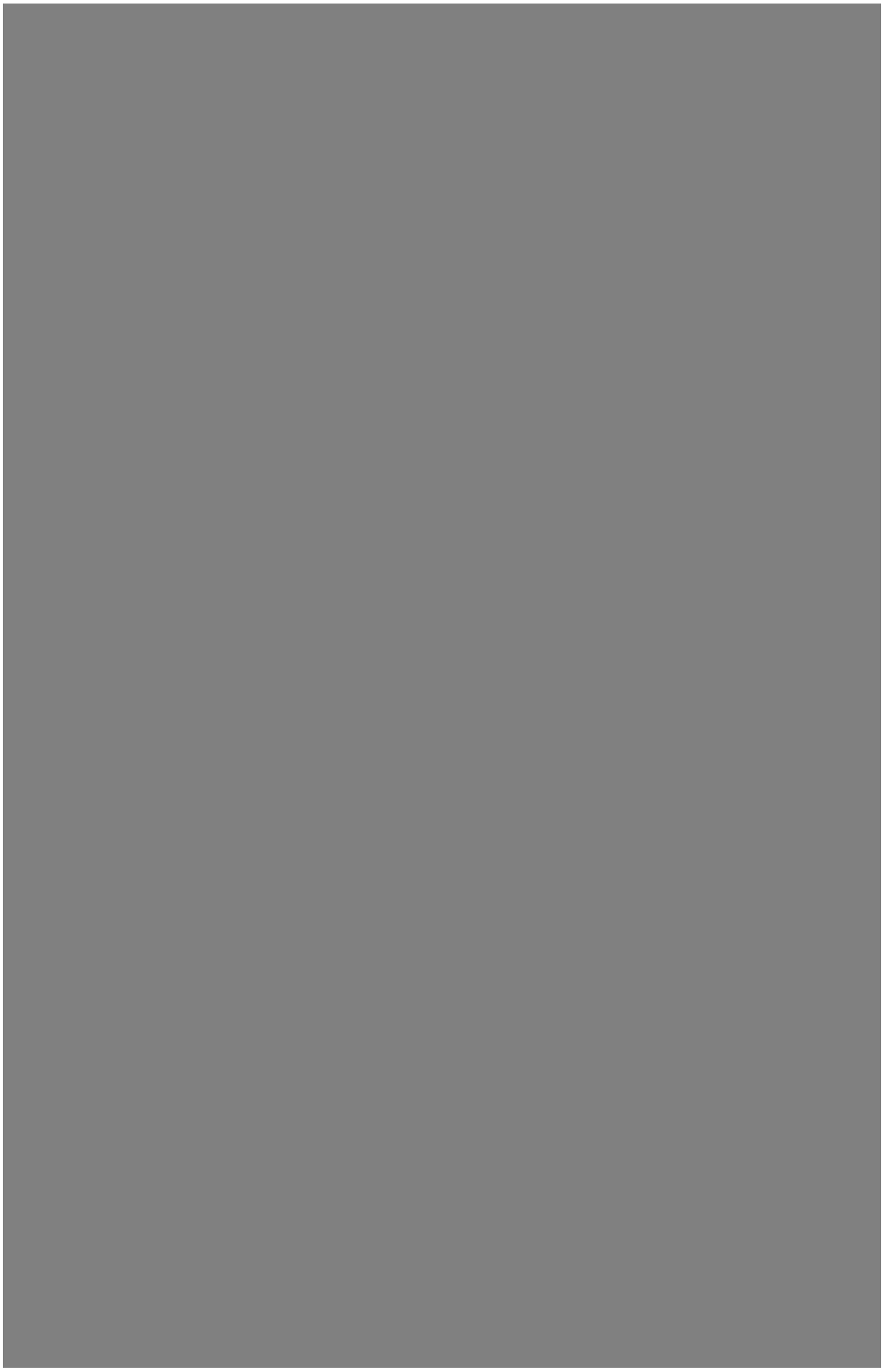


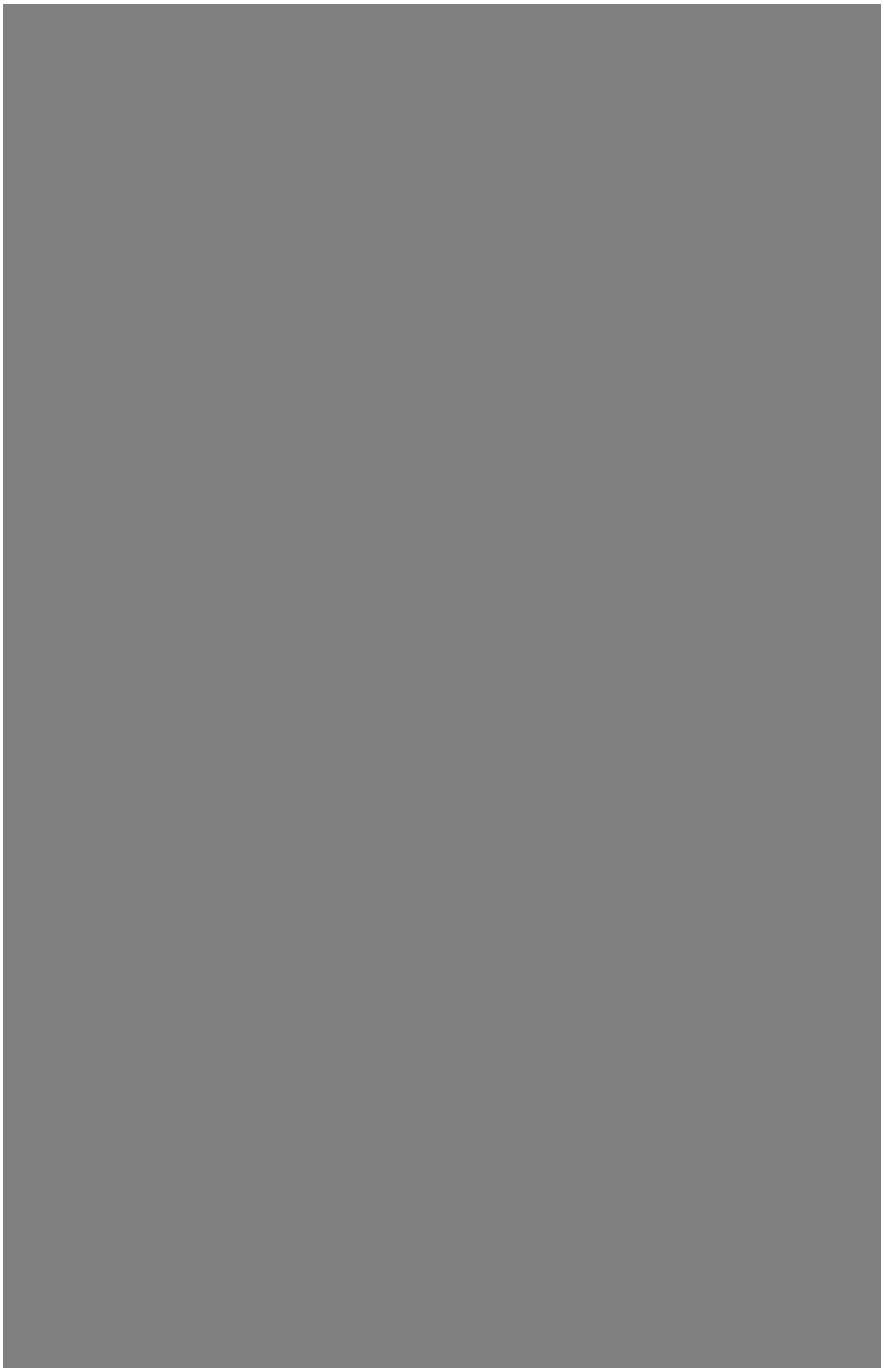


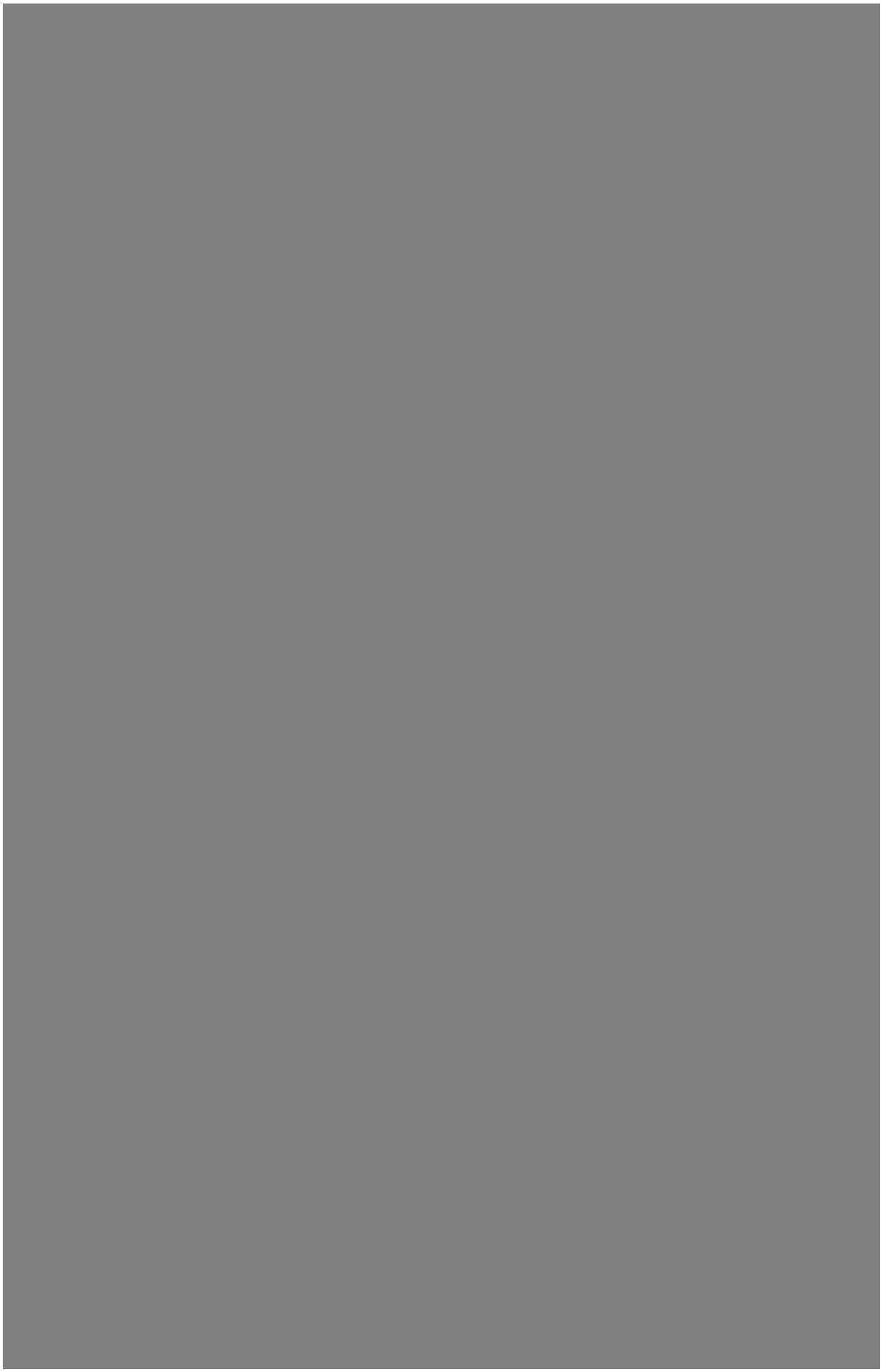


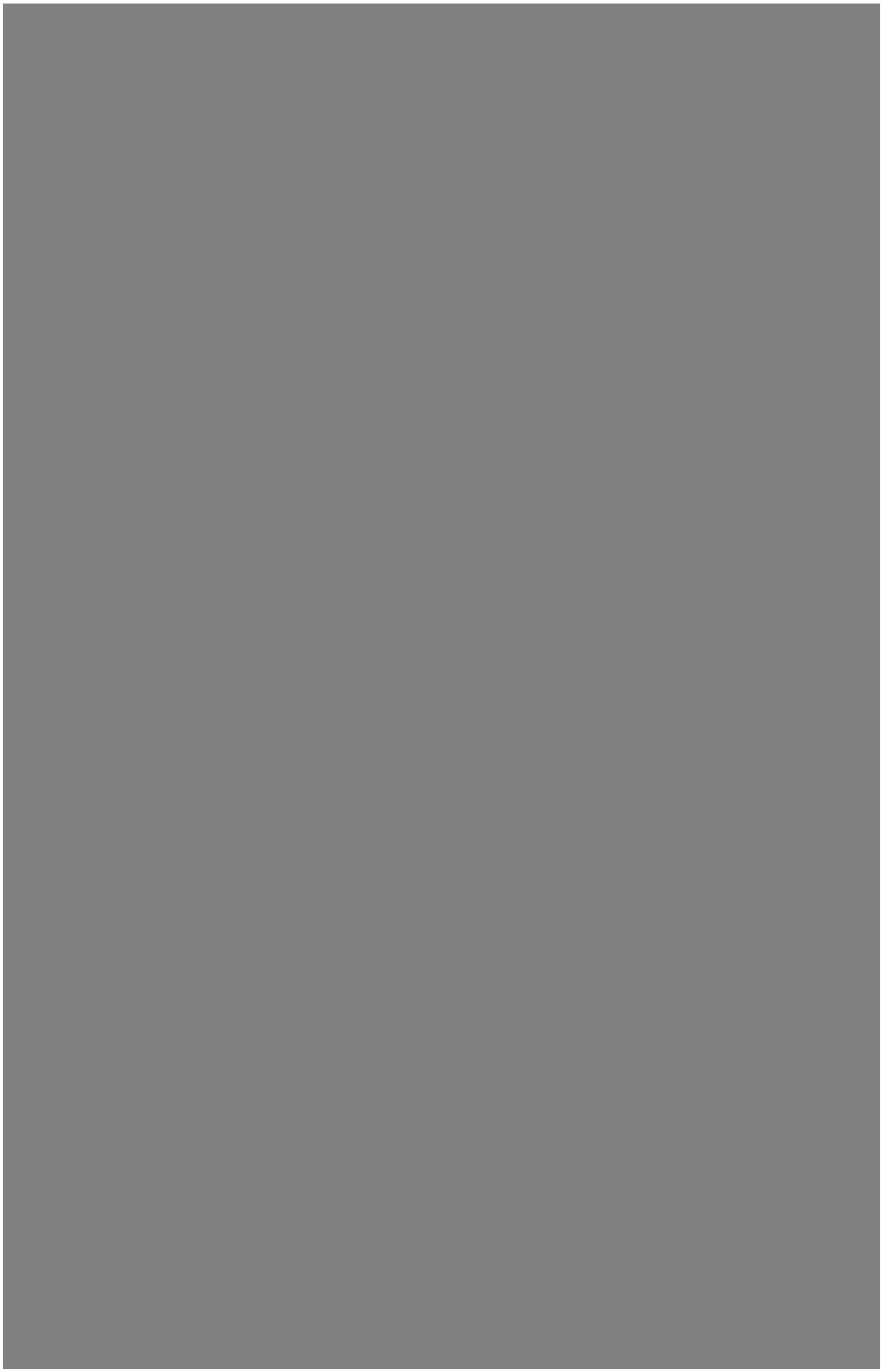


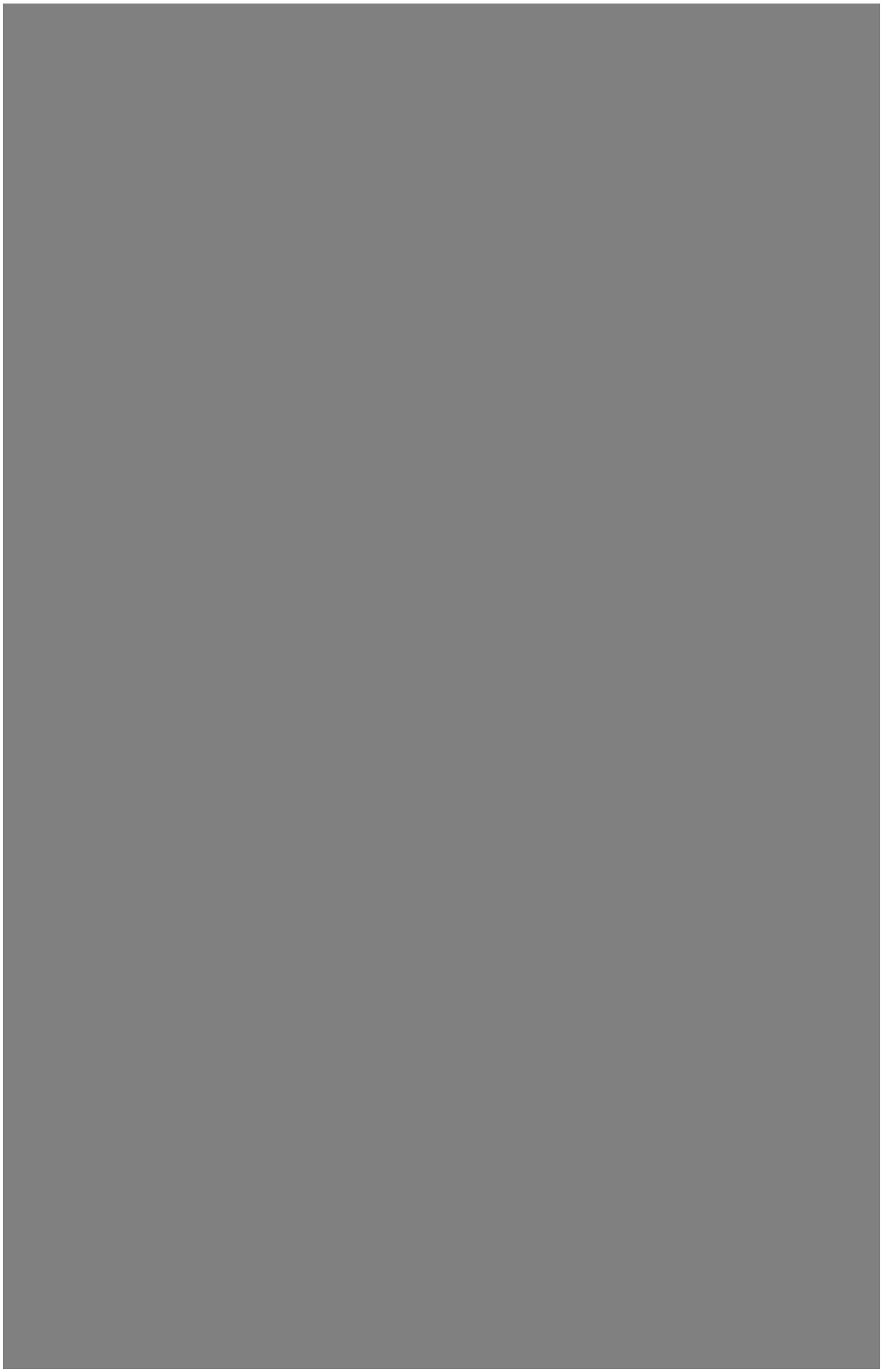


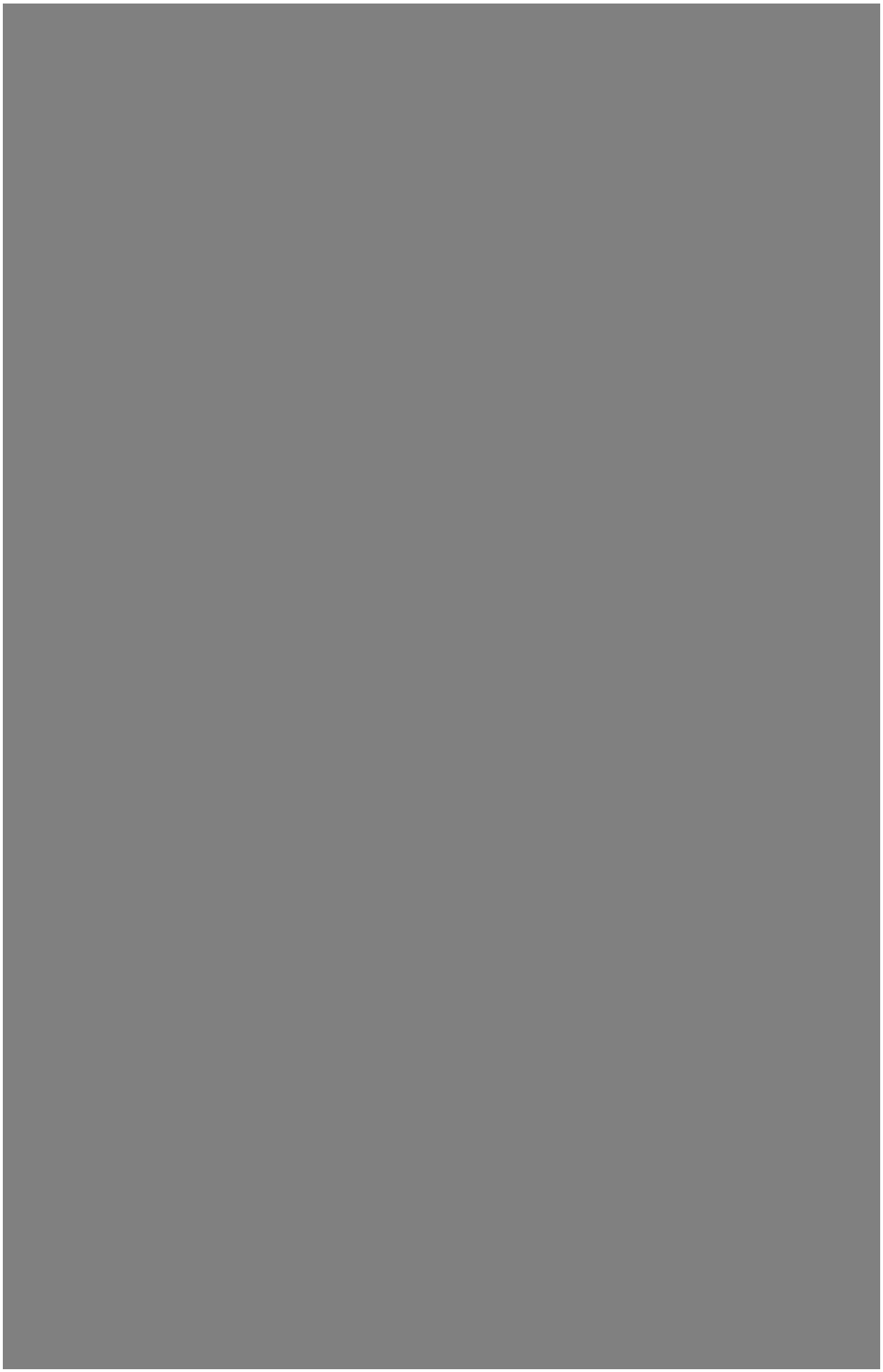


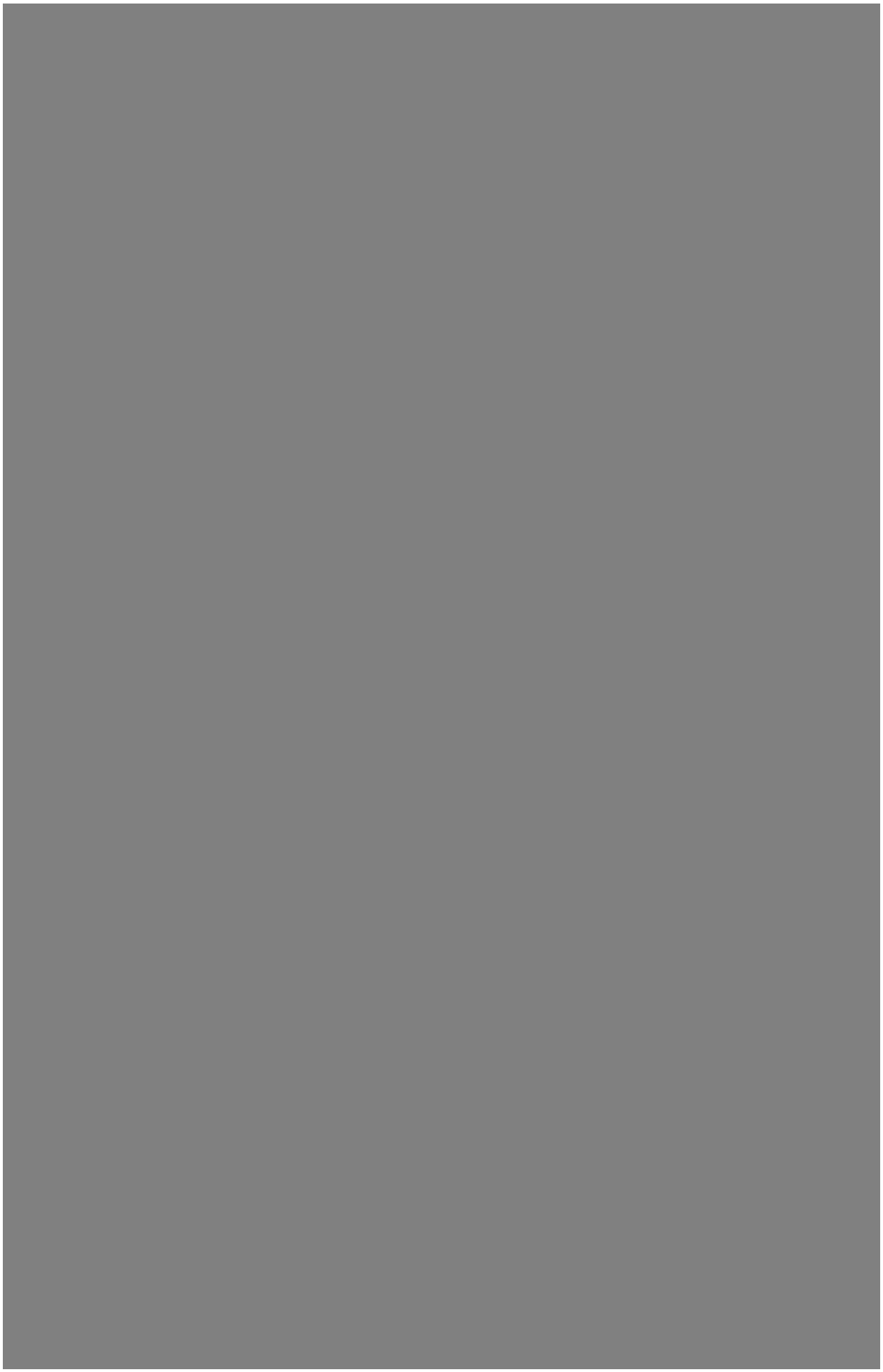


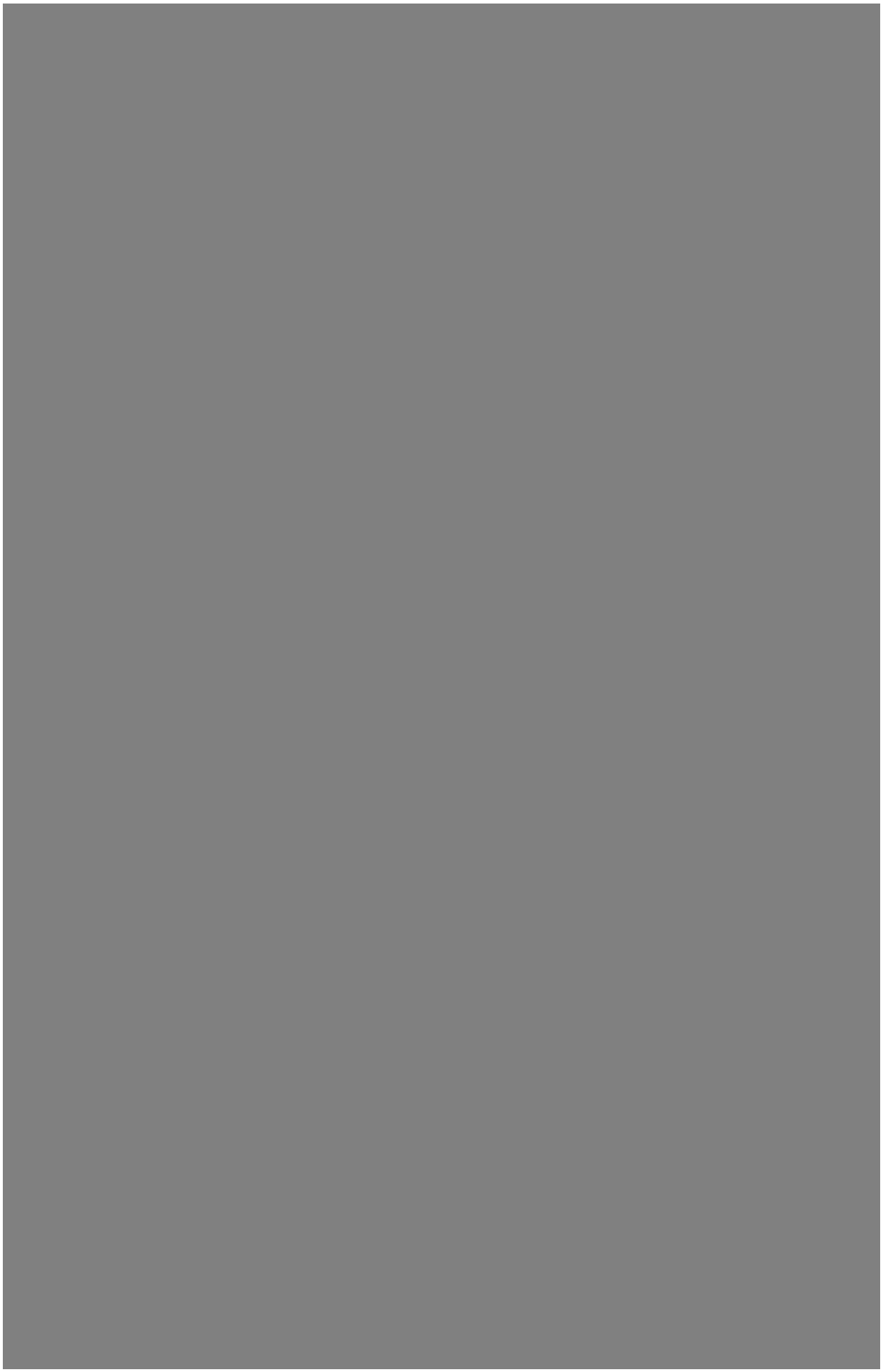


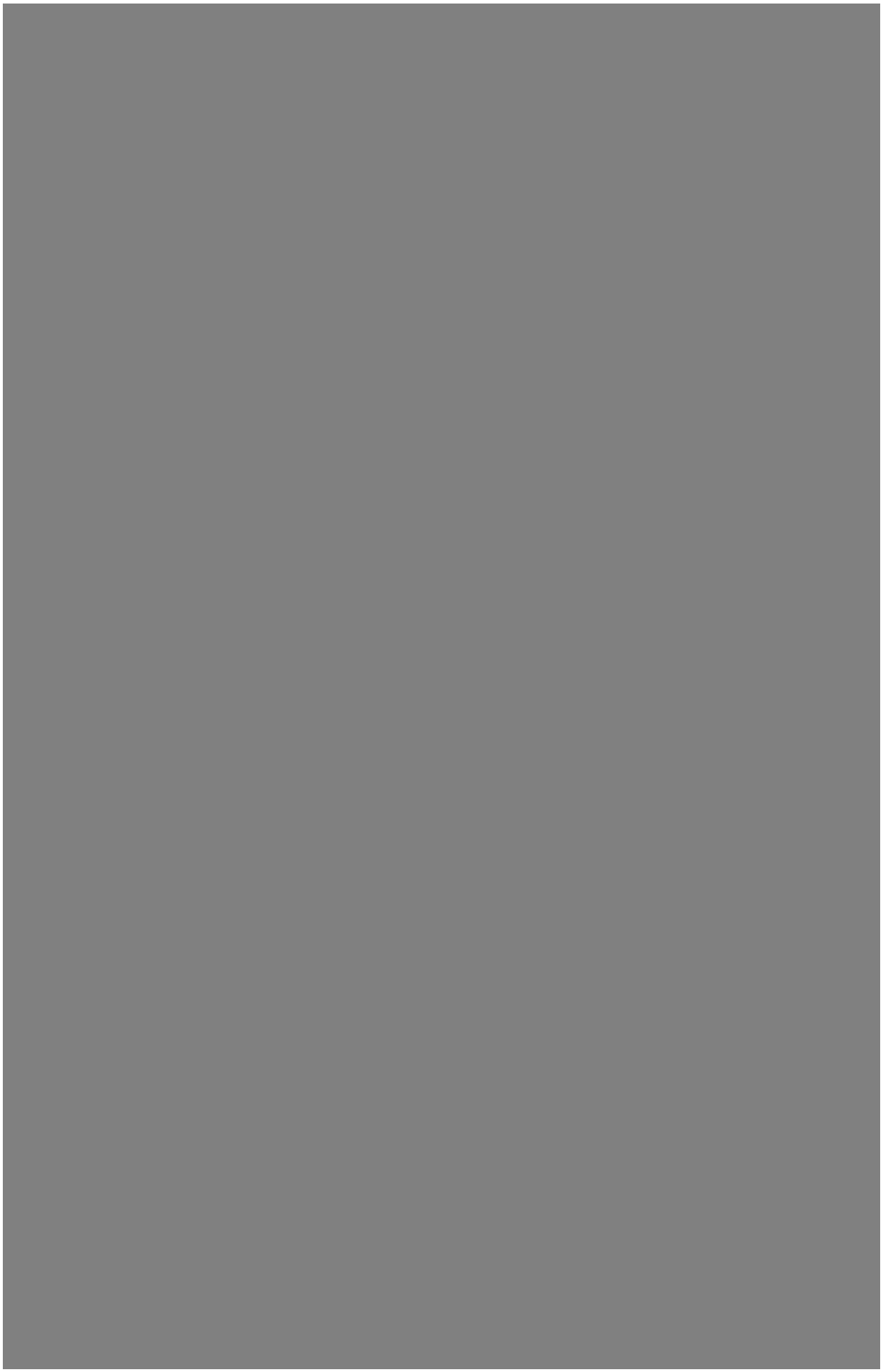


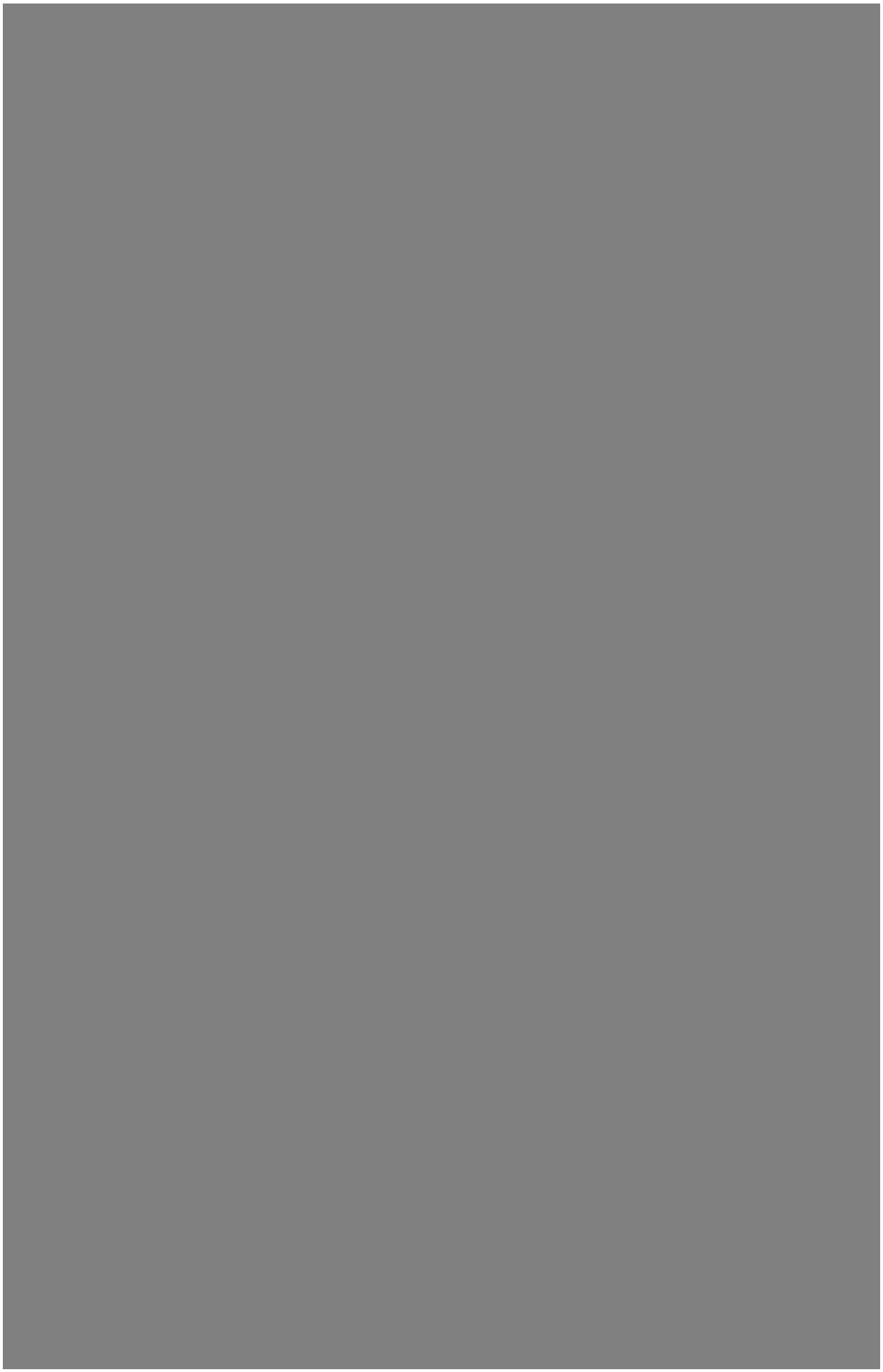


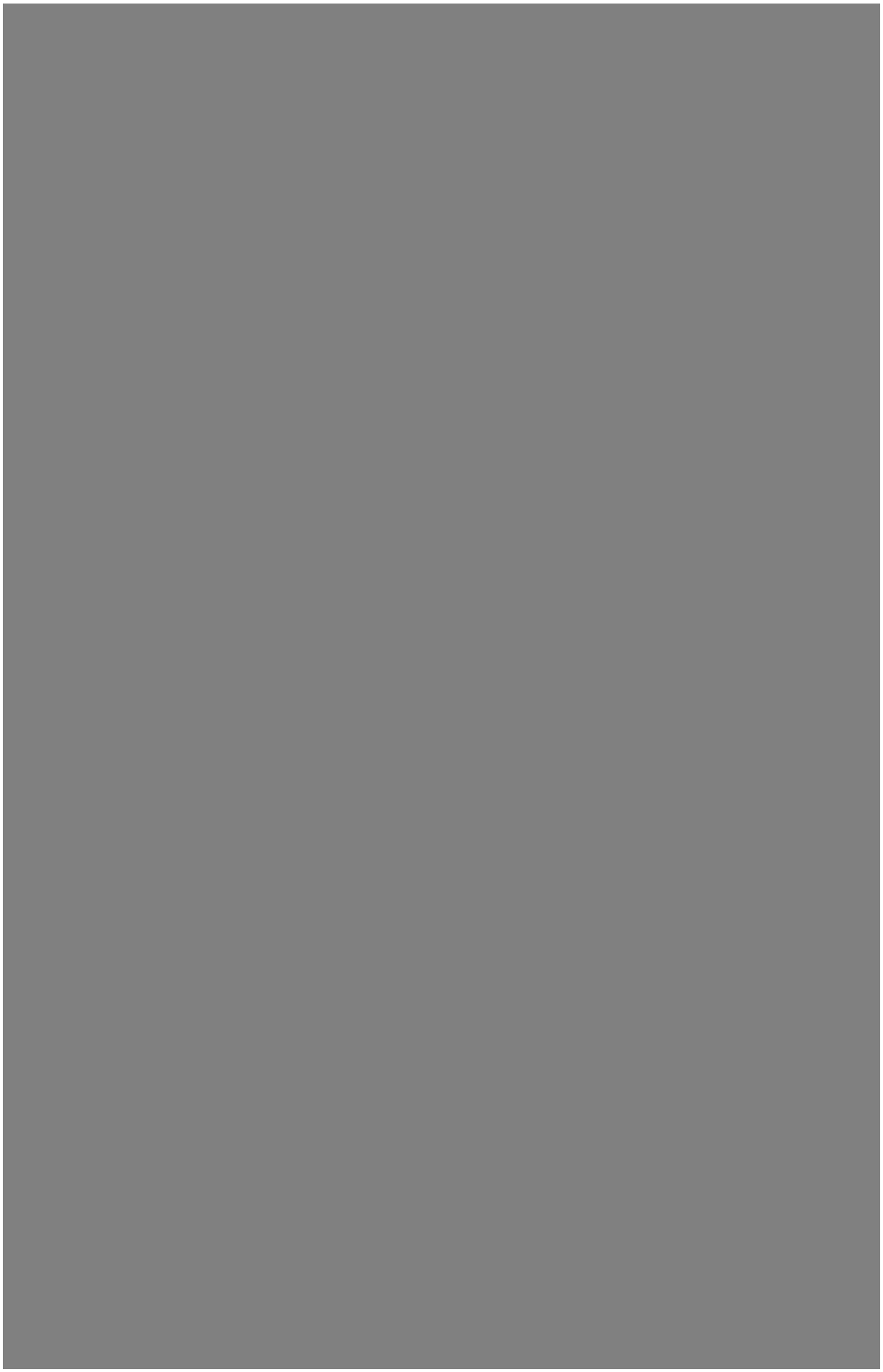


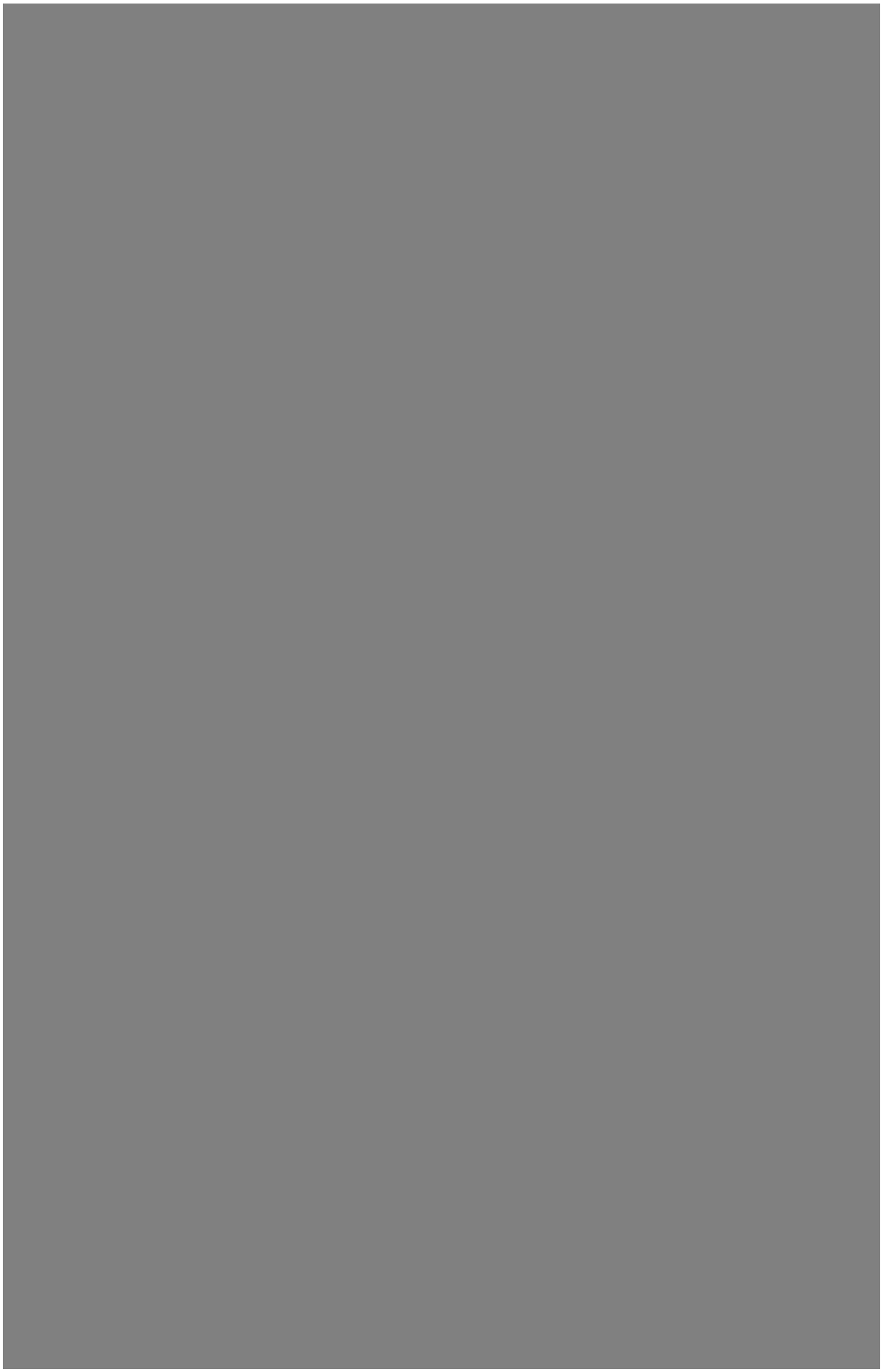


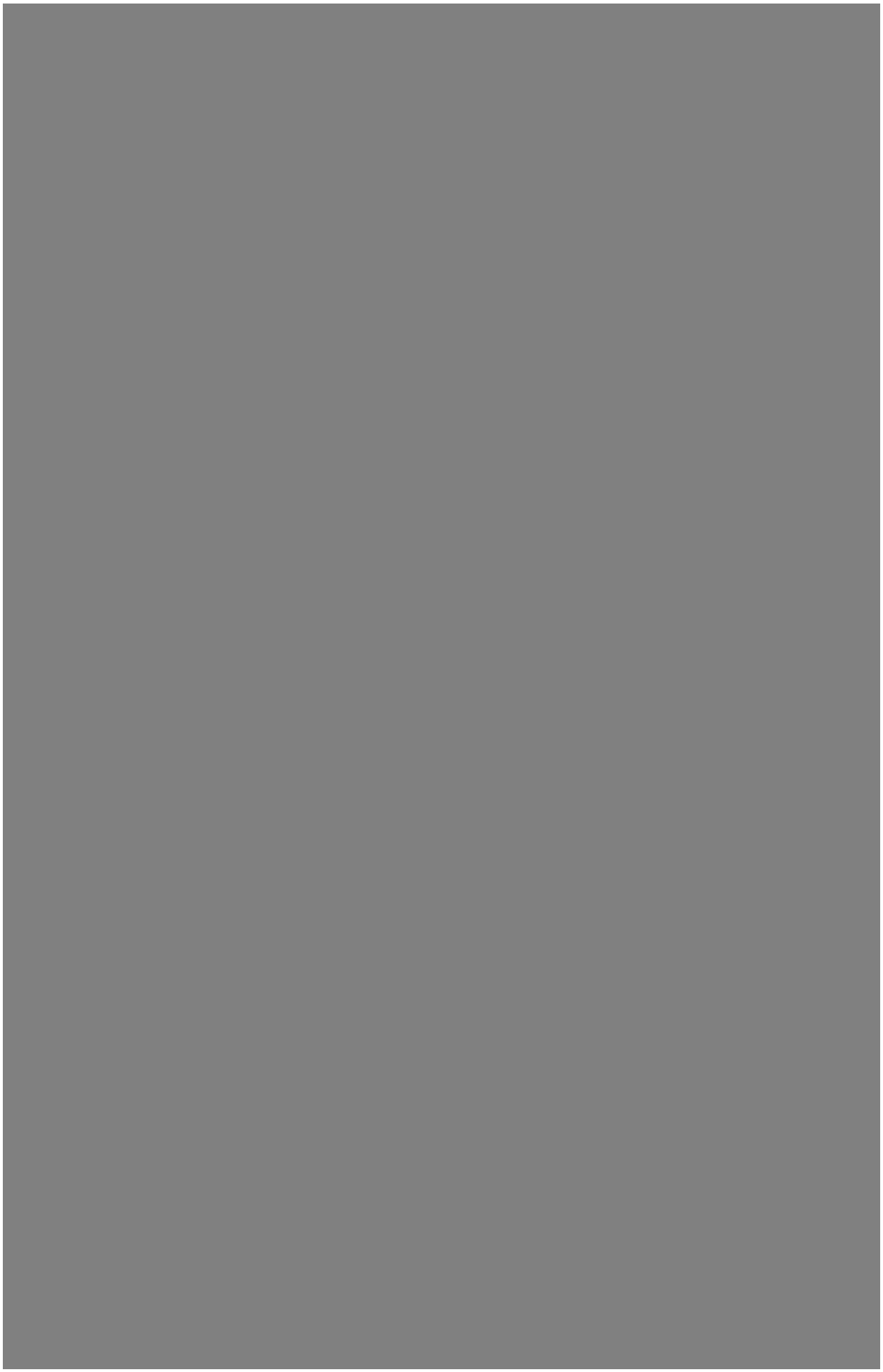


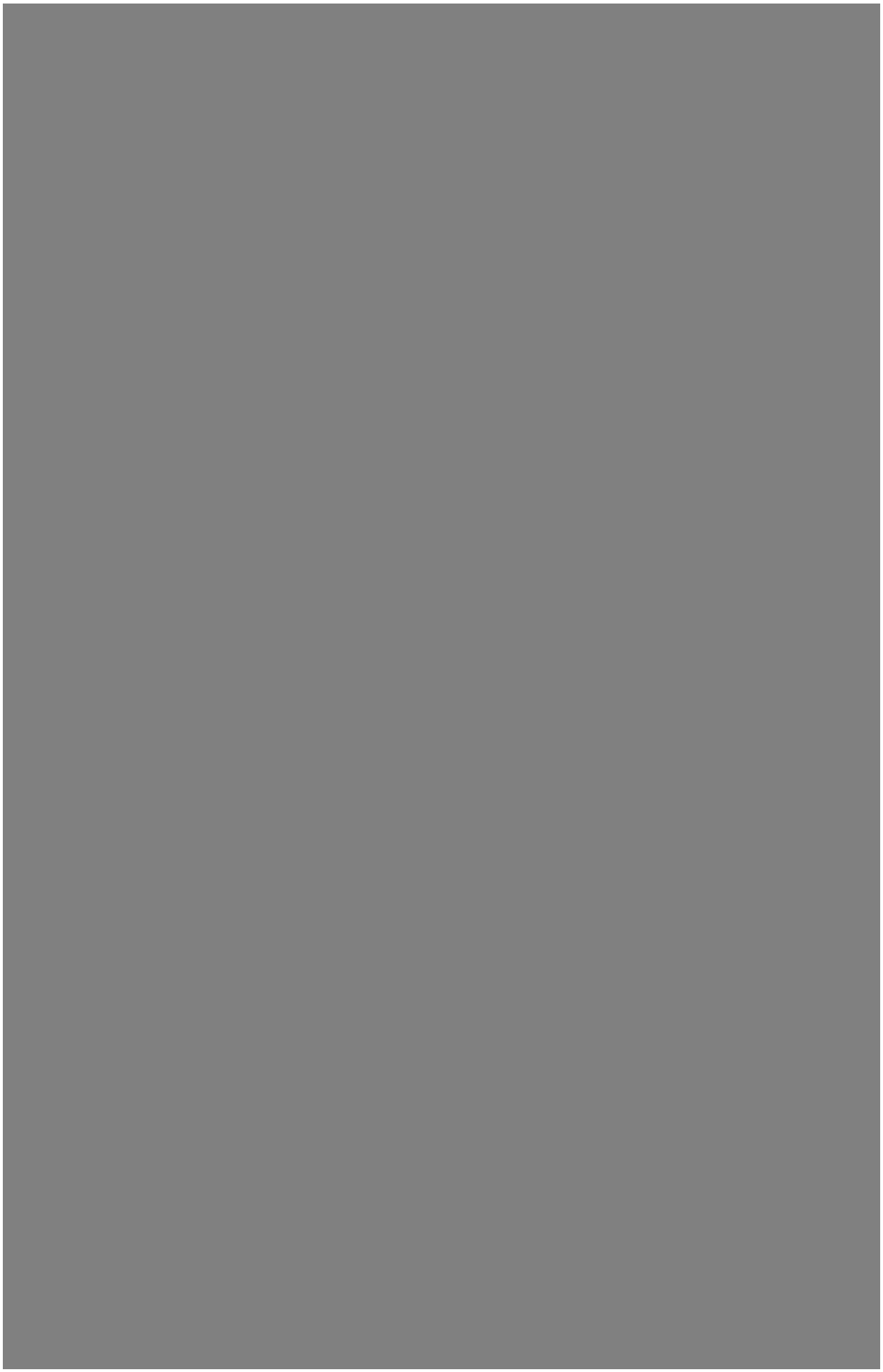


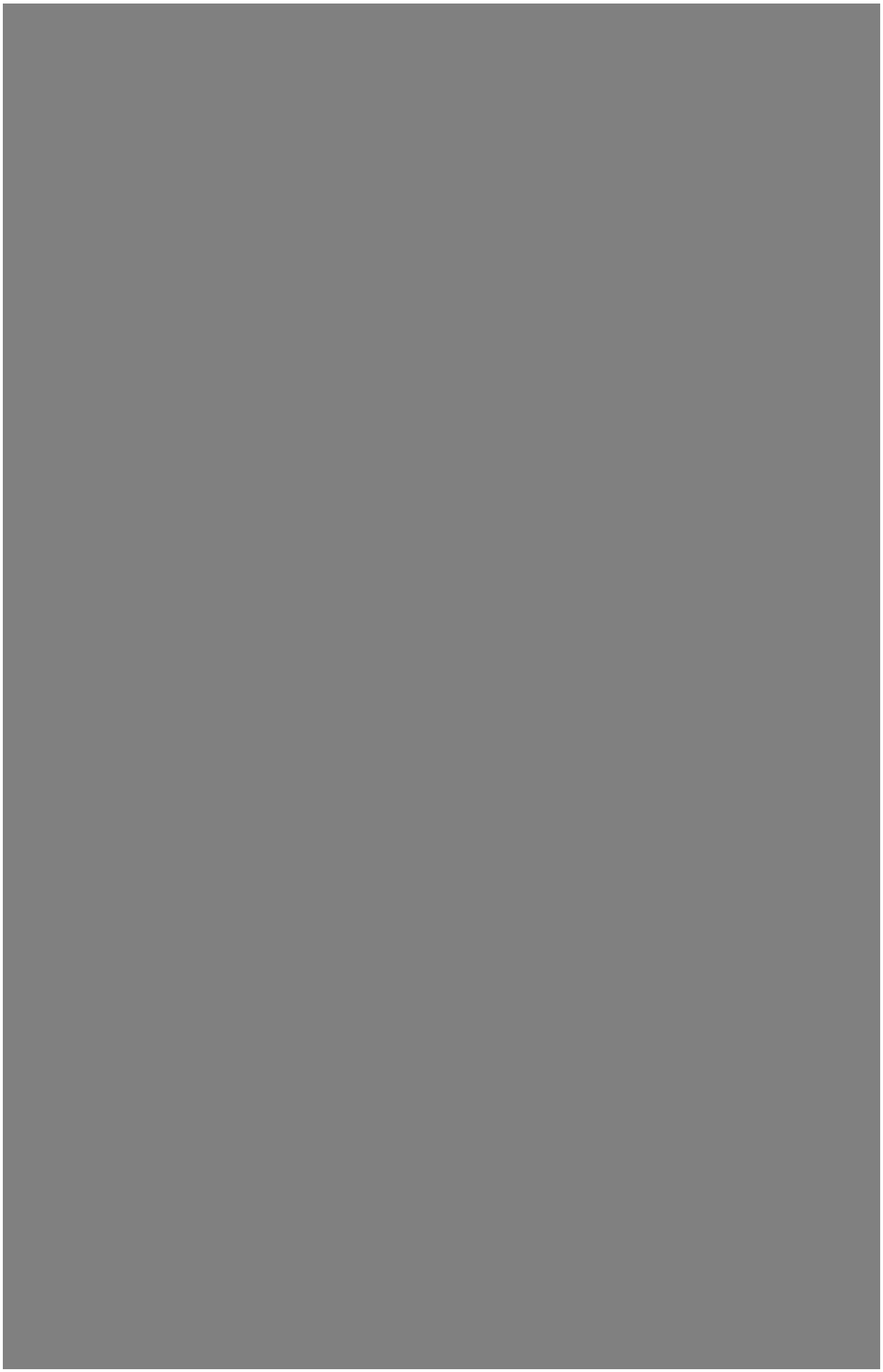


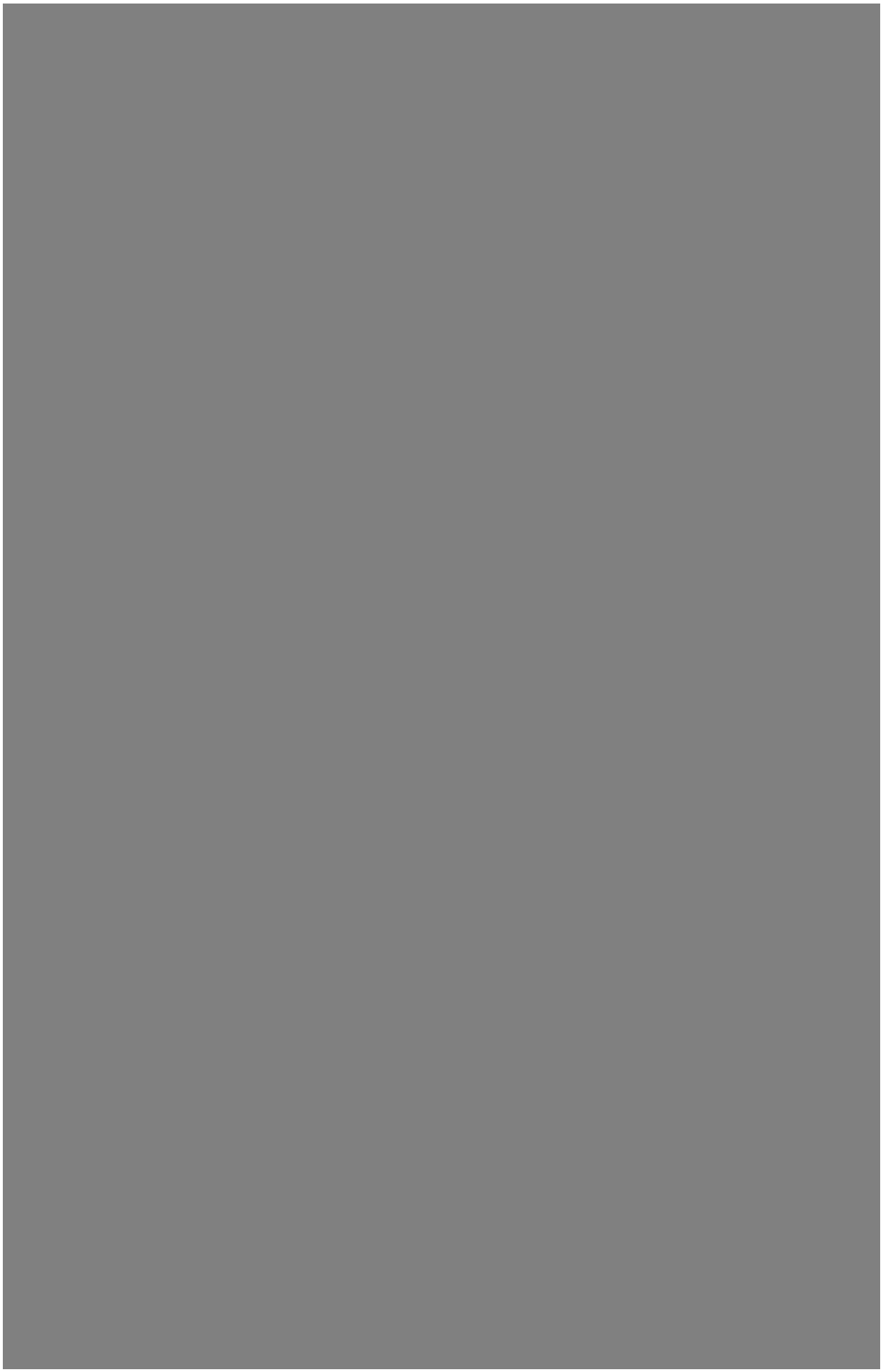


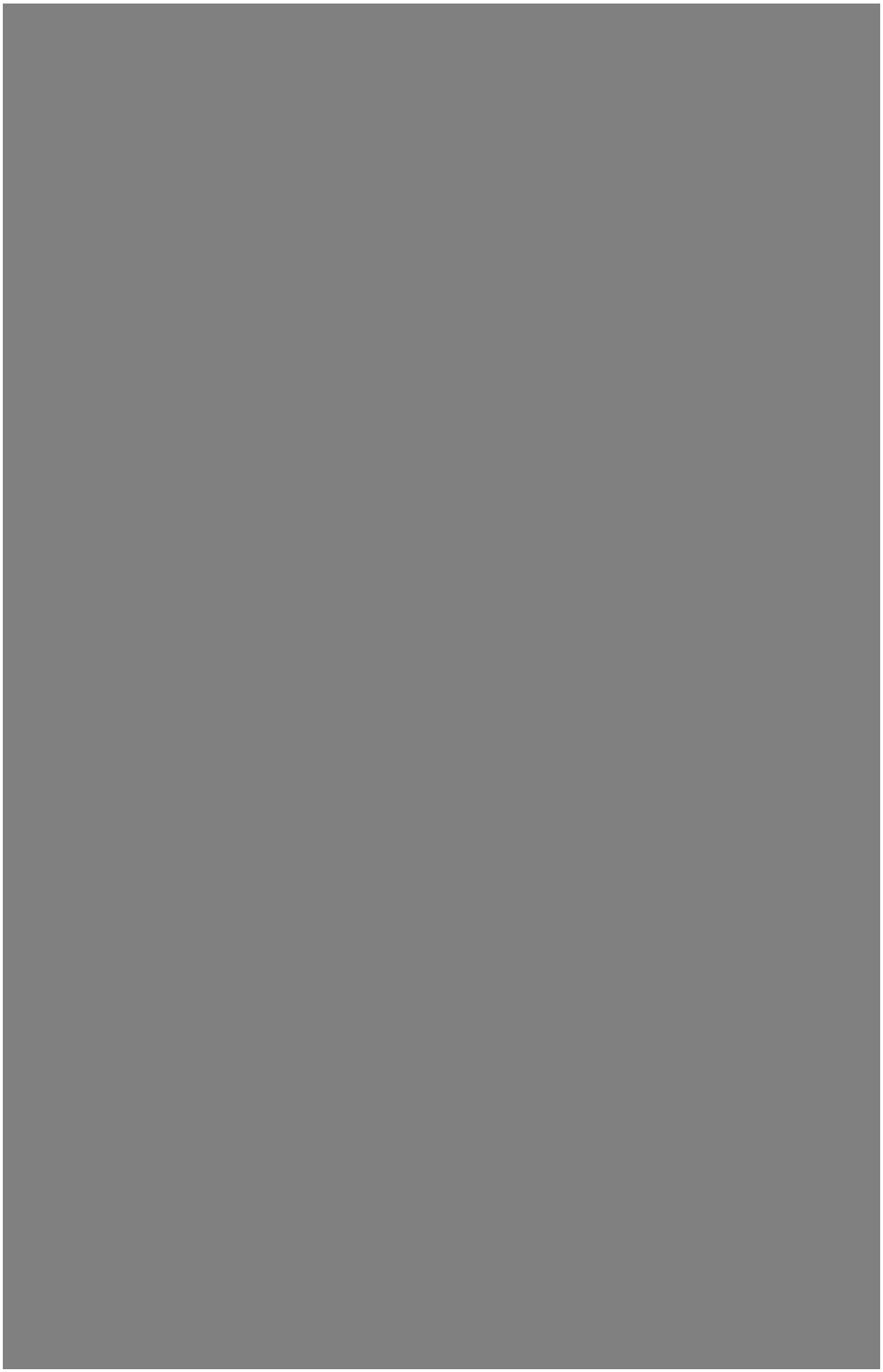


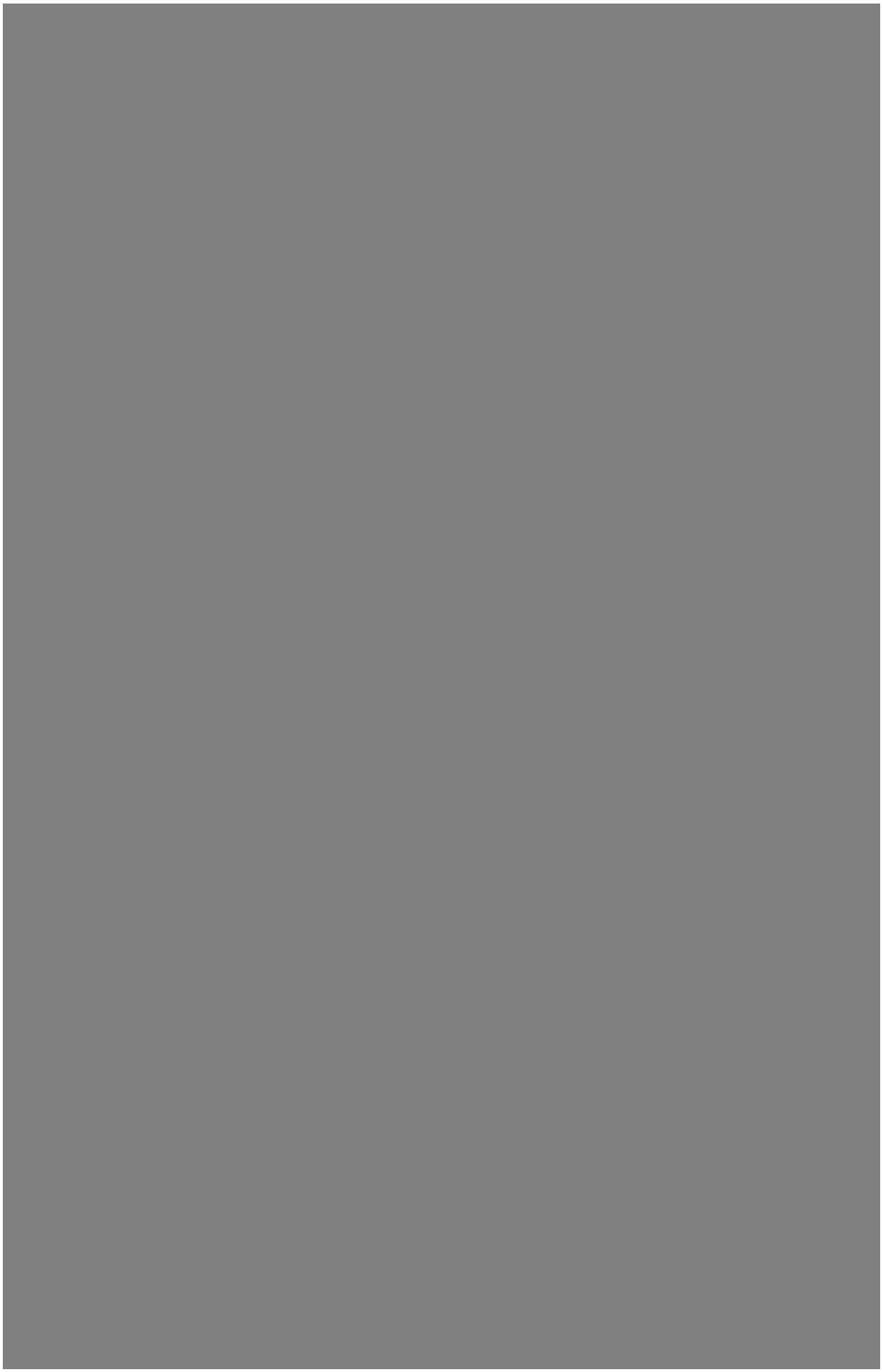


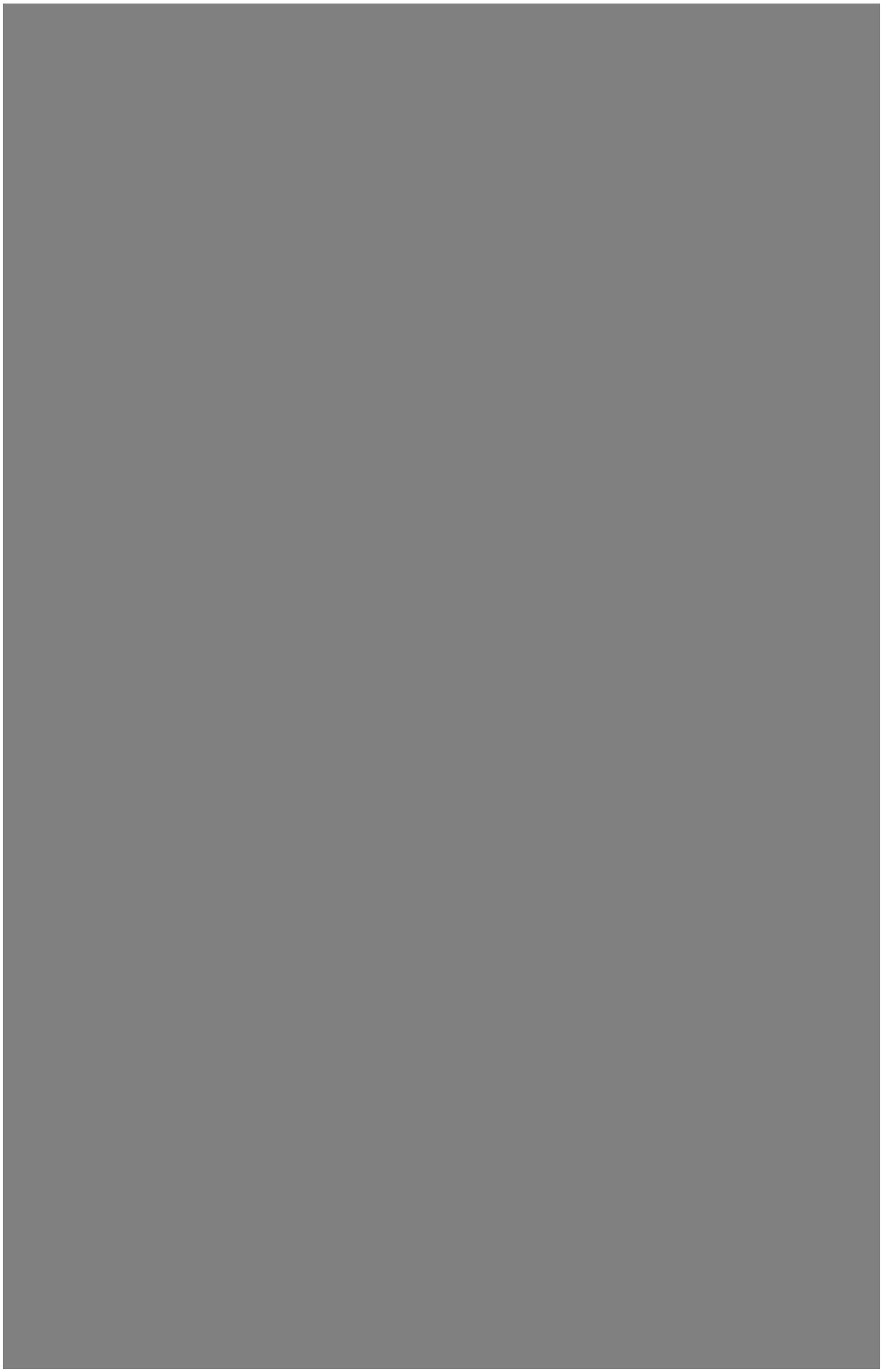


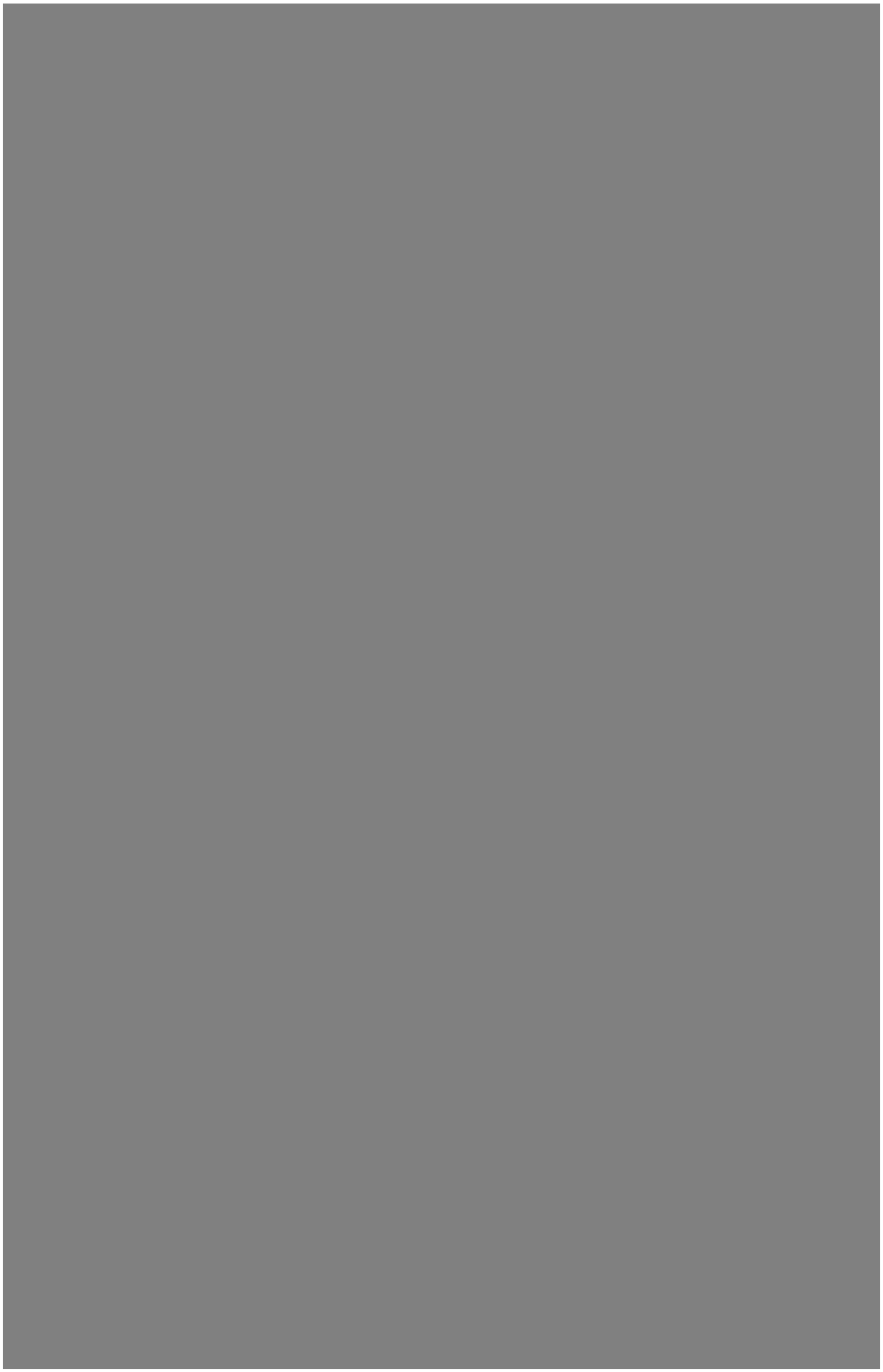


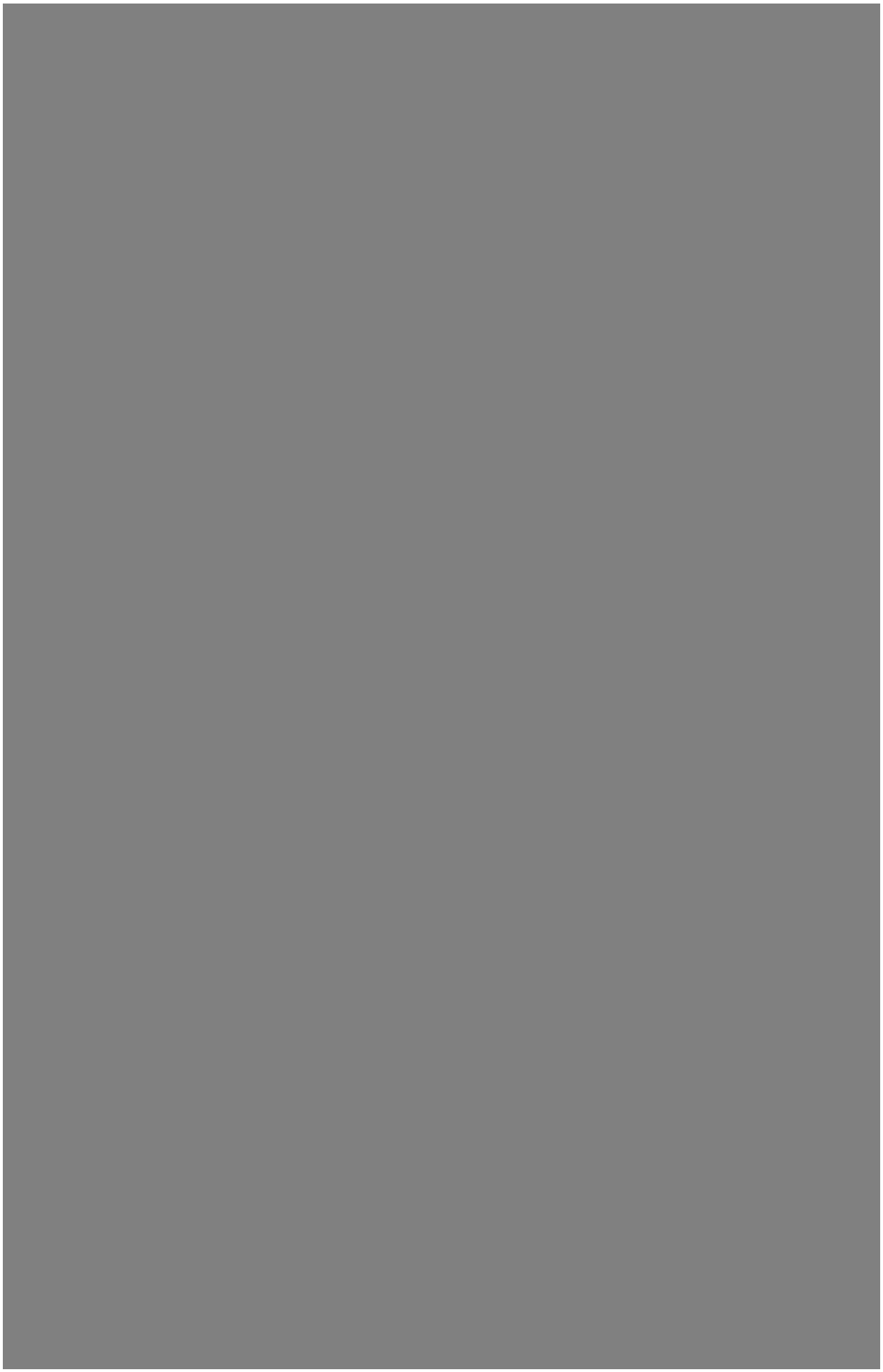


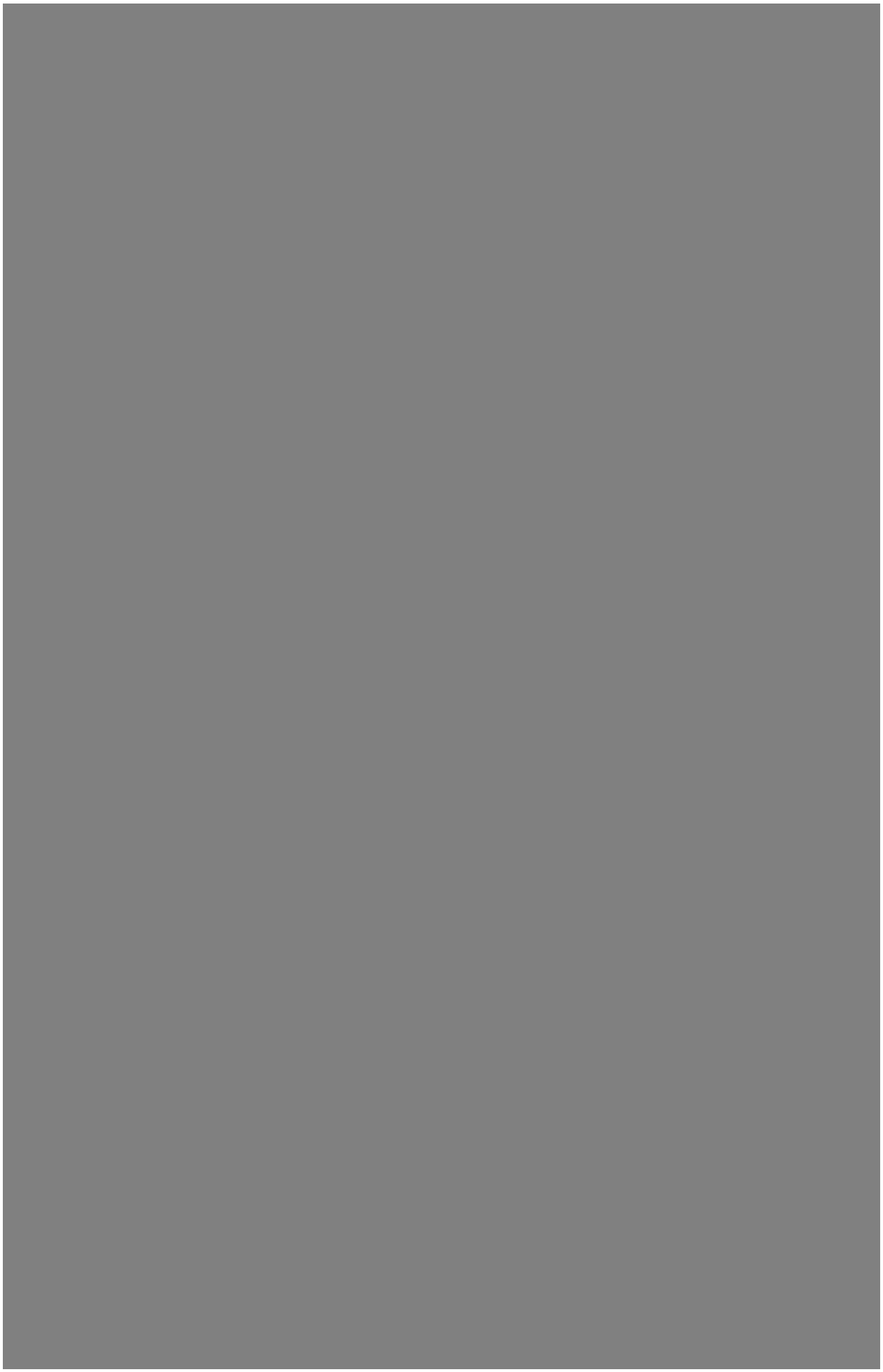


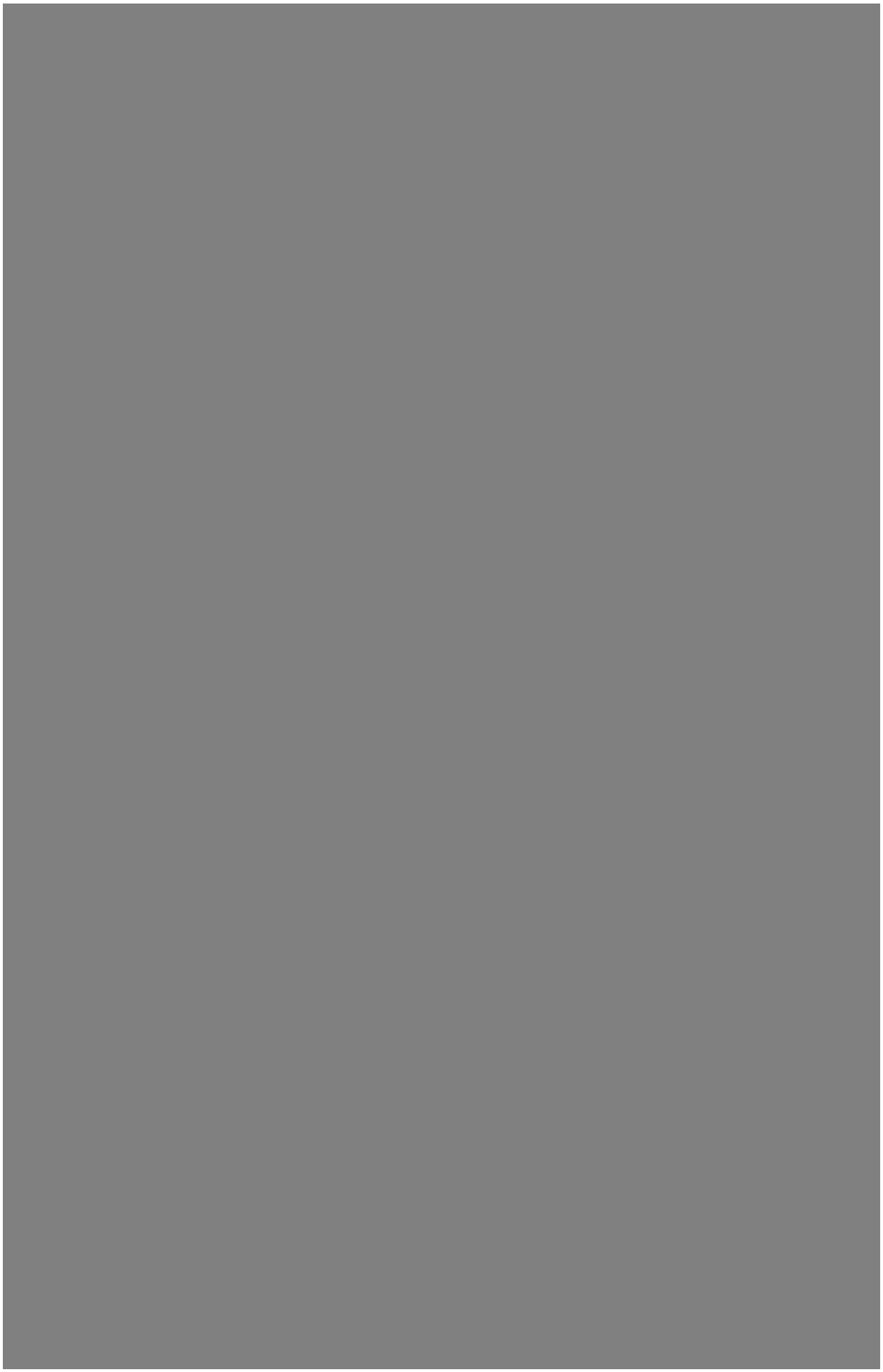


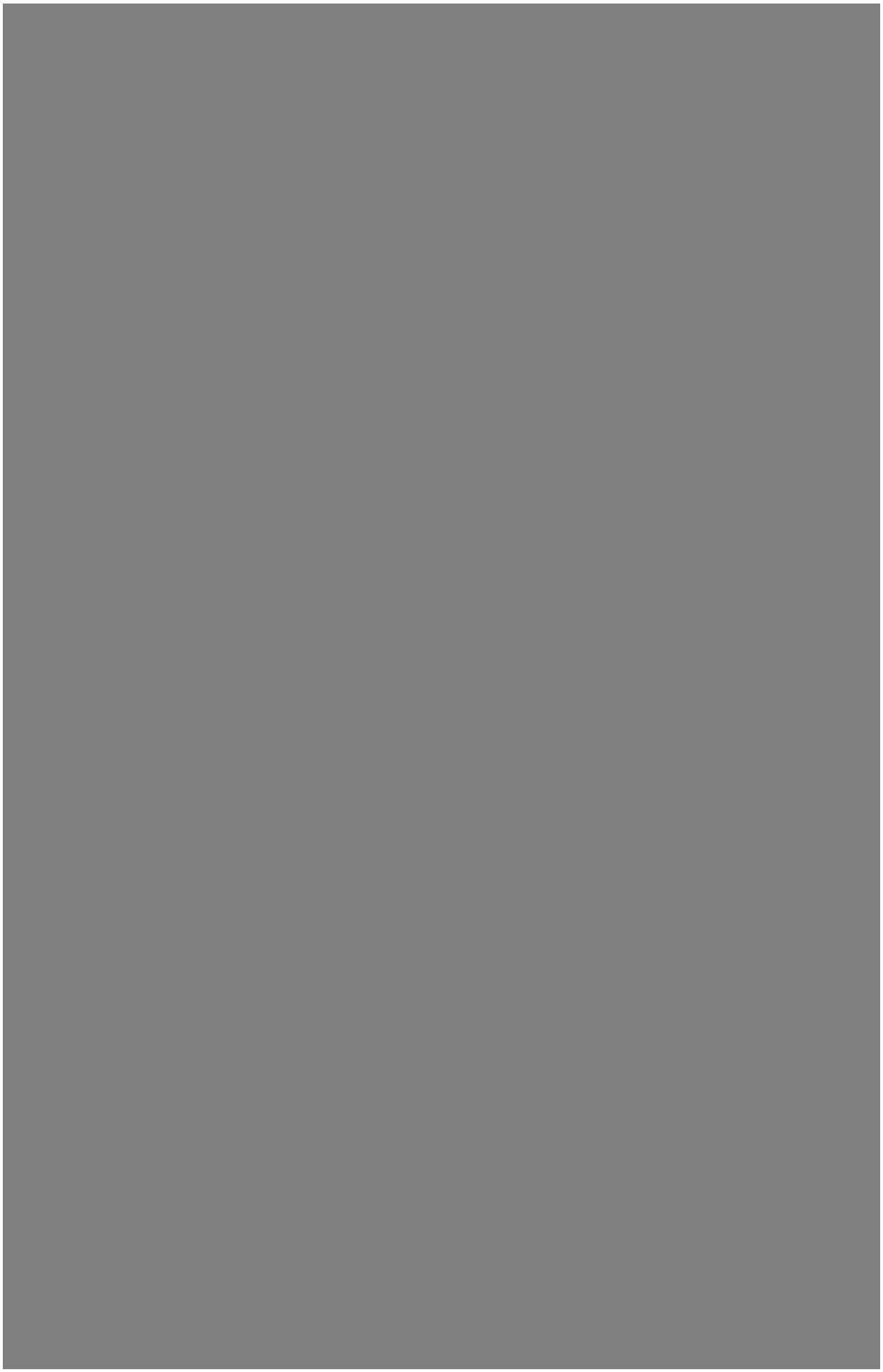


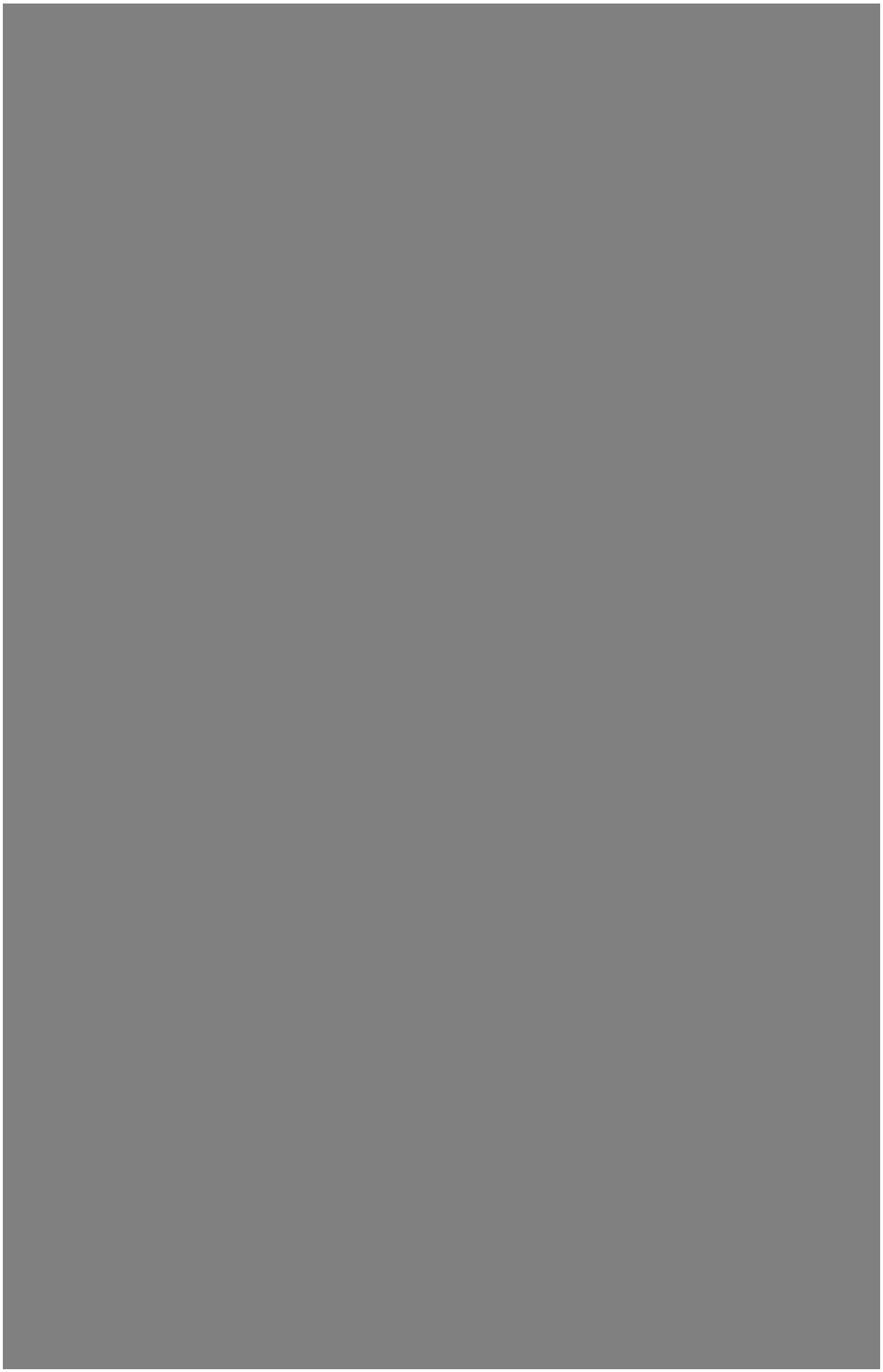


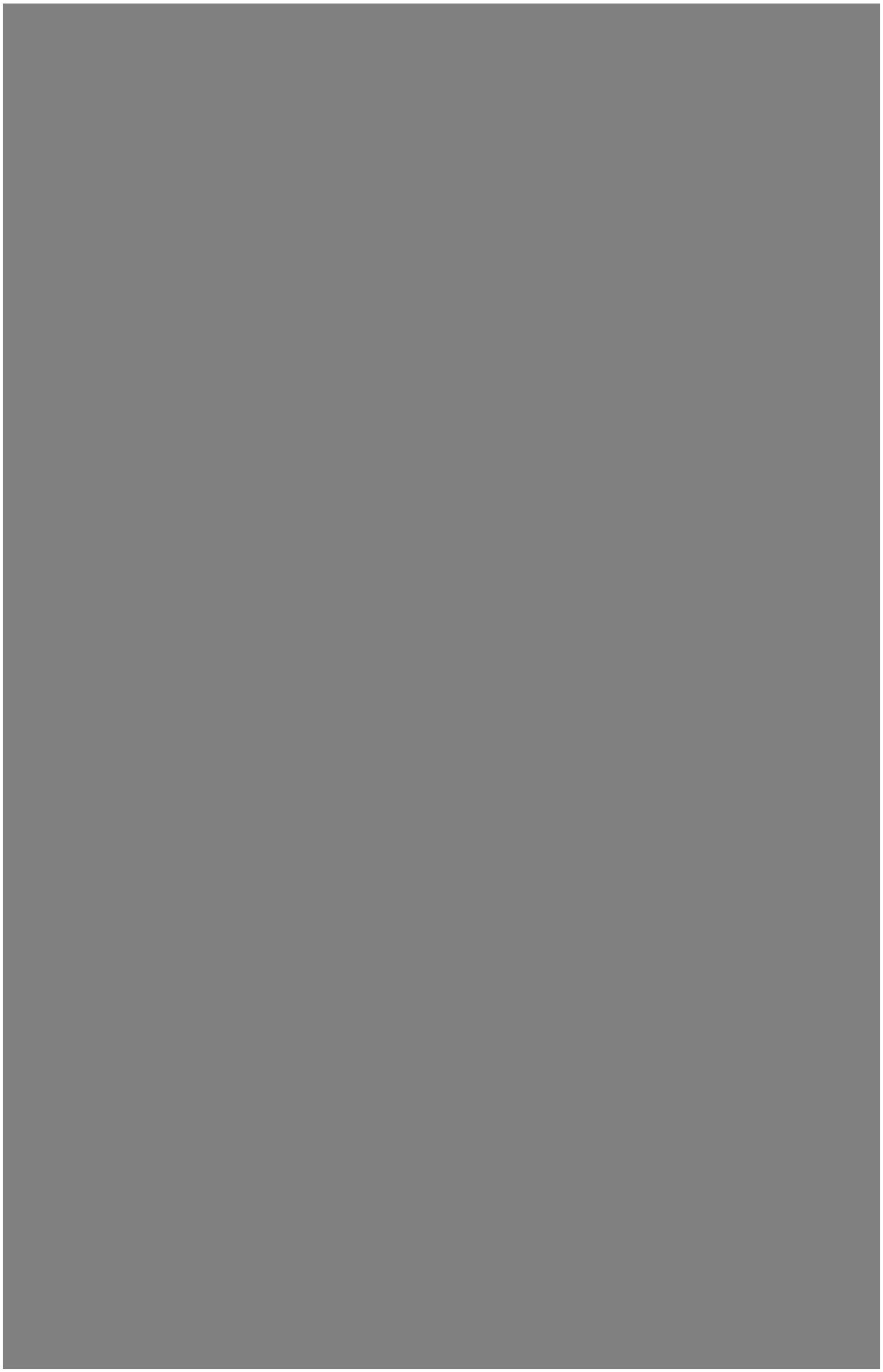


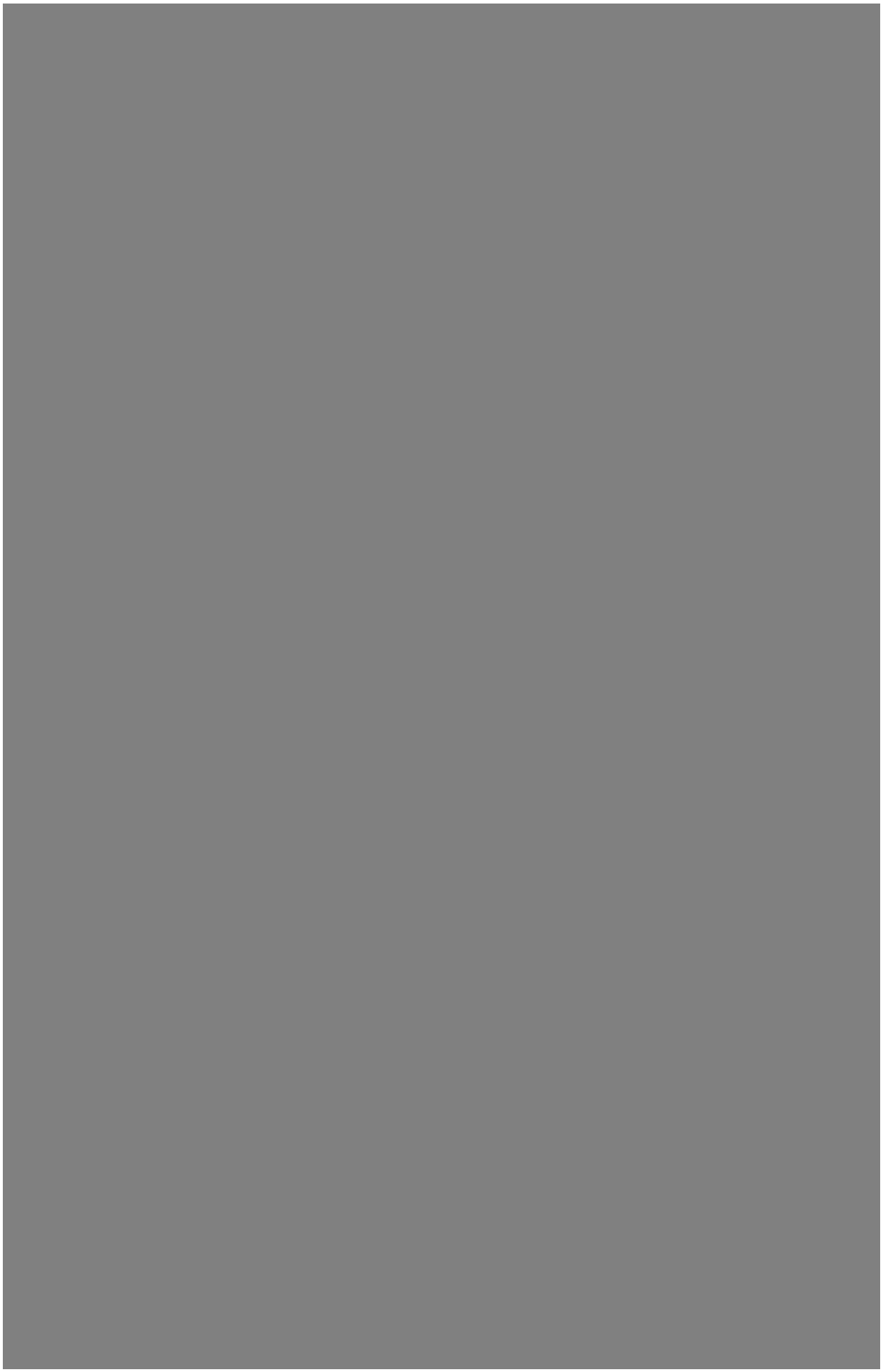


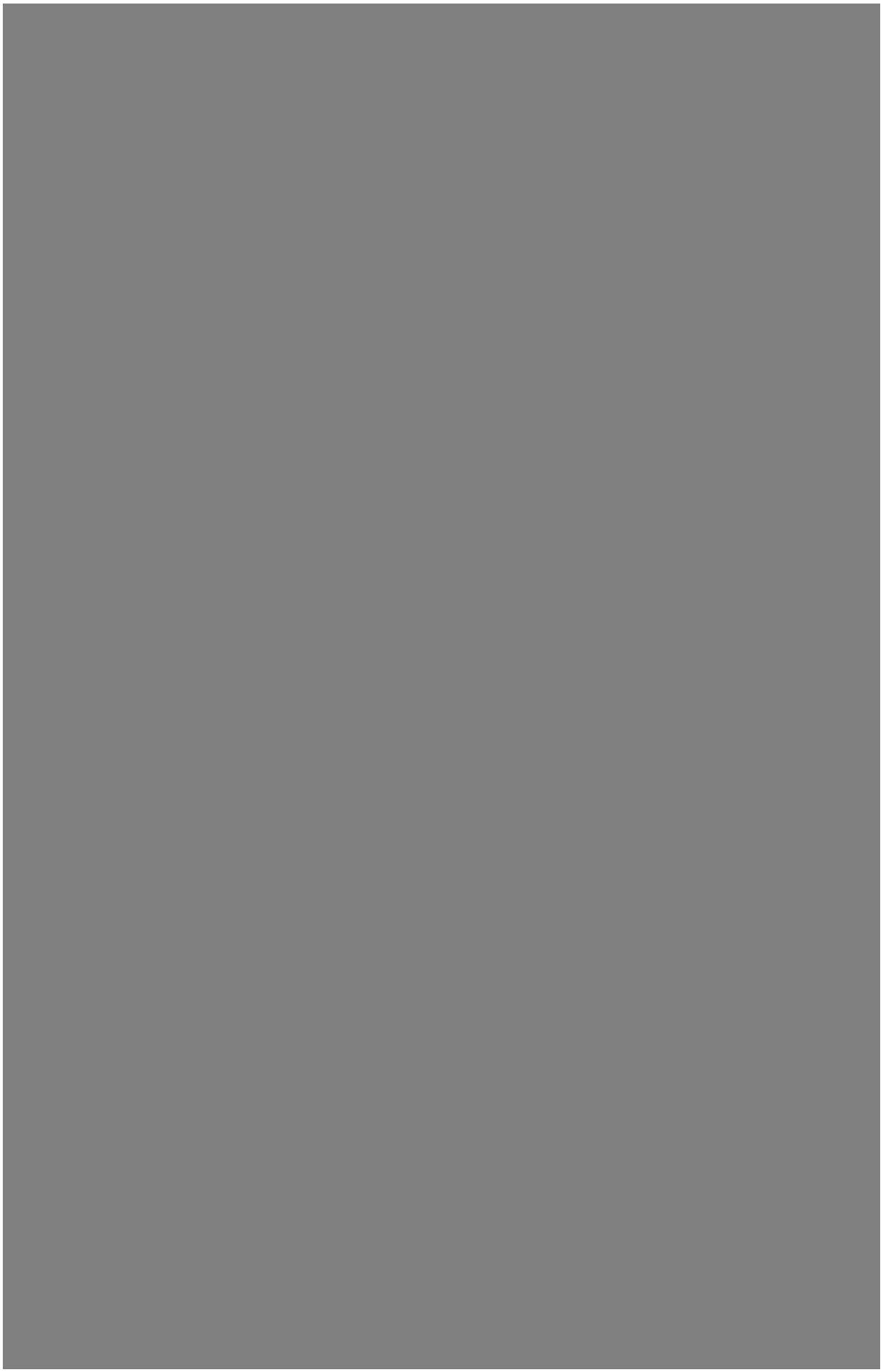


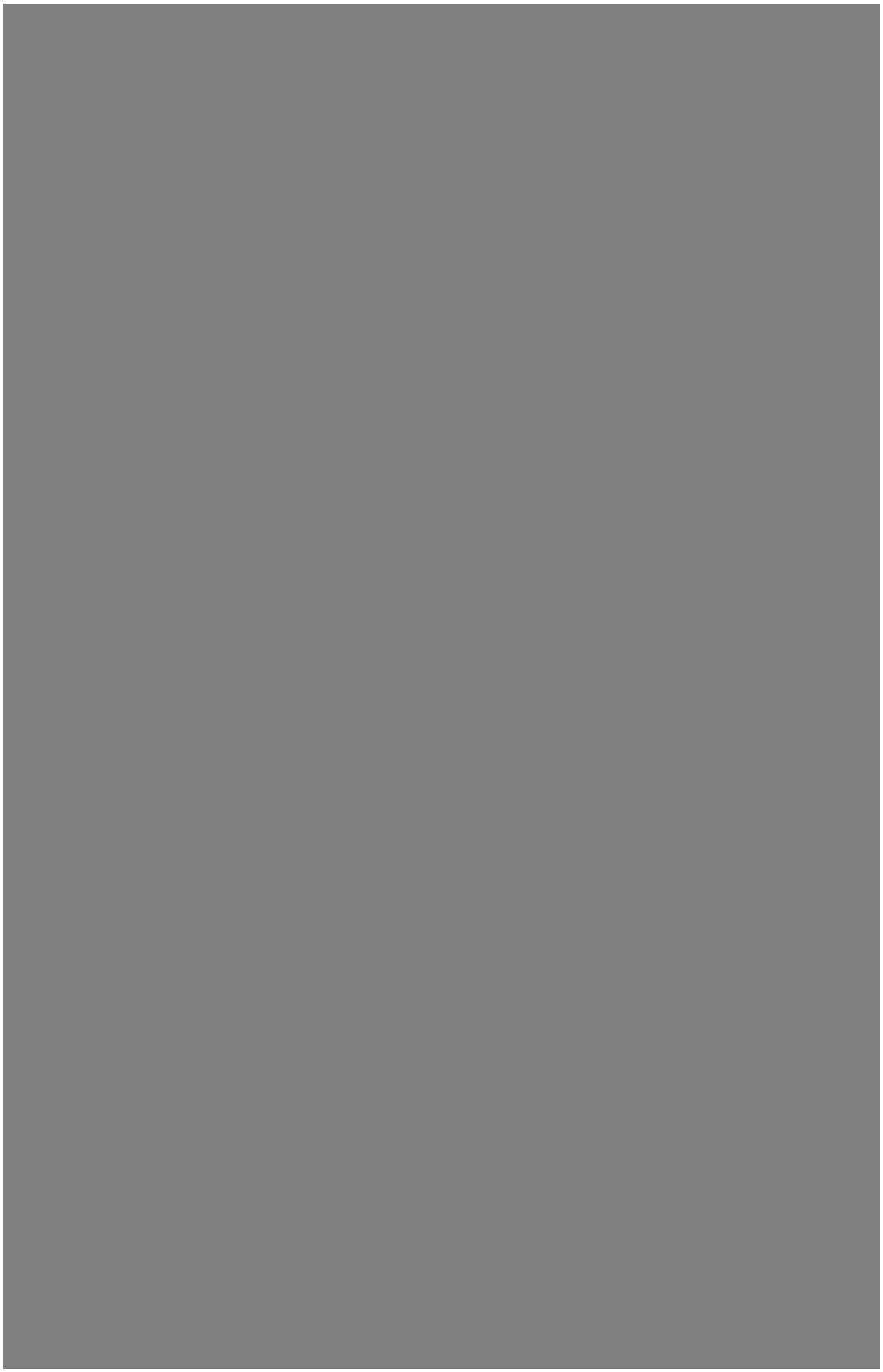


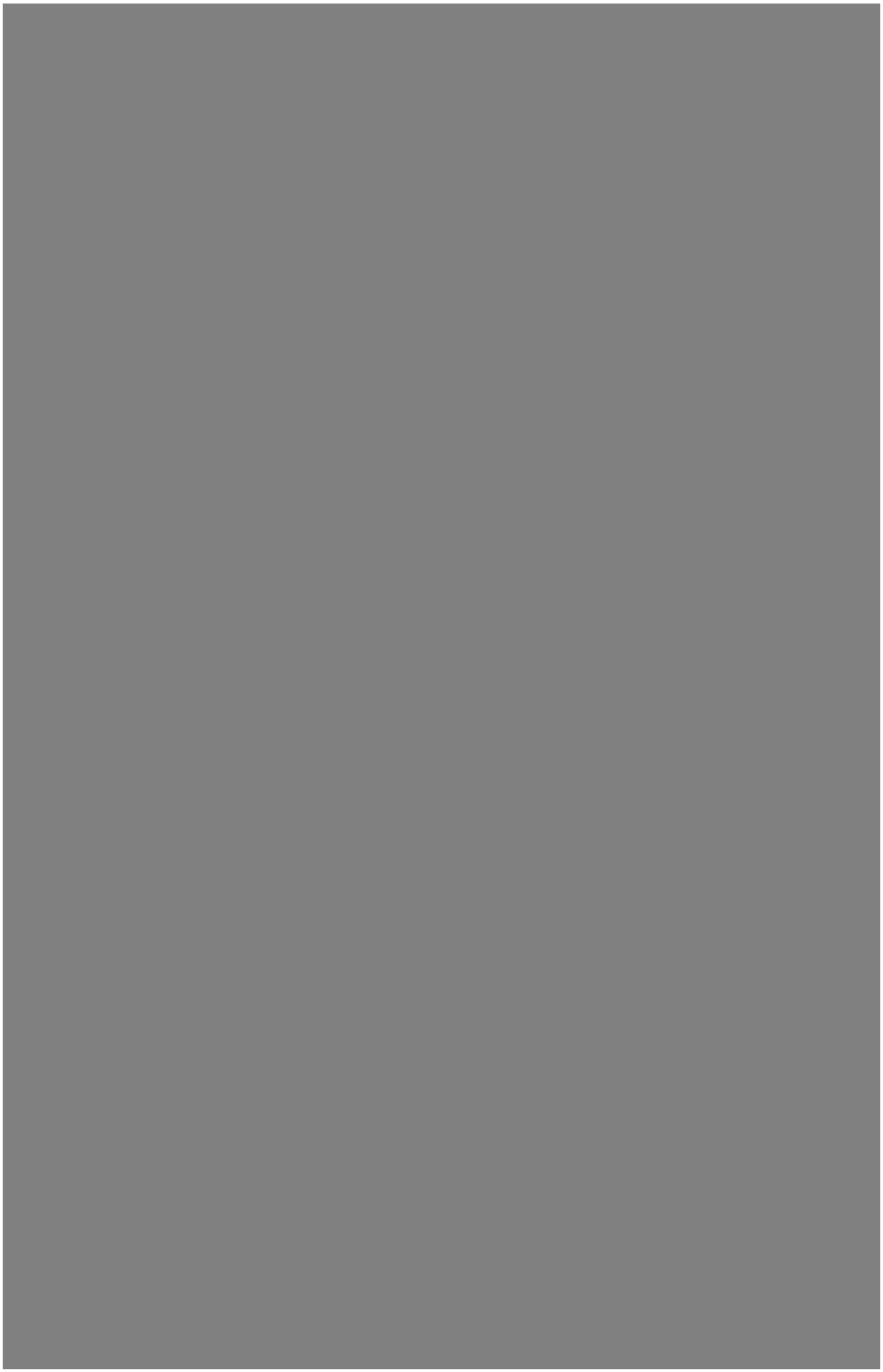


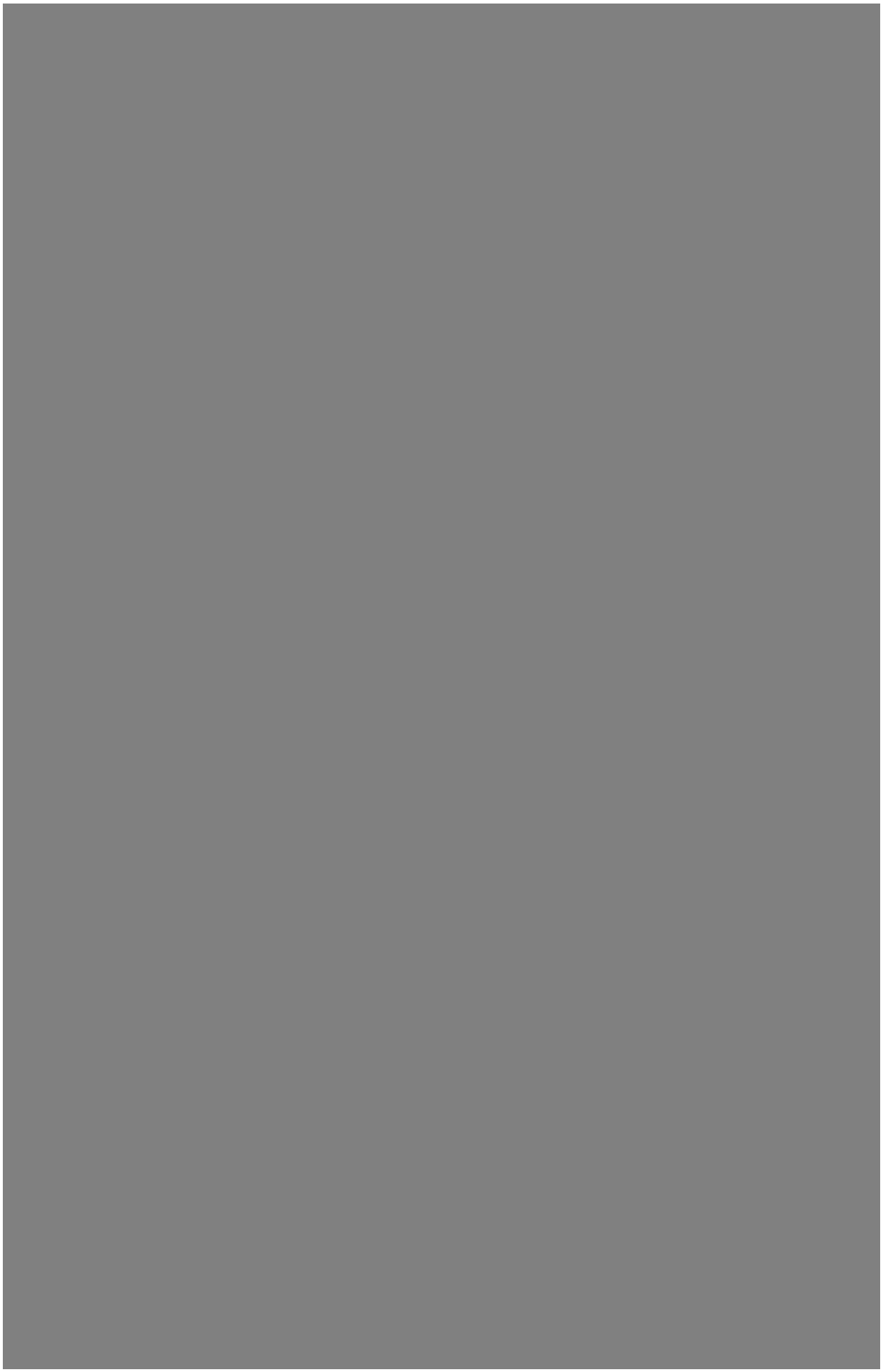


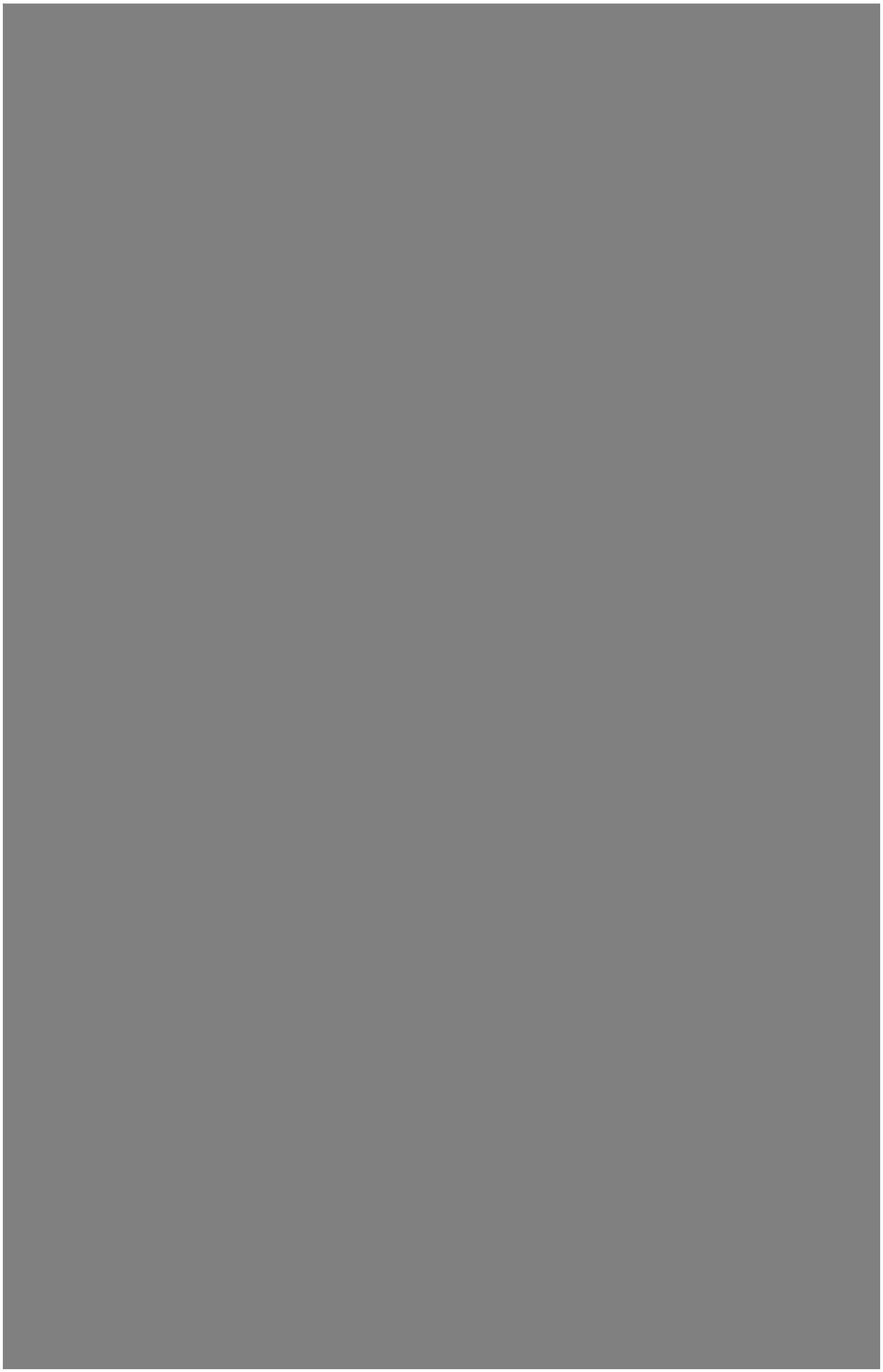


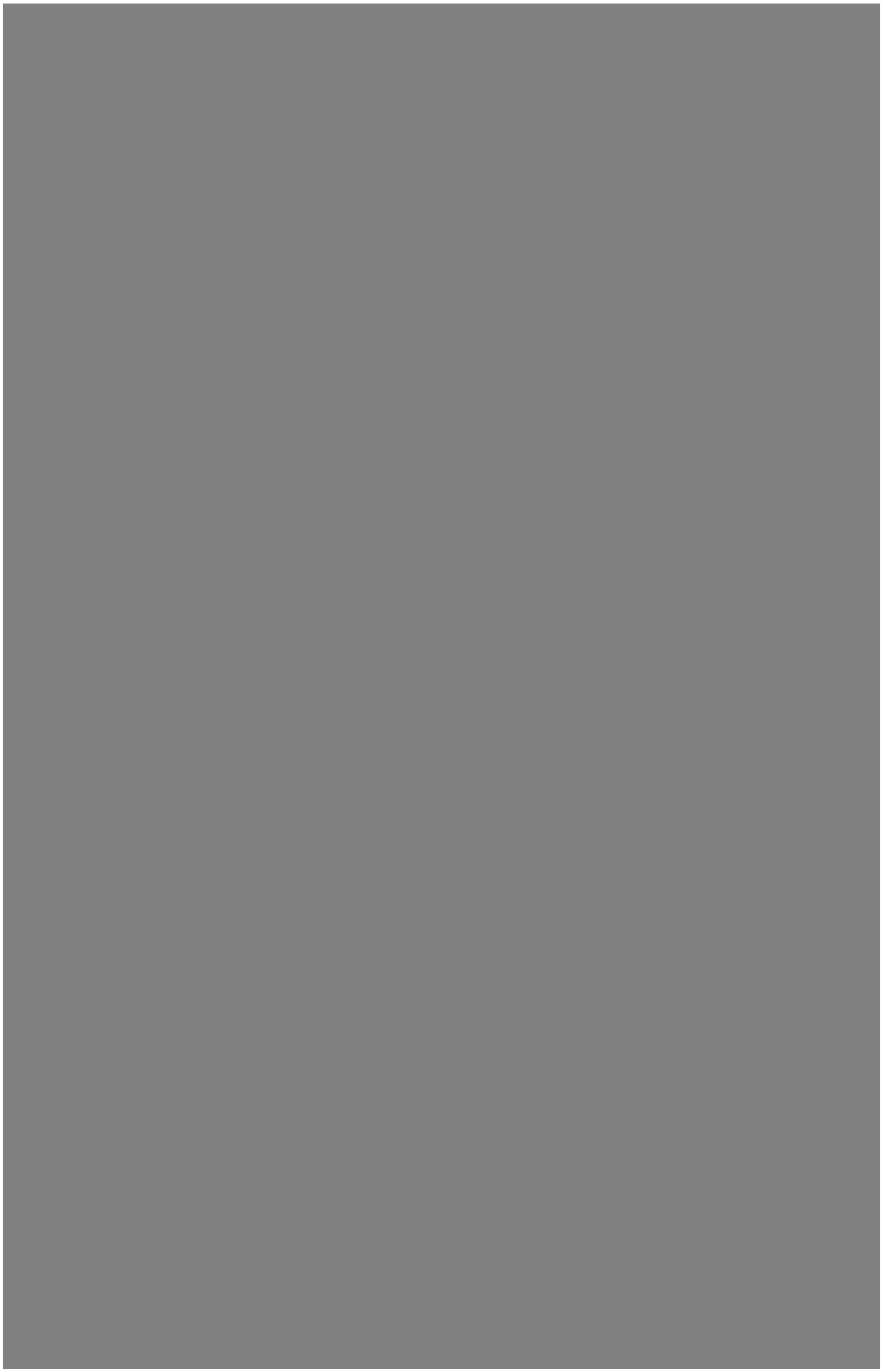


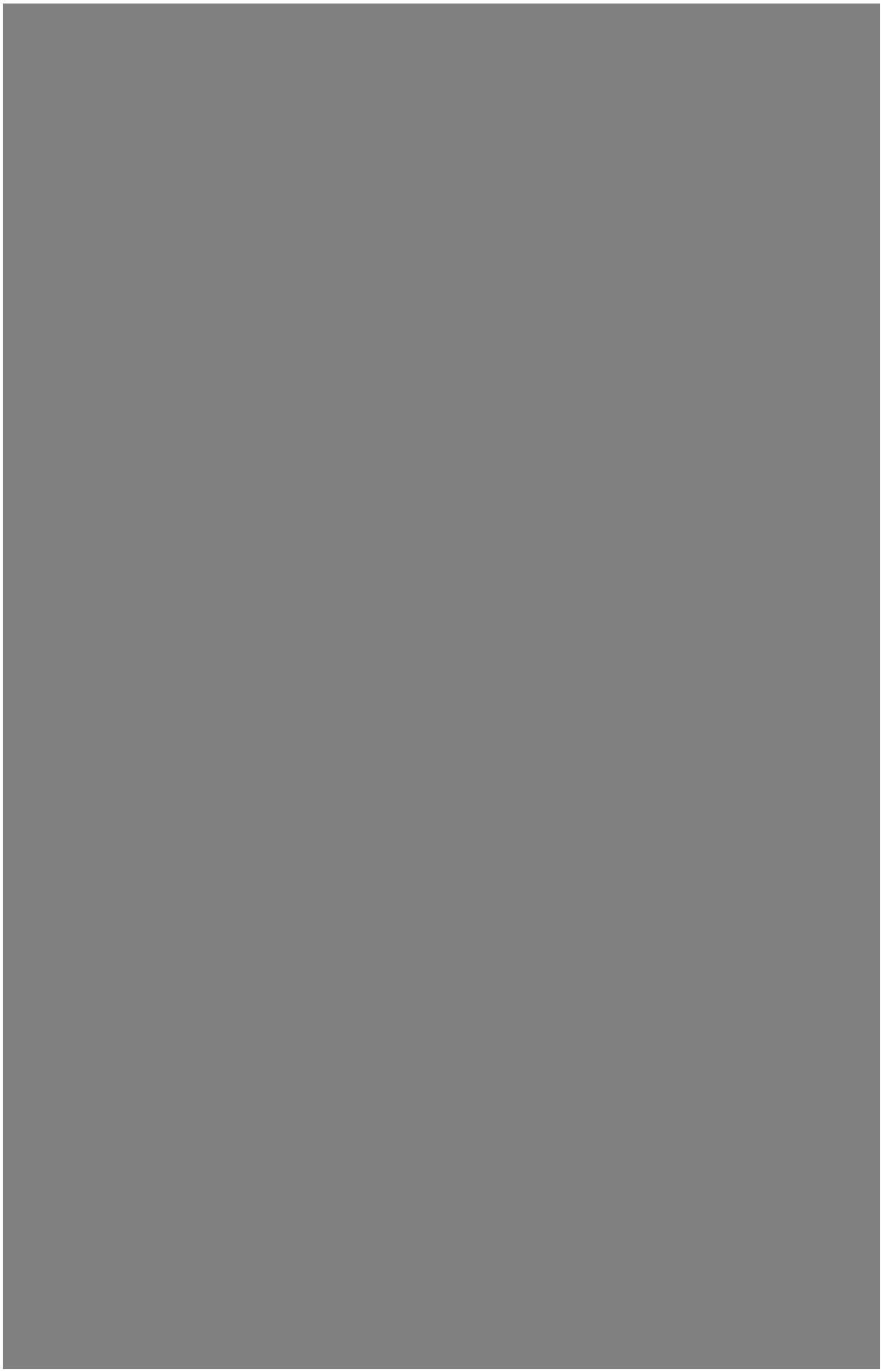


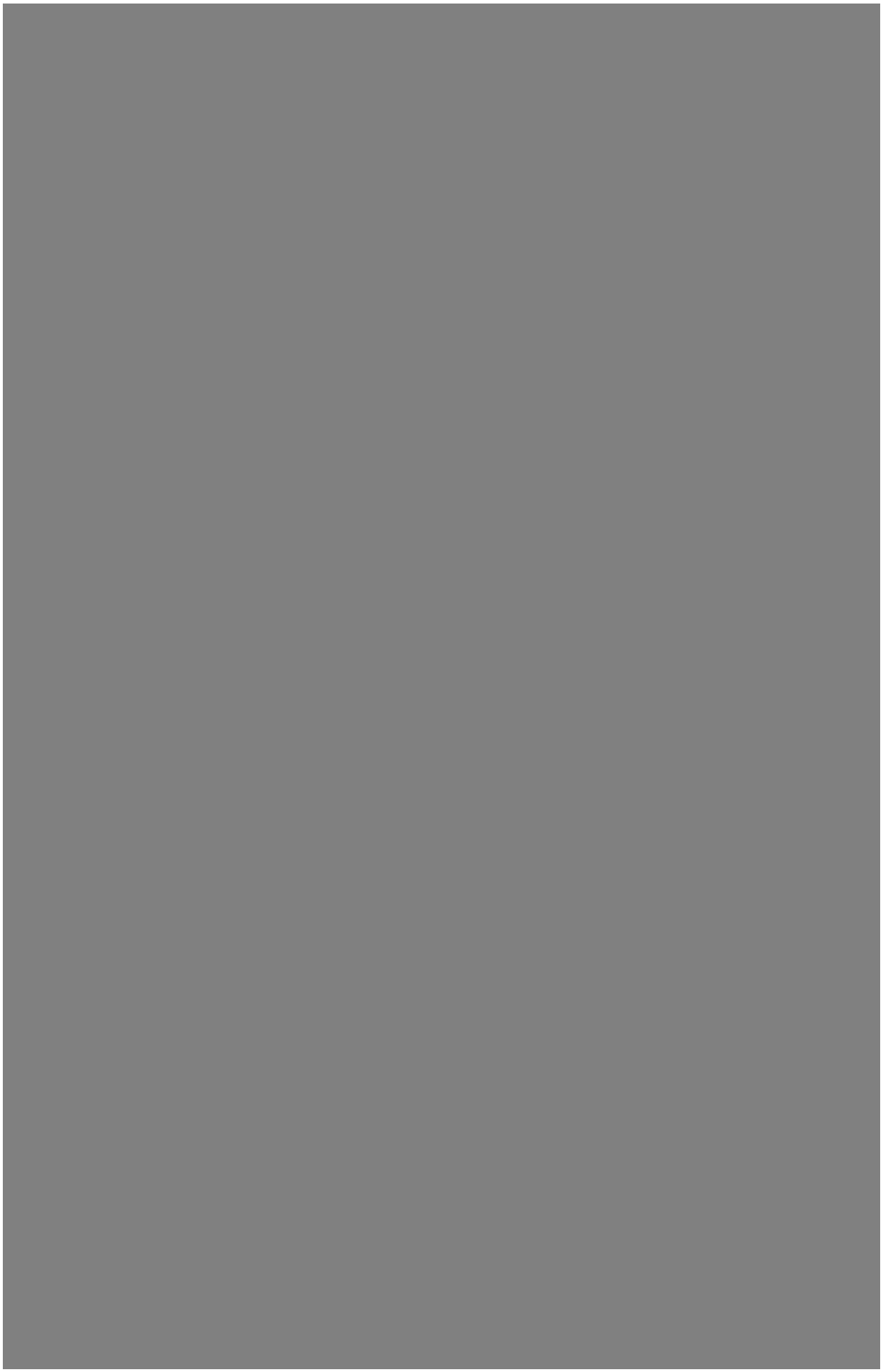


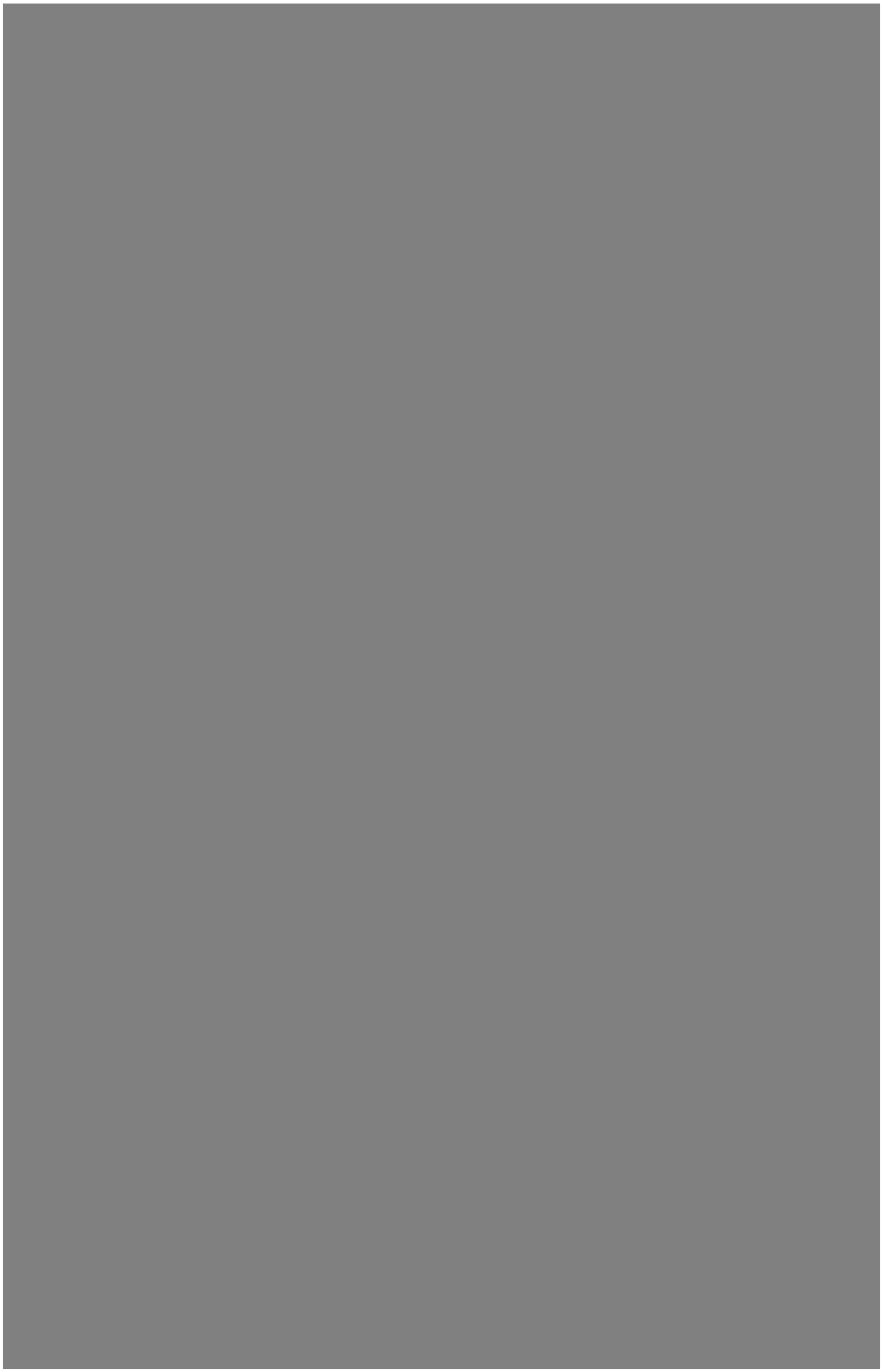


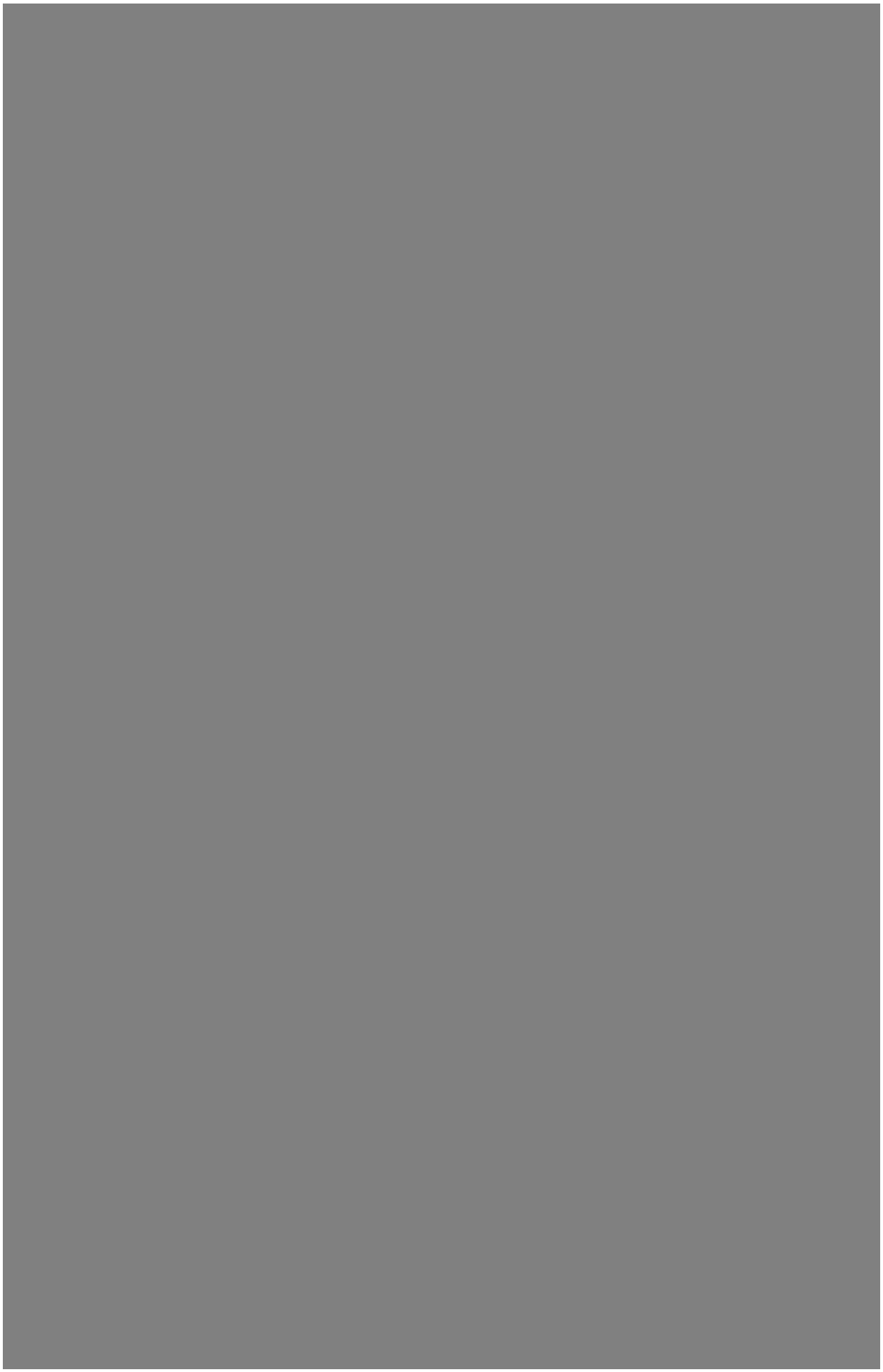


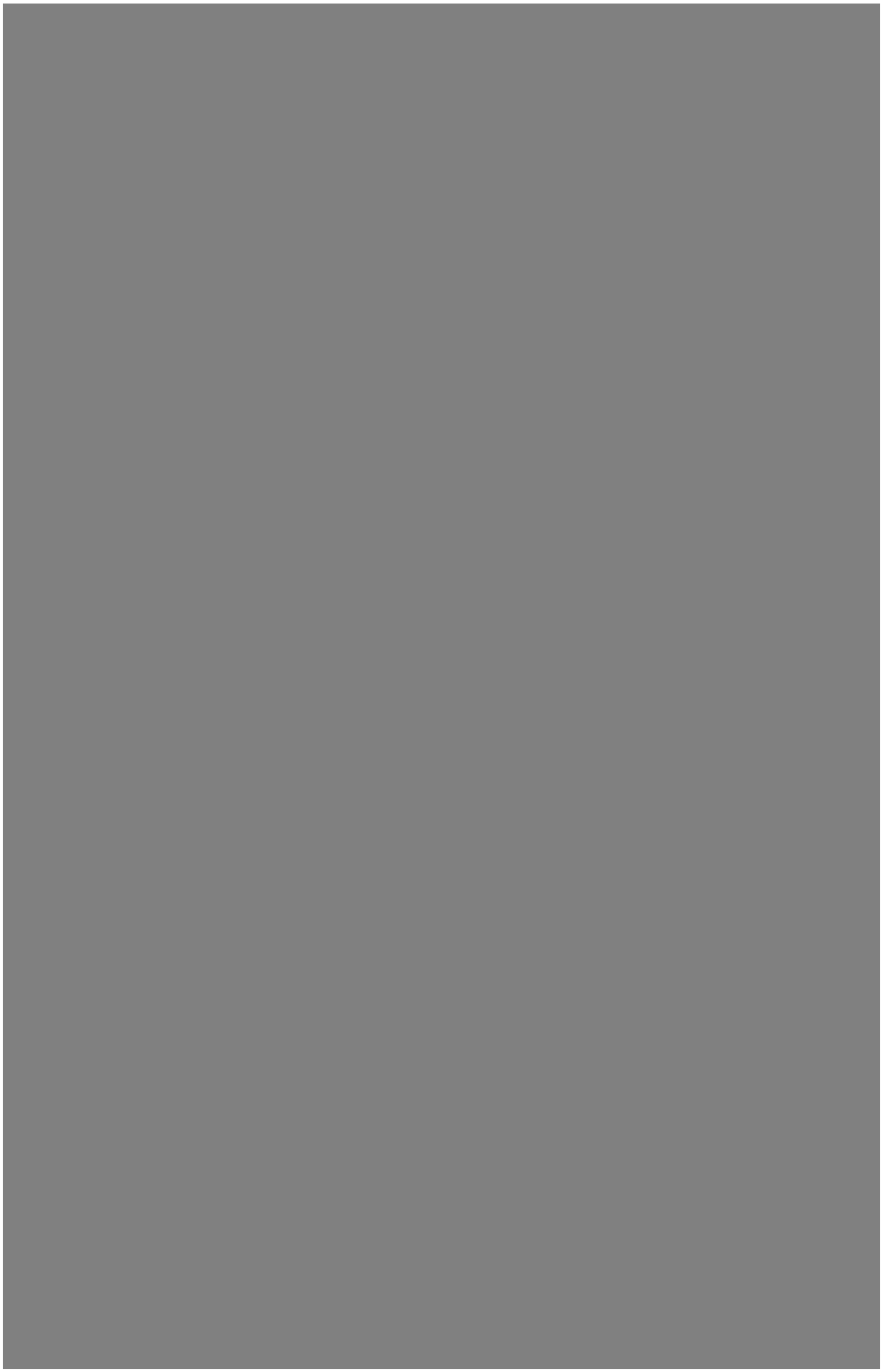


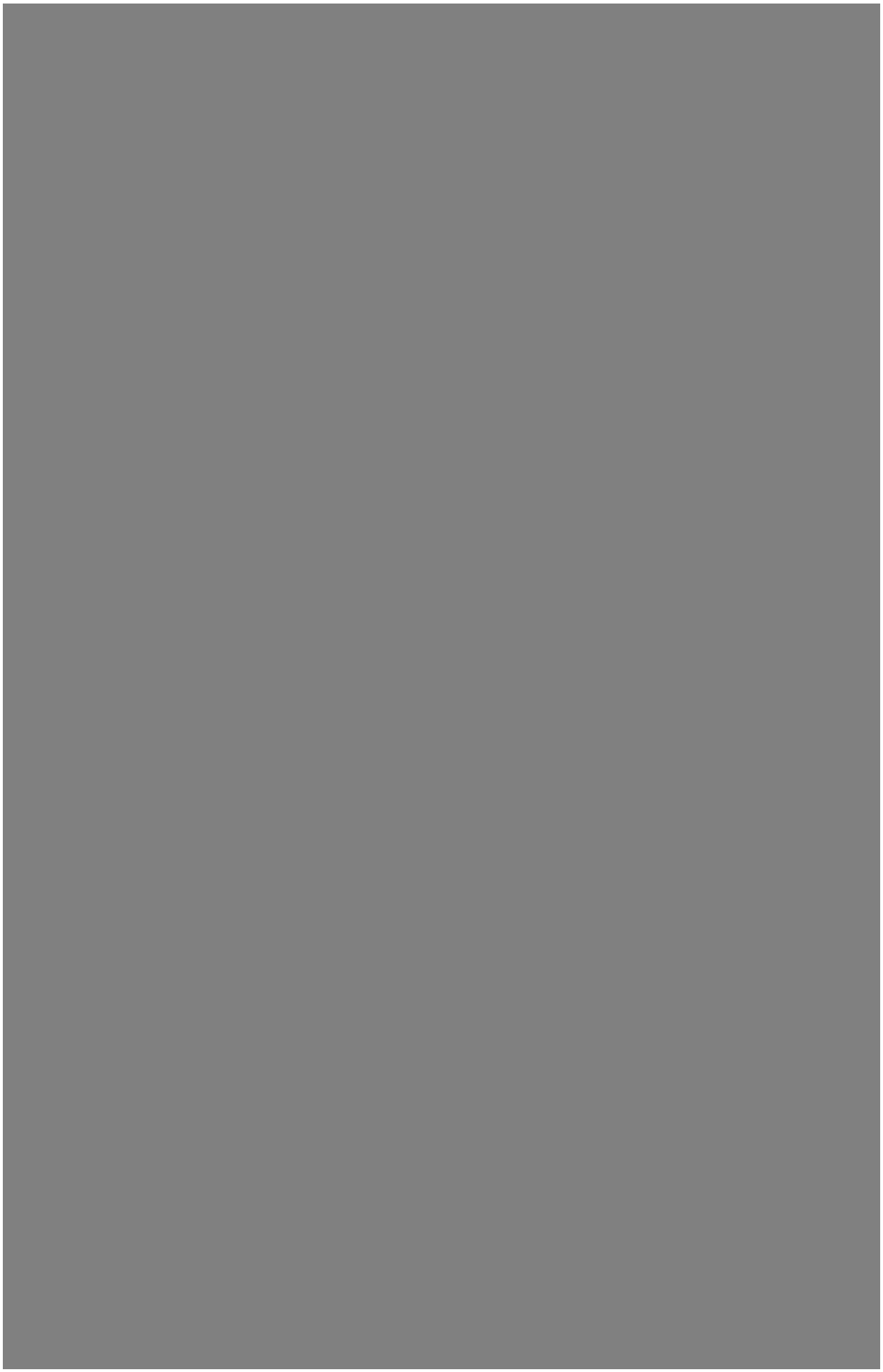


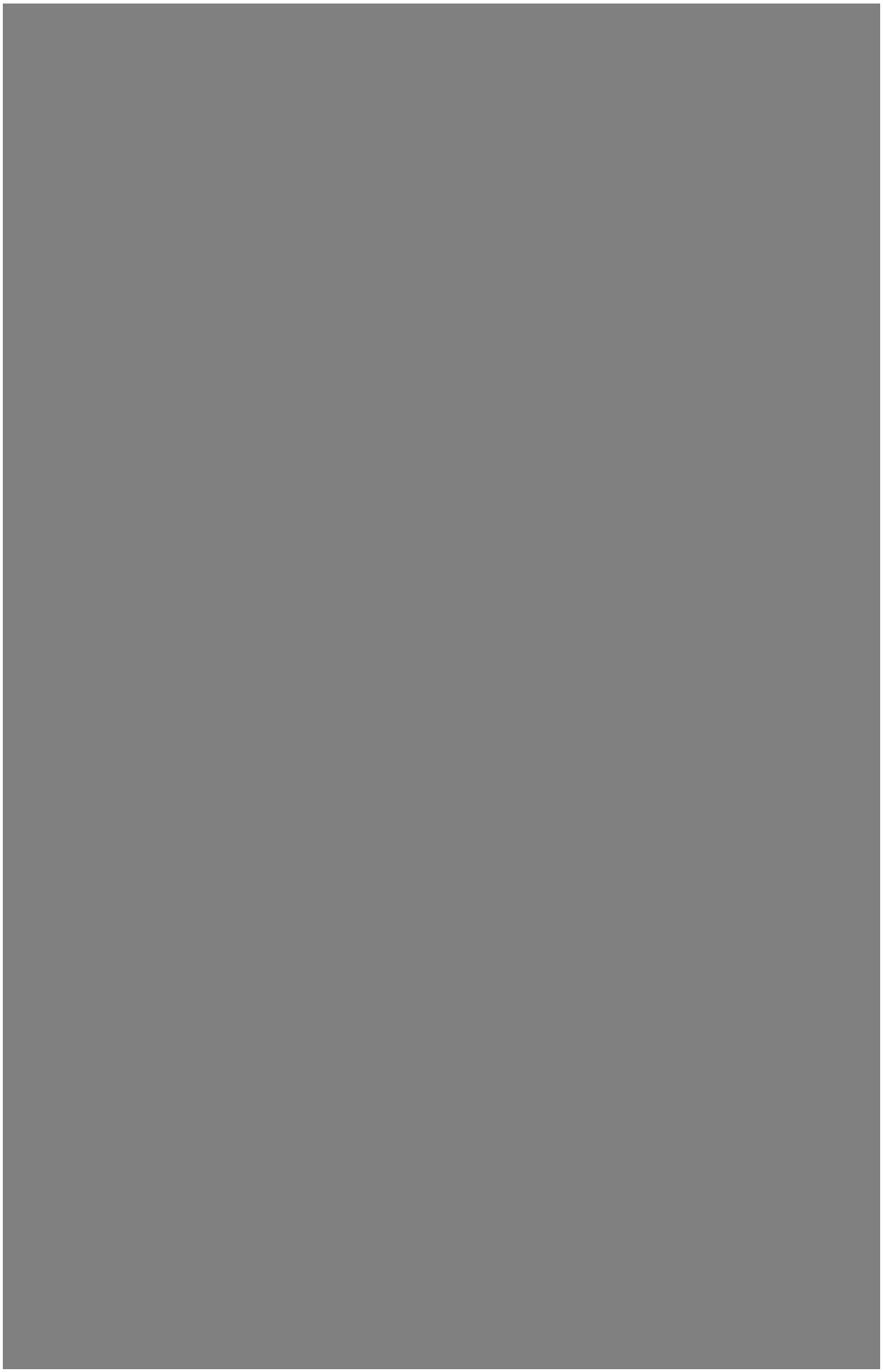


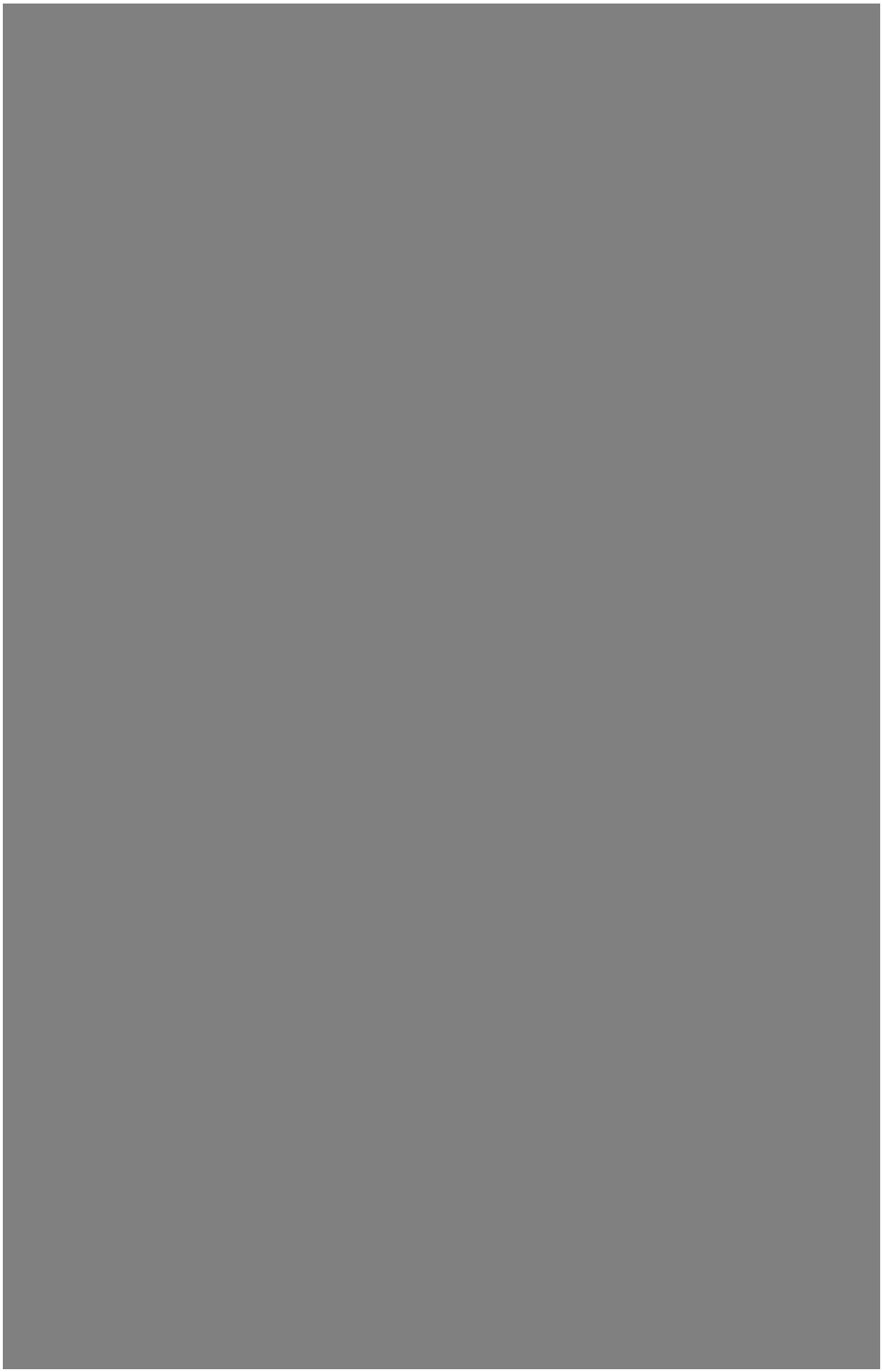


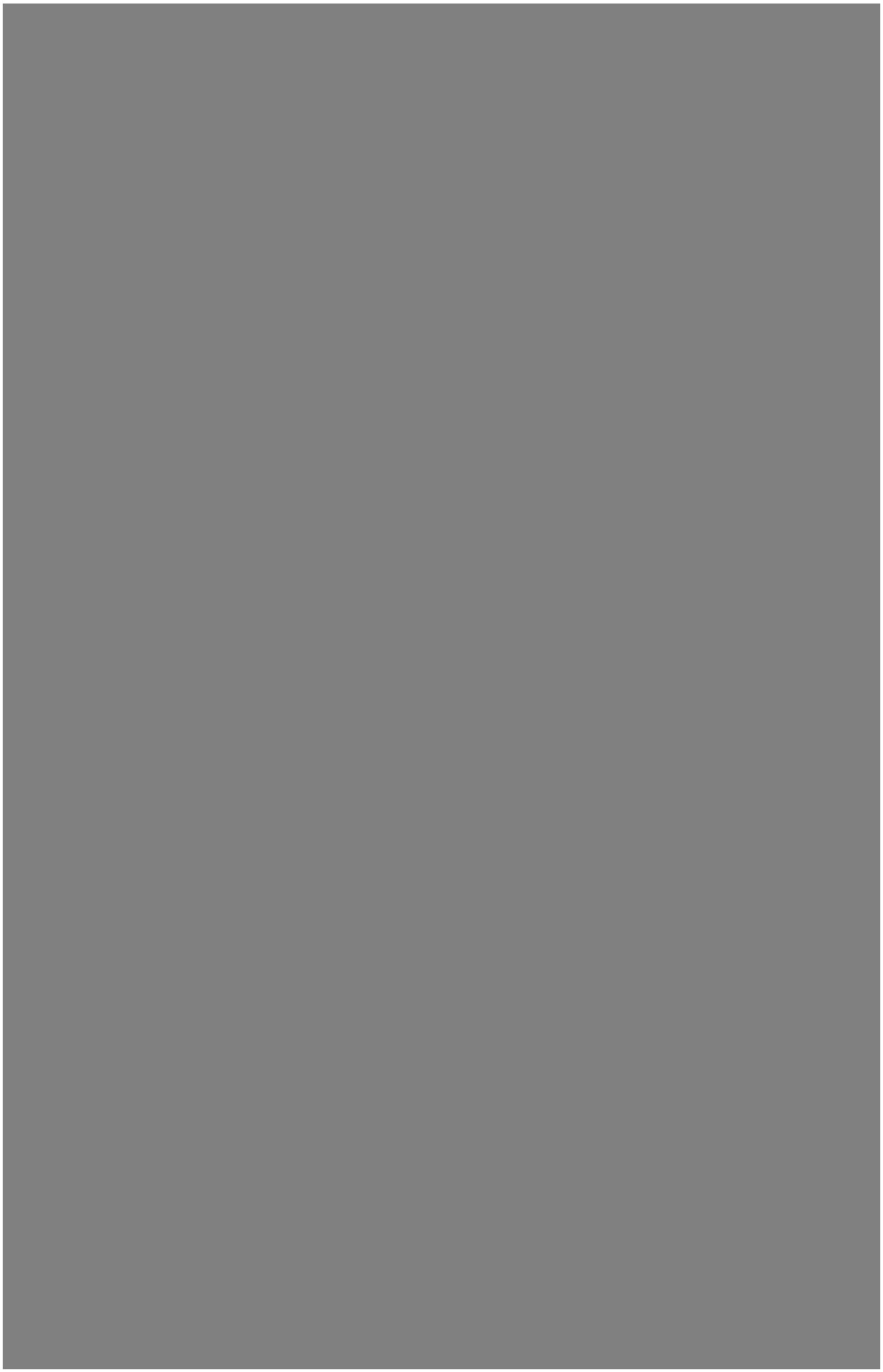


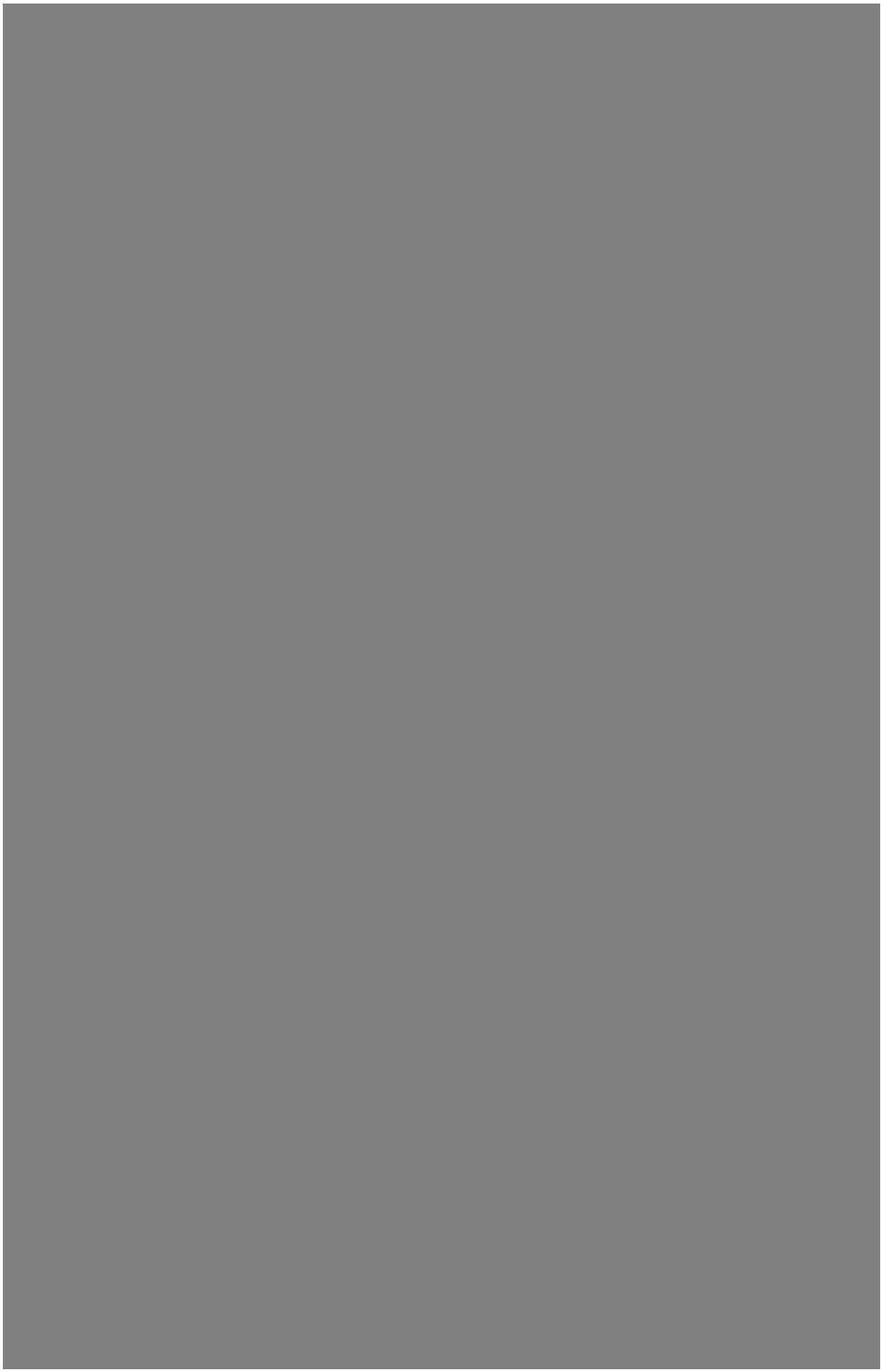


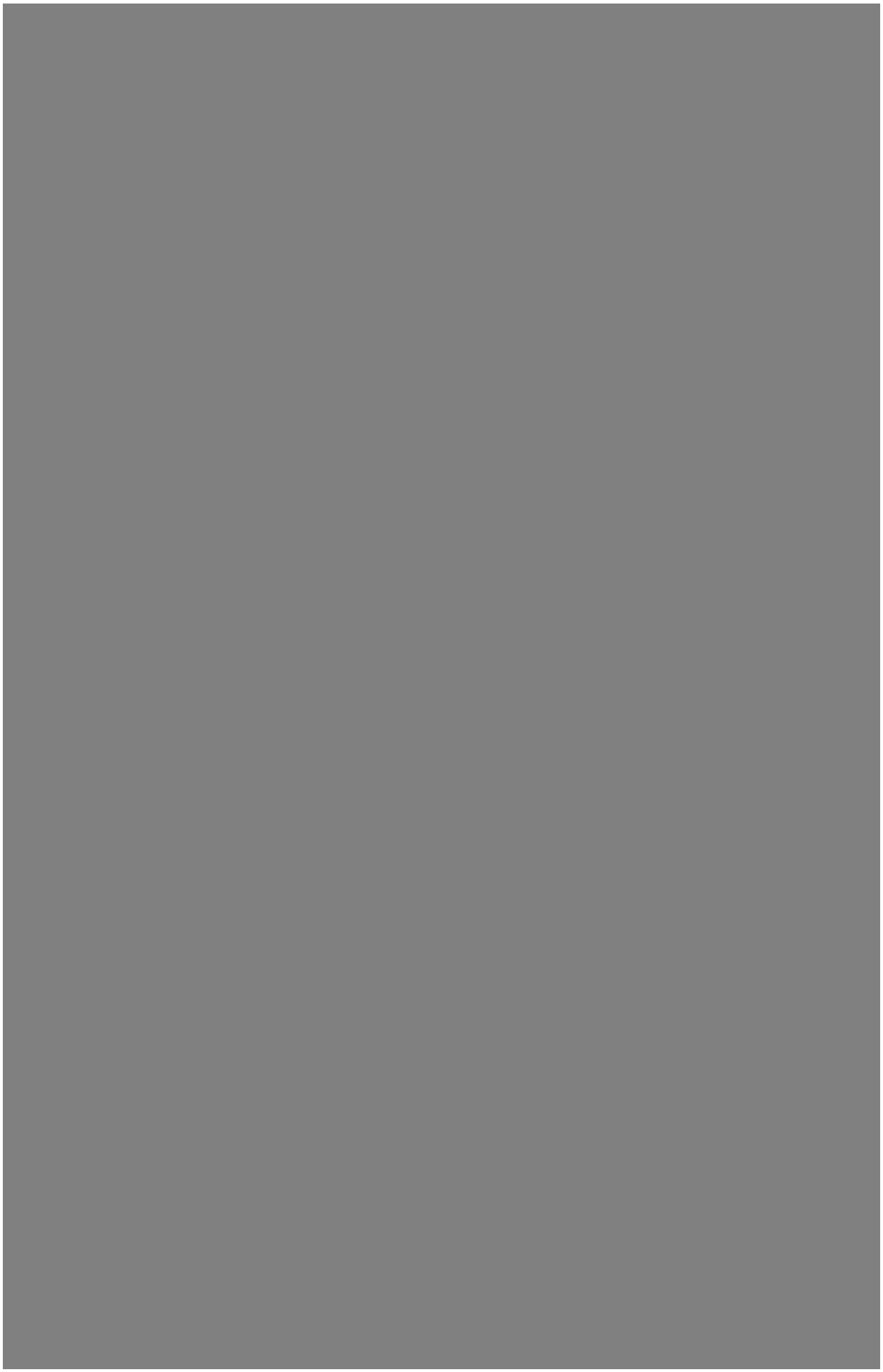


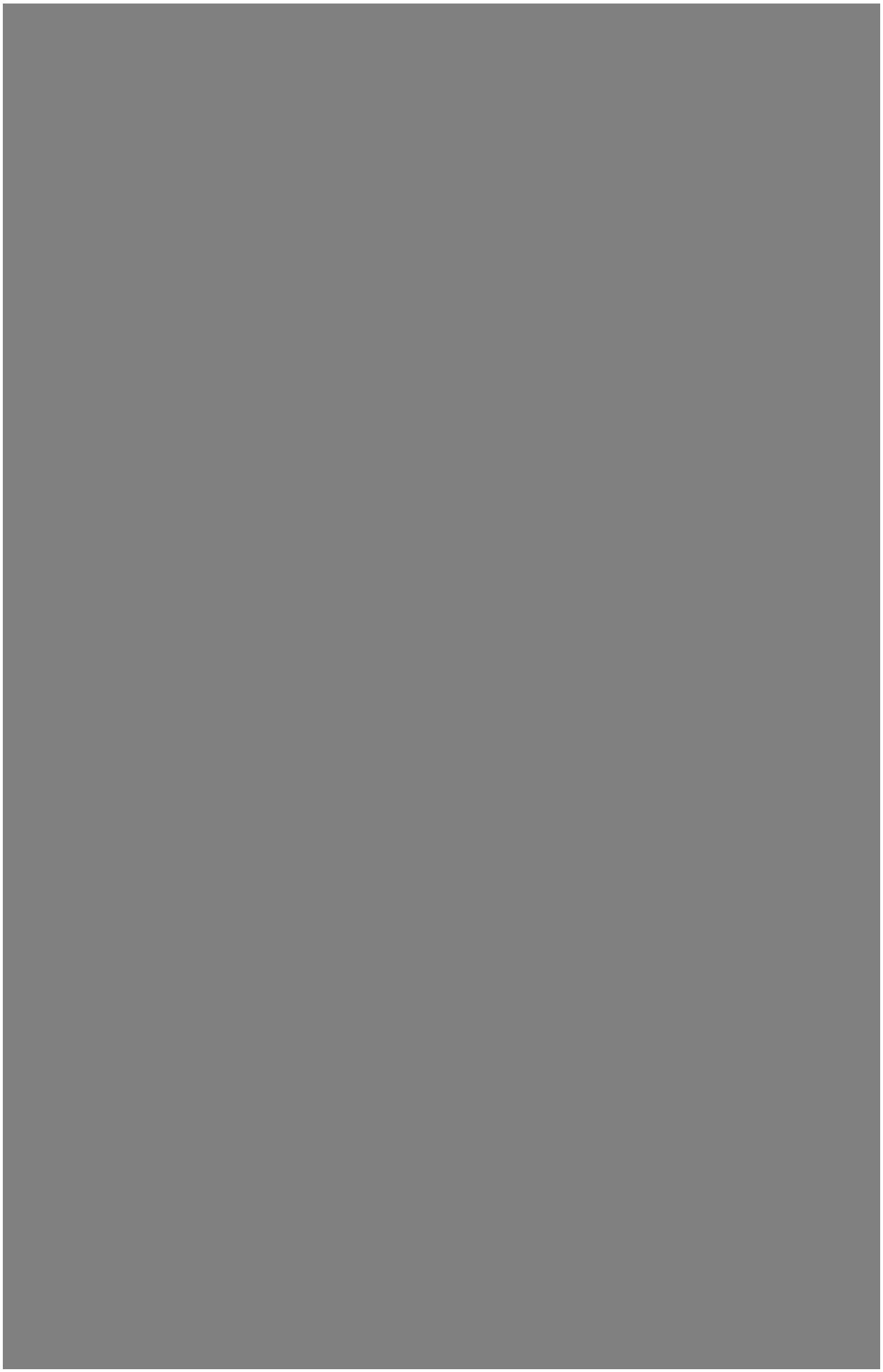


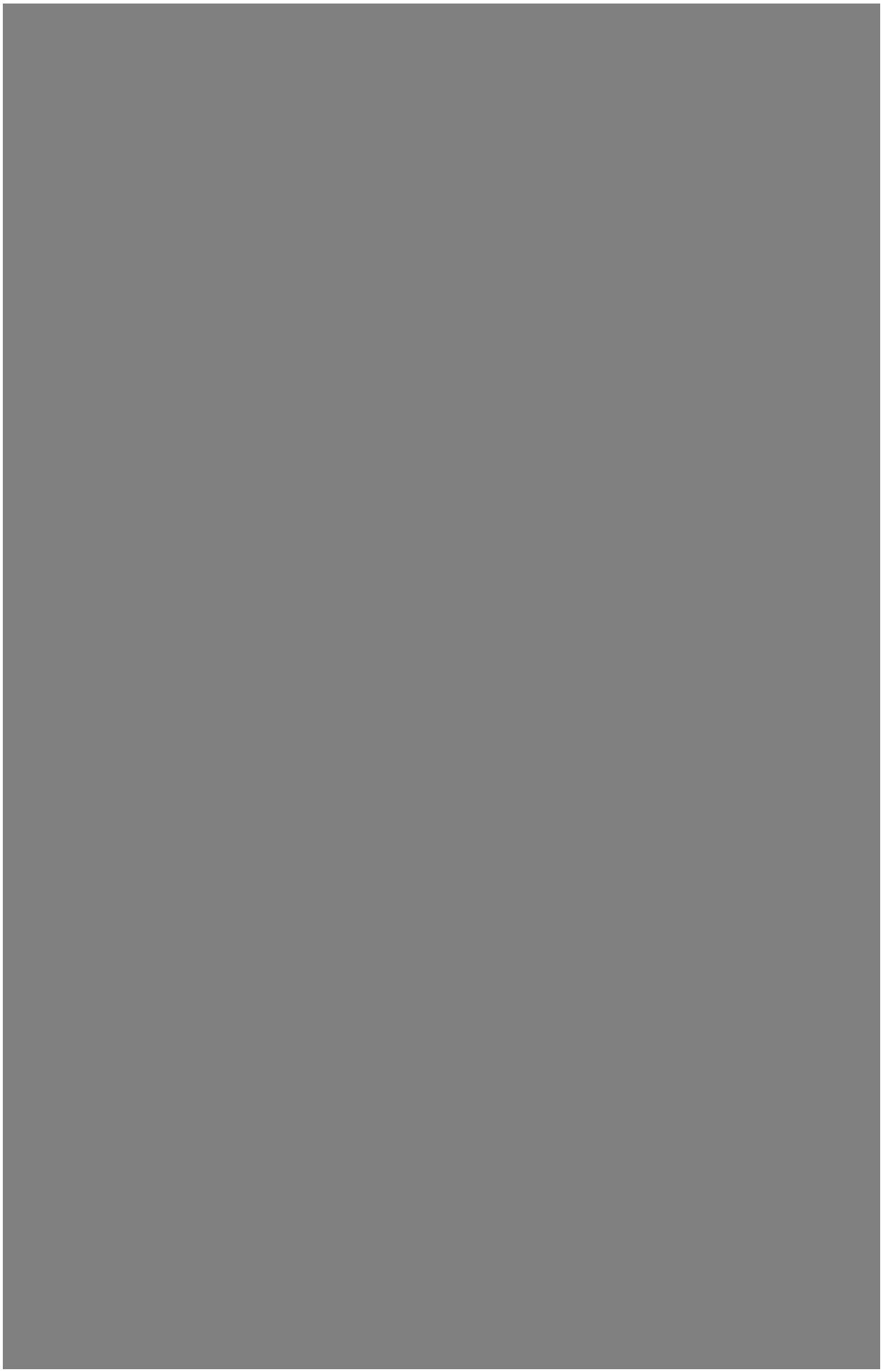


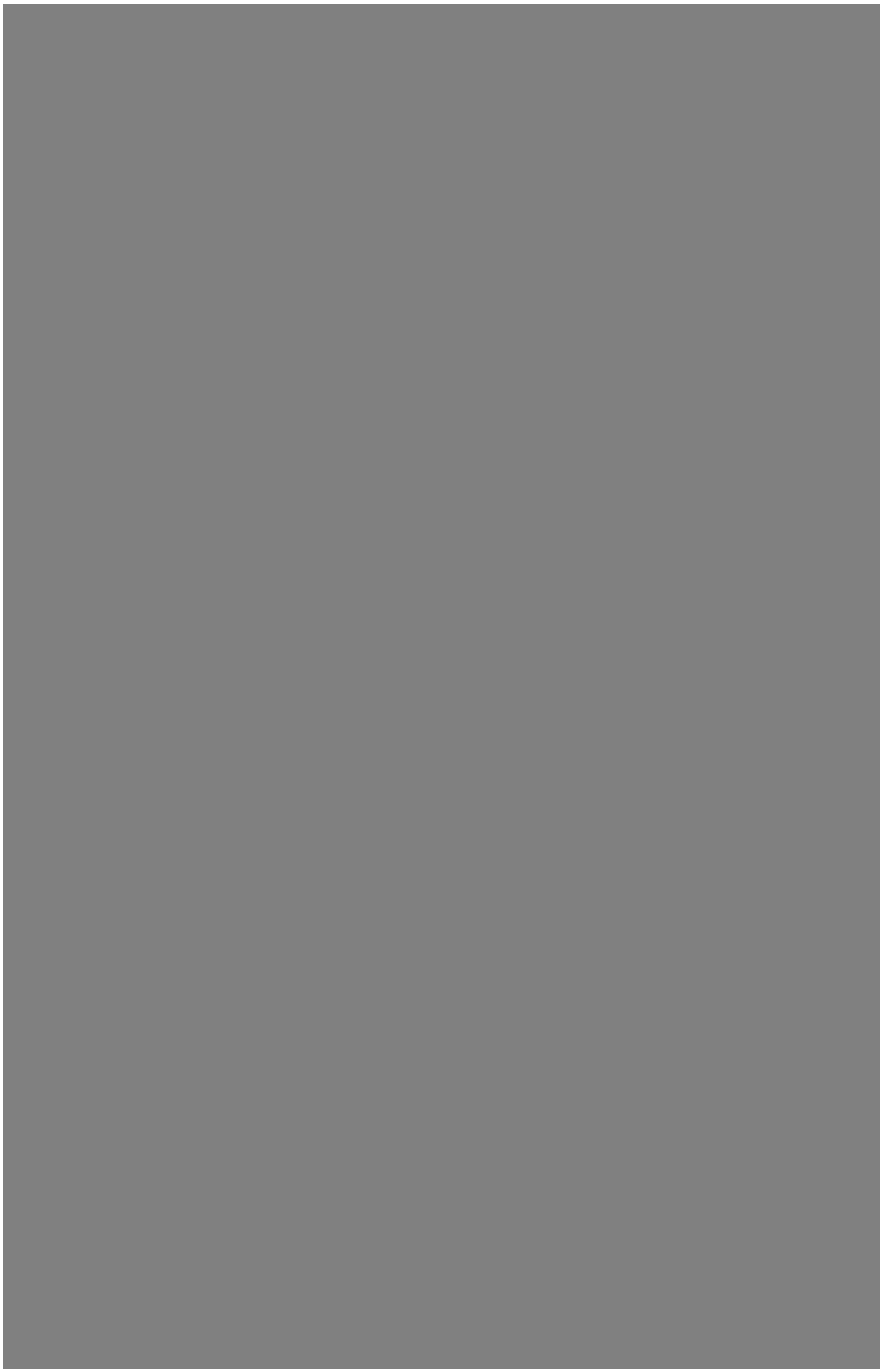


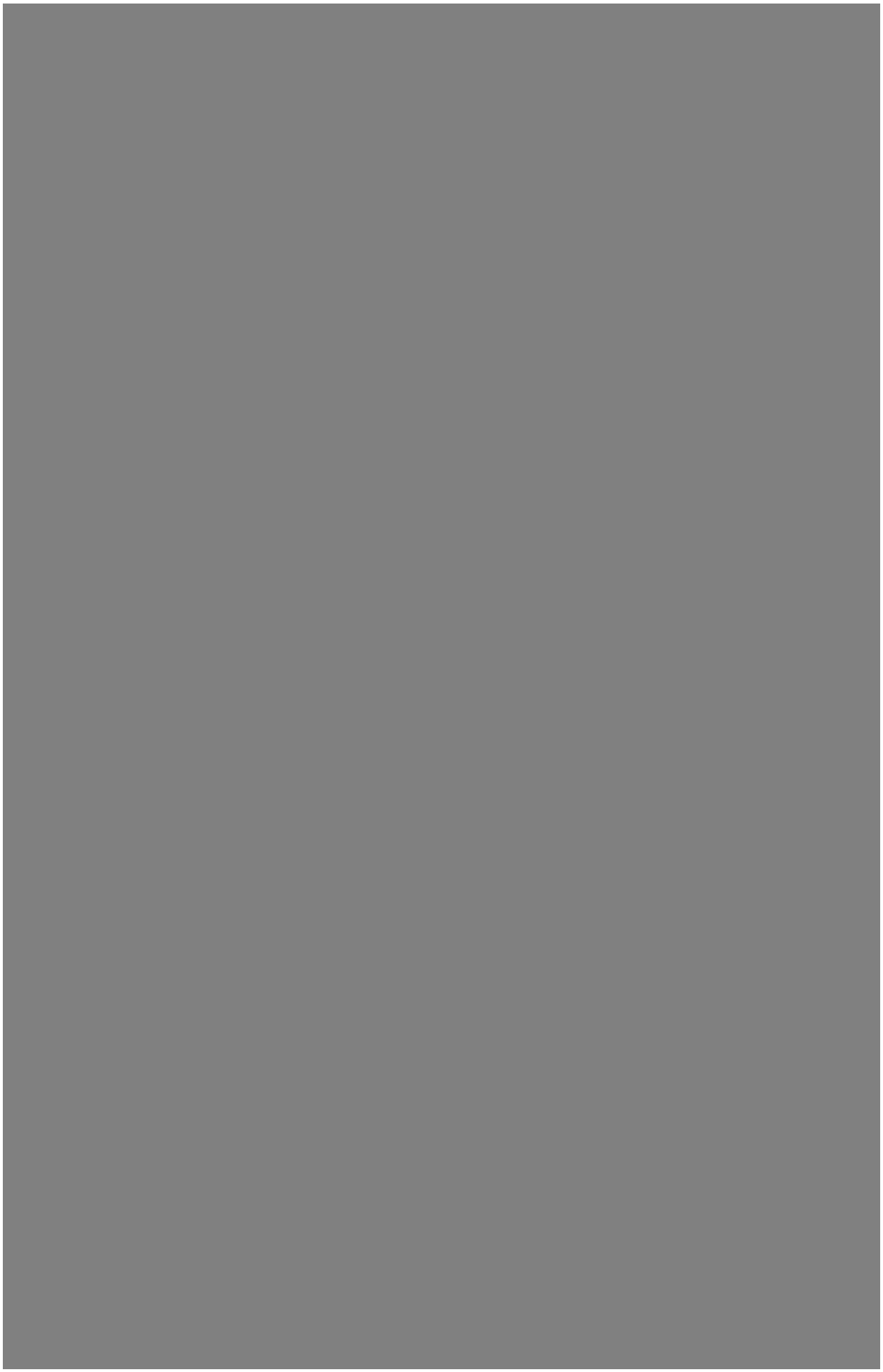


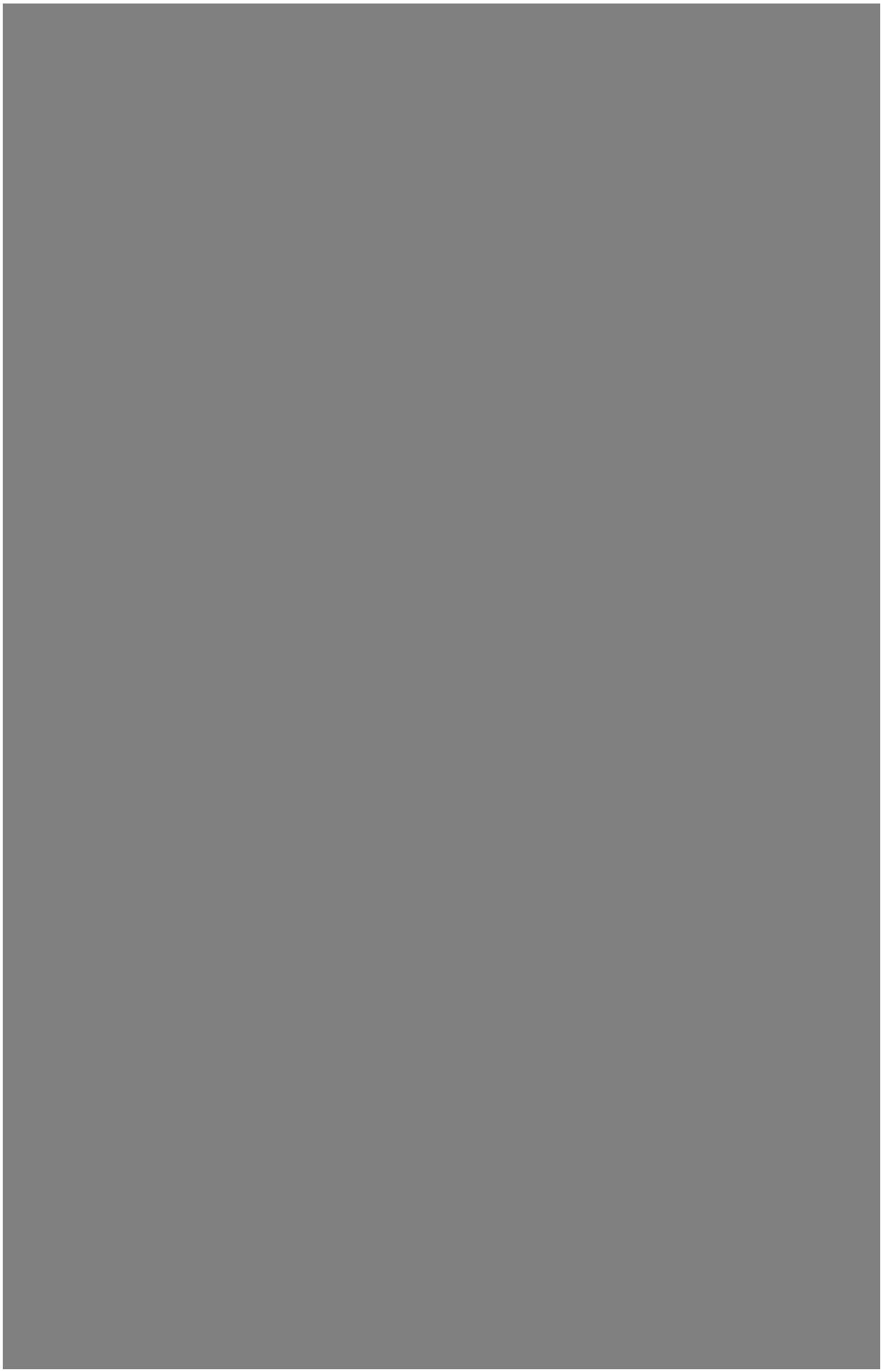


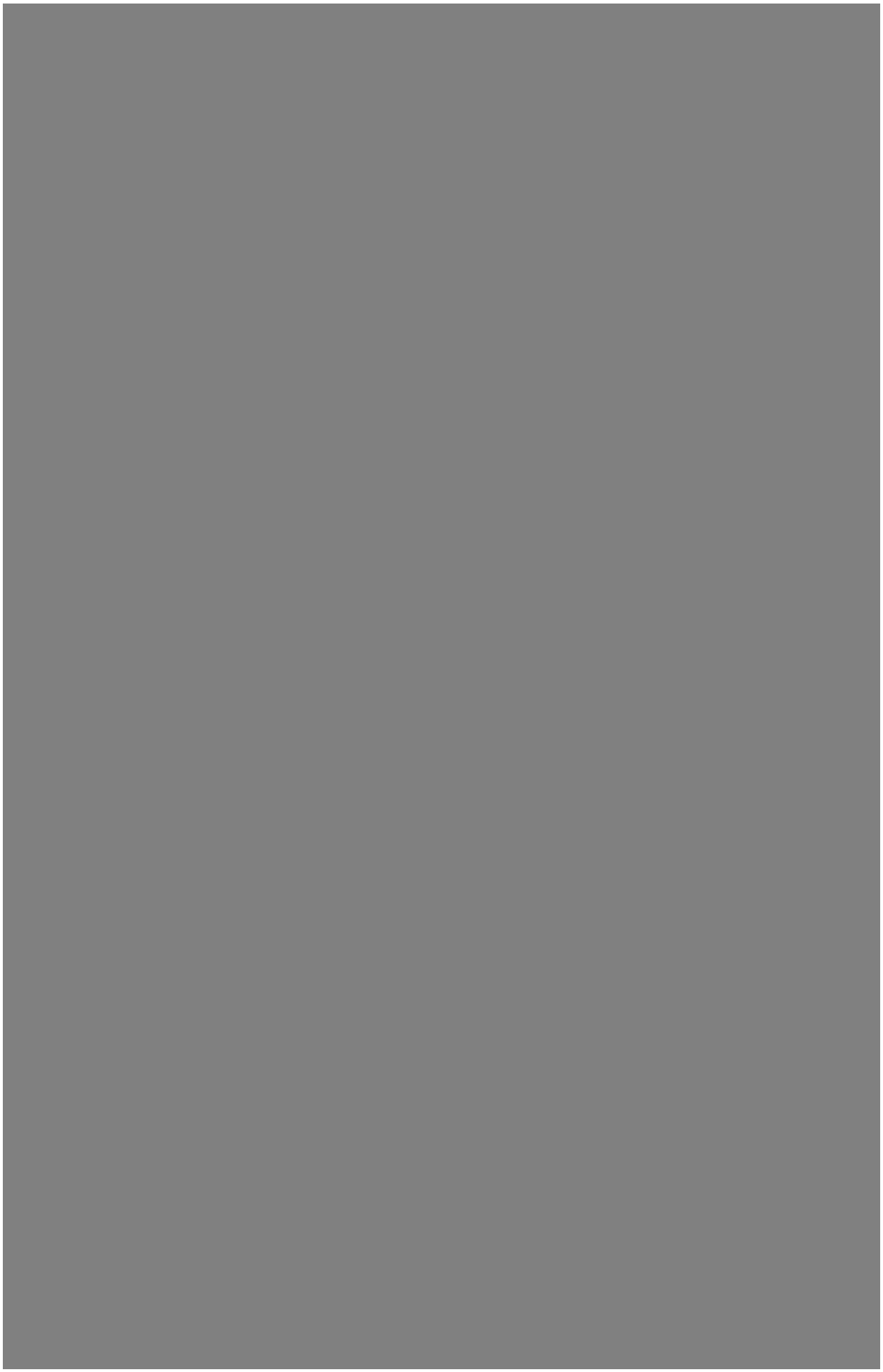


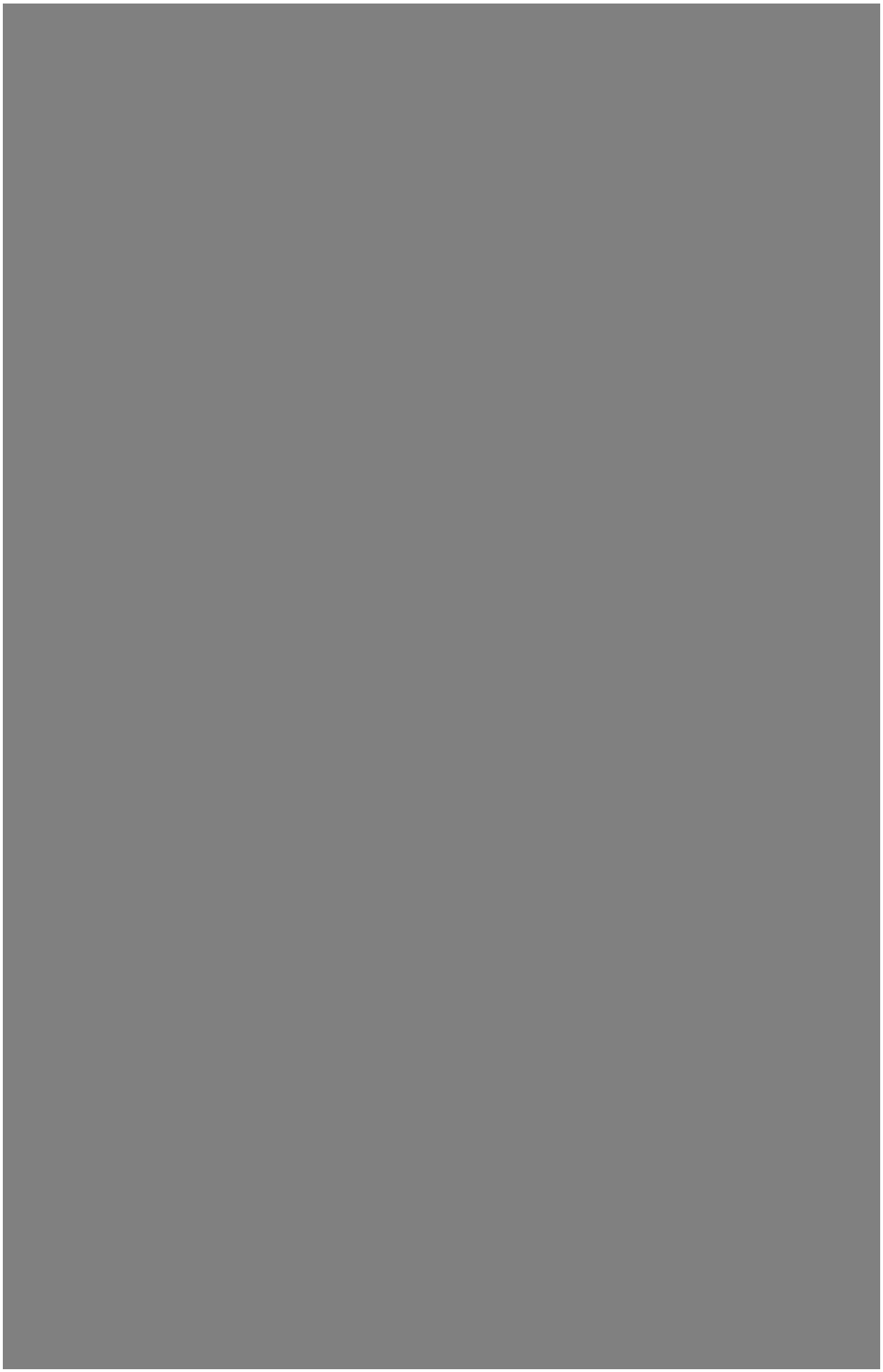


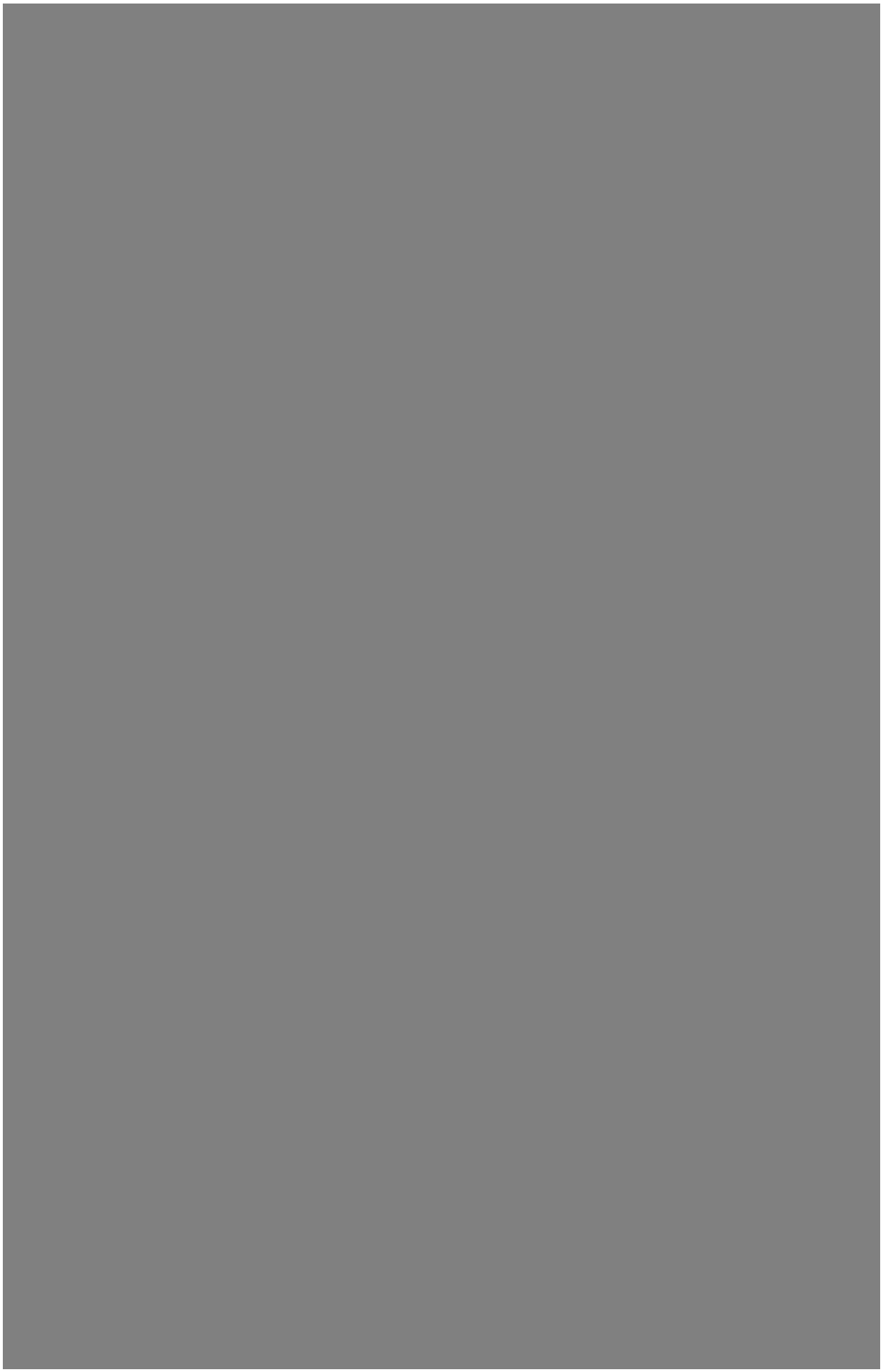


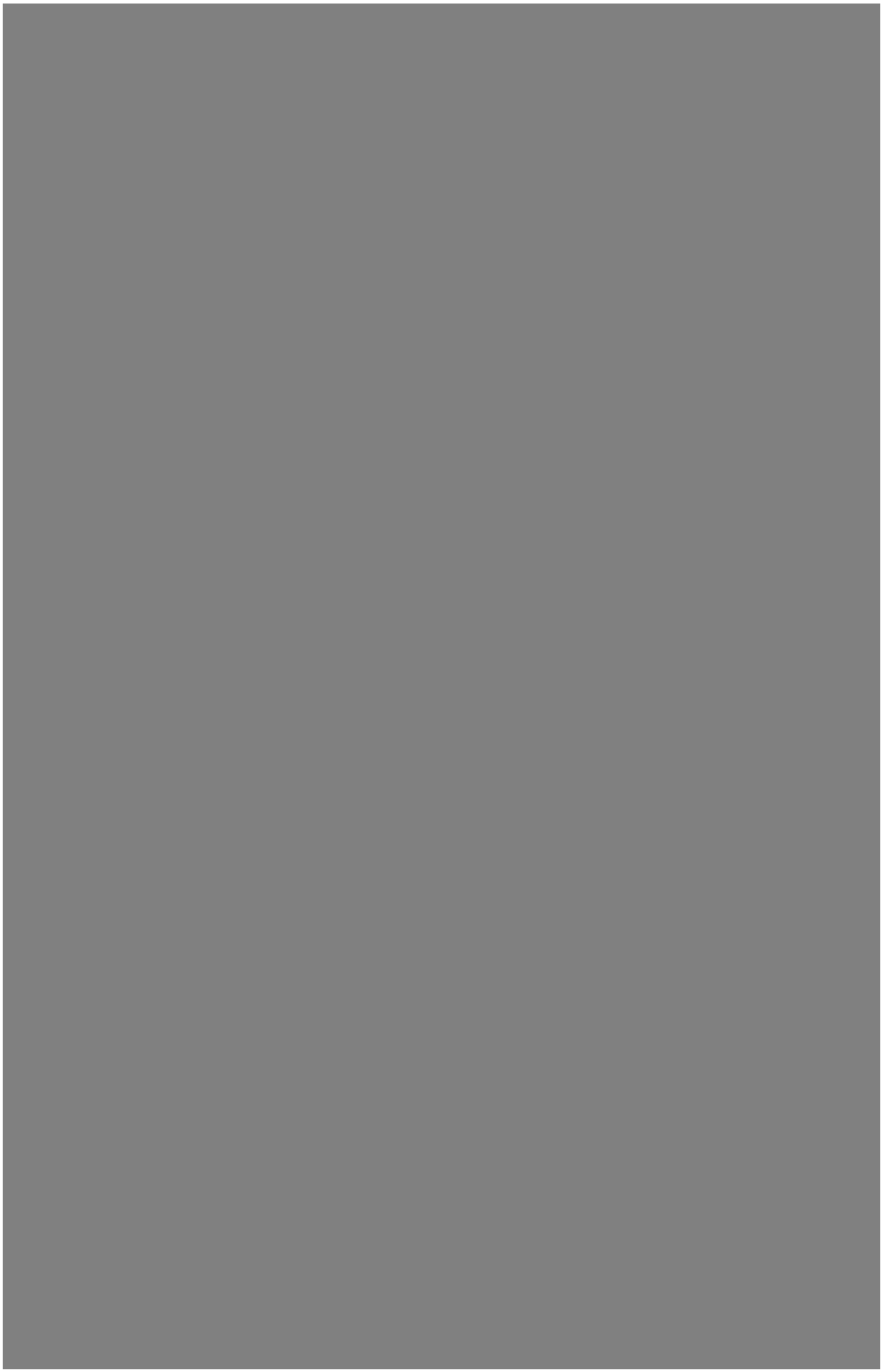


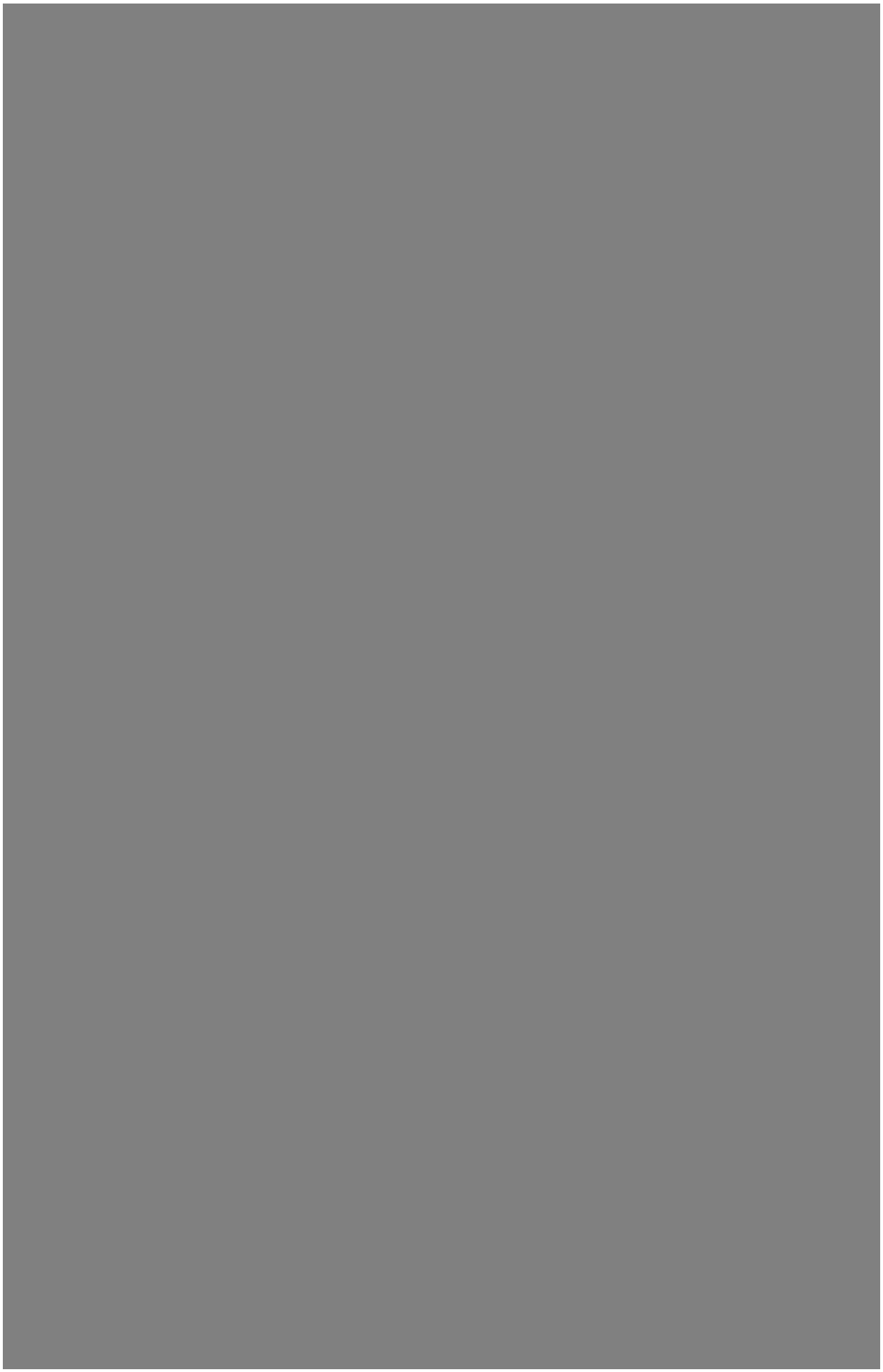


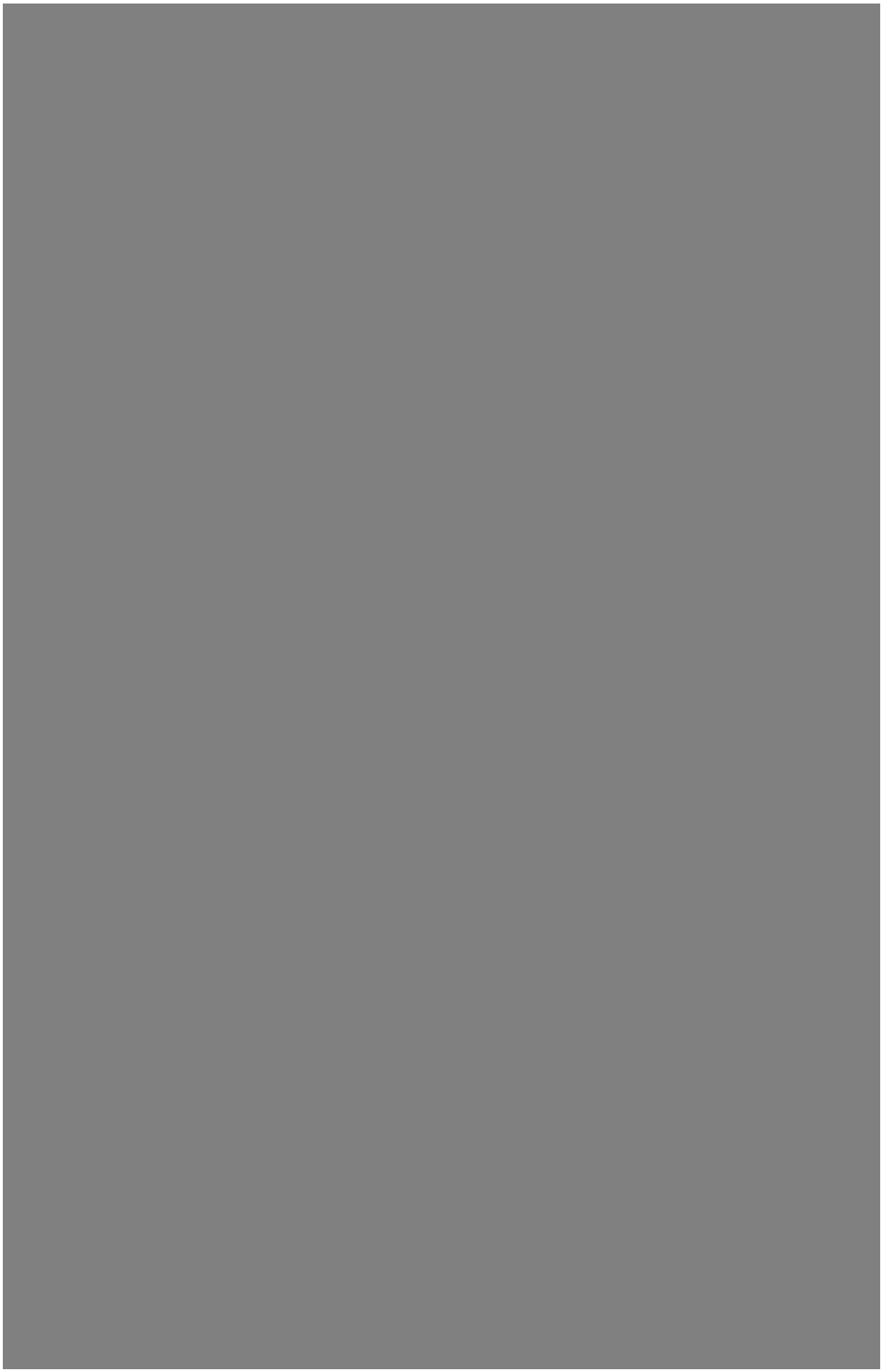


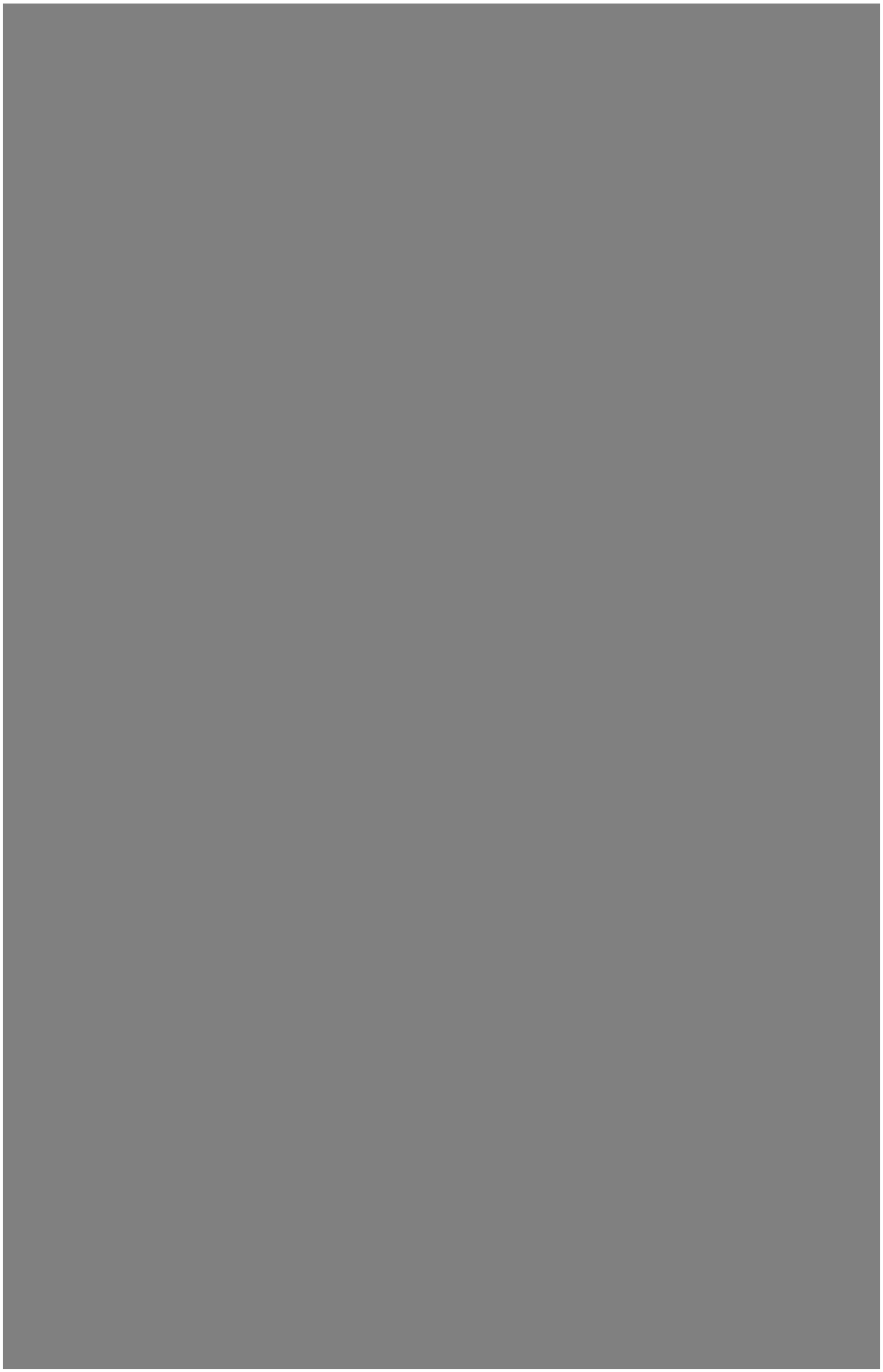


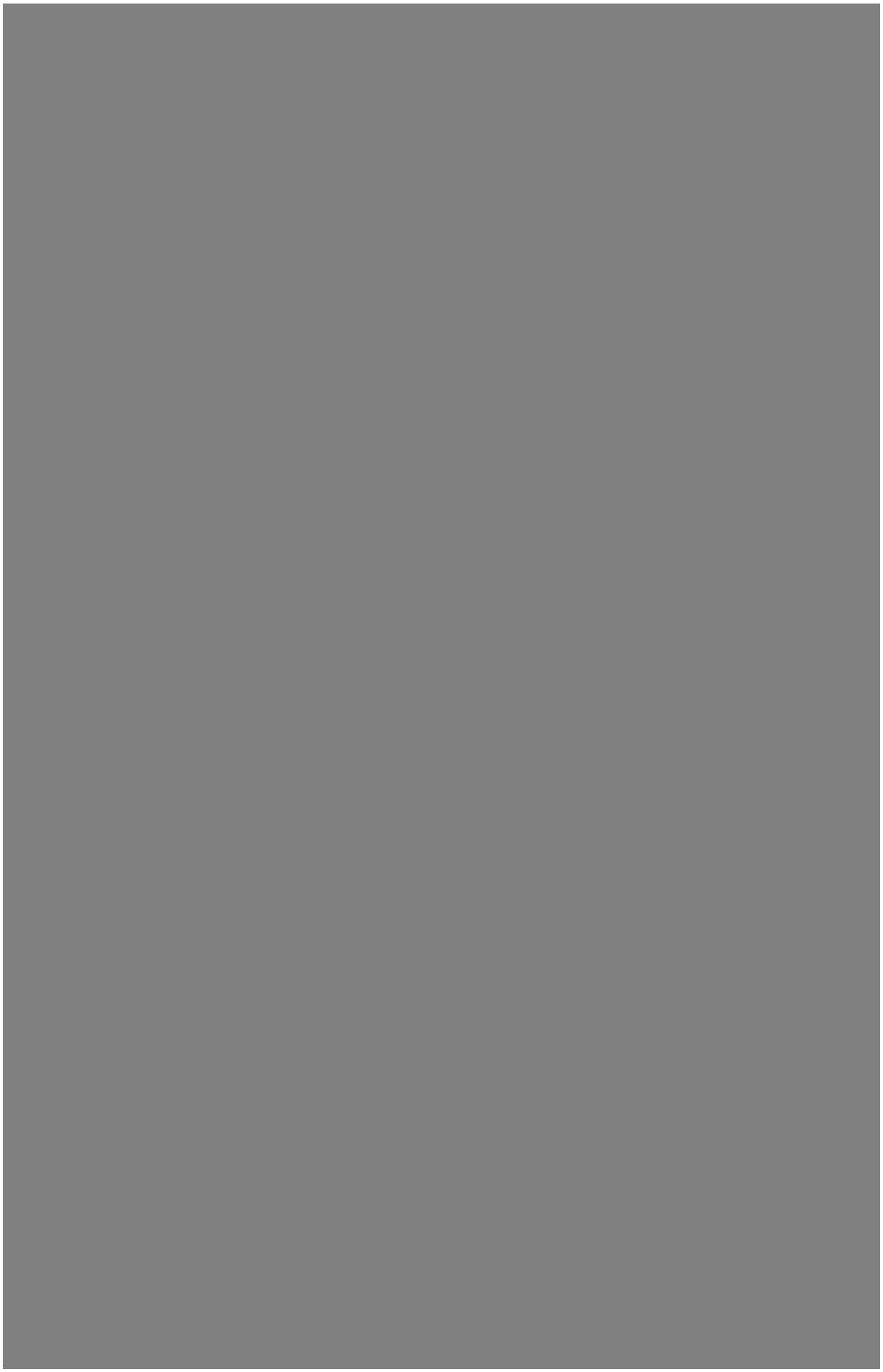


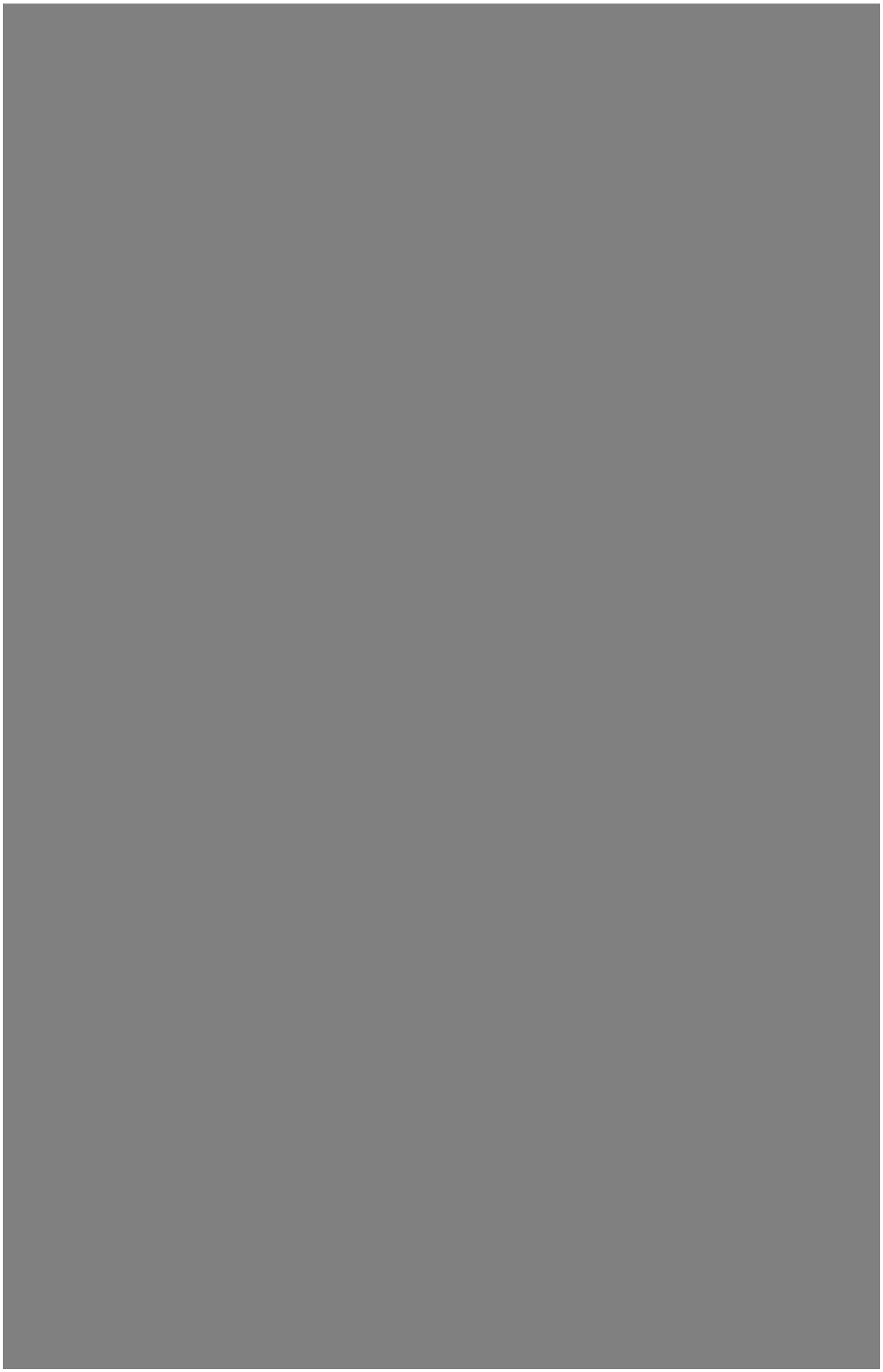


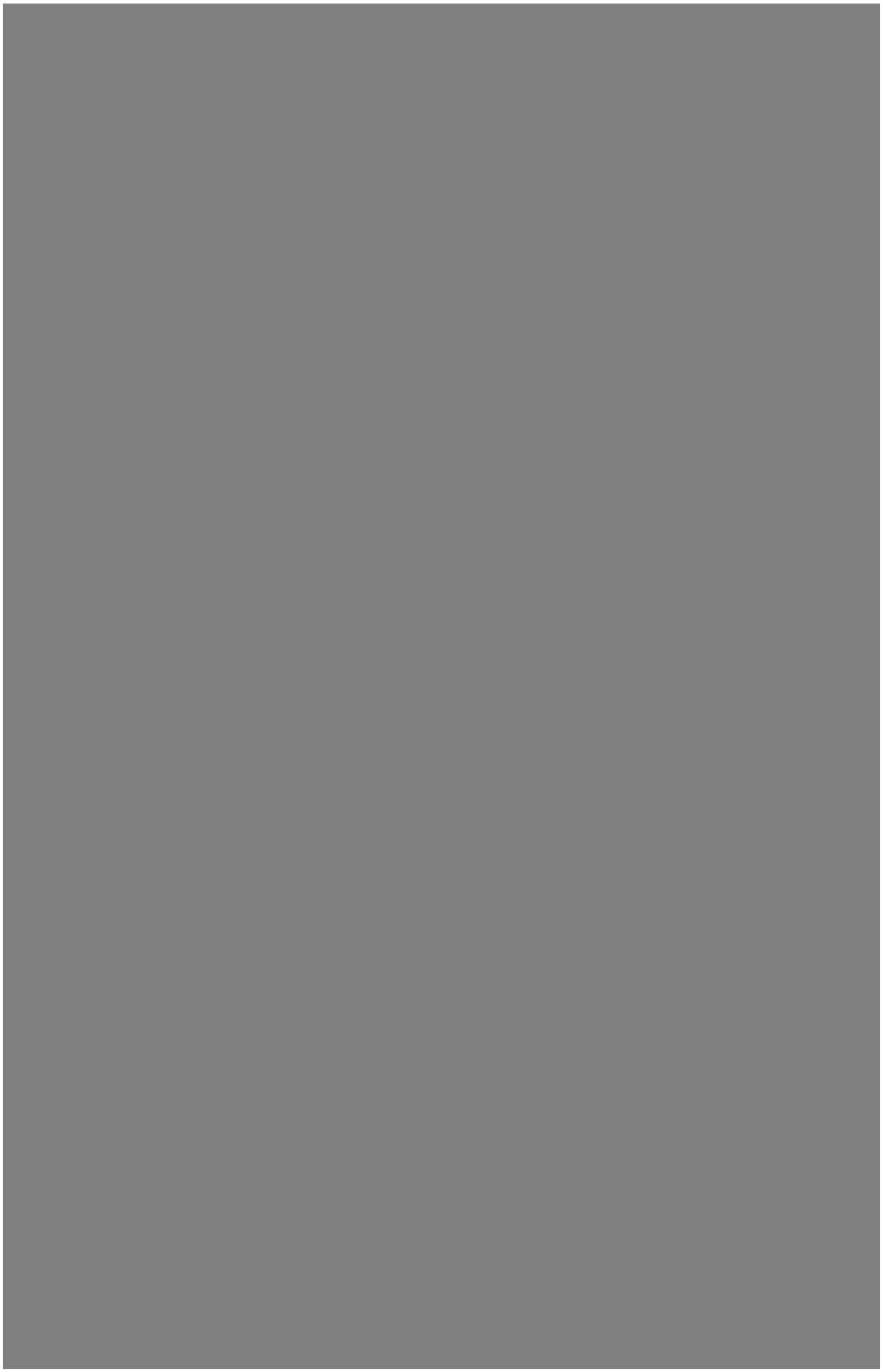


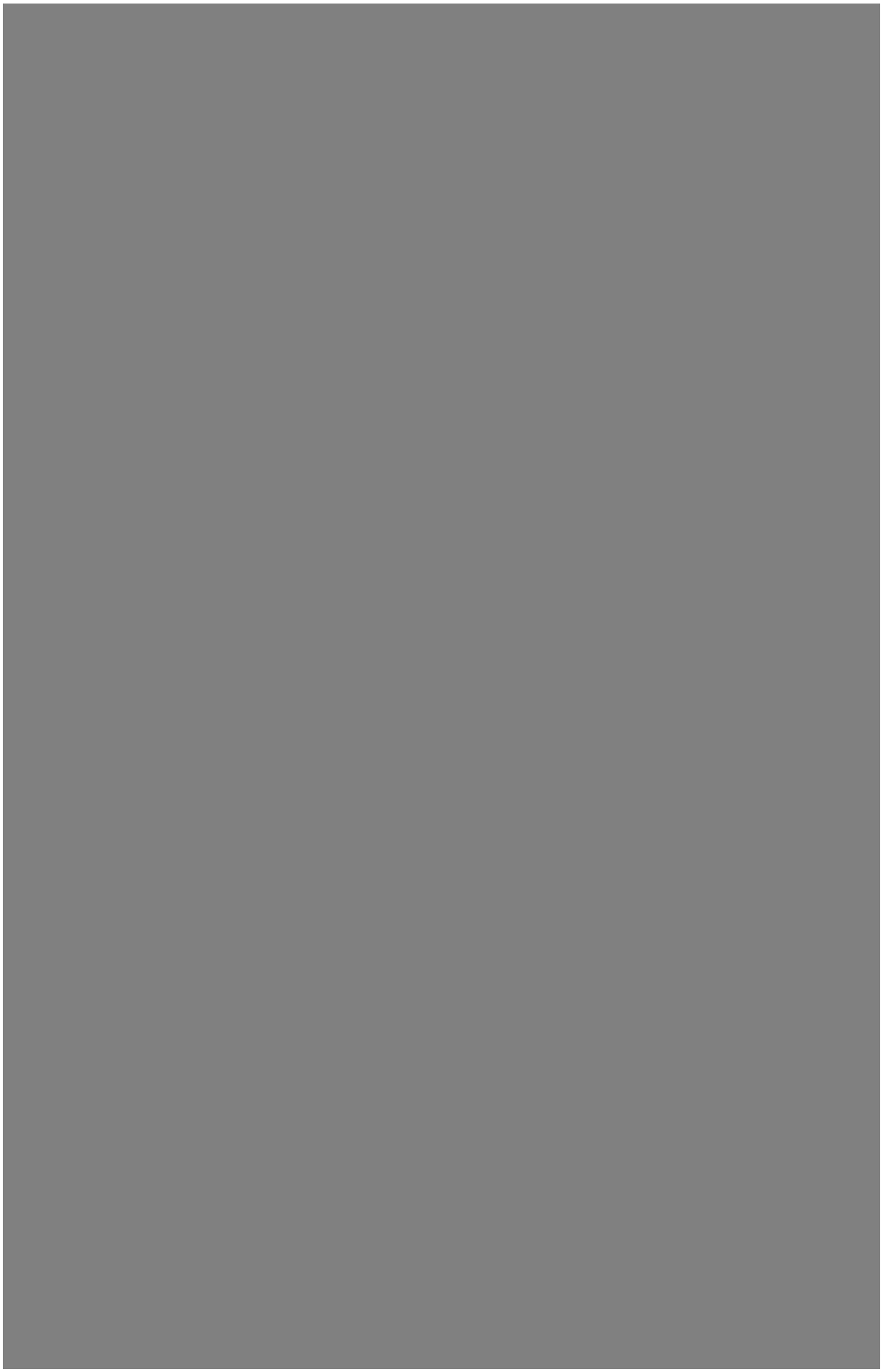


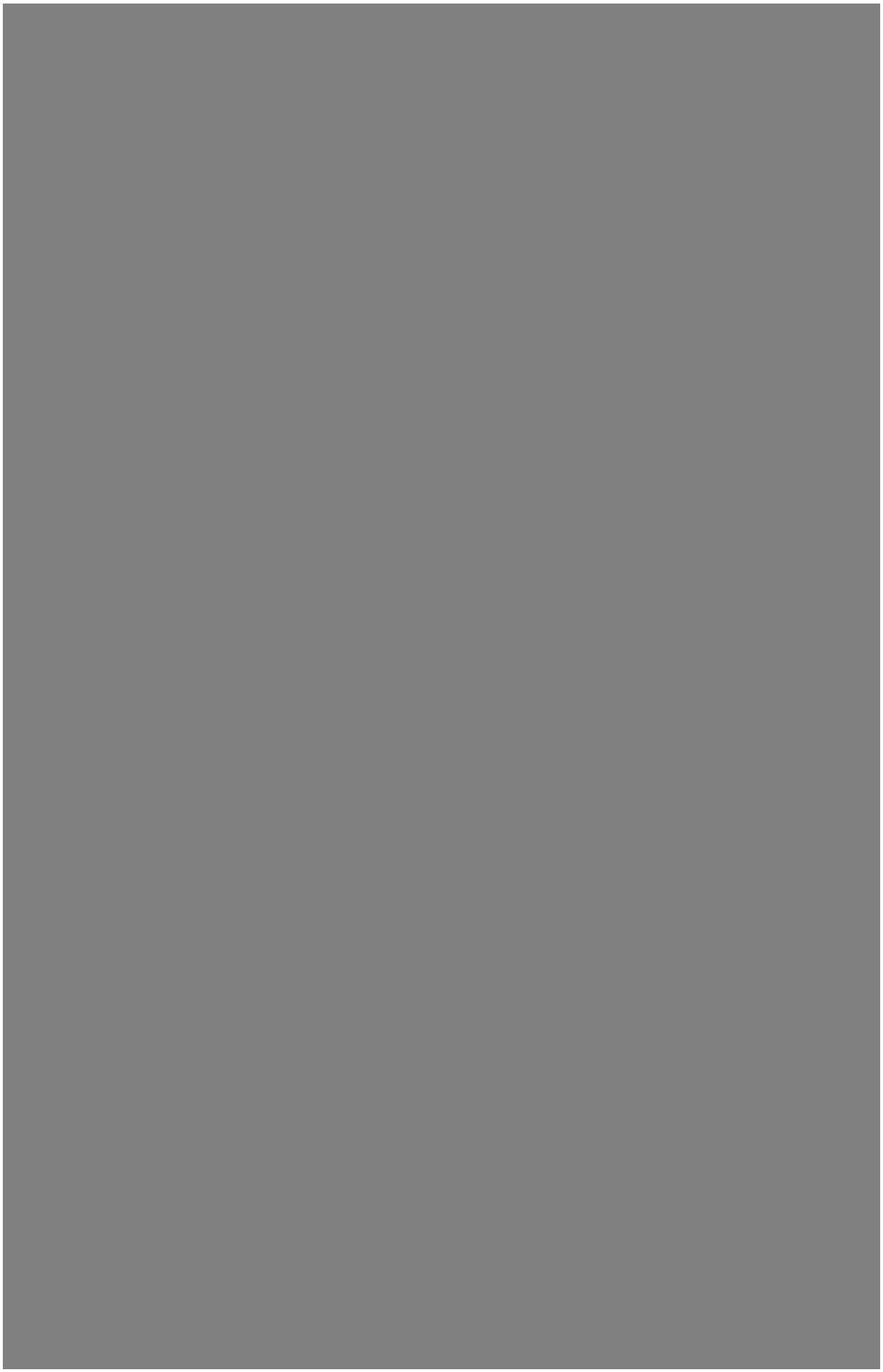


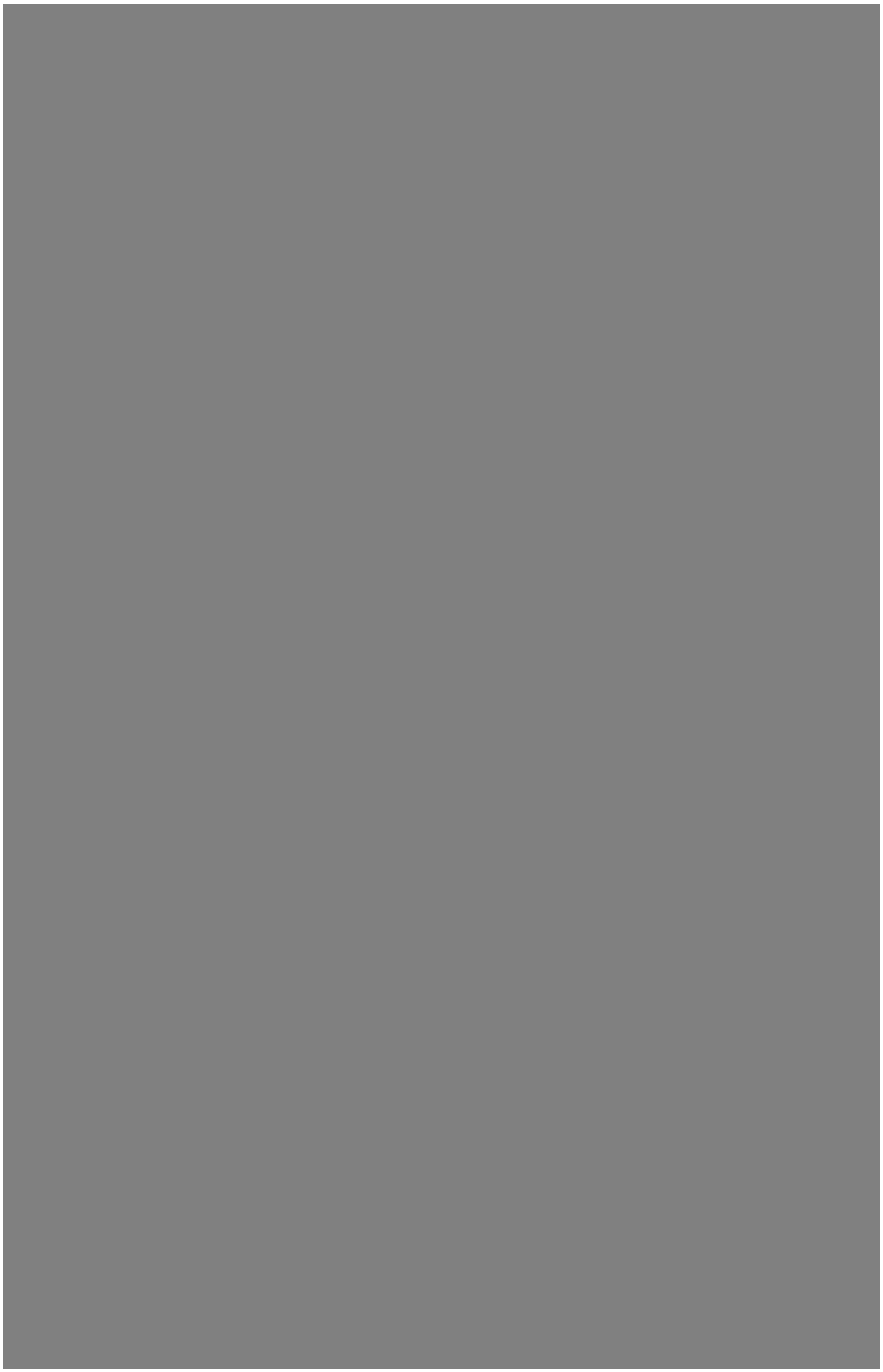


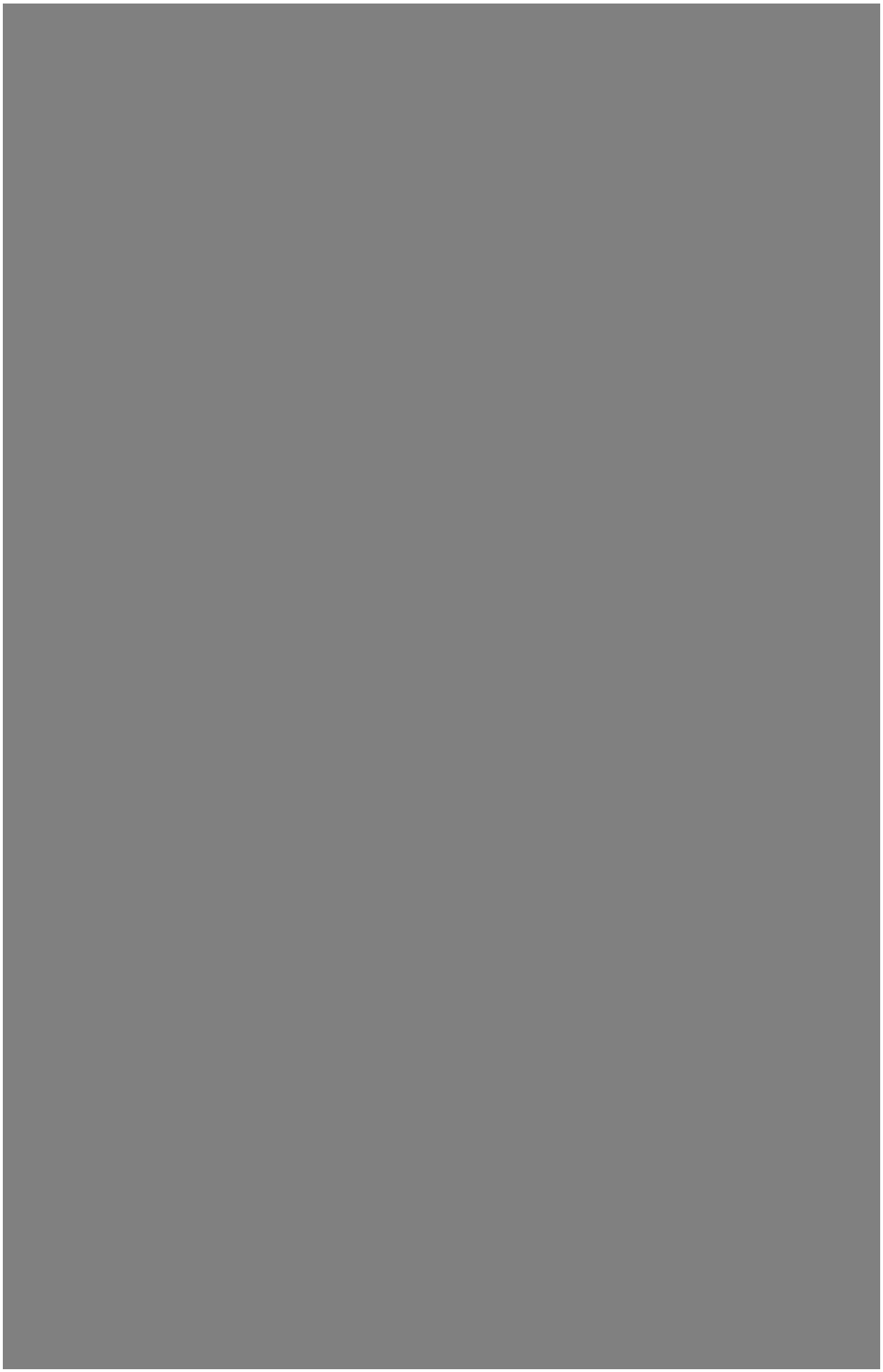


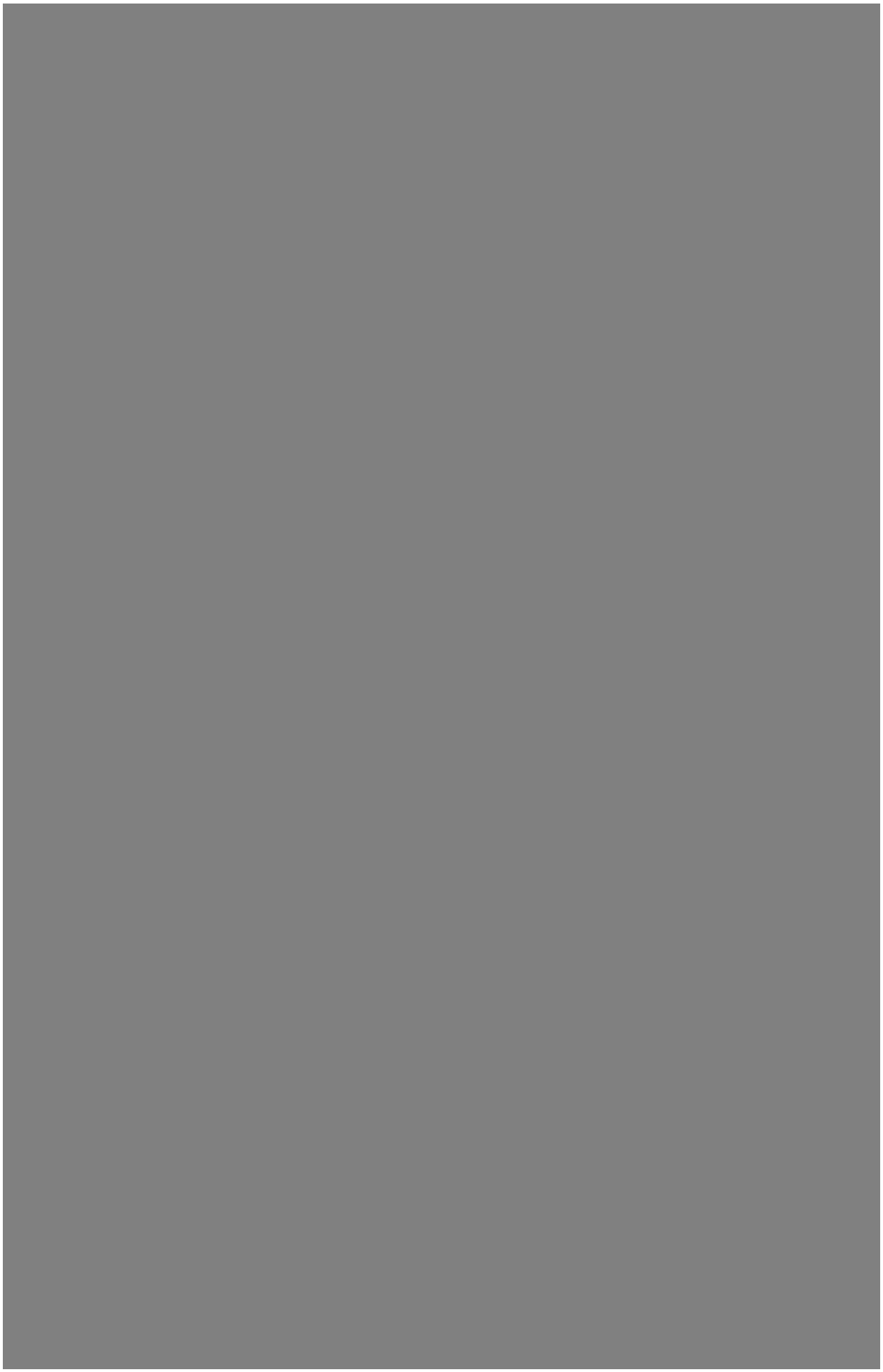


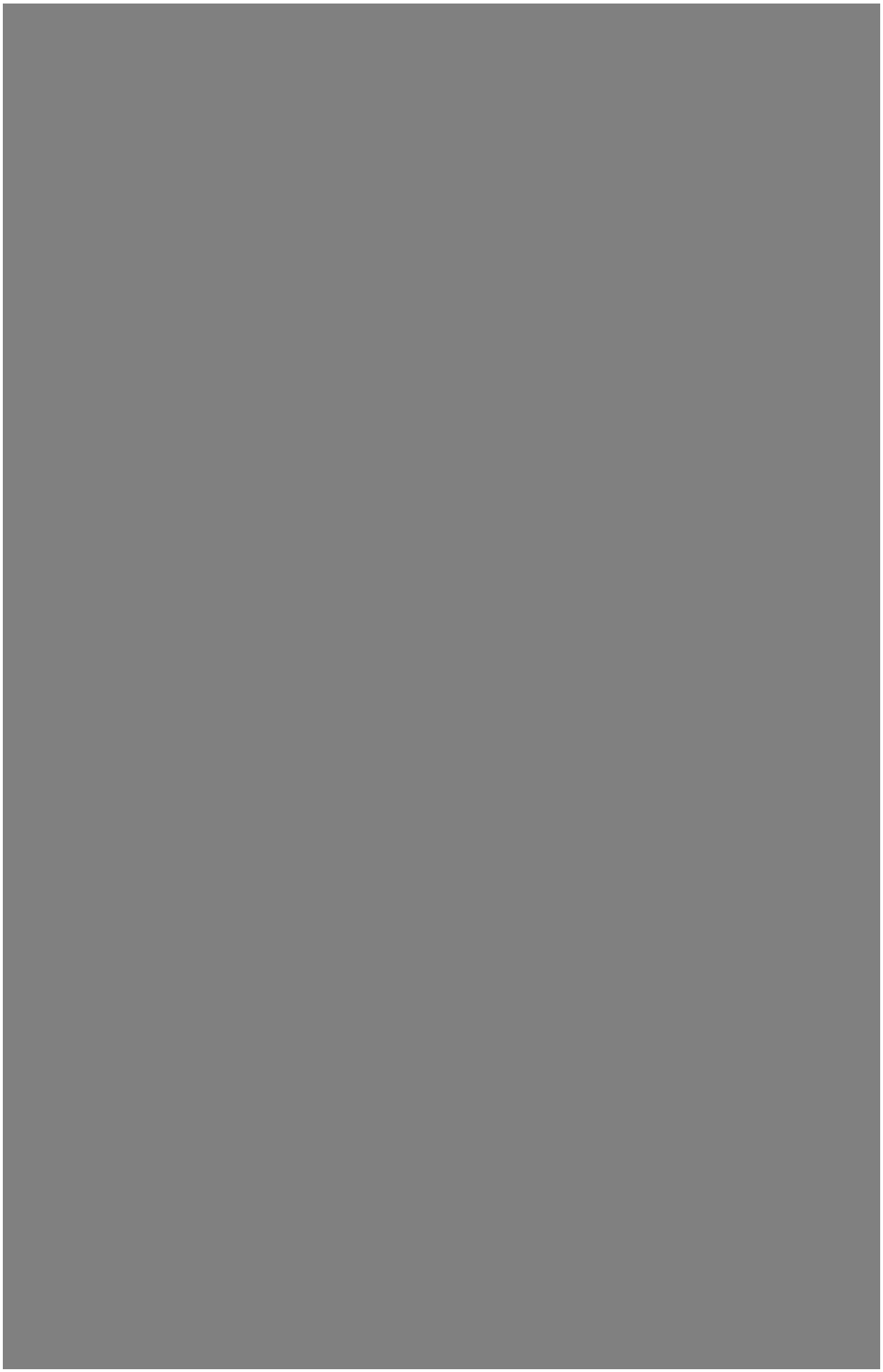


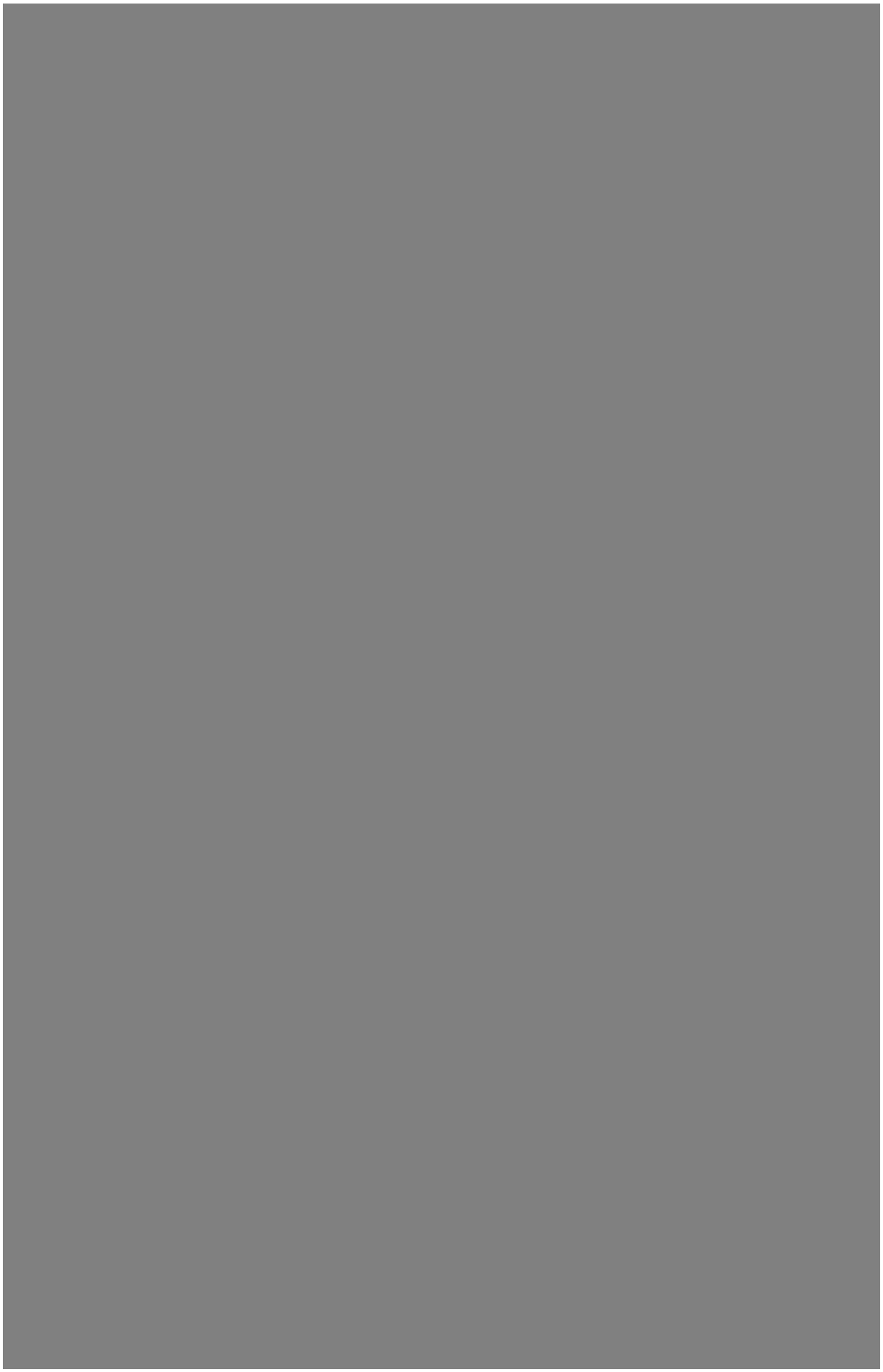


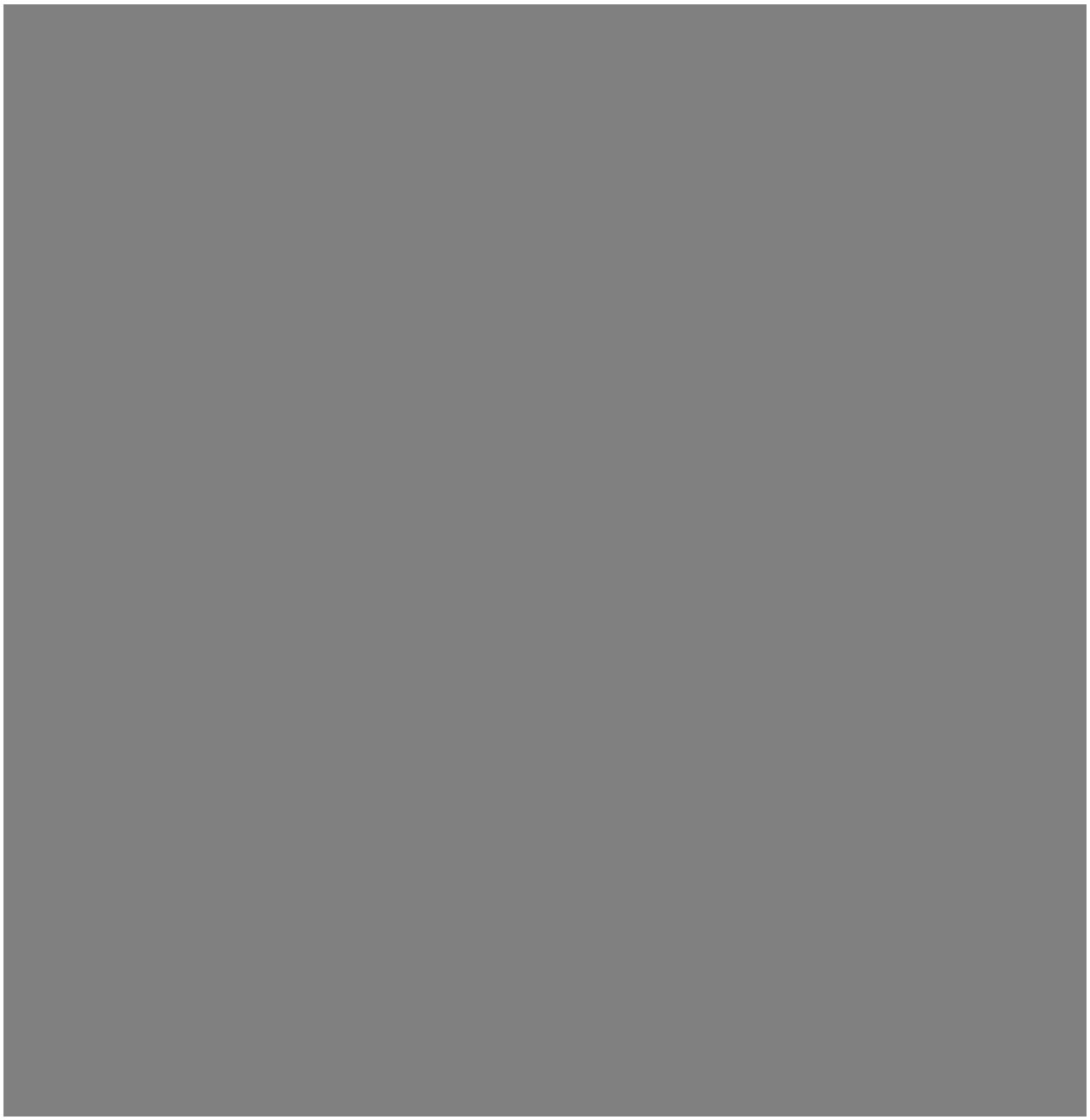


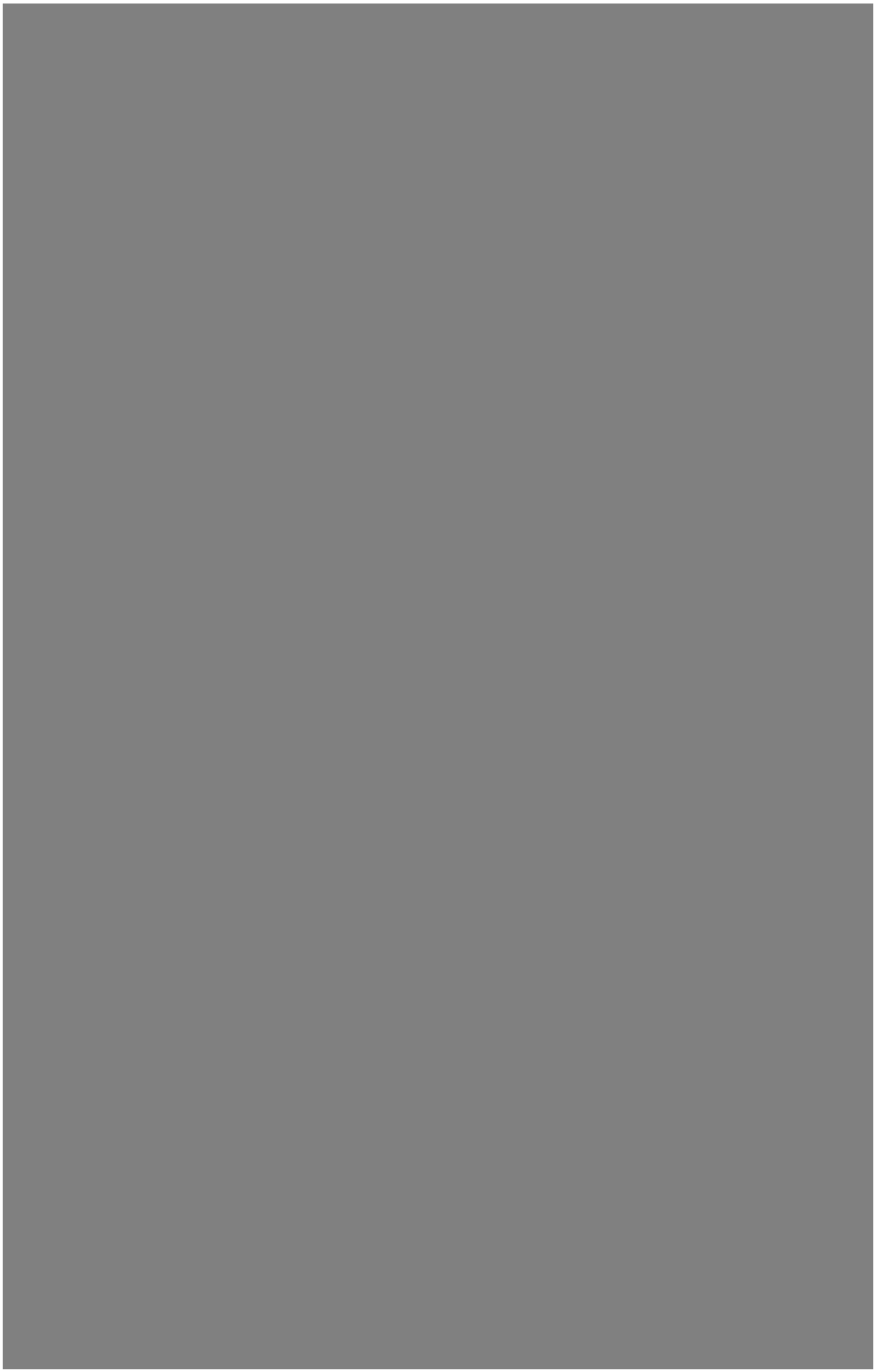


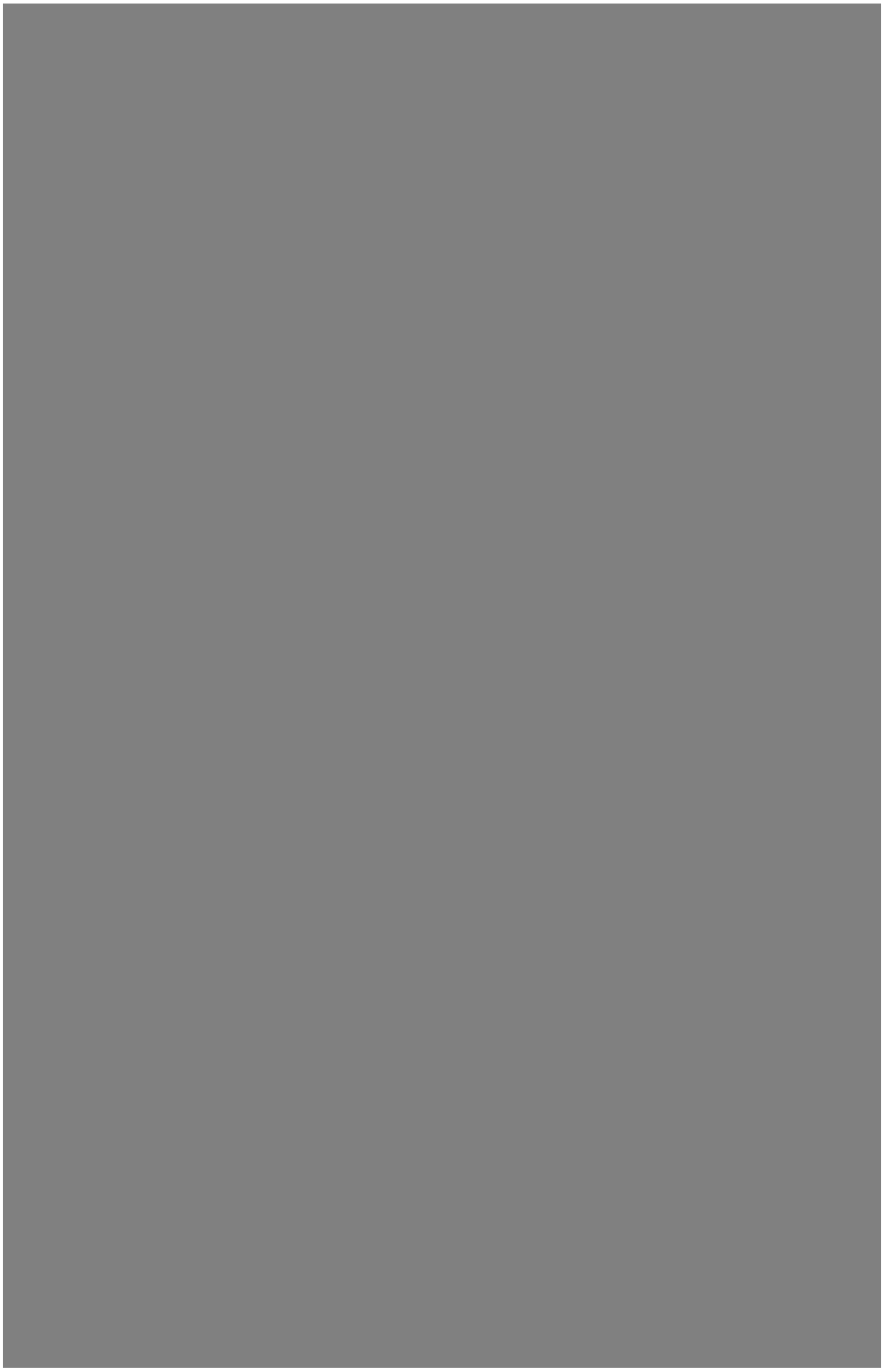


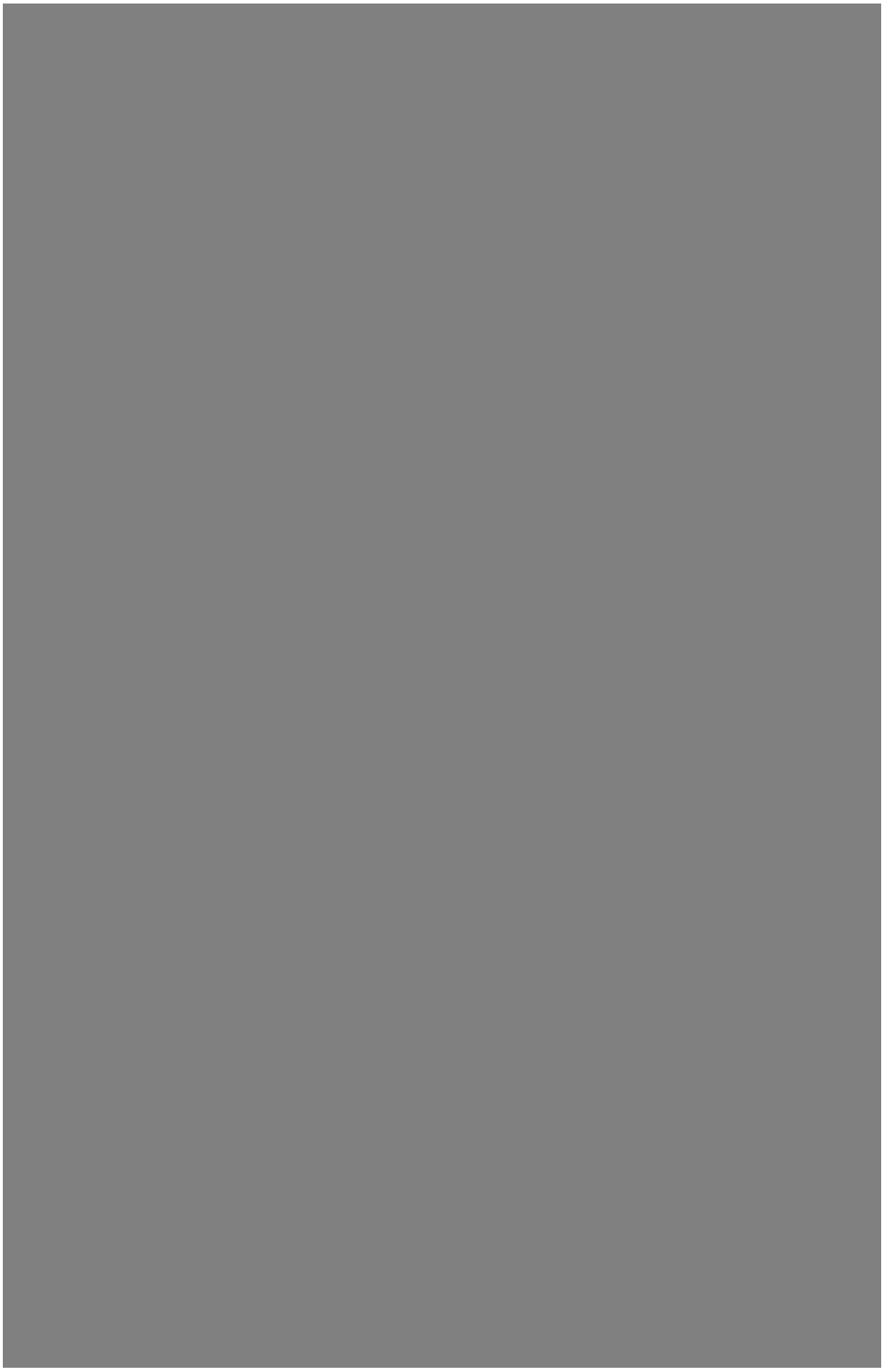


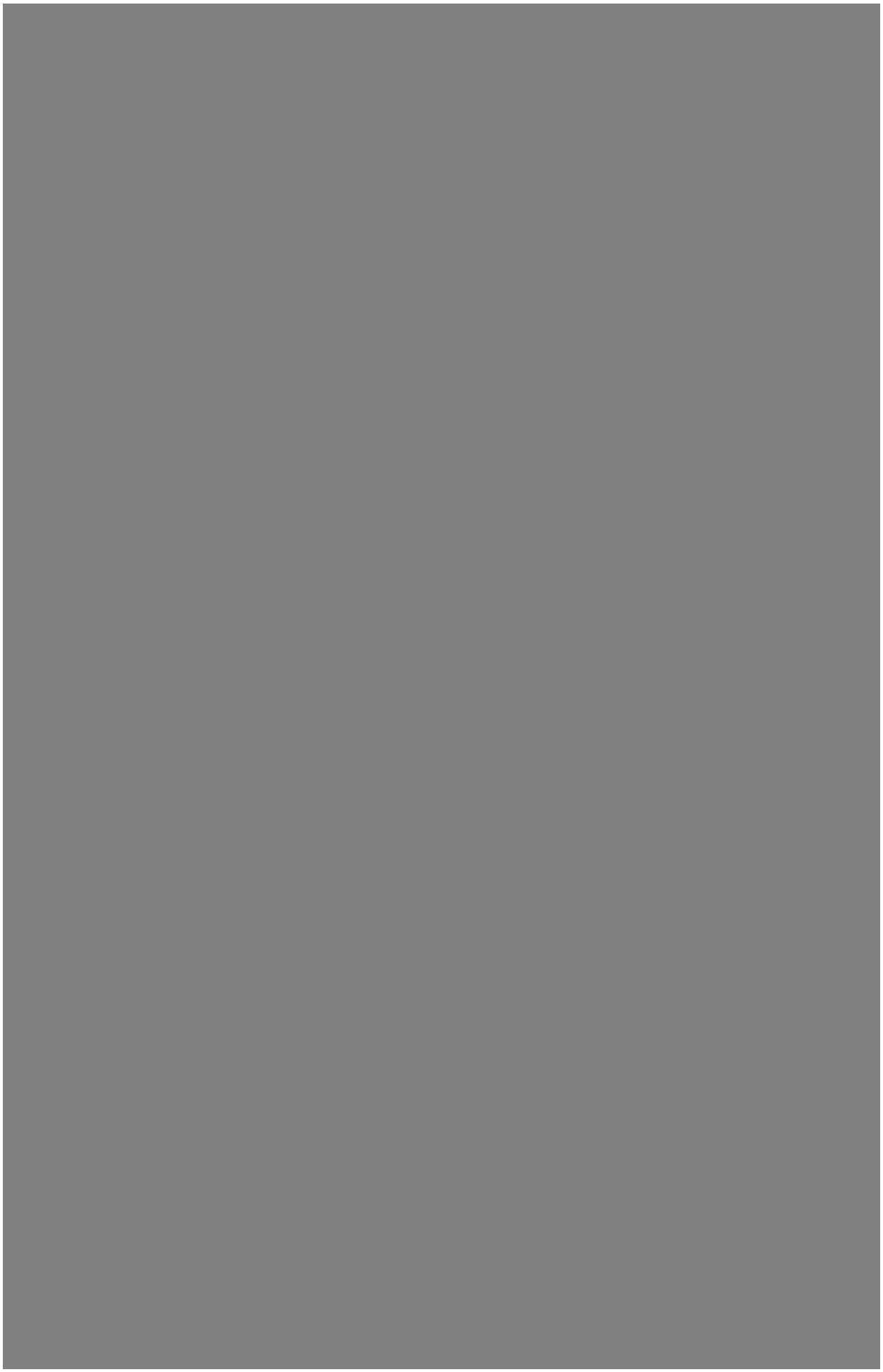


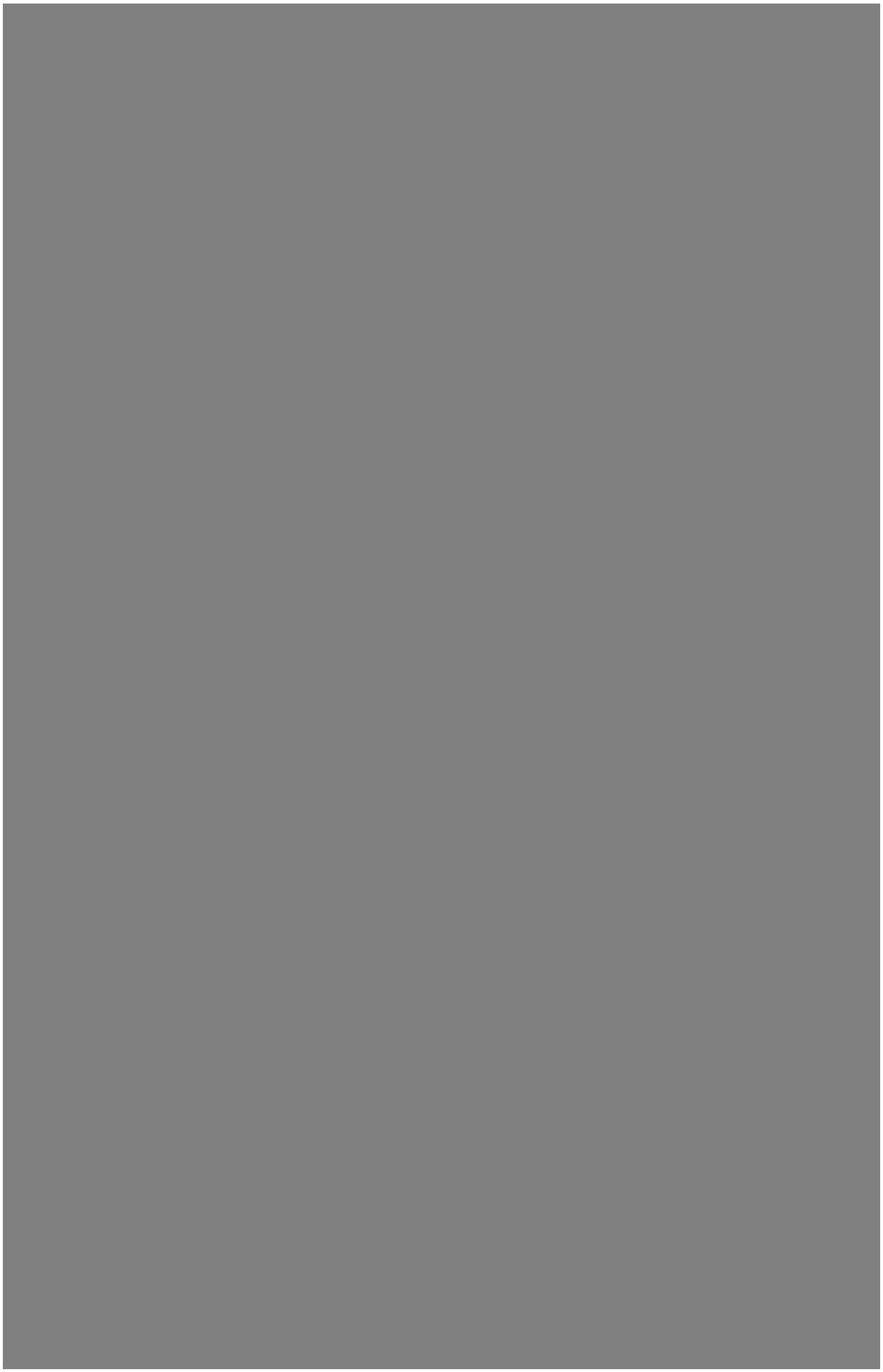


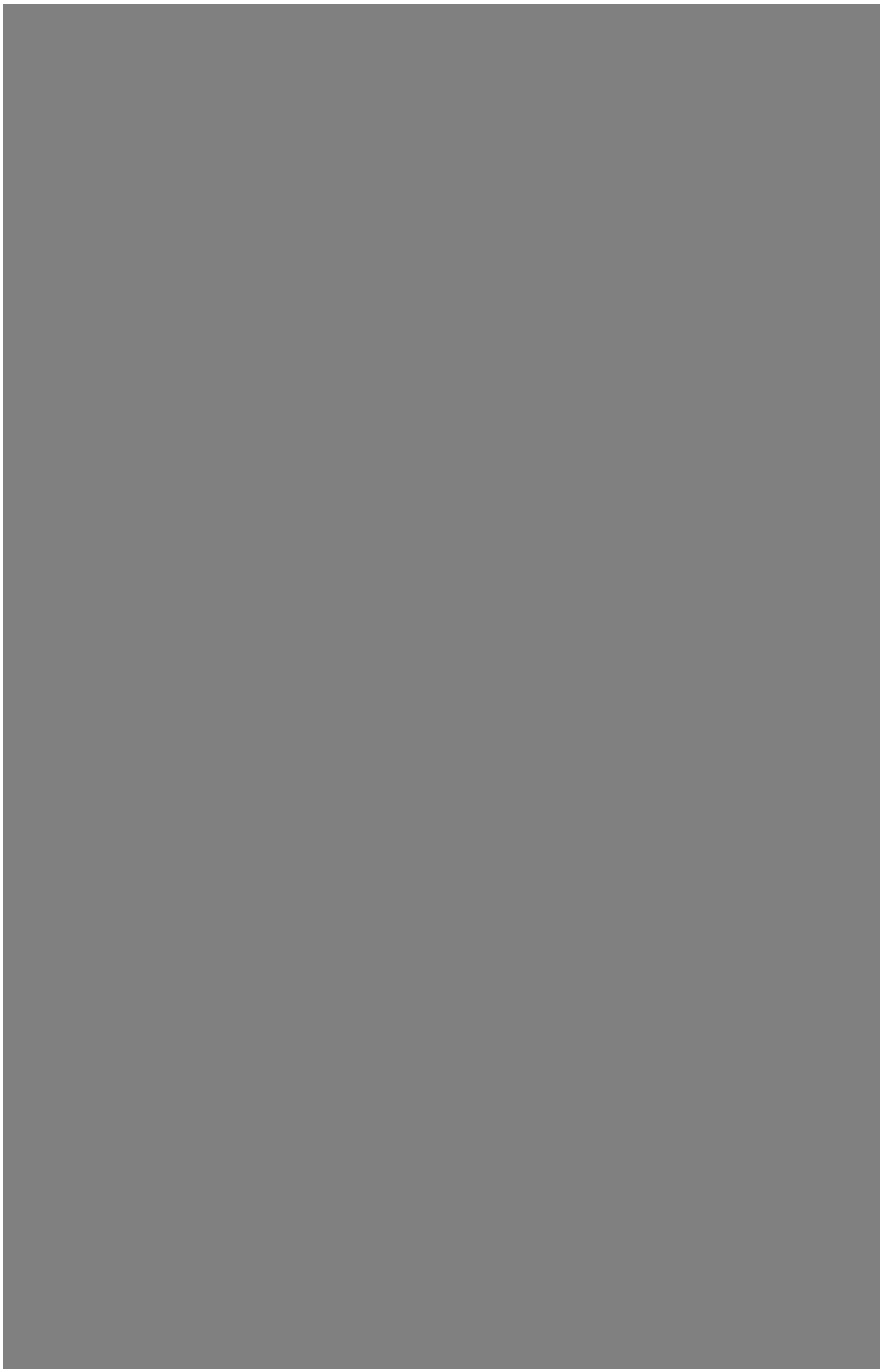


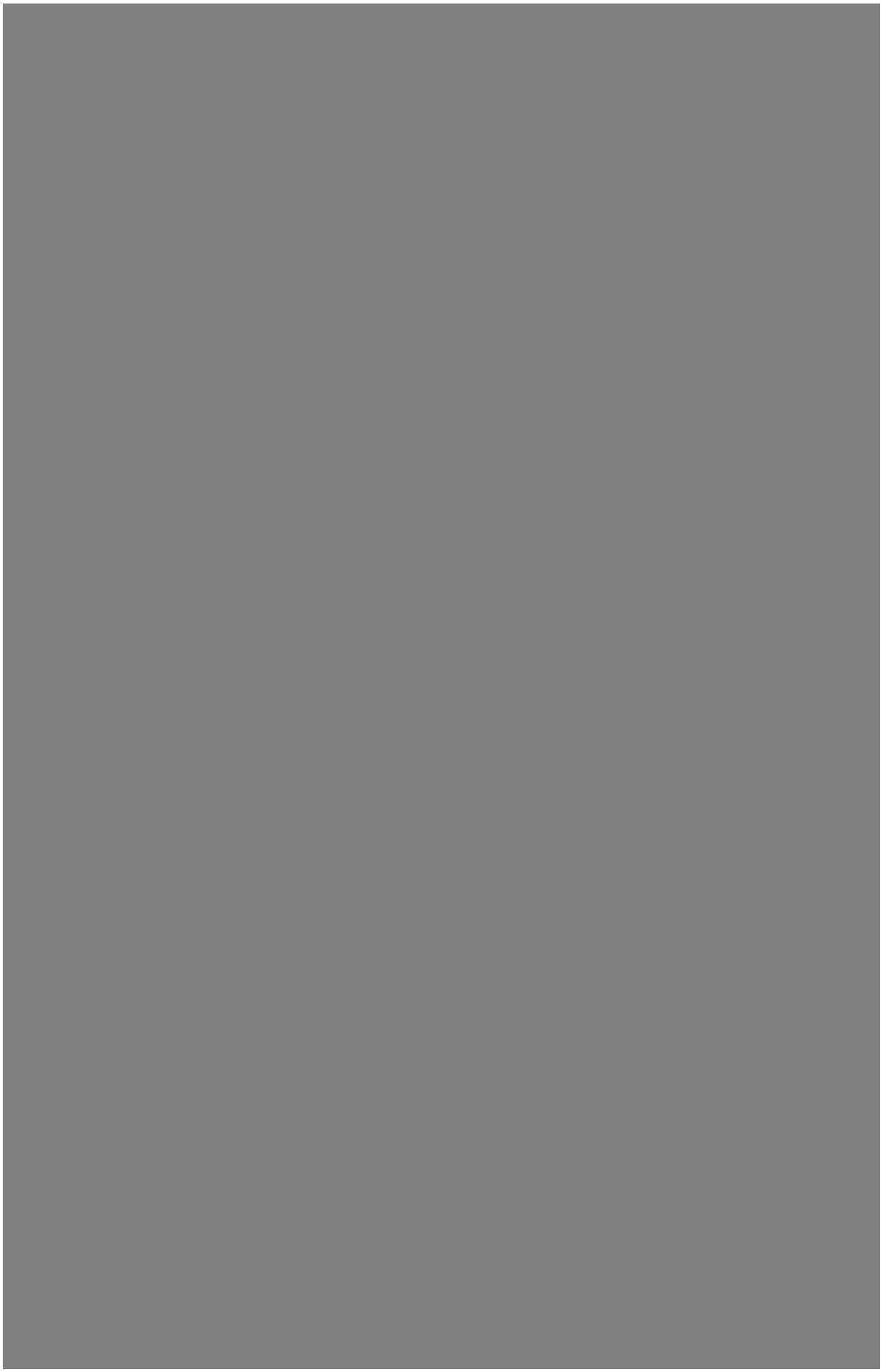


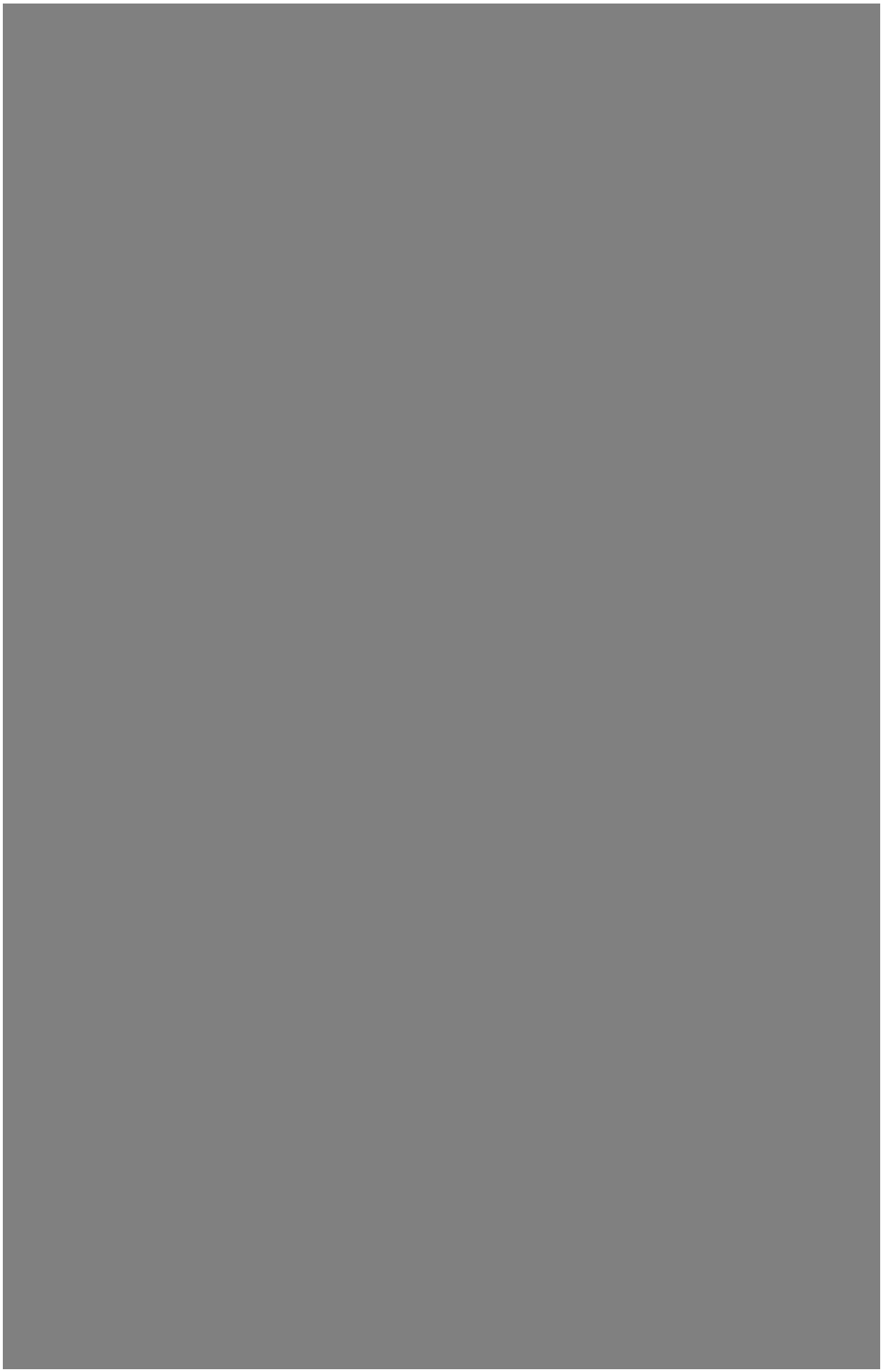


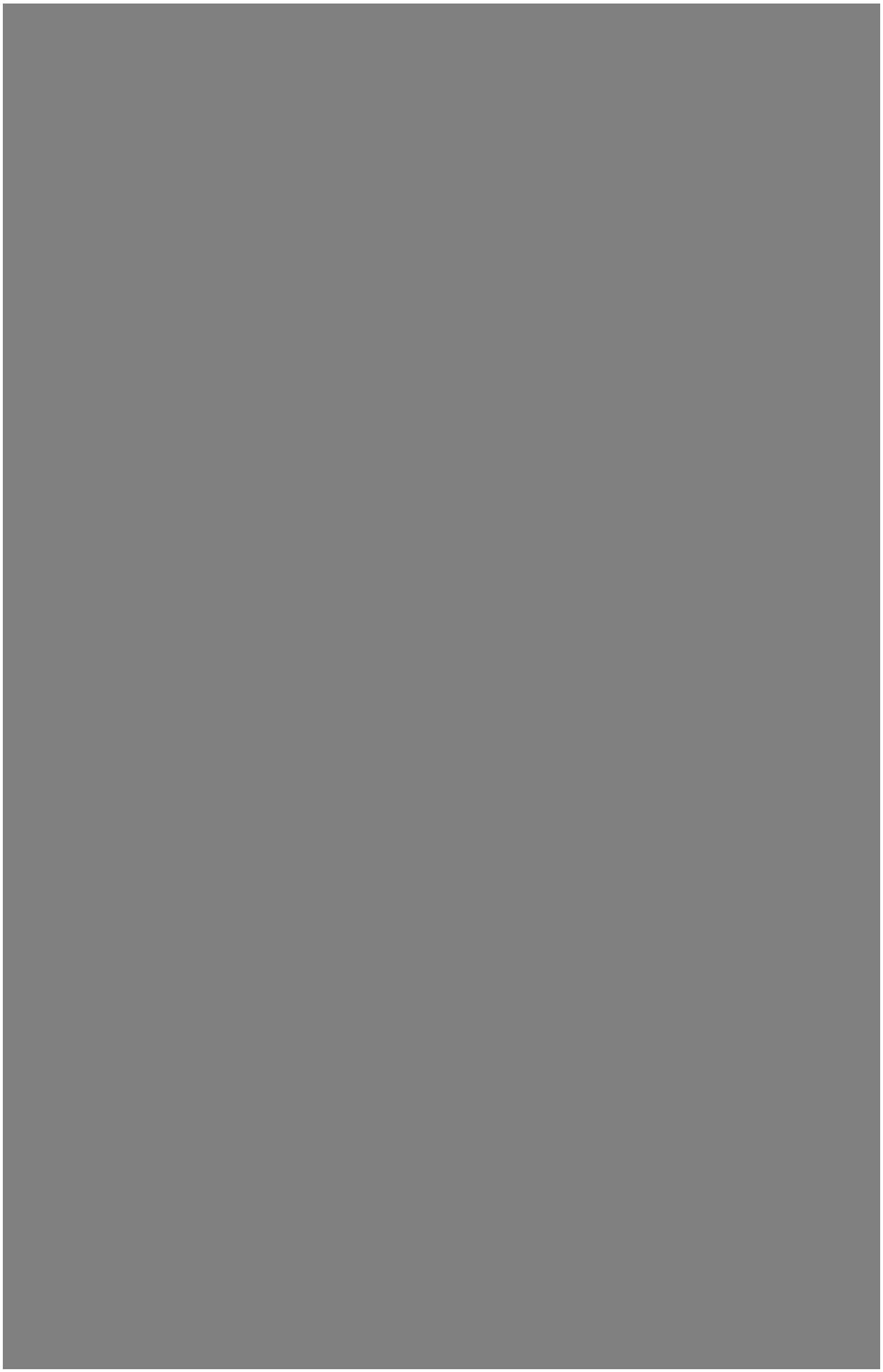


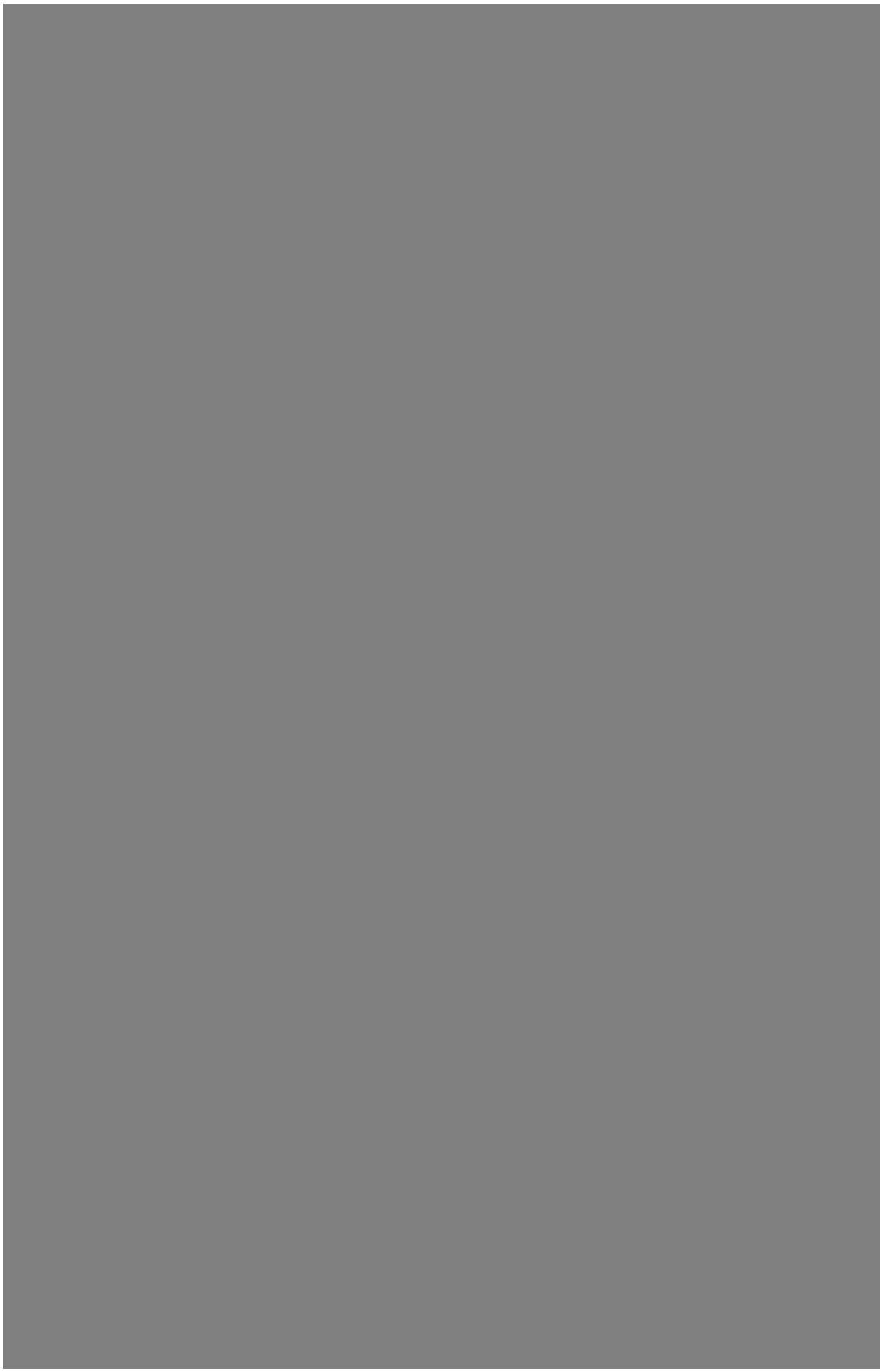


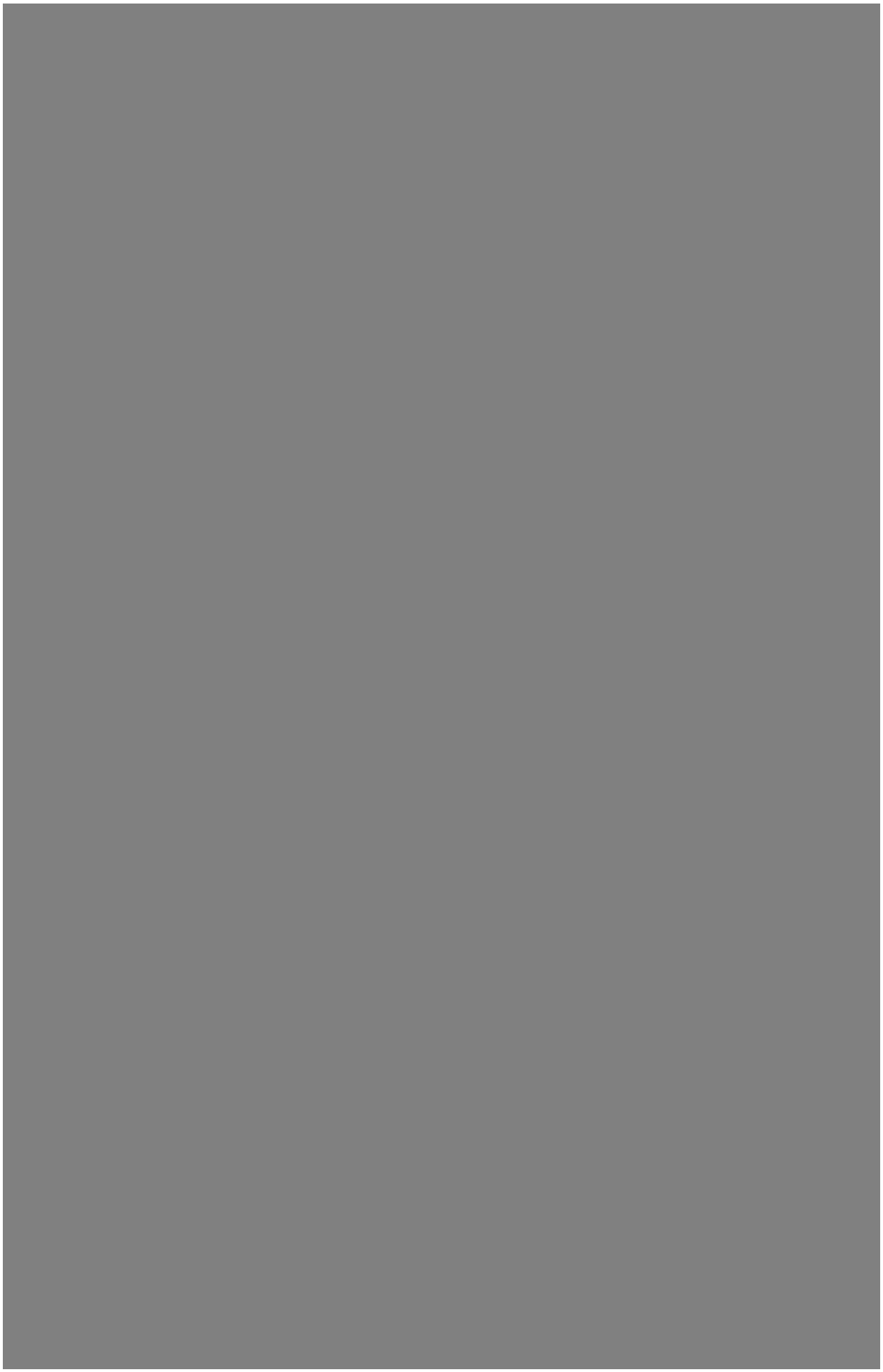


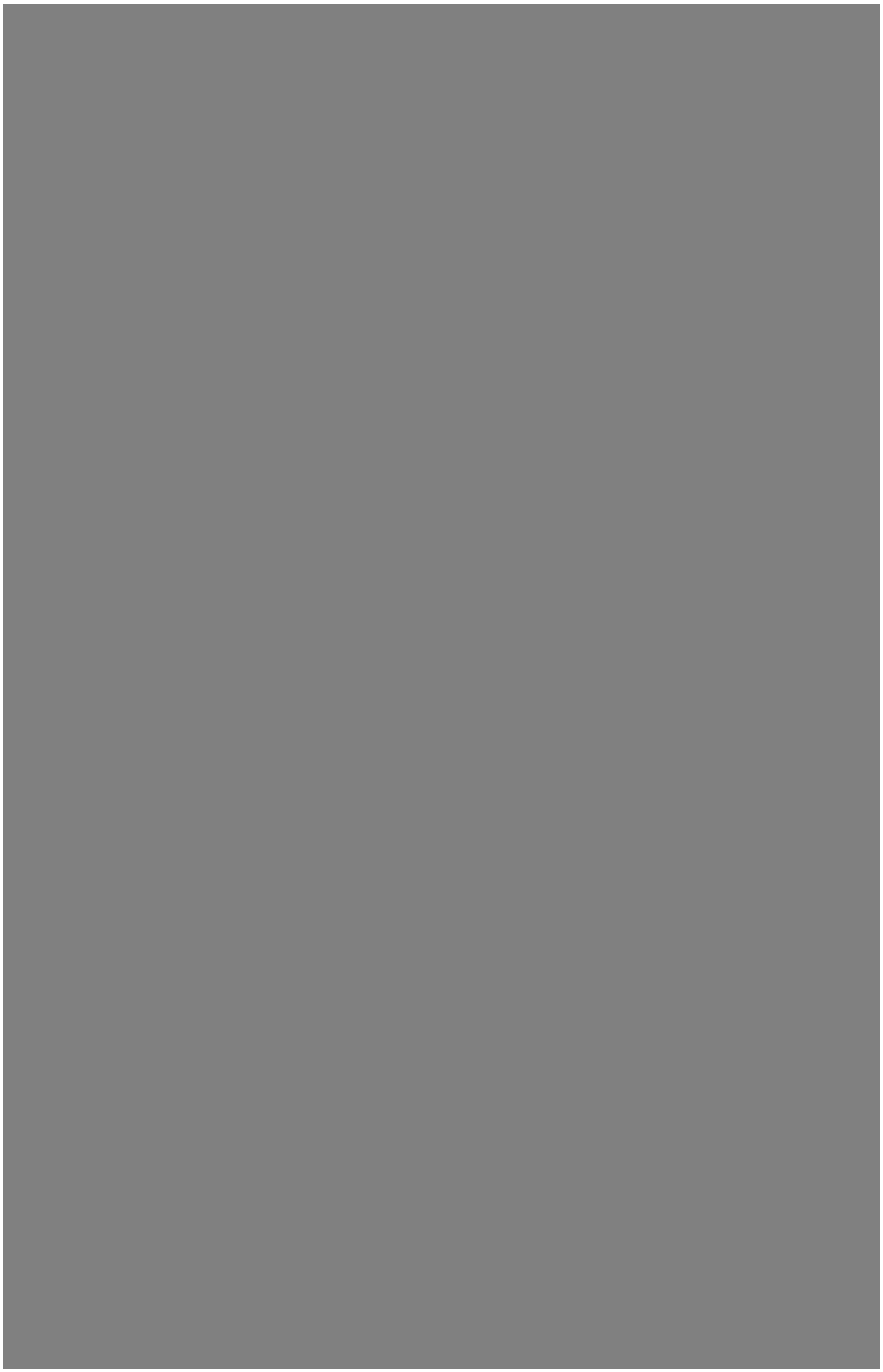


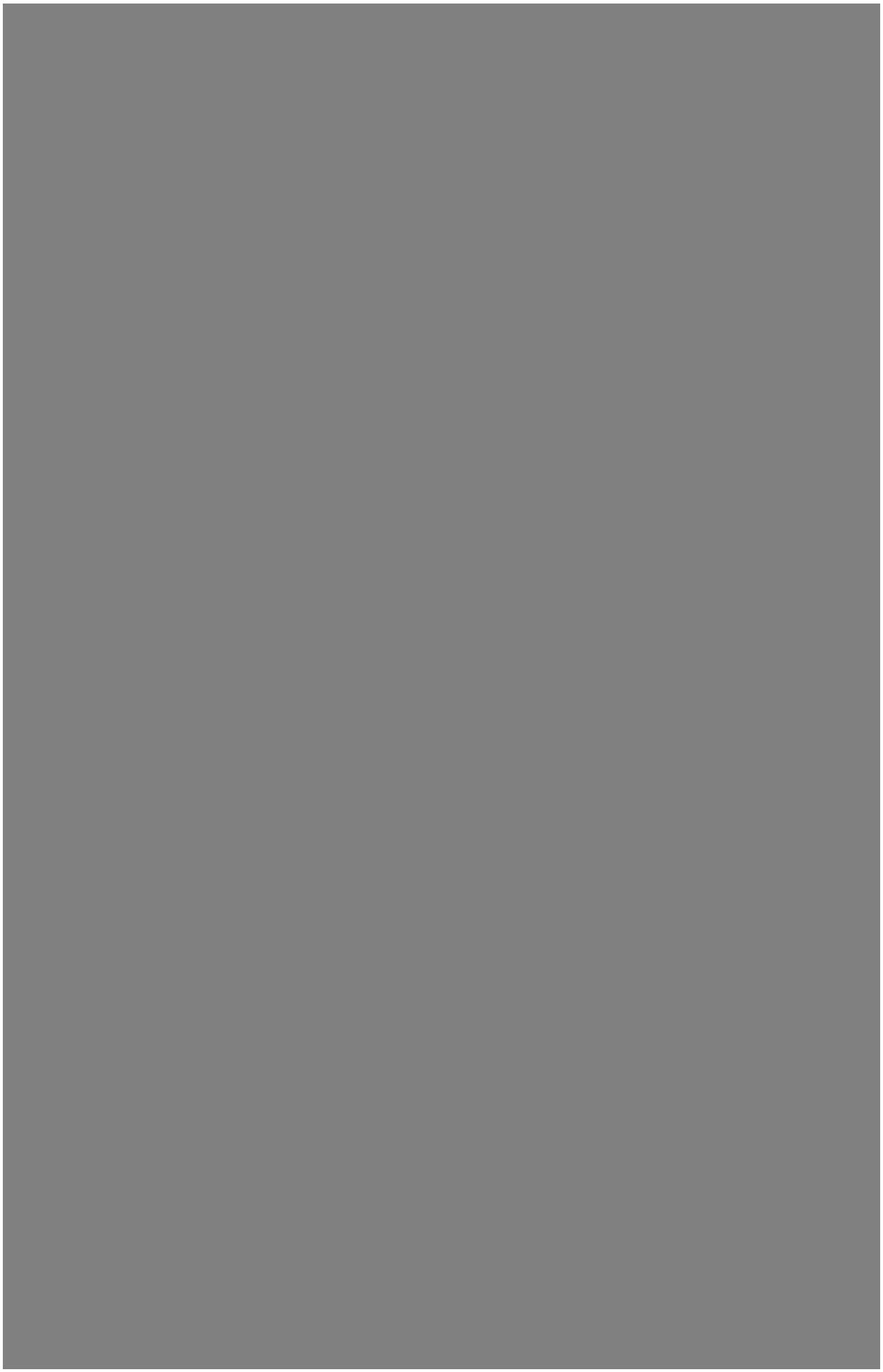


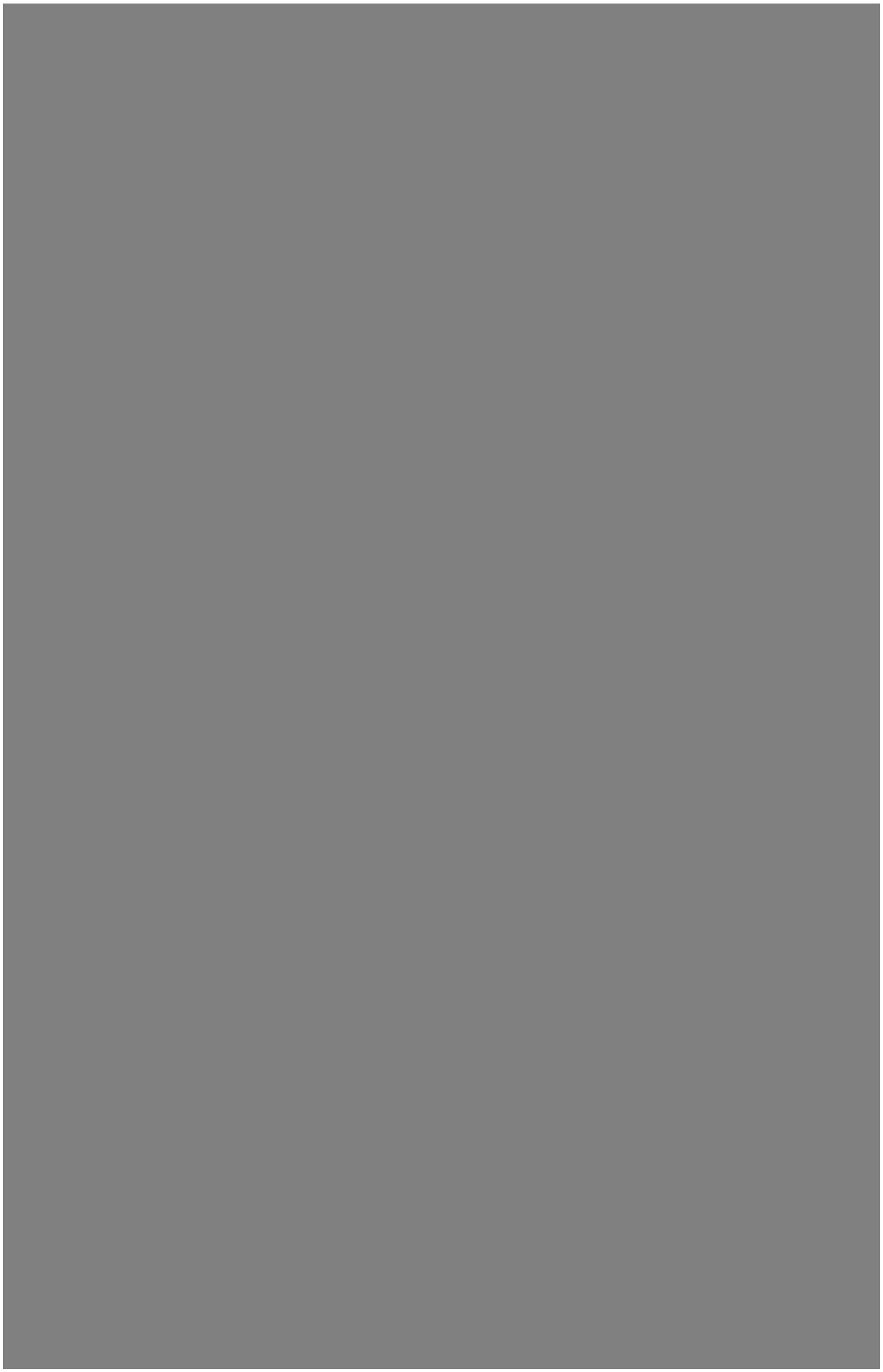


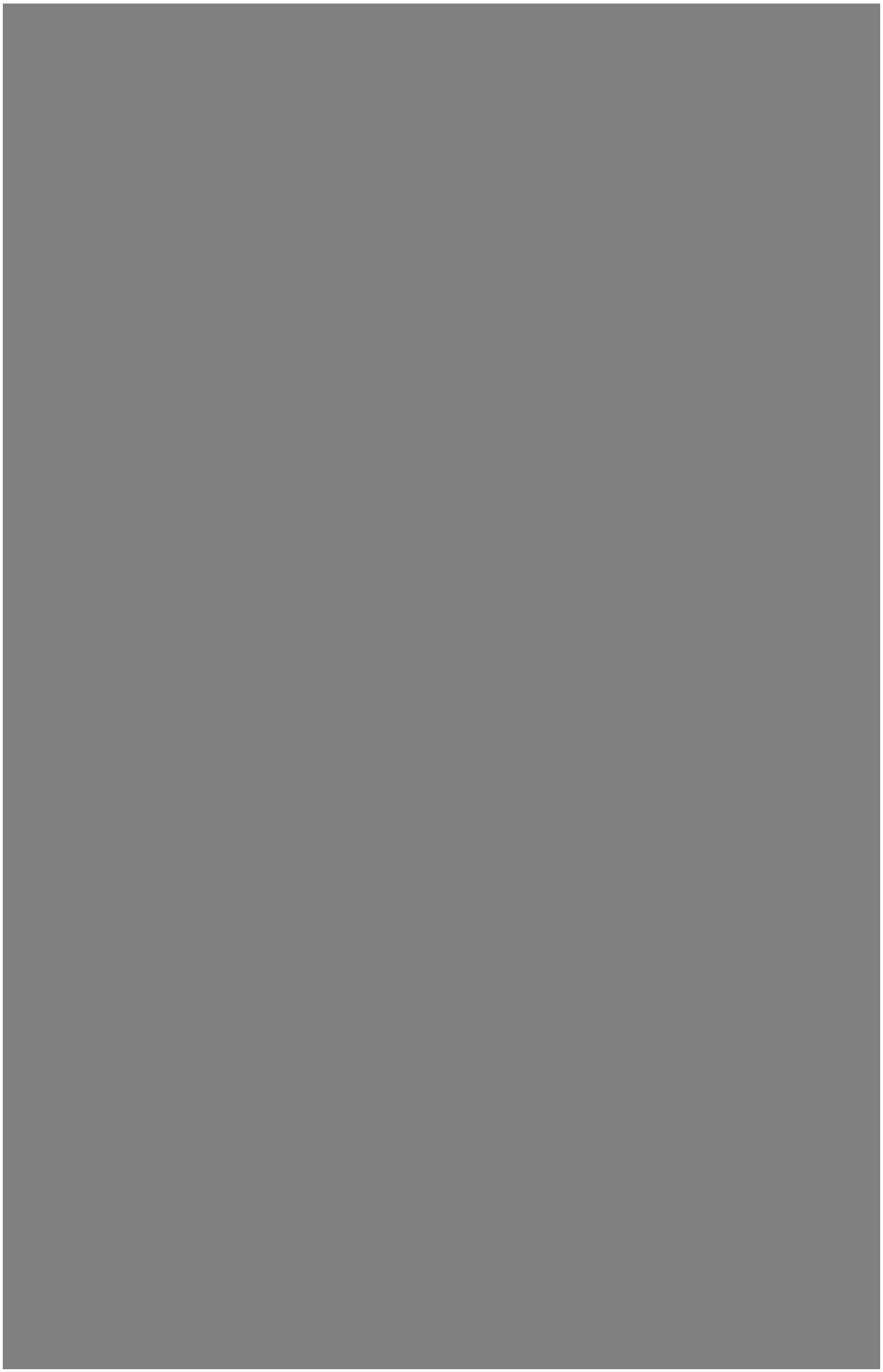


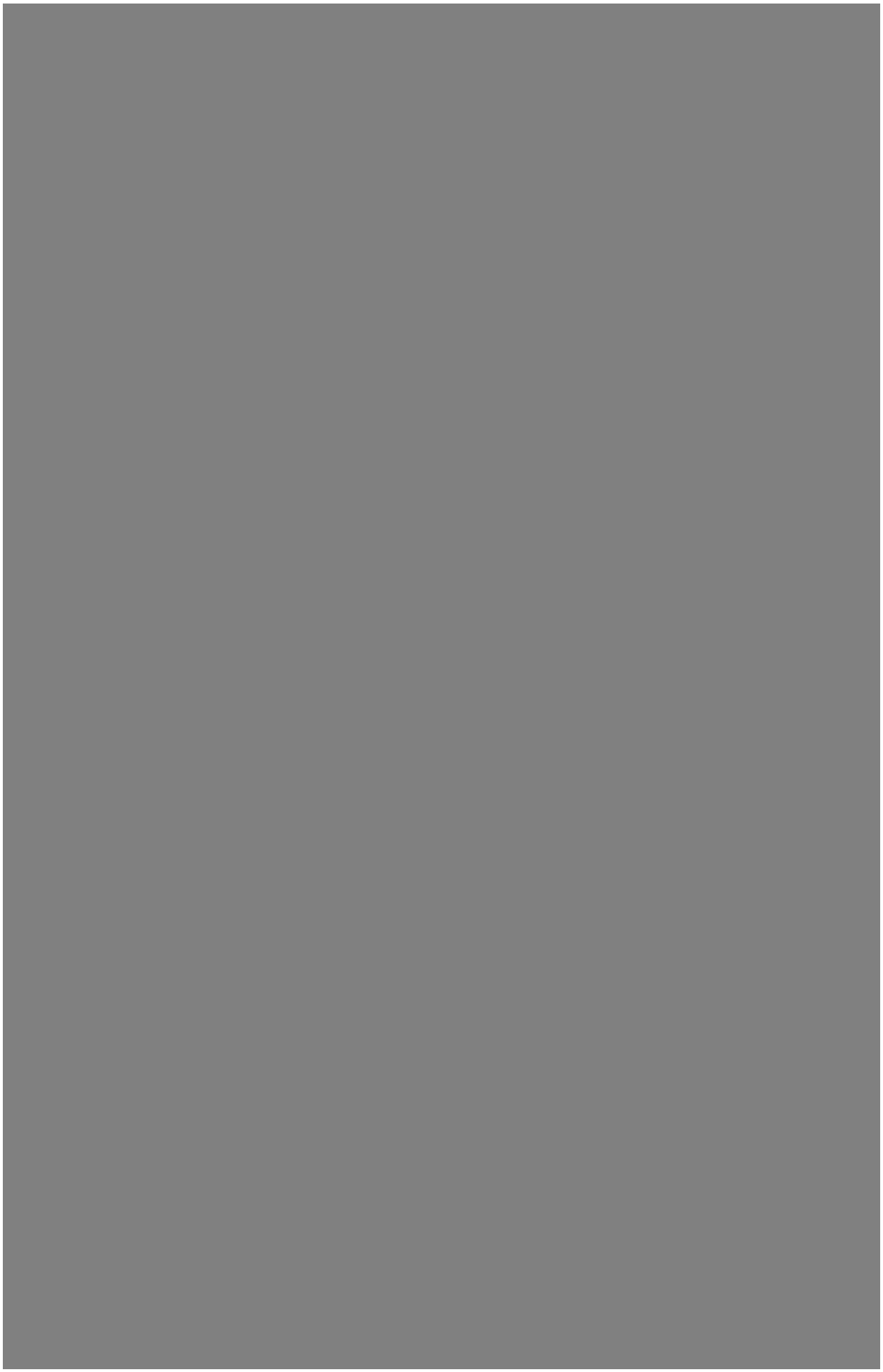


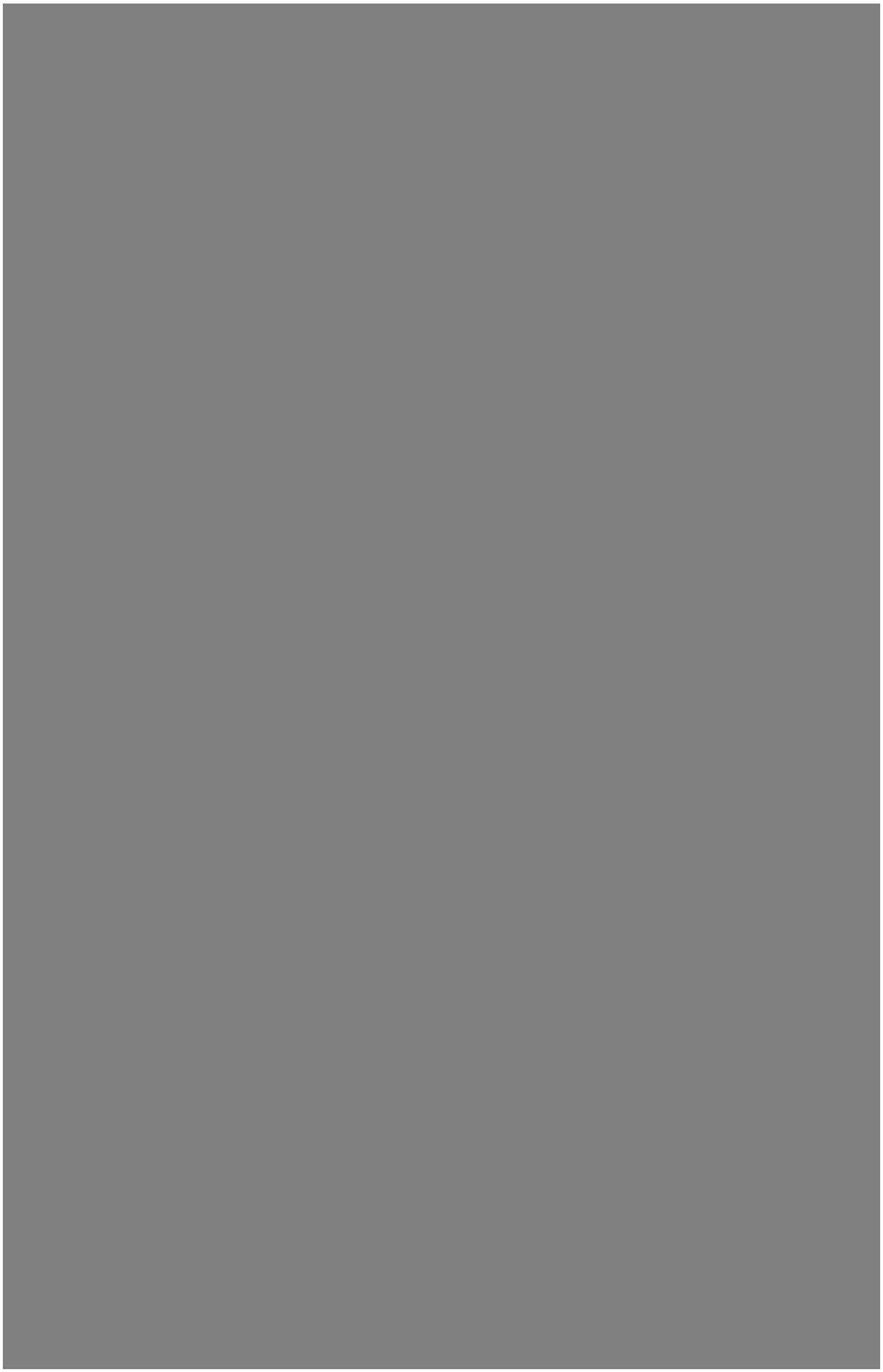


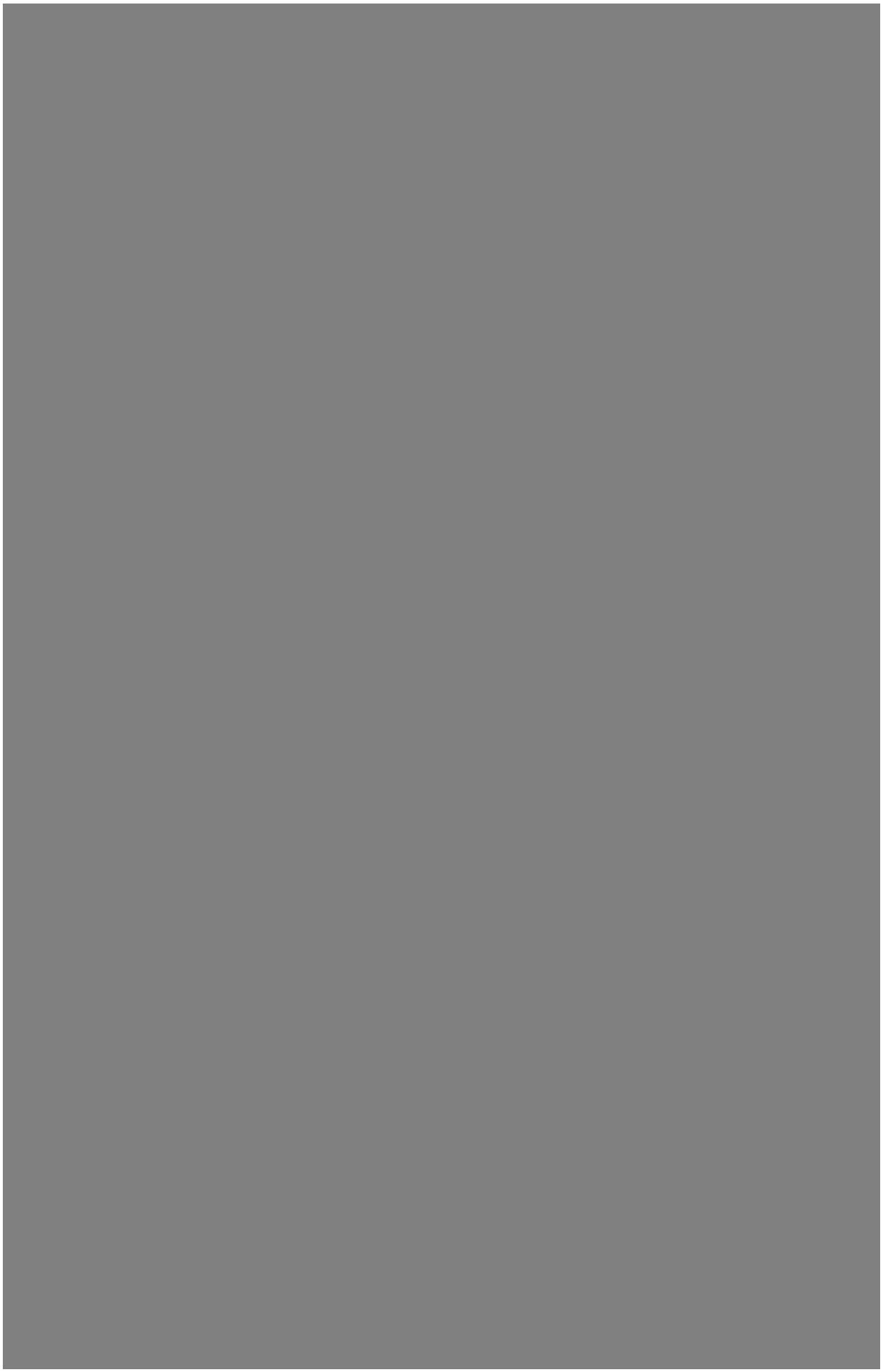


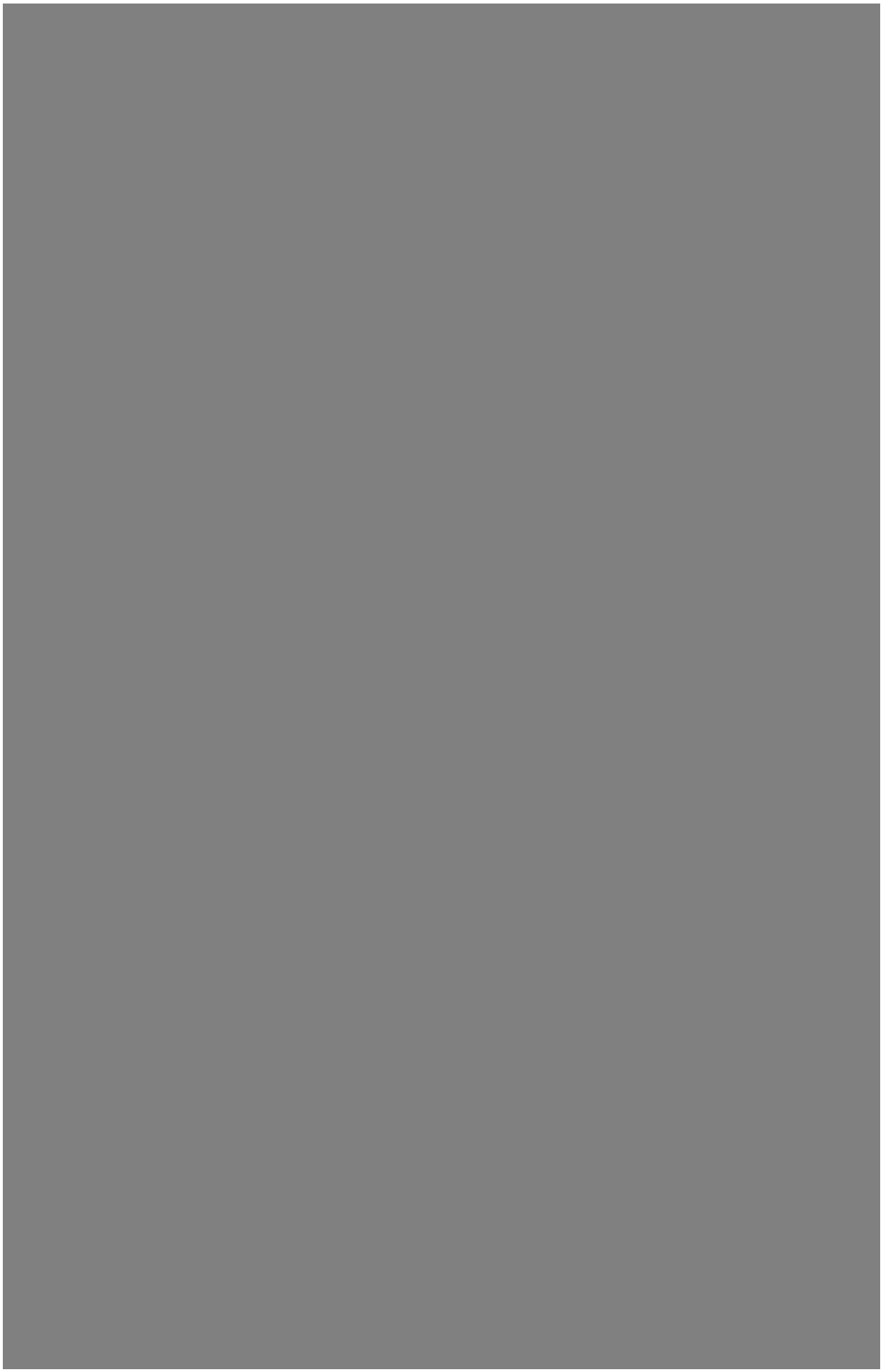


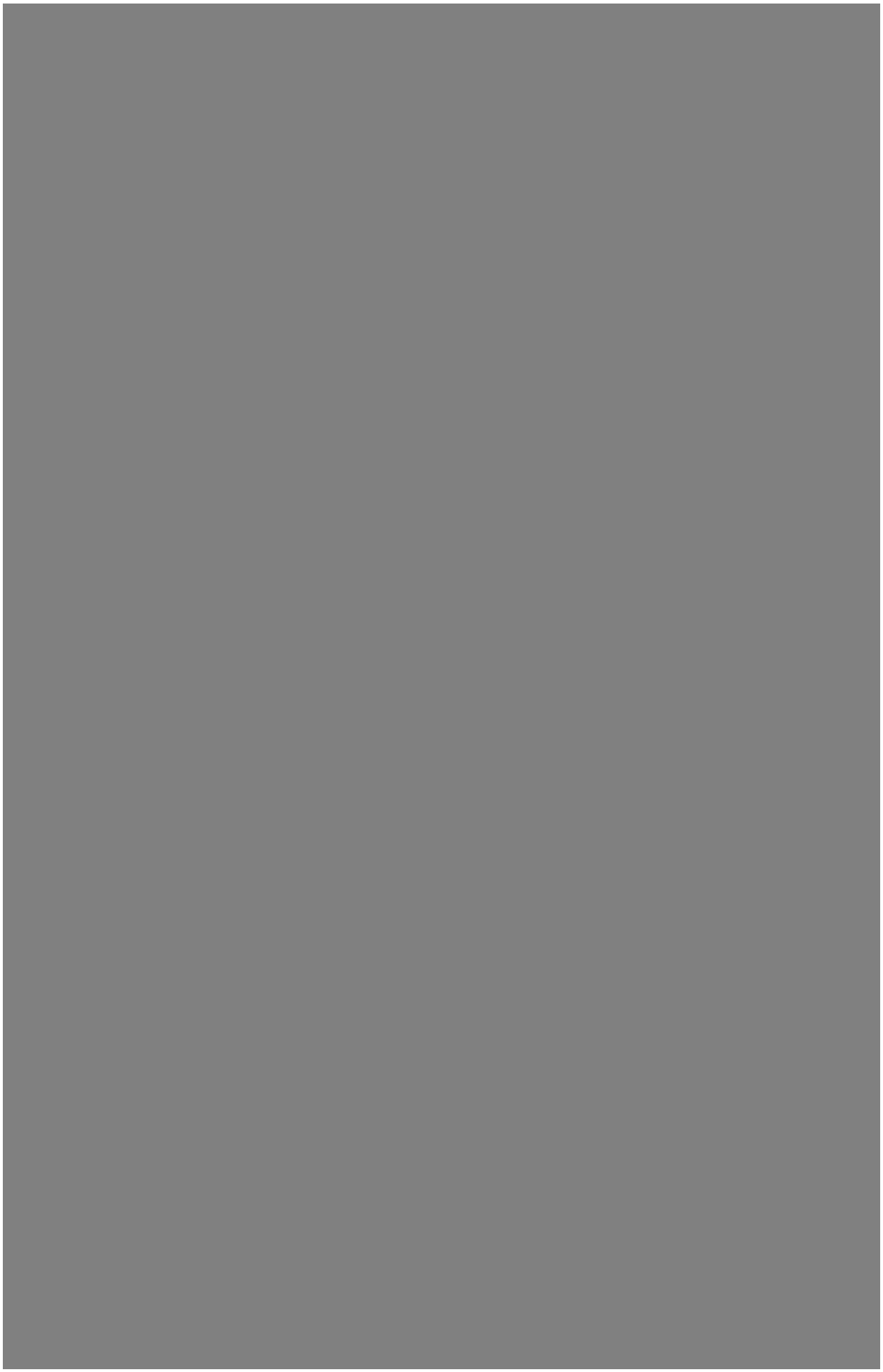


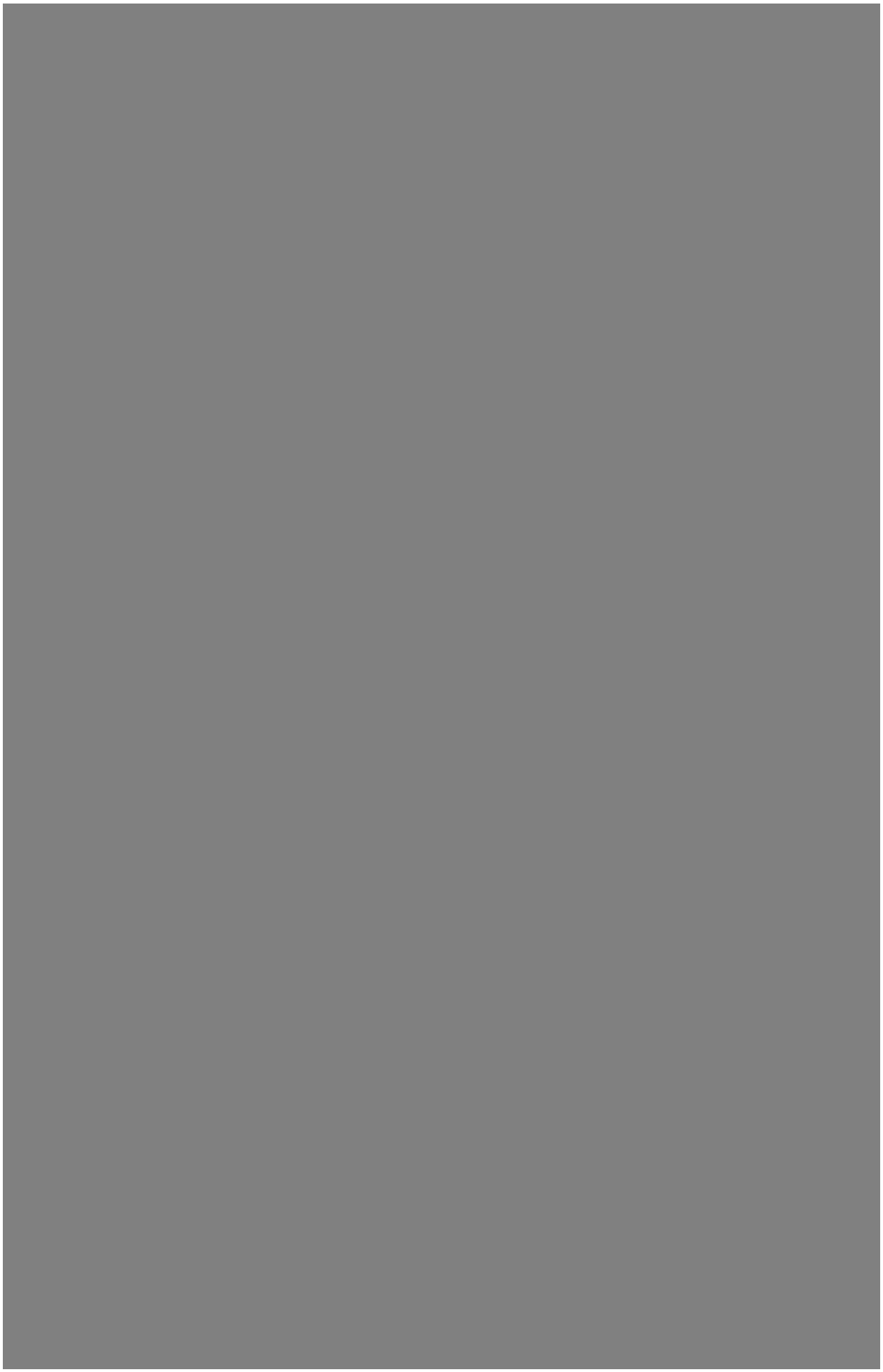


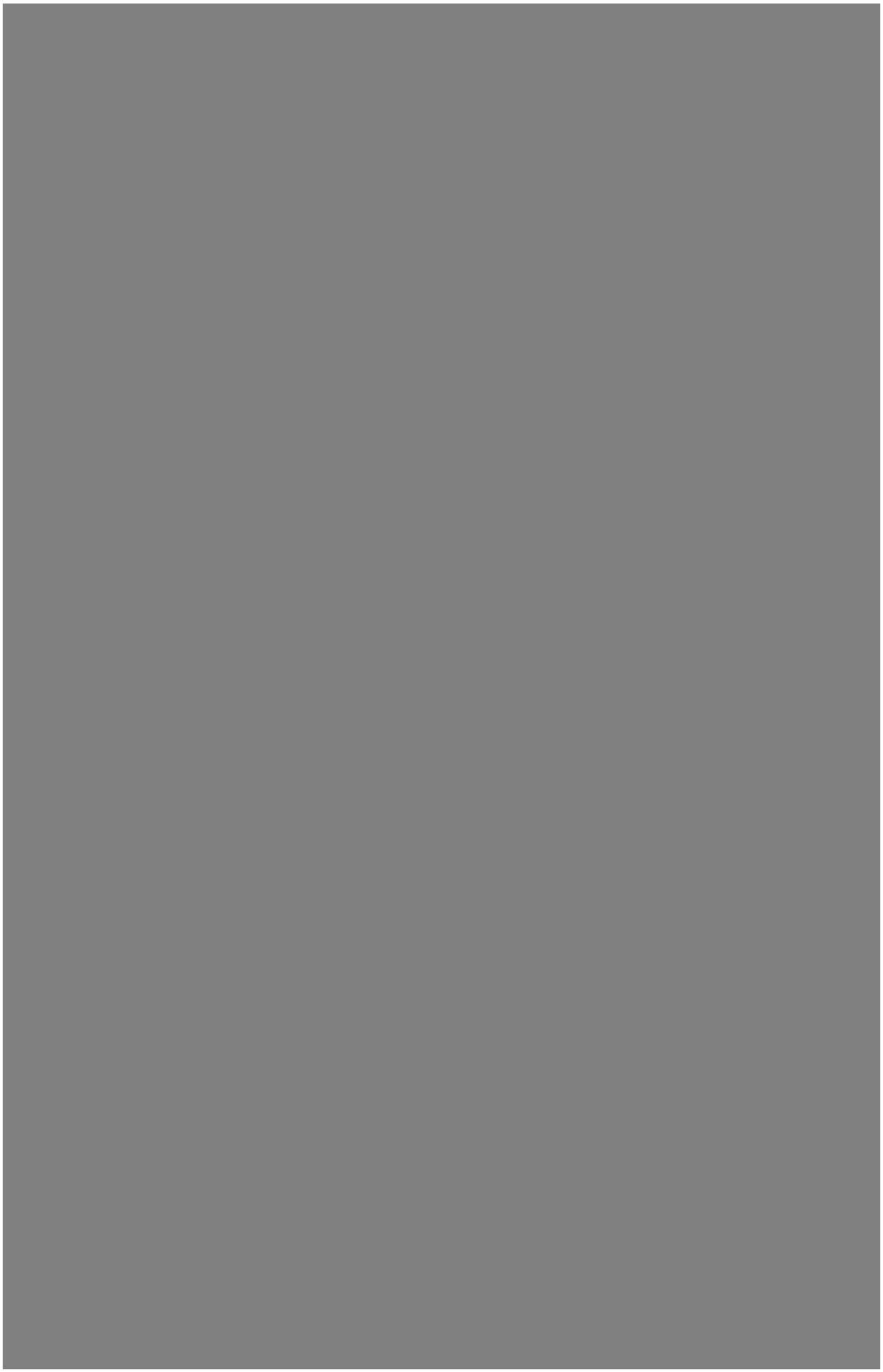


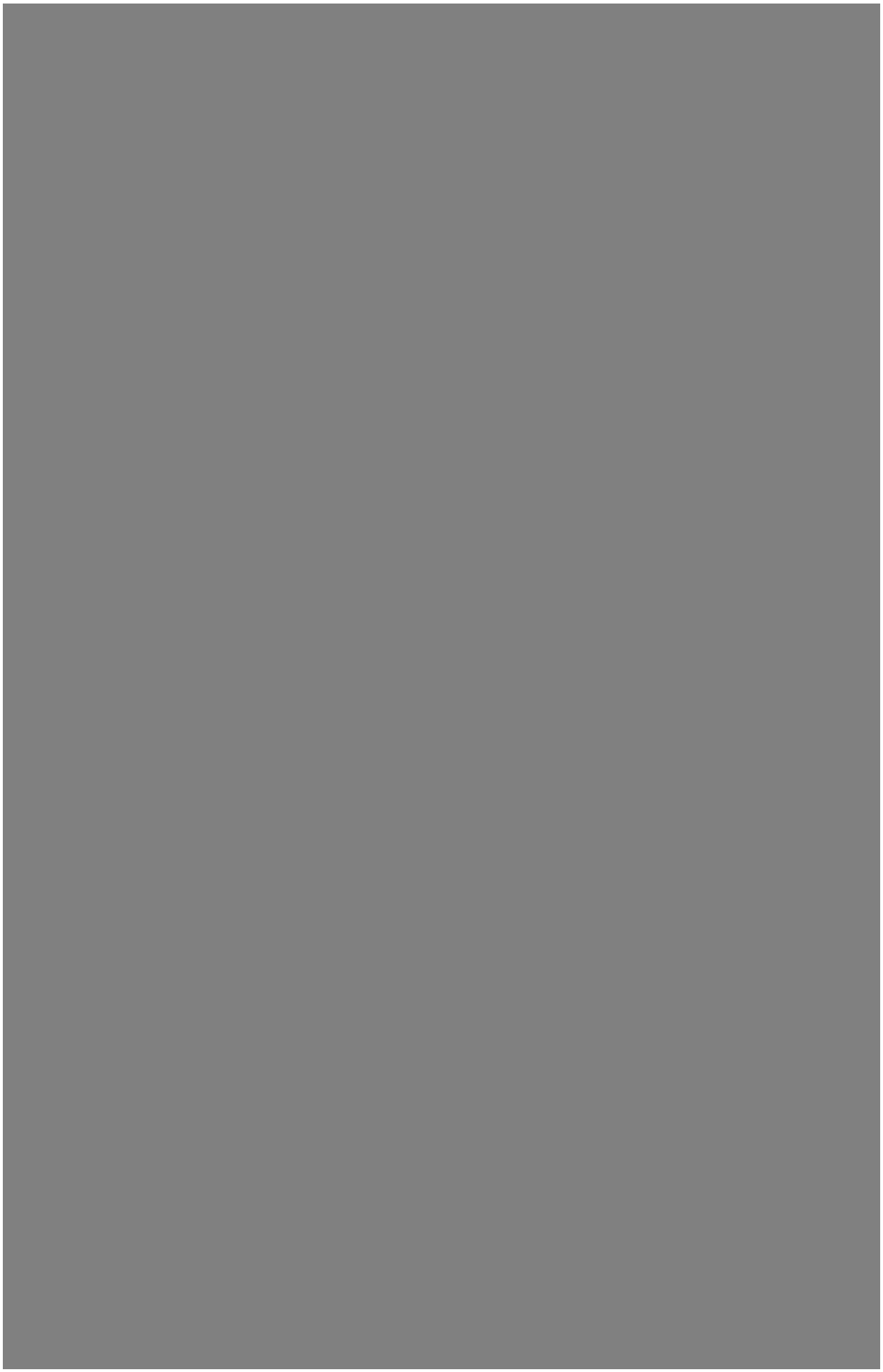


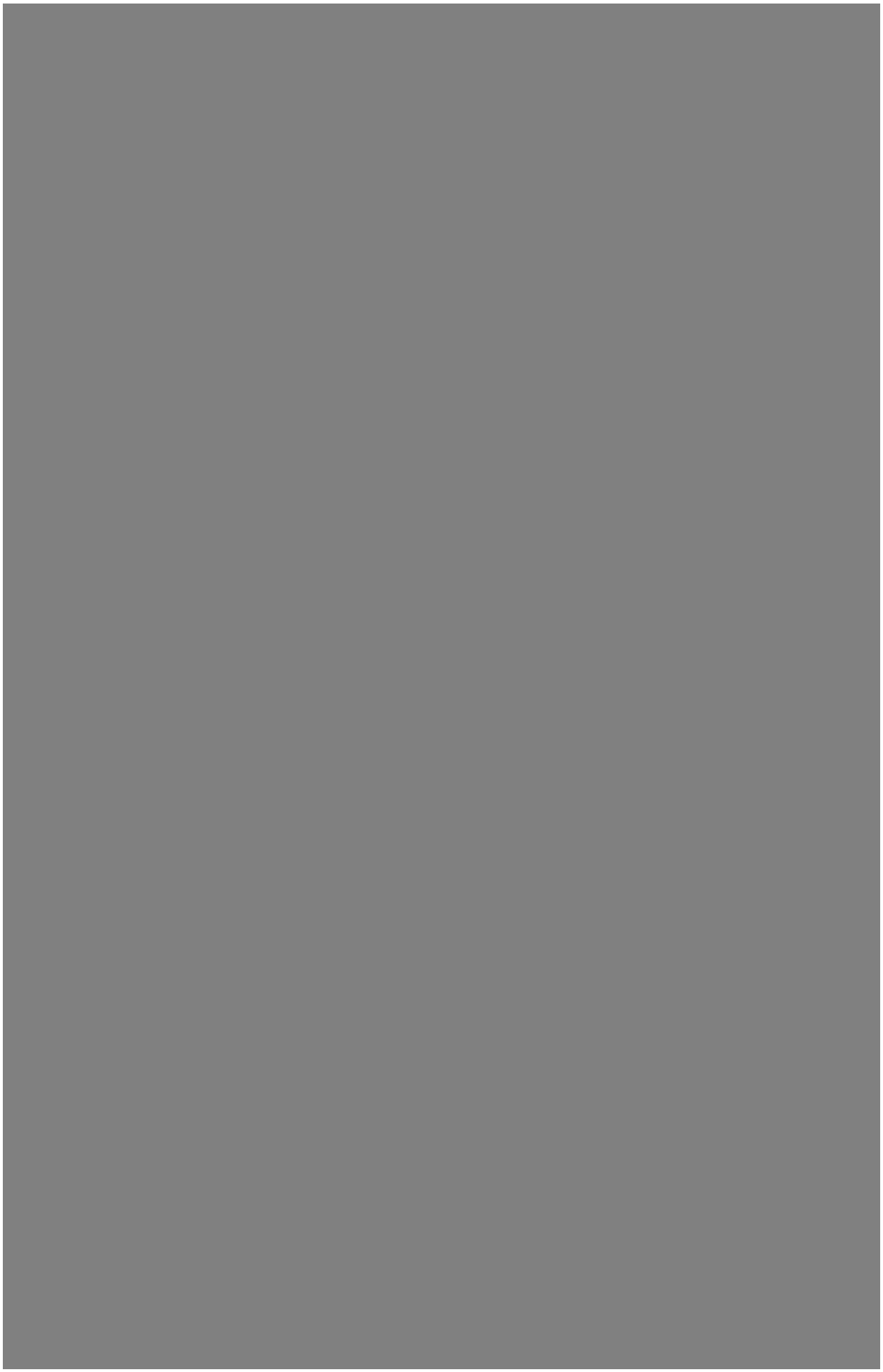


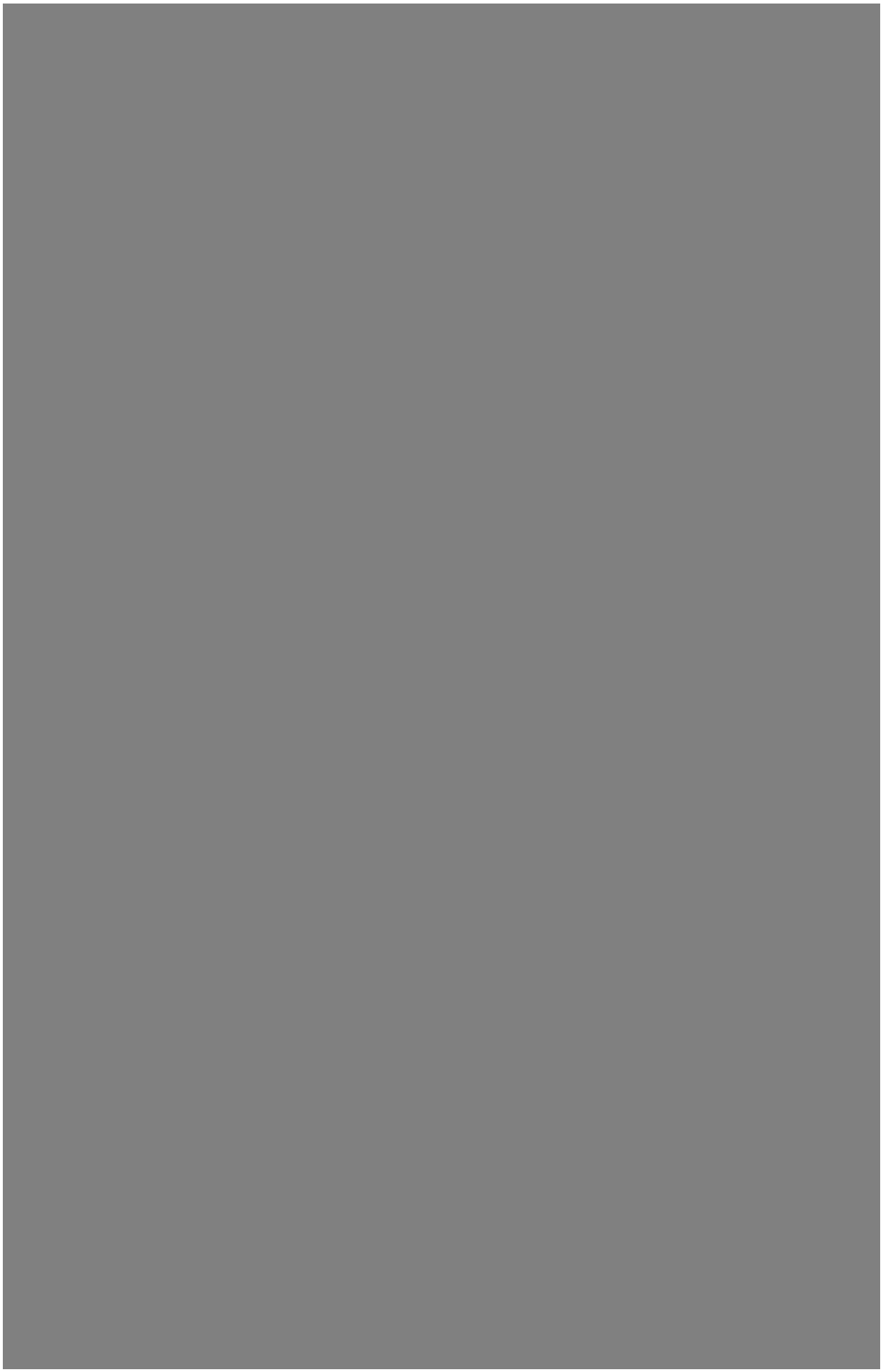


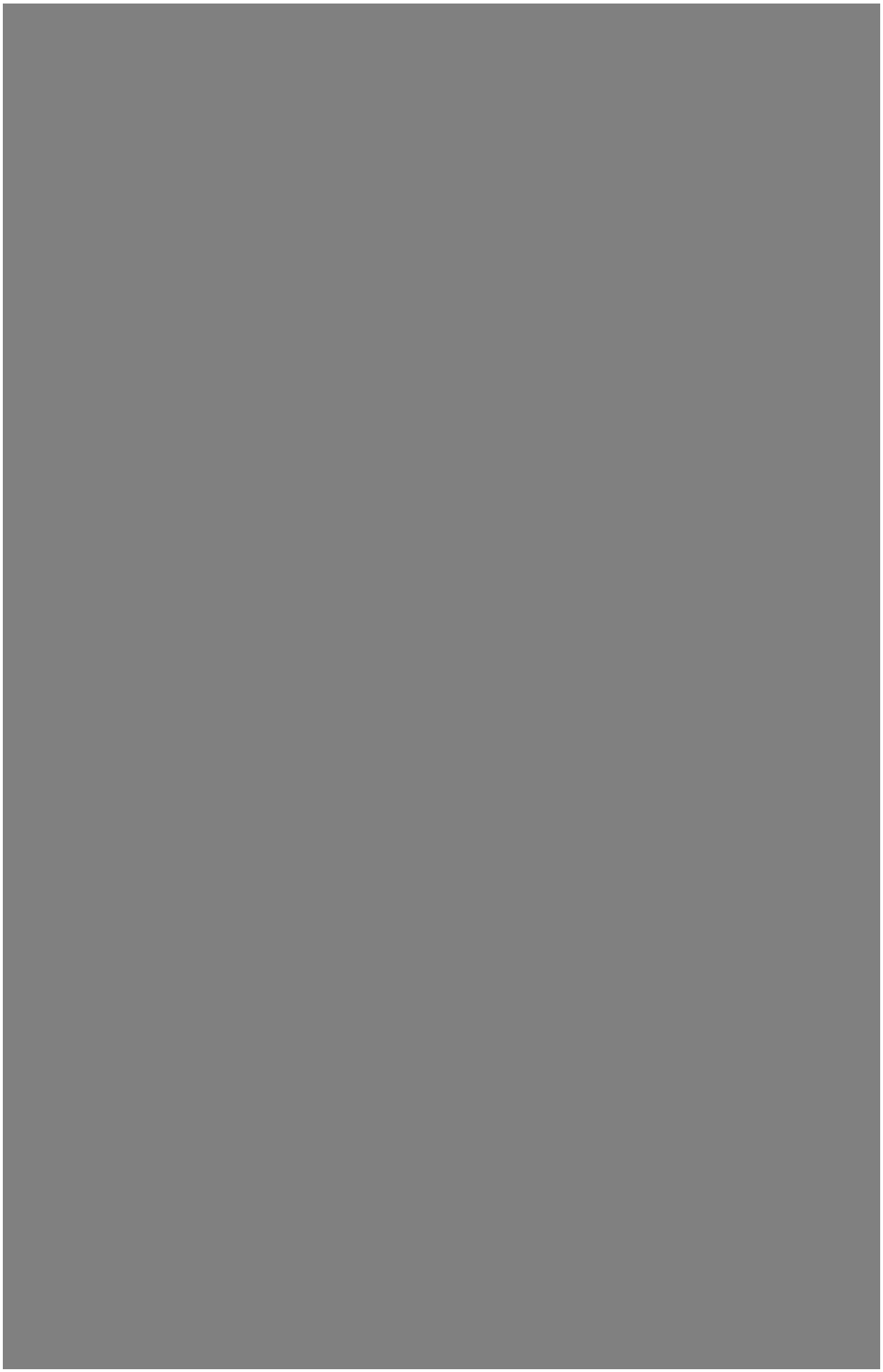


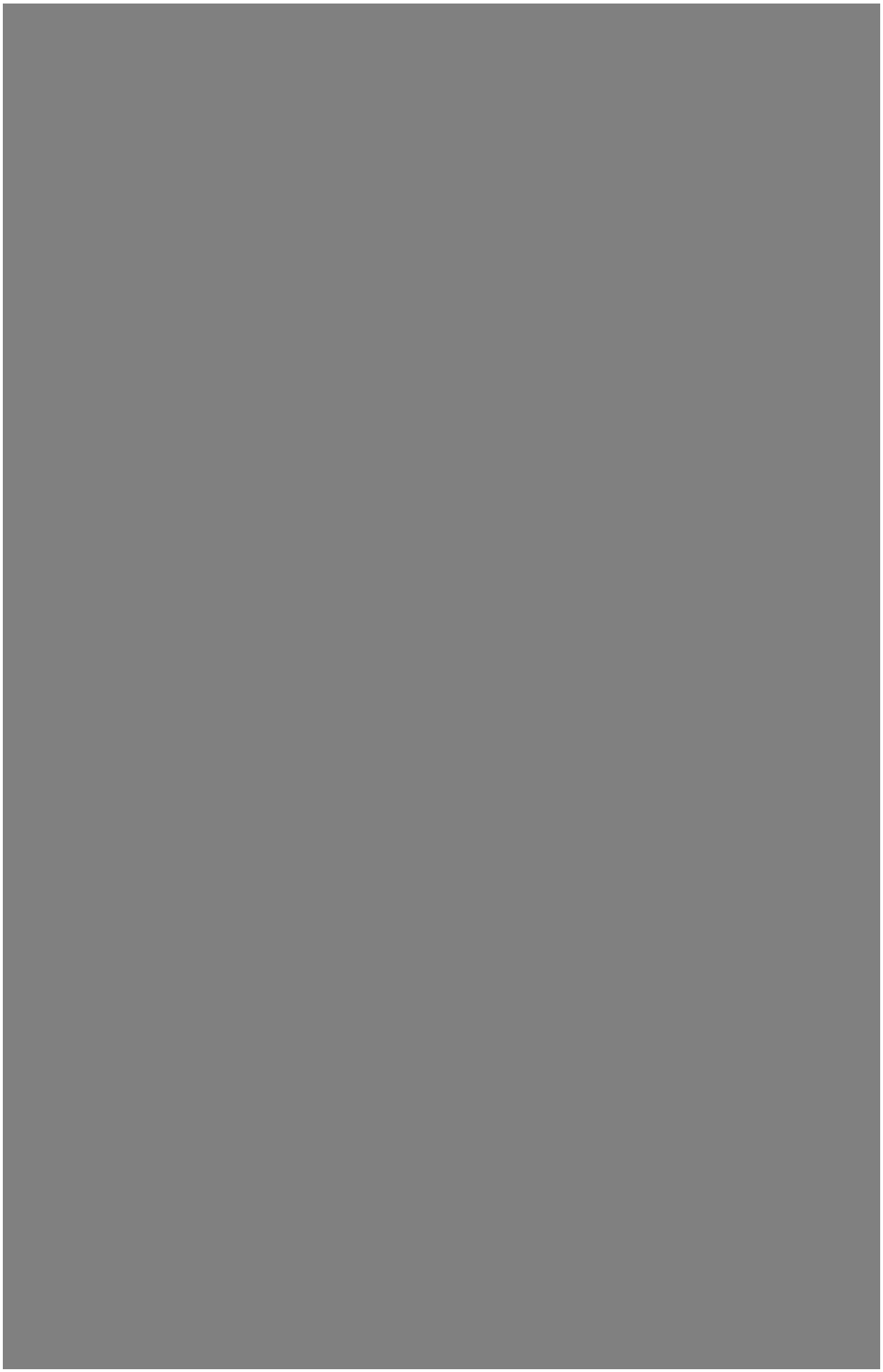


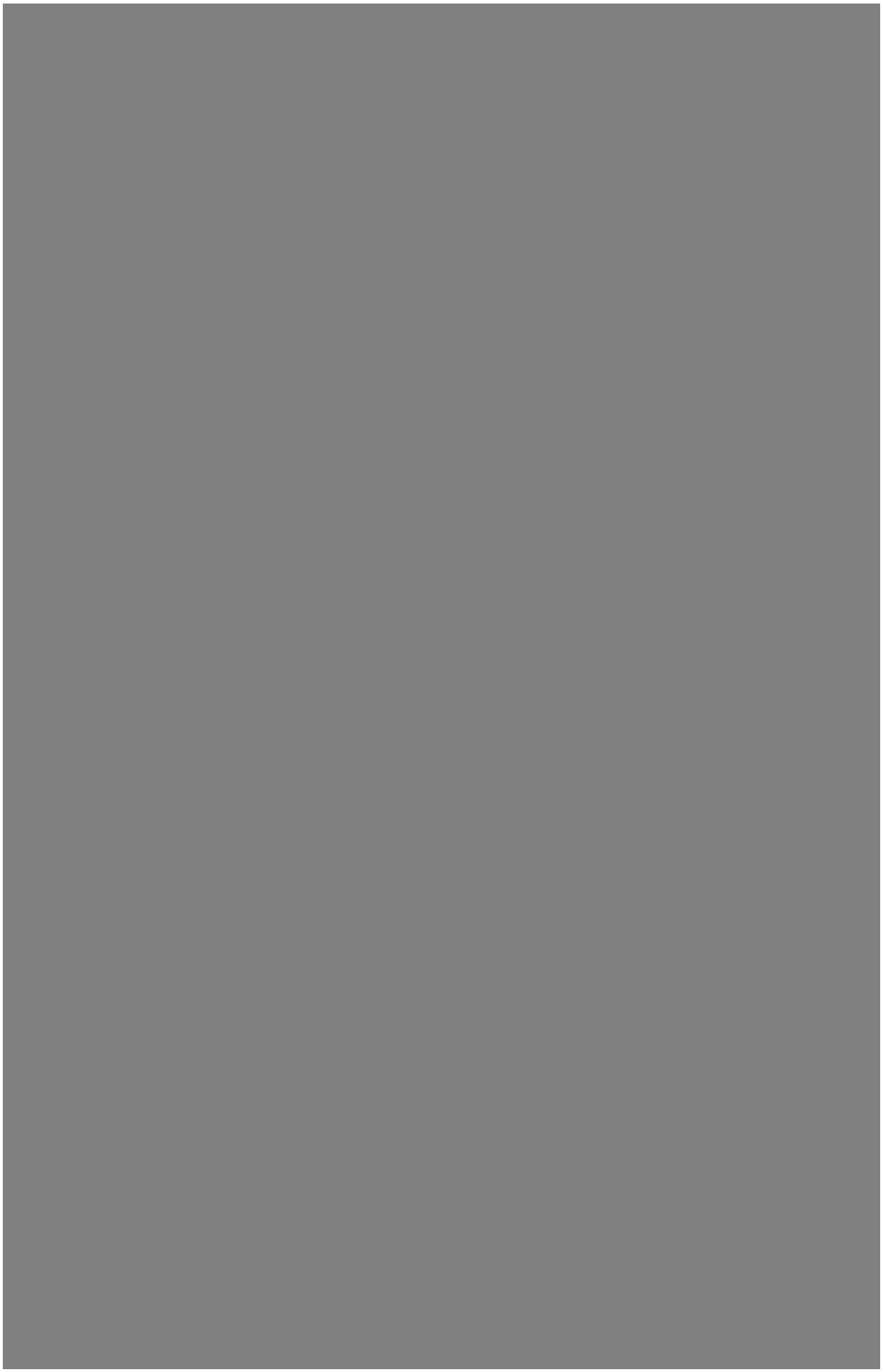


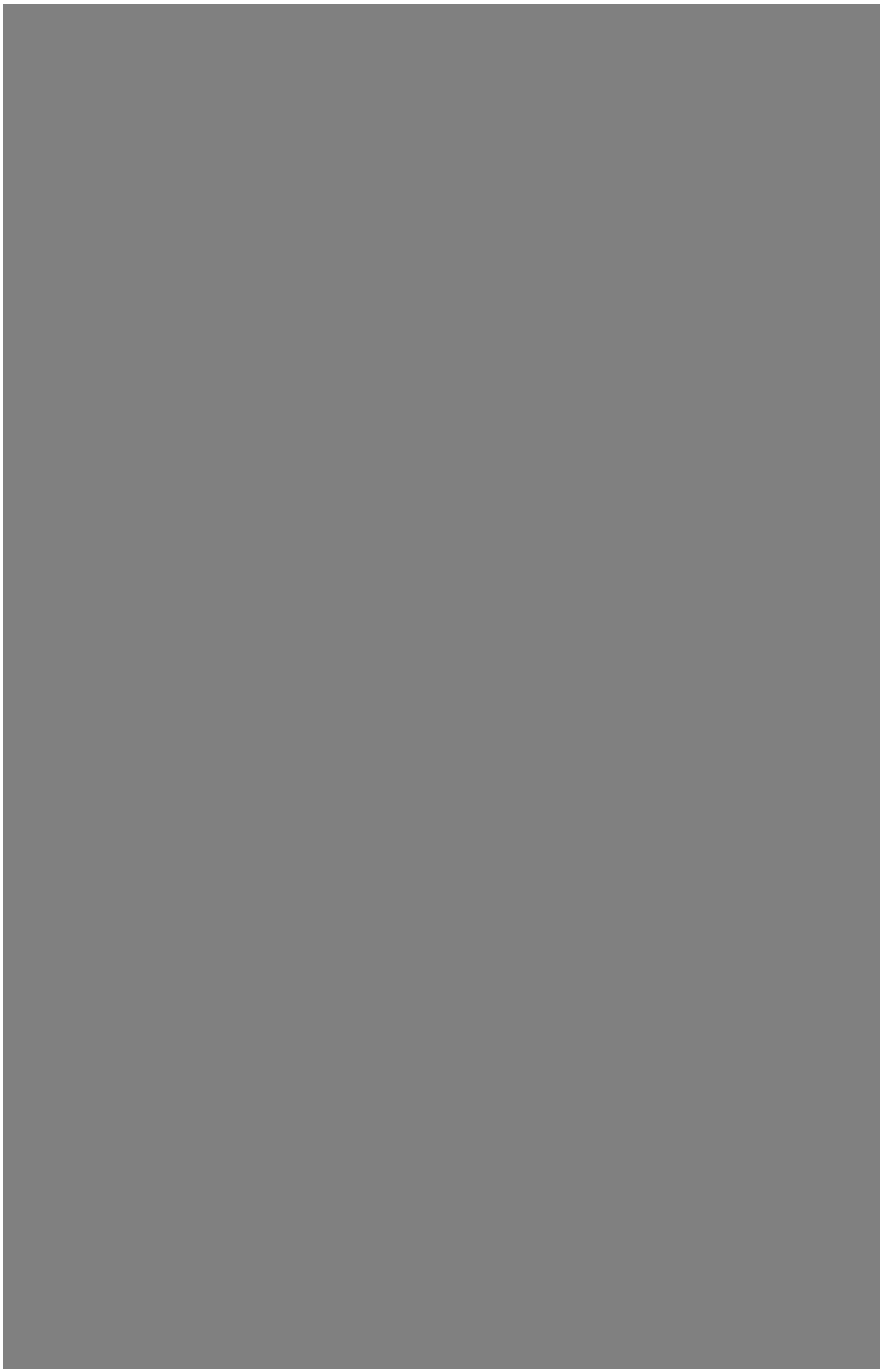


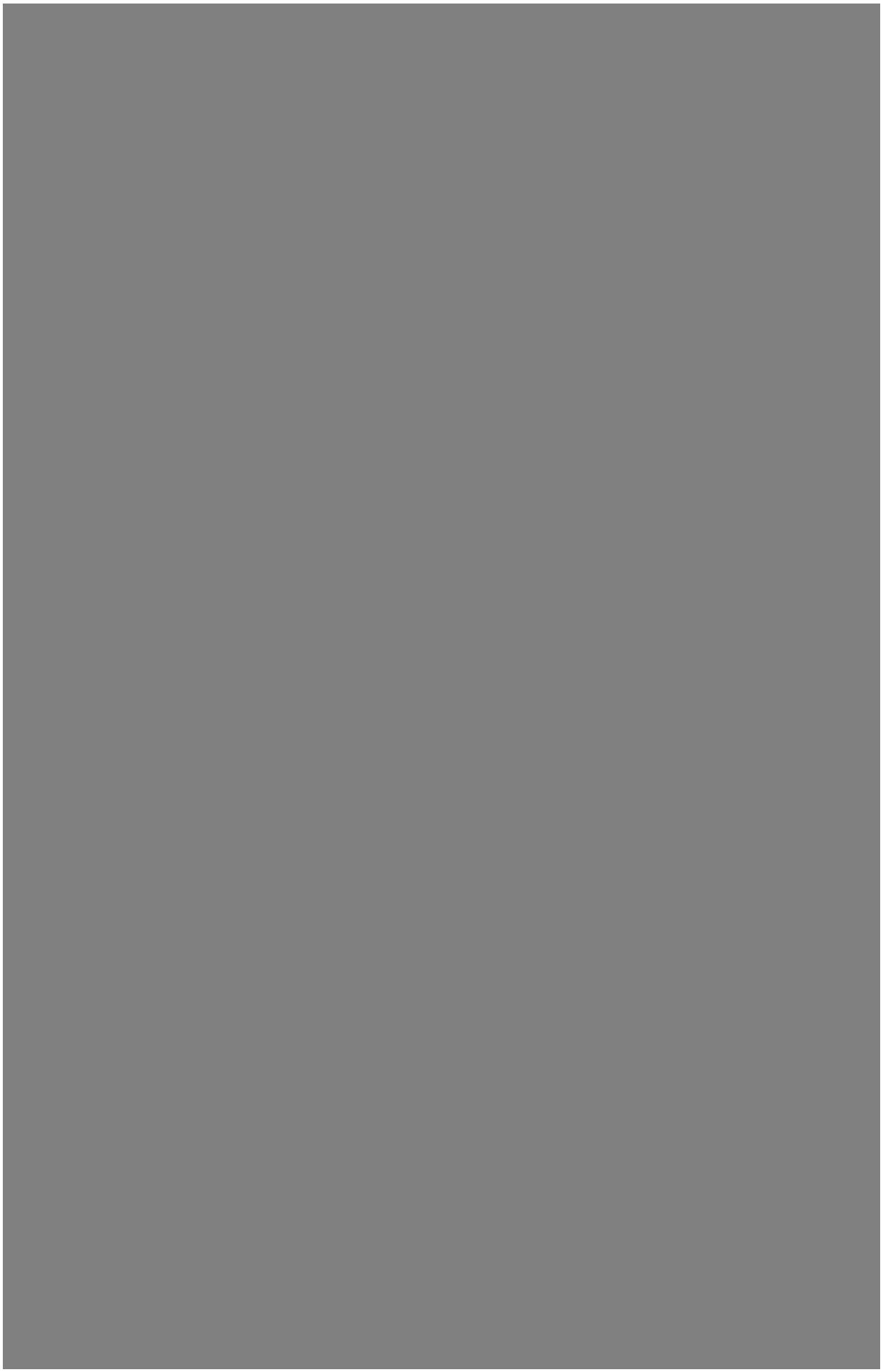


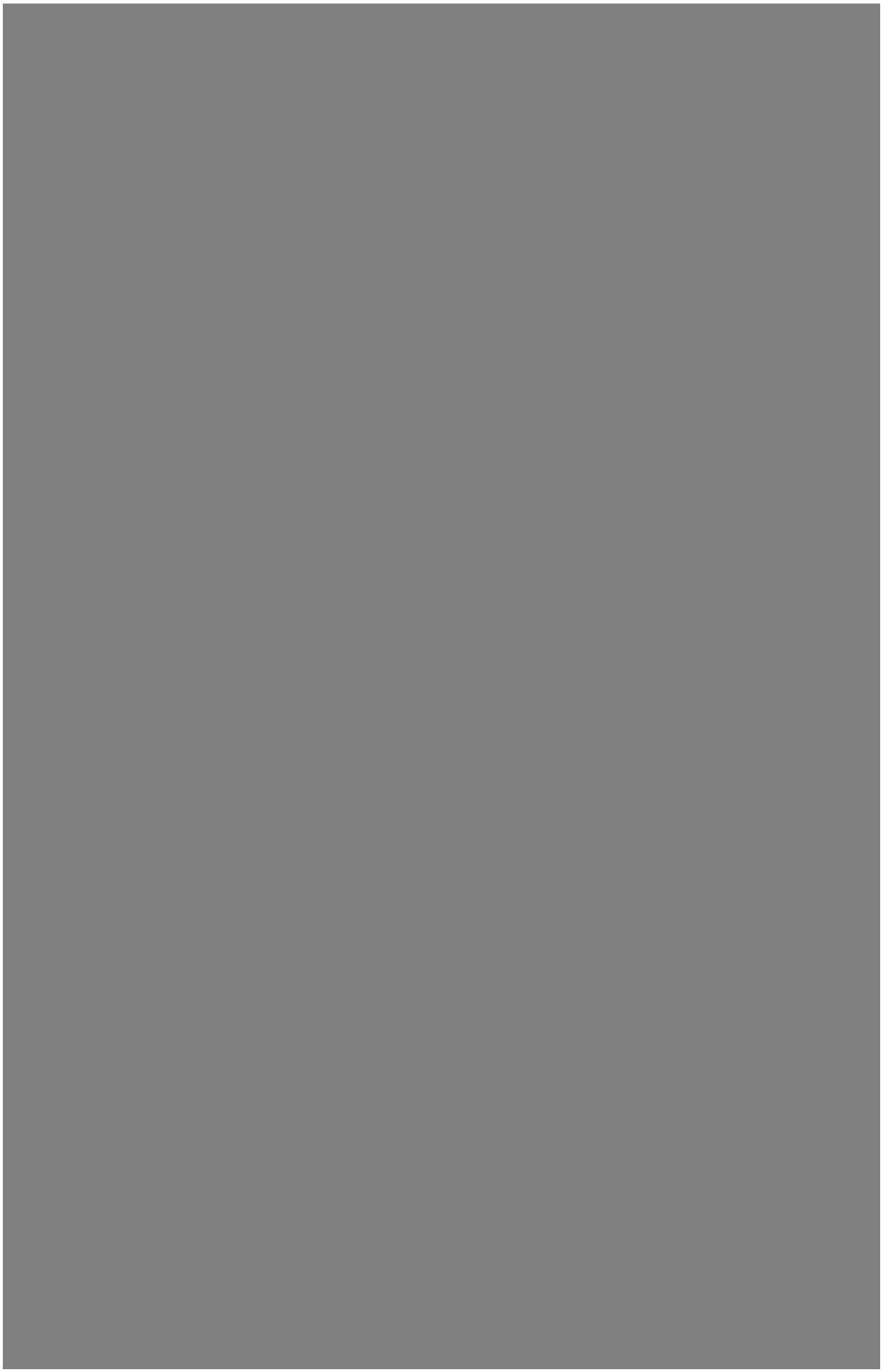


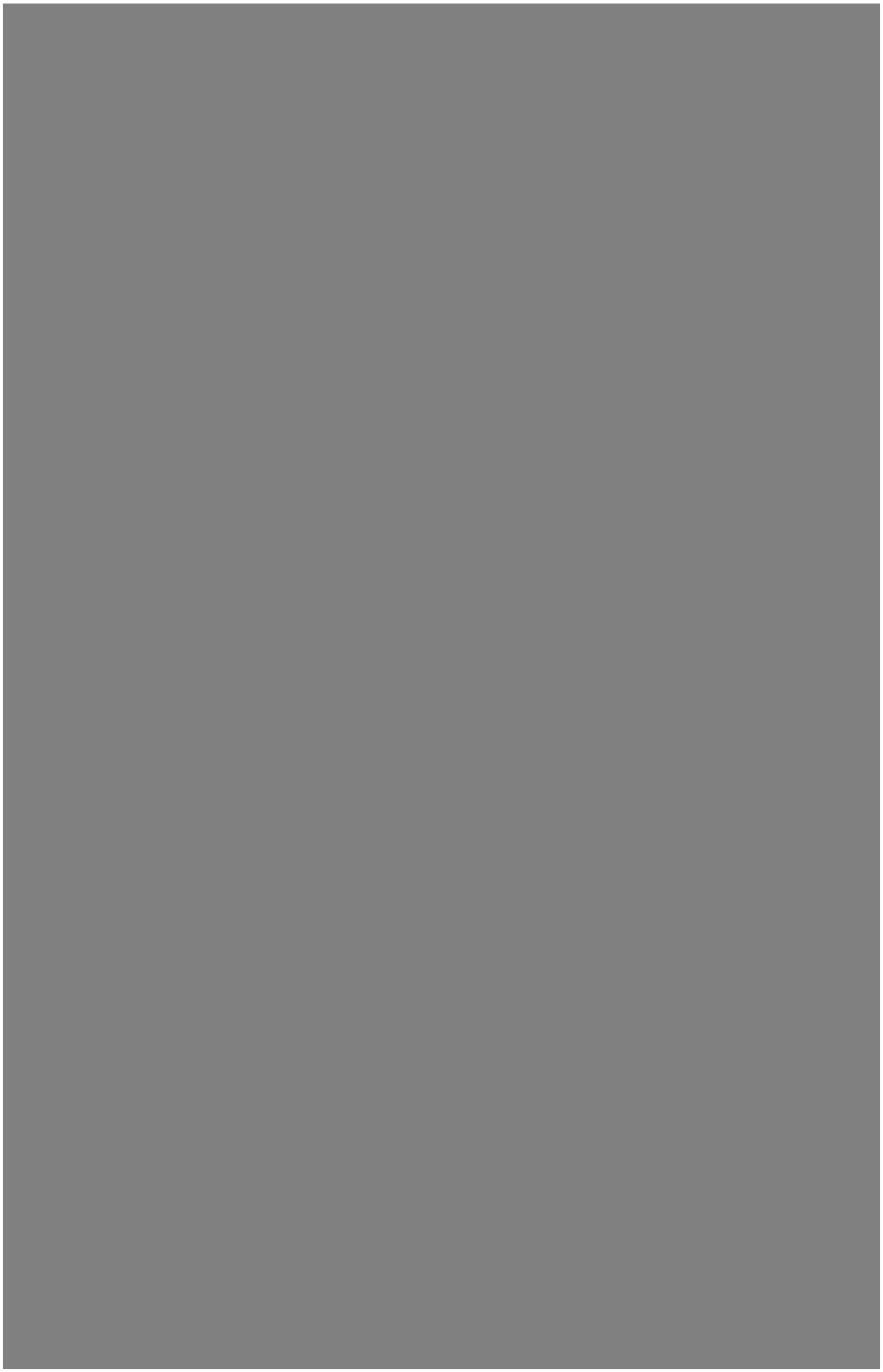


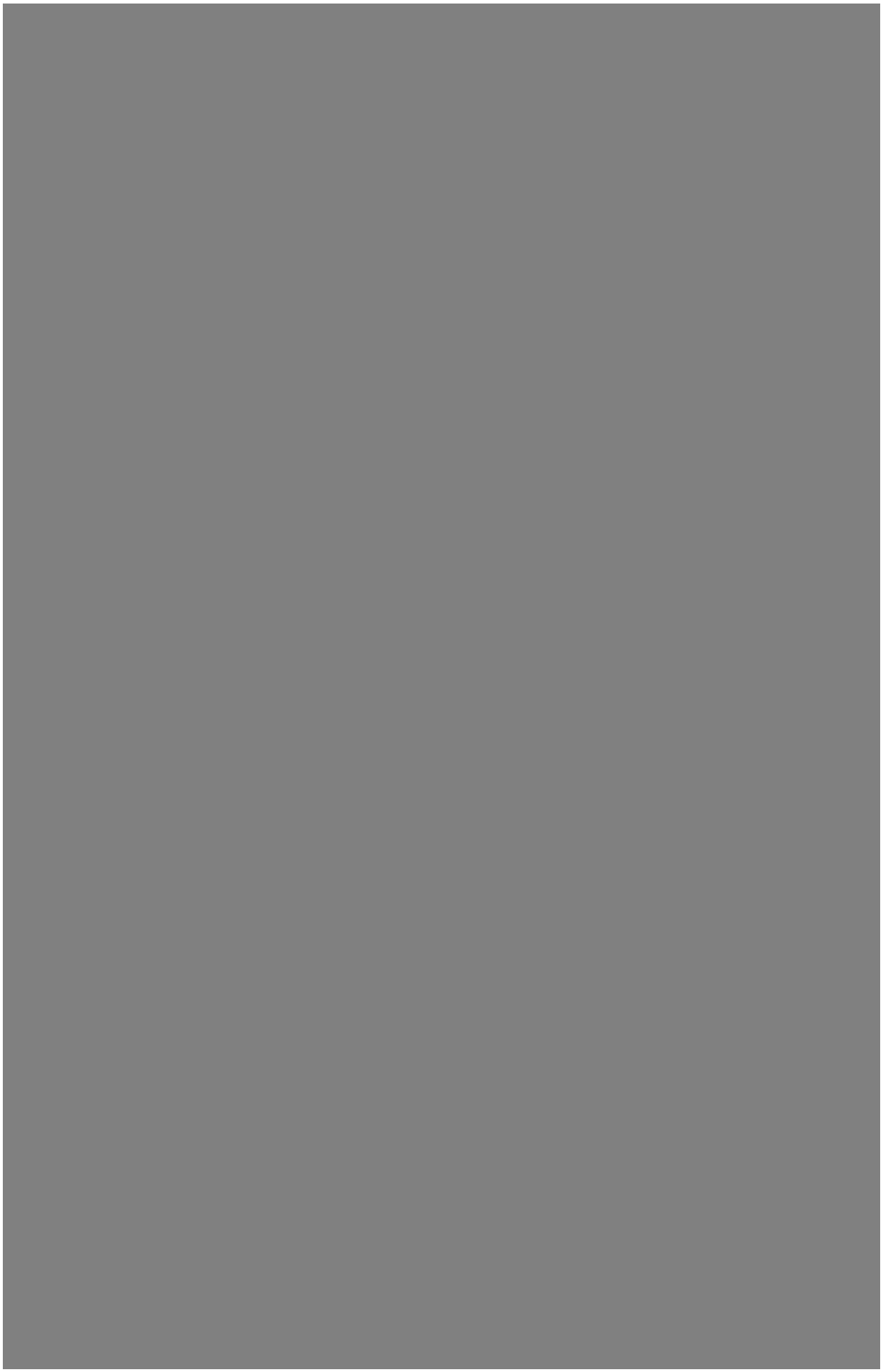


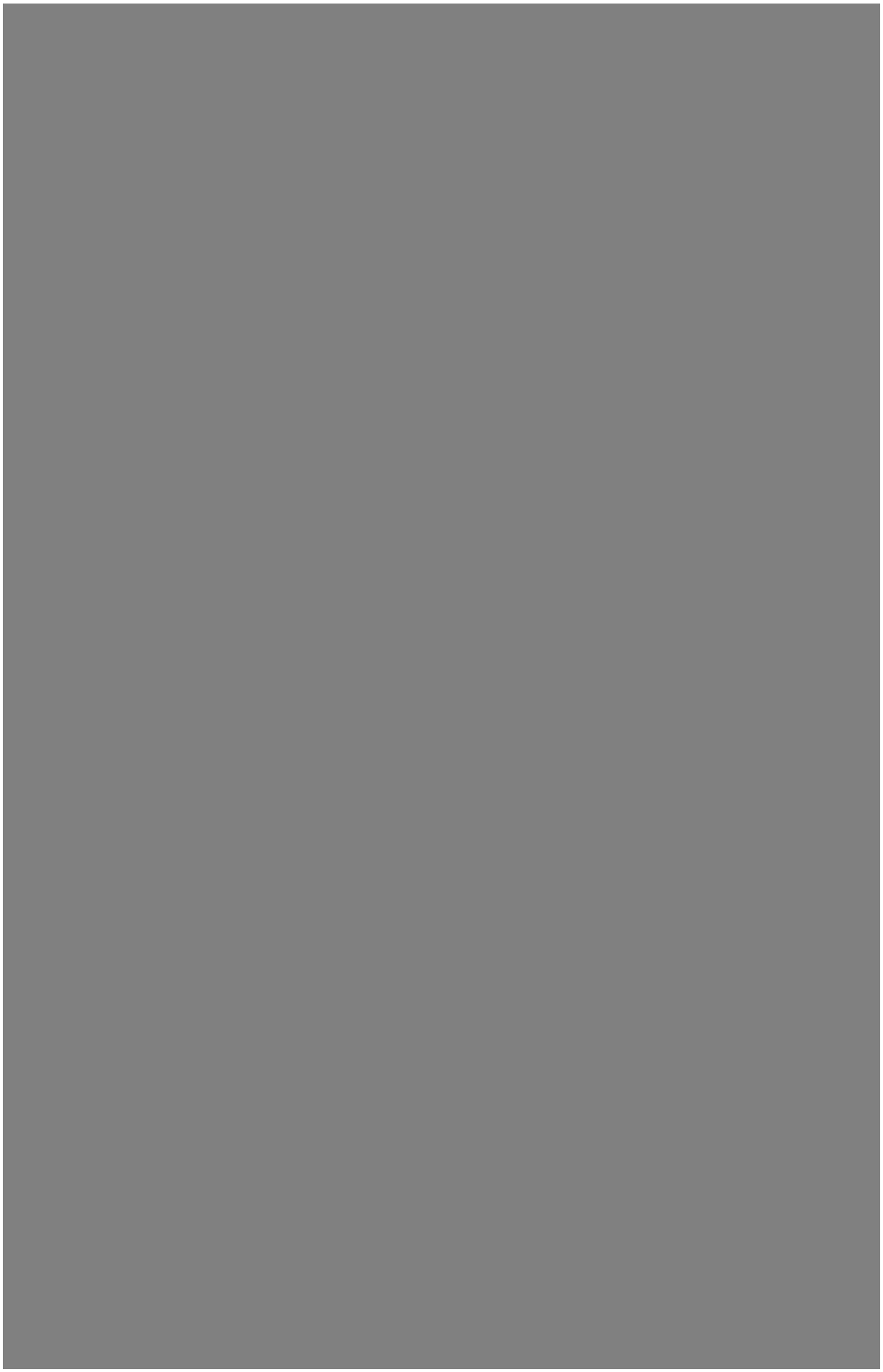


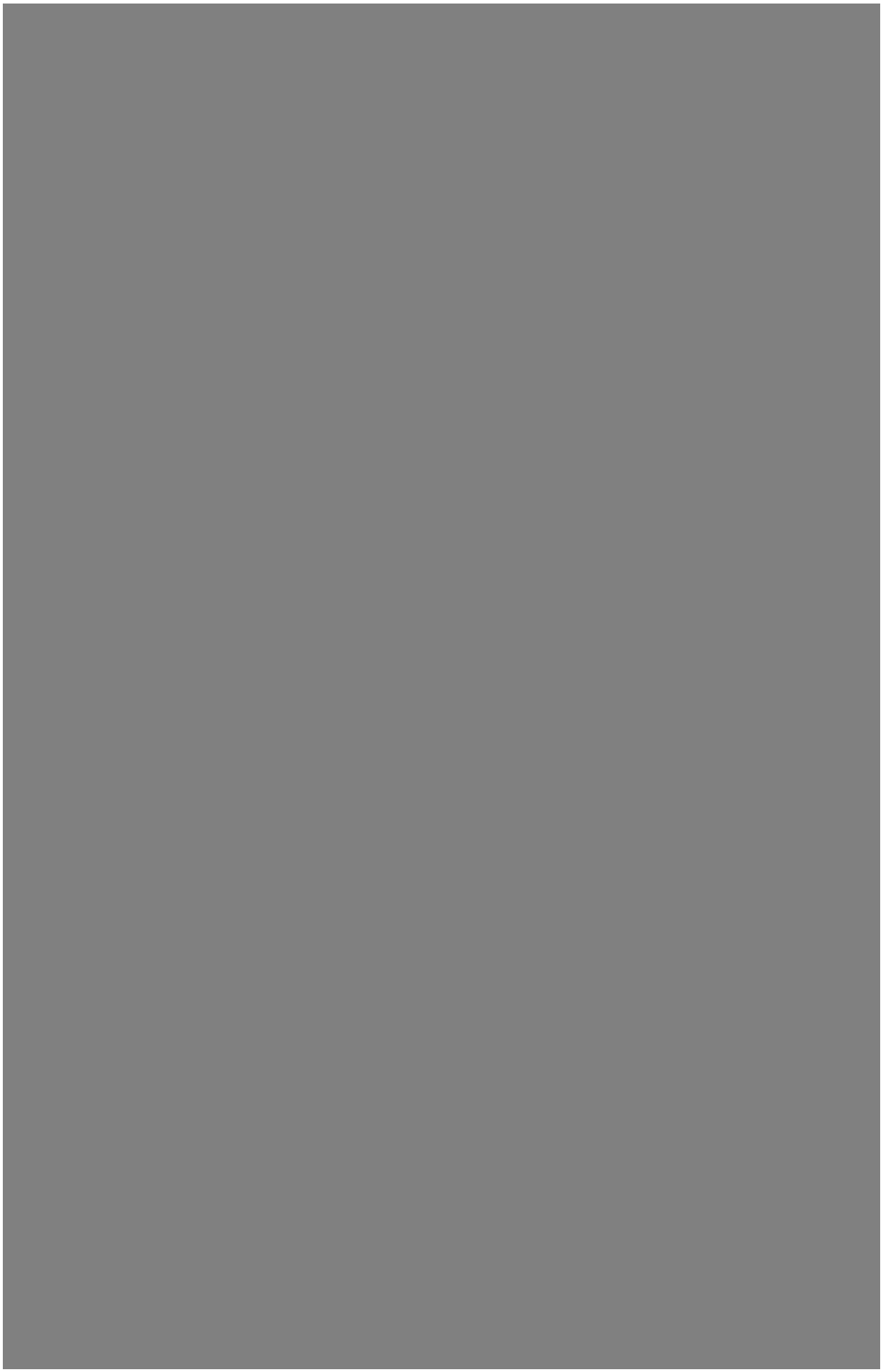


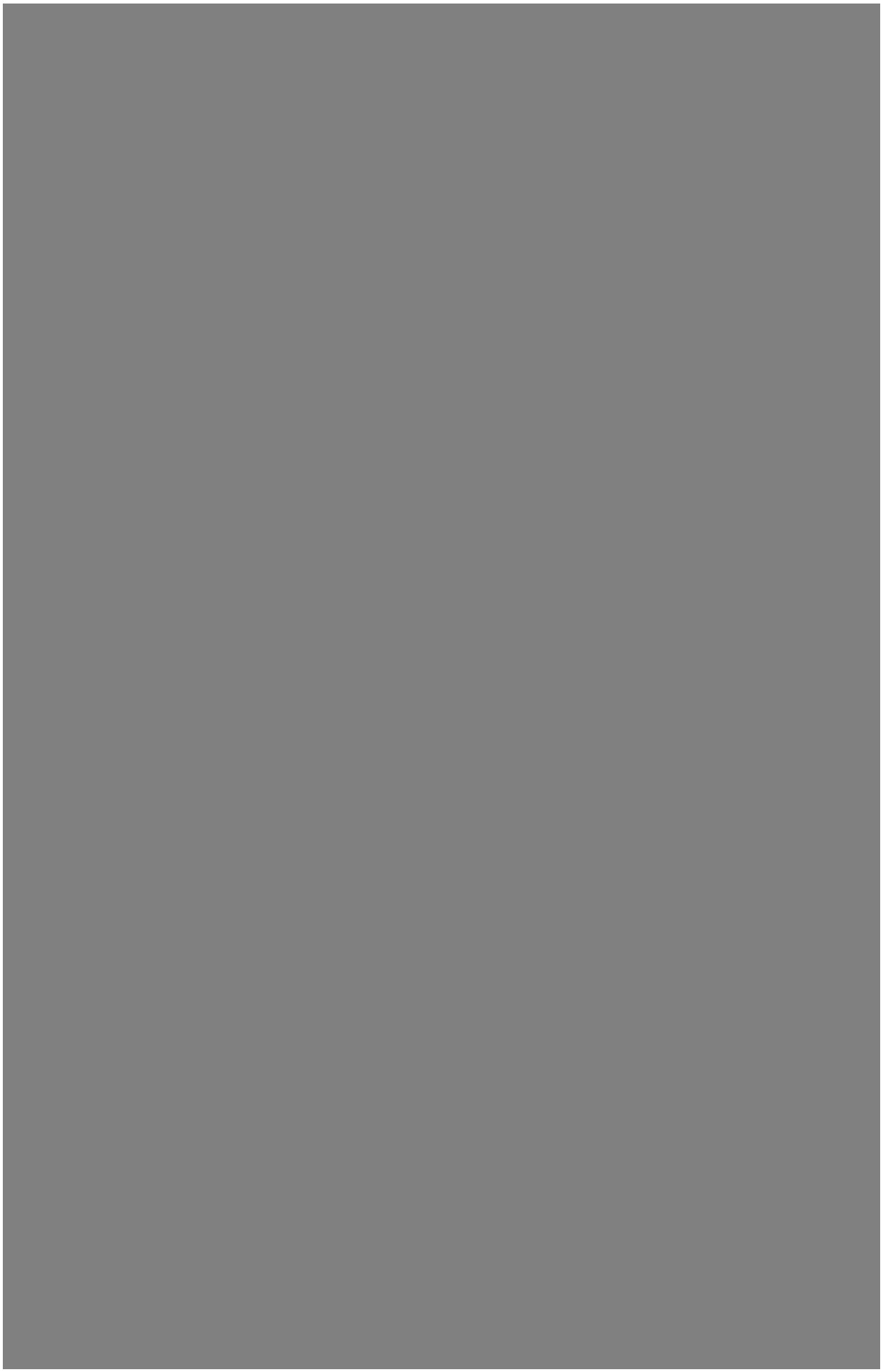


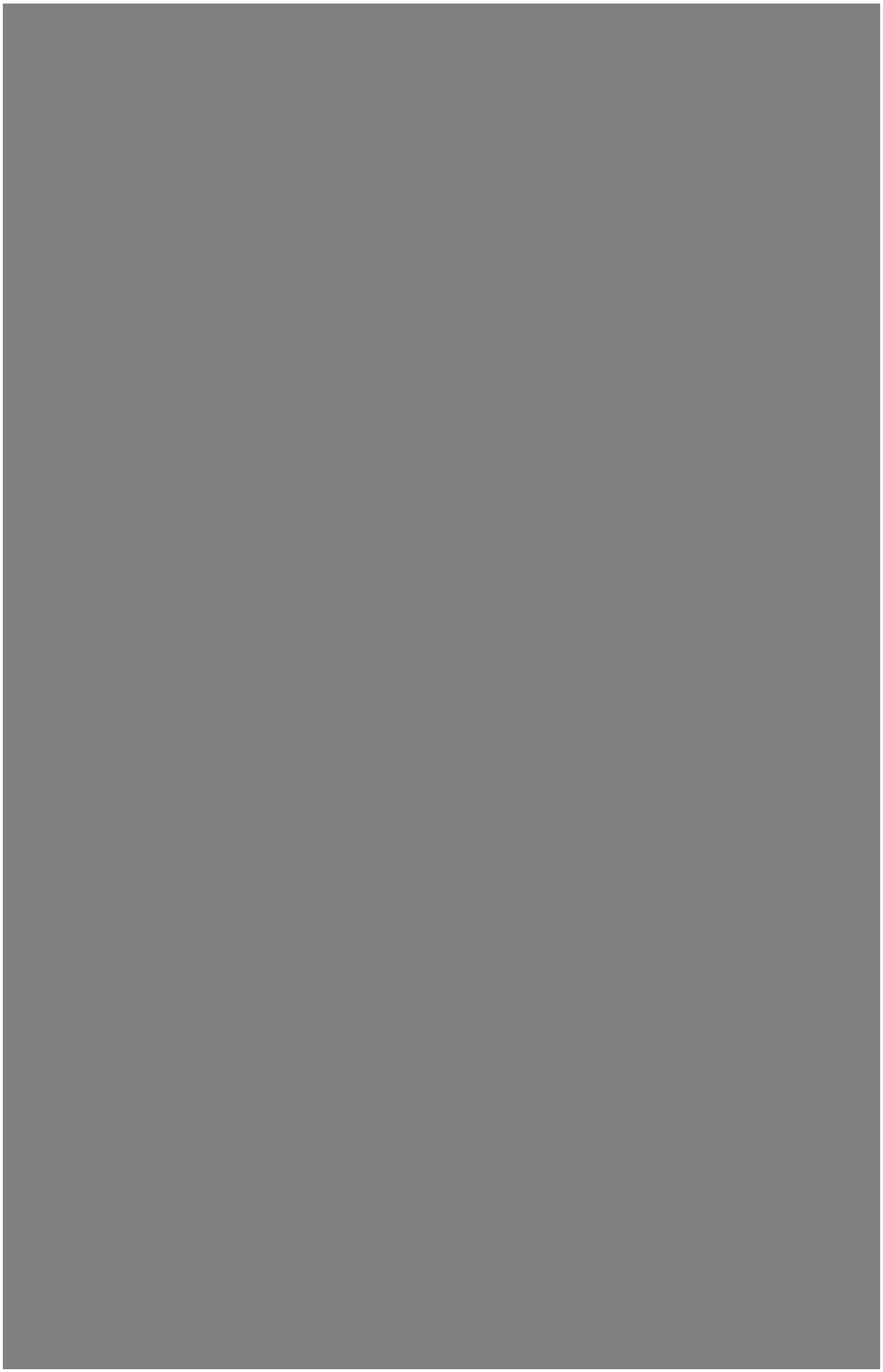


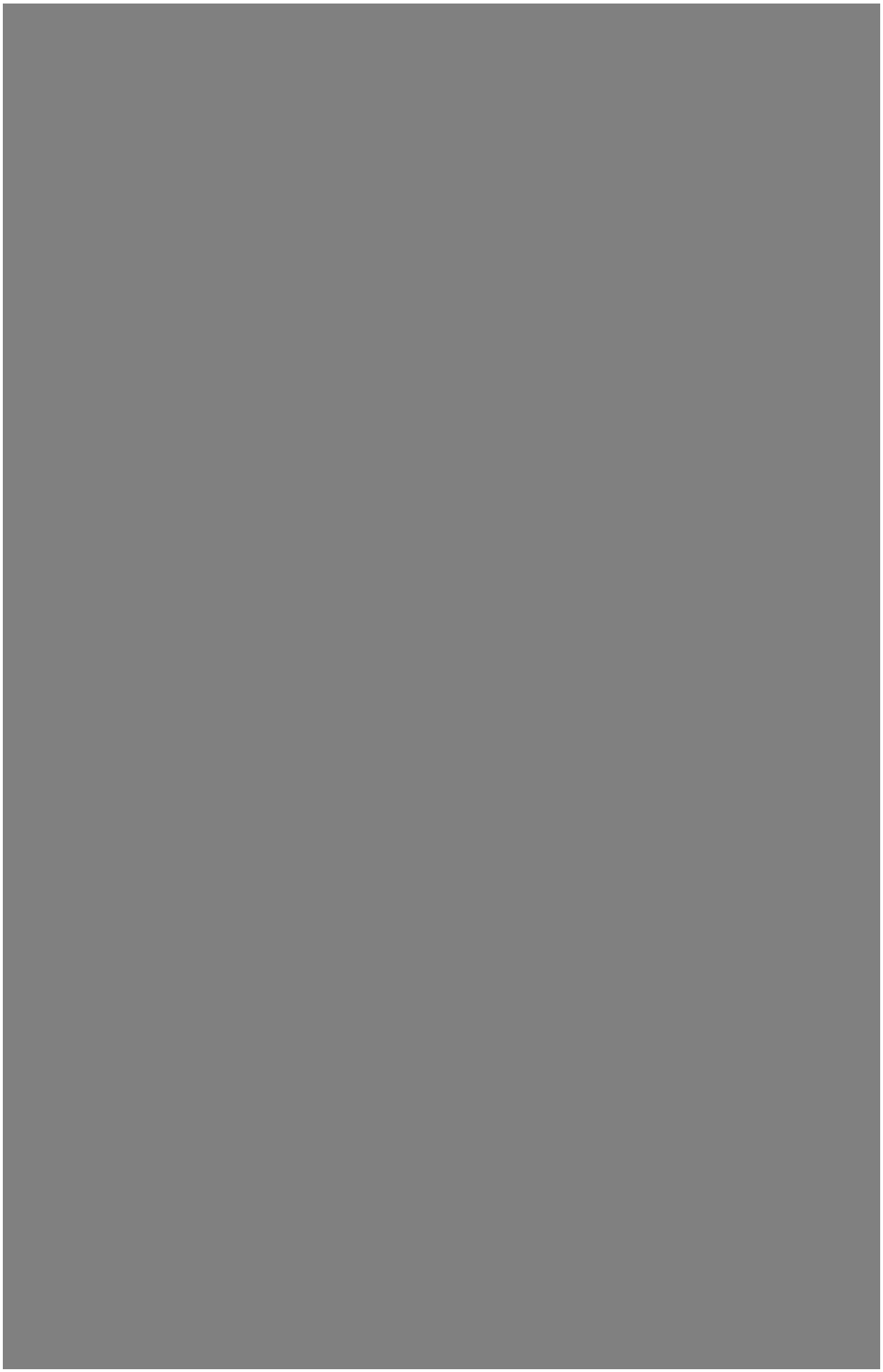


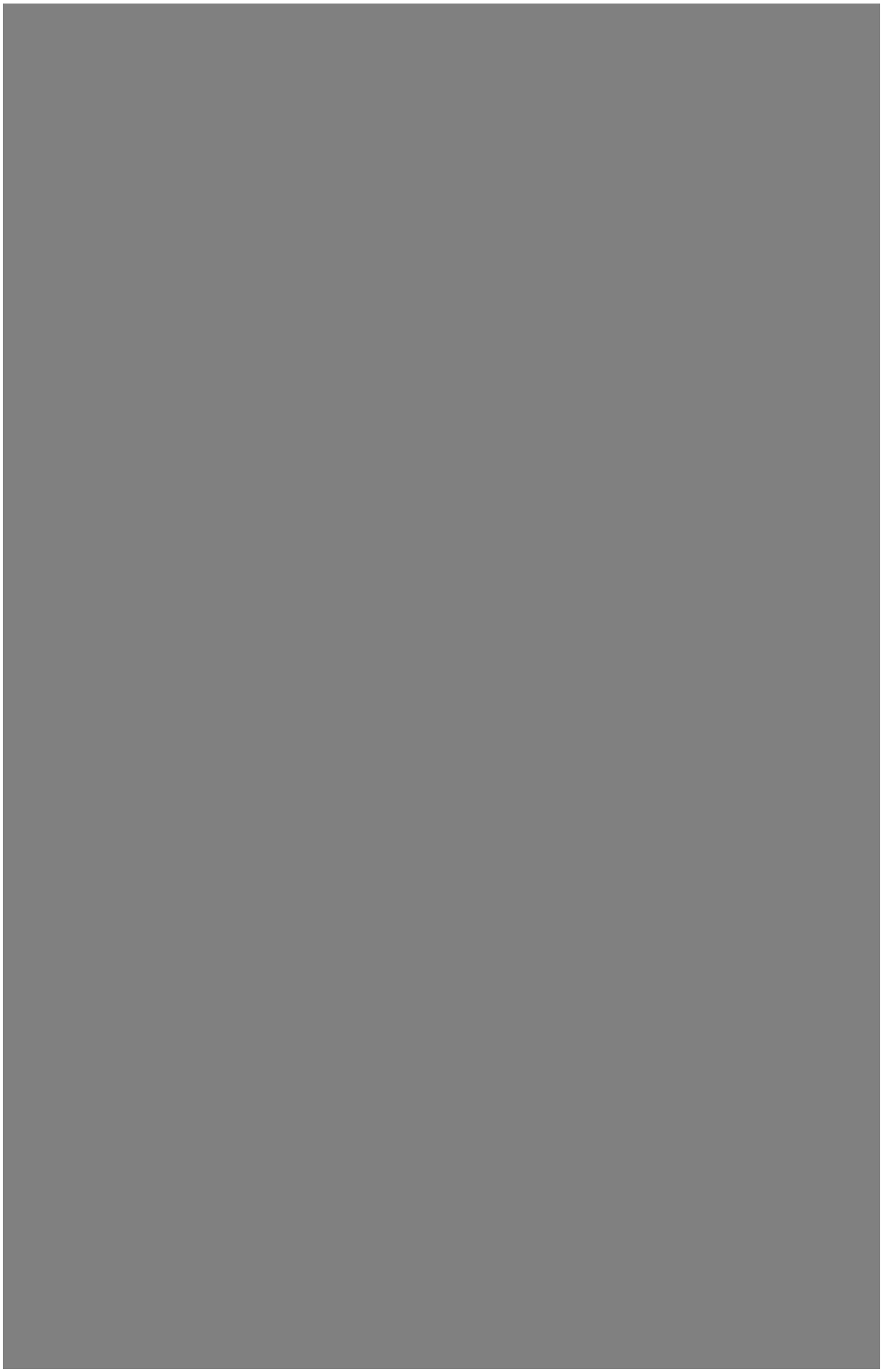


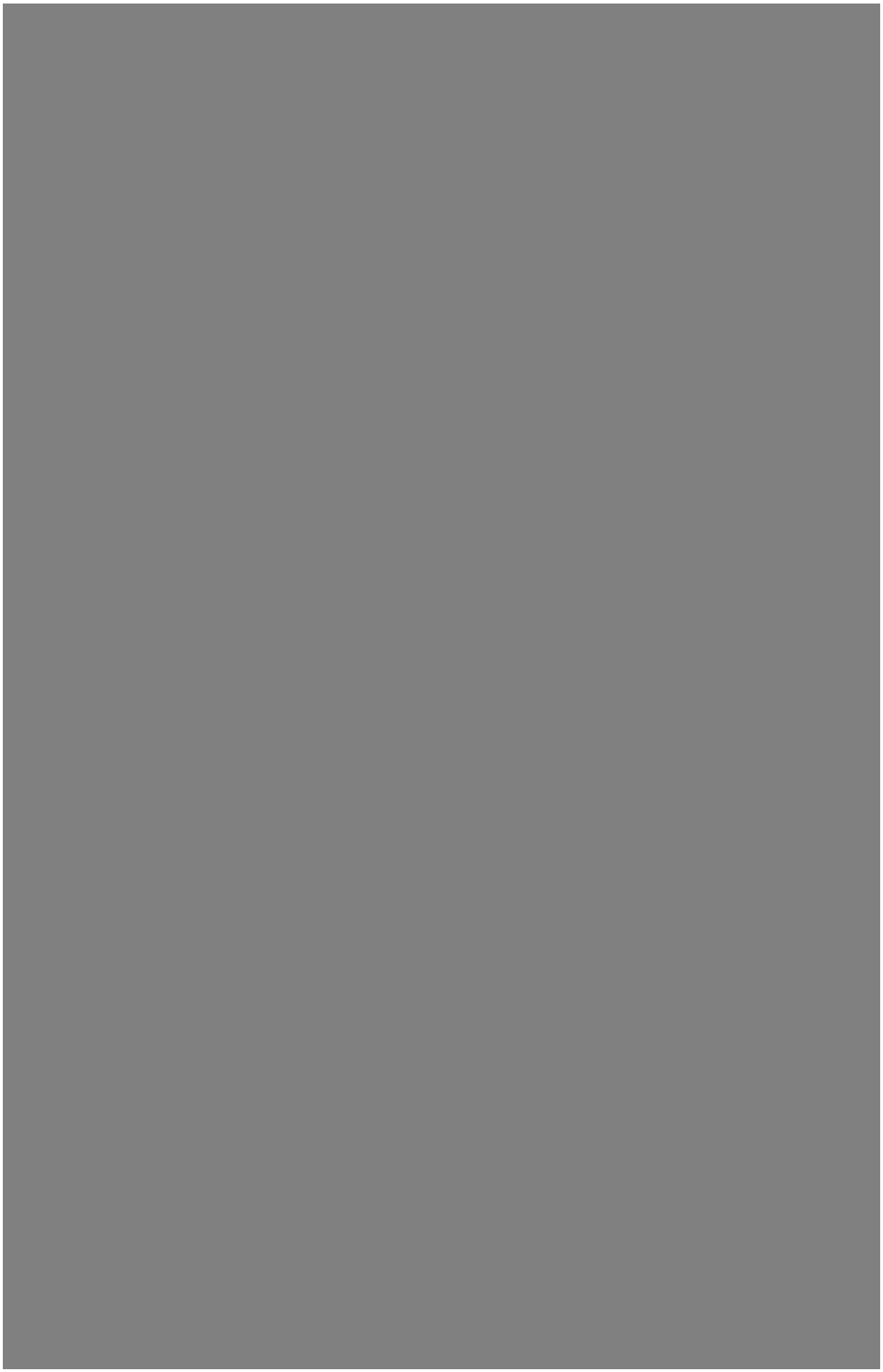


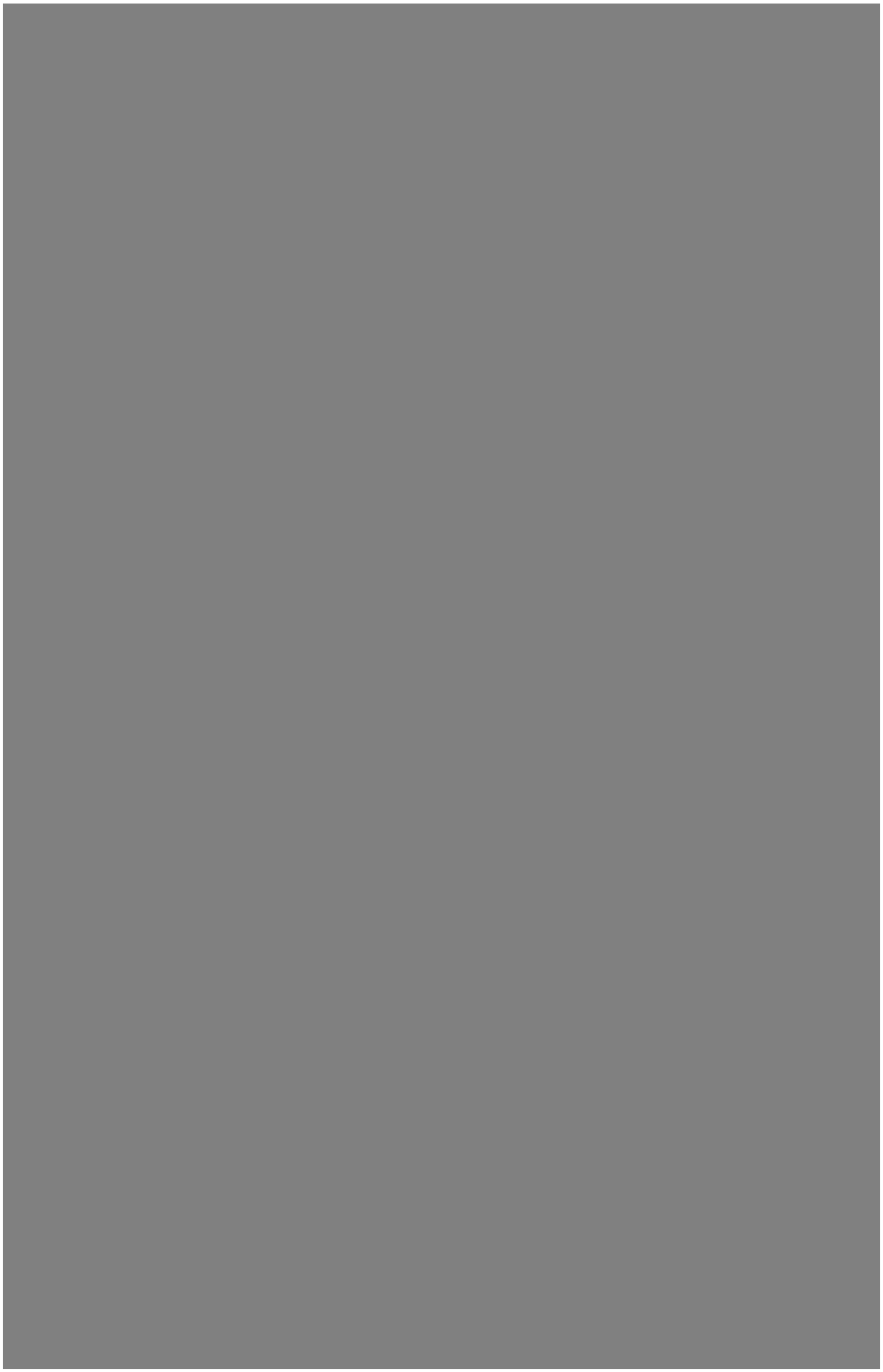


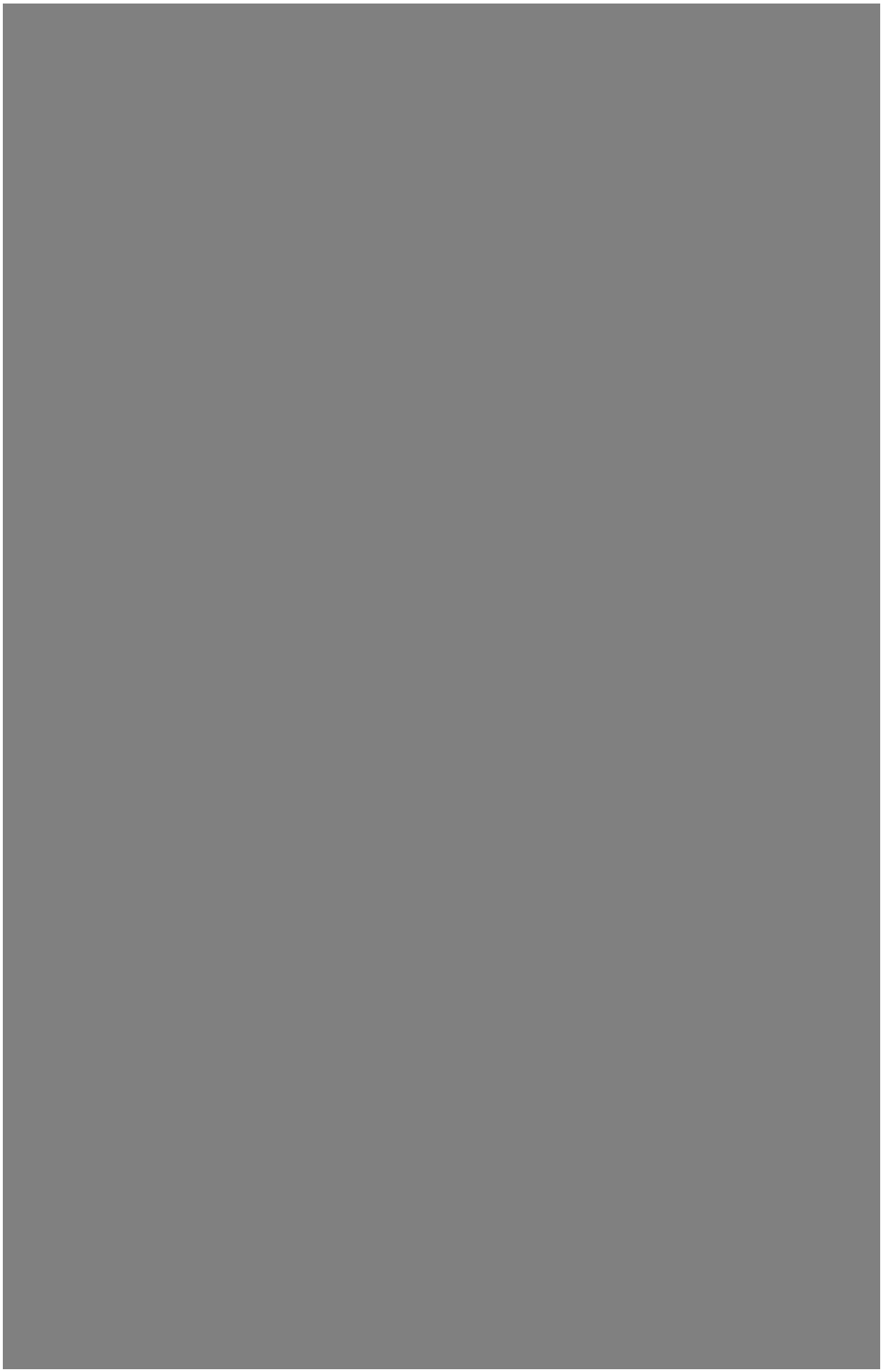


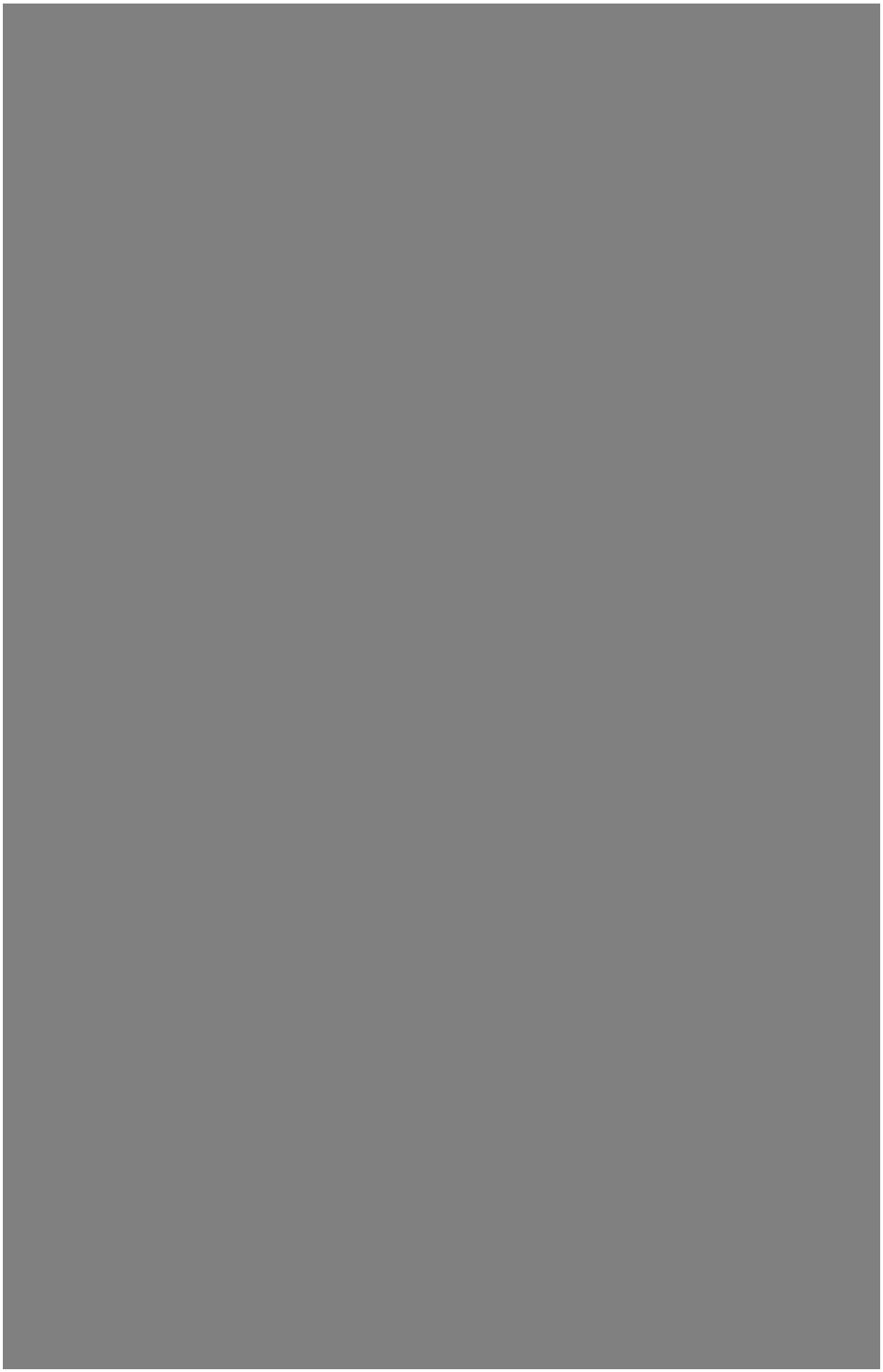


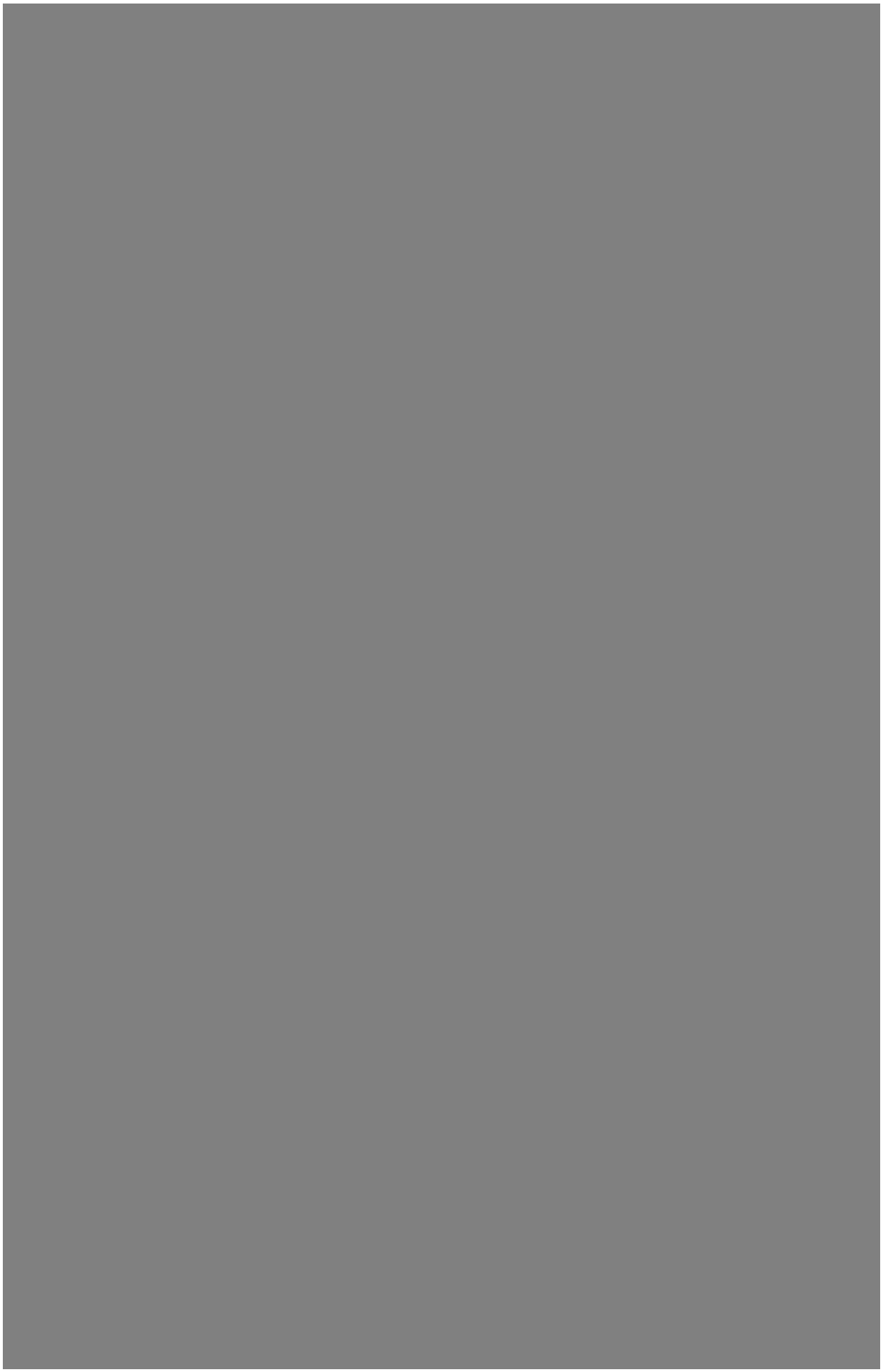


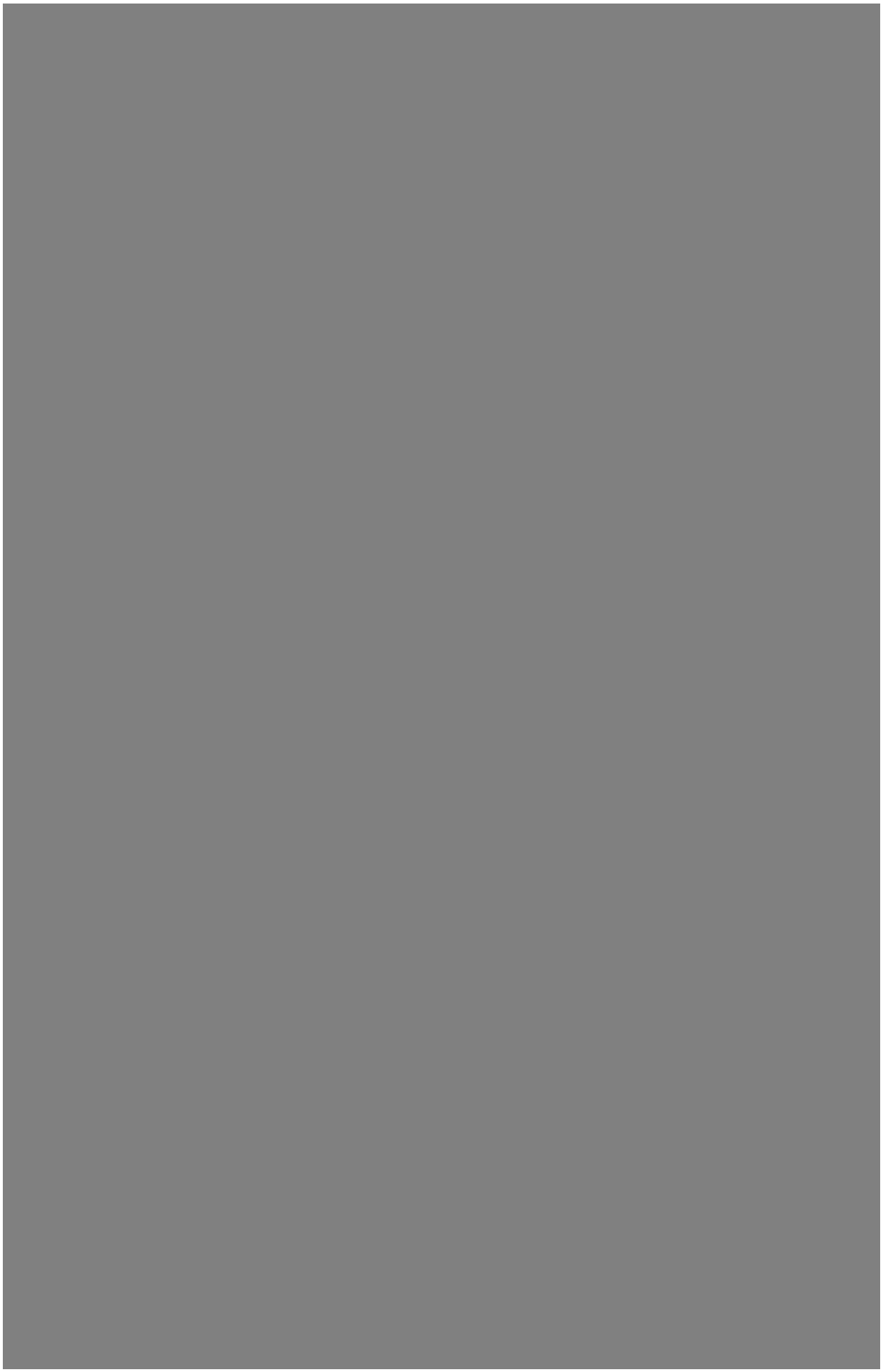


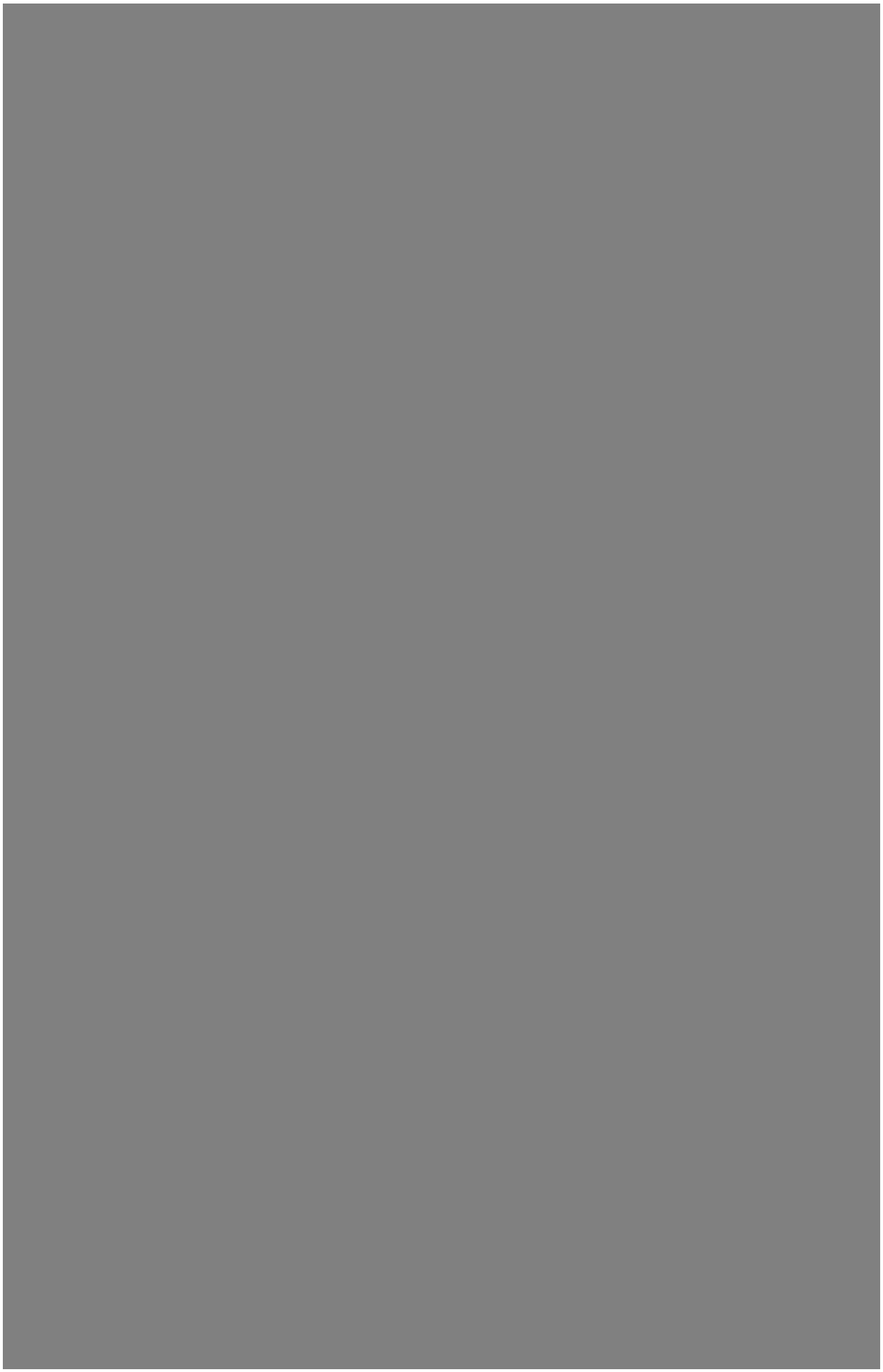


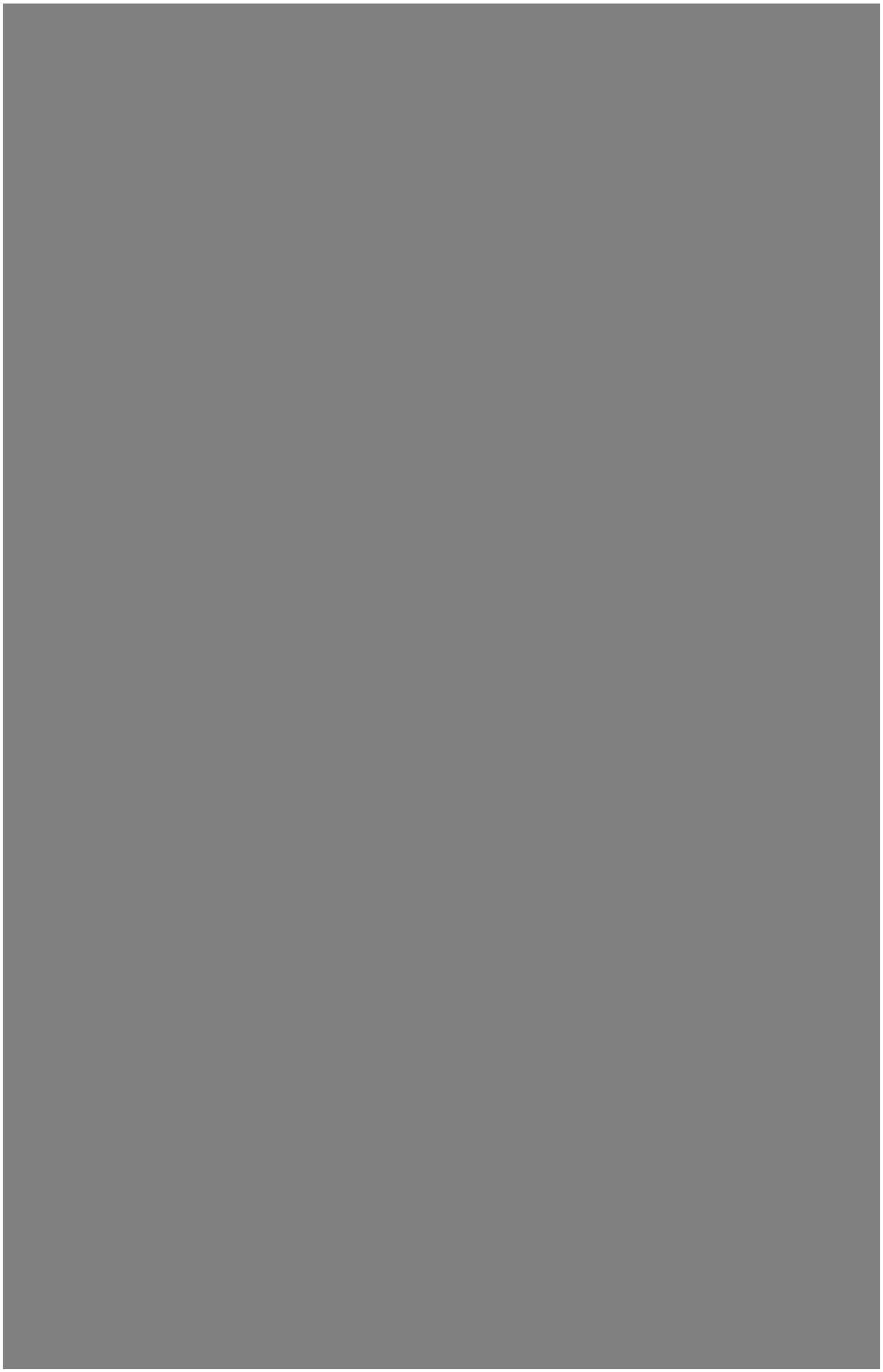


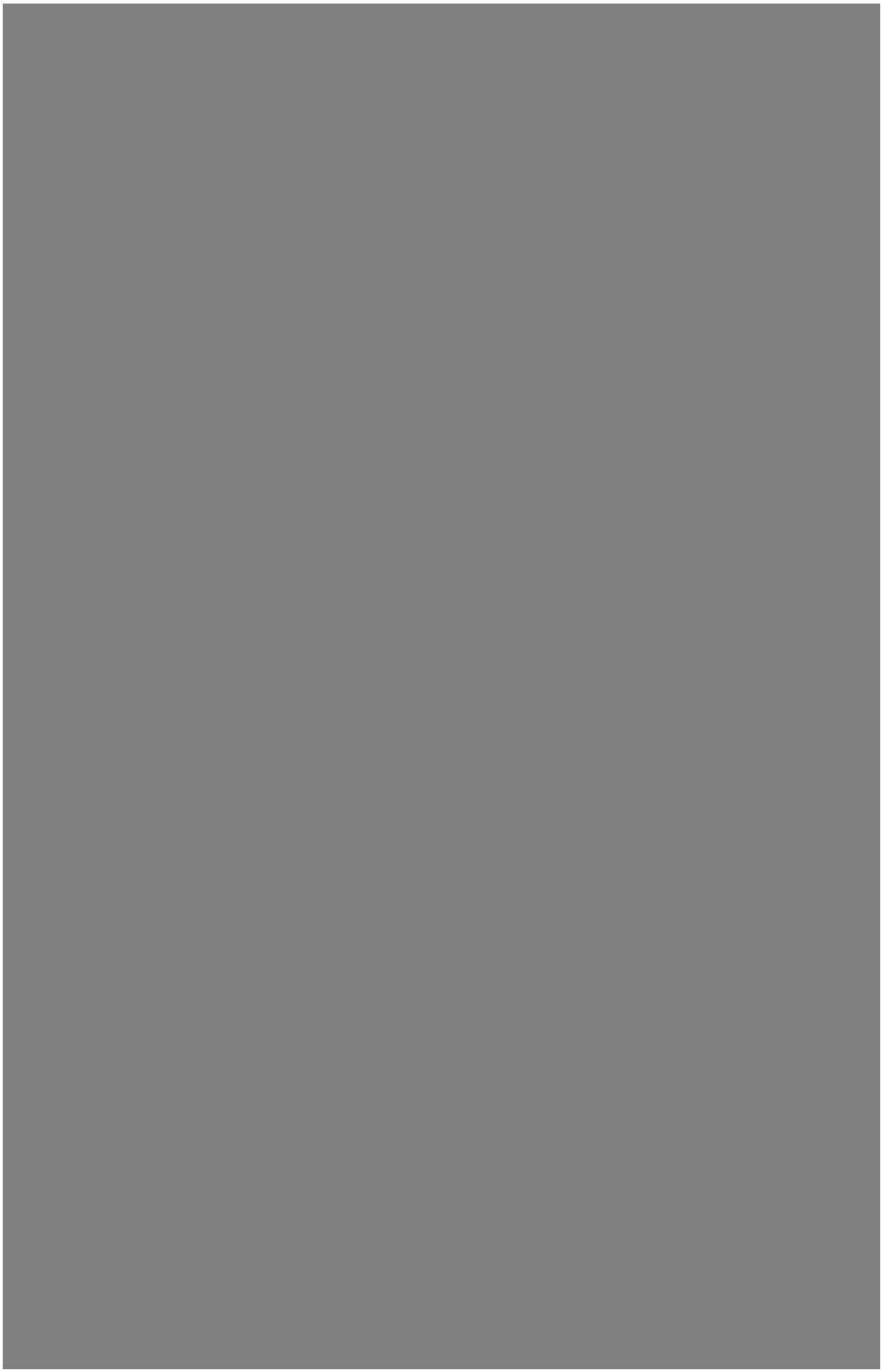


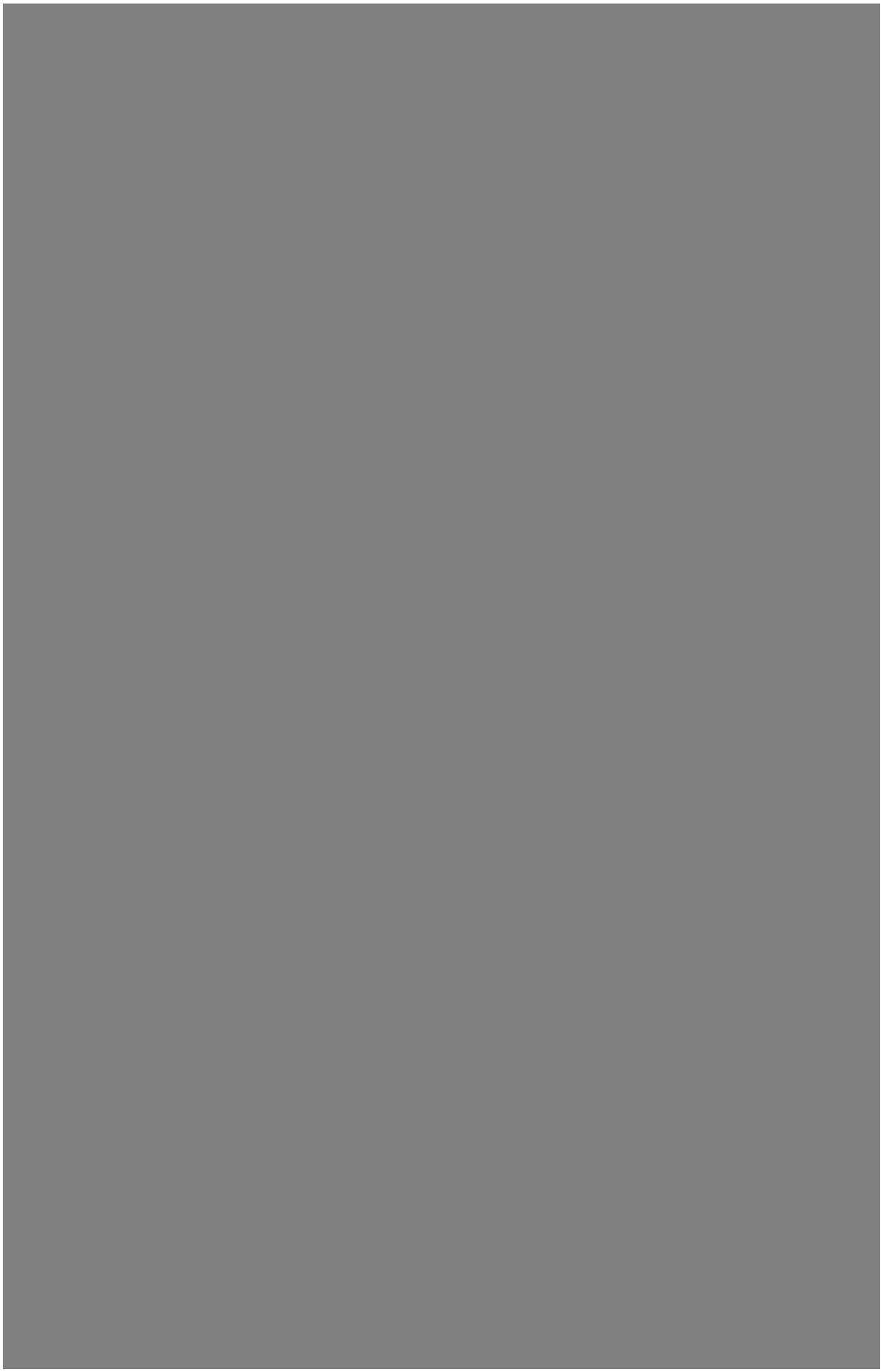


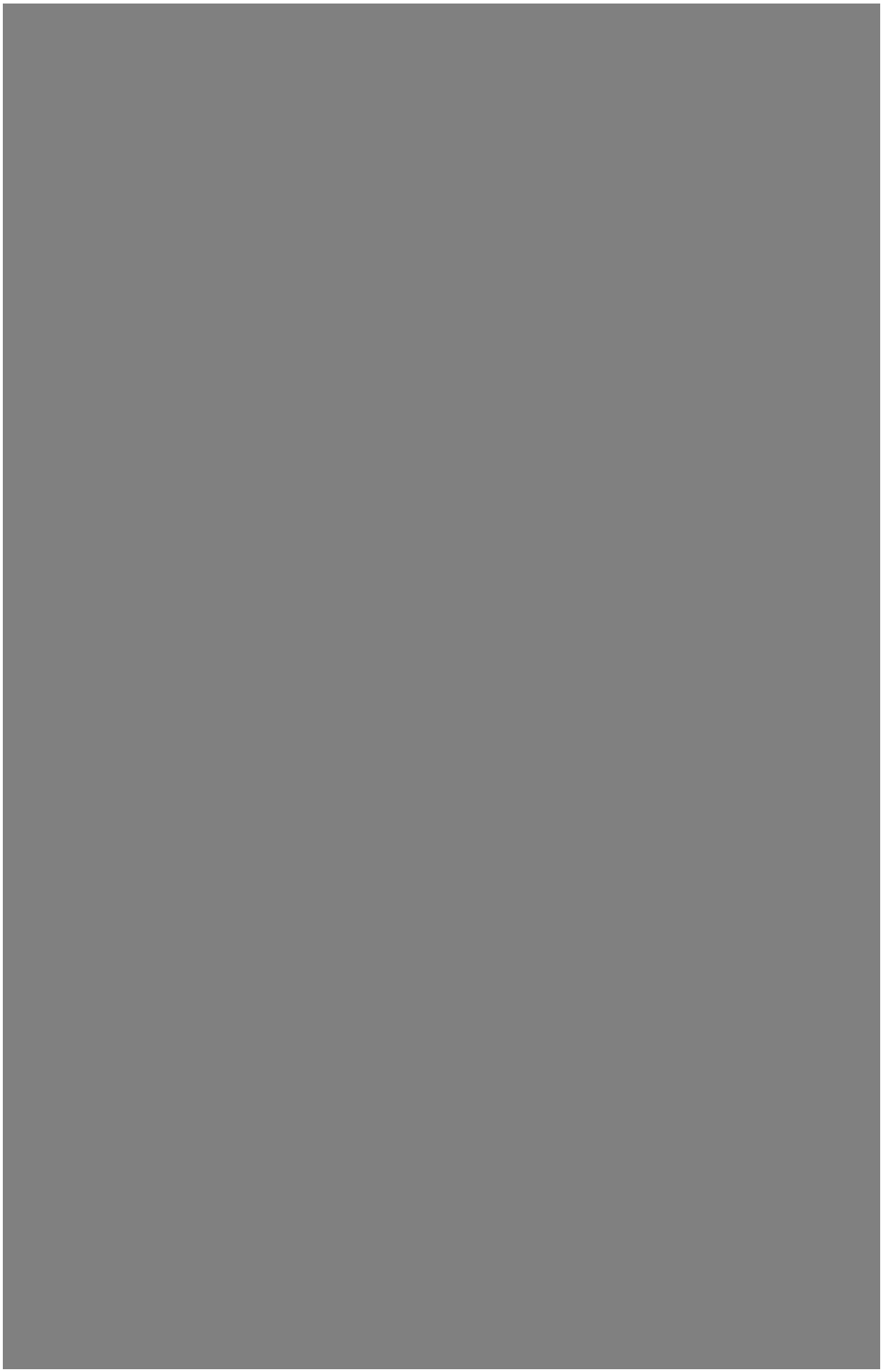


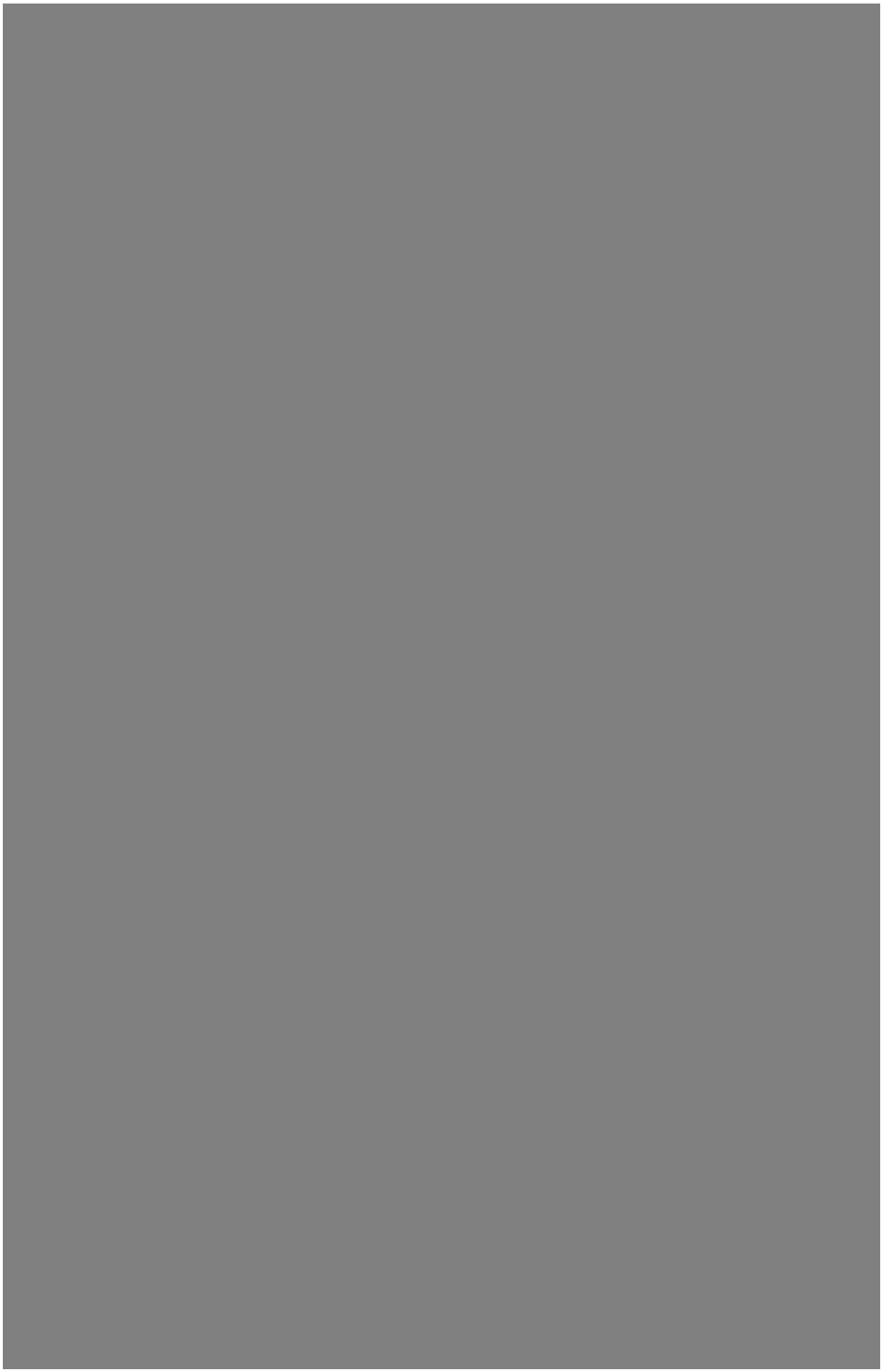


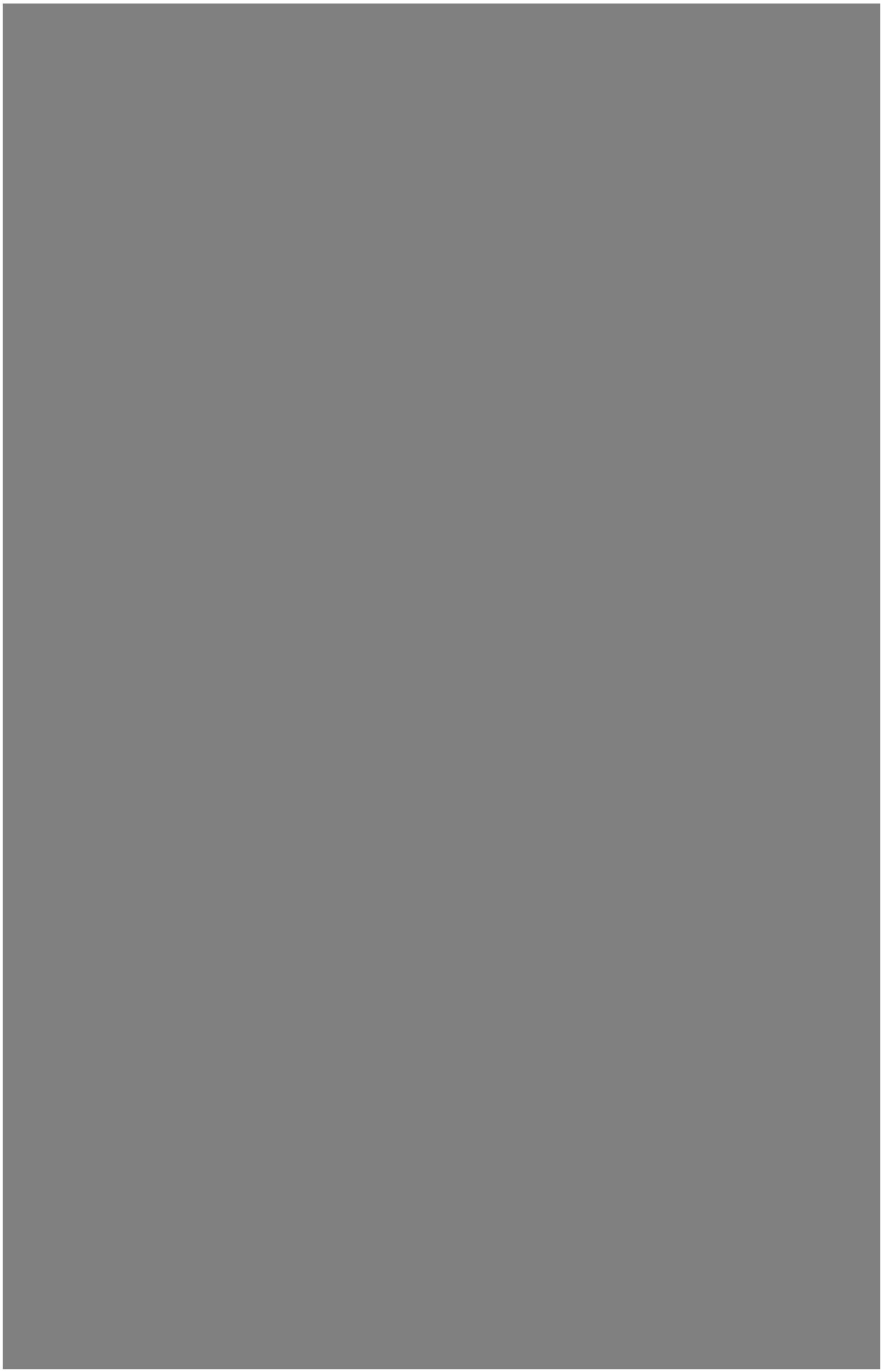


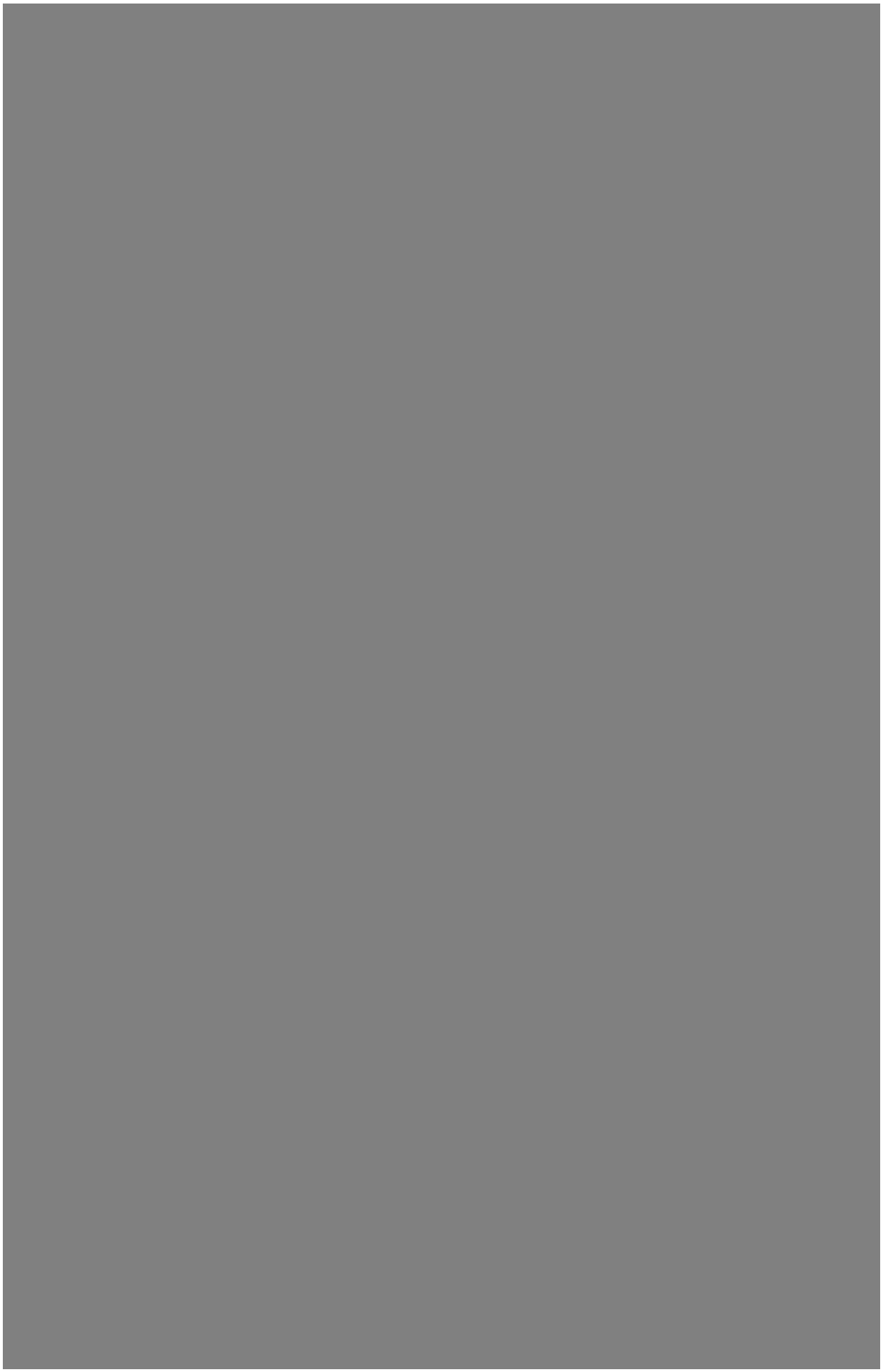


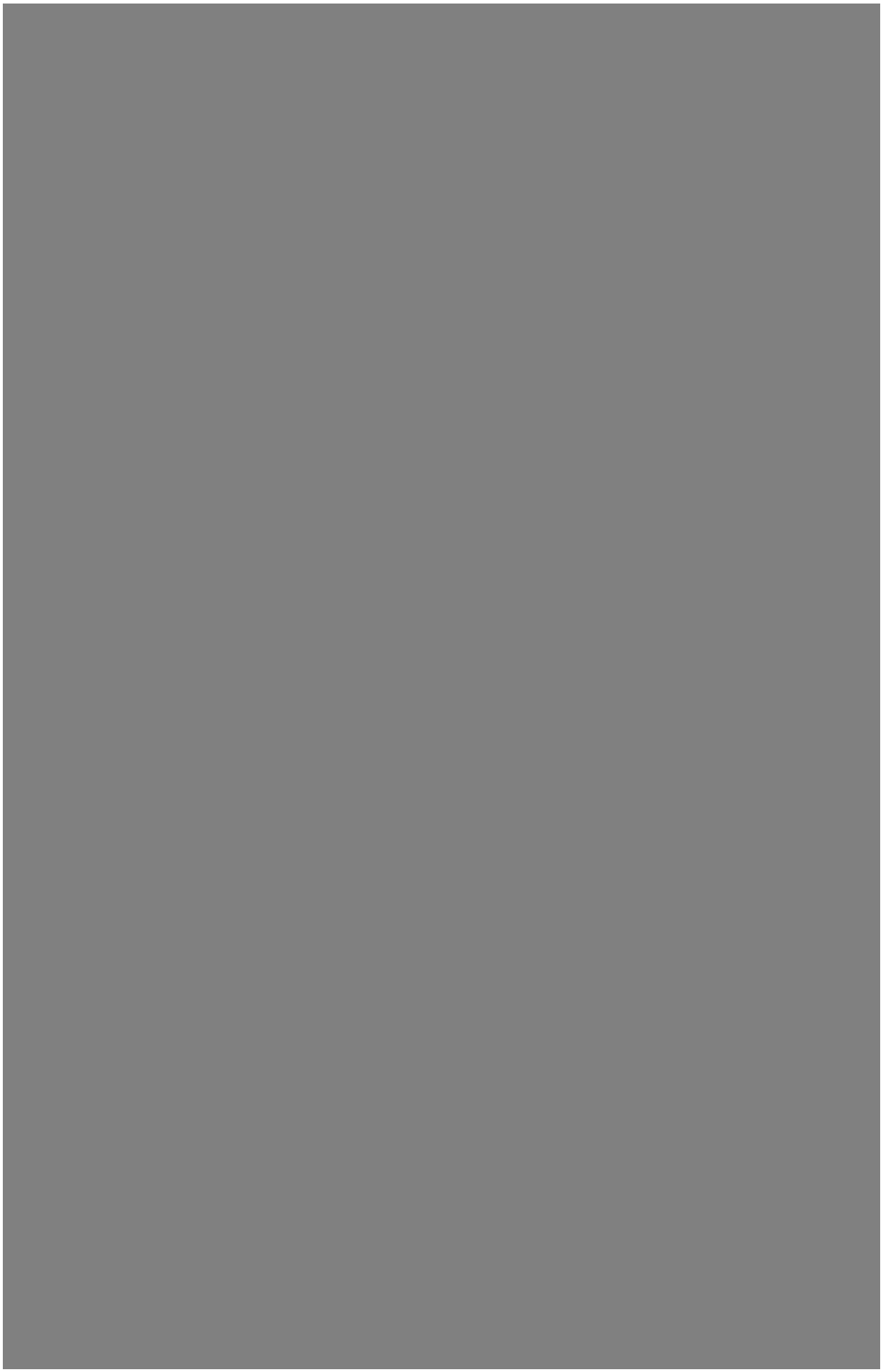


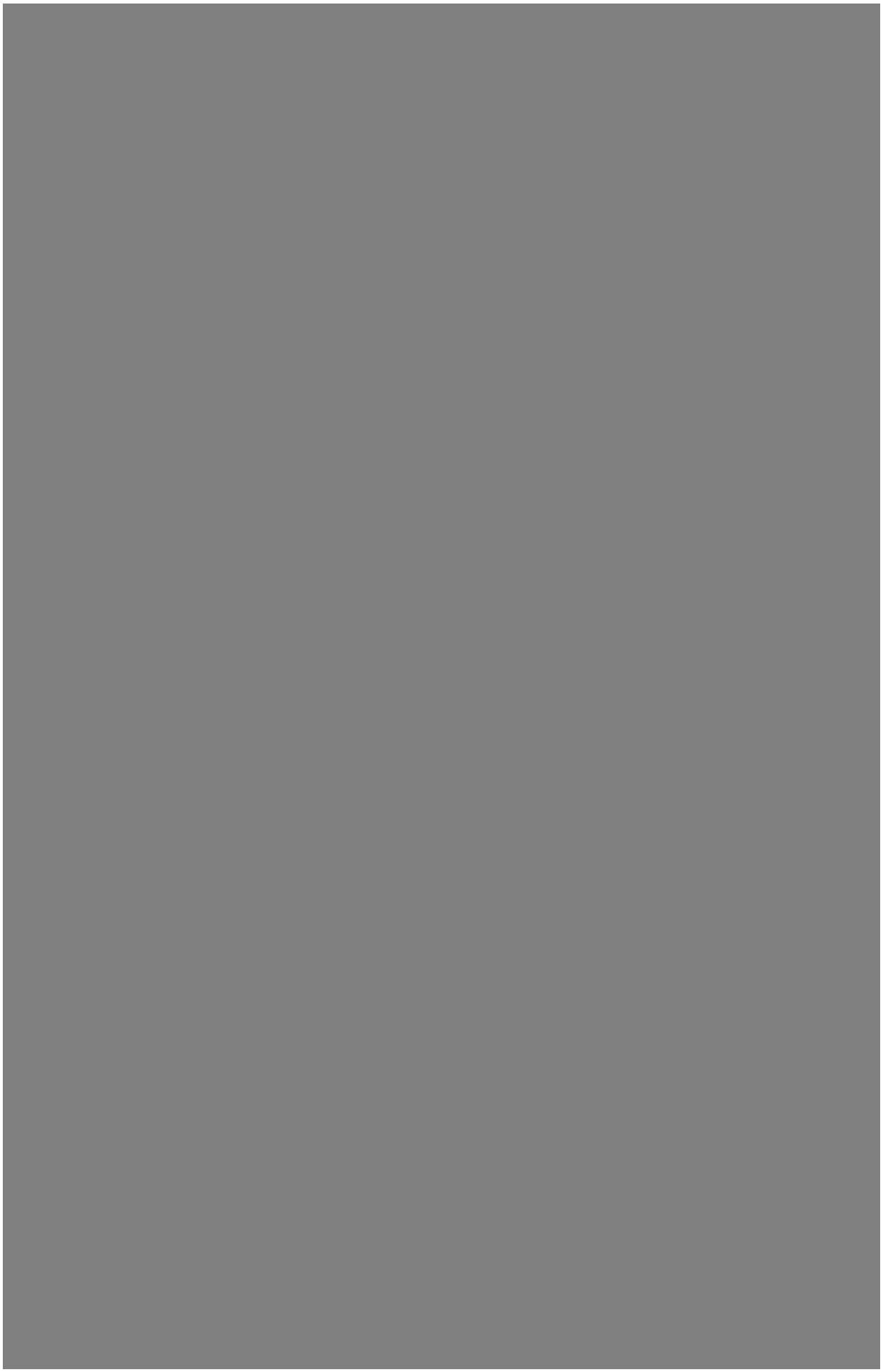


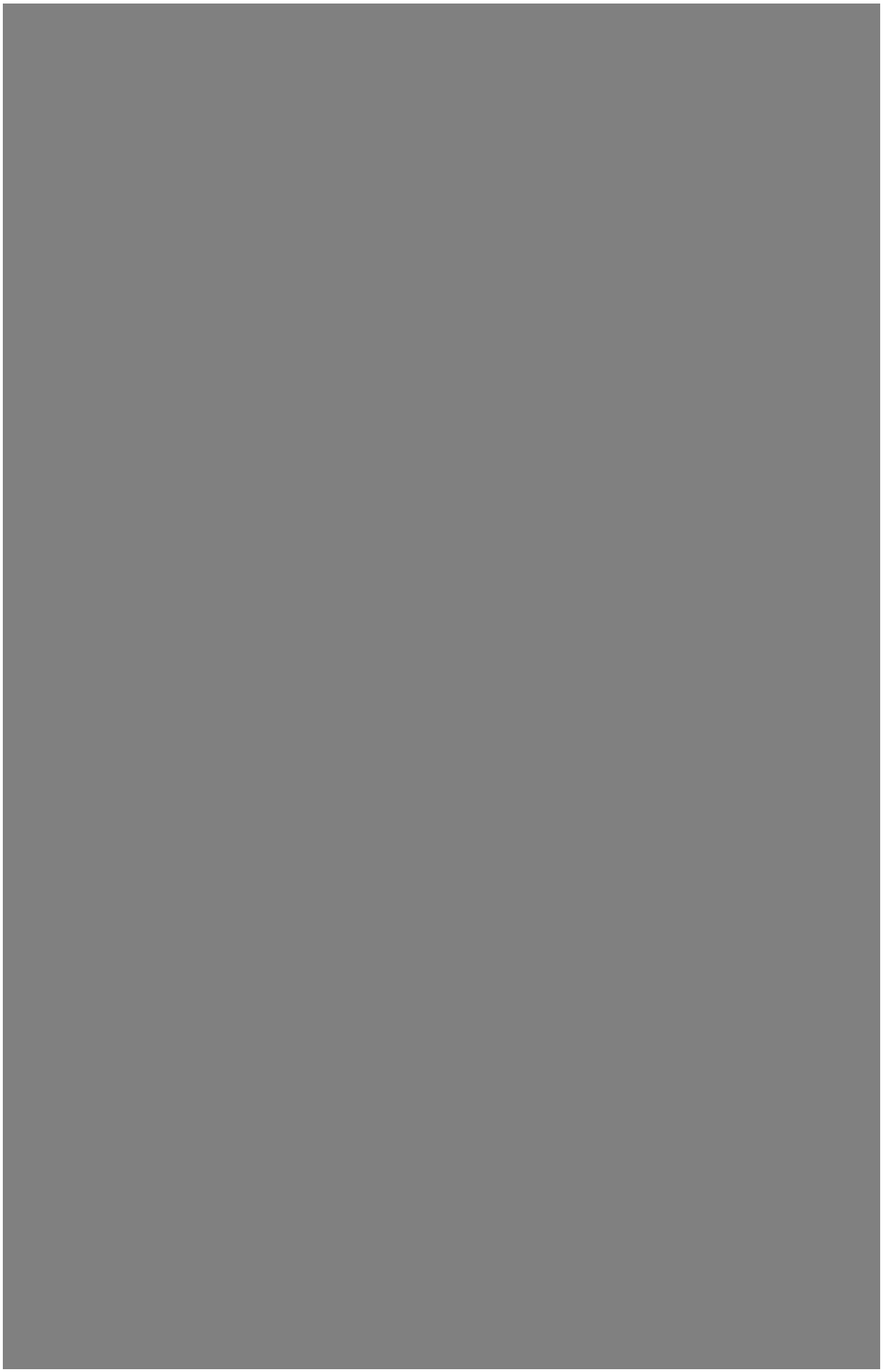


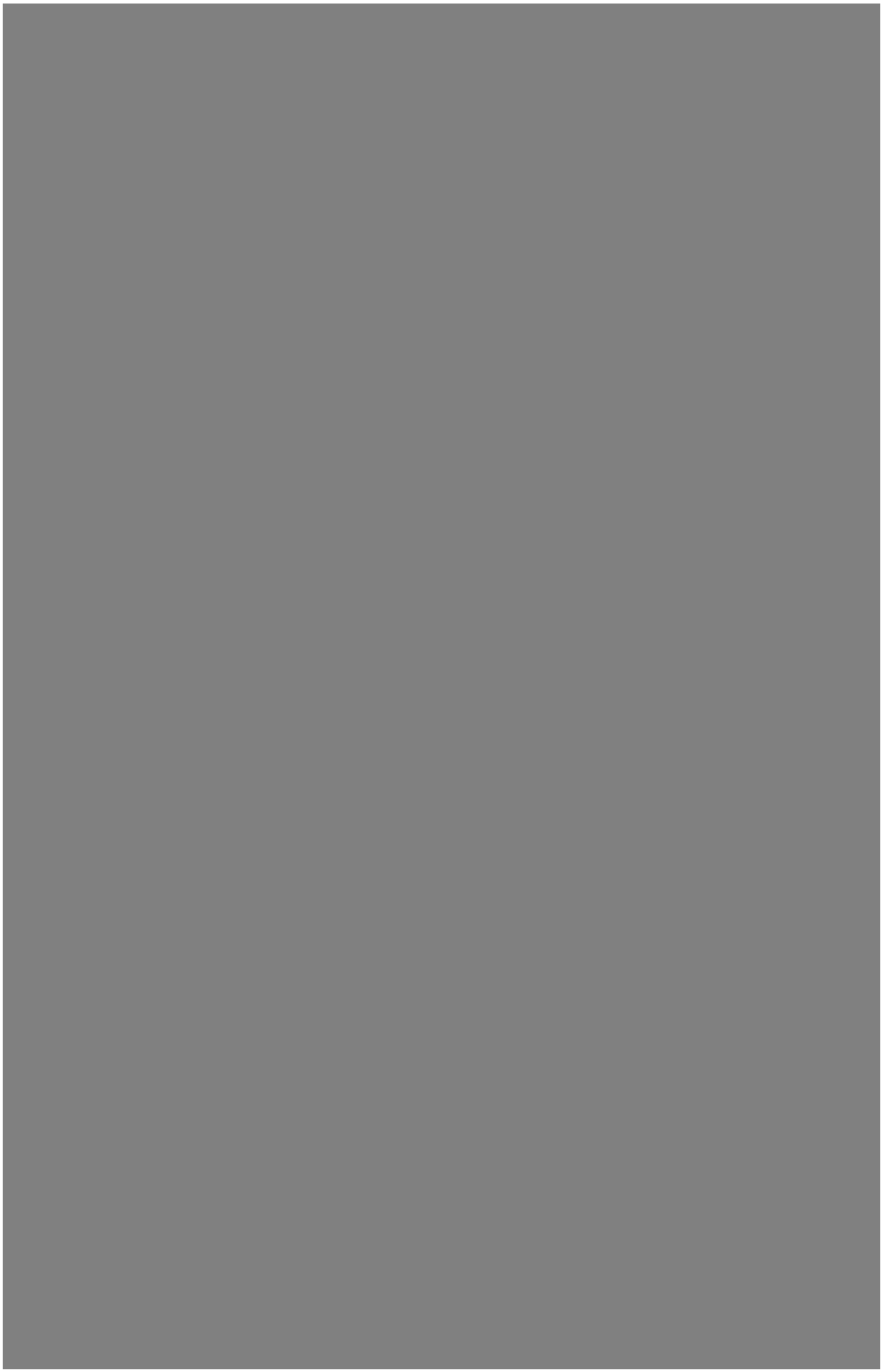


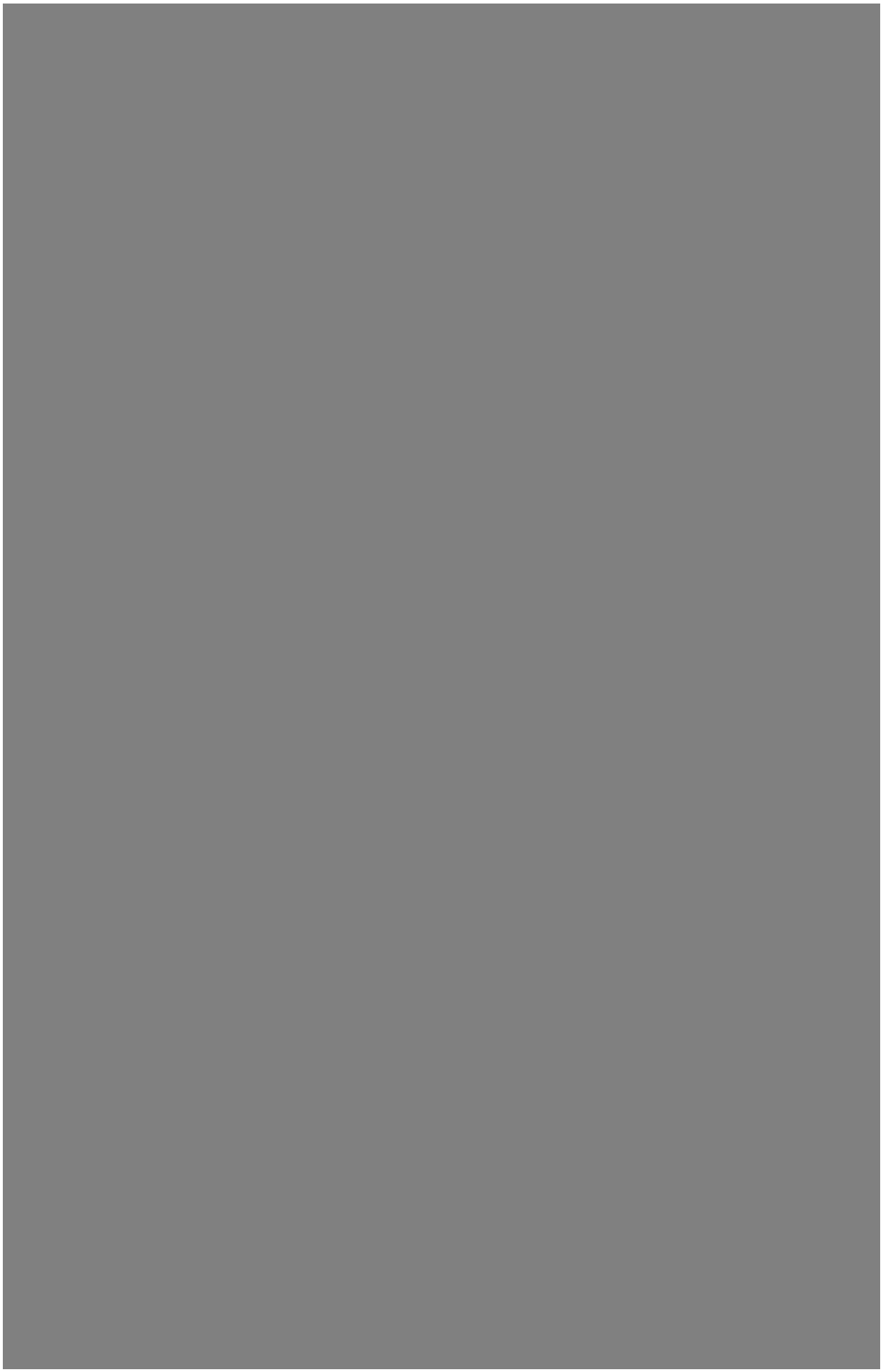


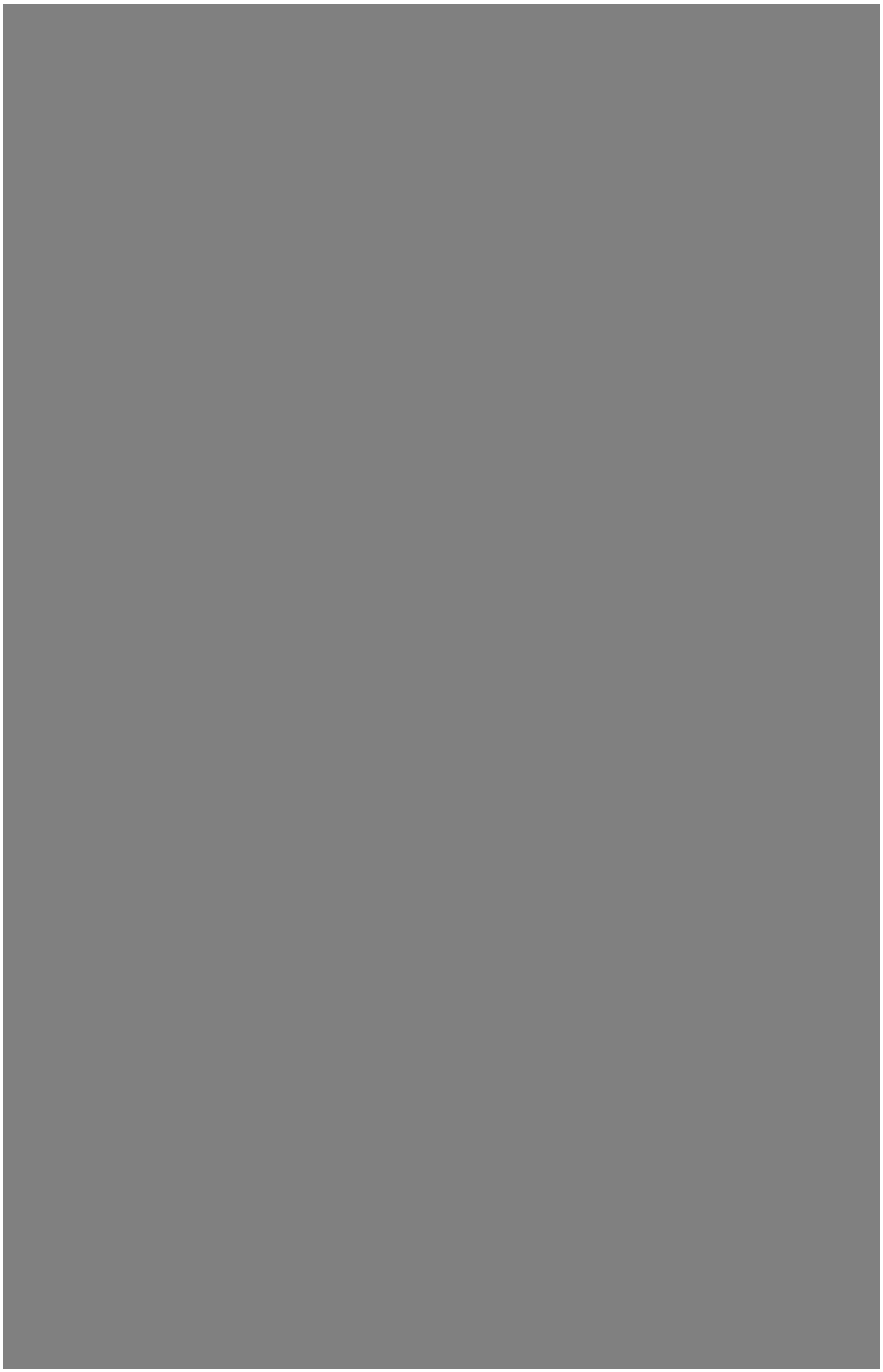


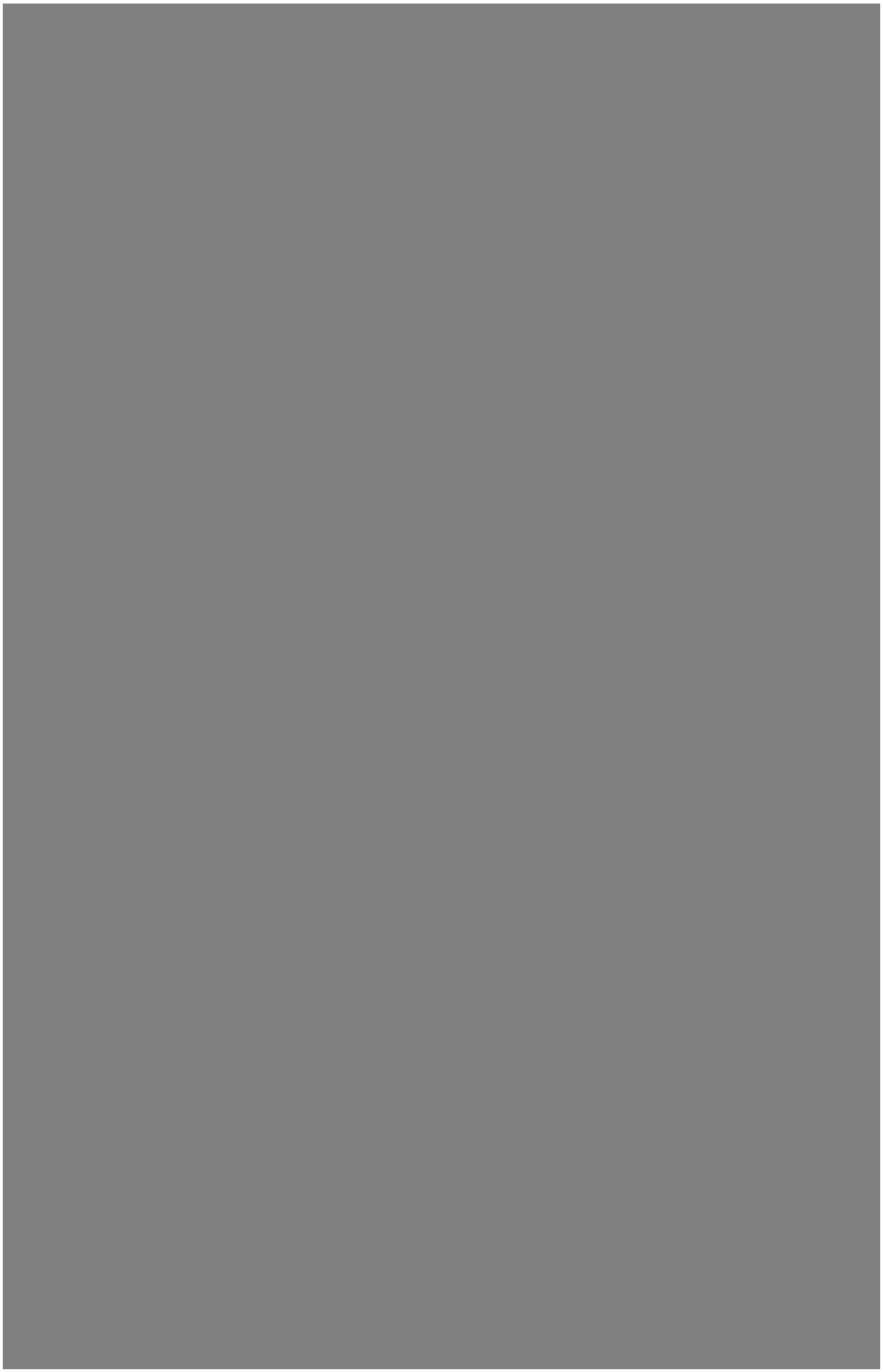


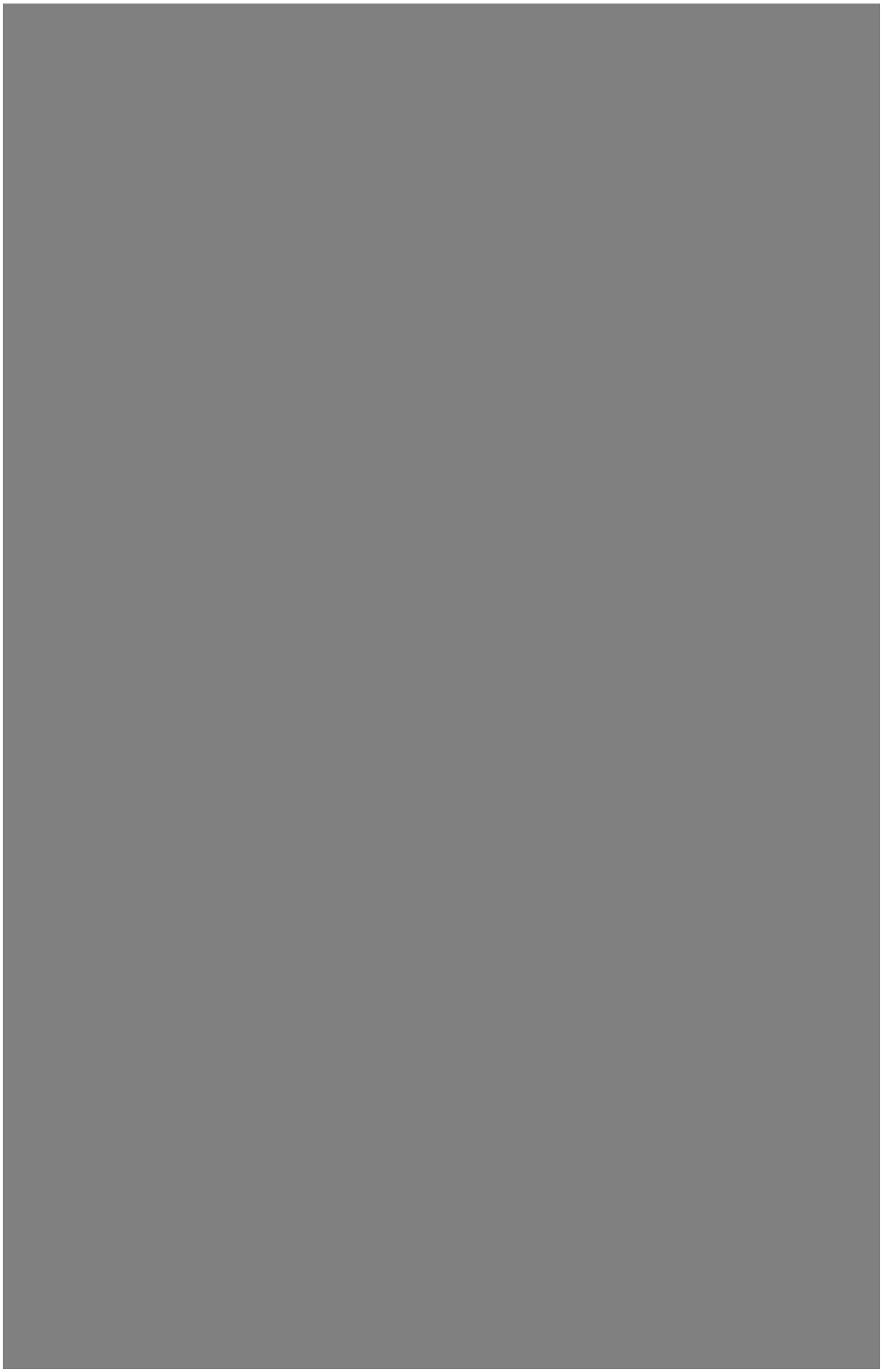


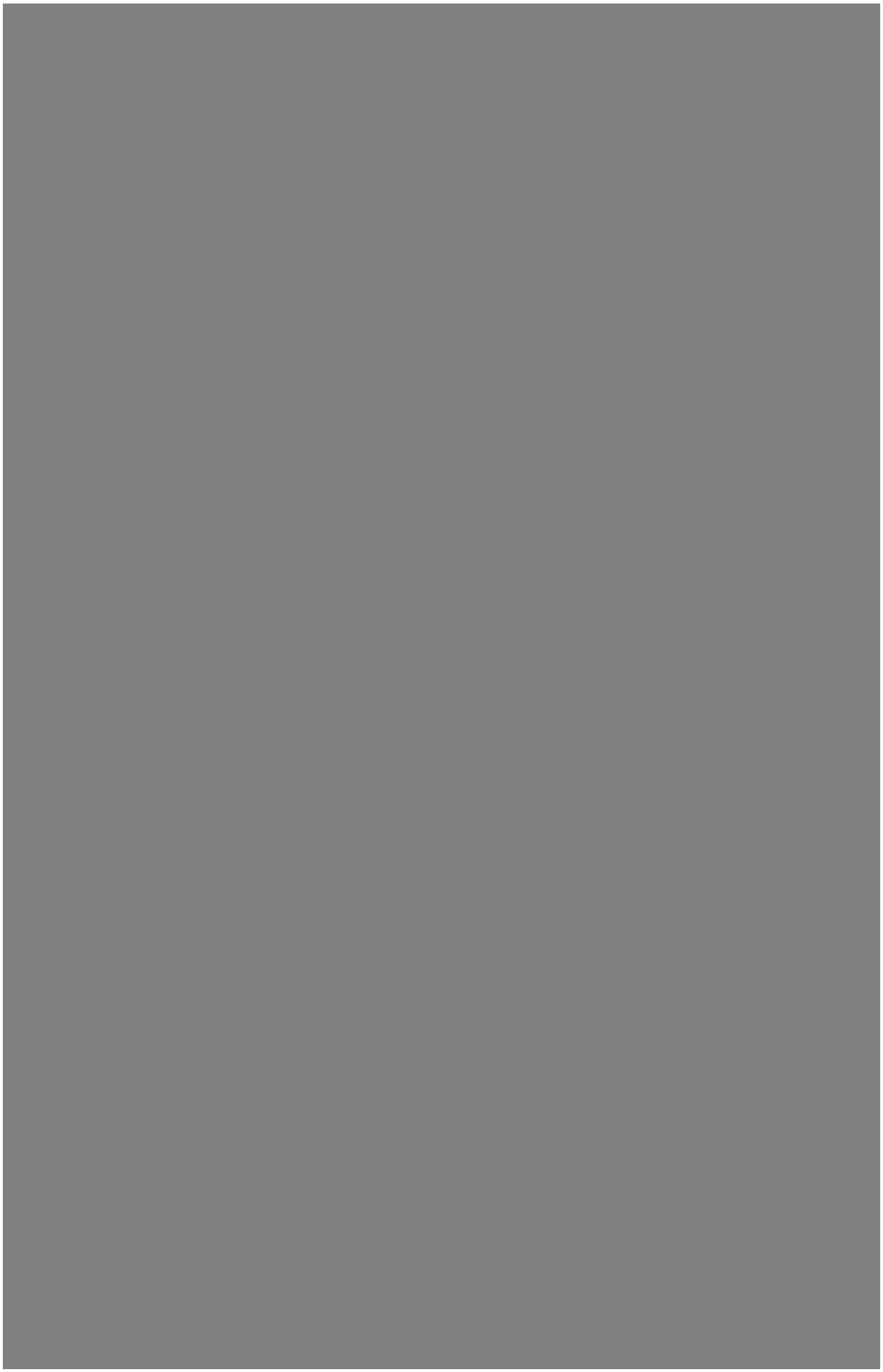


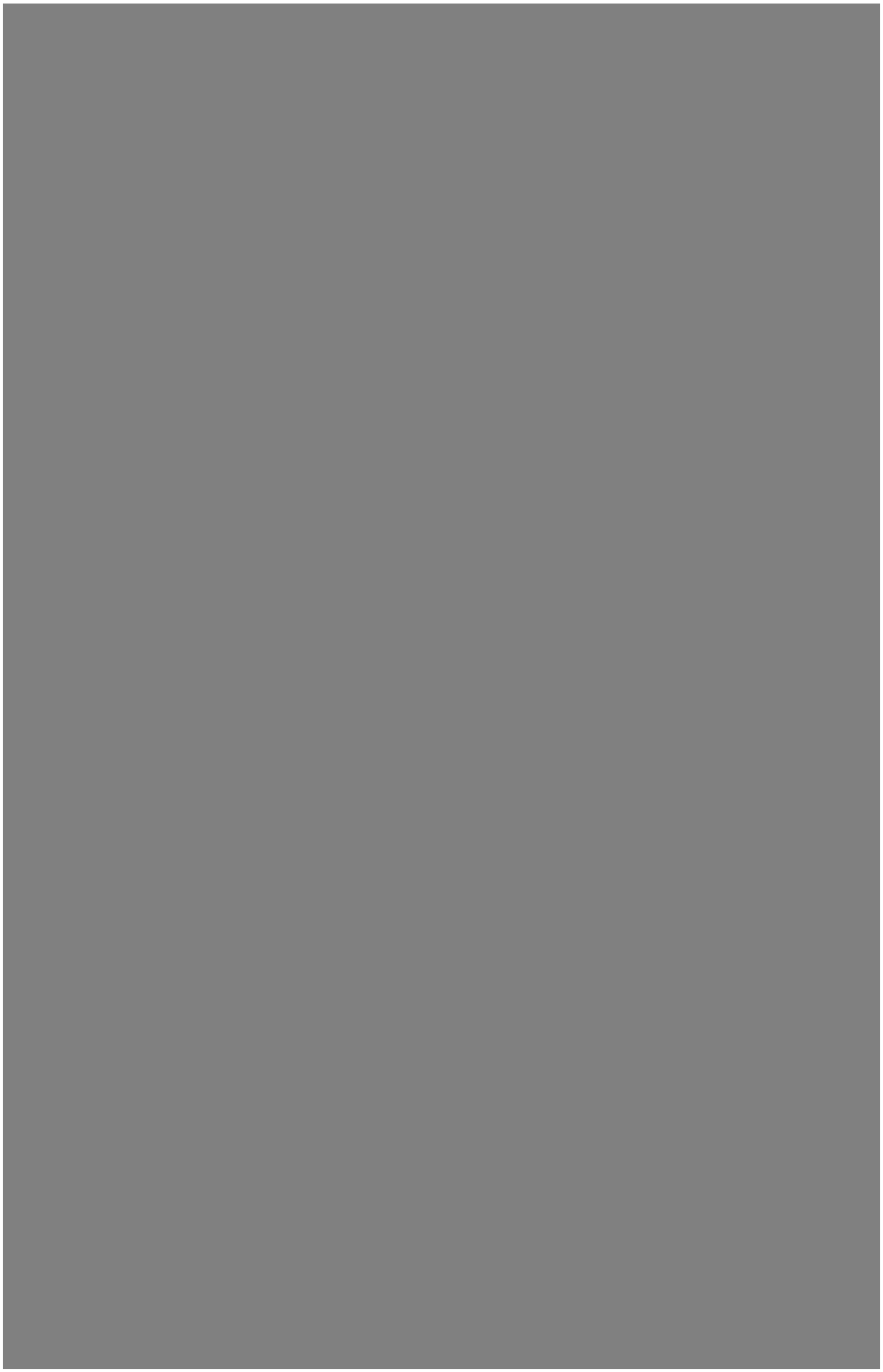


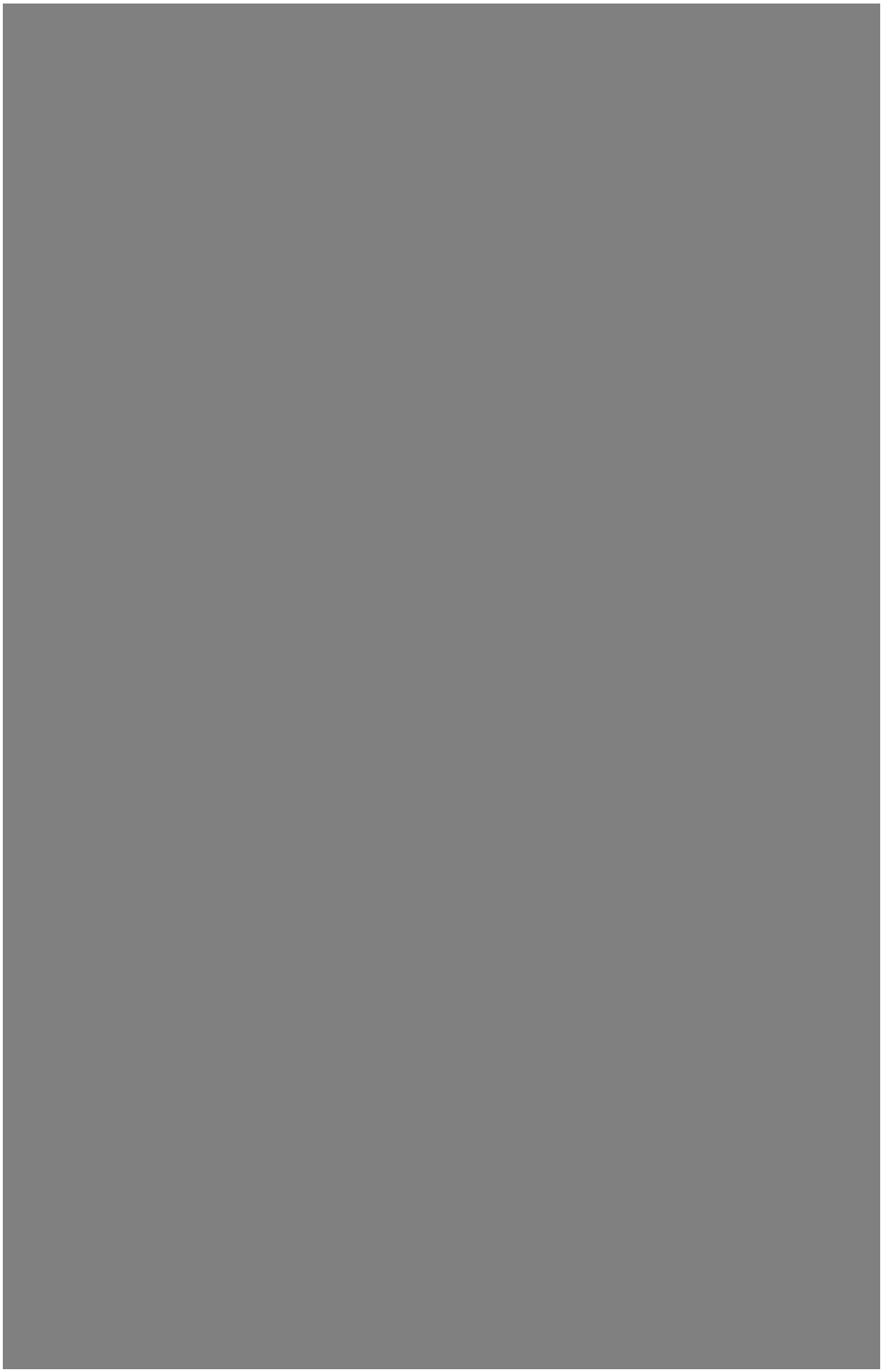


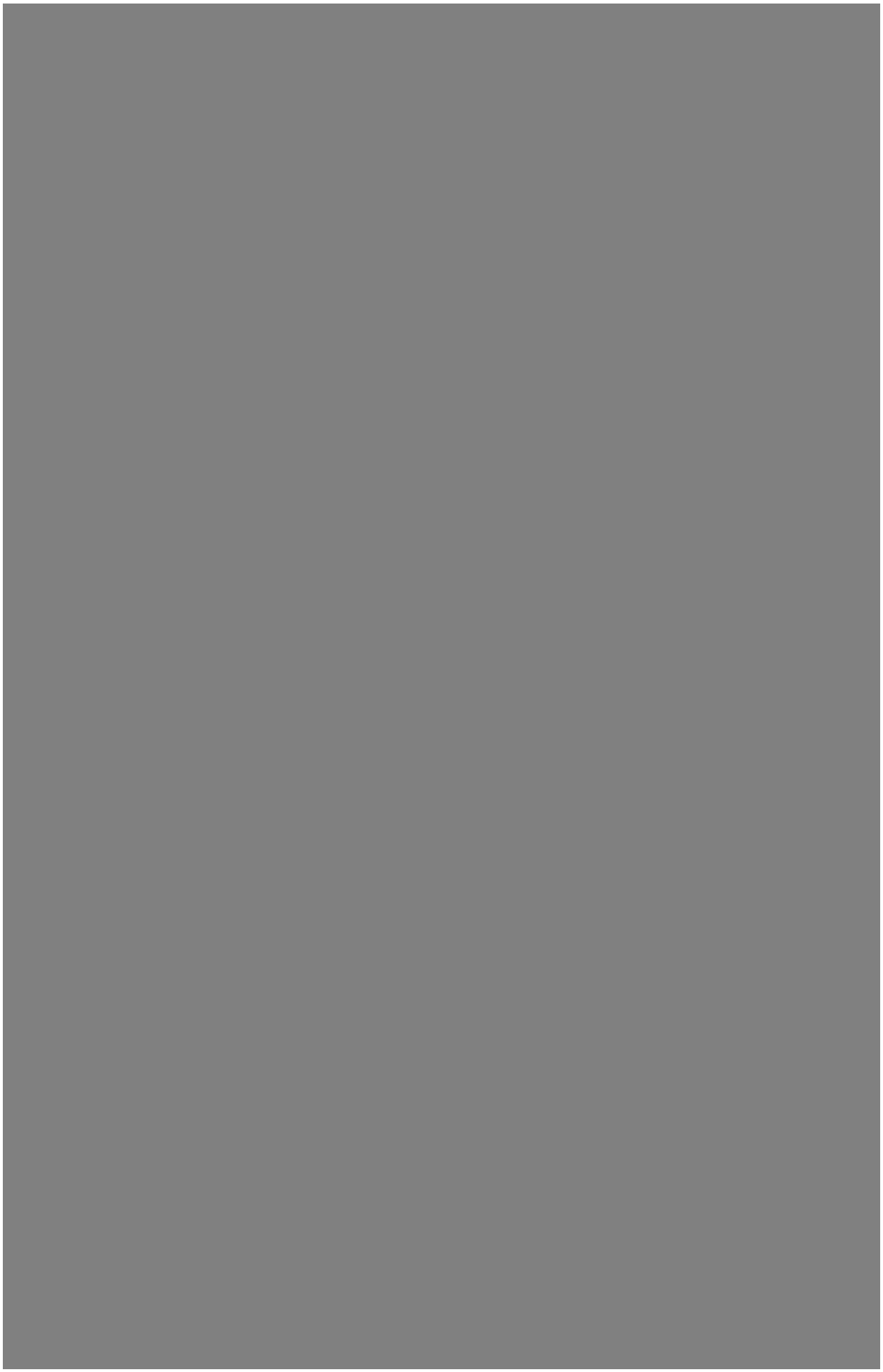


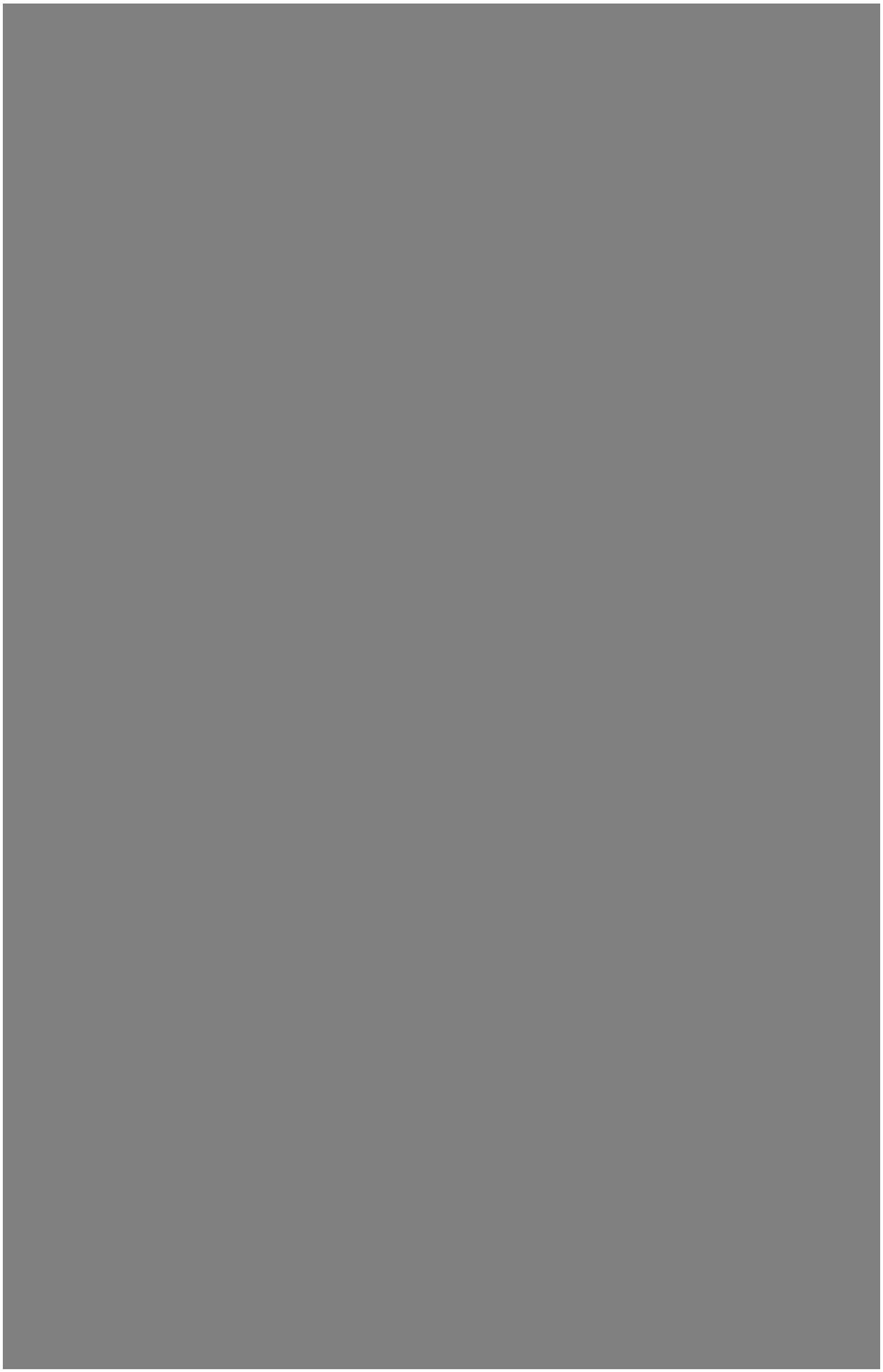


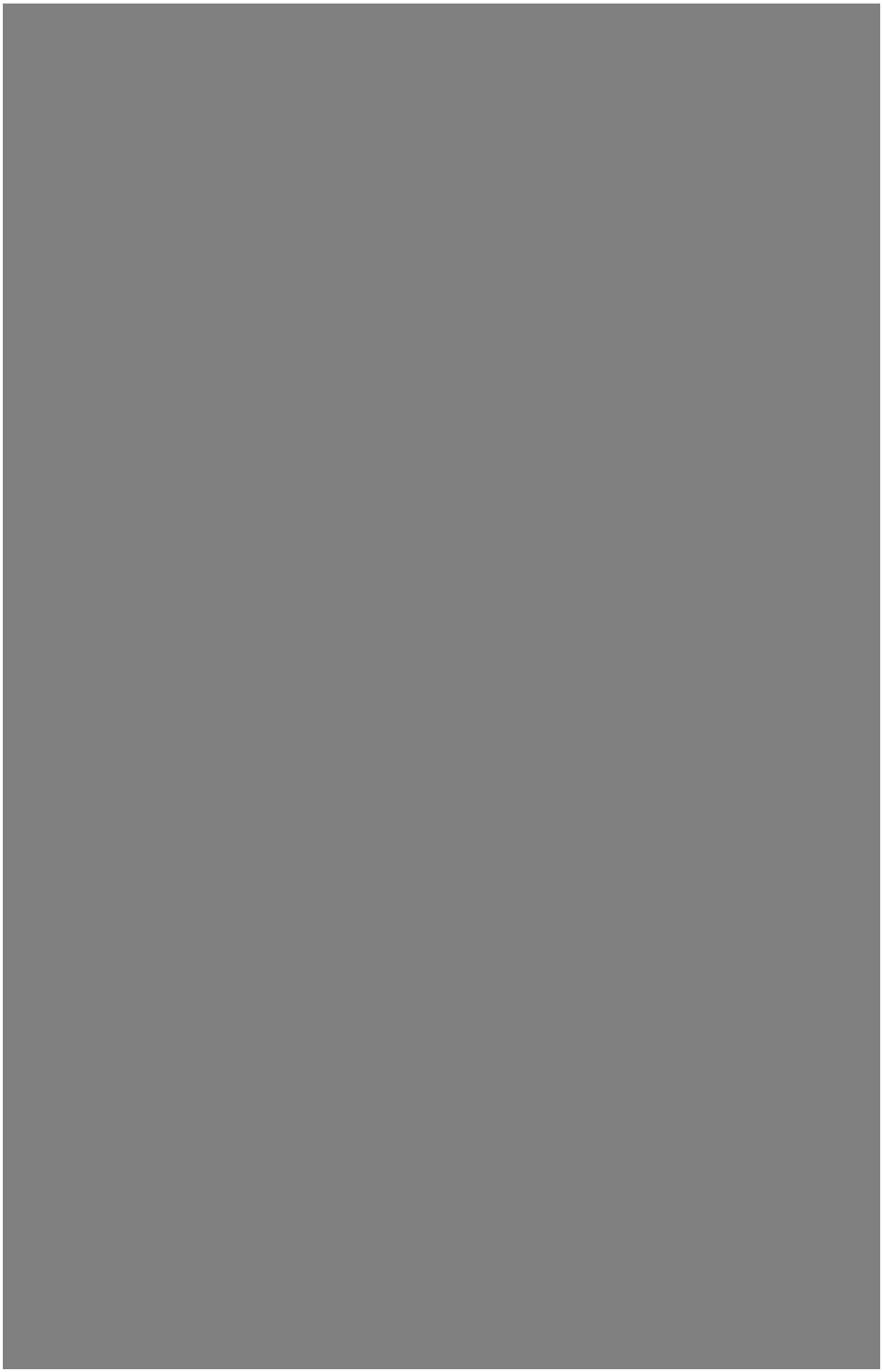


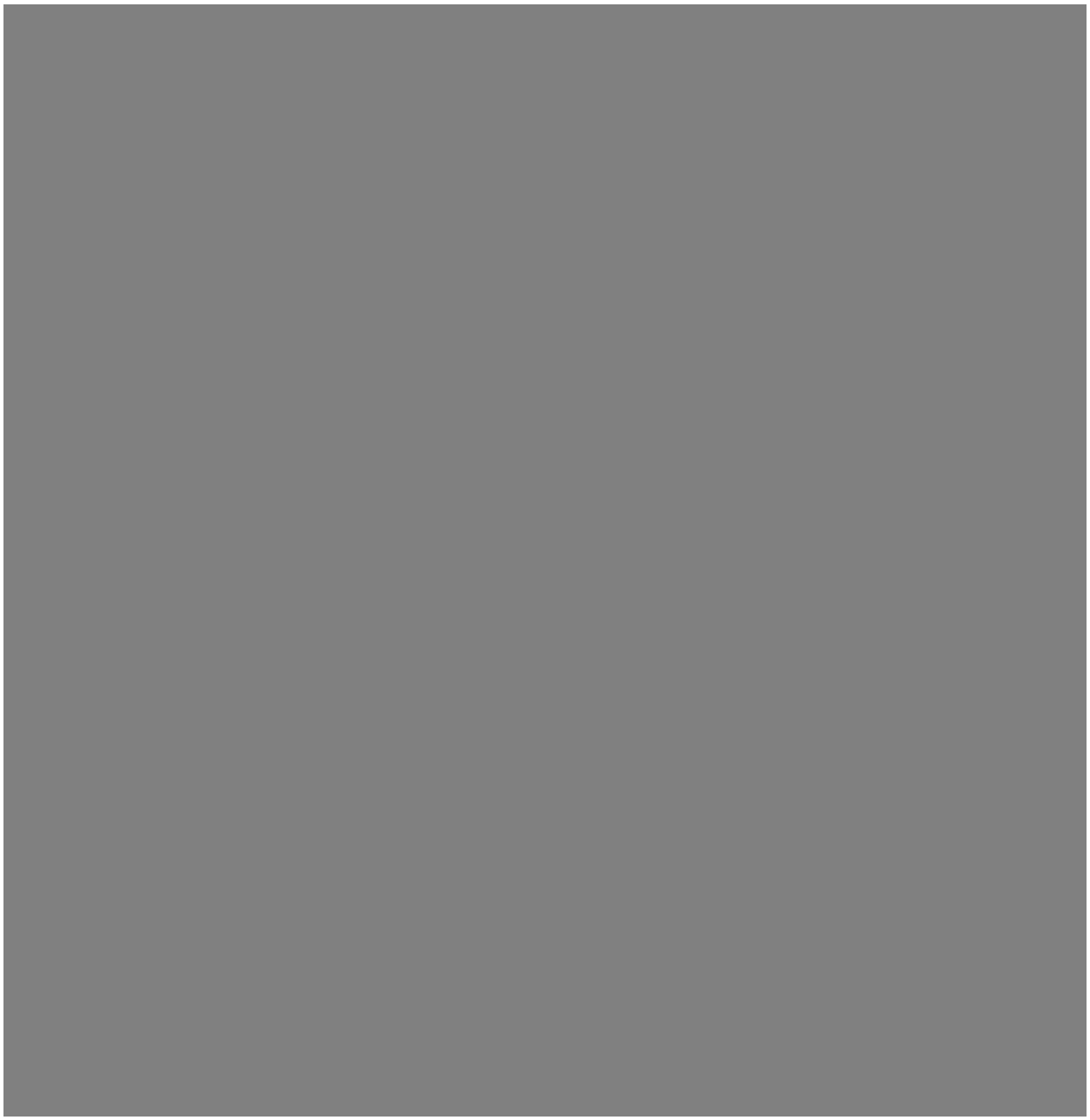


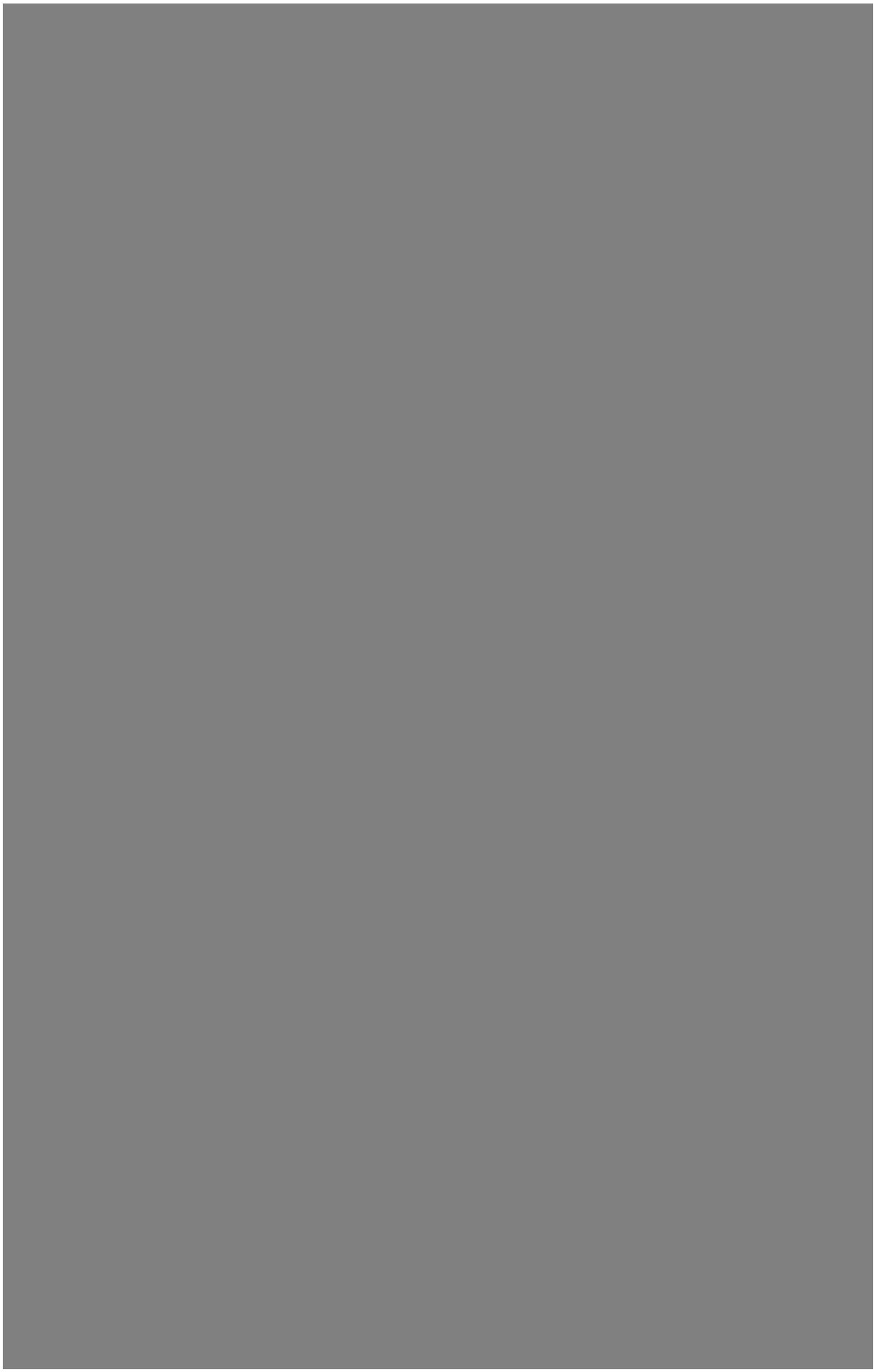


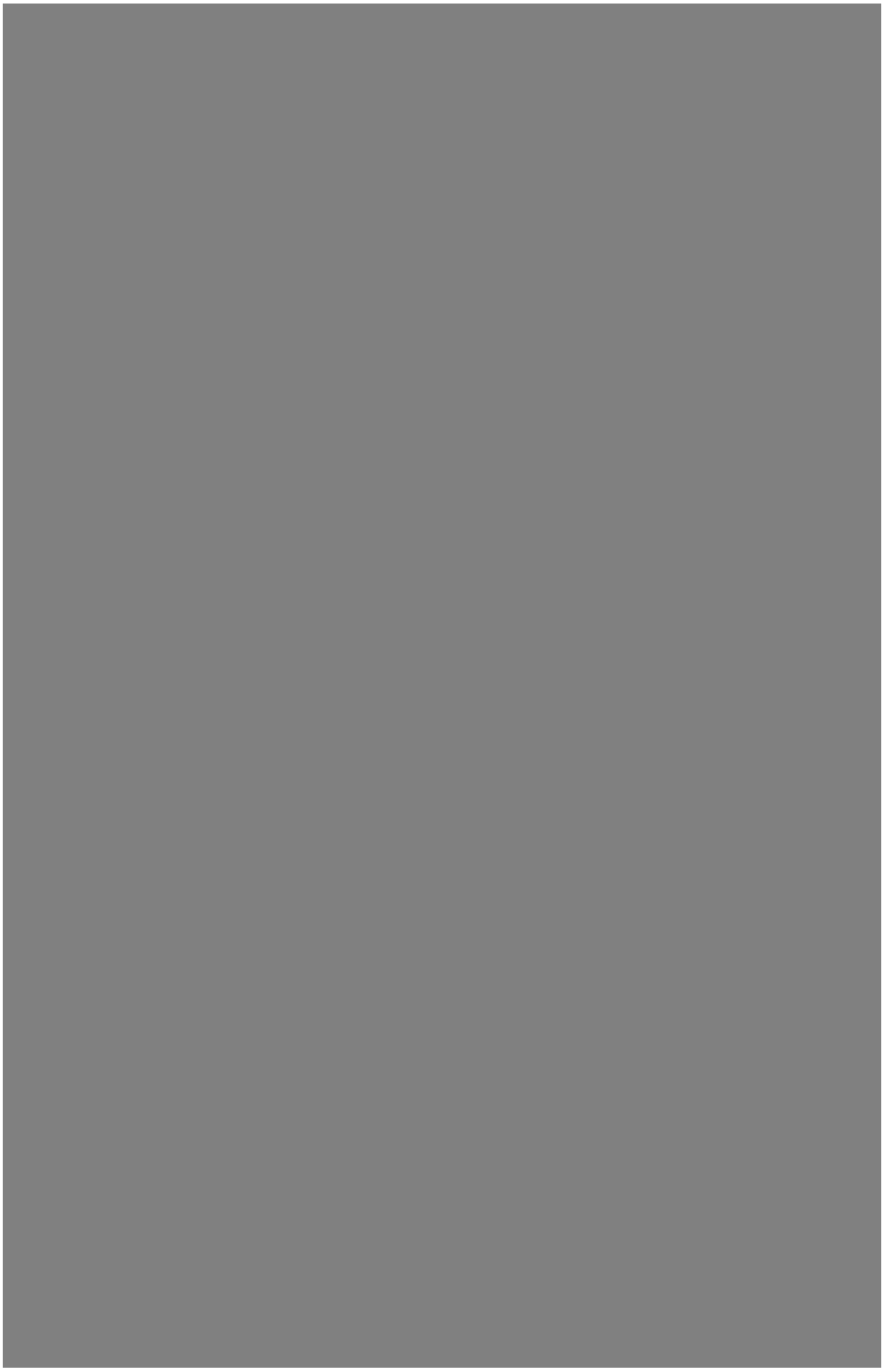


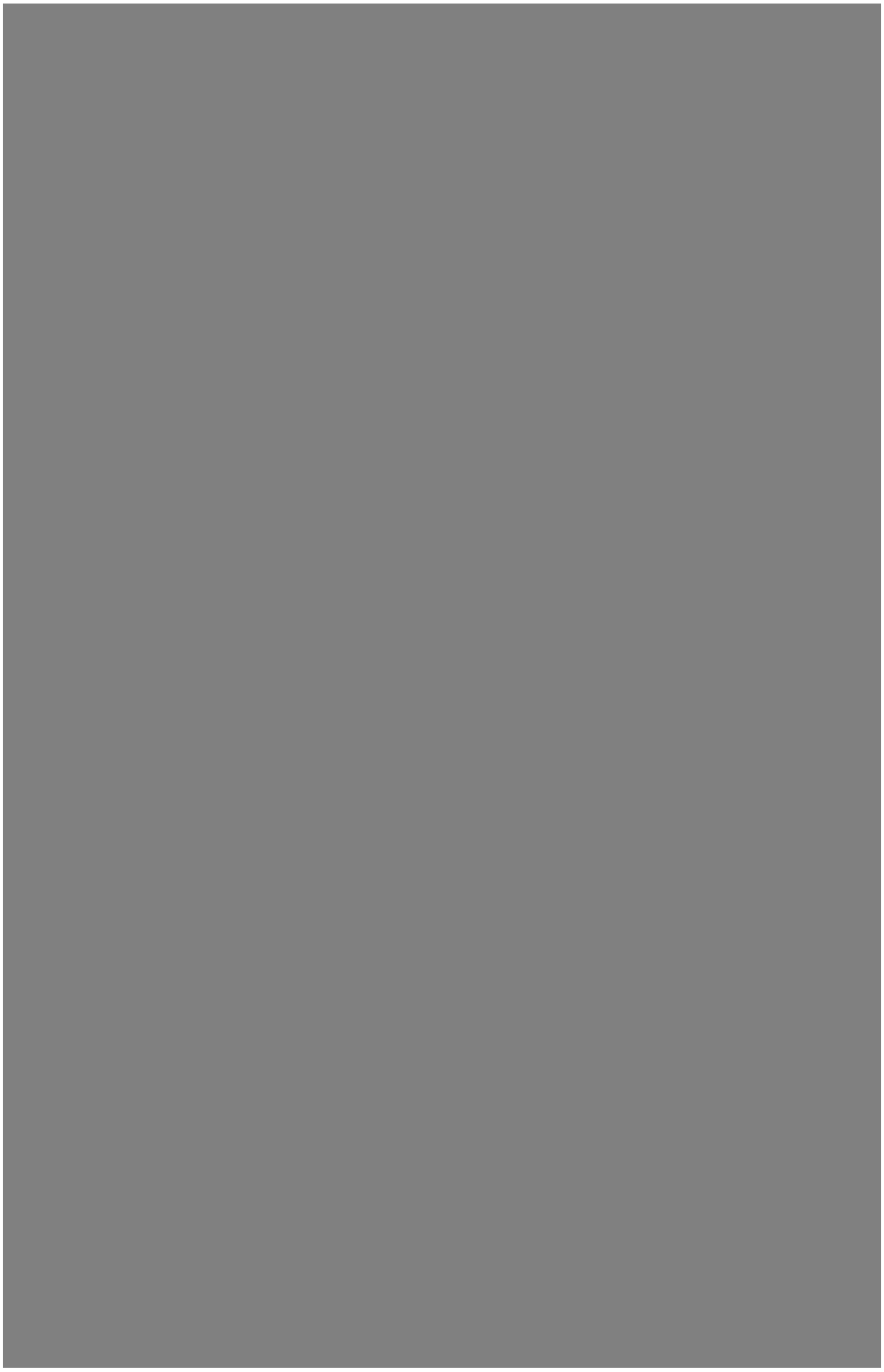


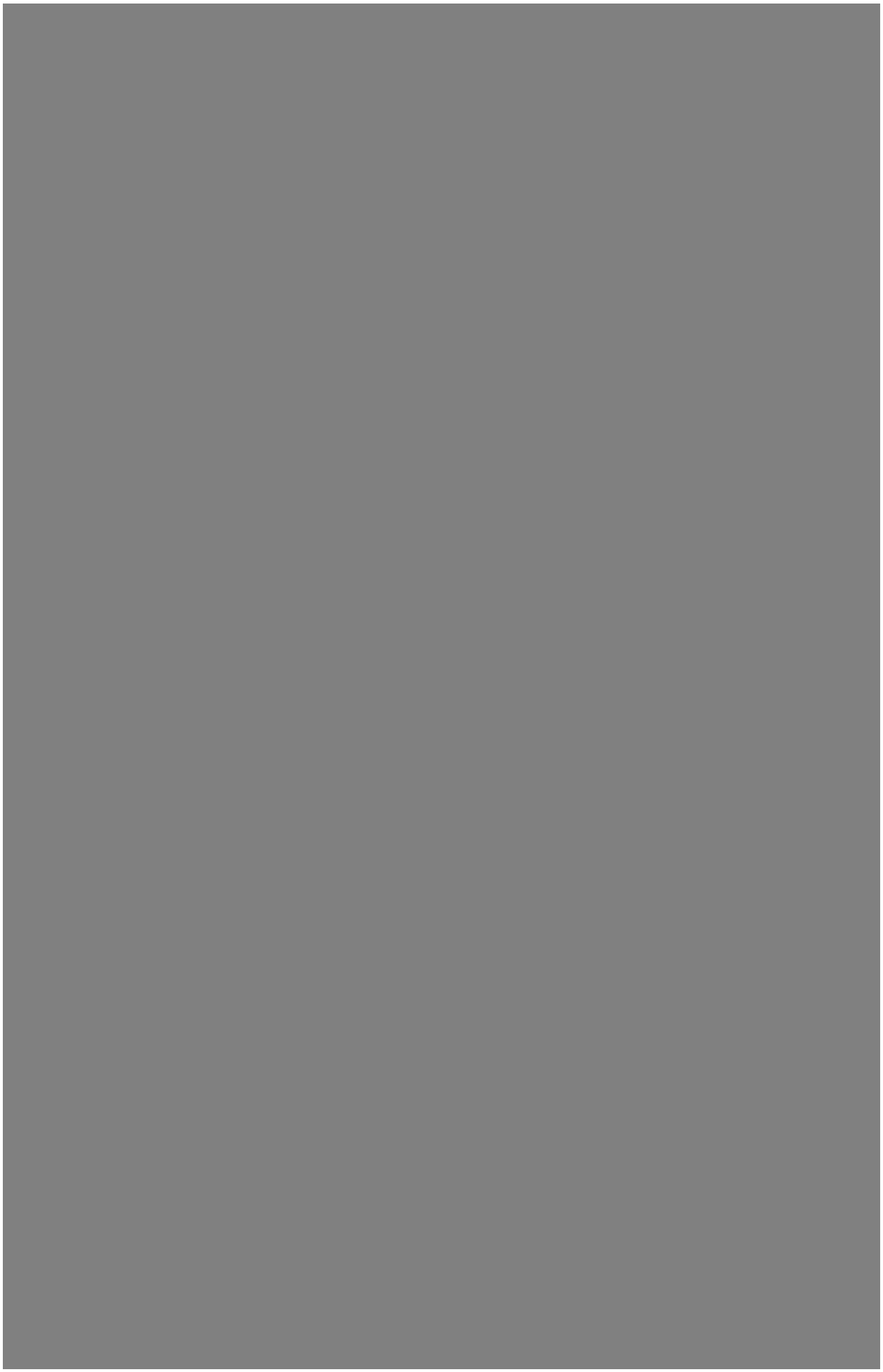


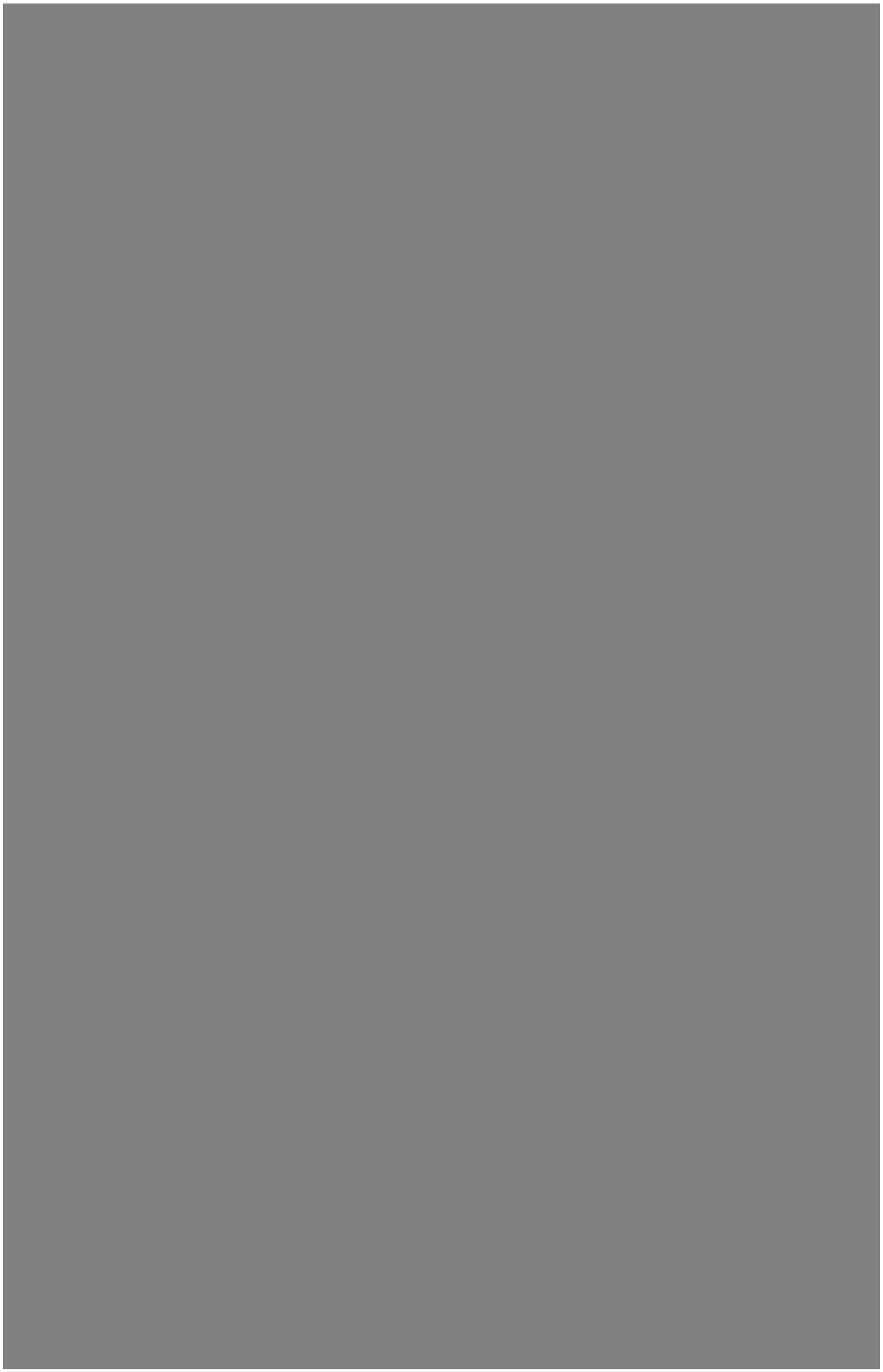


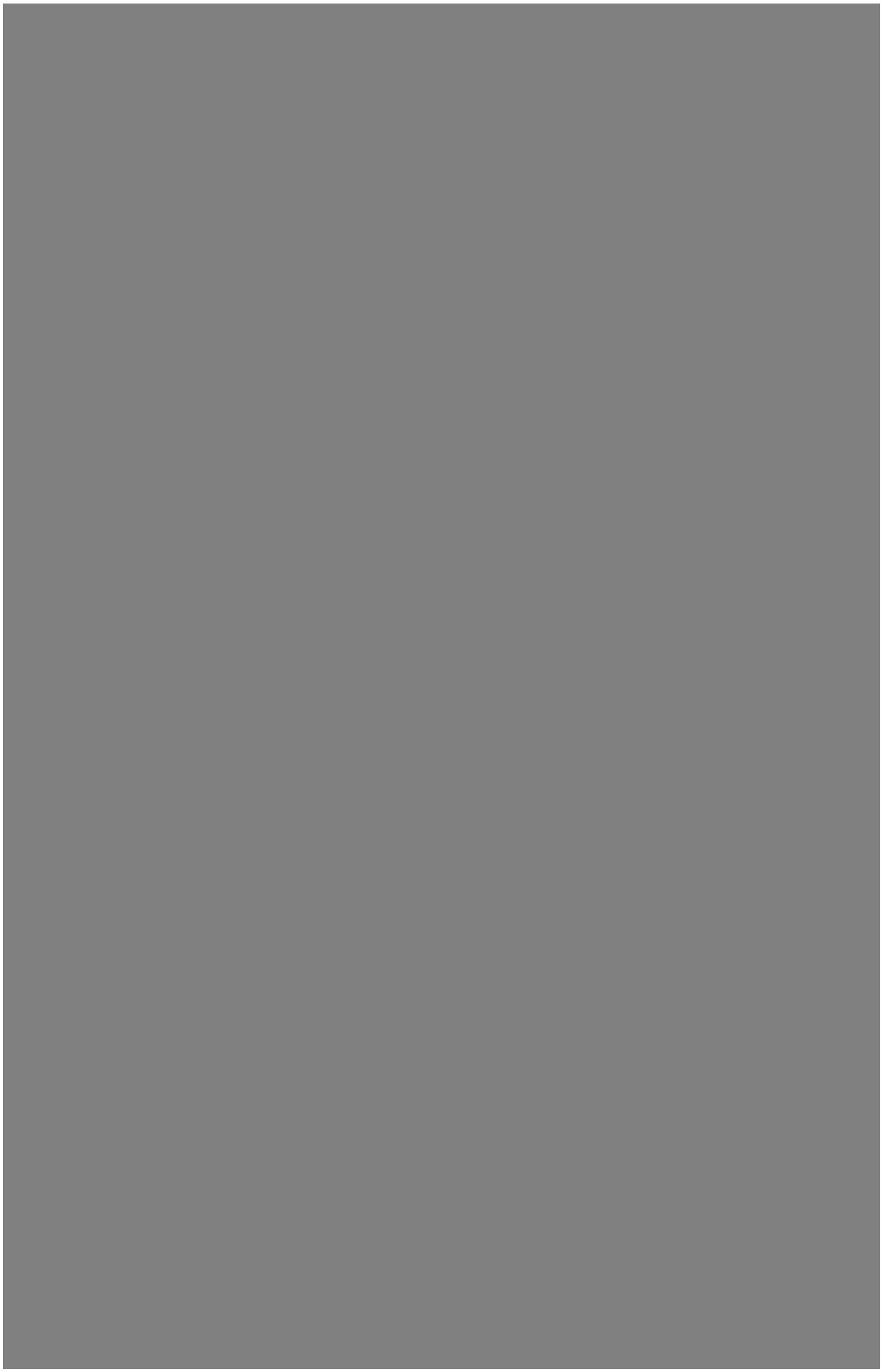


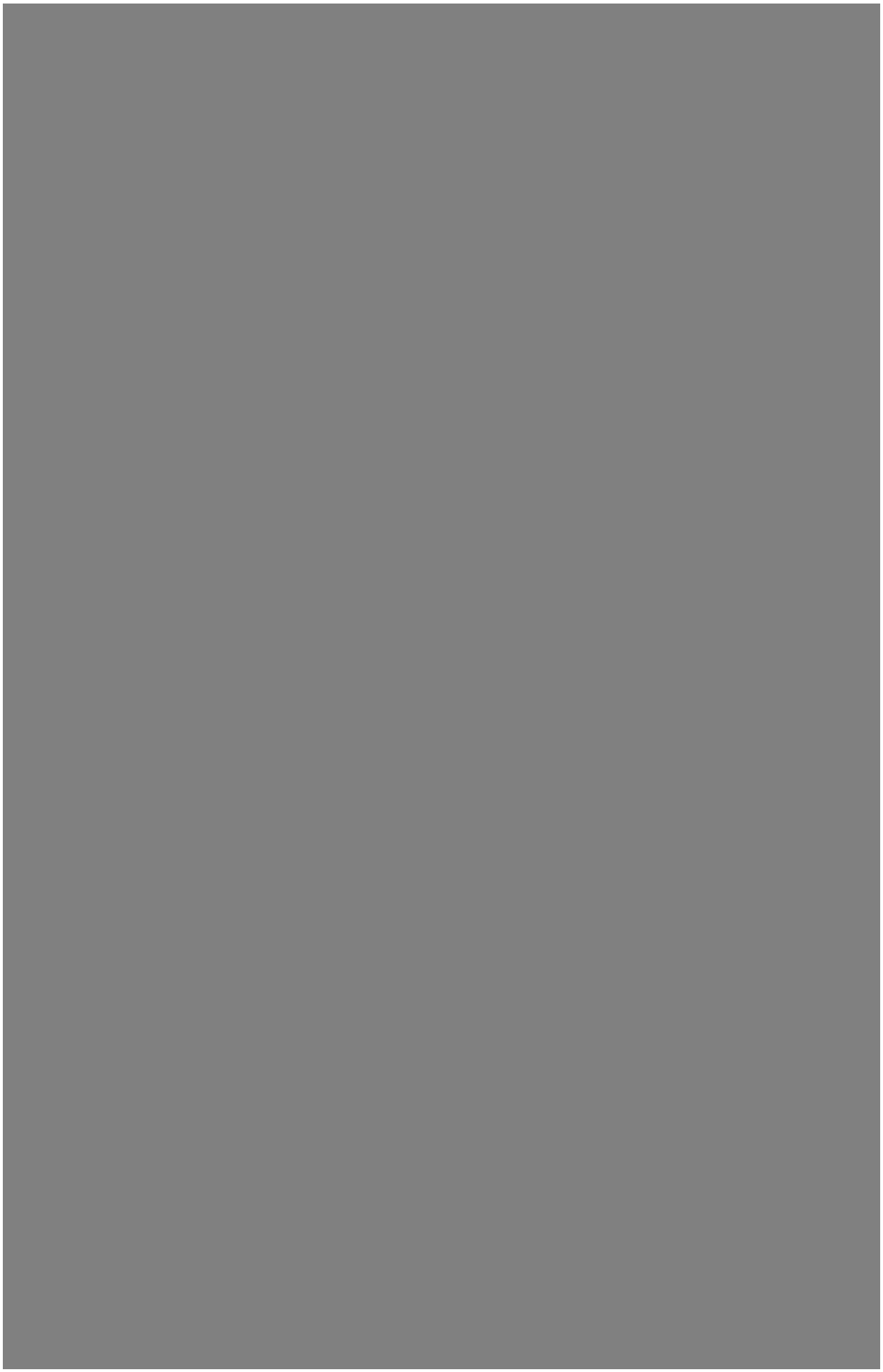


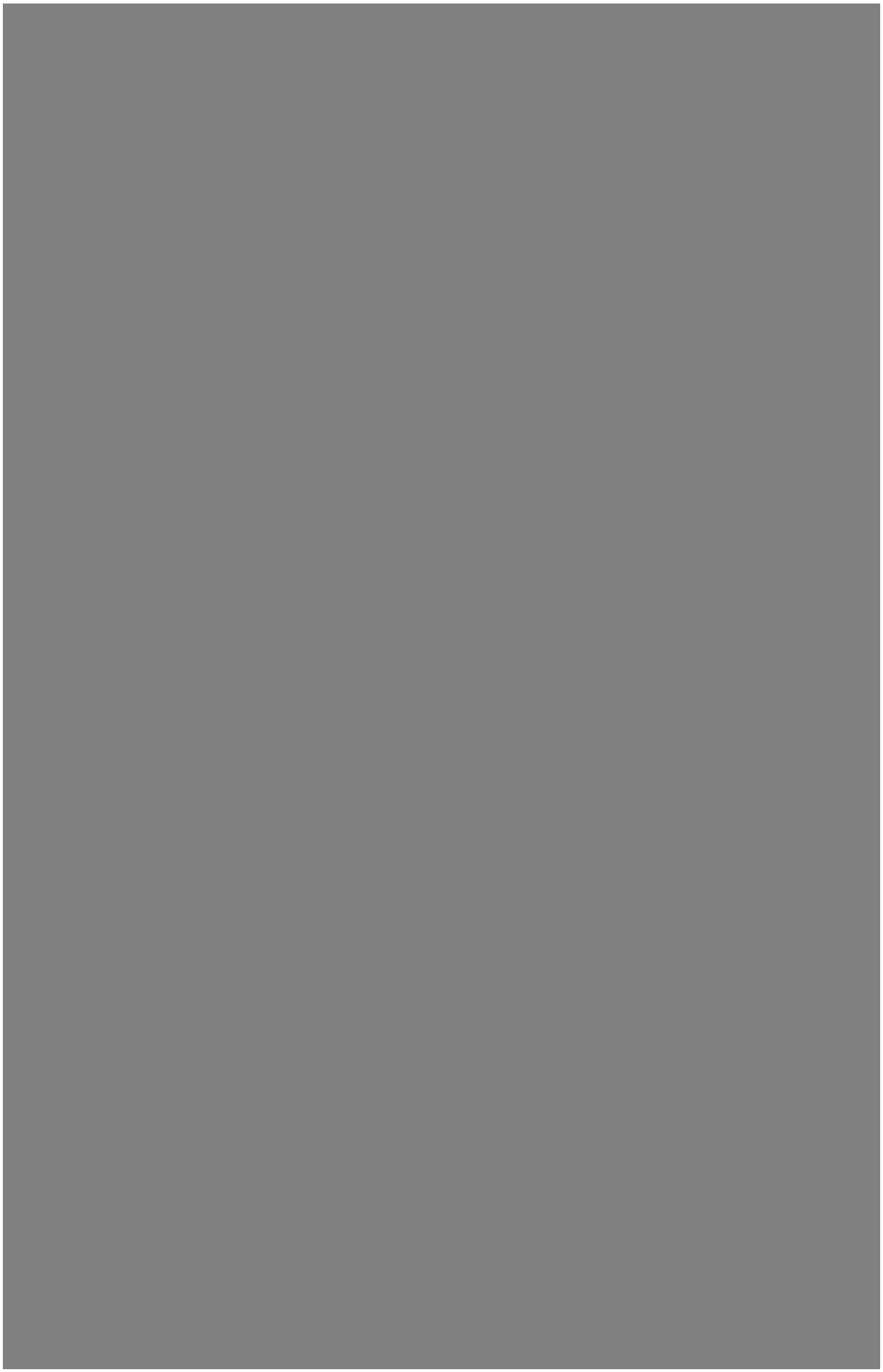


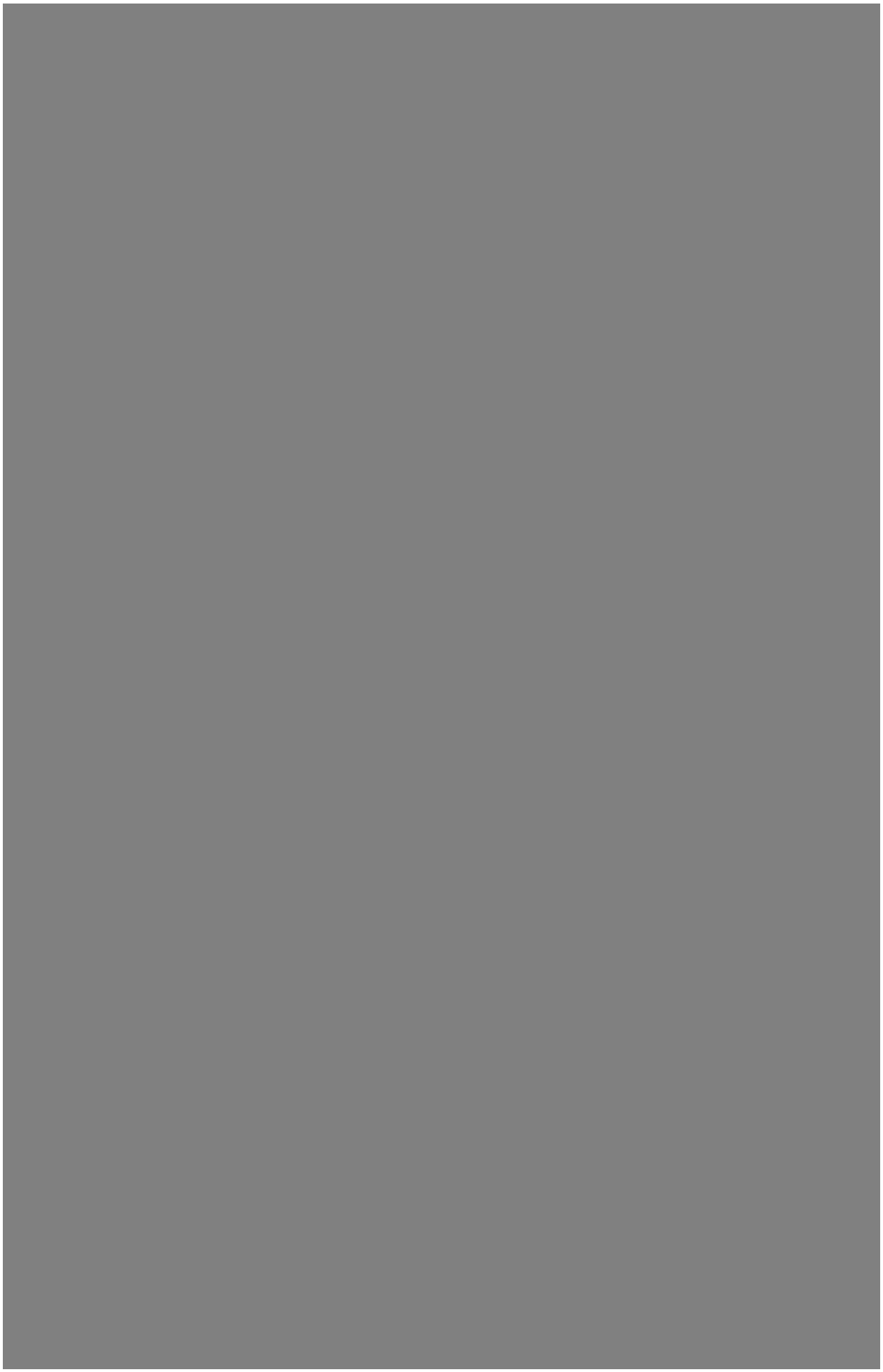


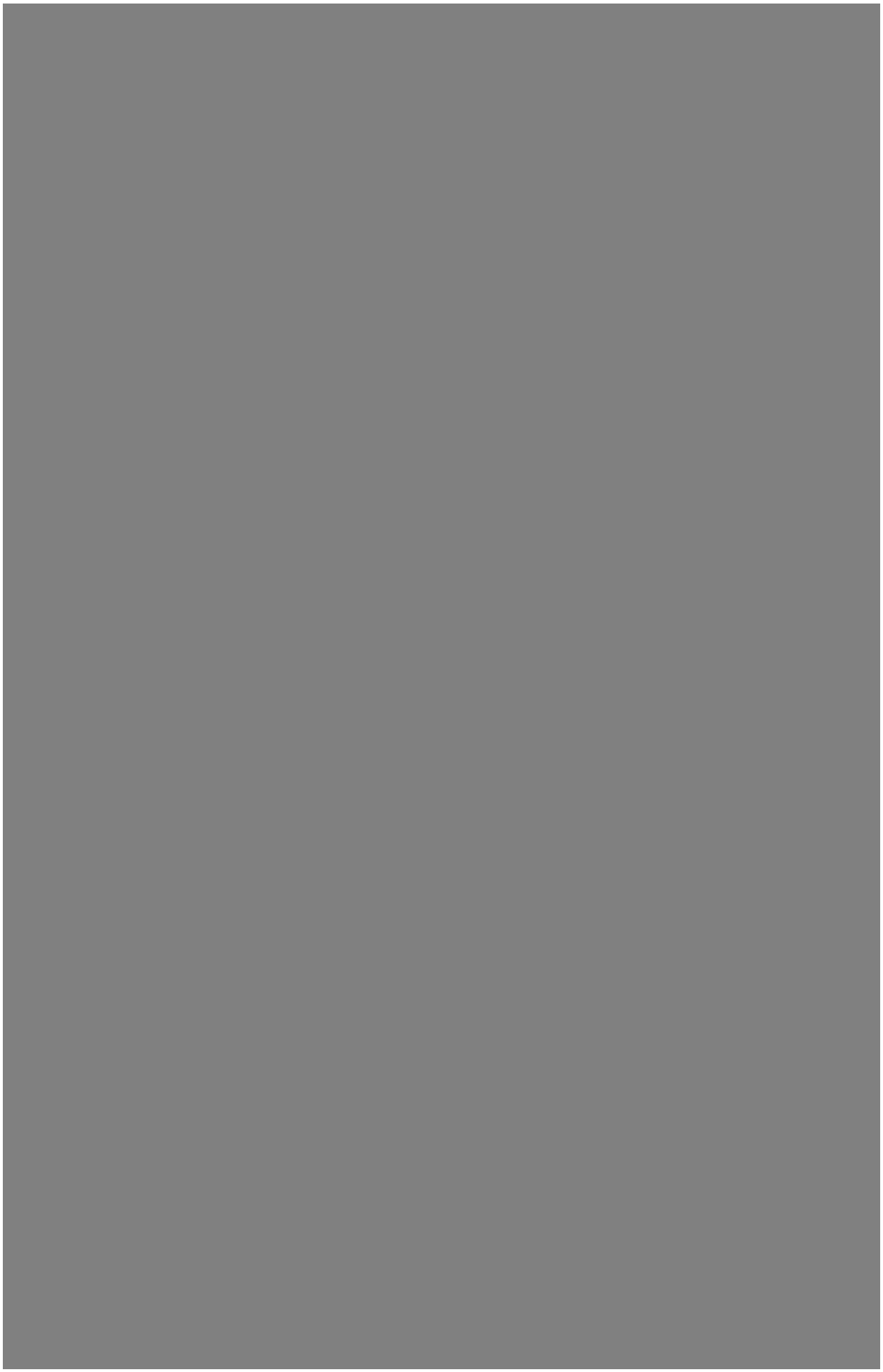


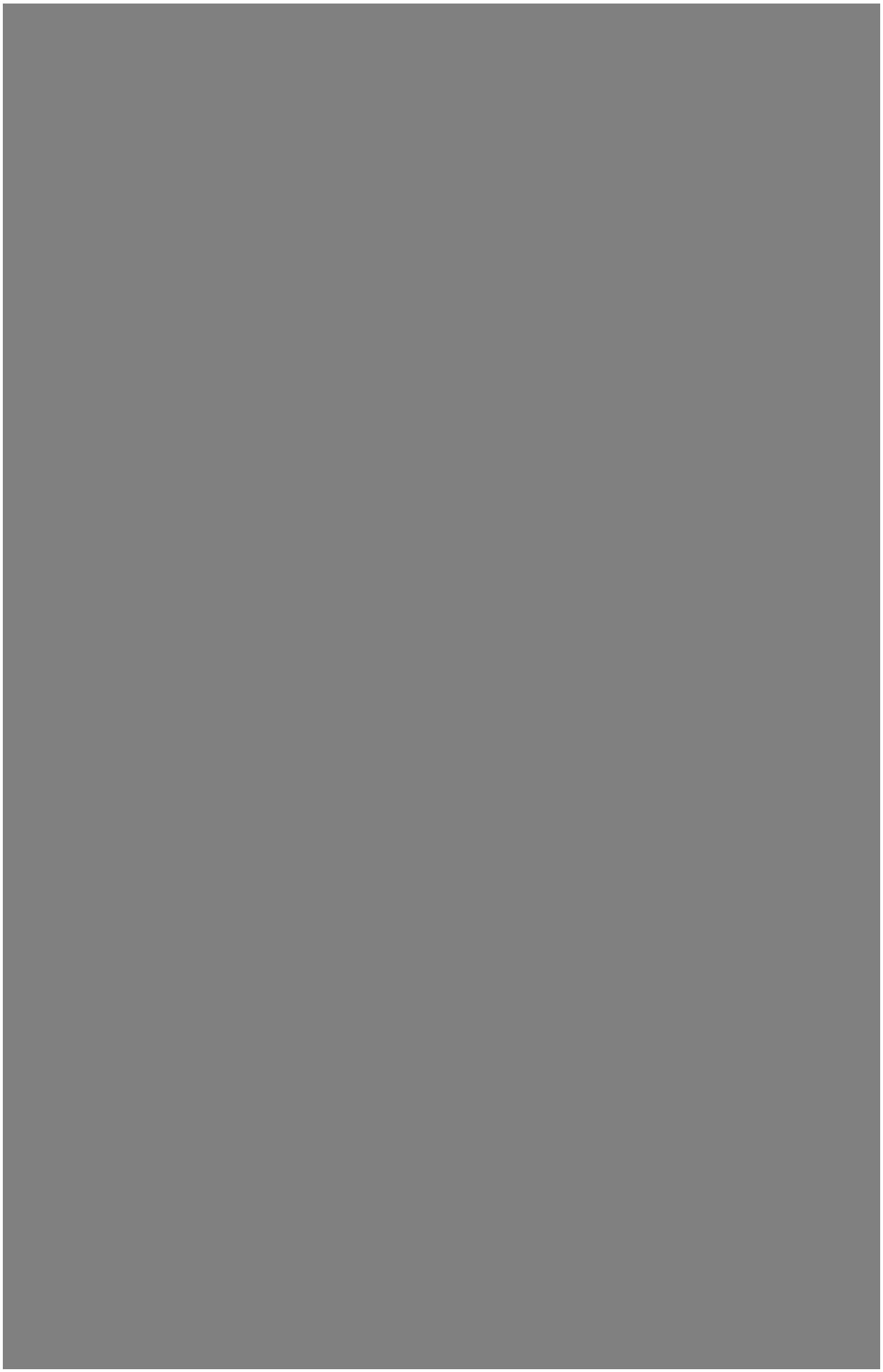


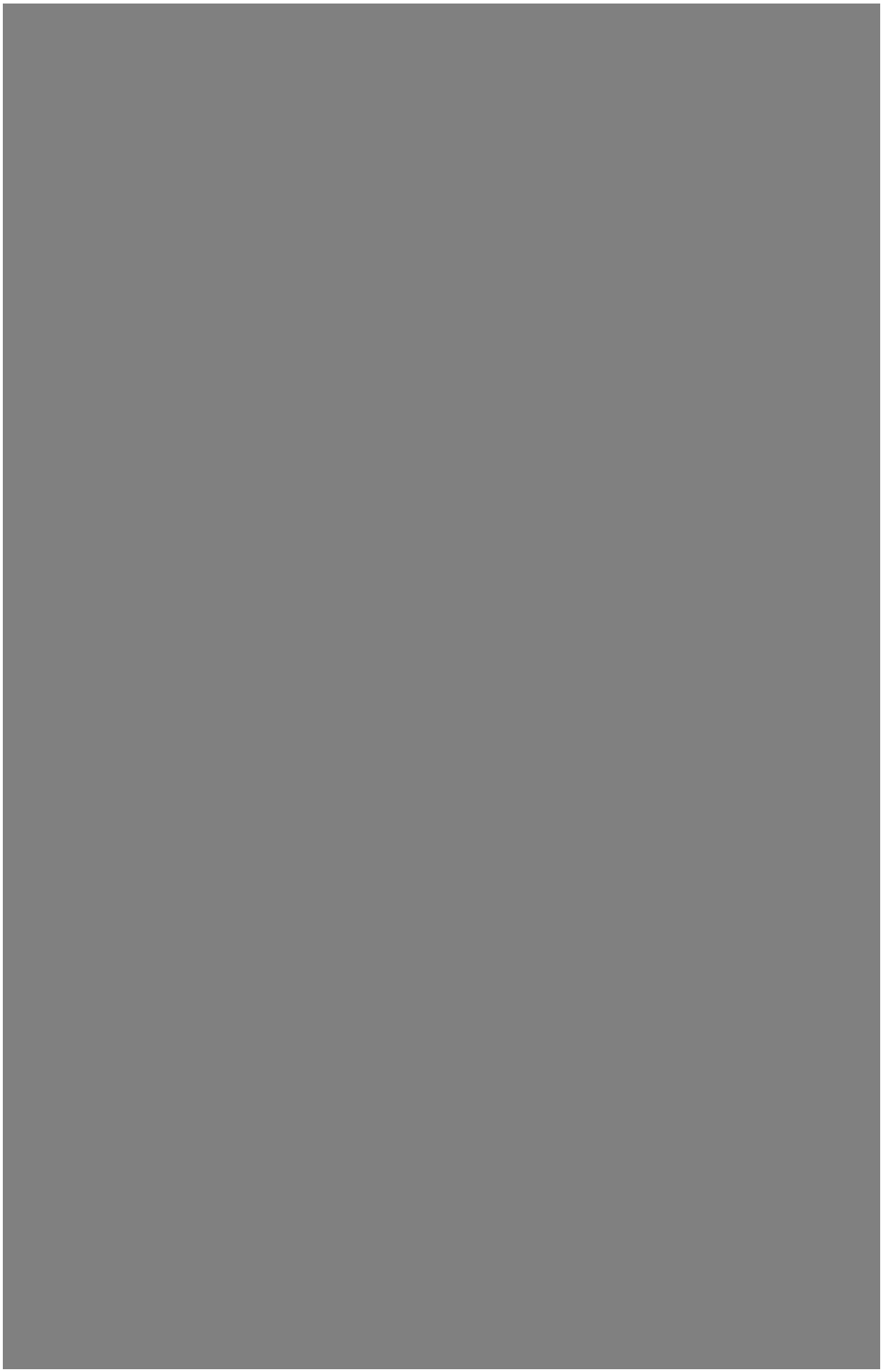


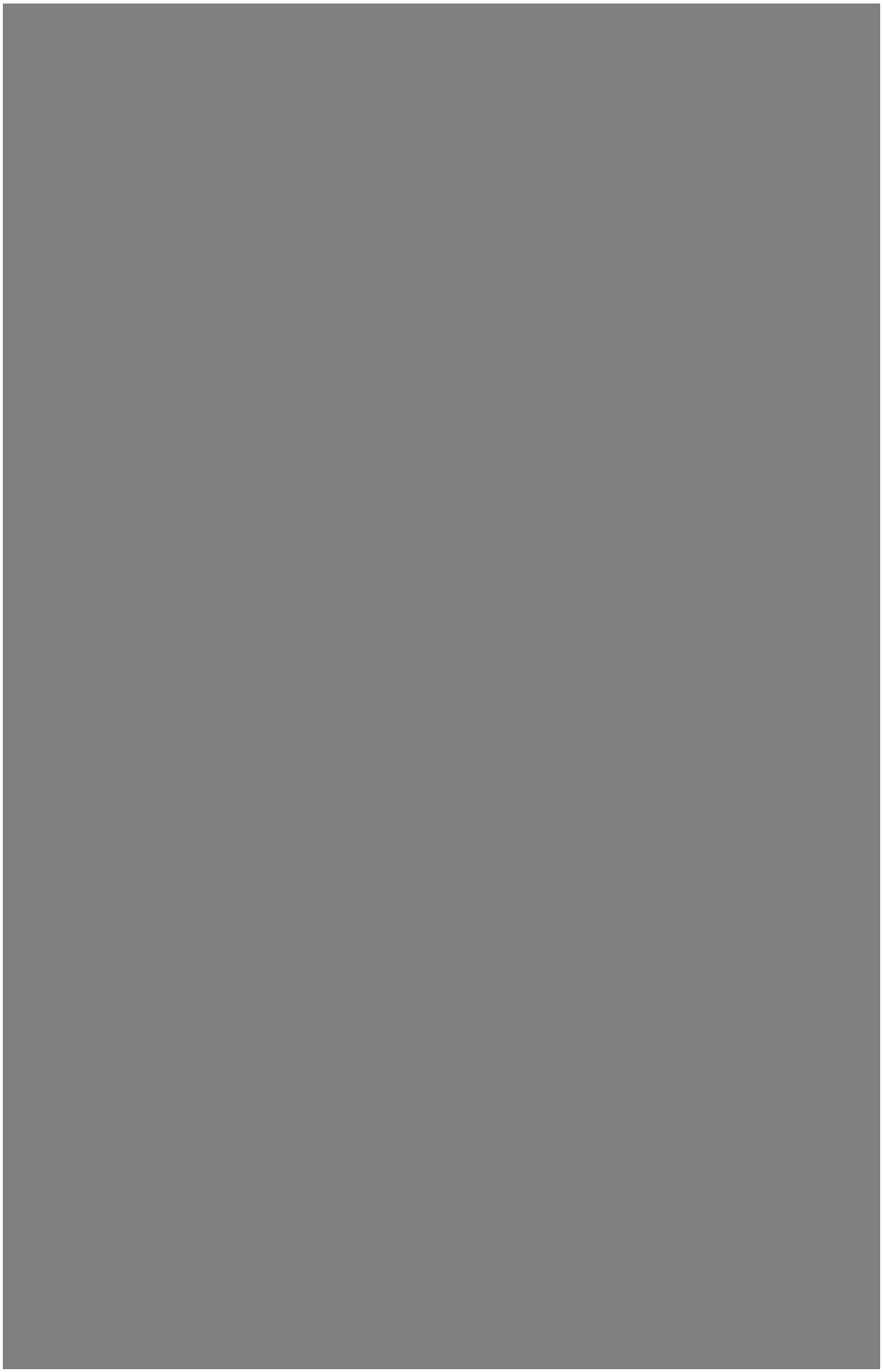


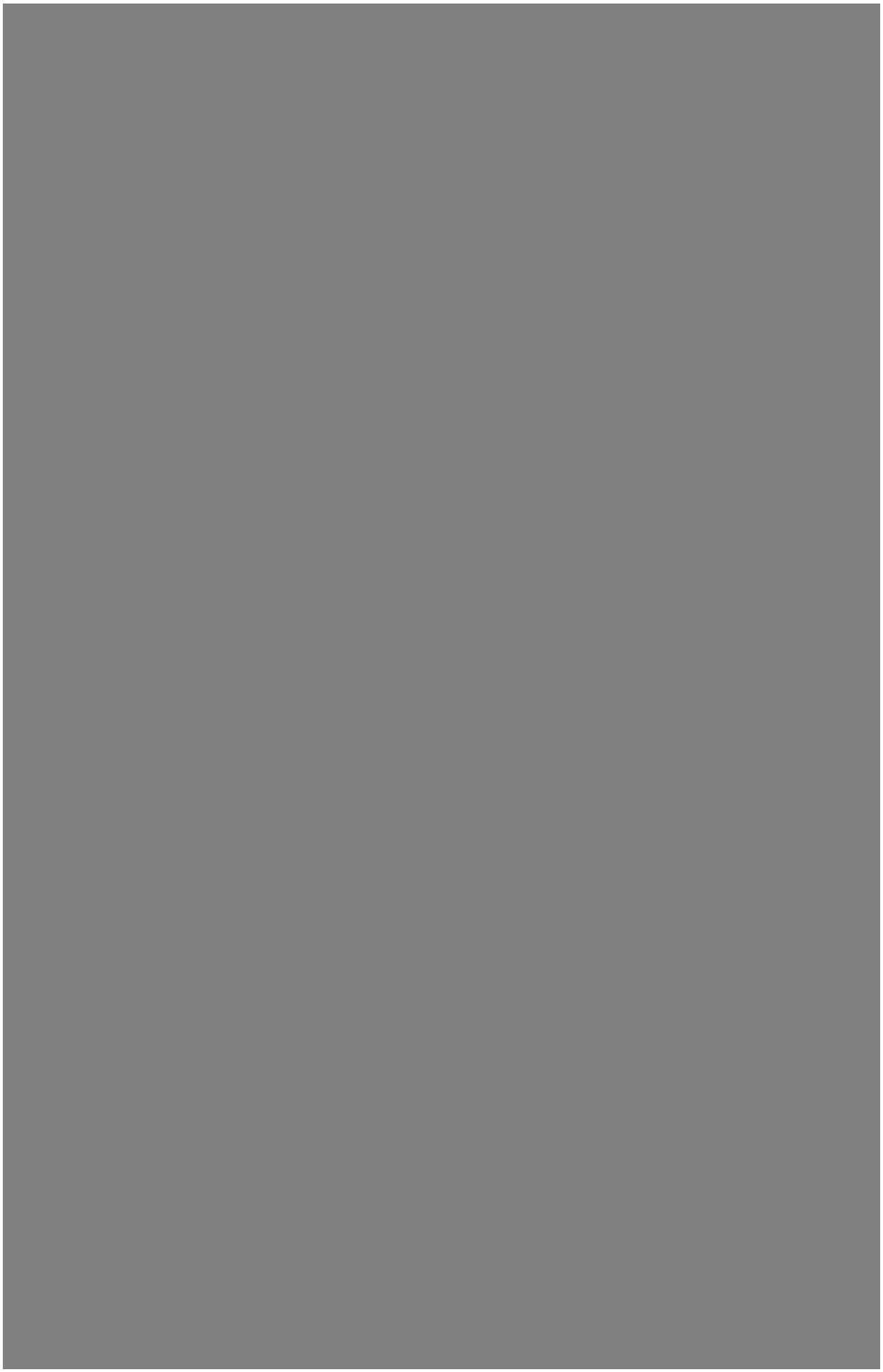


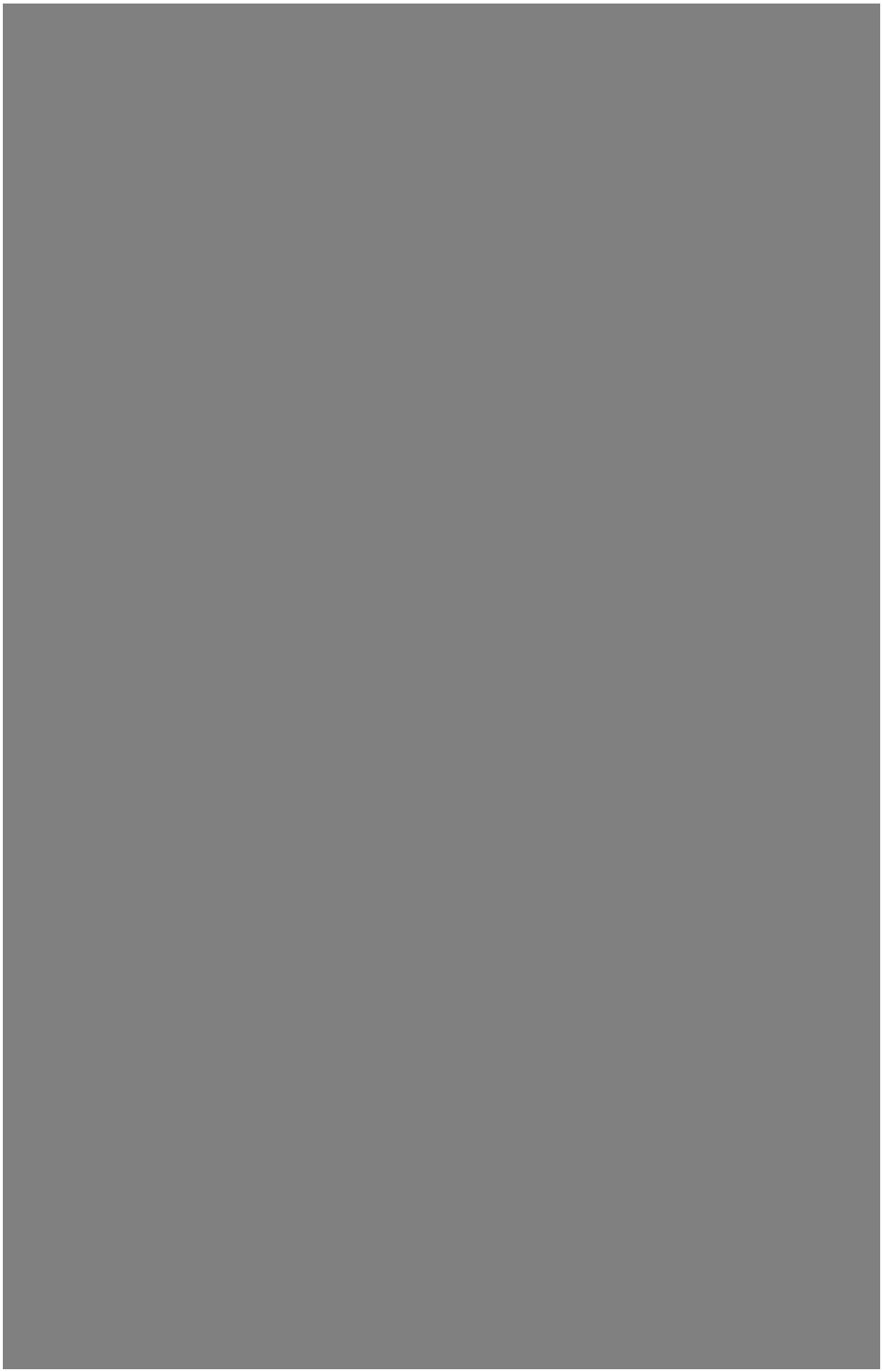


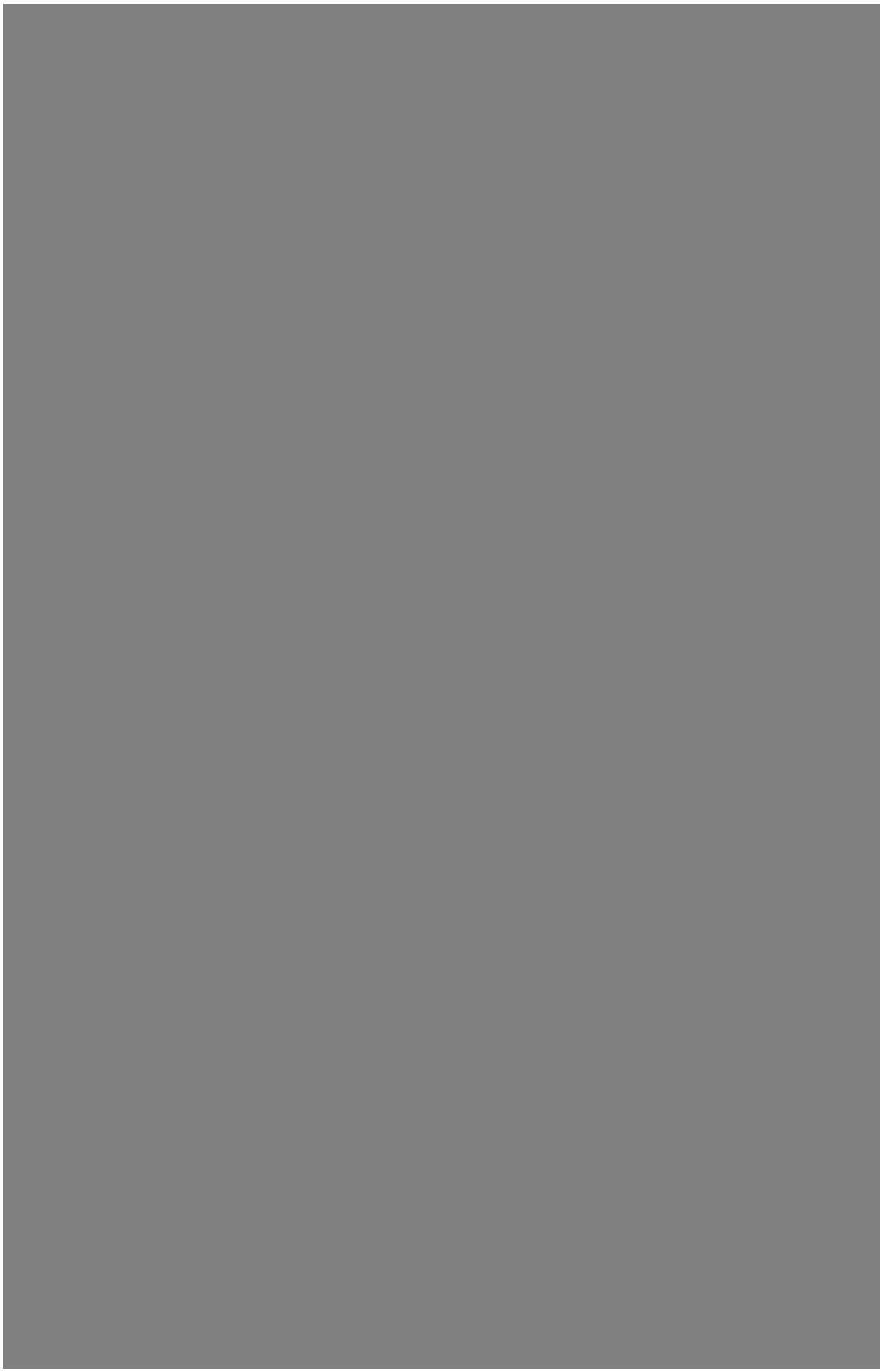


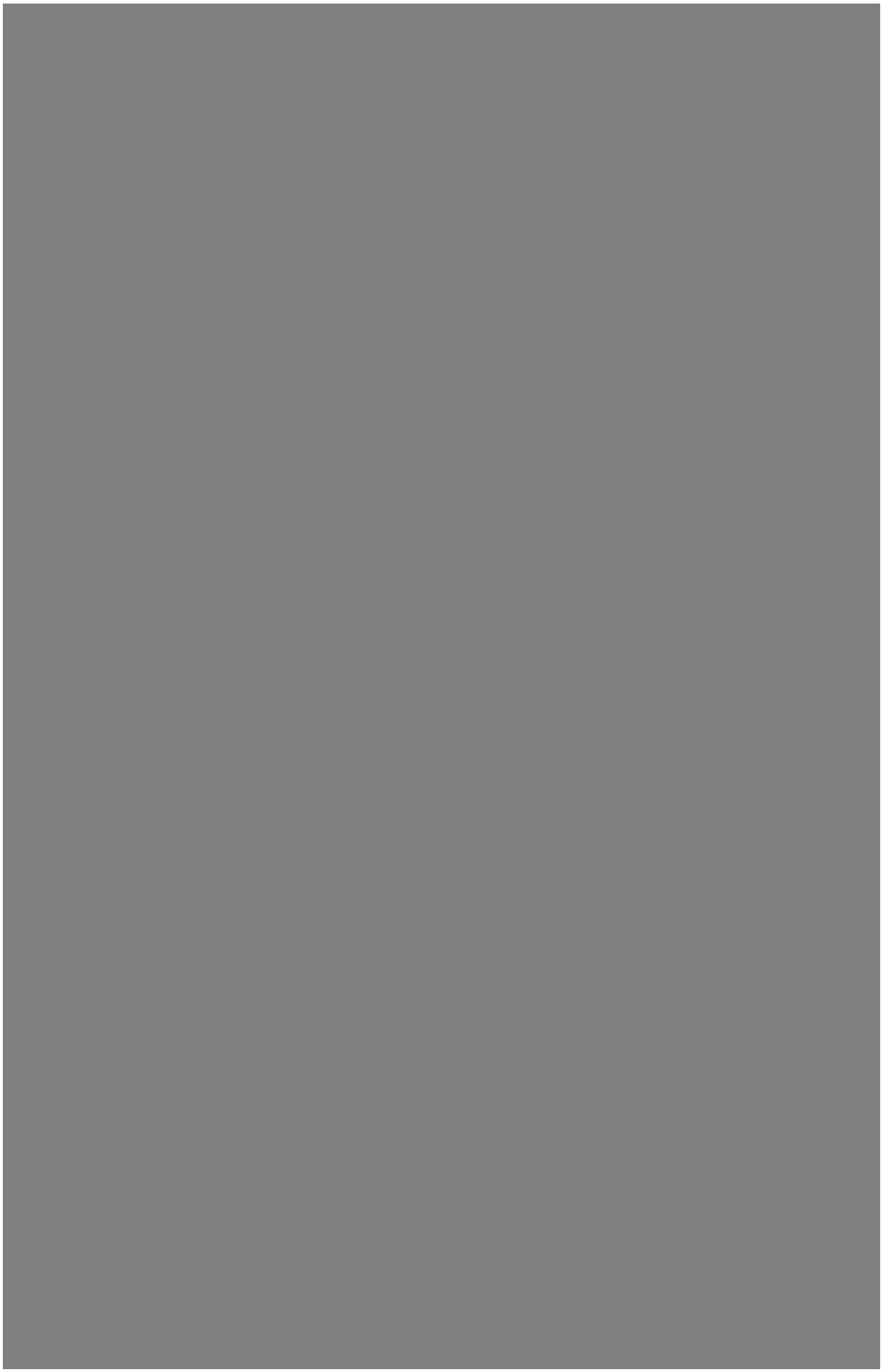


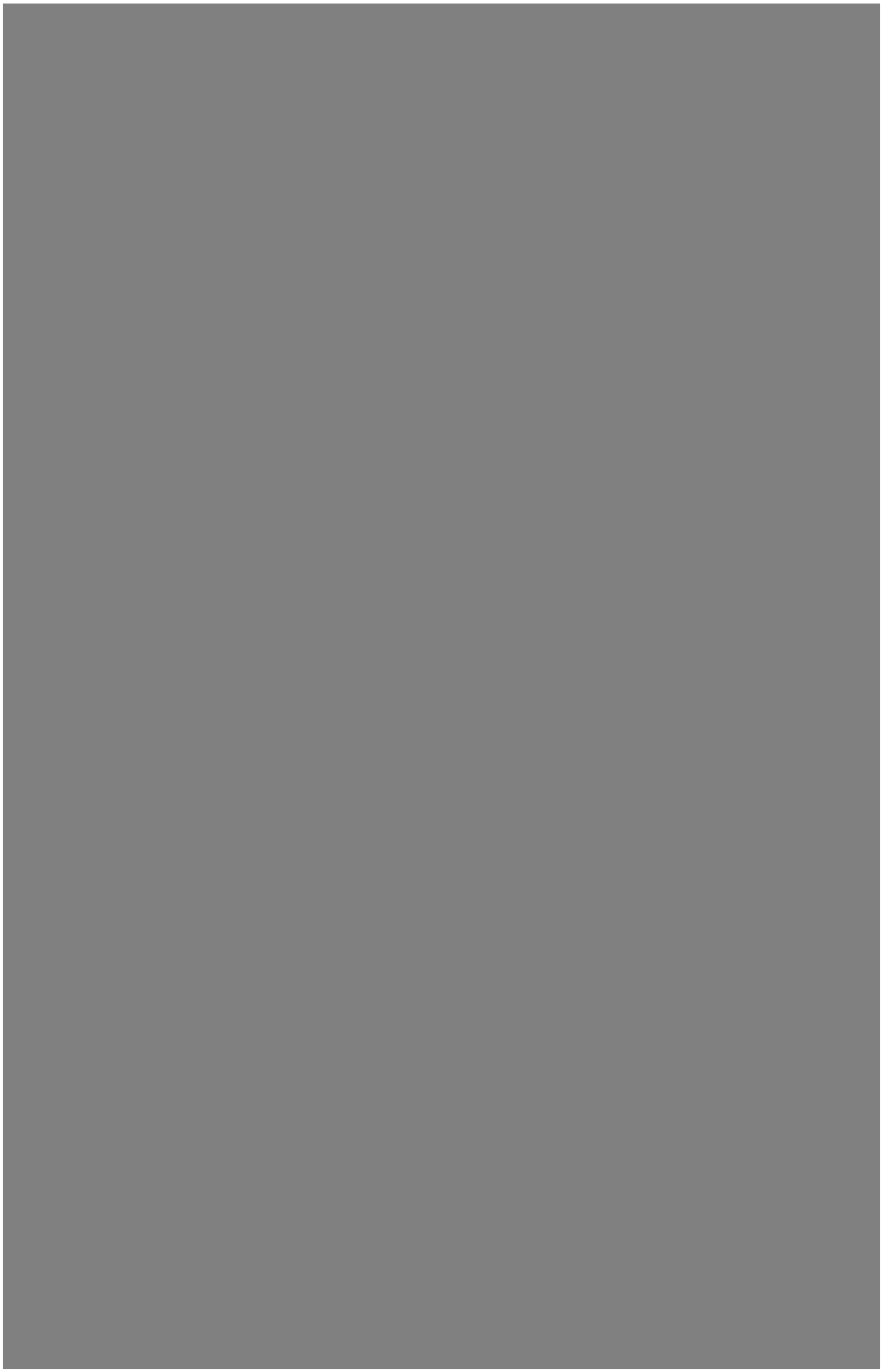


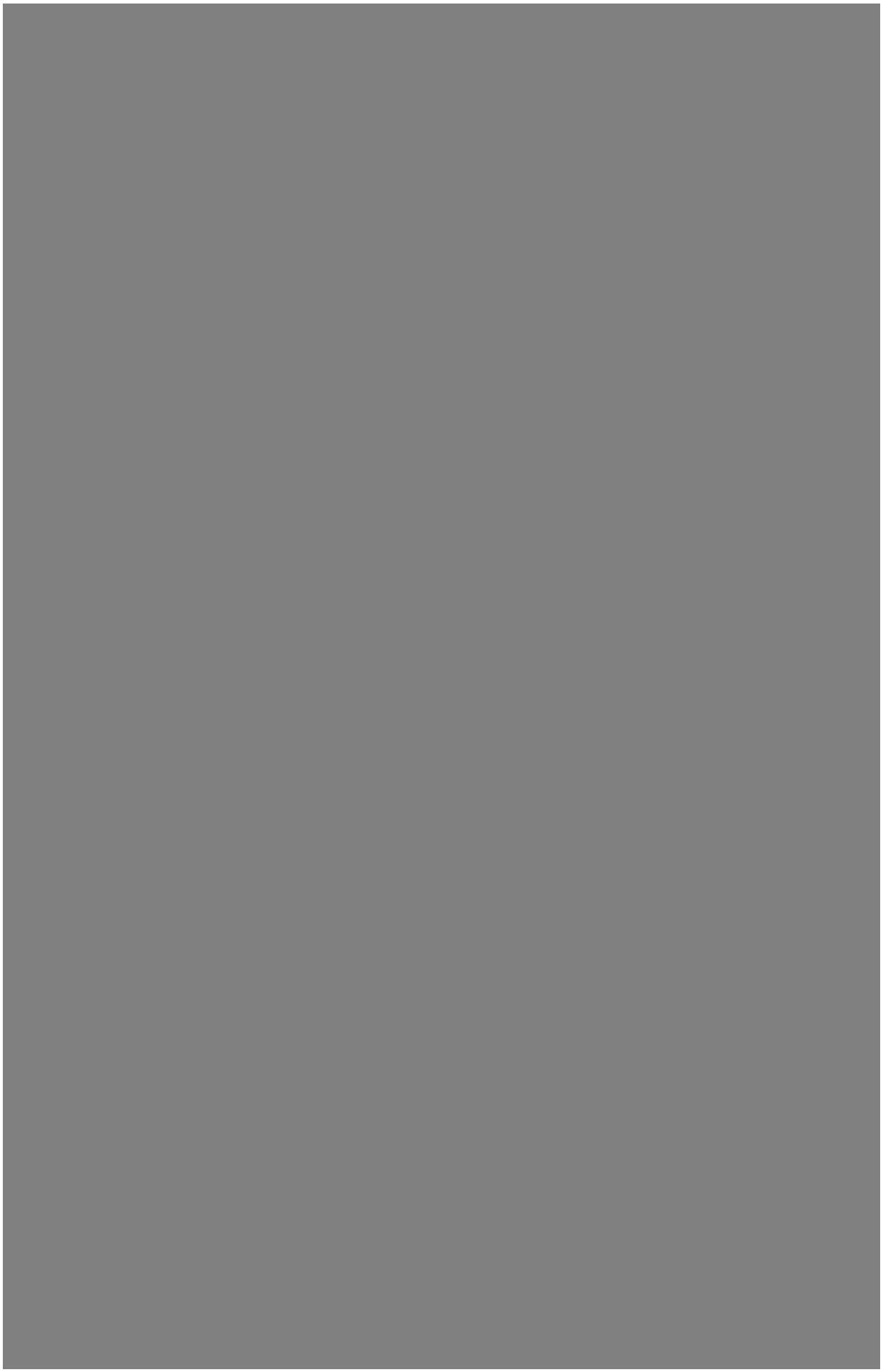


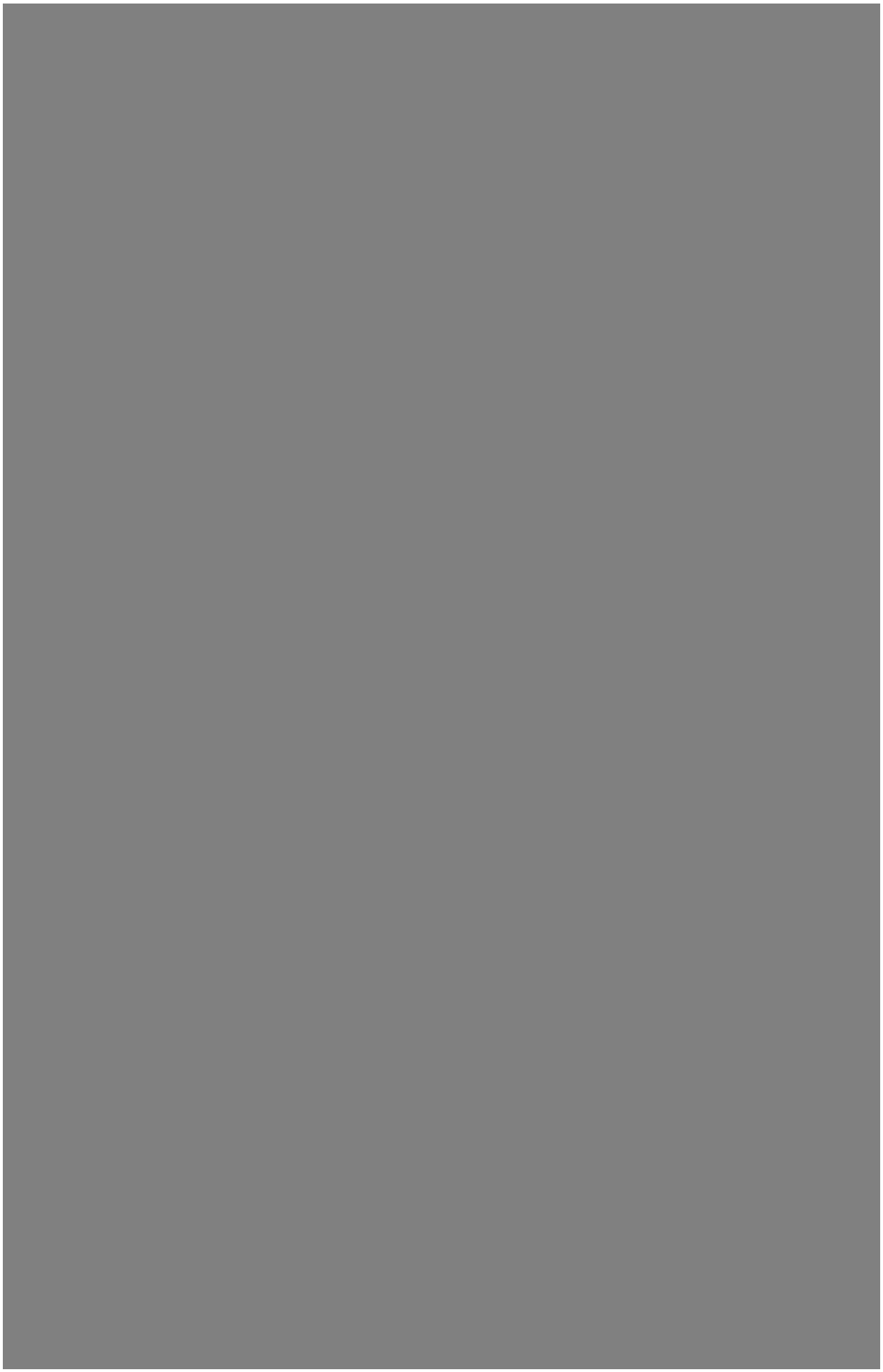


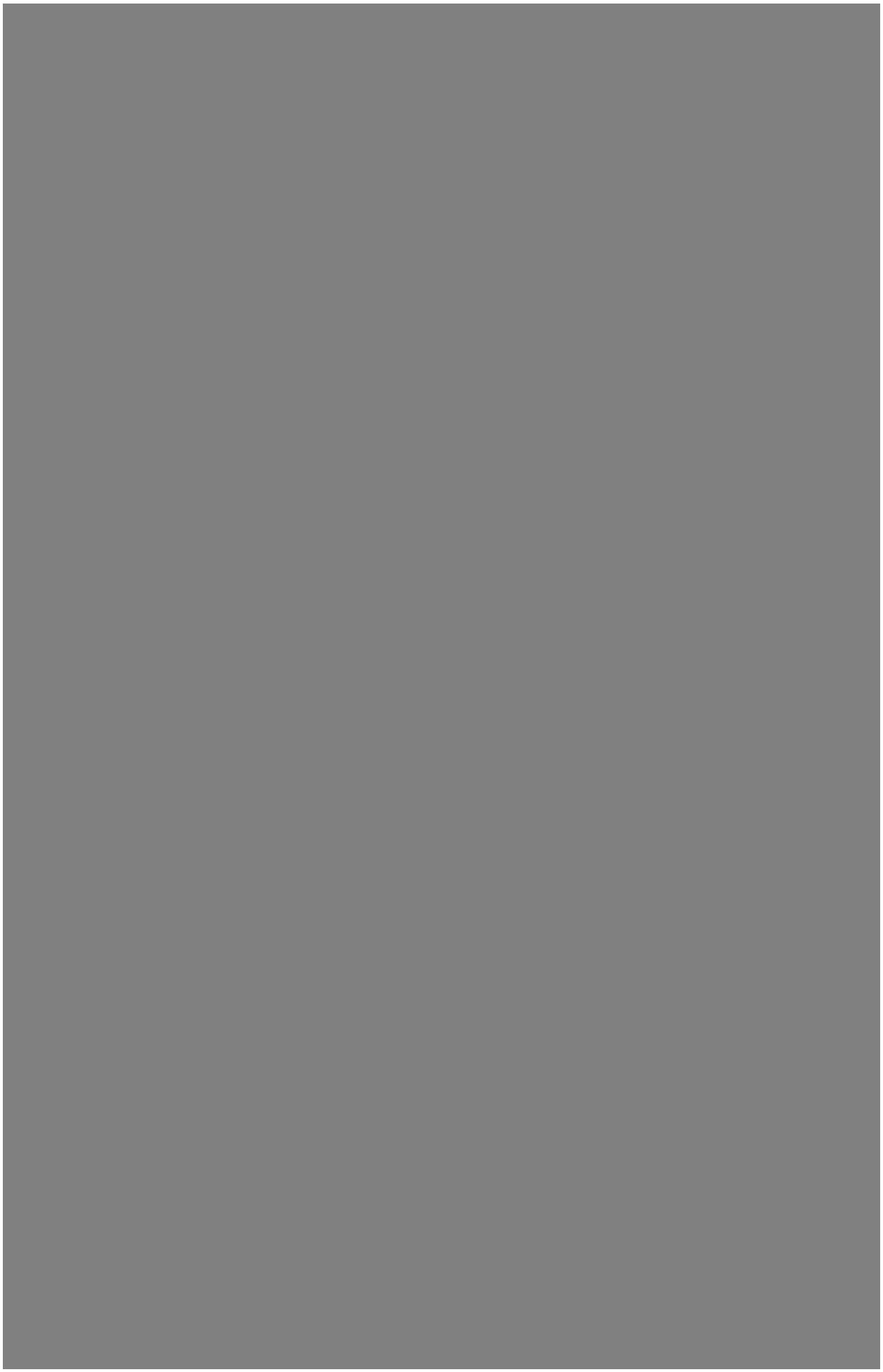


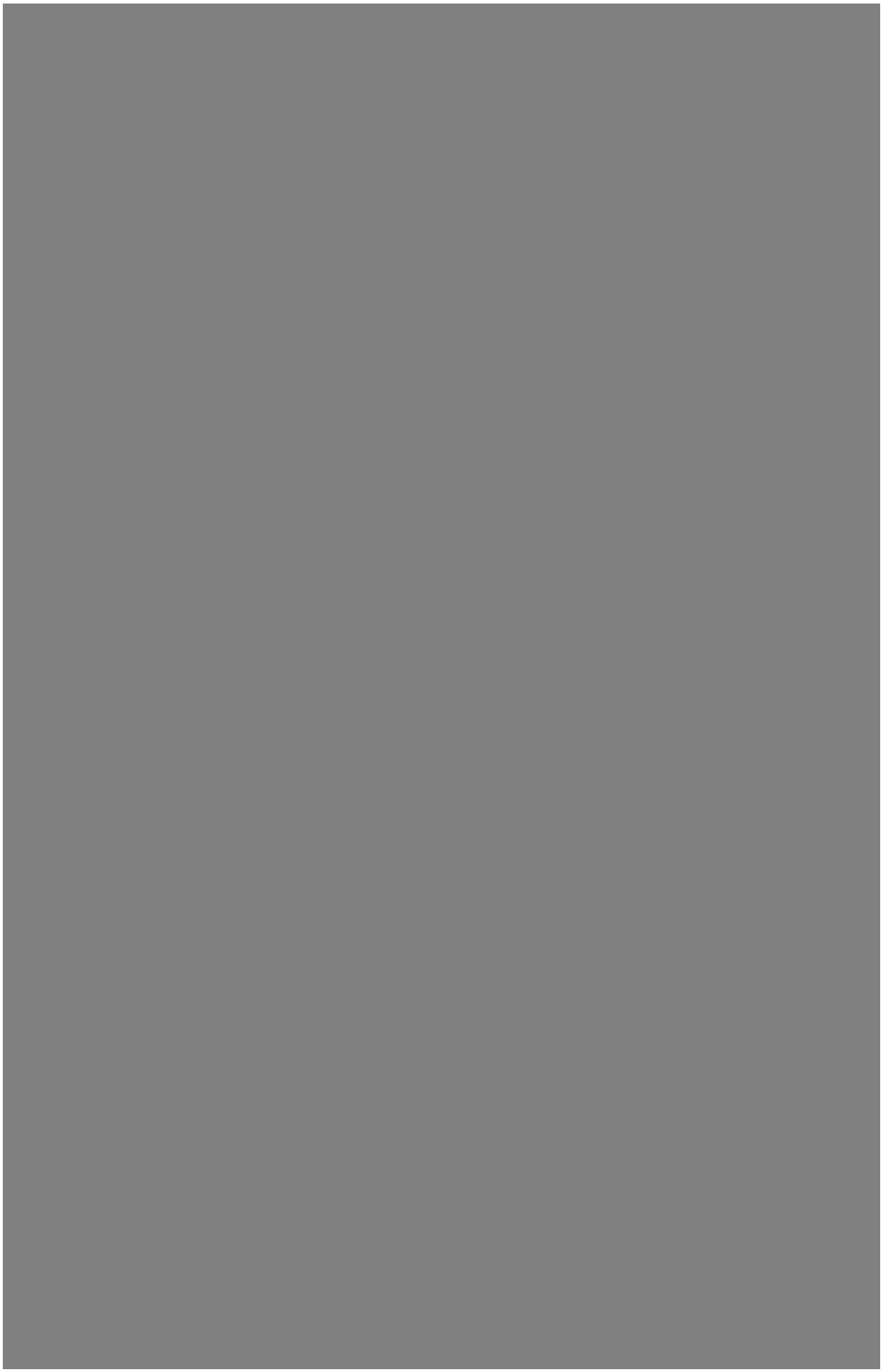


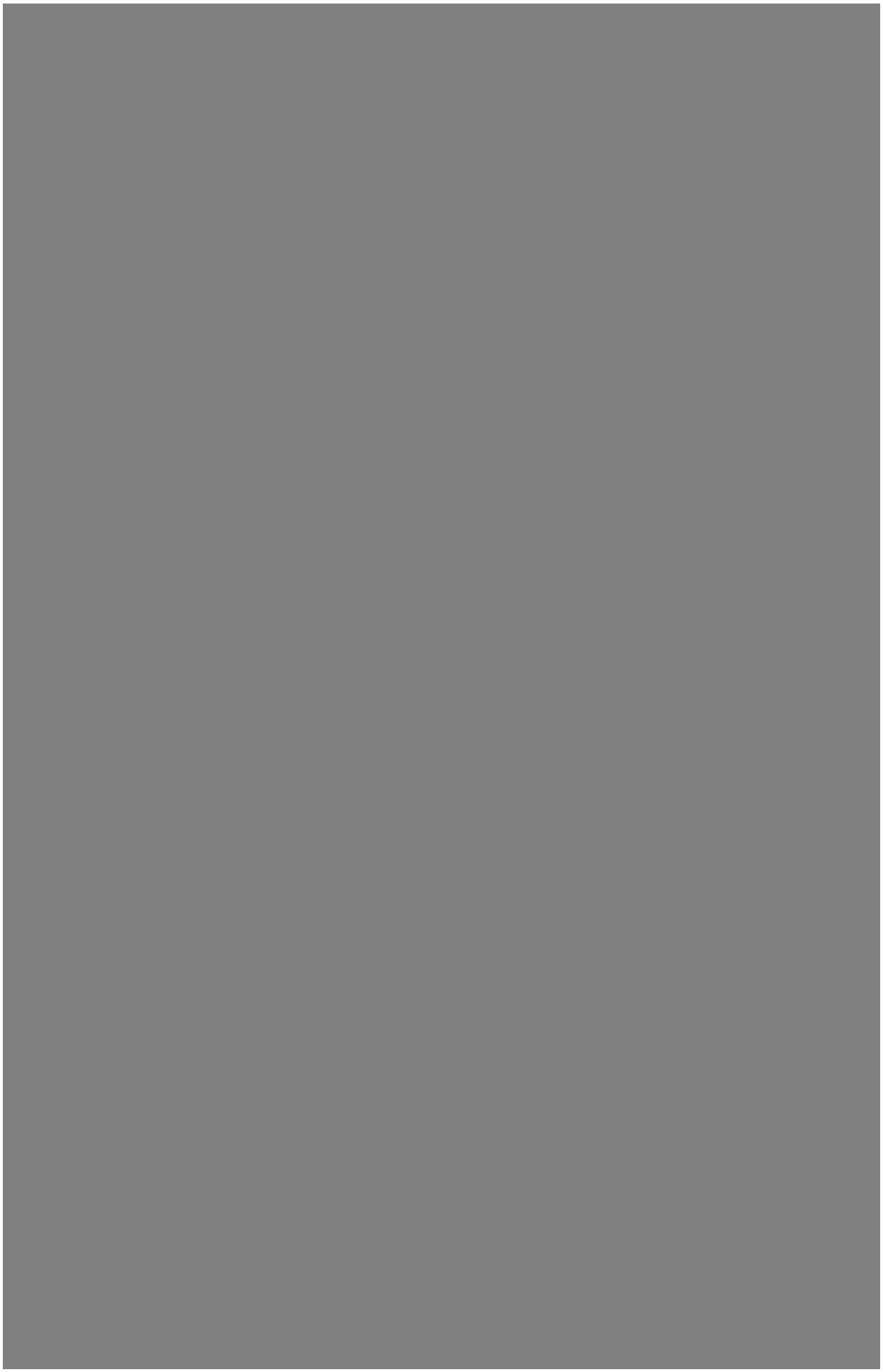


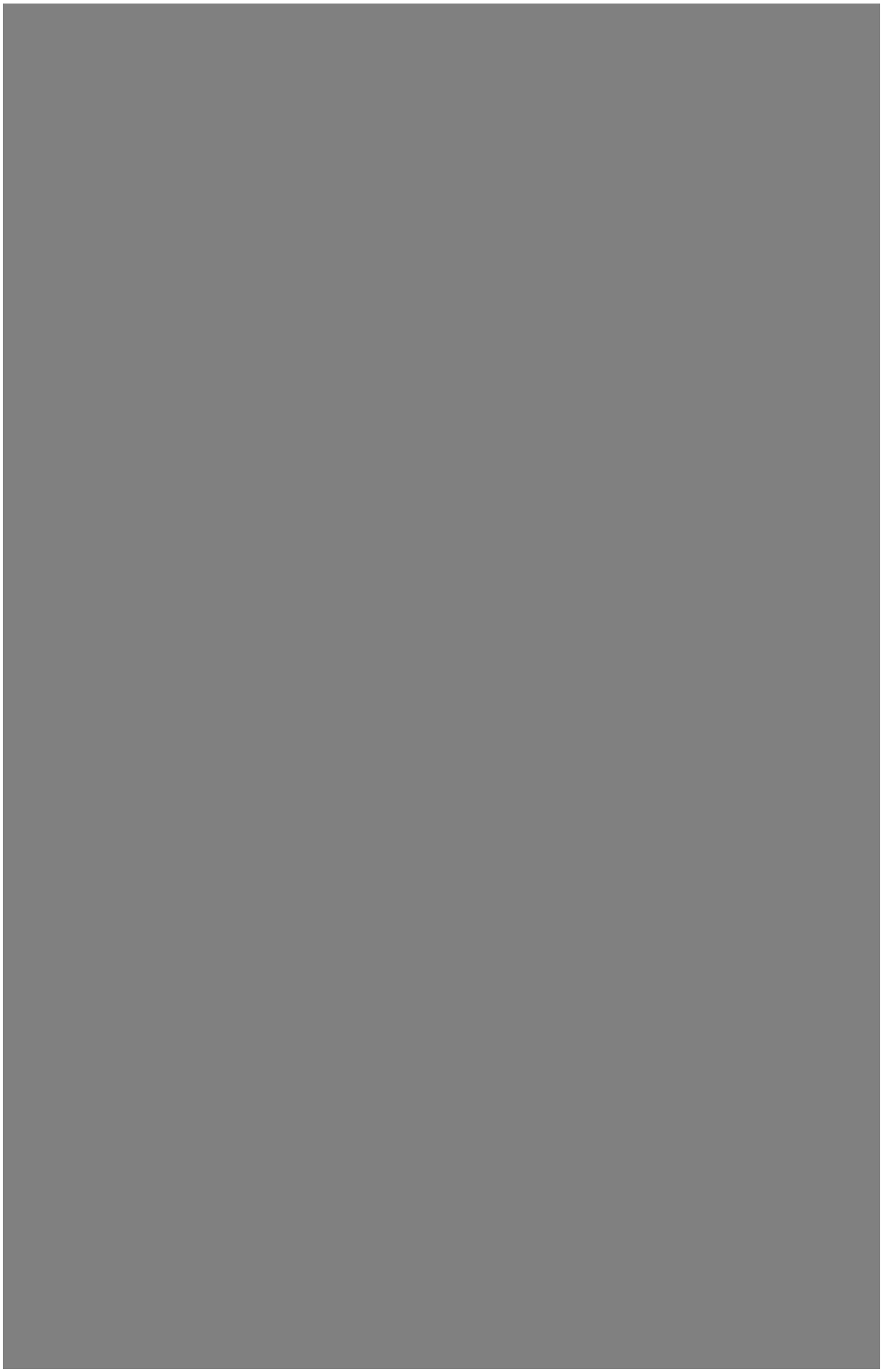


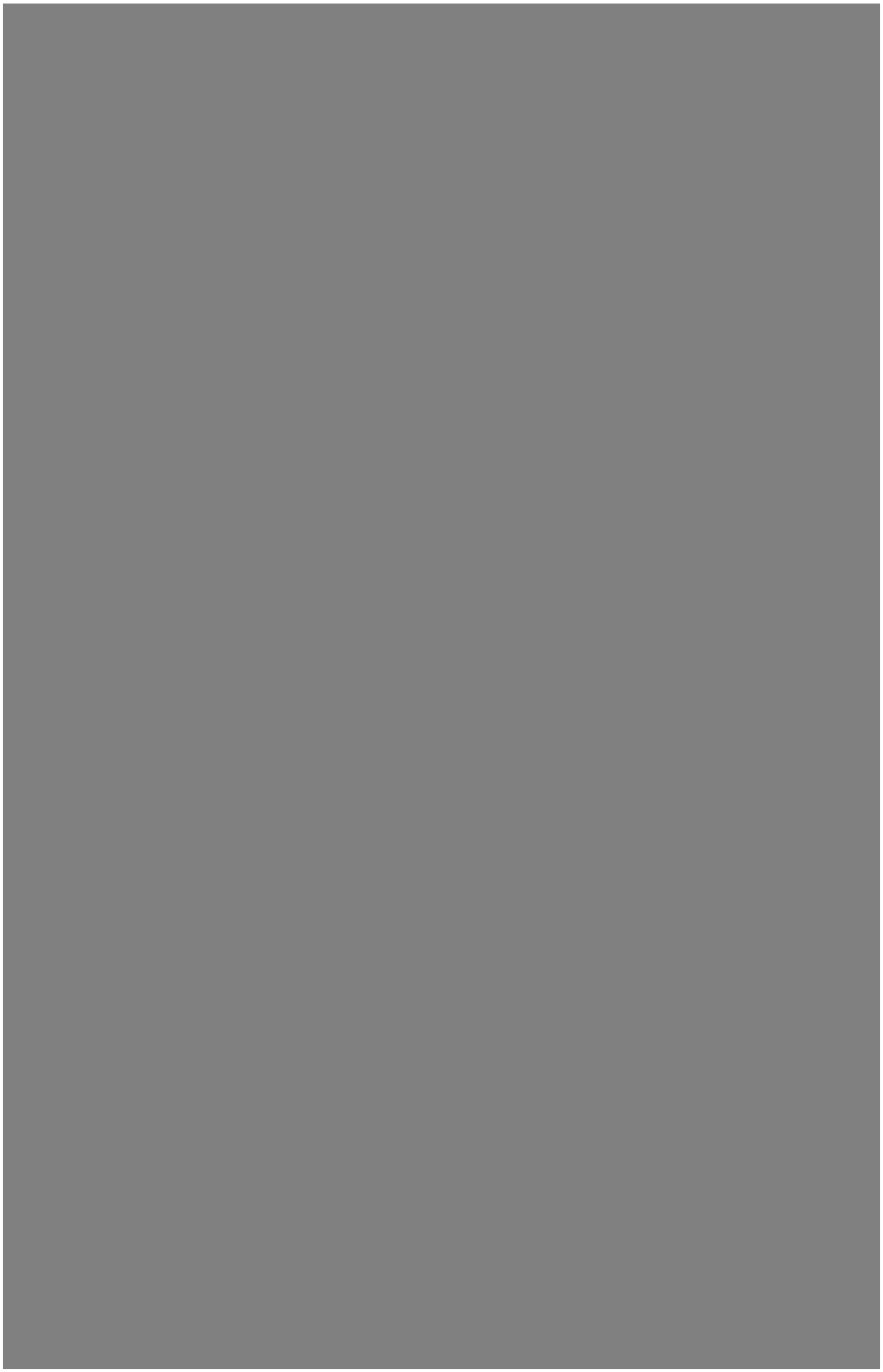


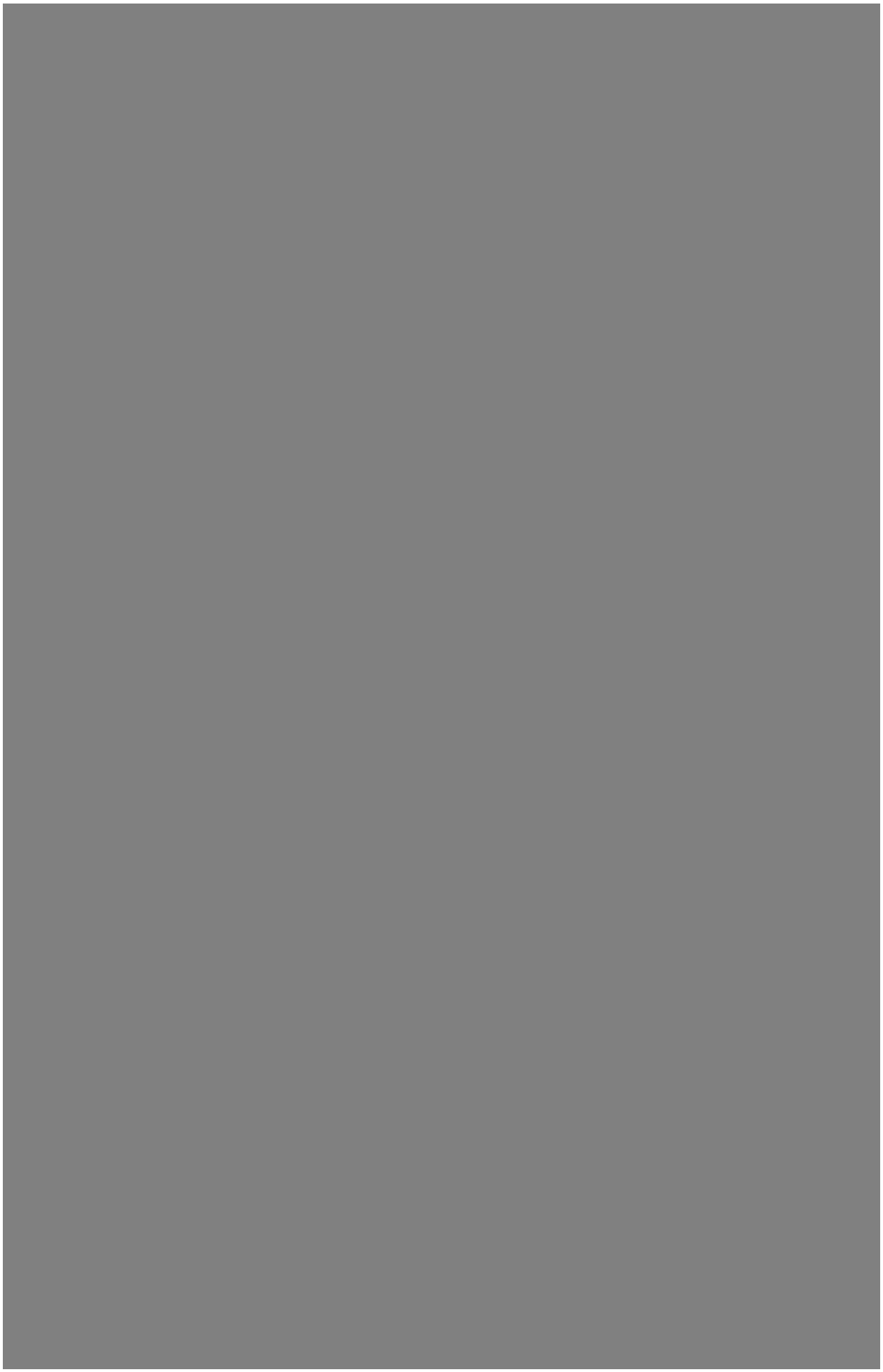


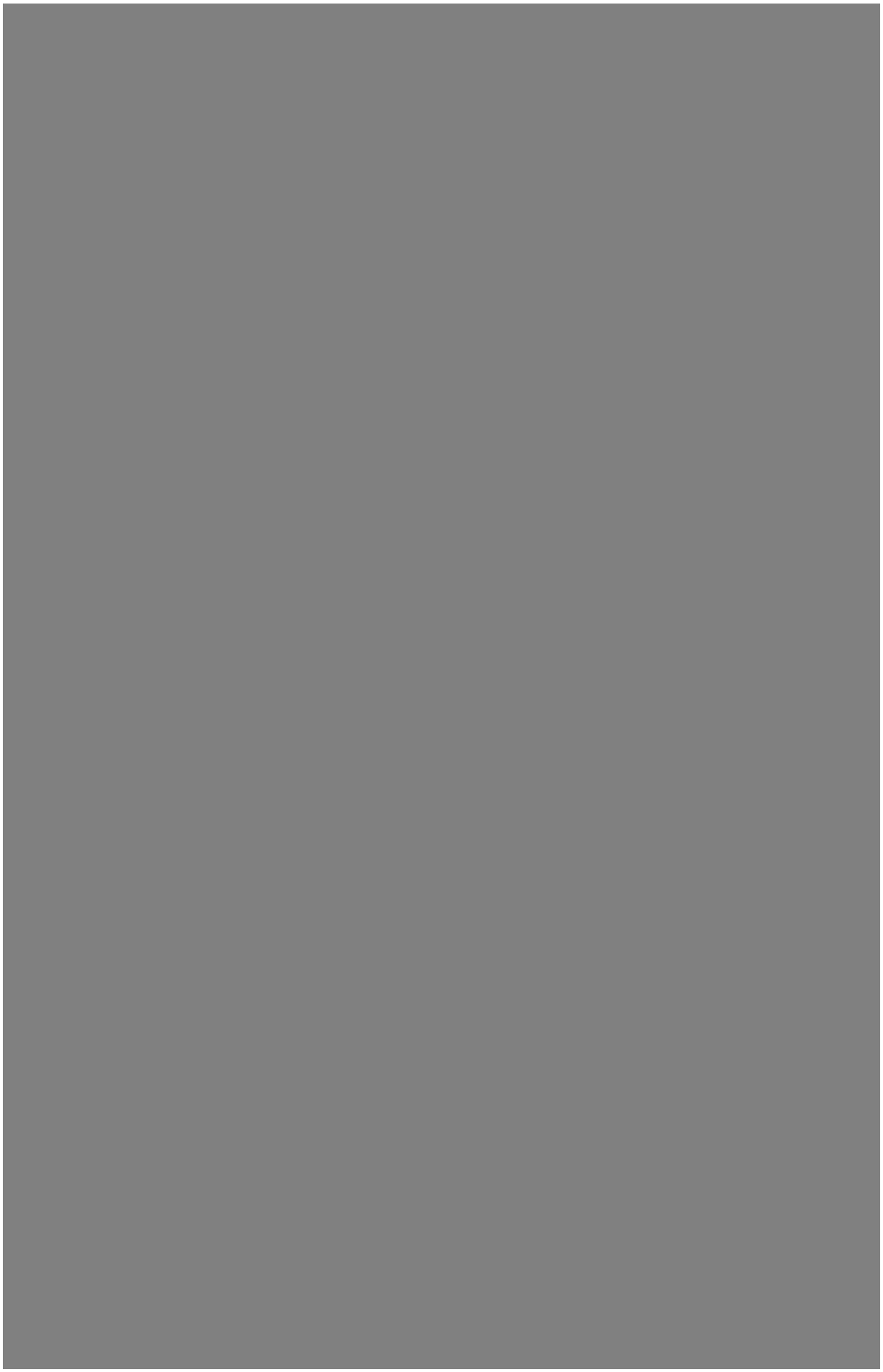


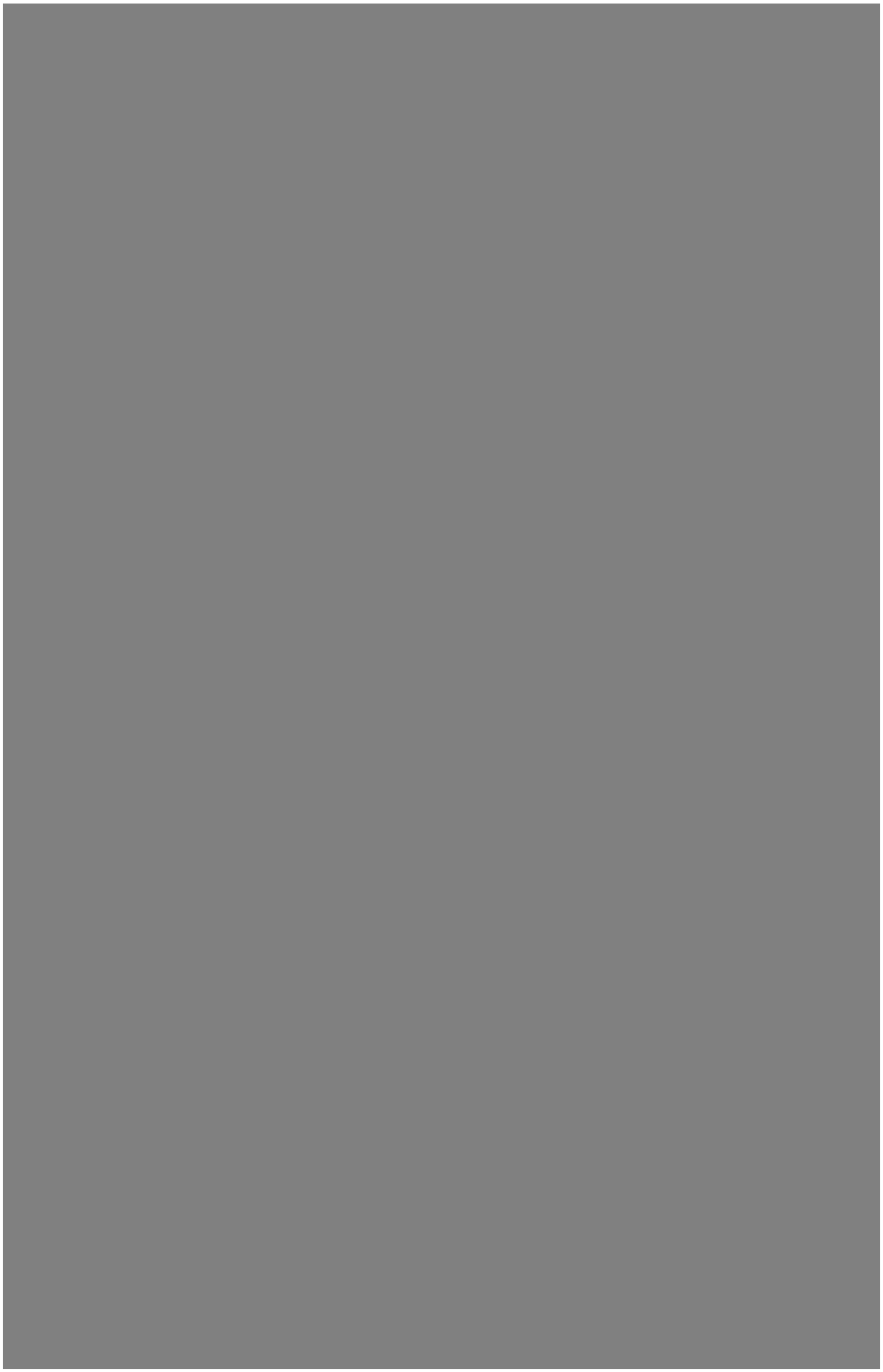


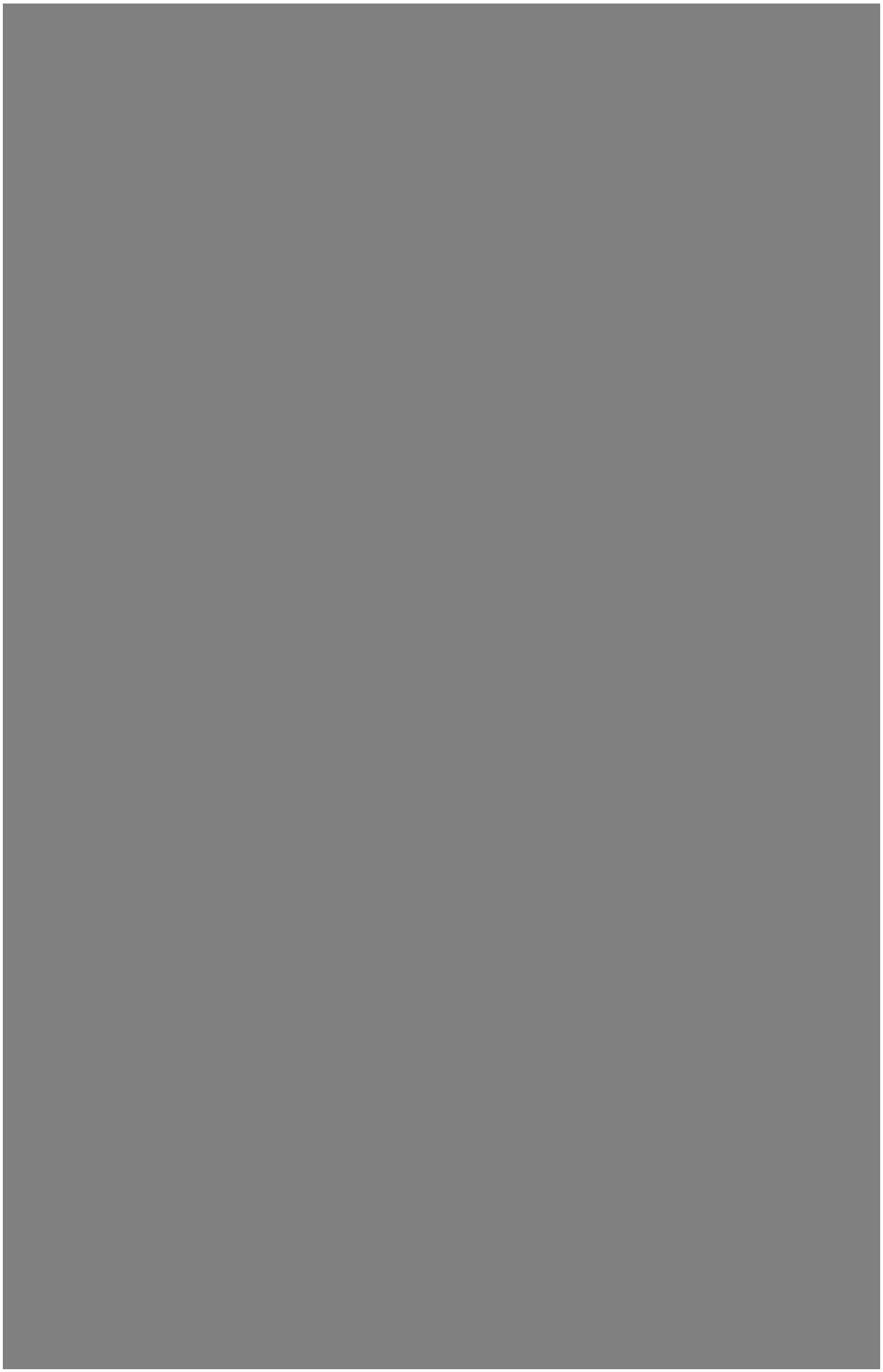


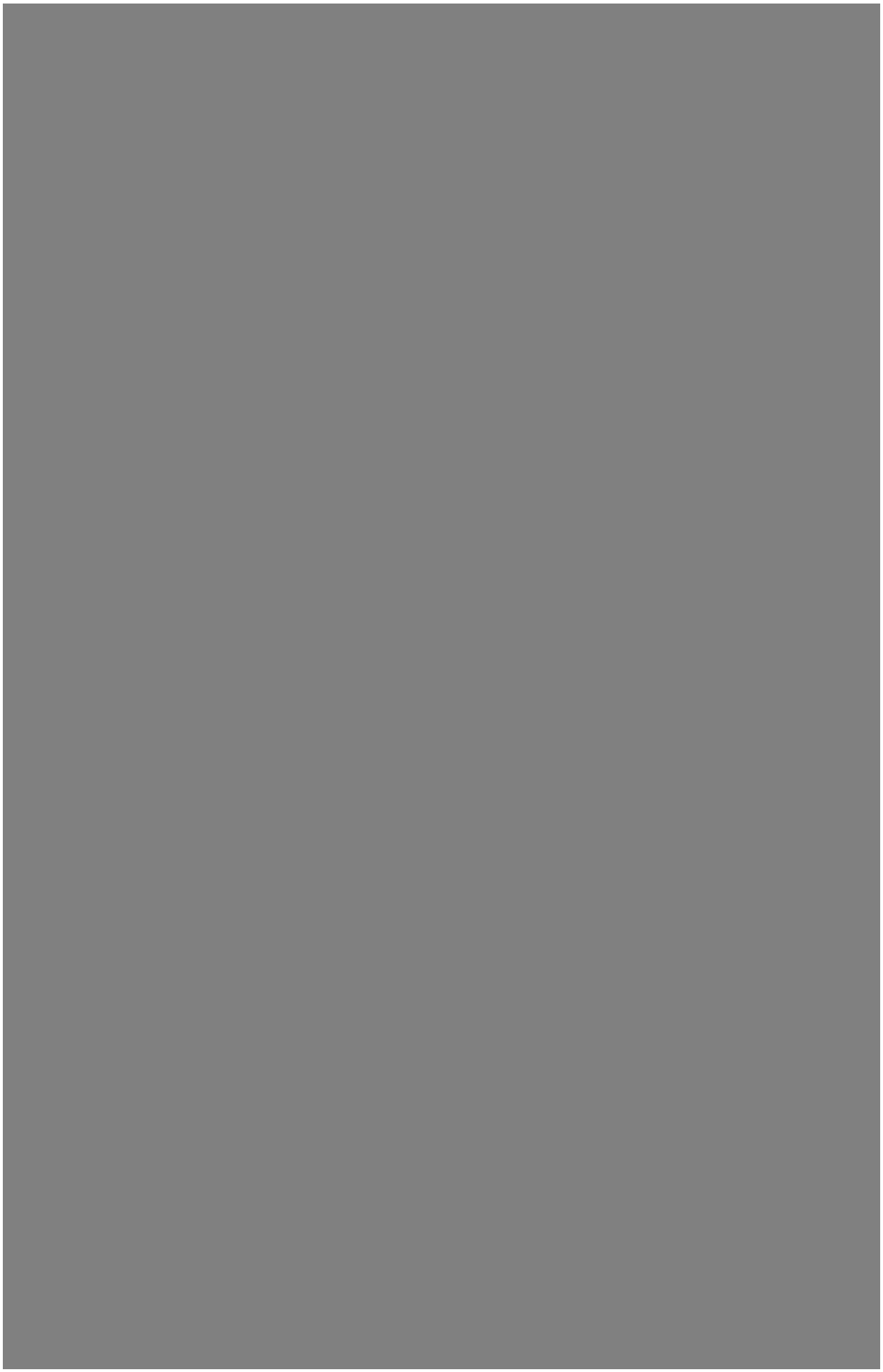


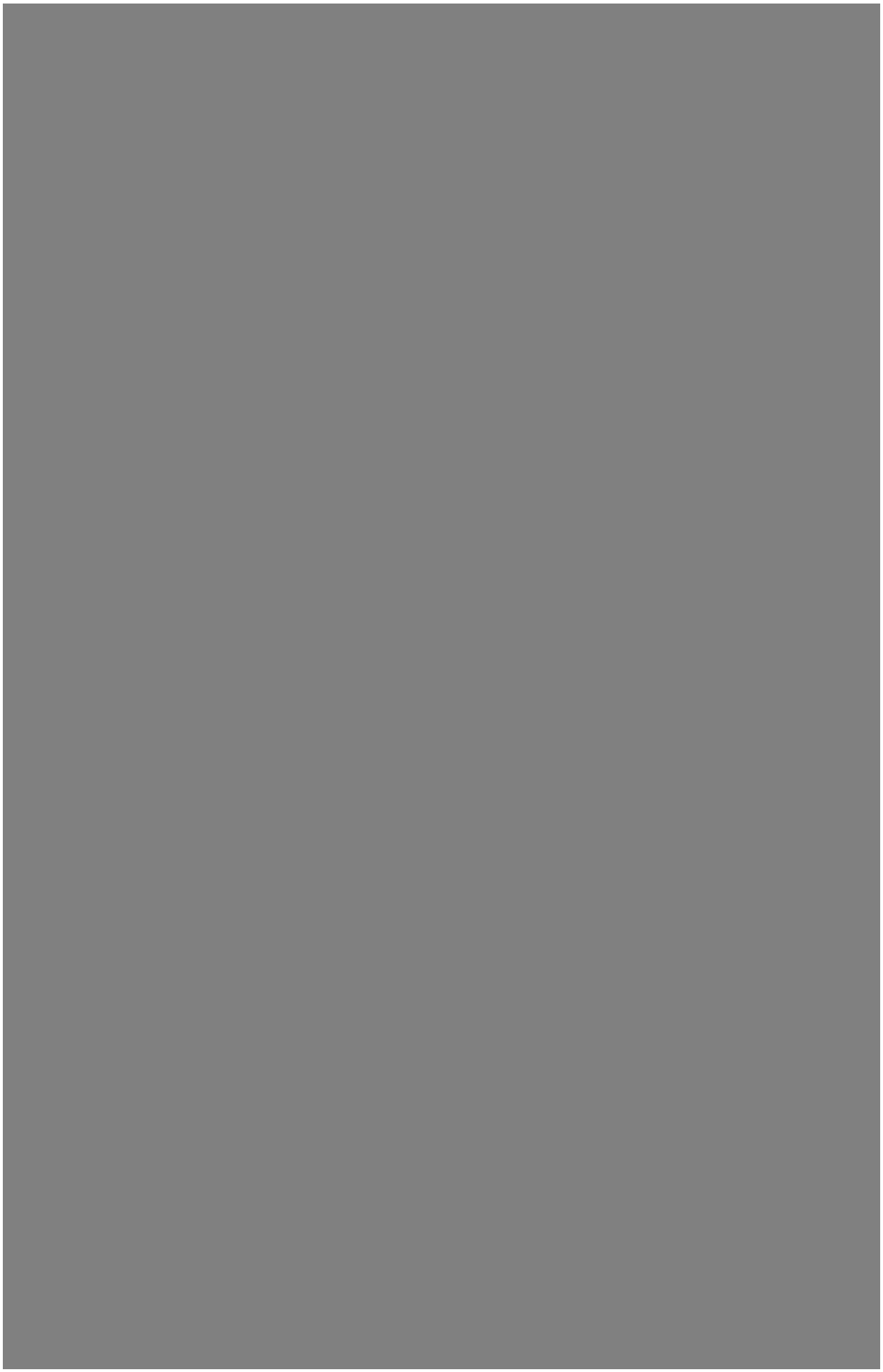


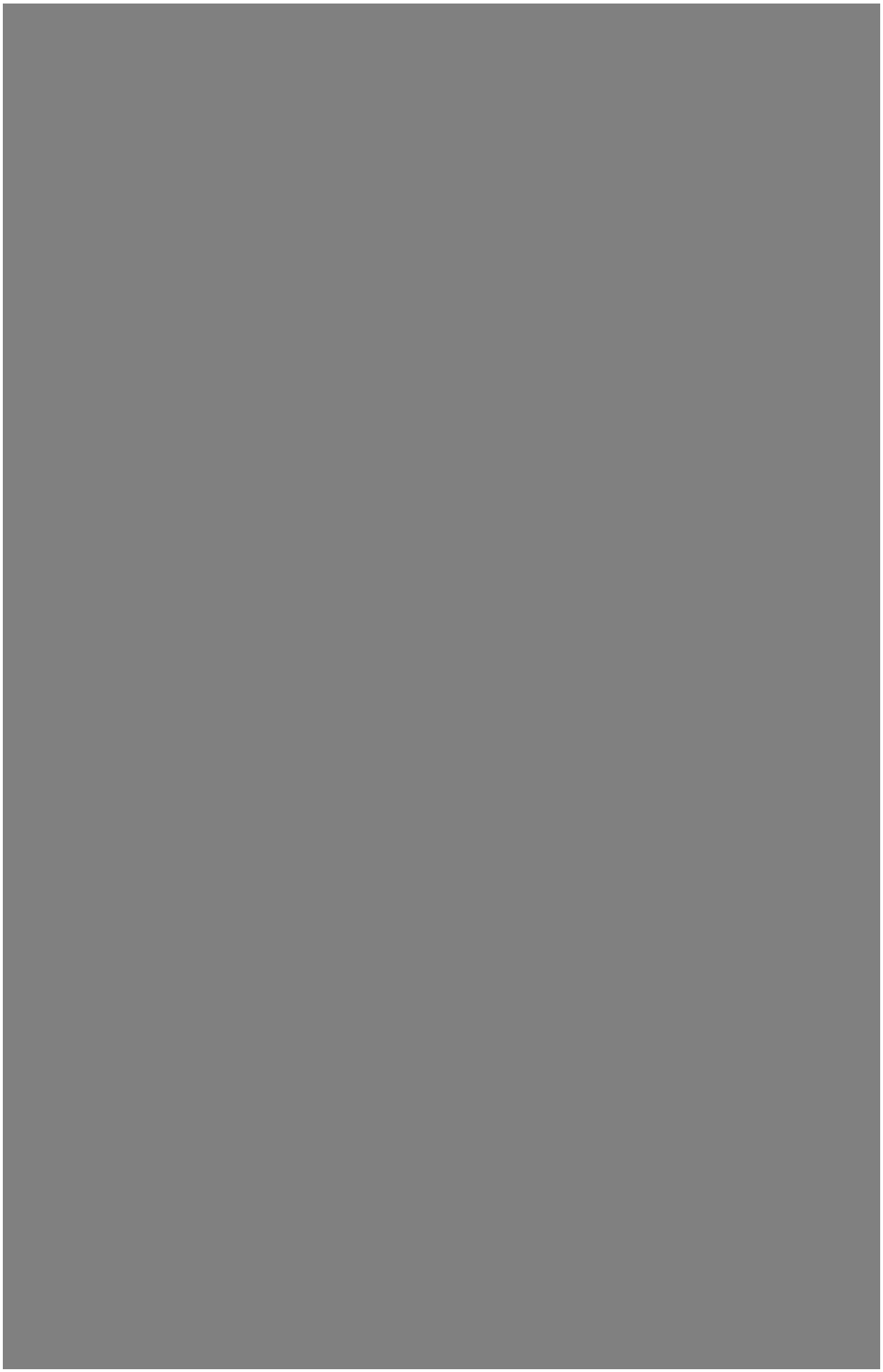


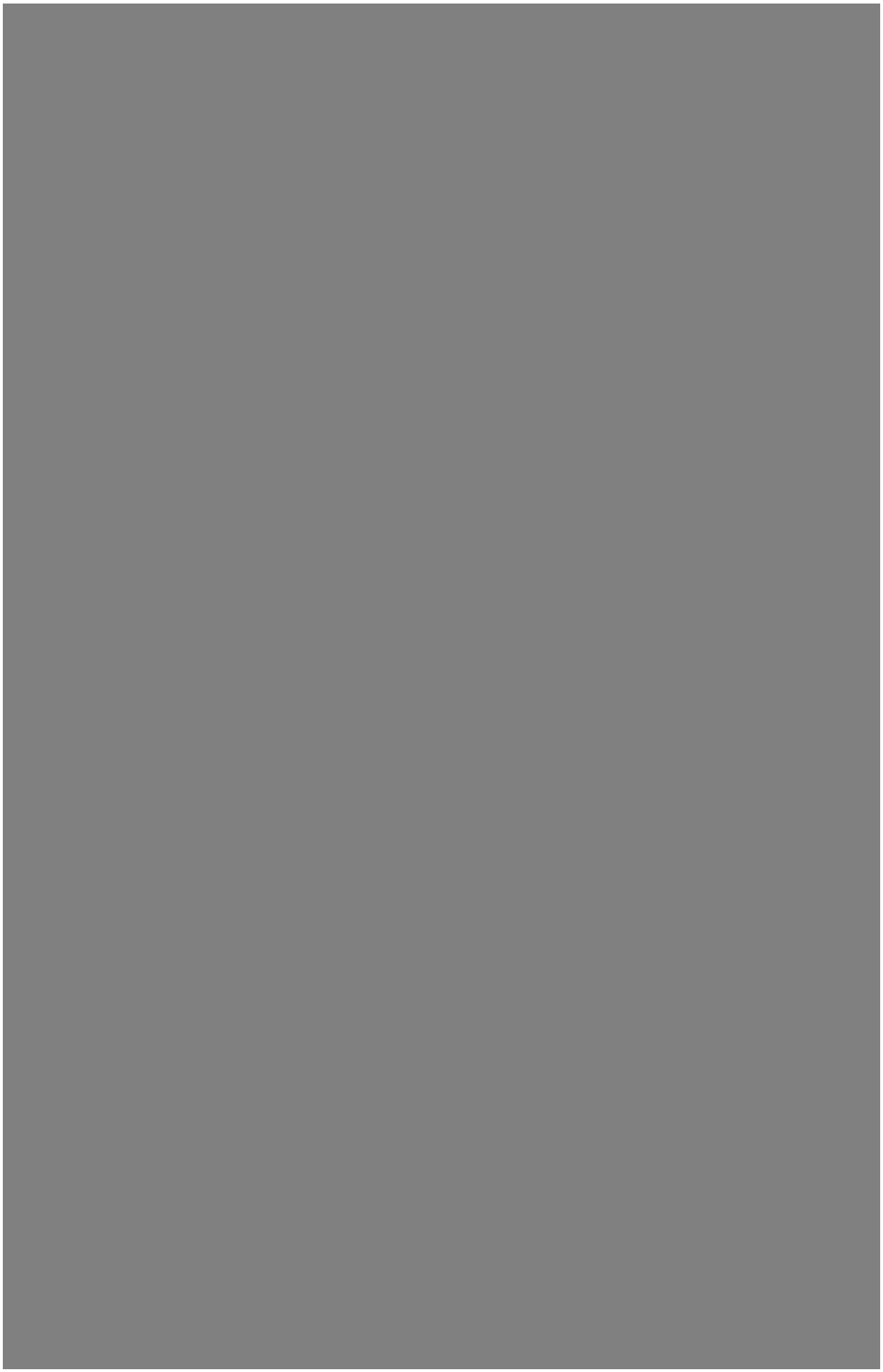


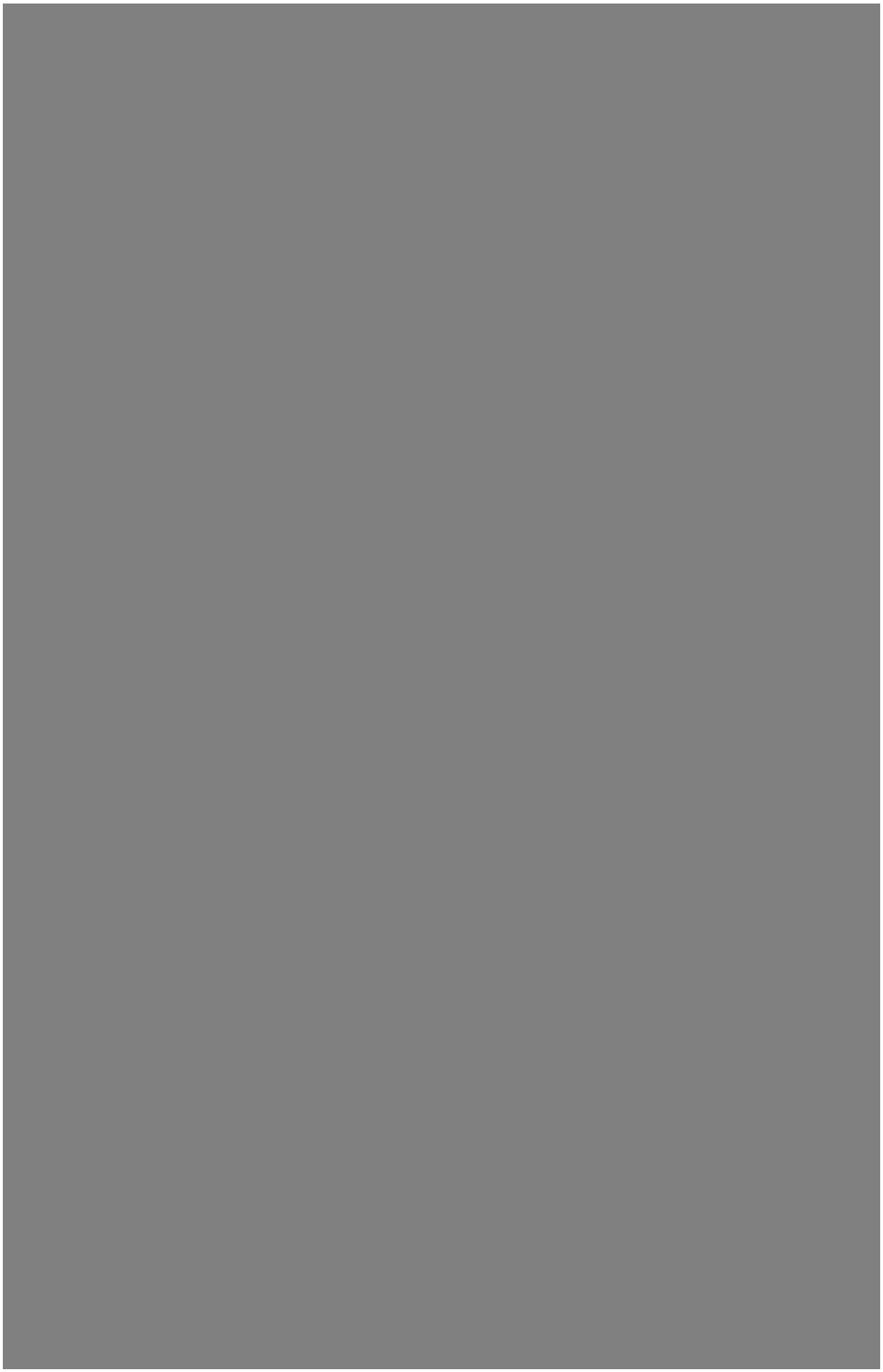


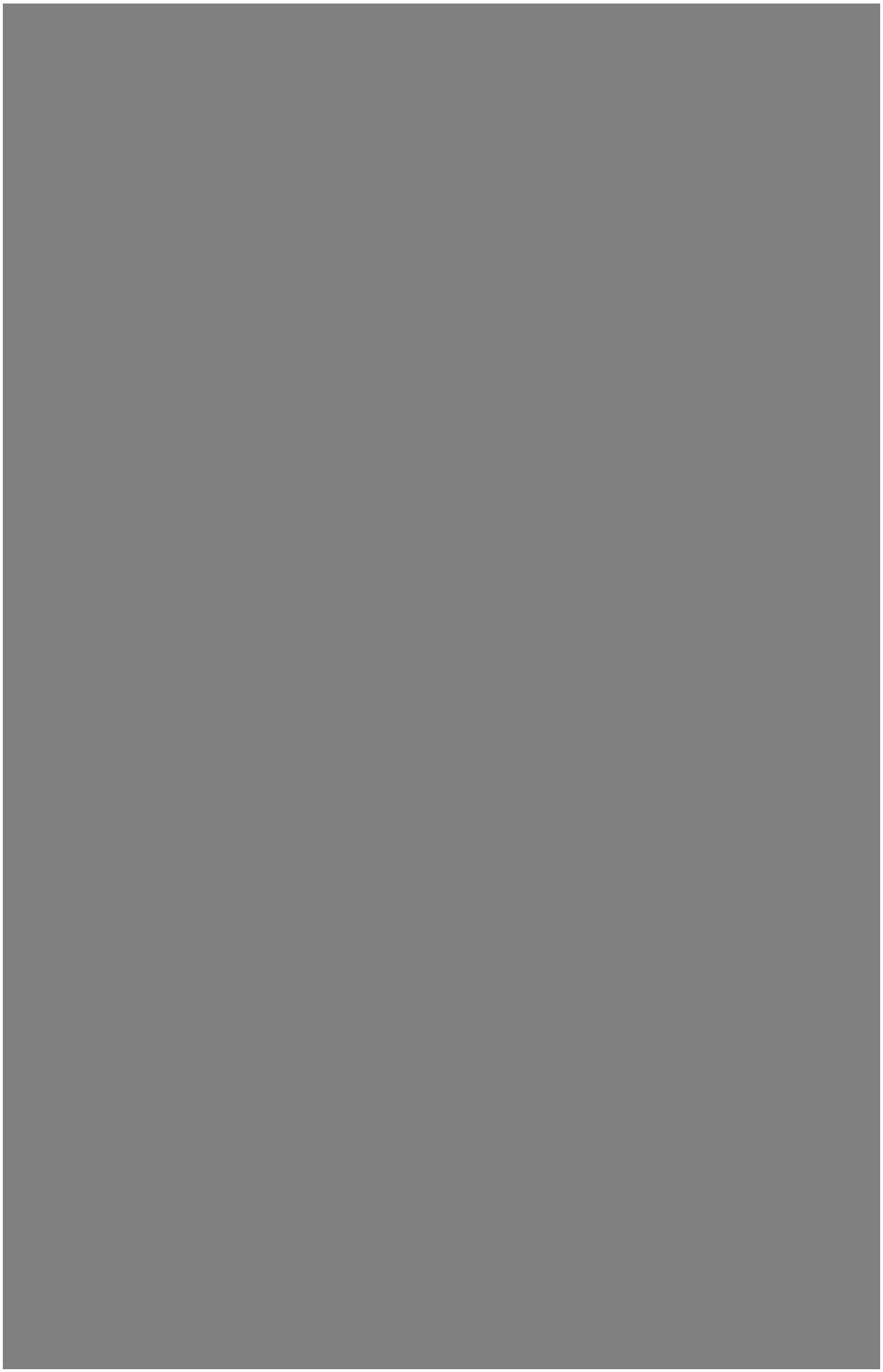


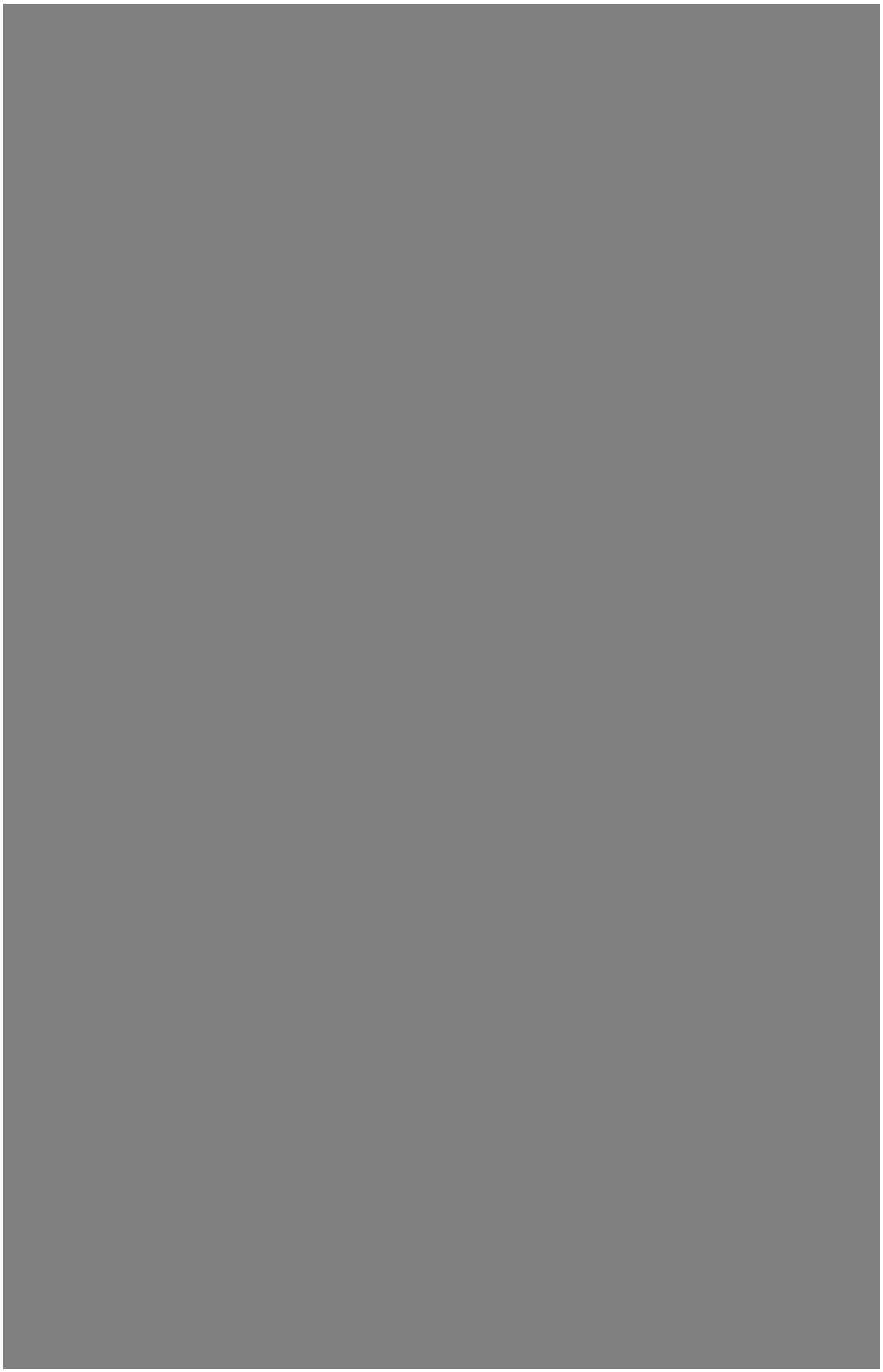


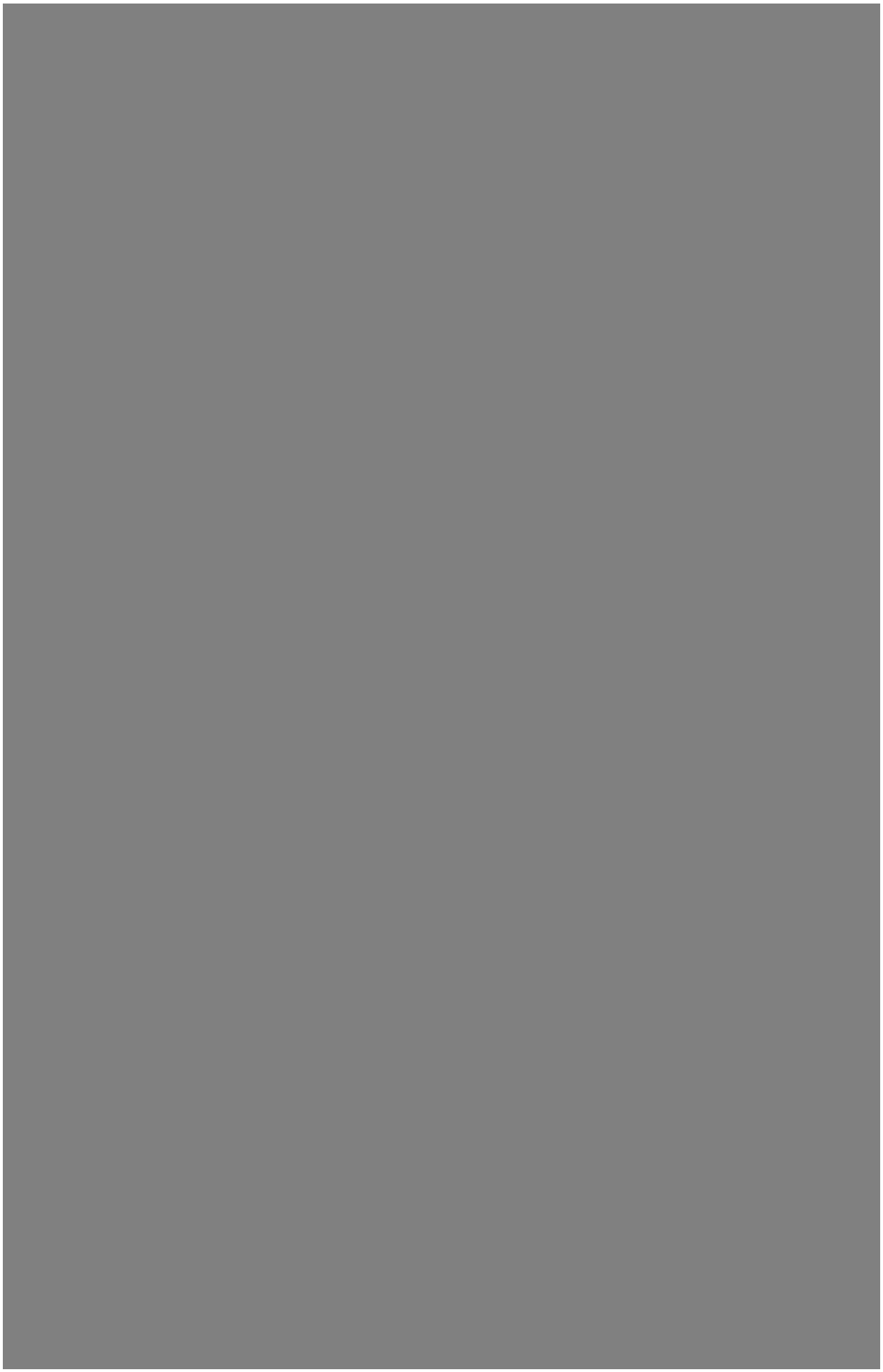


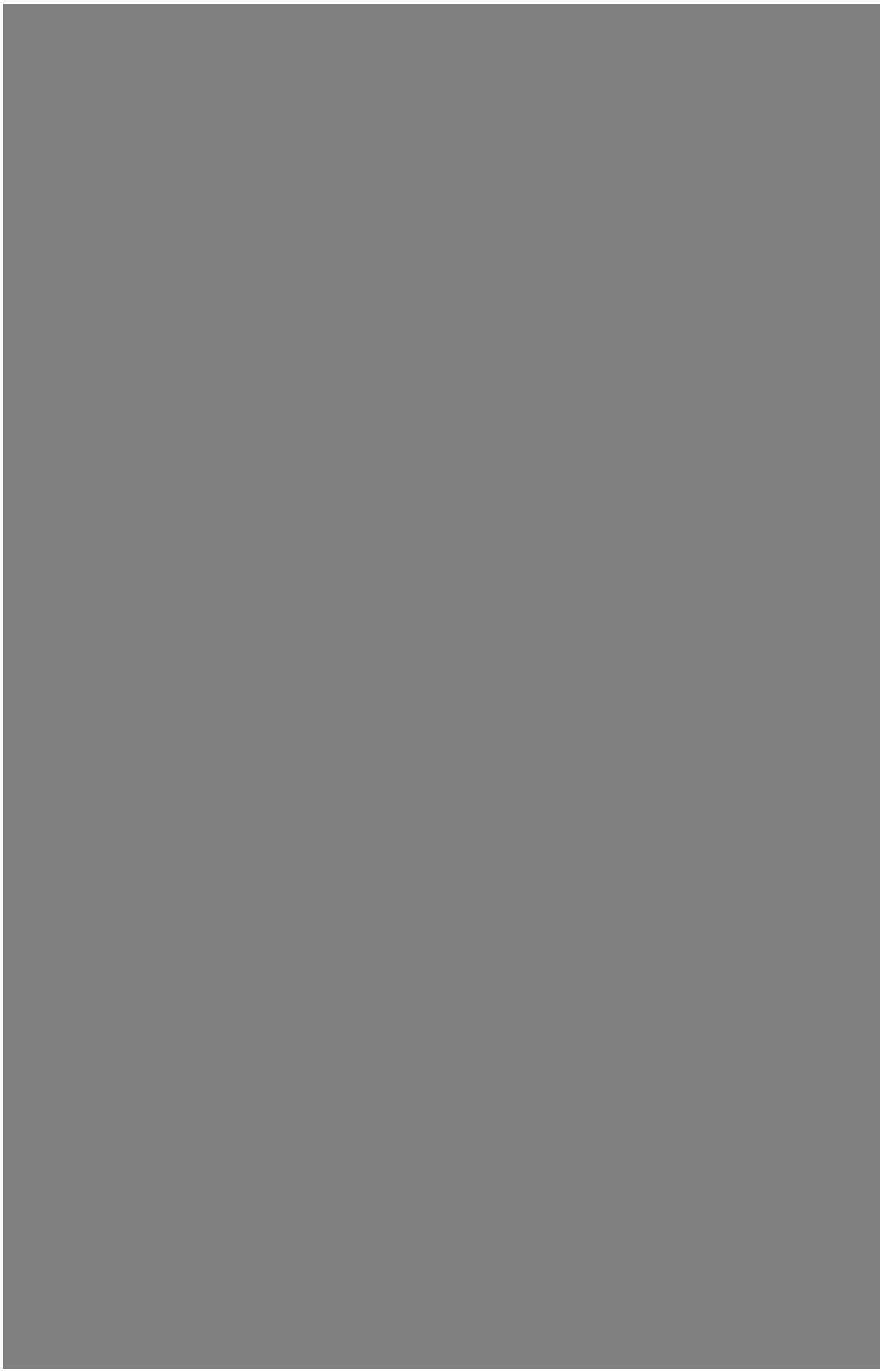


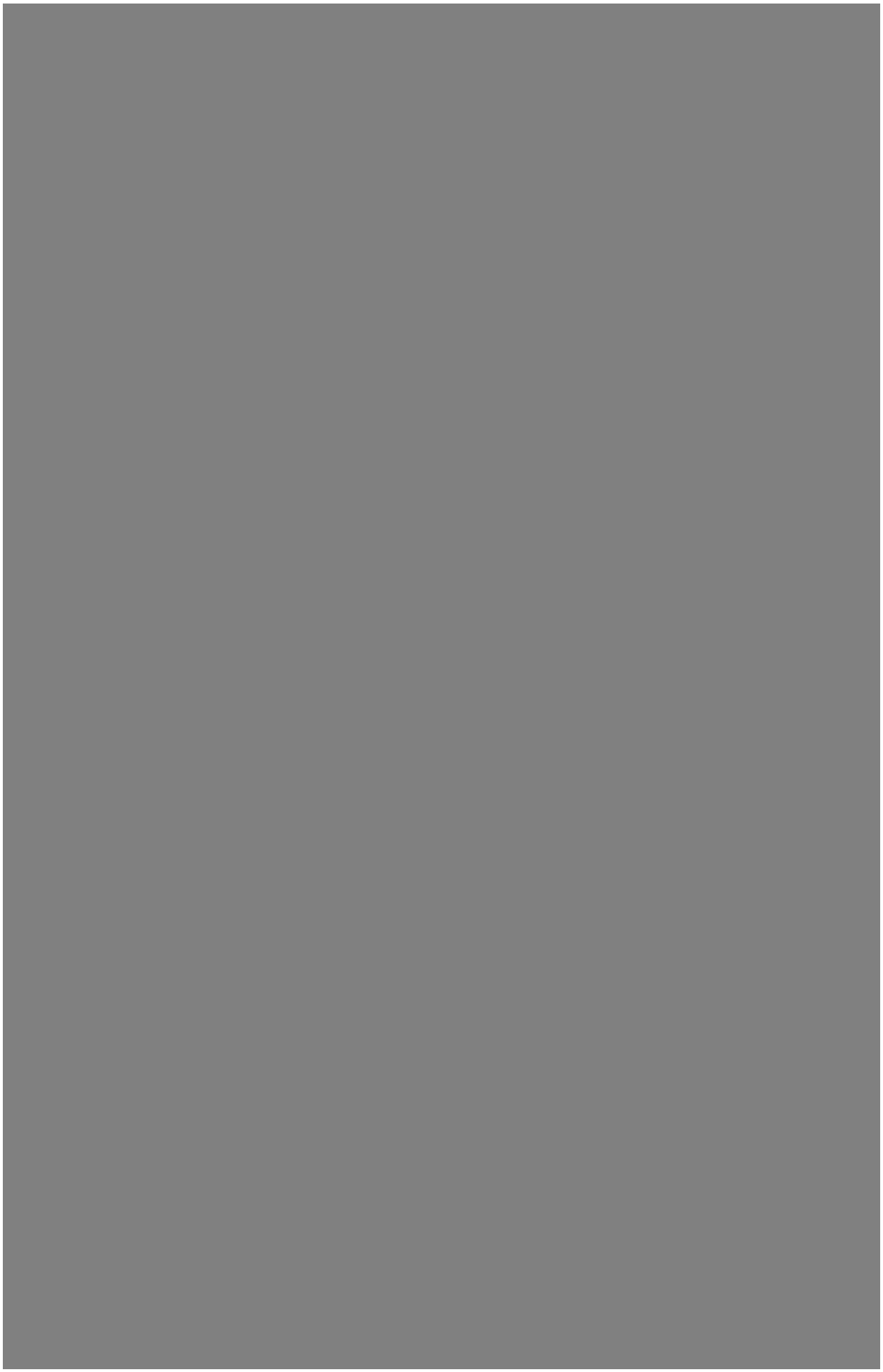


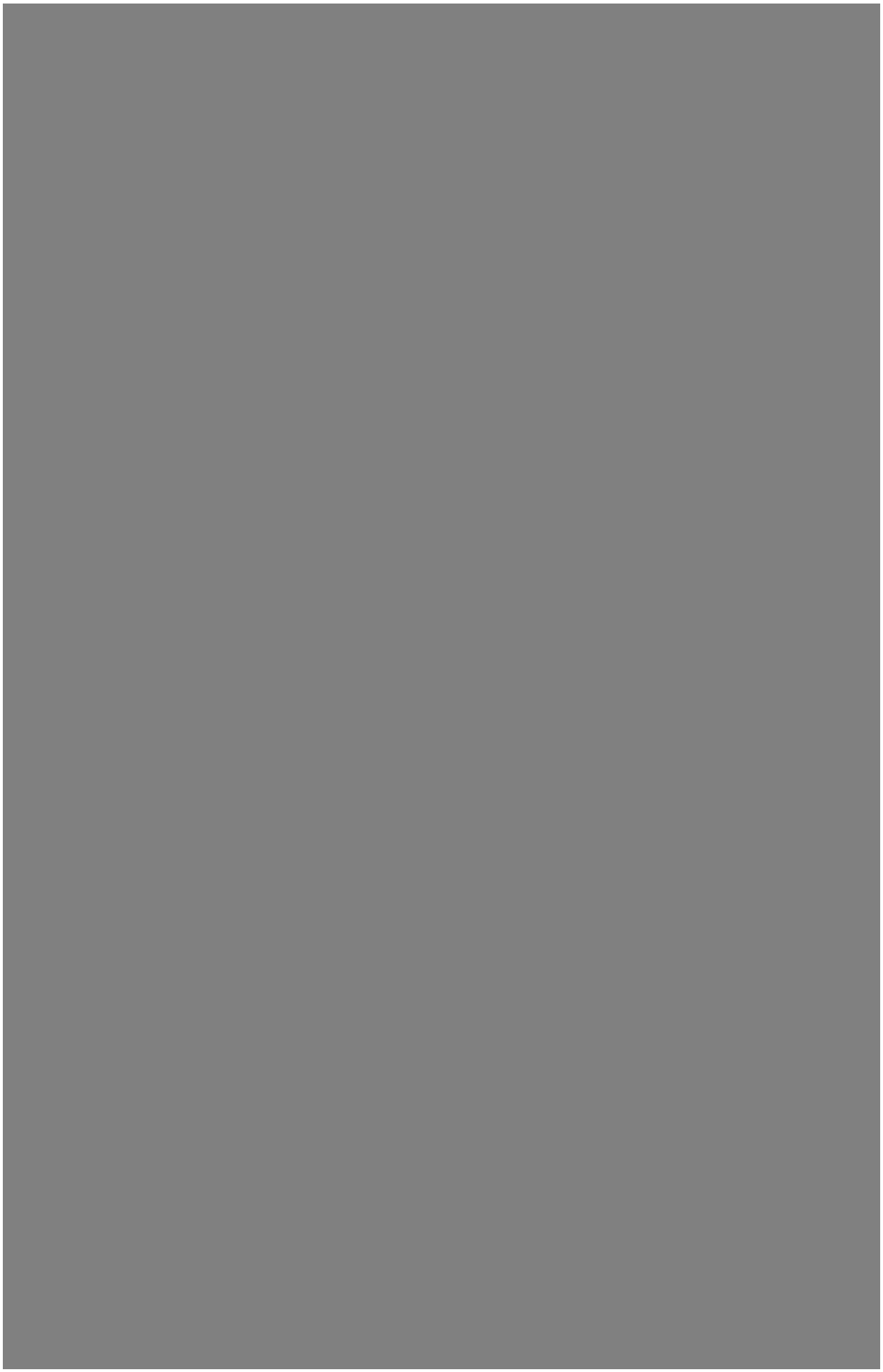


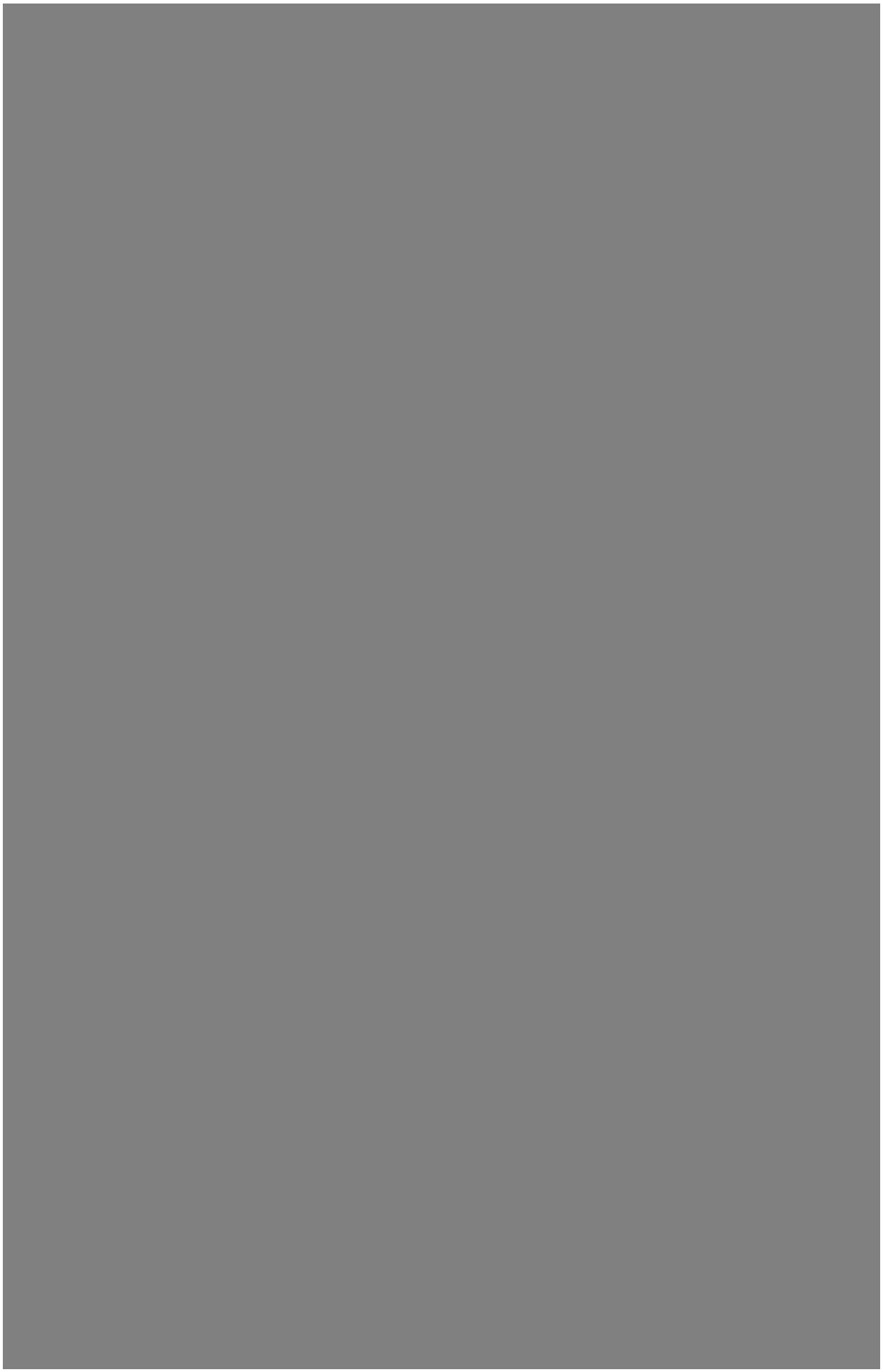


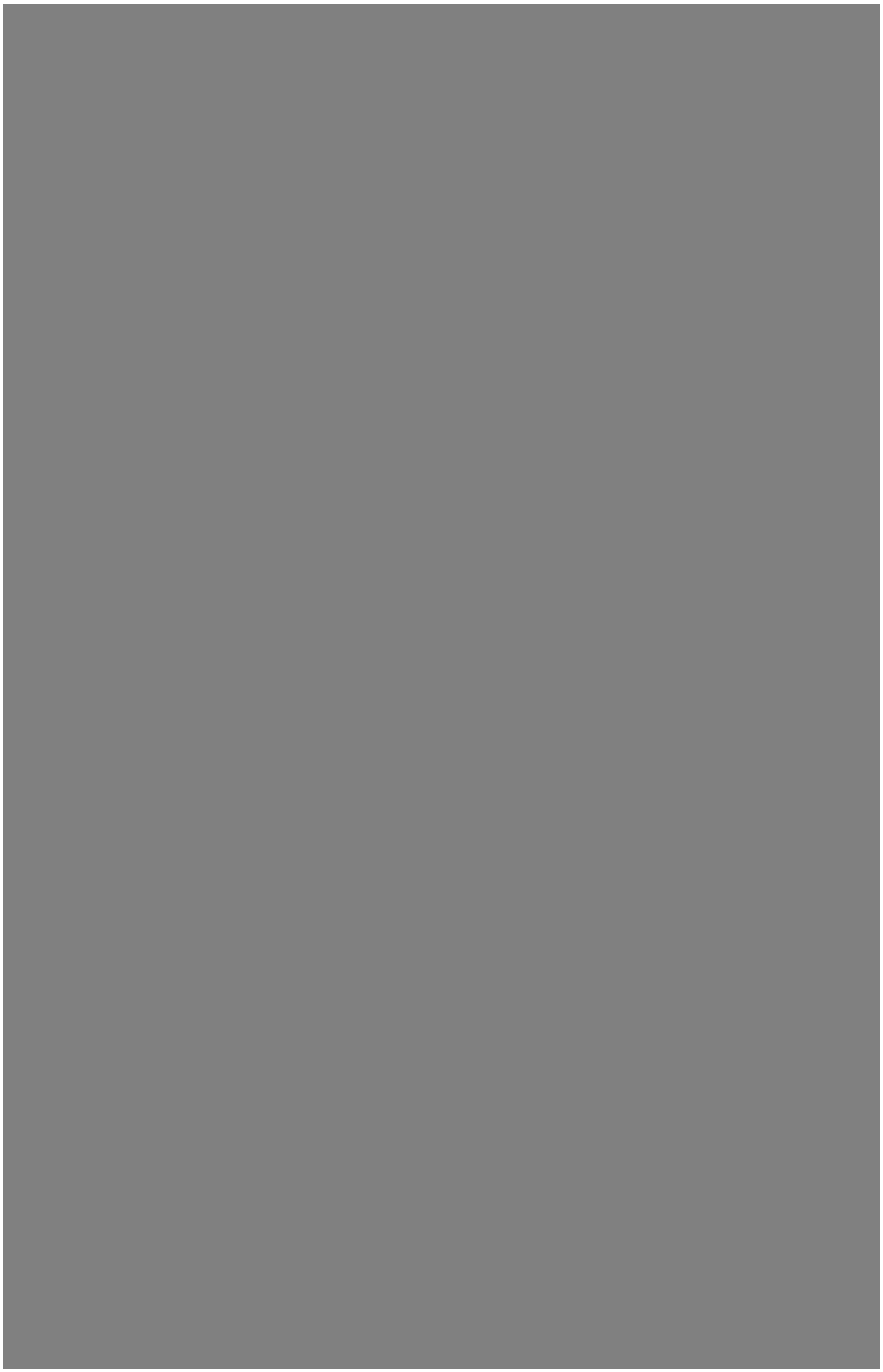


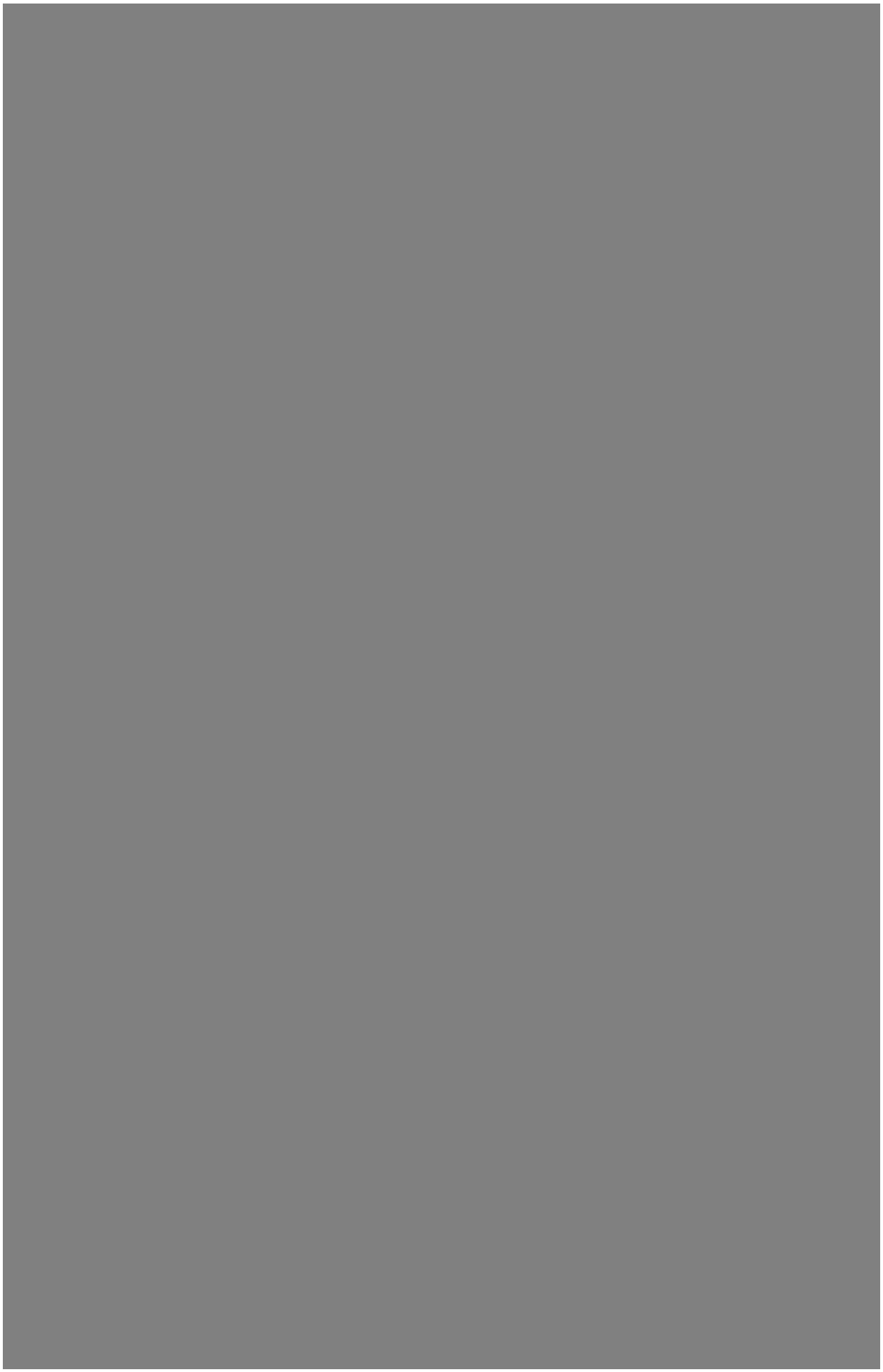


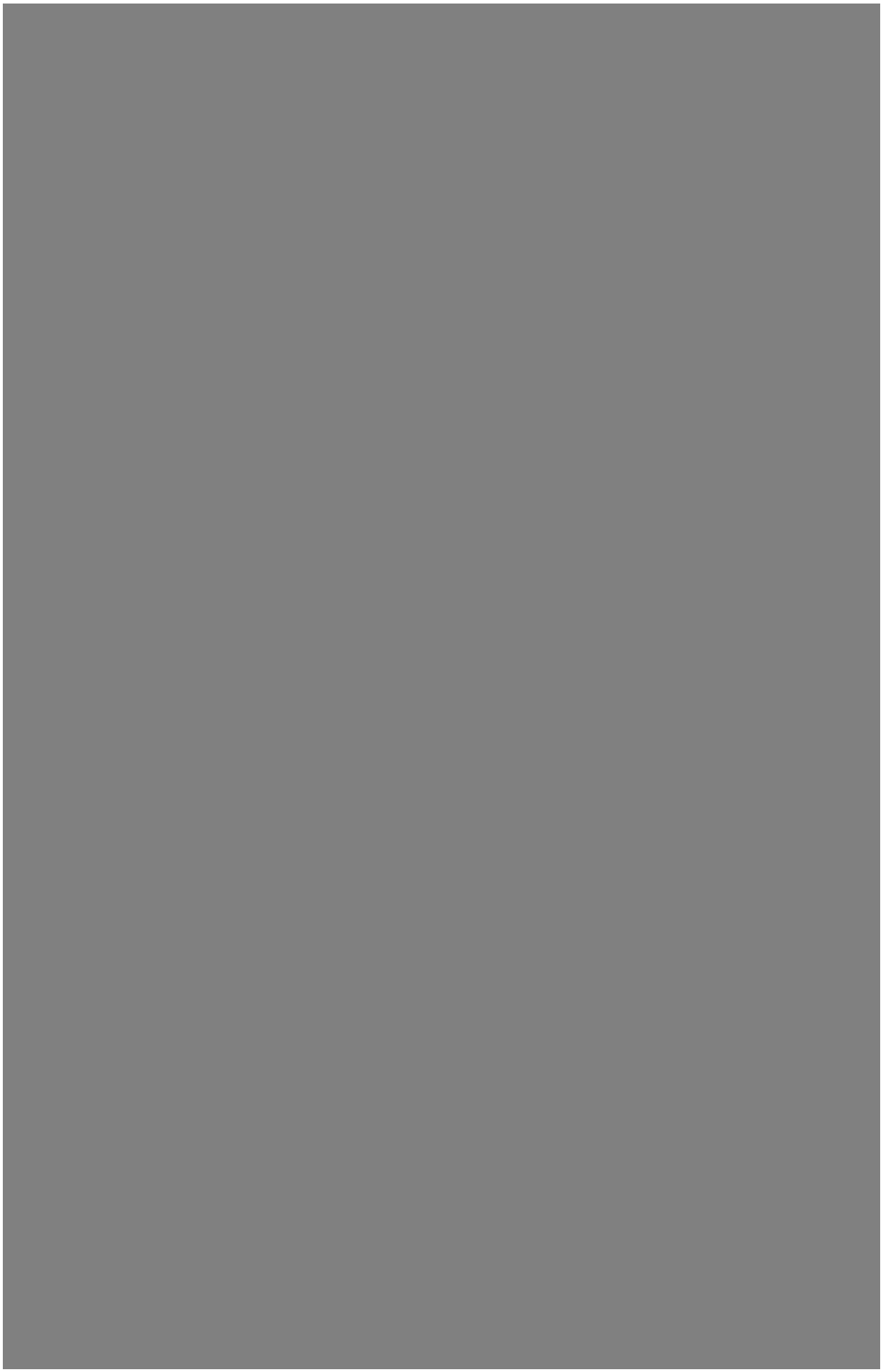


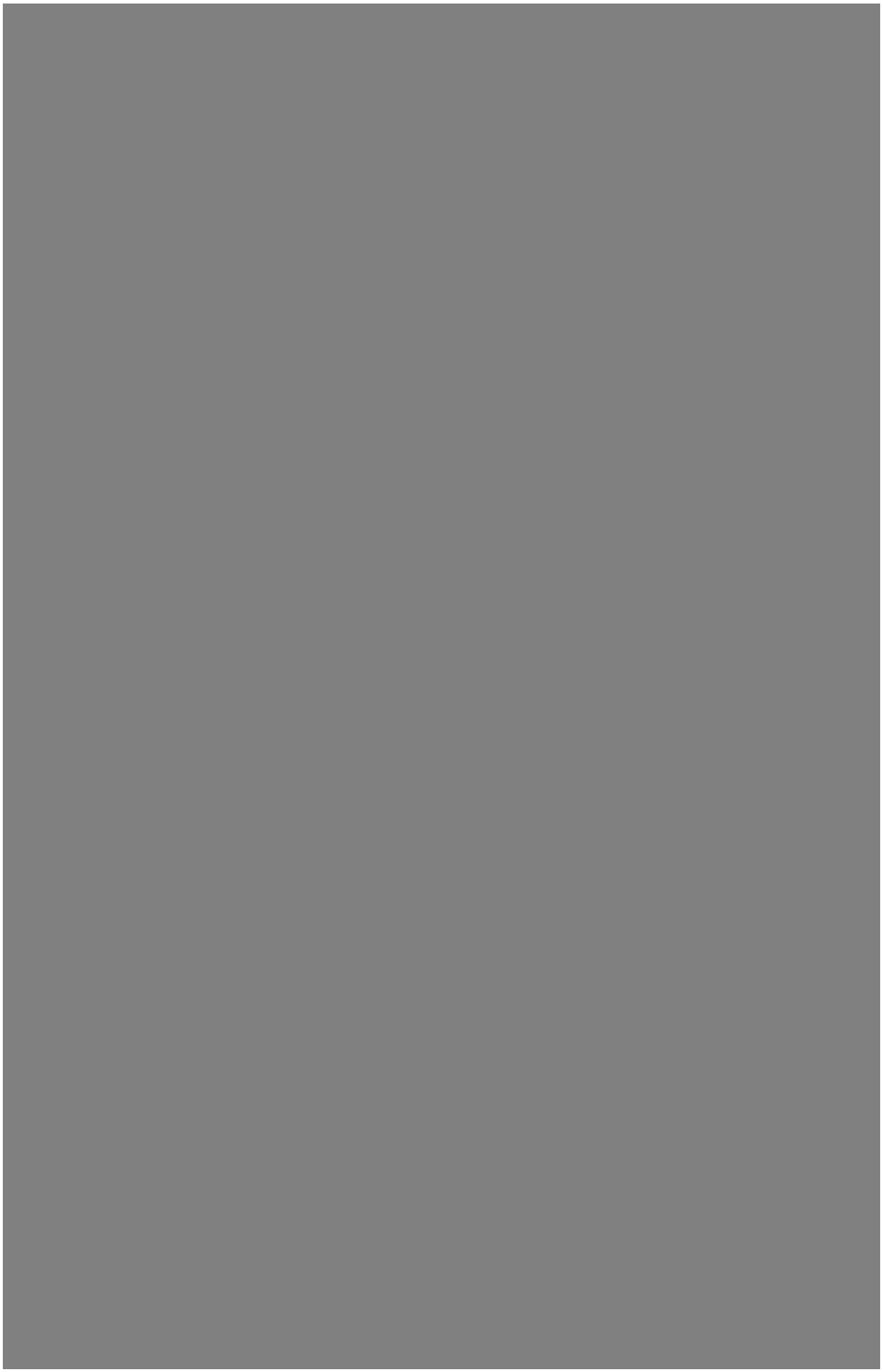


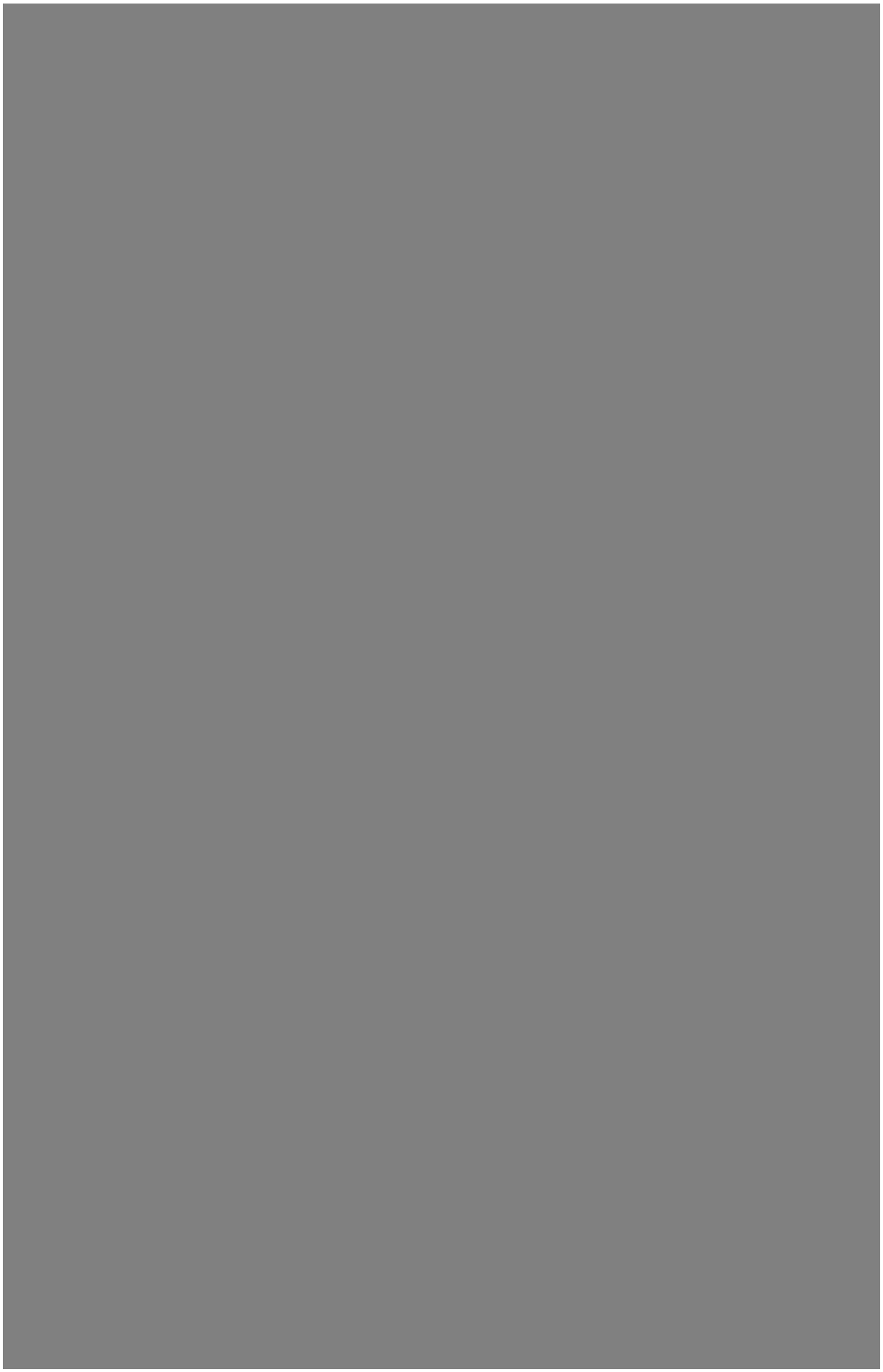


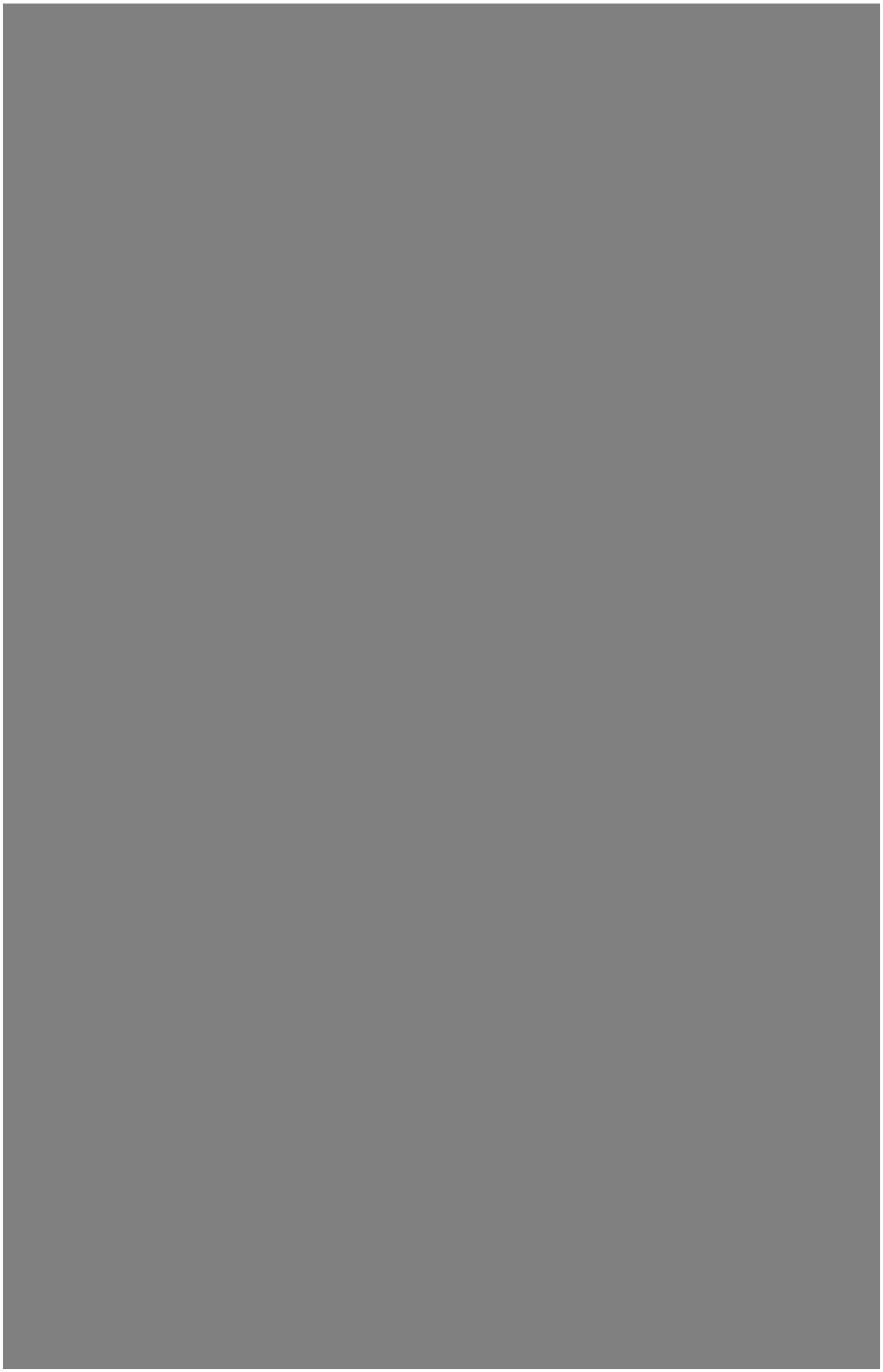


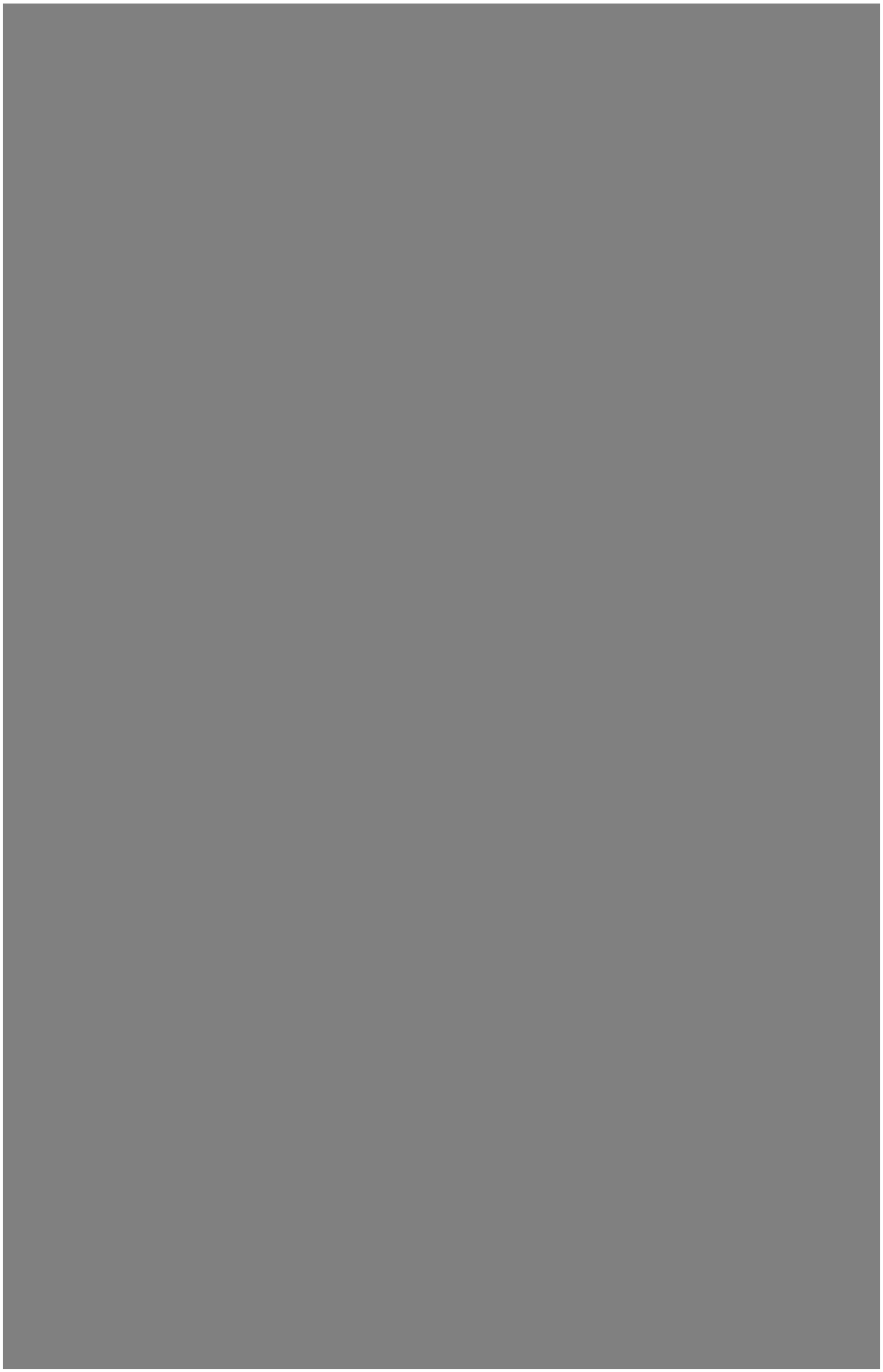


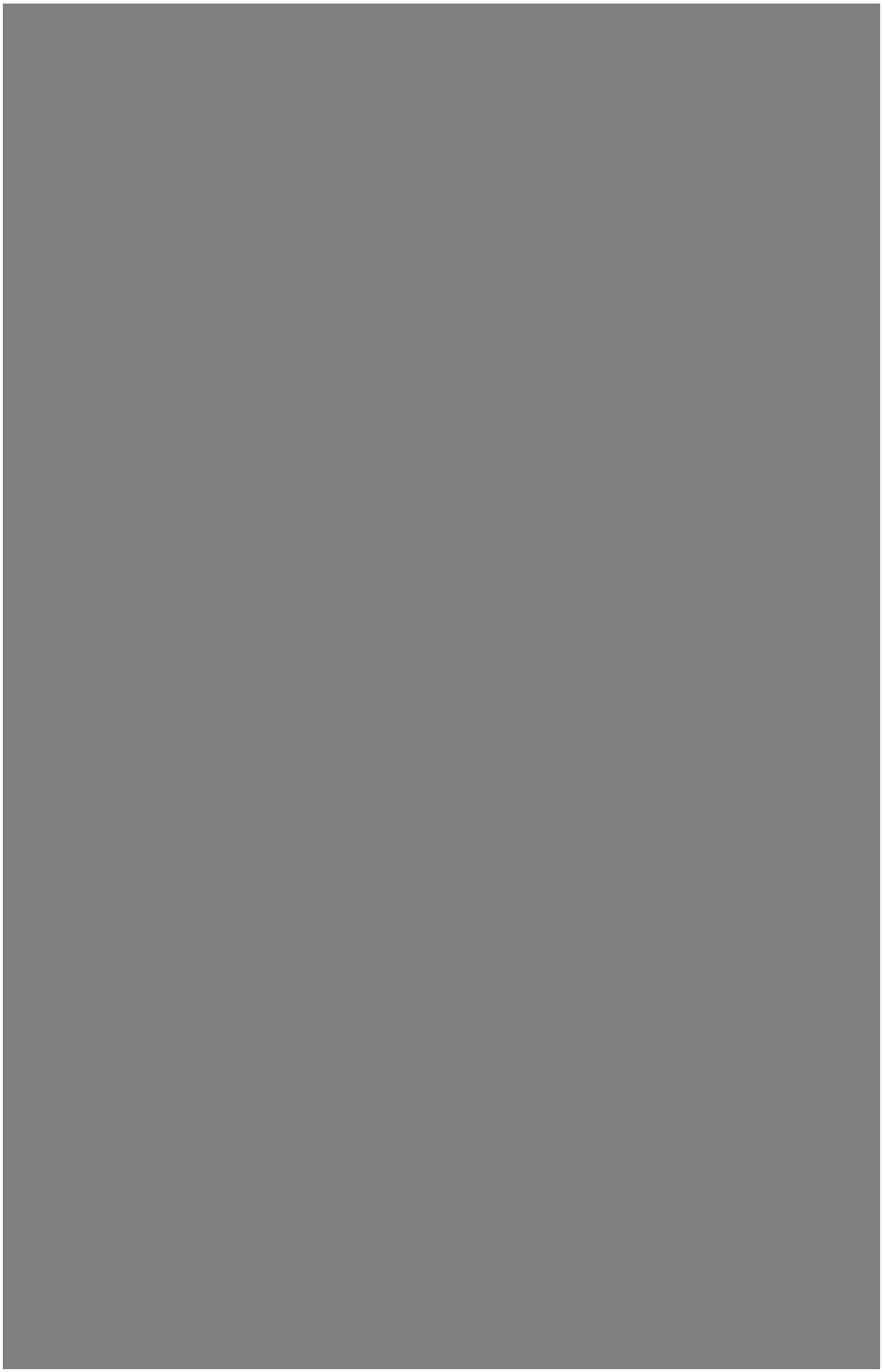


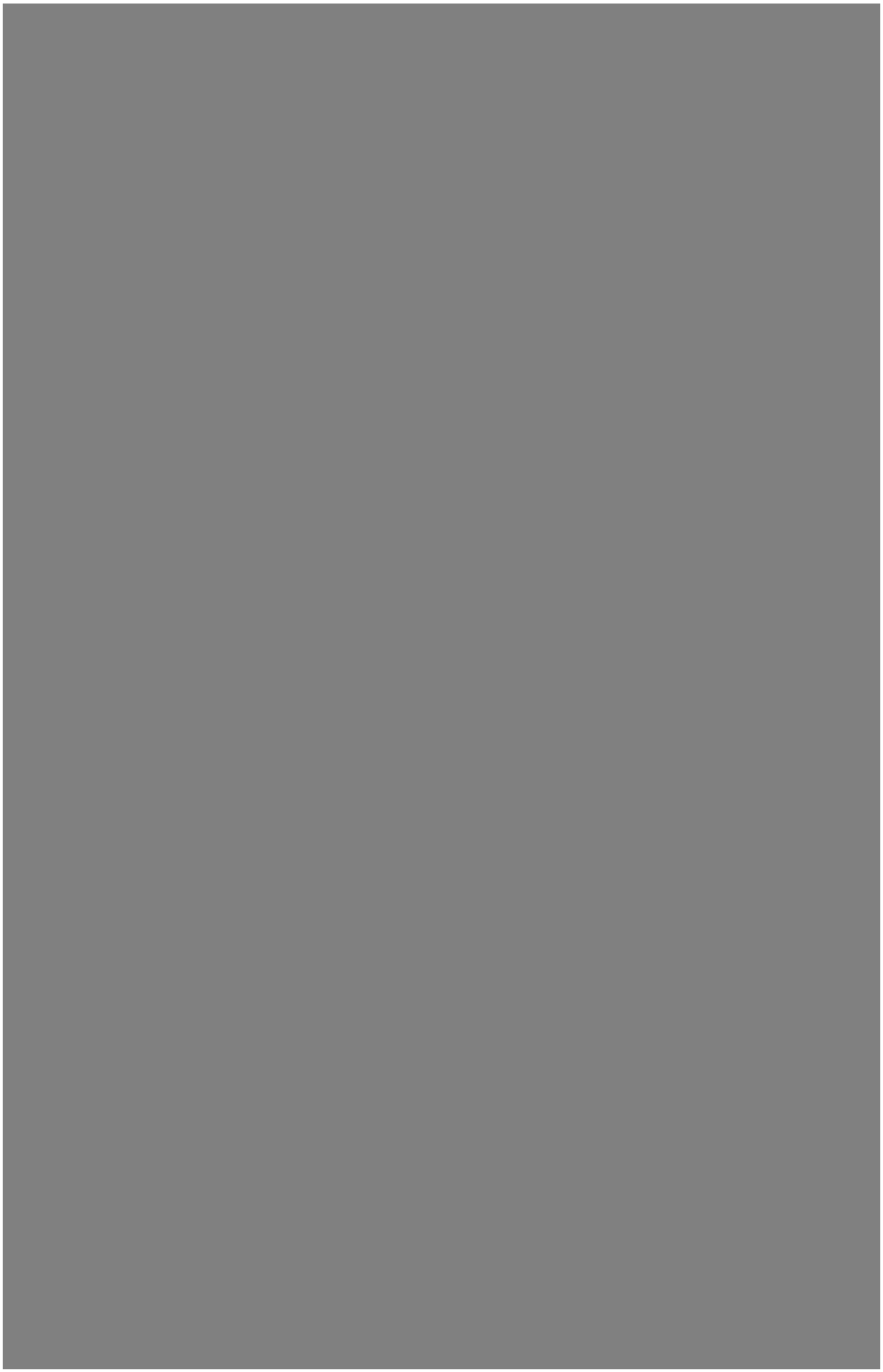


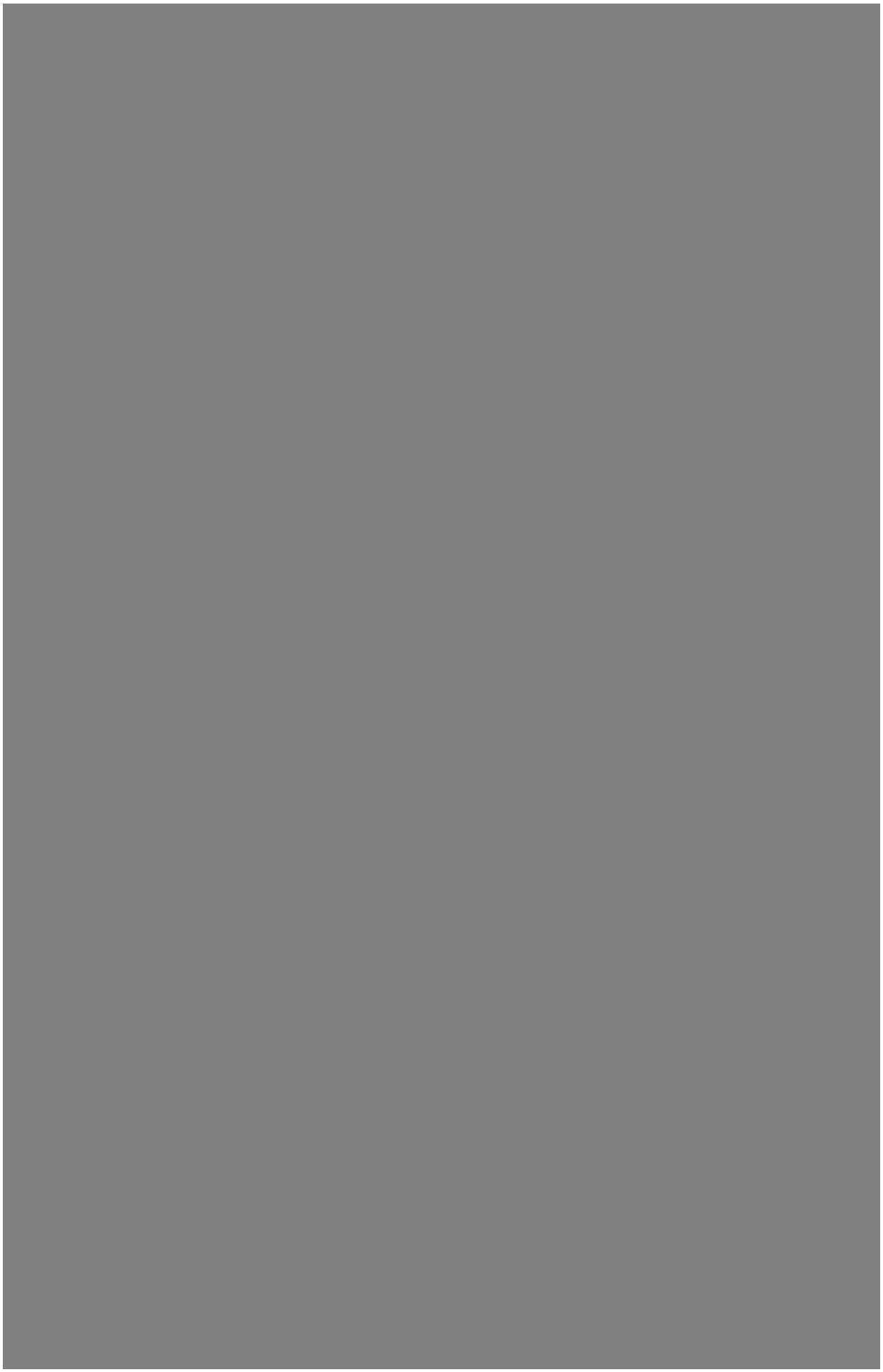


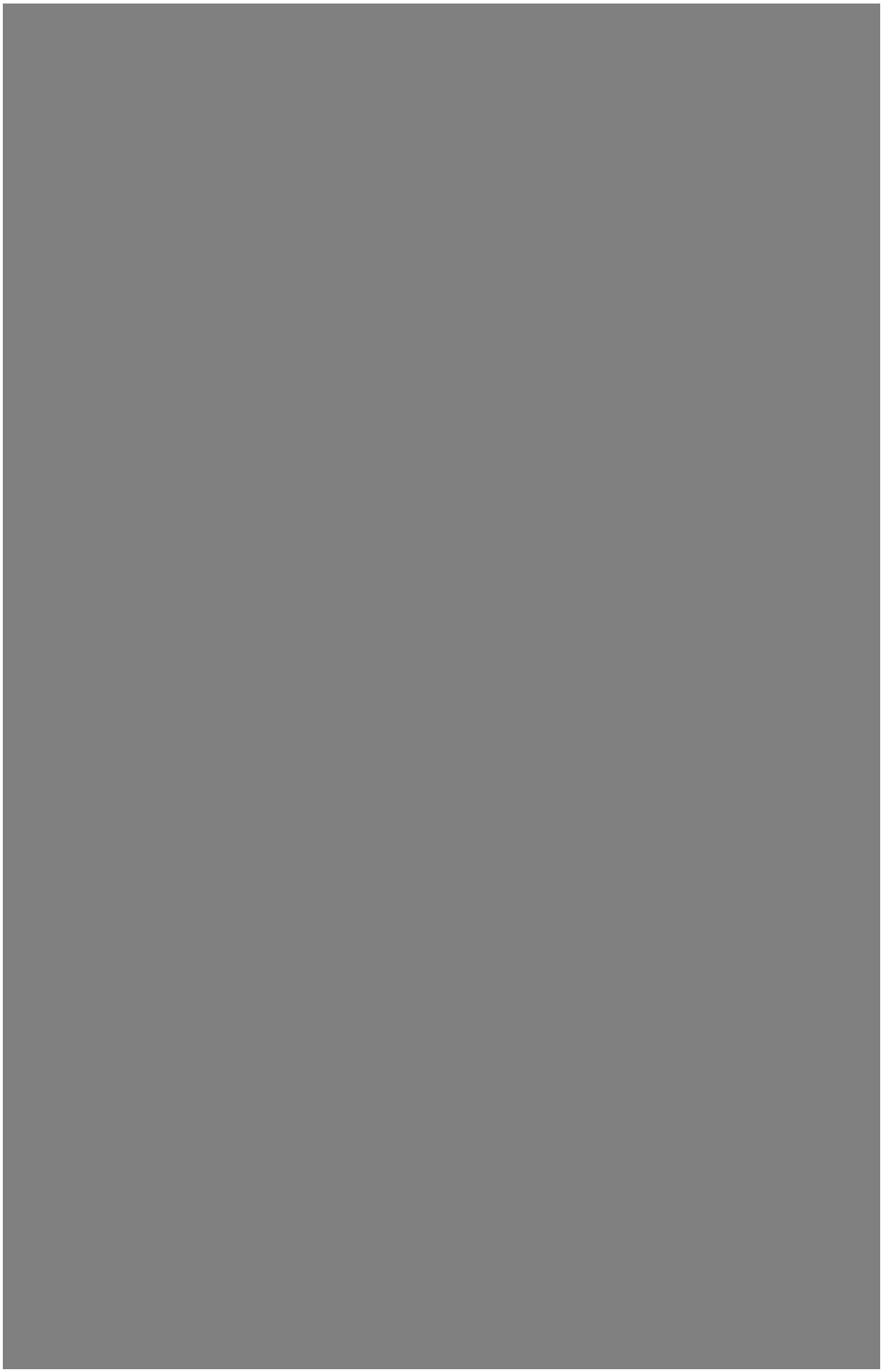


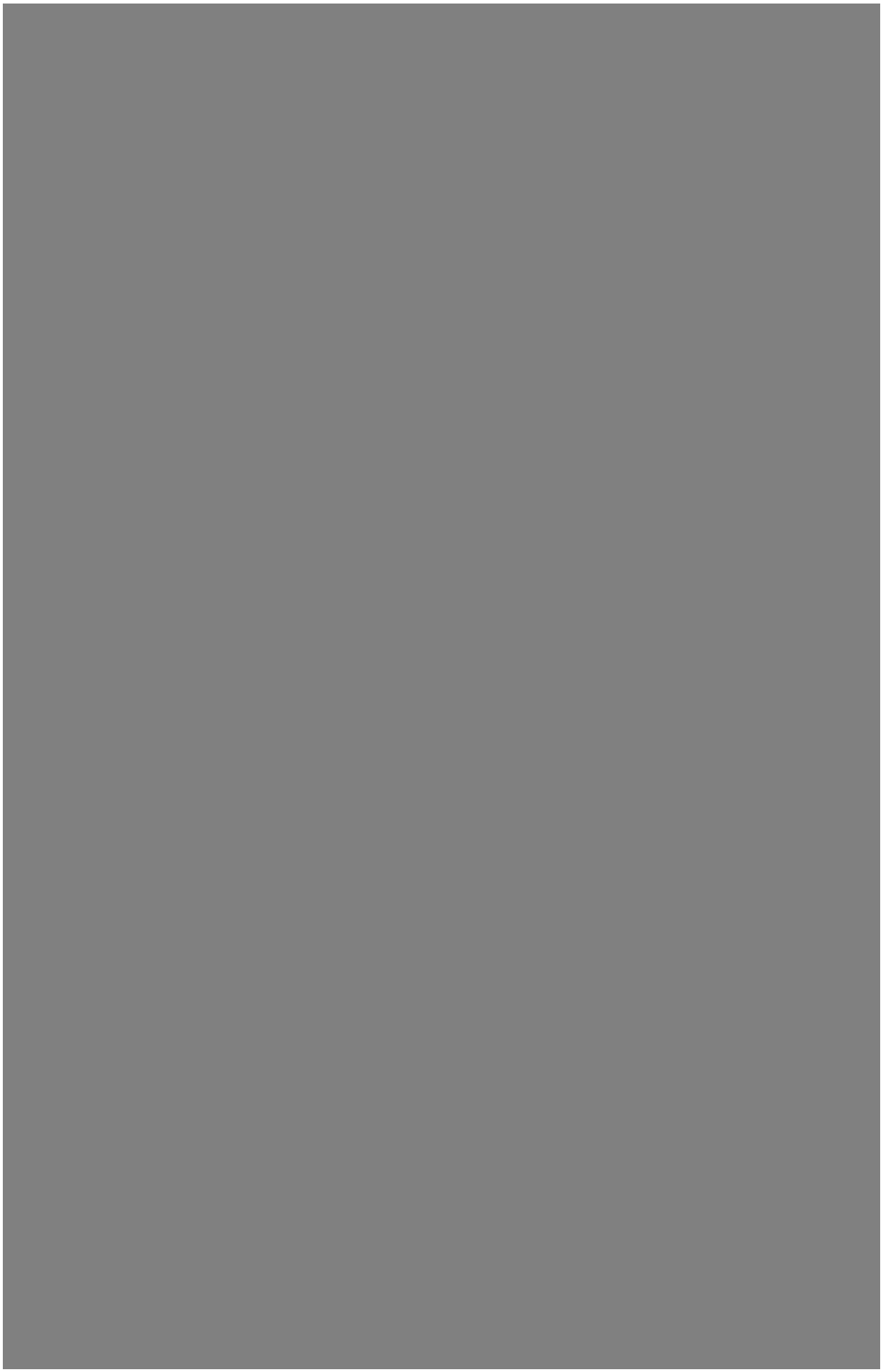


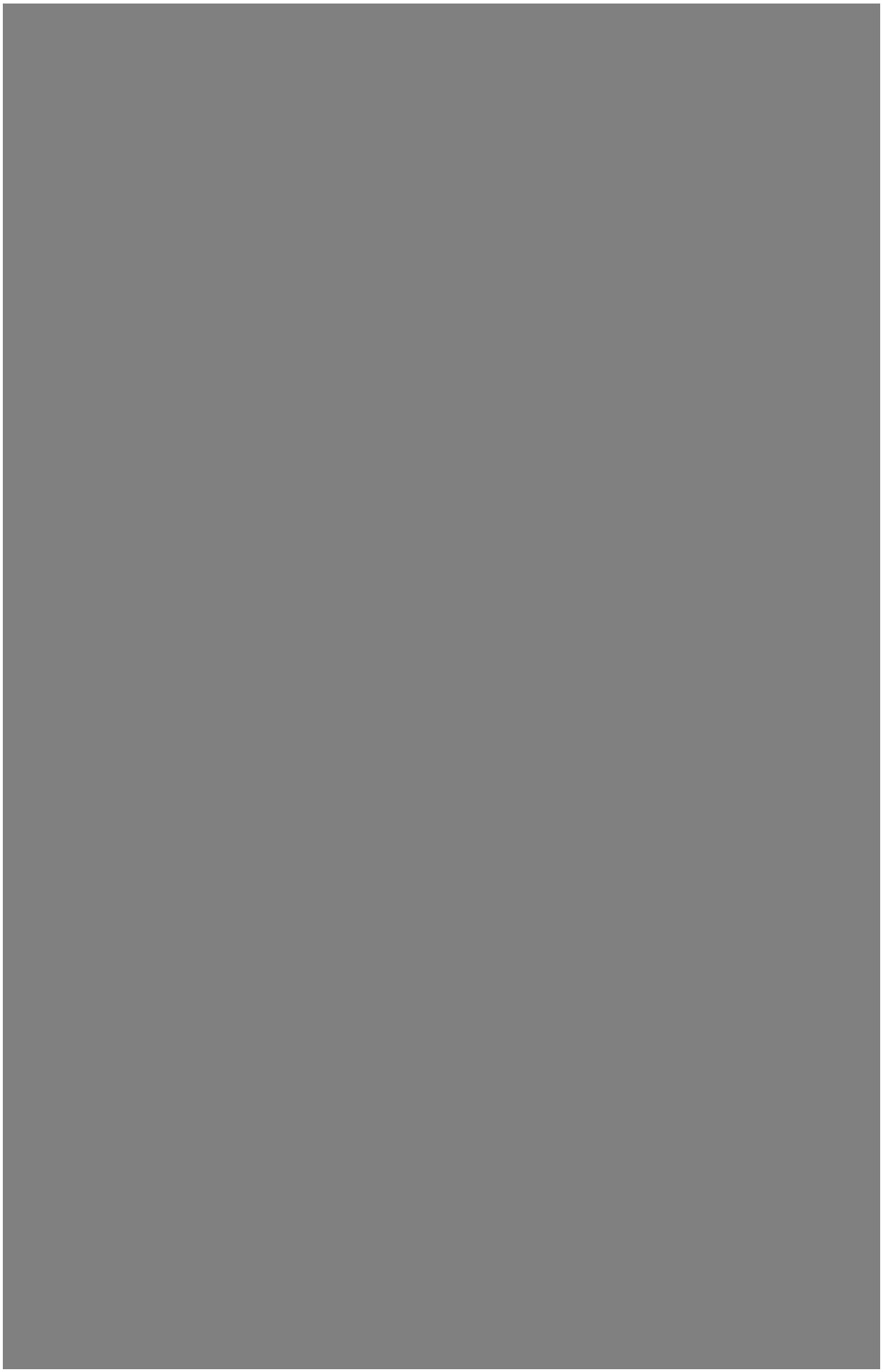


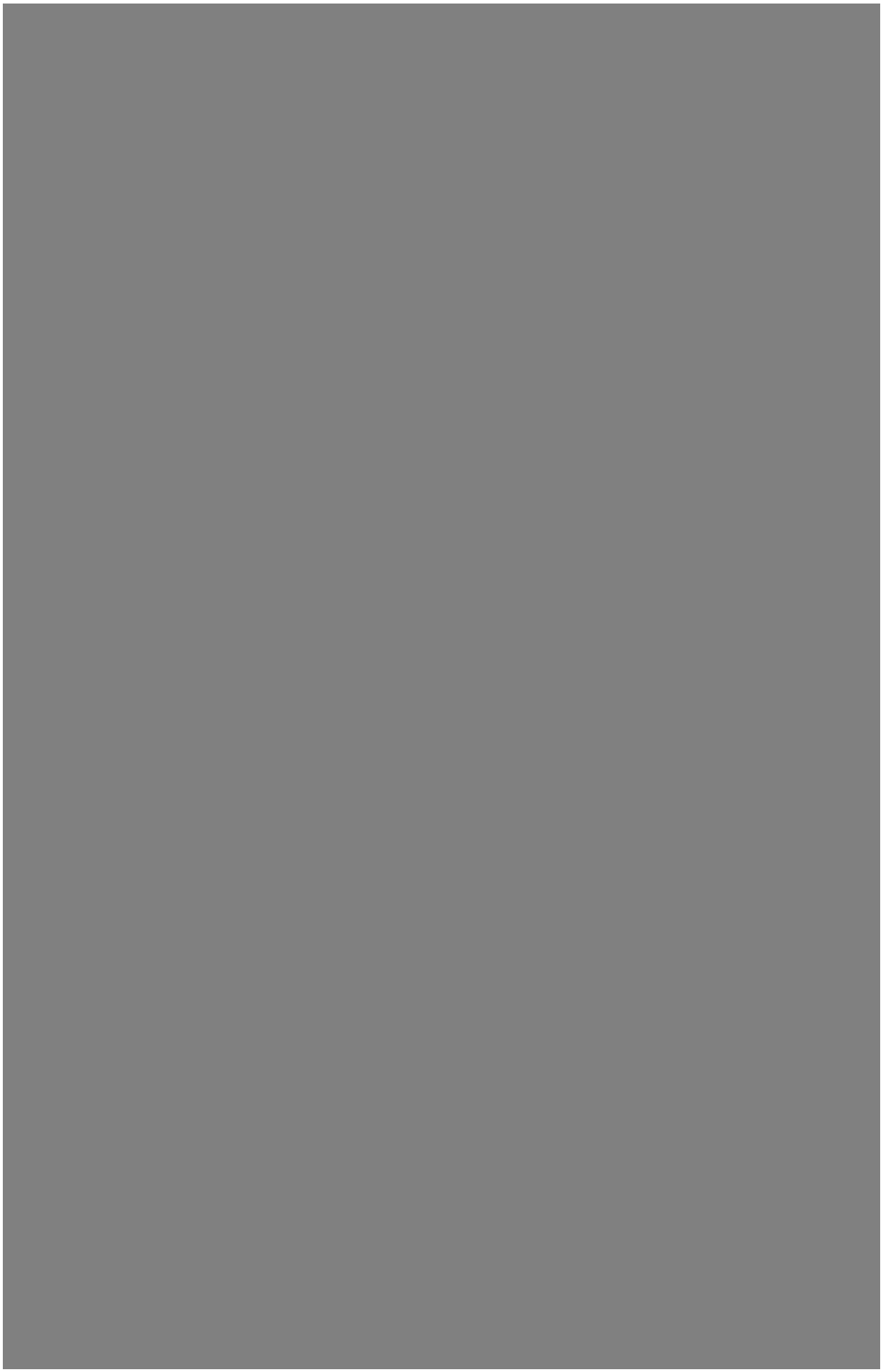


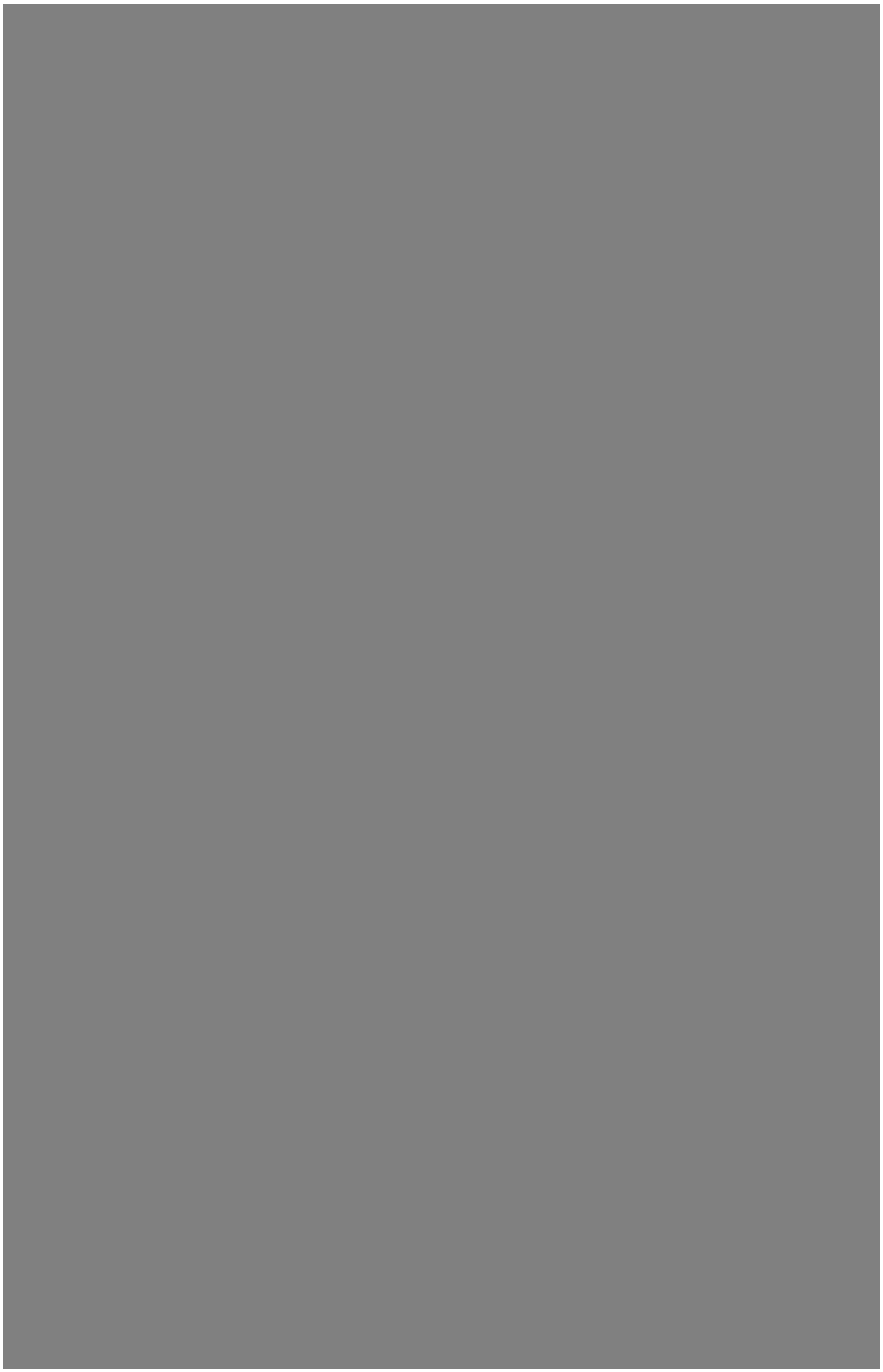


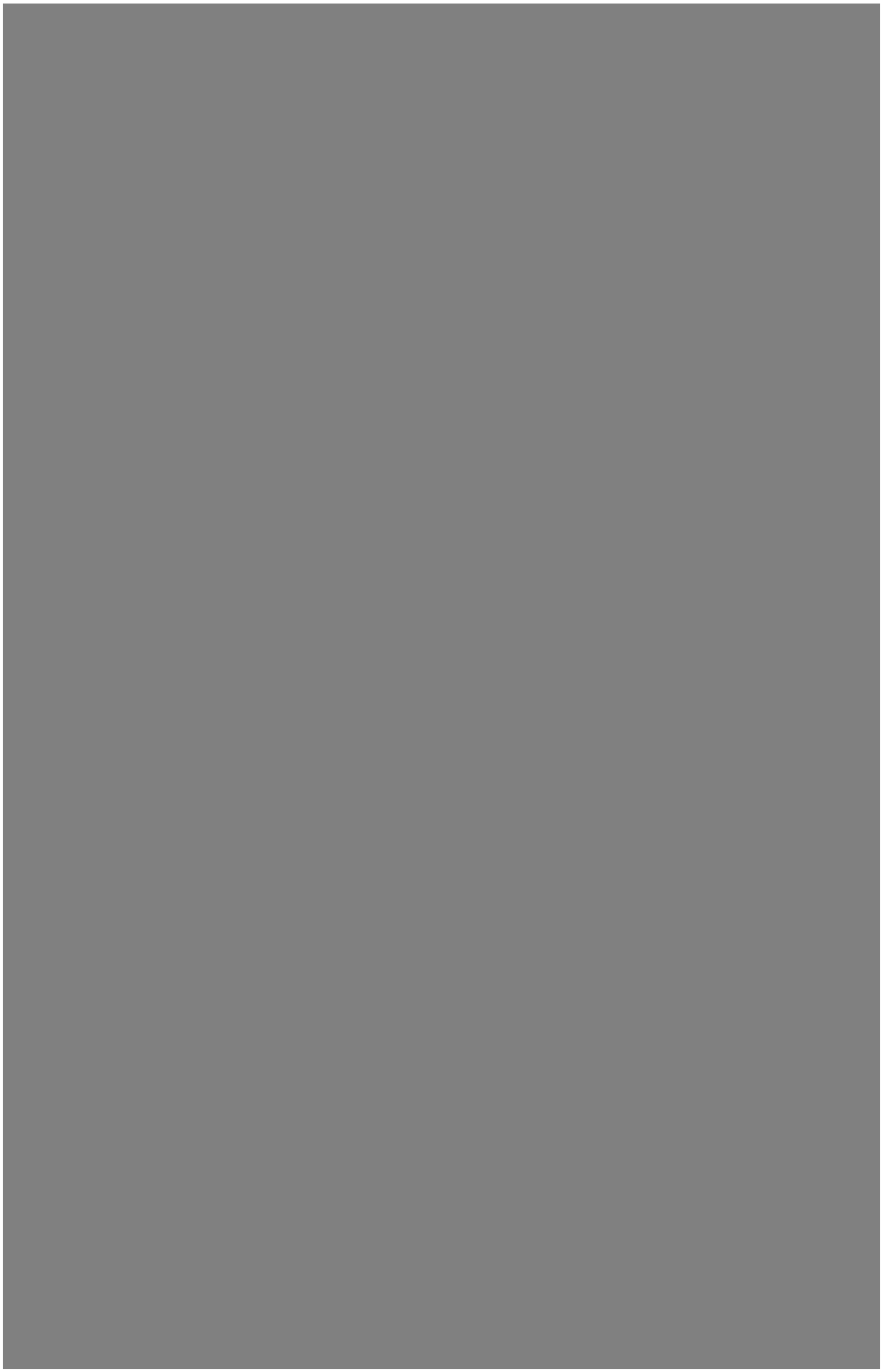


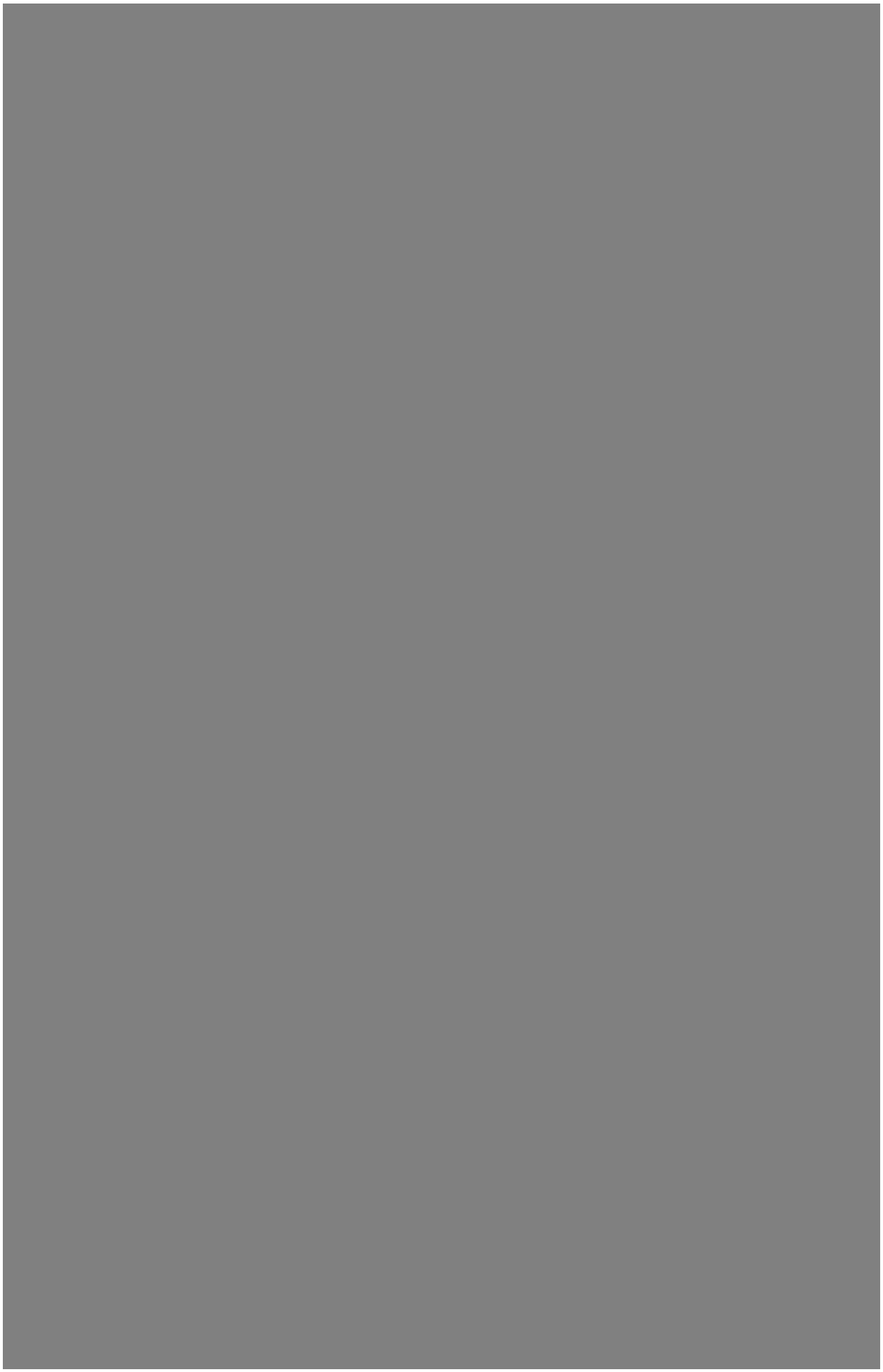


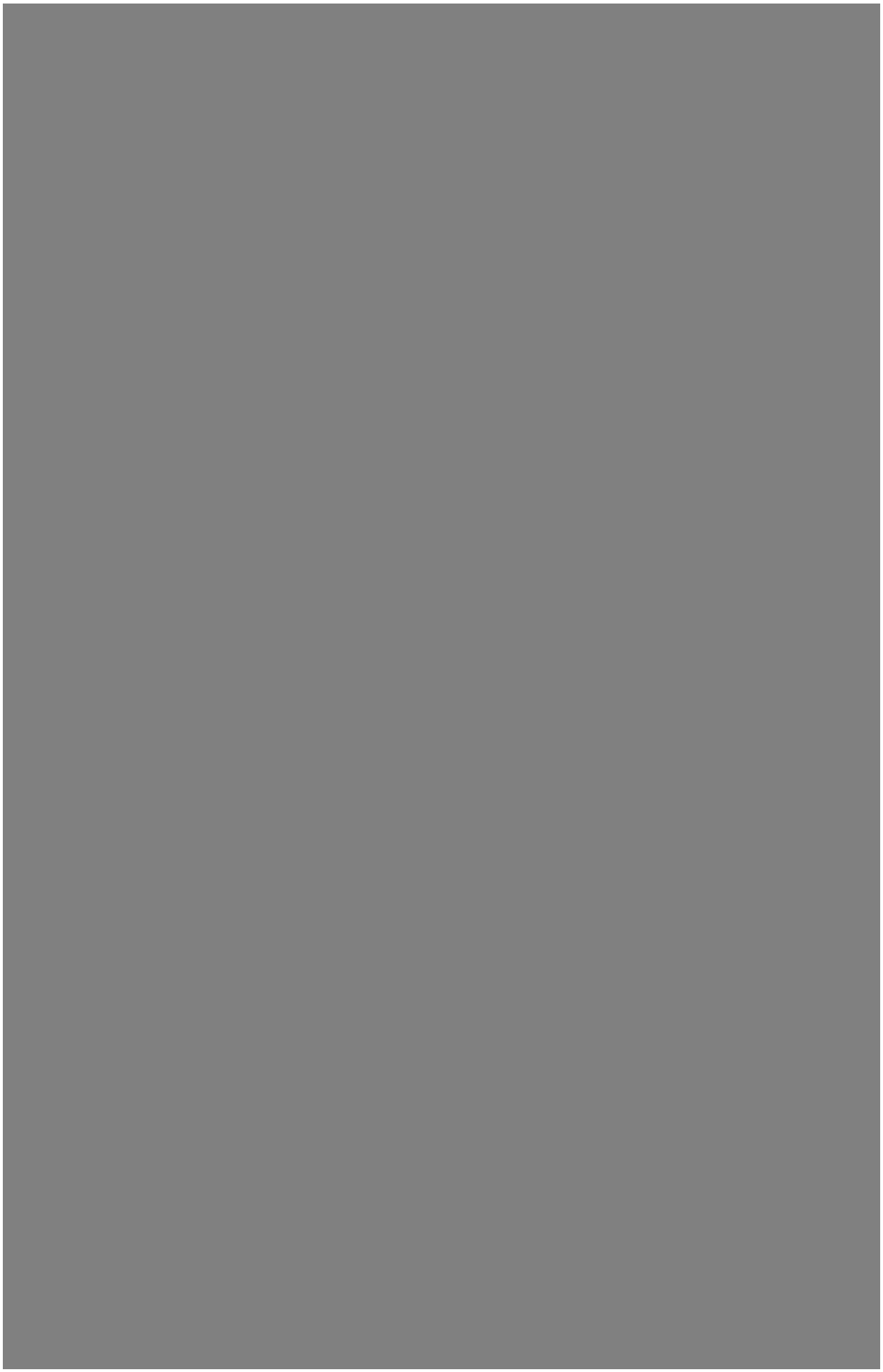


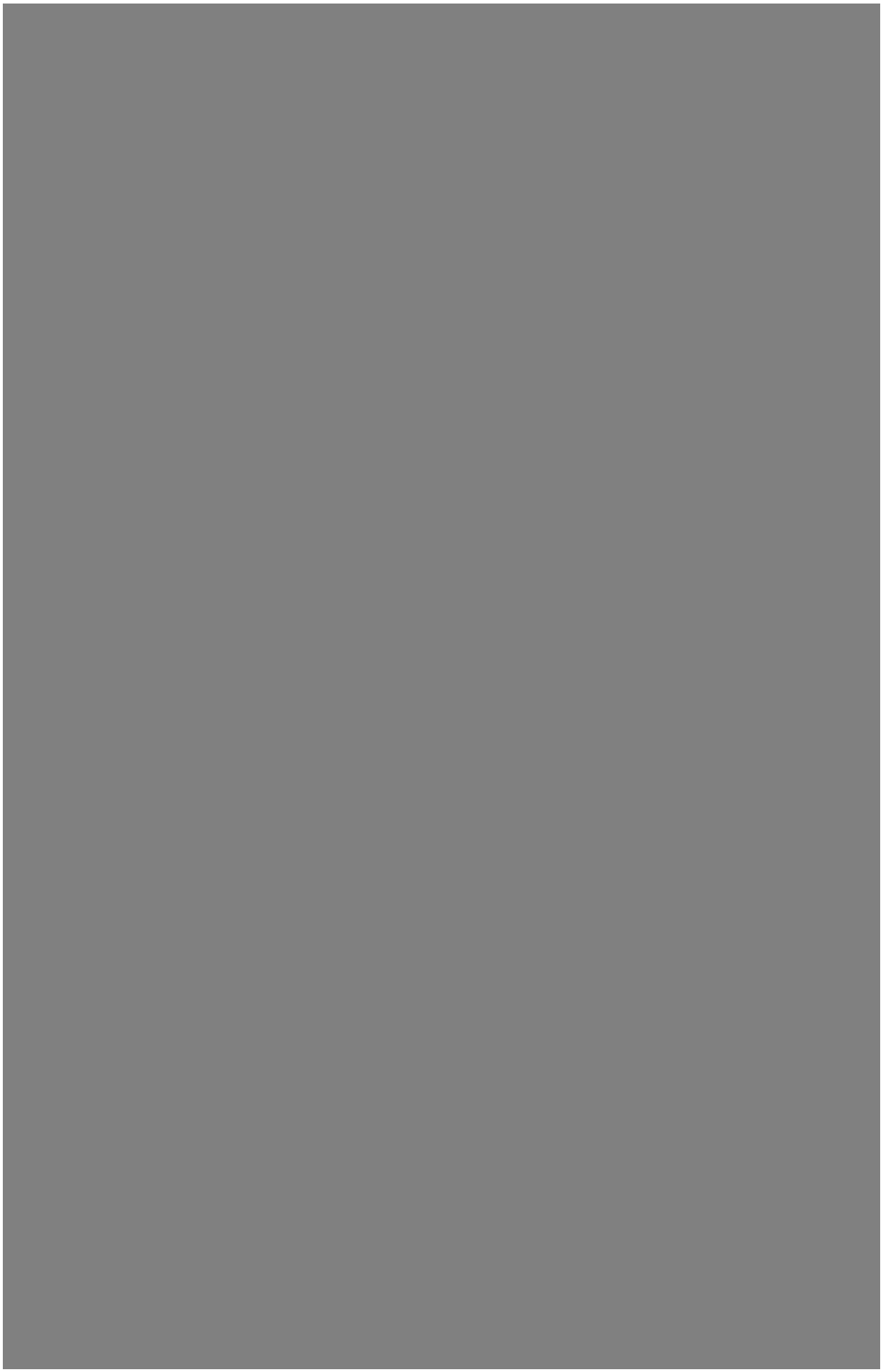


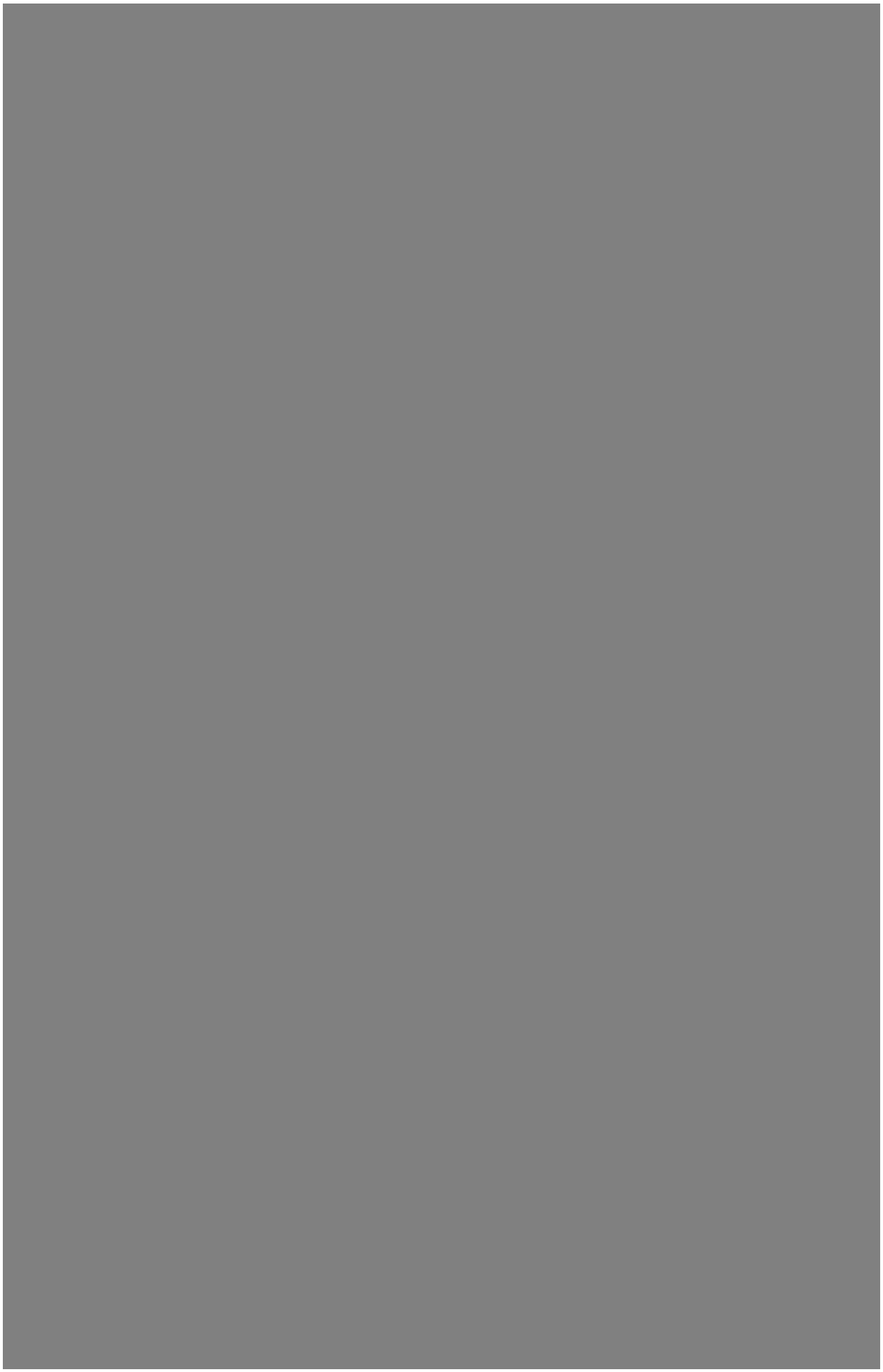


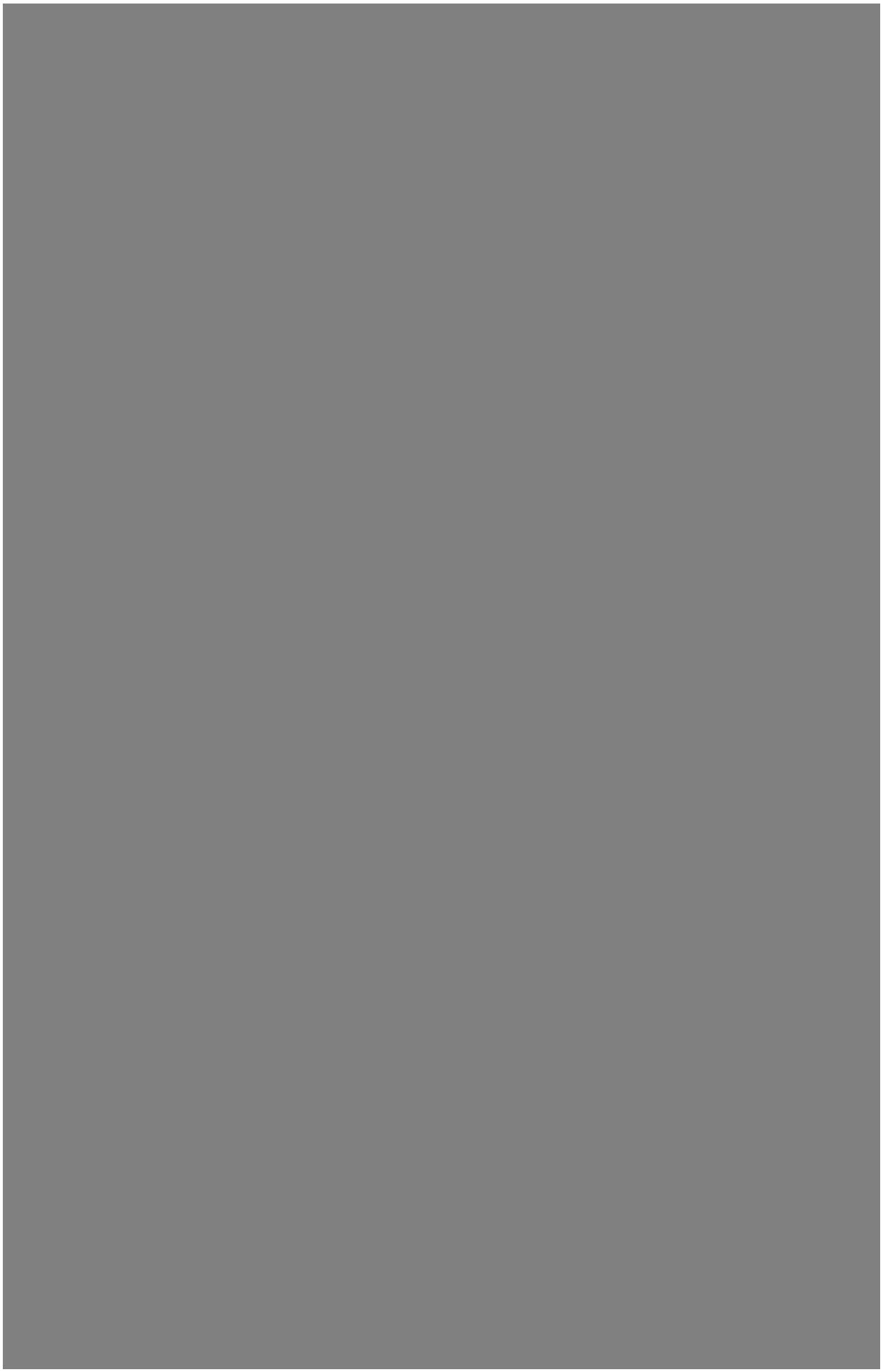


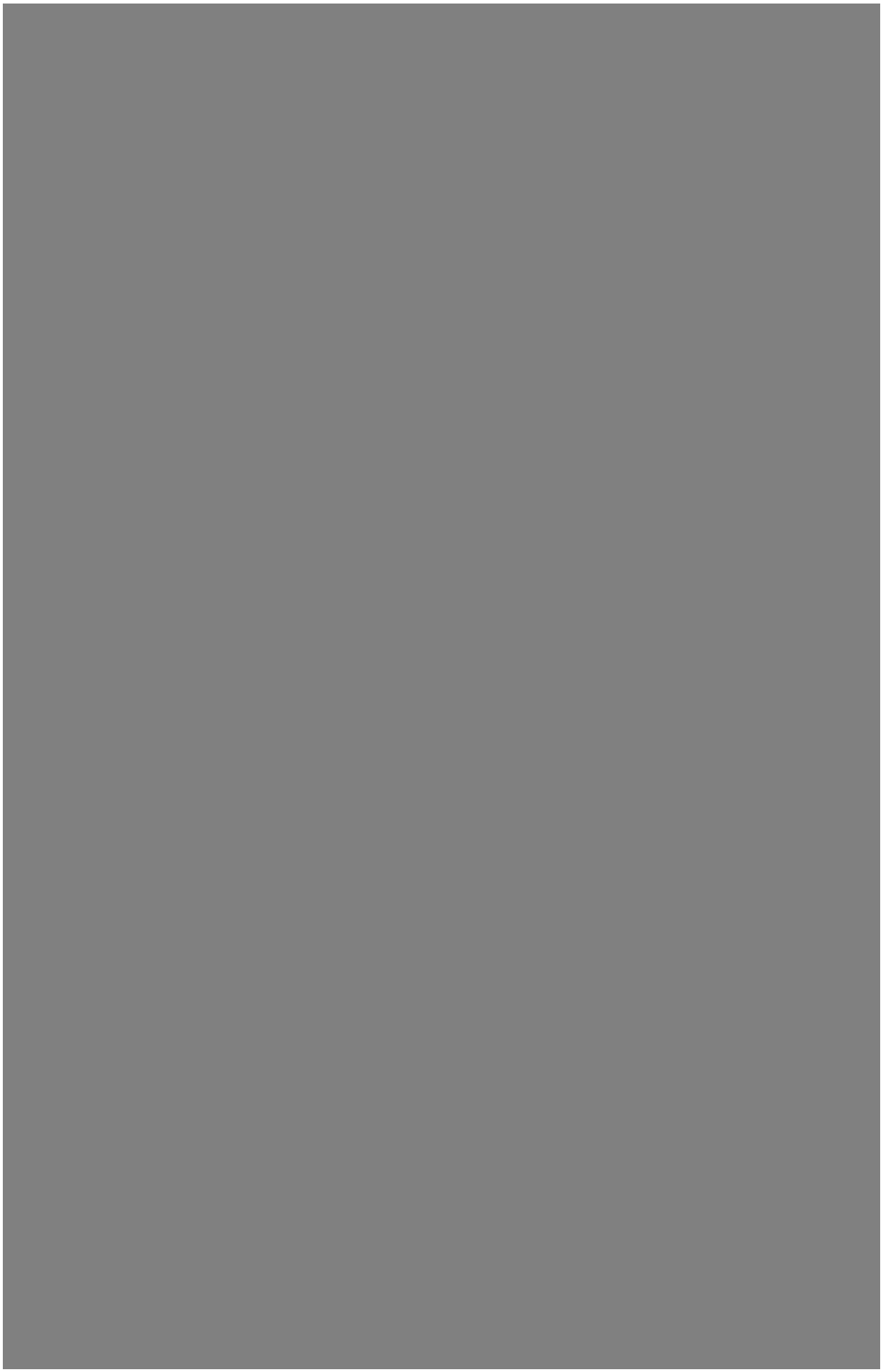


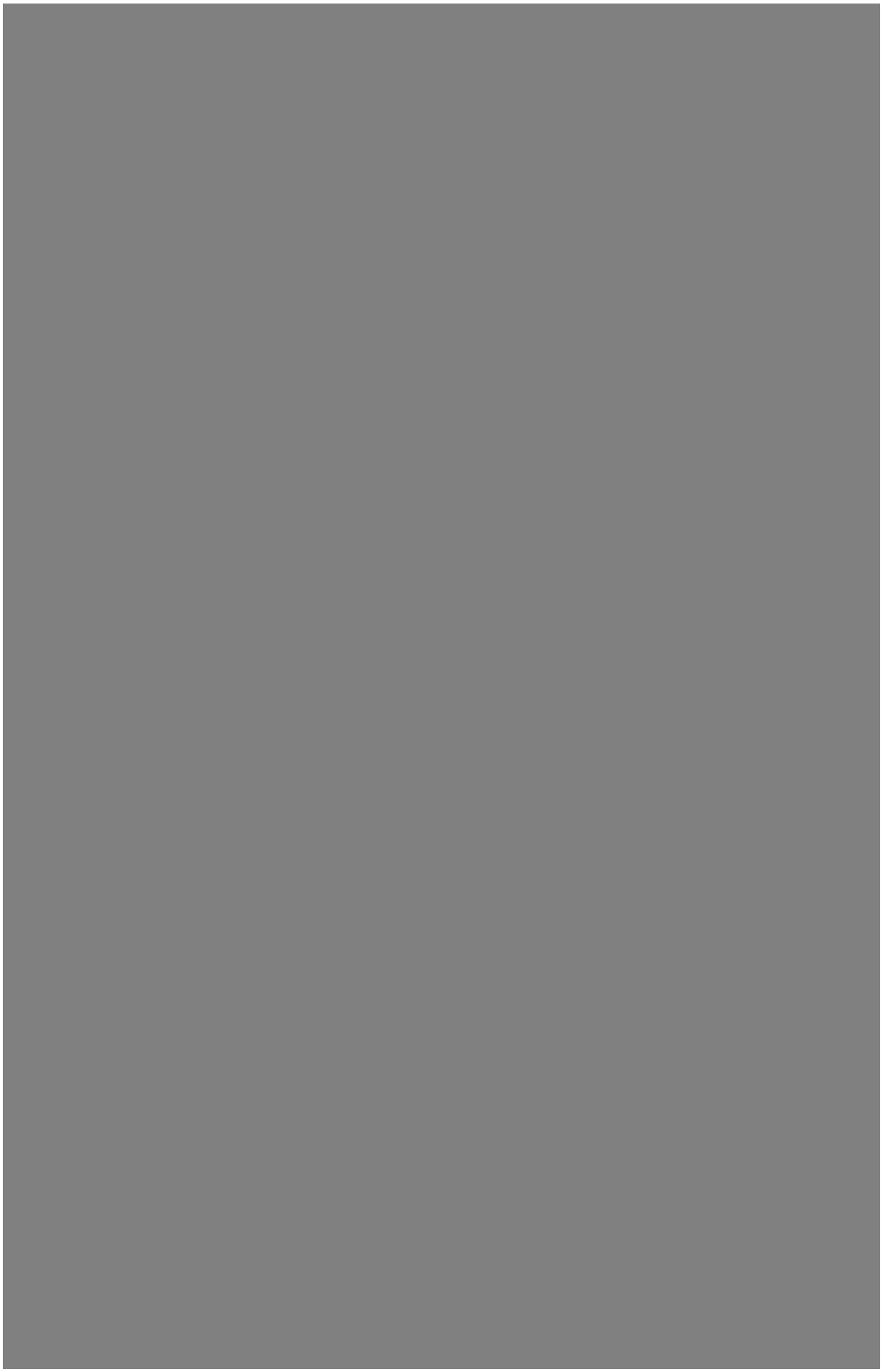


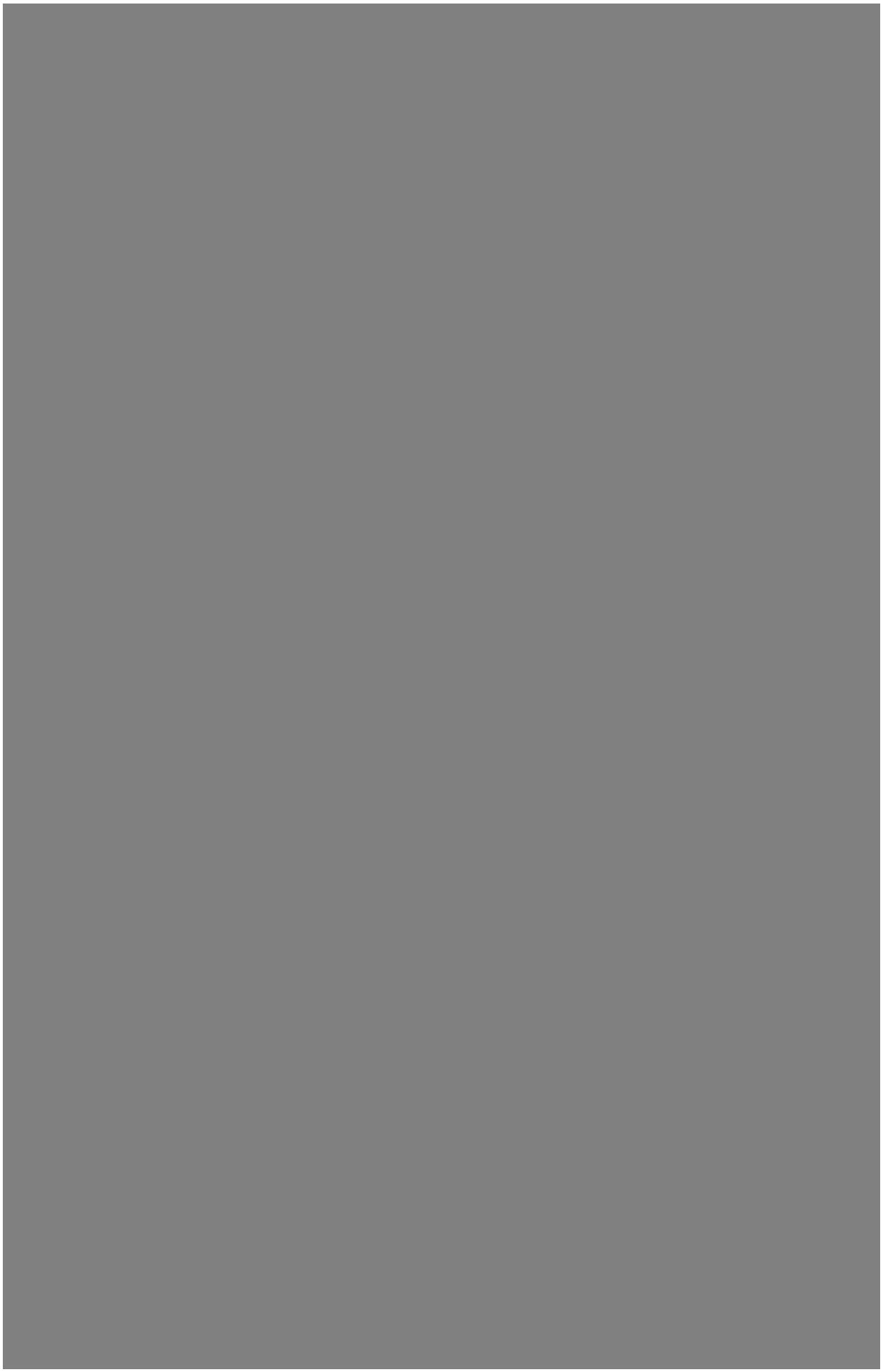


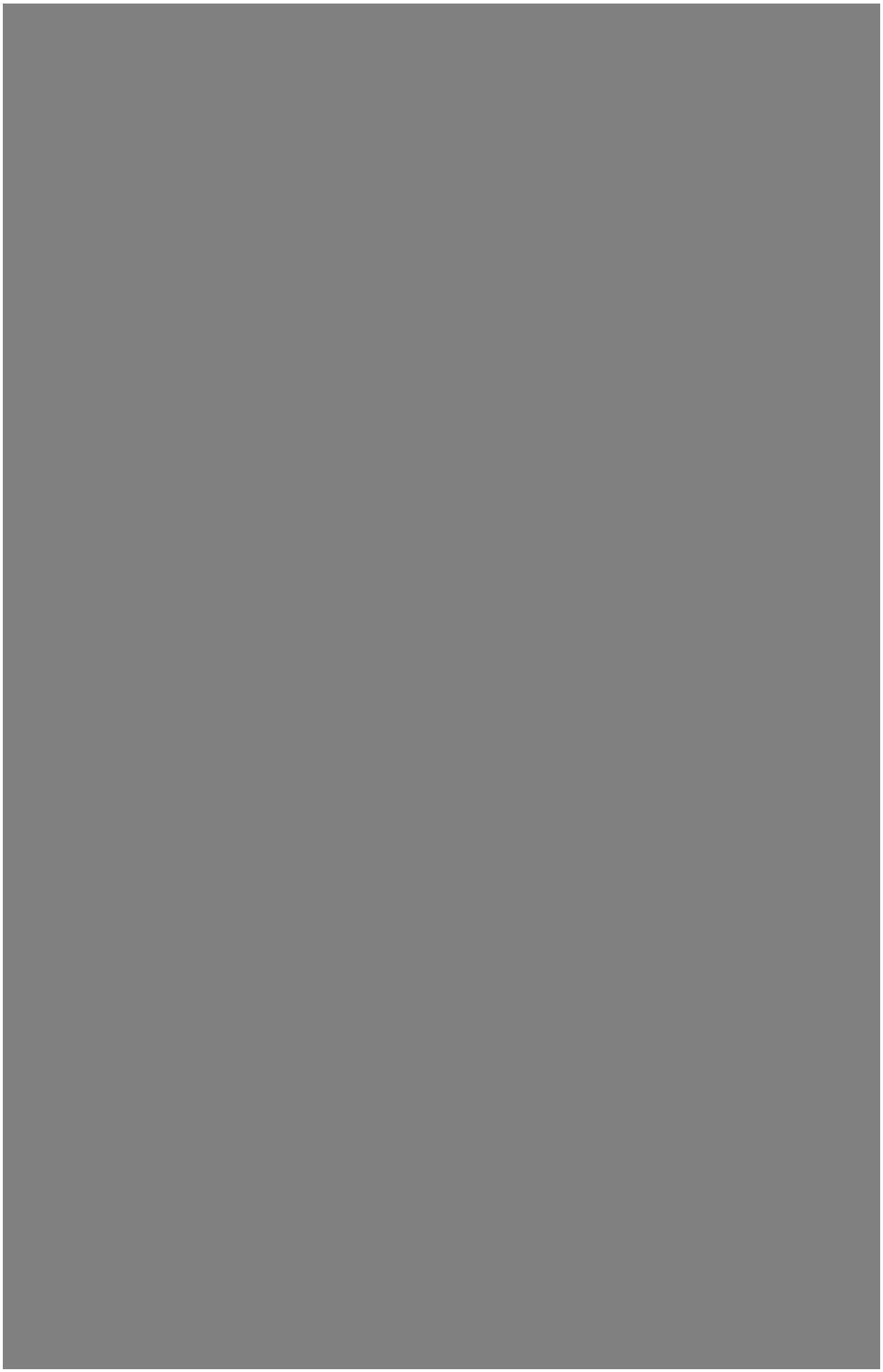


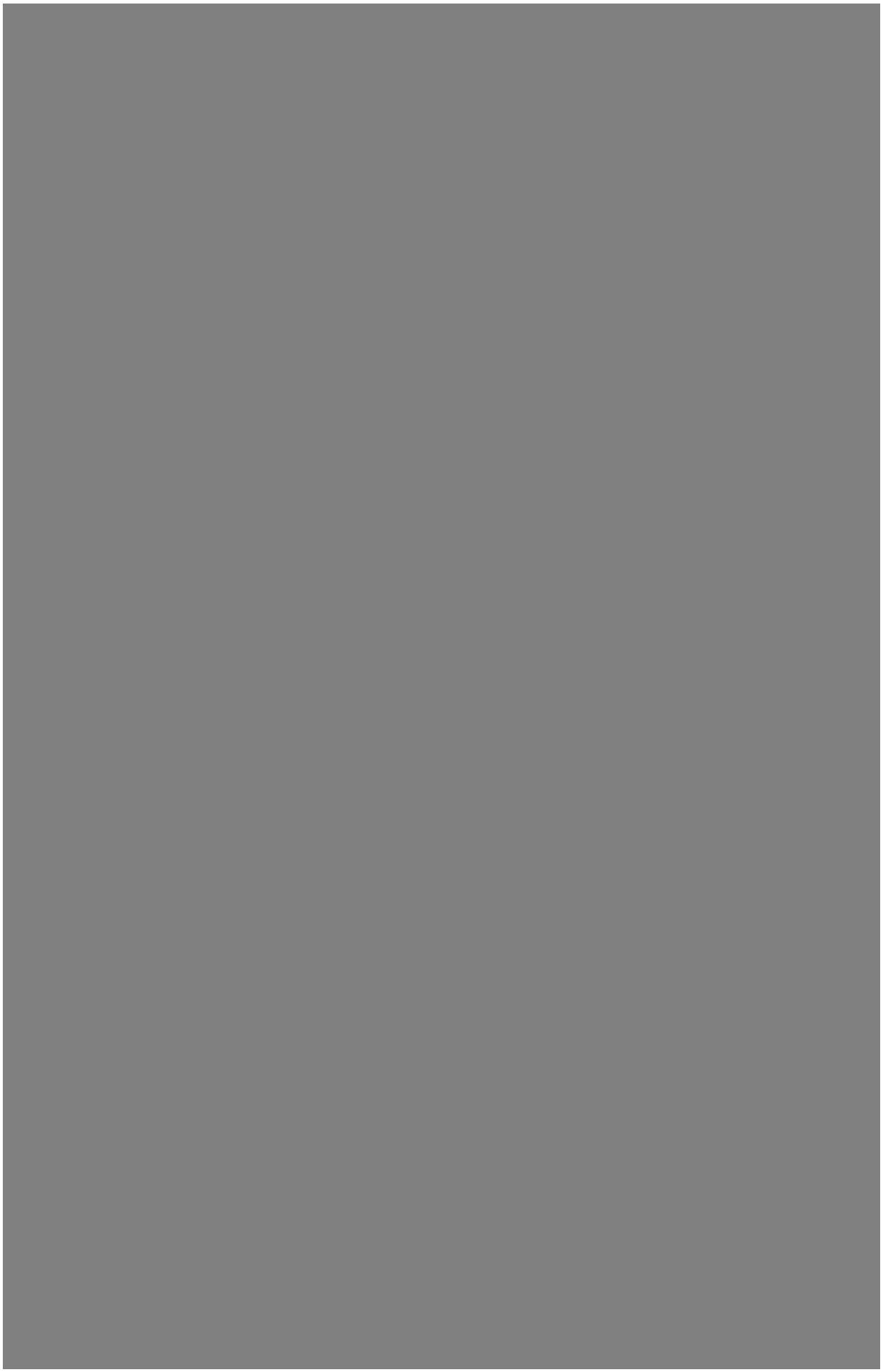


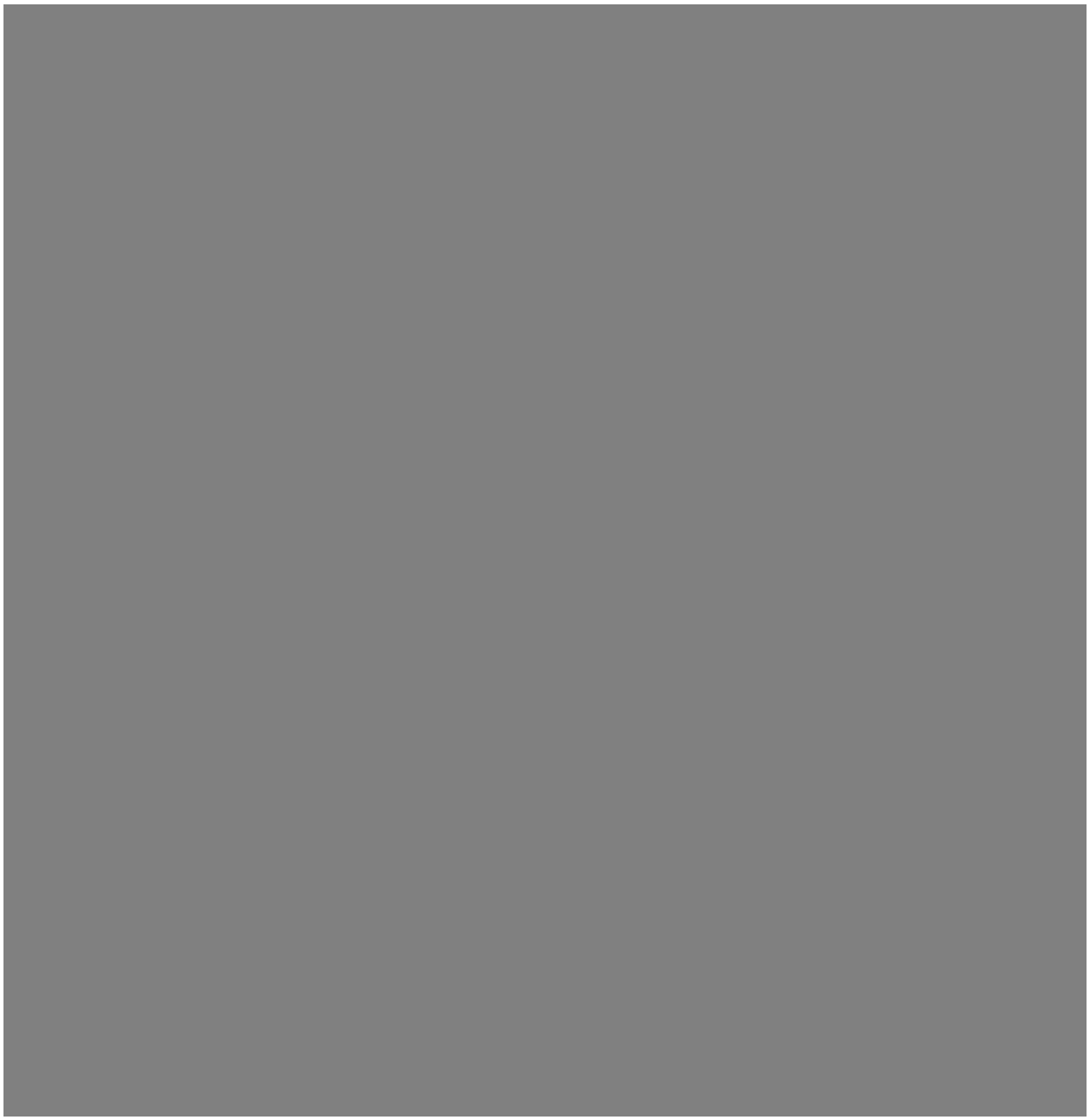


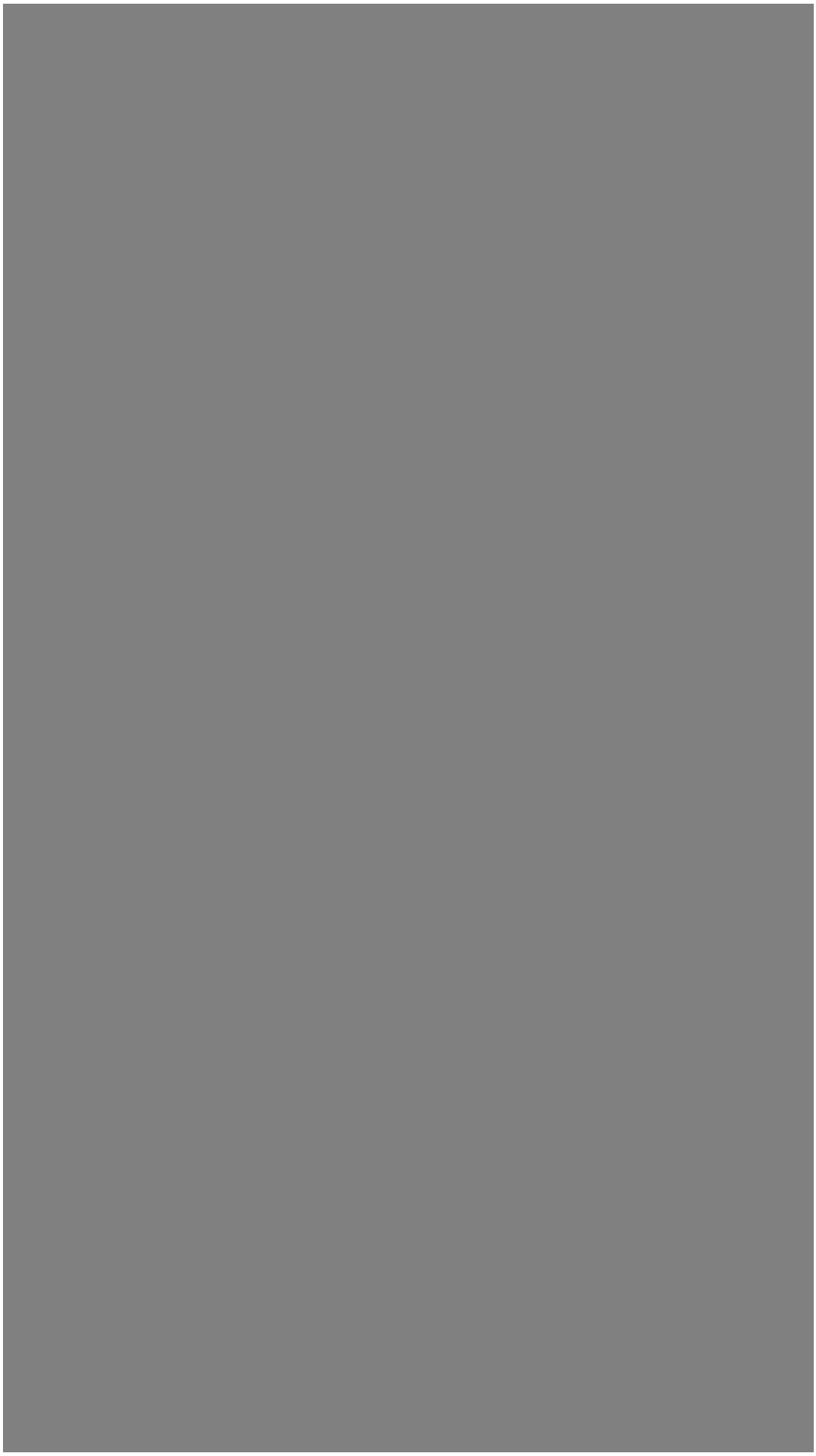


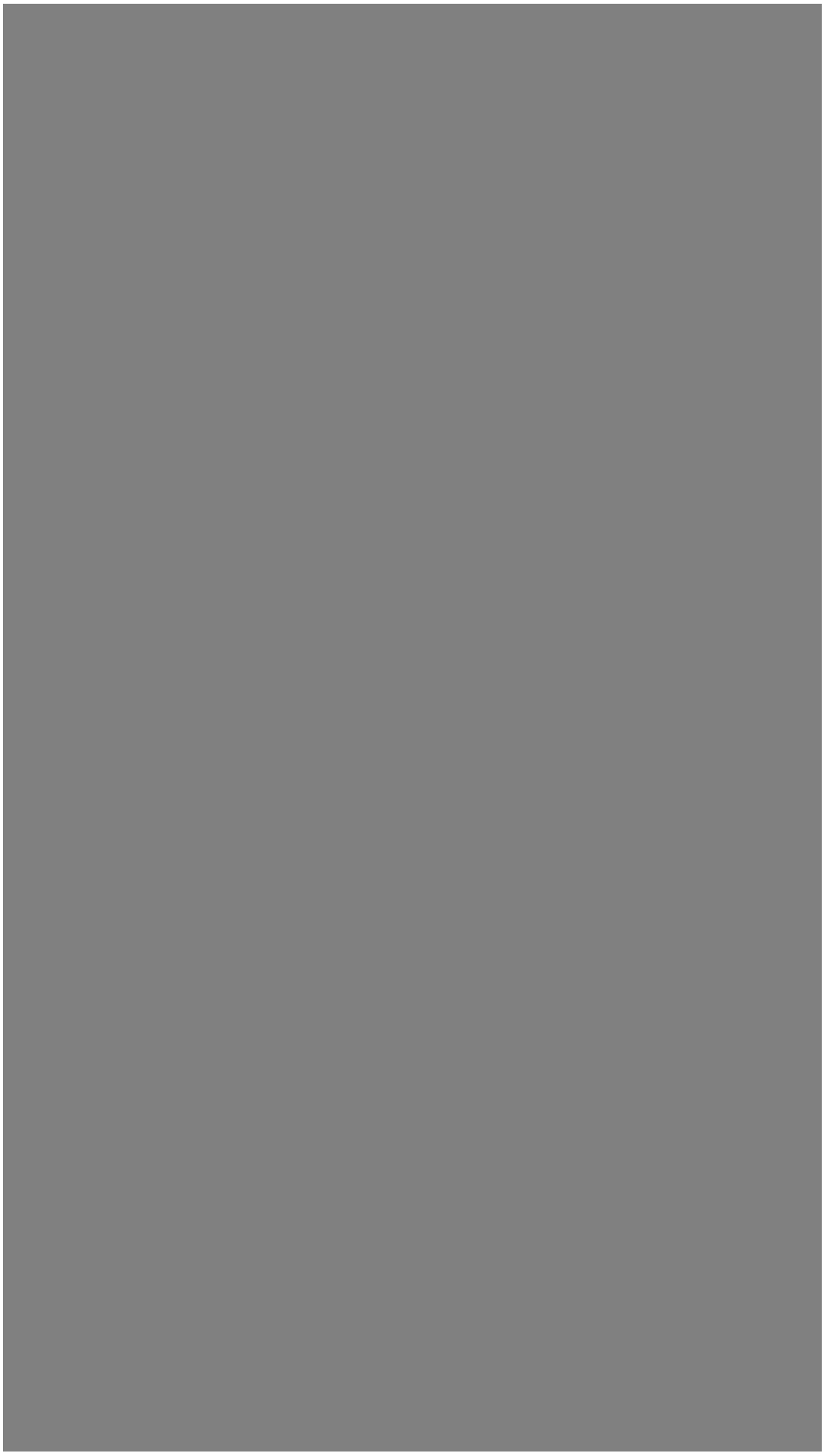


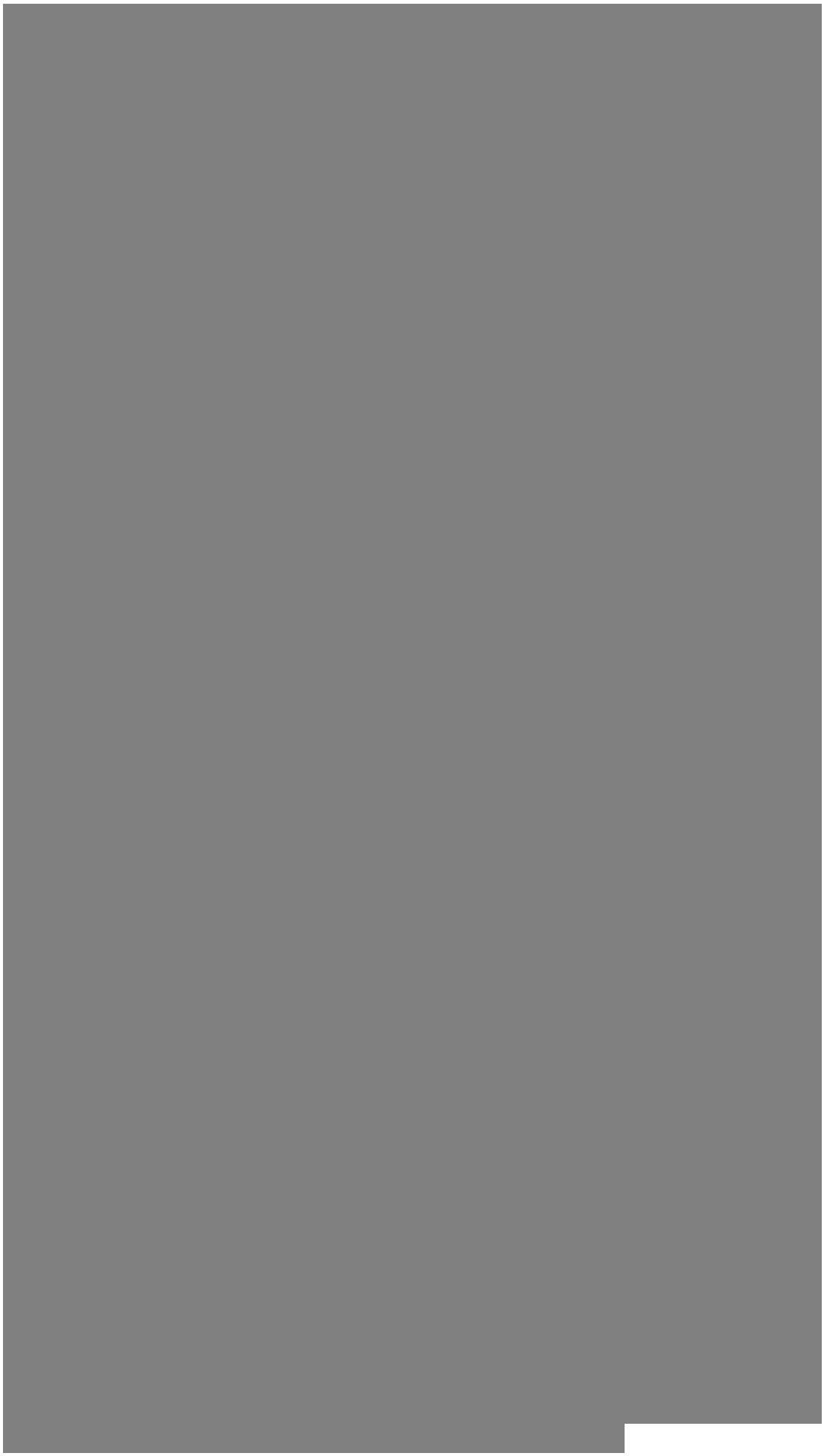








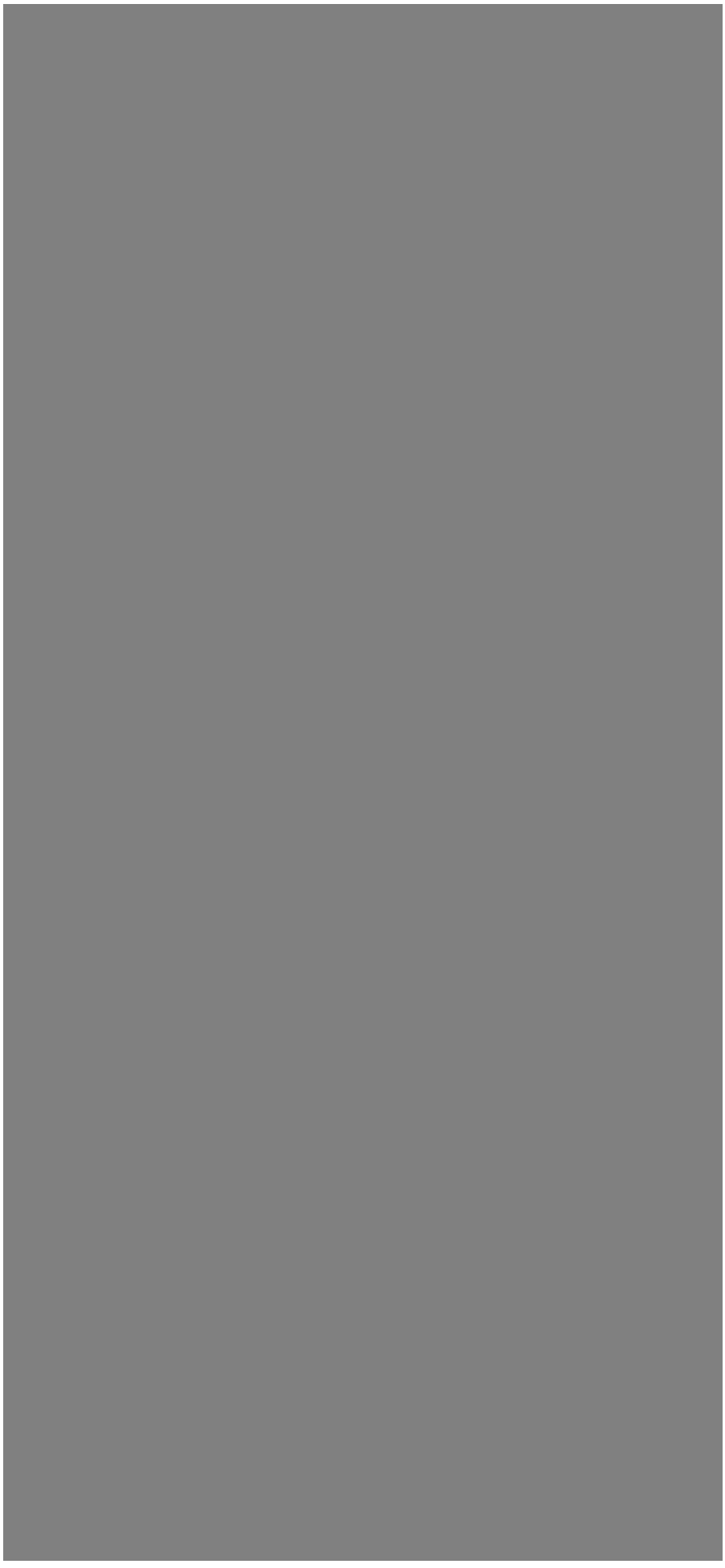


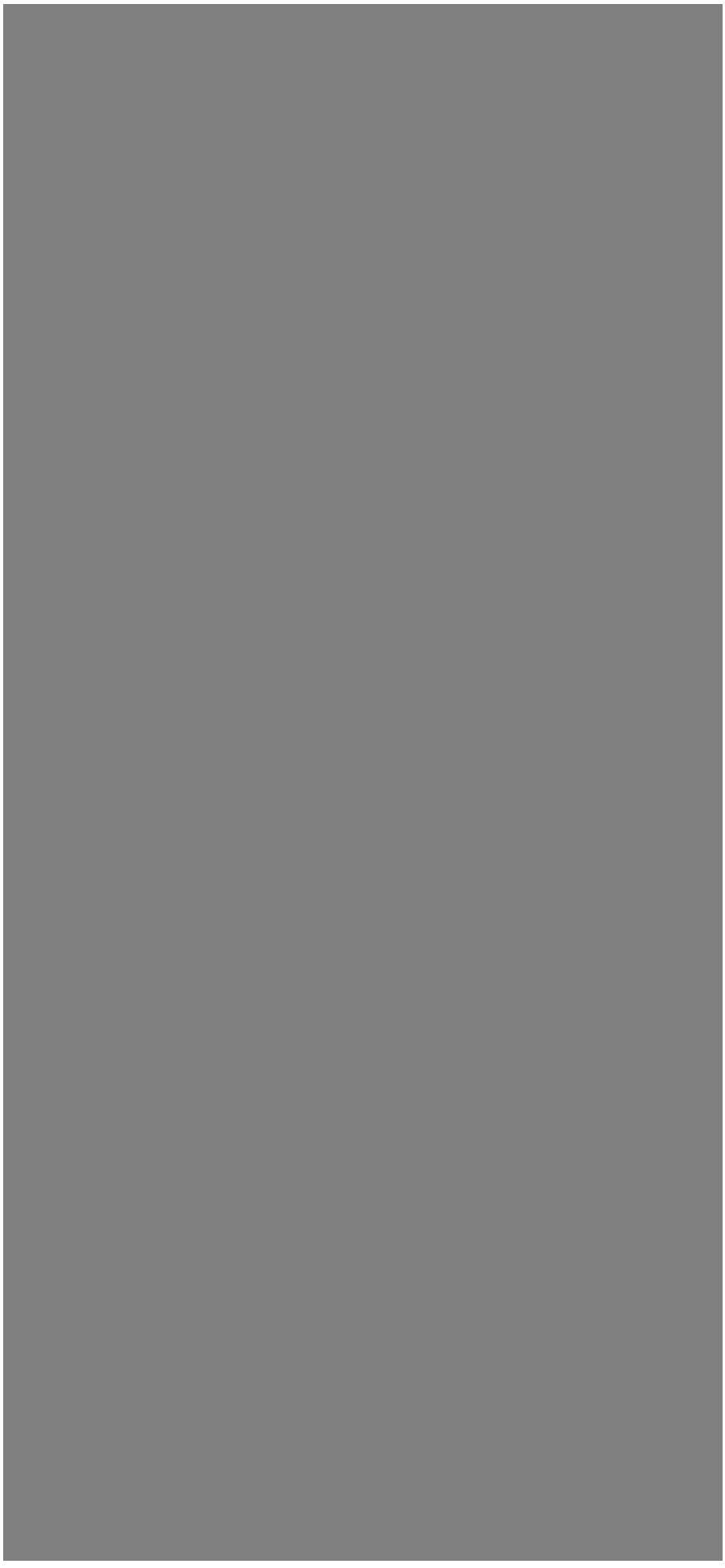


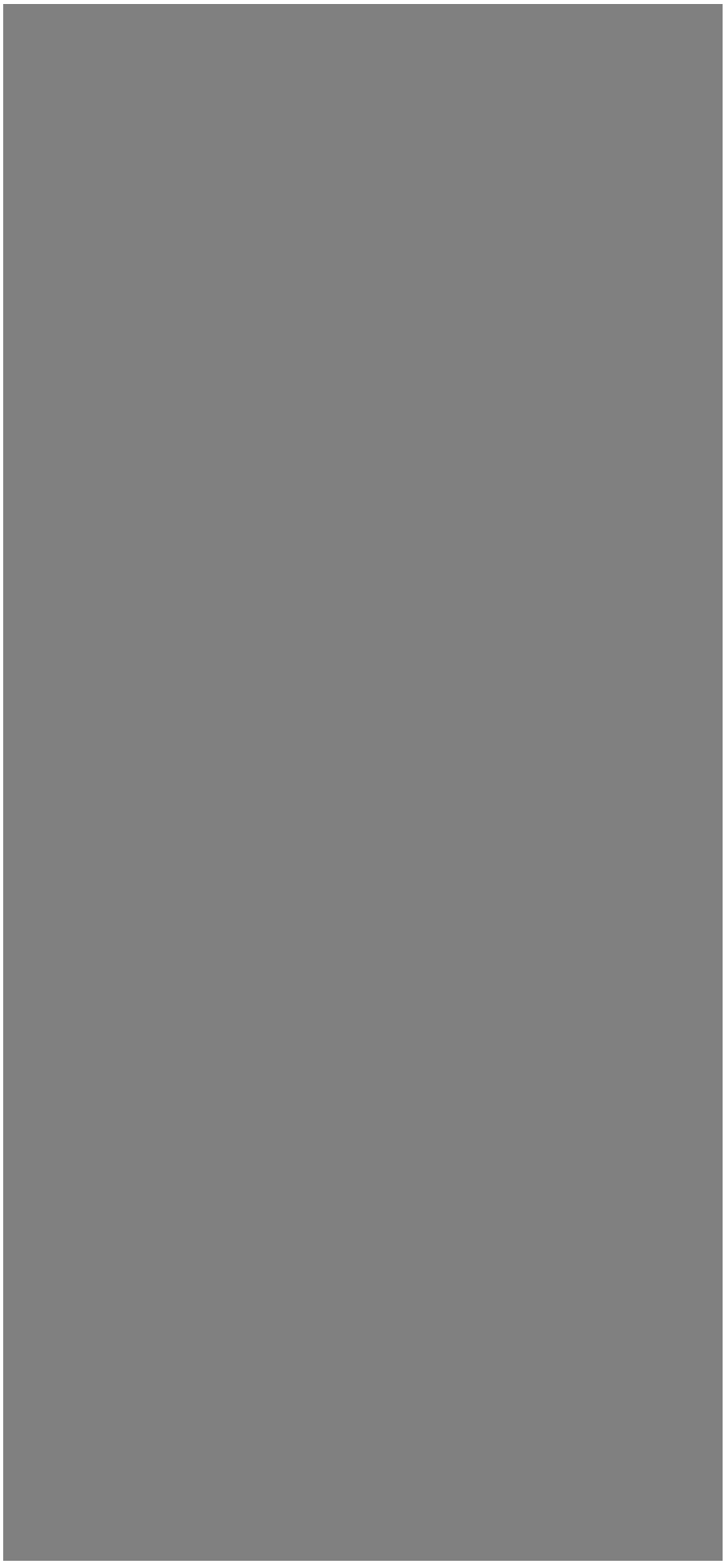
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**PLEASE NOTE** that all cells shown in white on the compliance
0 can be entered in fields which are not applicable.

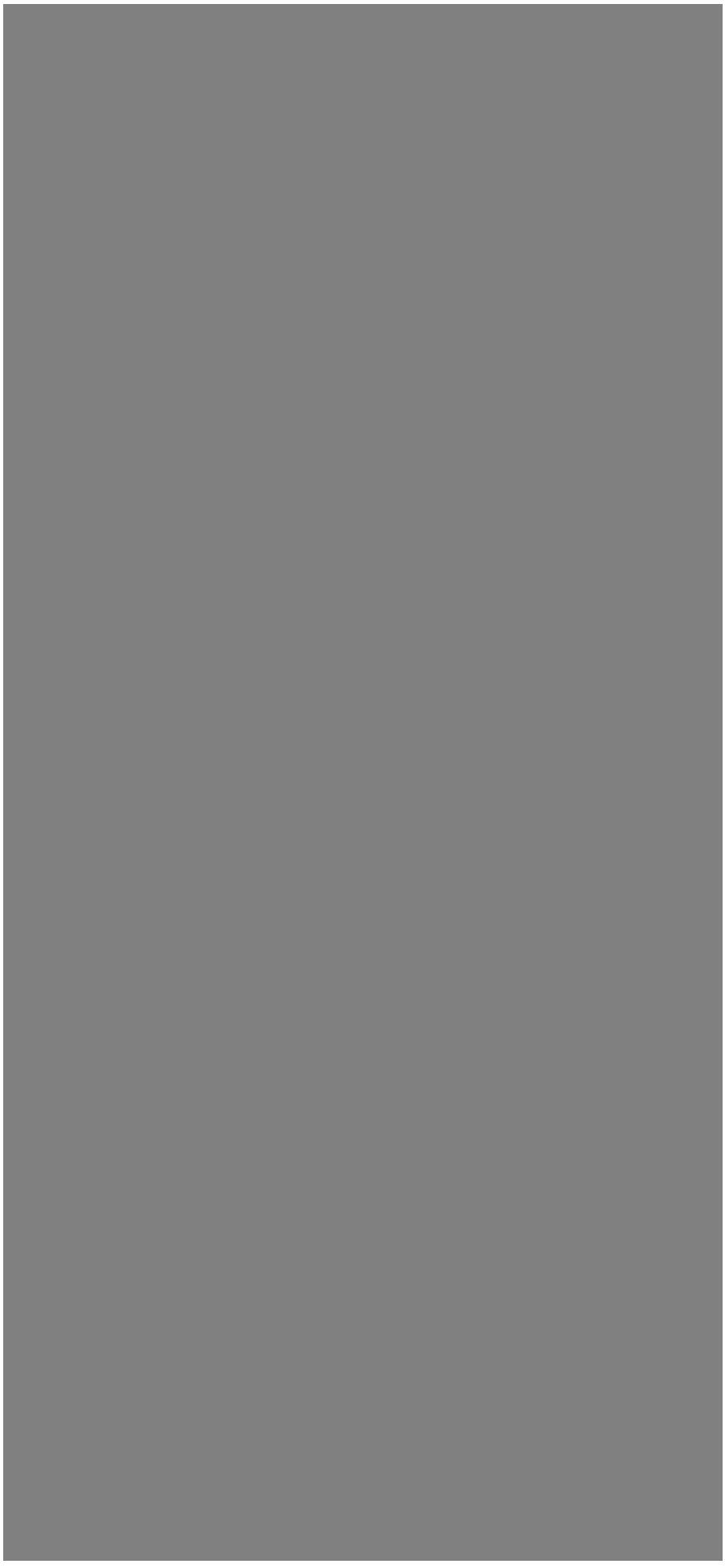
| | |
|---|---|
| **1. GENERAL INFORMATION** | |
| 1.1 | Name of the owner |
| 1.2 | Address of the installation |
| 1.3 | Address of the owner |
| **2. DESIGN INFORMATION** | |
| | i. Intermittent or Continuous heating? |
| | ii. Design External temperature (°C) |
| | iii. Total Building Heat Loss at Design Condition (kW) |
| **3.HEAT EMITTER INFORMATION** | |
| | i. What Heat Emitter types are installed? |
| | ii. What is the temperature of water leaving the heat pump when supplying space heating at the design day condition? |
| | iii. Has a copy of the room by room heat loss calculations and heat emitter selections been given to the client? |
| **4. DOMESTIC HOT WATER** | |
| | i. What is the maximum design water temperature in (°C) leaving the heat pump when in hot water heating mode? |
| | ii. Has the DHWS reheat time been estimated and agreed with the customer? |
| **5. IF GROUND SOURCE HEAT PUMPS** | |

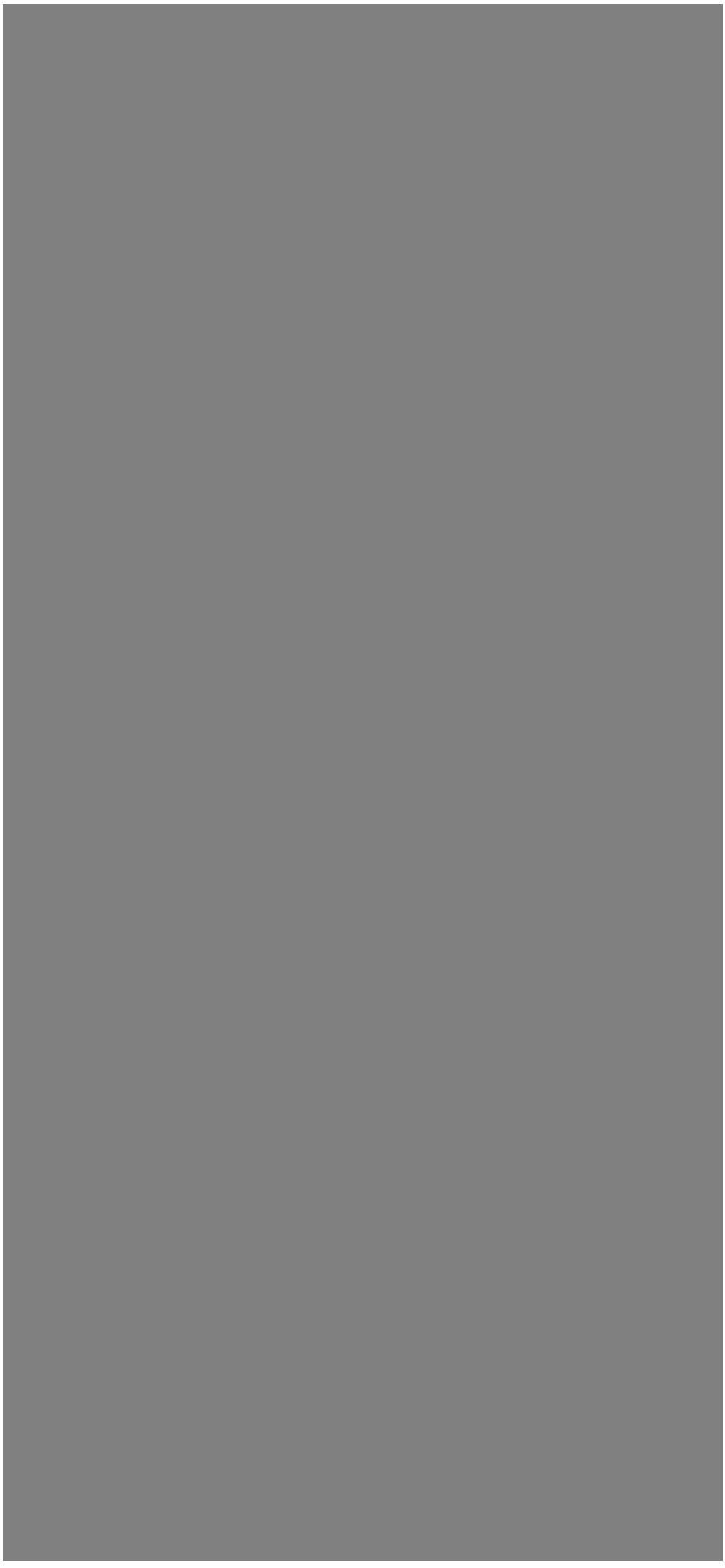
| | |
|---|---|
| | i. Type of ground heat exchanger: vertical/ horizontal/ slinky/ open loop (if horizontal, indicate minimum depth (m); if vertical, indicate maximum depth (m) |
| | ii. Ground conductivity factor used |
| **6. EPC** | **(IF APPLICABLE)** |
| | i. EPC Number |
| | ii. EPC annual space heating / hot water demand figure (kWh/ry) |
| **7. DECLARATIONS** | |
| I confirm that: | |
| | i. I am authorised to complete the certificate on behalf of the MCS Contractor named below: |
| | ii. The customer will receive an MCS Installation certificate within 10 working days of the installation commissioning date |
| | iii. MIS 3005 scheme requirements have been met |
| | iv. The installation complies with system design as per the contract agreement |
| **8. CONFIRMATION** | |
| | i. Organisation Name |
| | ii. Full Name and Job Title: |
| | iii. Date: |
| | iv. Signature |

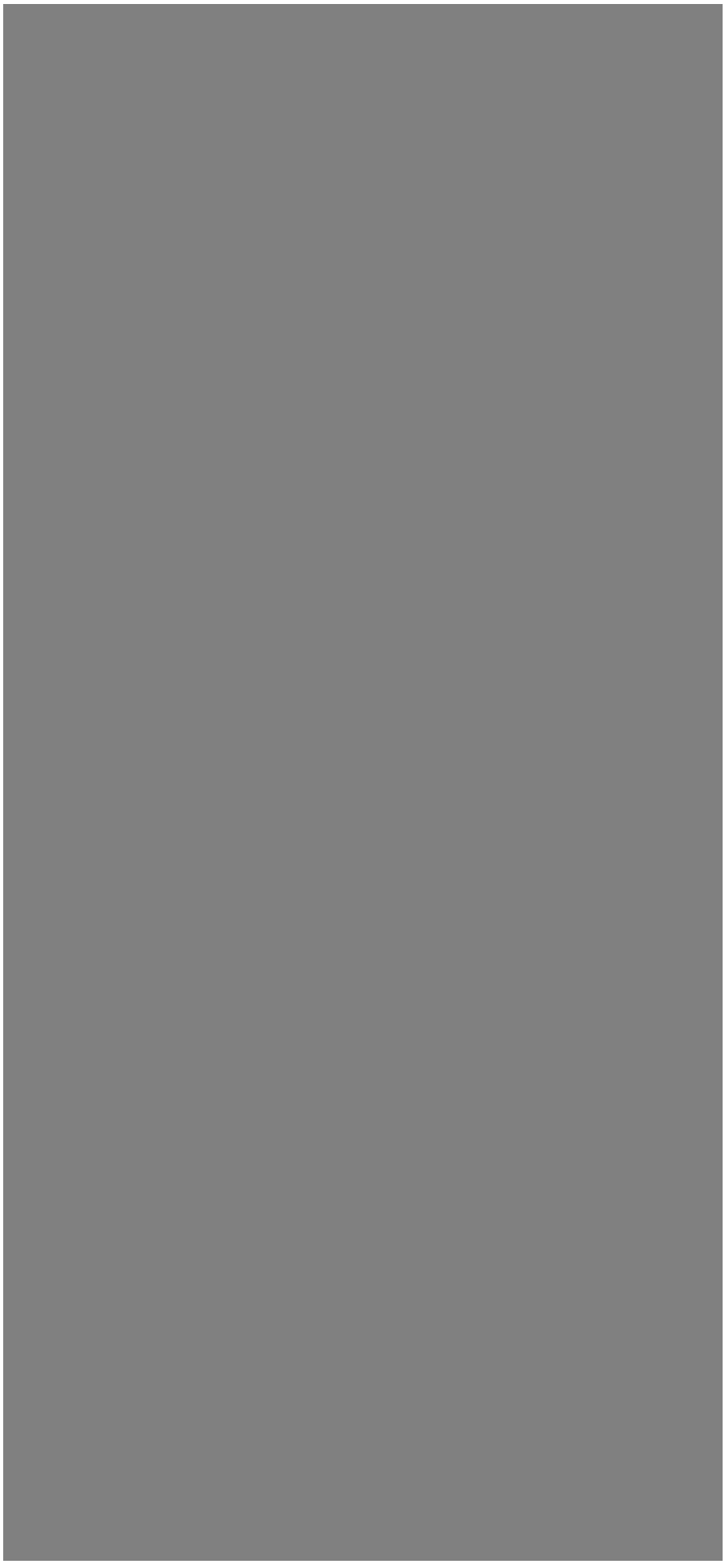


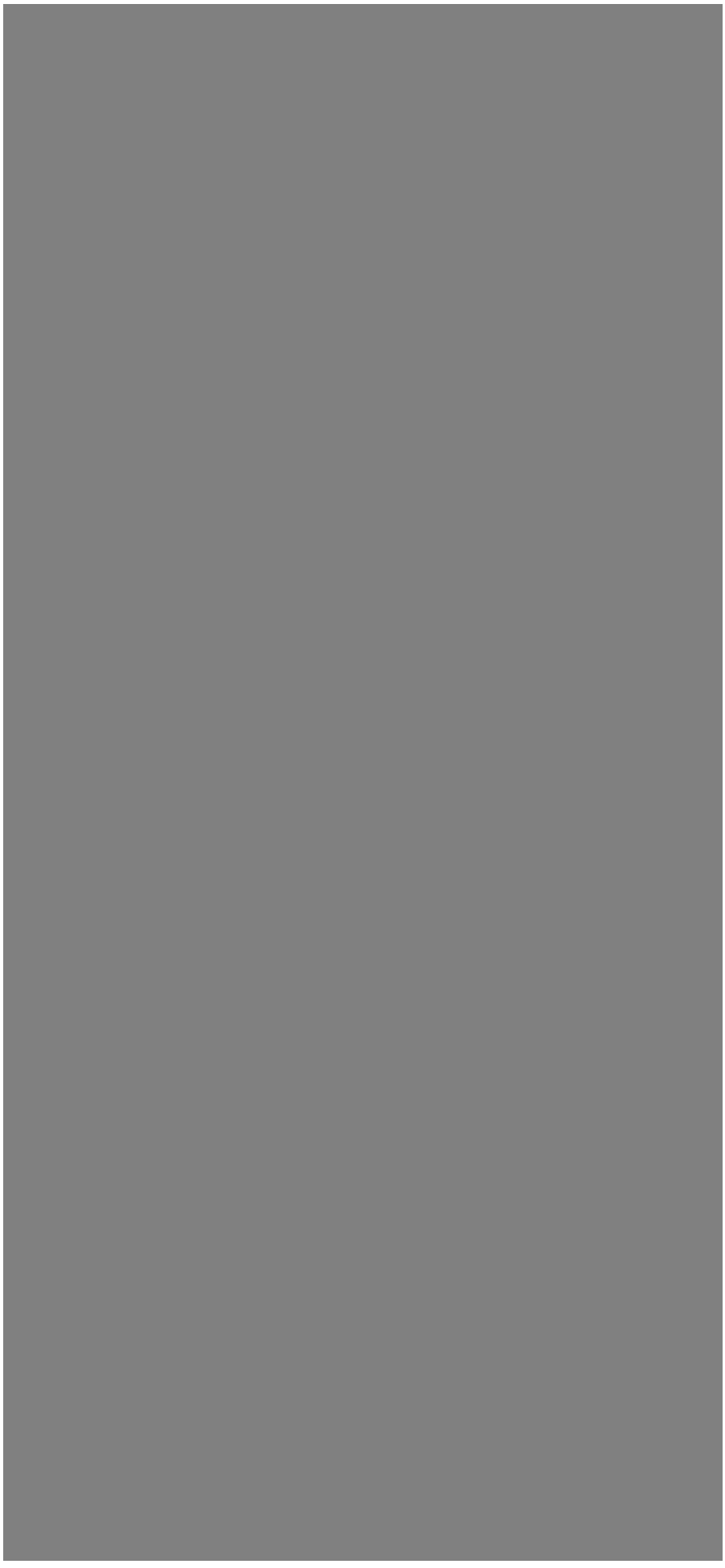


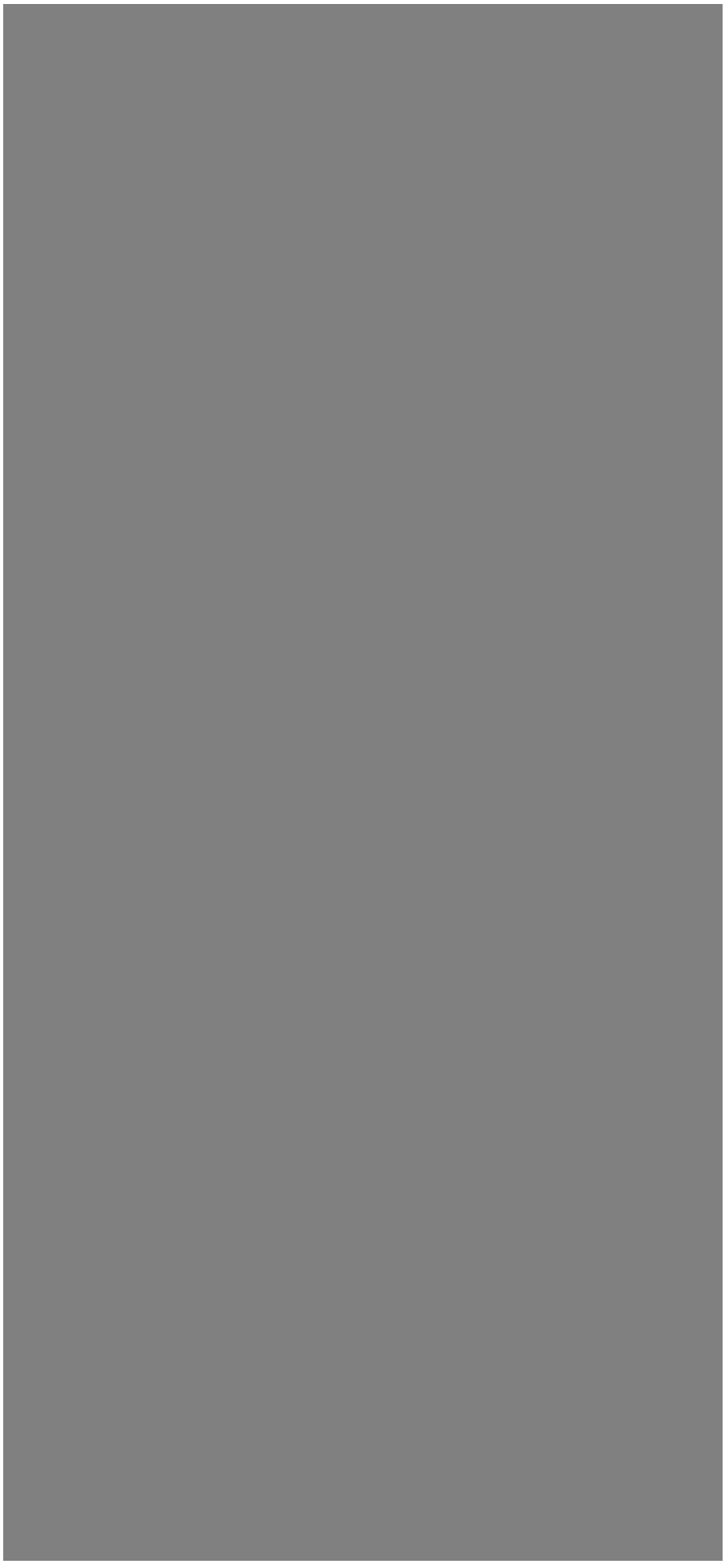


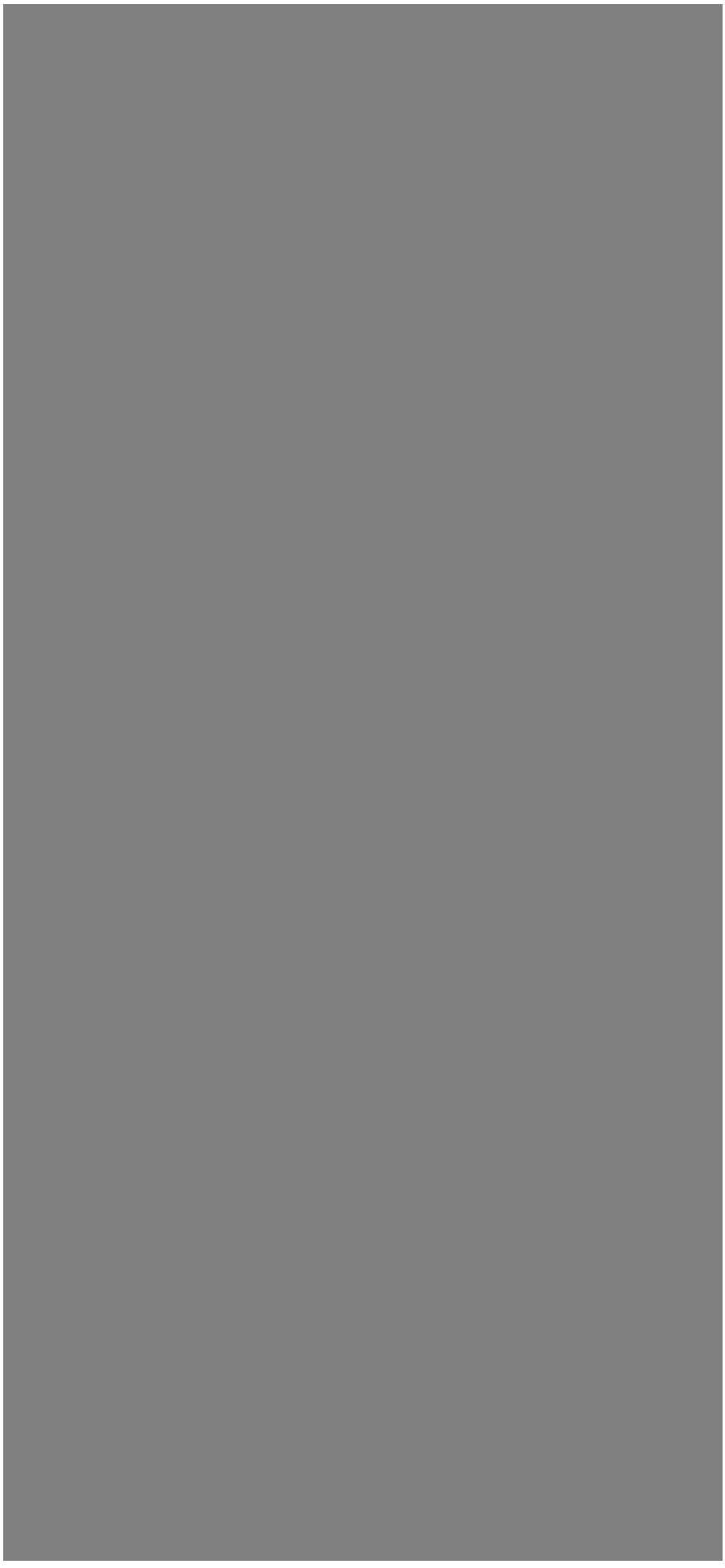


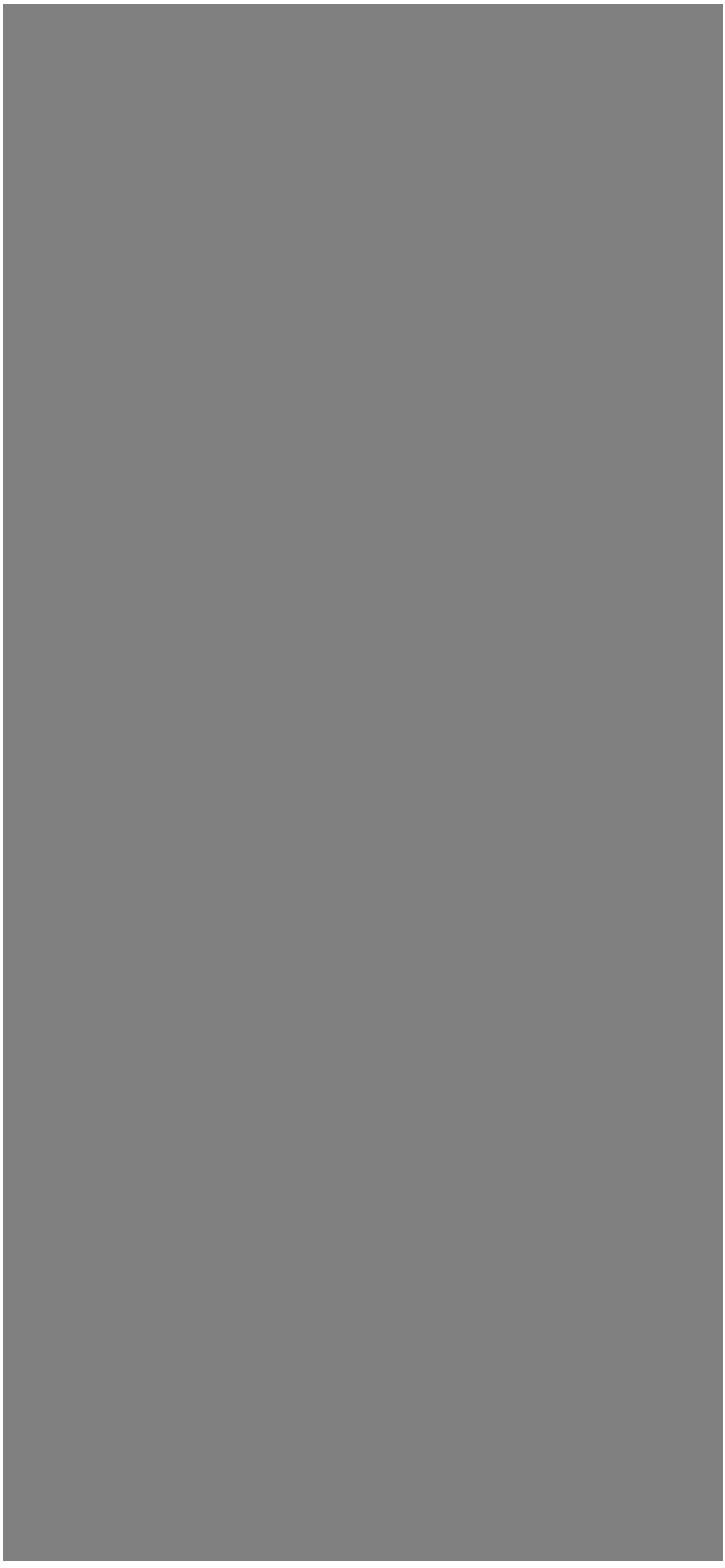


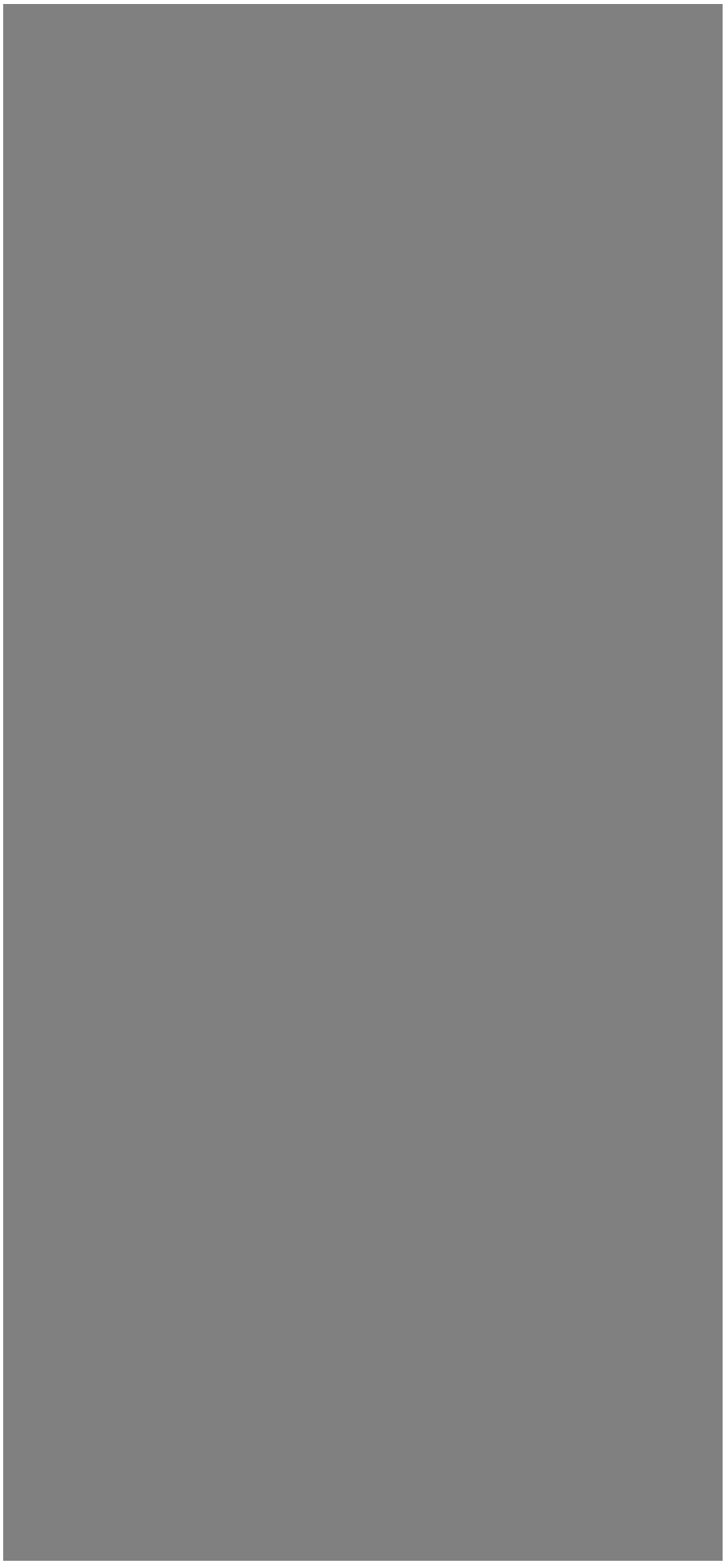


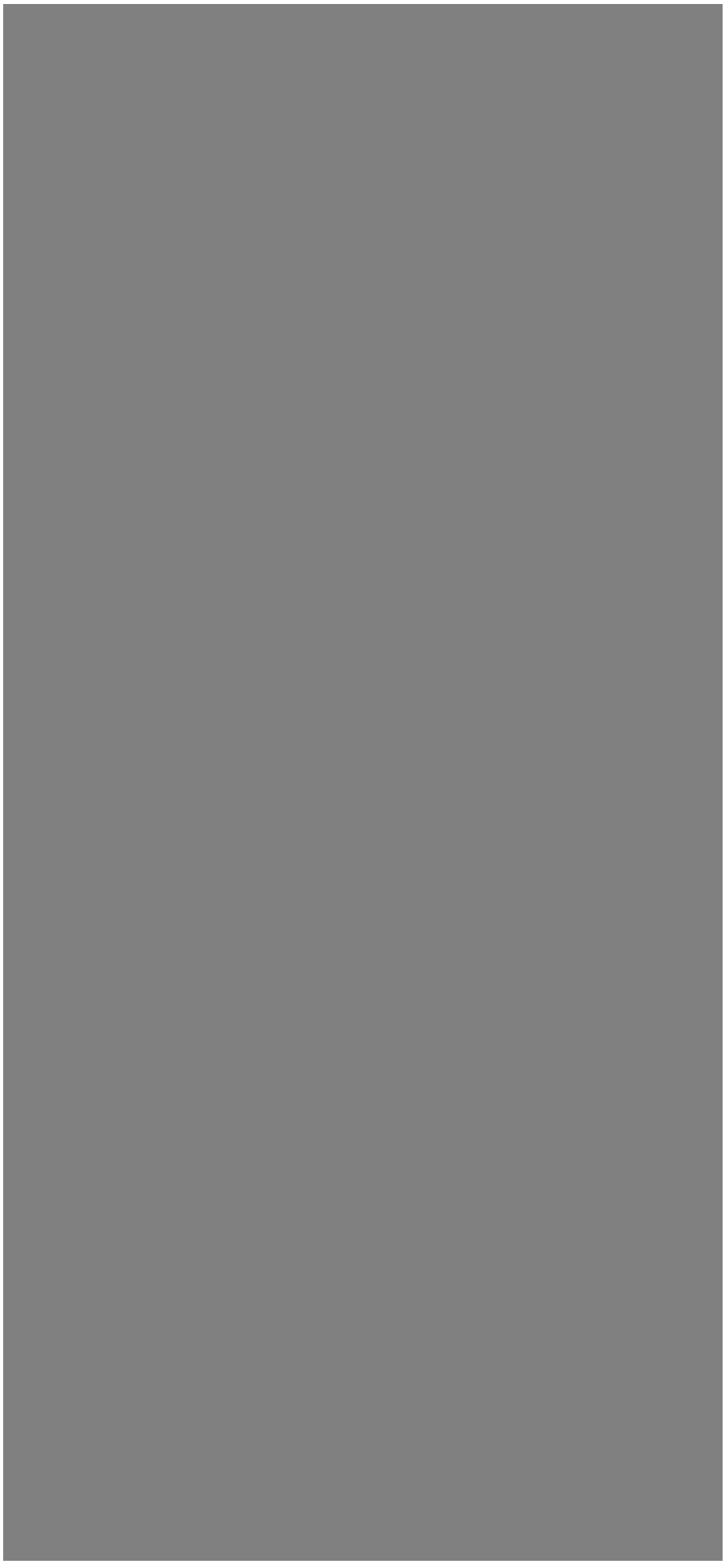


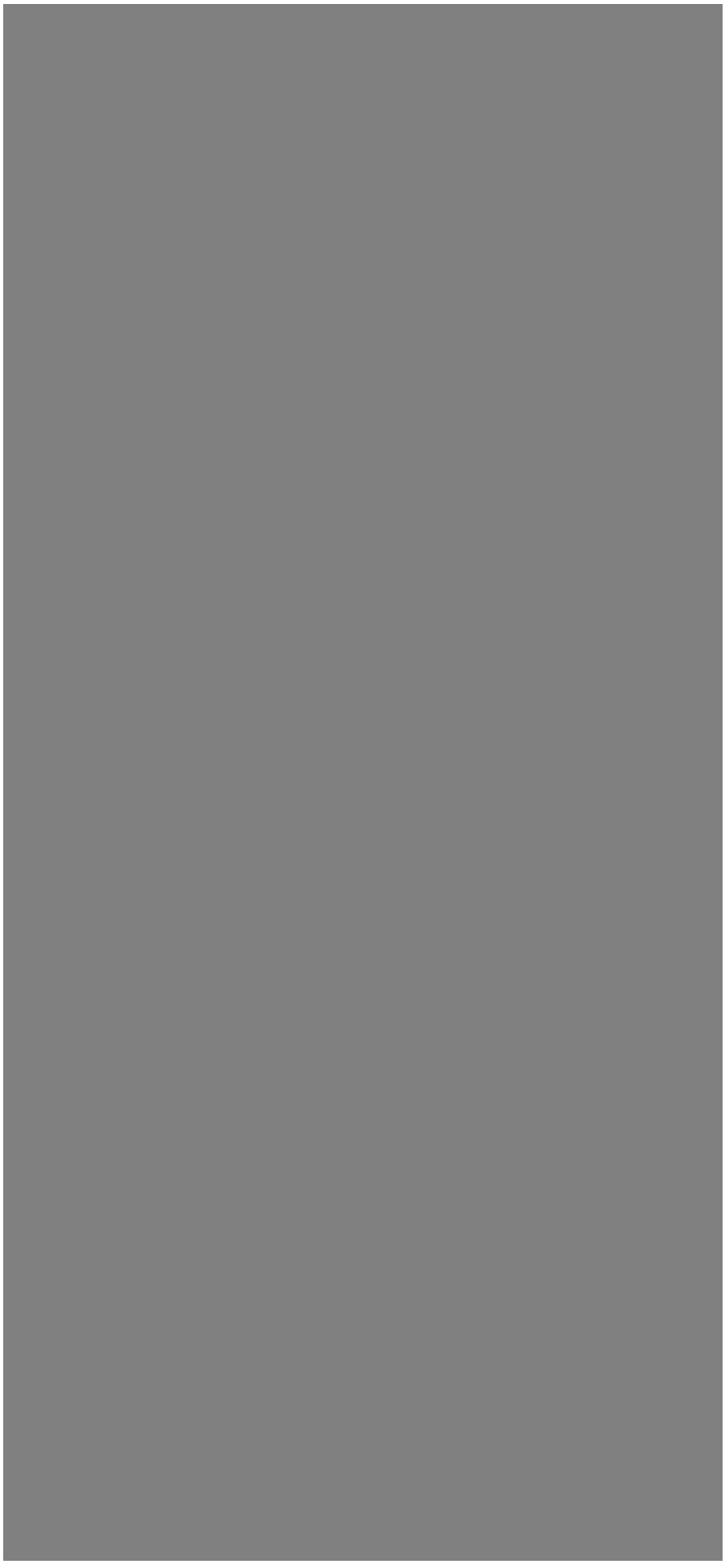


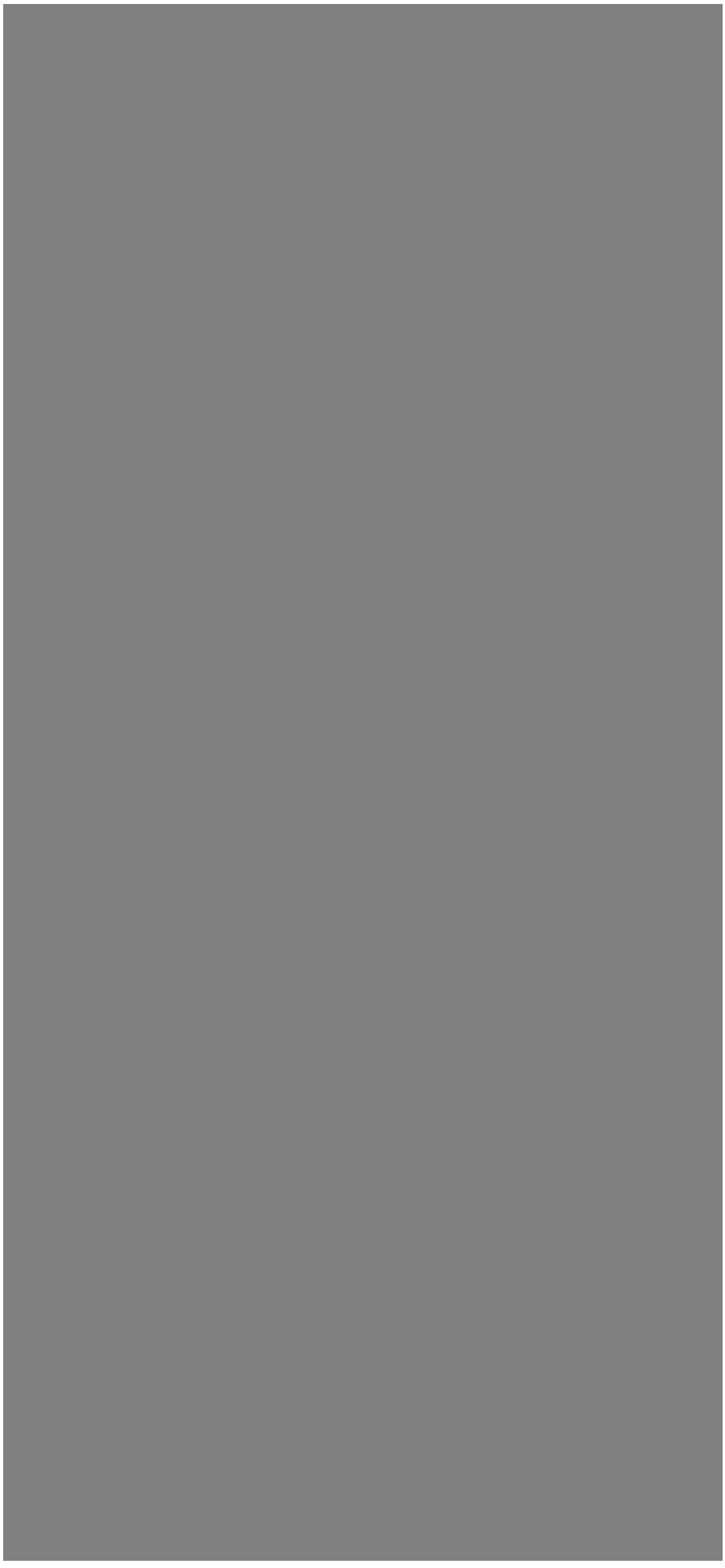


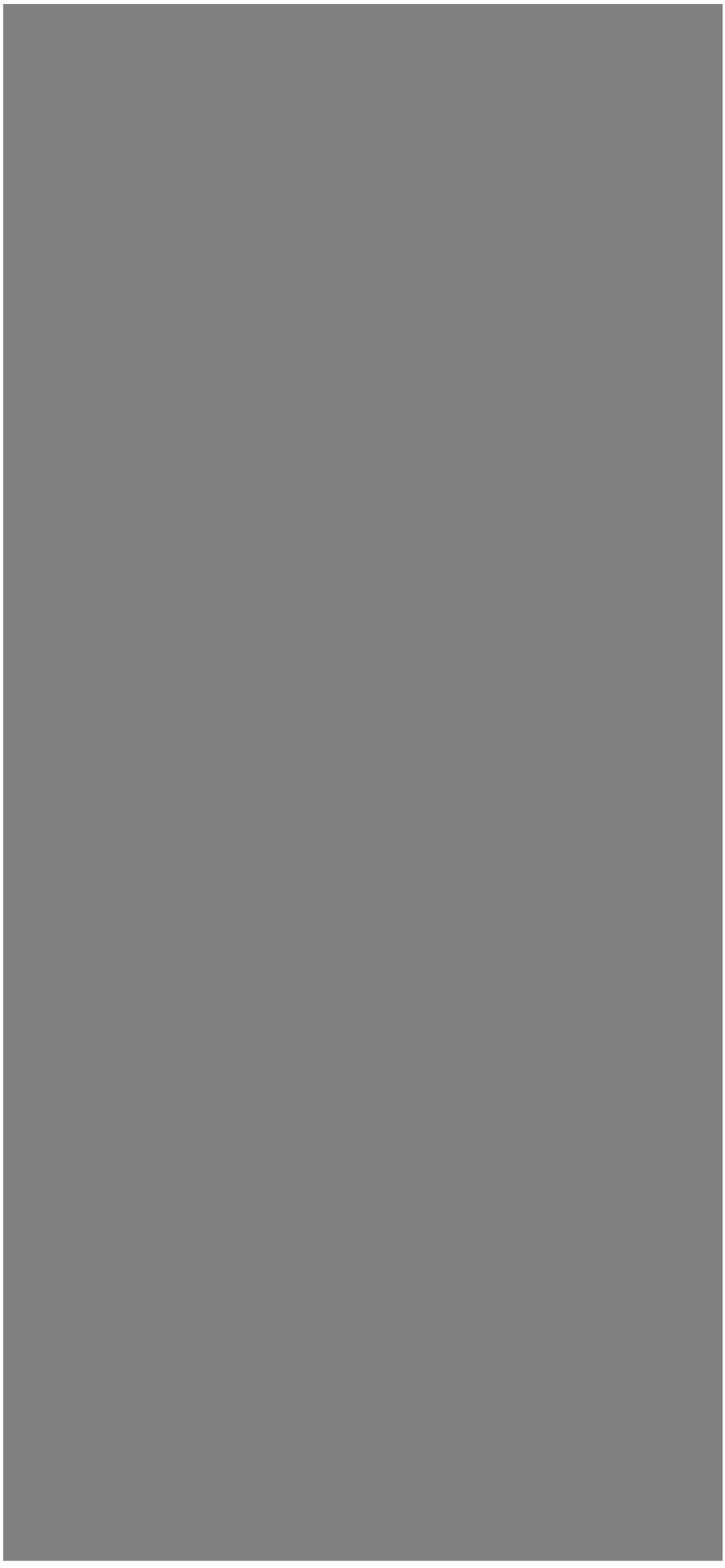


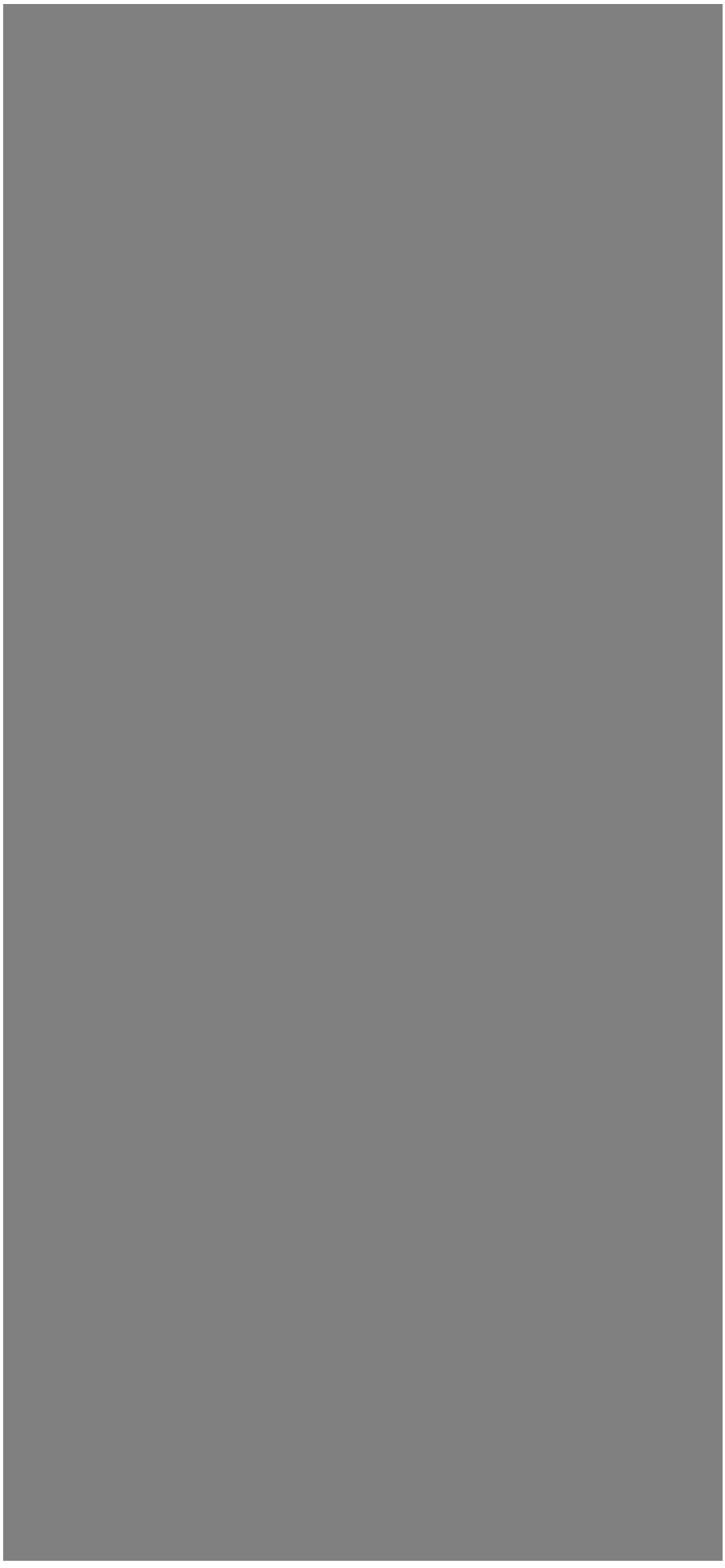










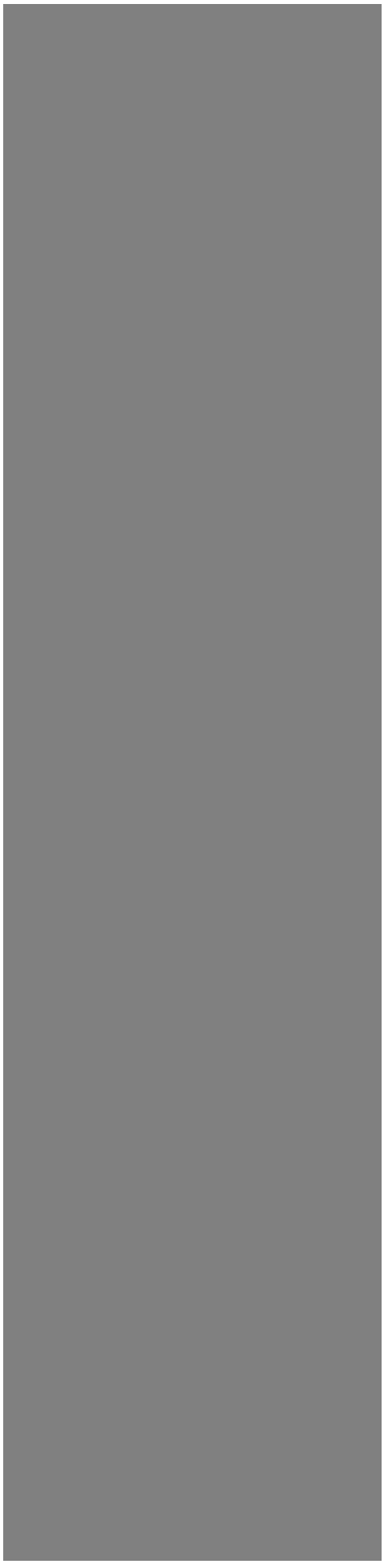


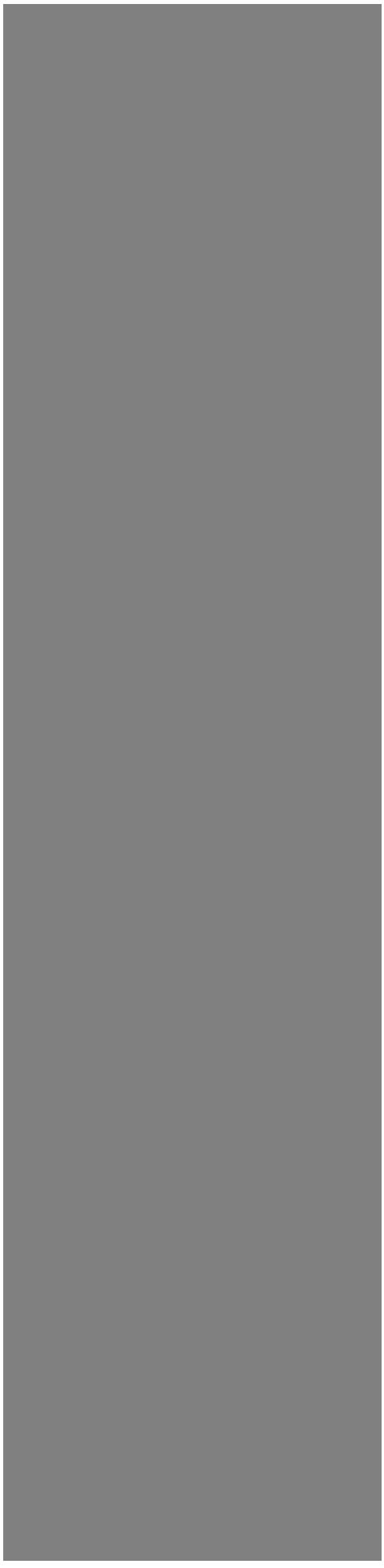


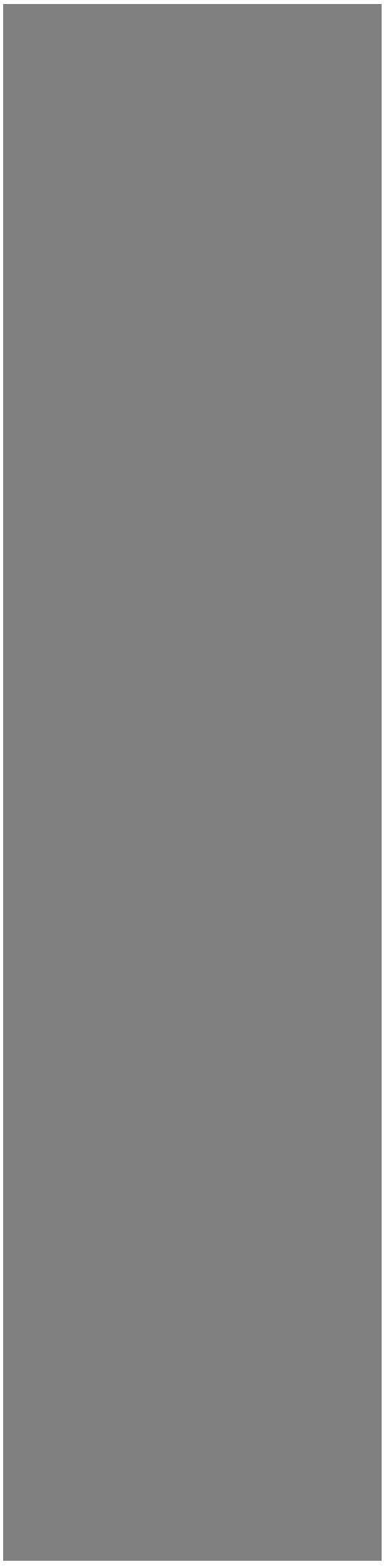
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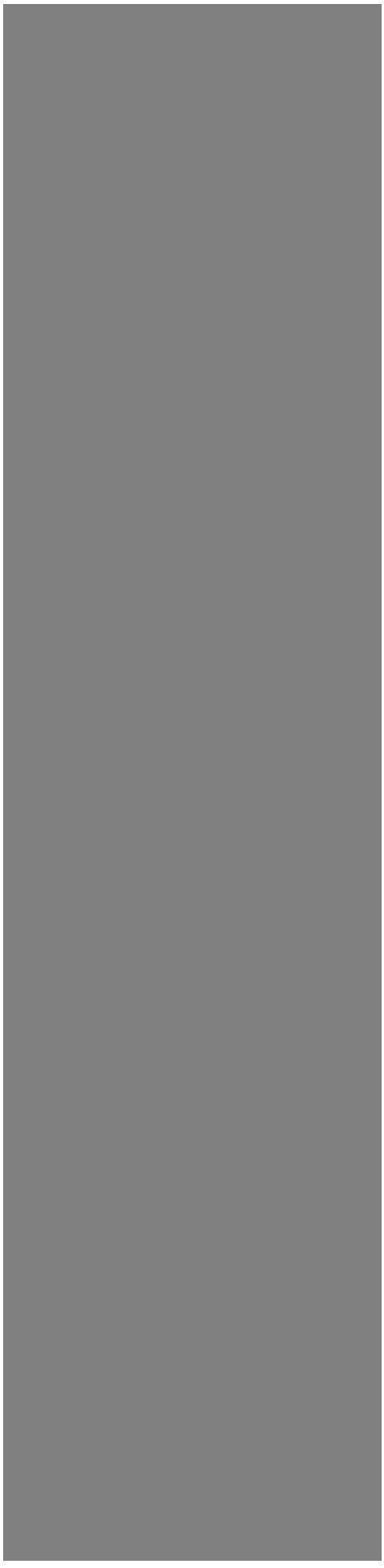
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| 4.2.1 a |
| 4.2.1 b, Table 2 |
| 4.2.1a, b, c |
| |
| 4.2.12 – 4.2.14 MCS021 Heat Emitter Guide for Domestic Heat Pumps |
| 4.2.1a, b, c |
| 4.2.12 – 4.2.14 MCS021 Heat Emitter Guide for Domestic Heat Pumps |
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| 4.2.3-4.2.7 |
| 4.2.5 |
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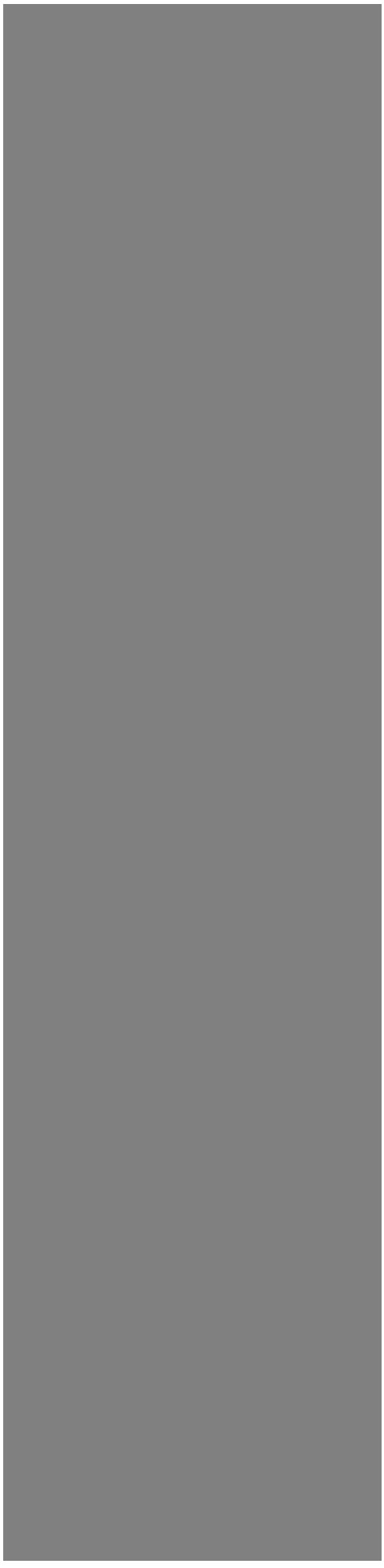
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| 4.2.19, MCS 022 |
| 4.2.23, Appendix C, MCS 022 |
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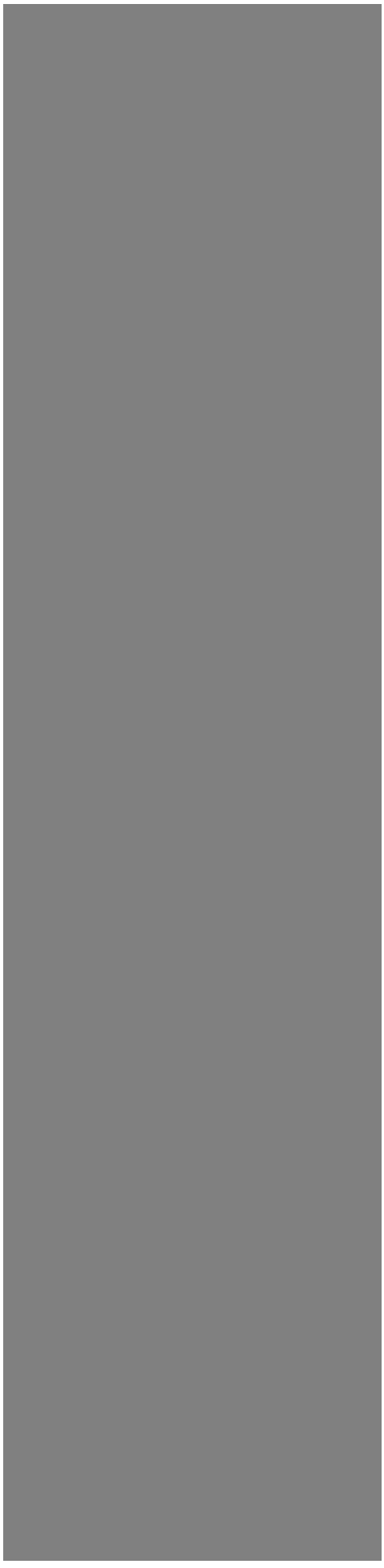


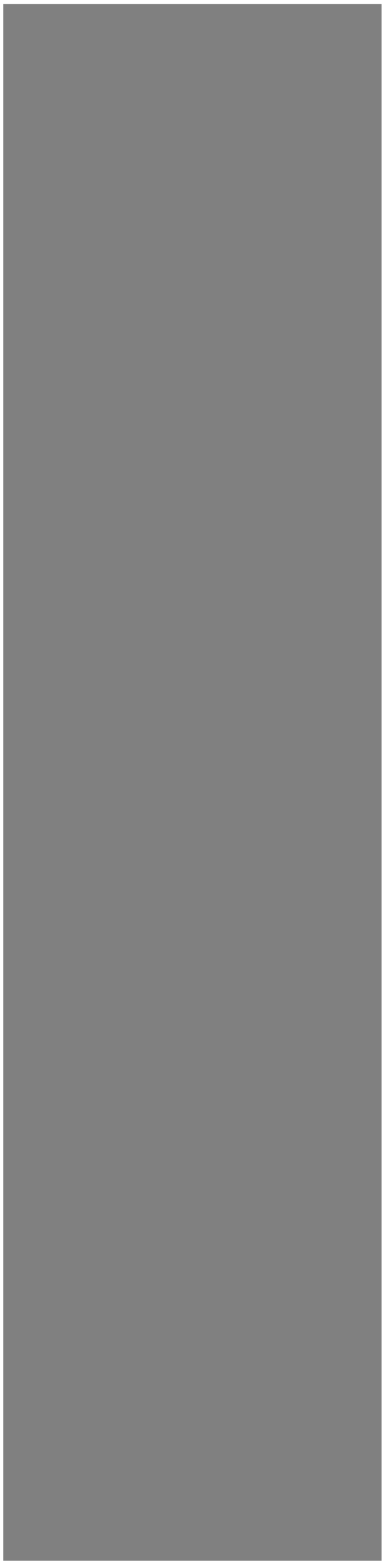


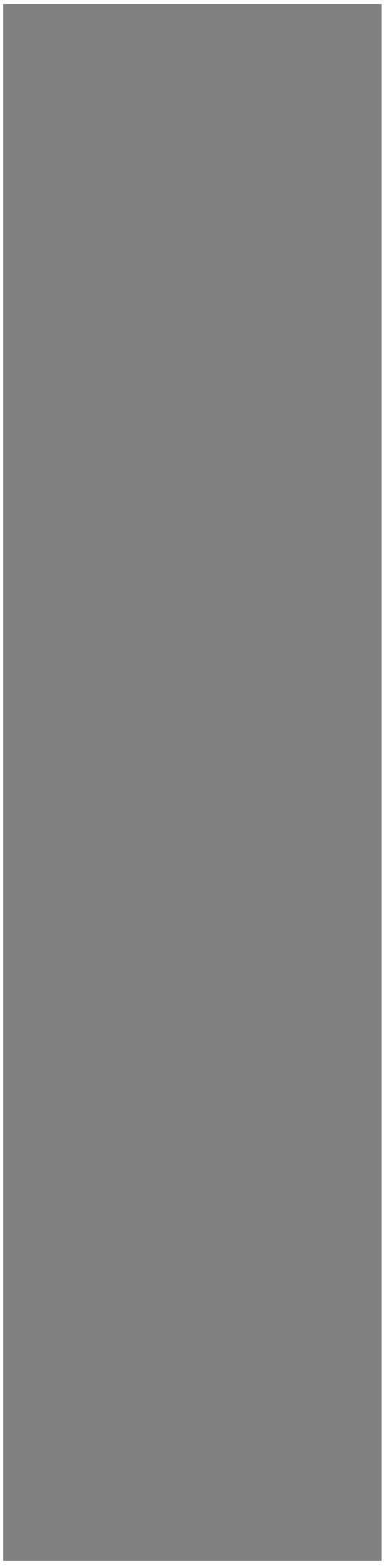


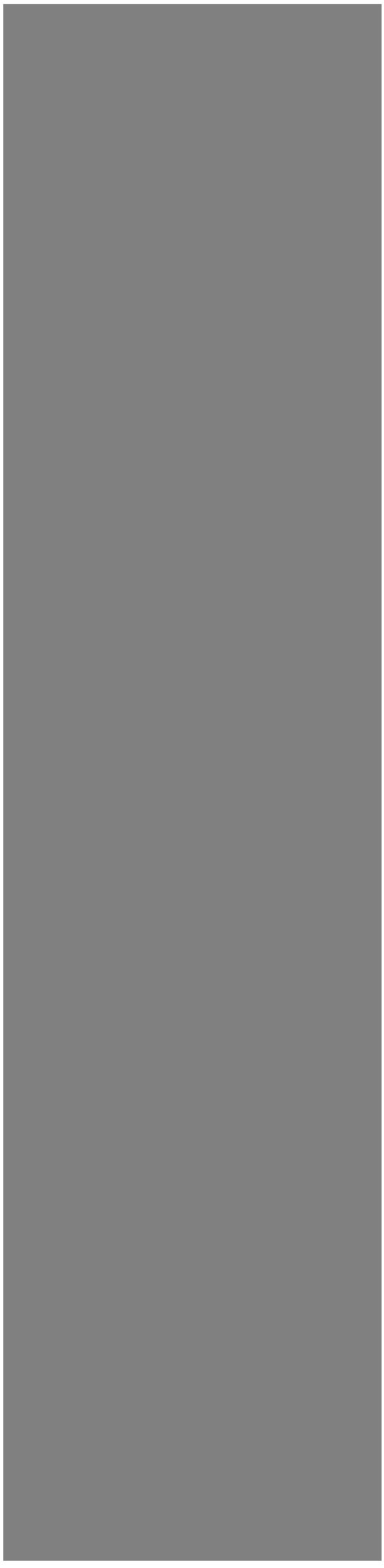


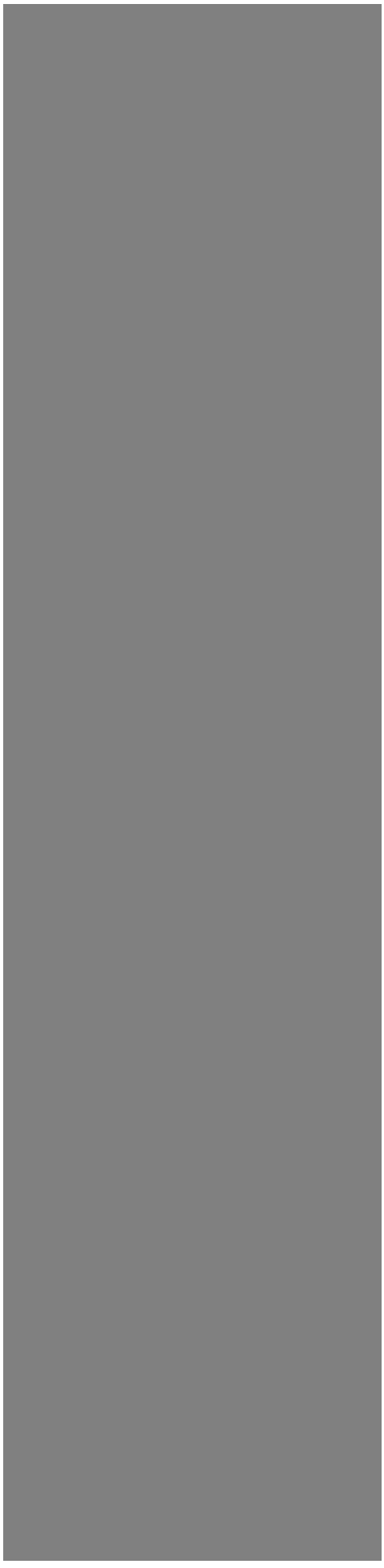


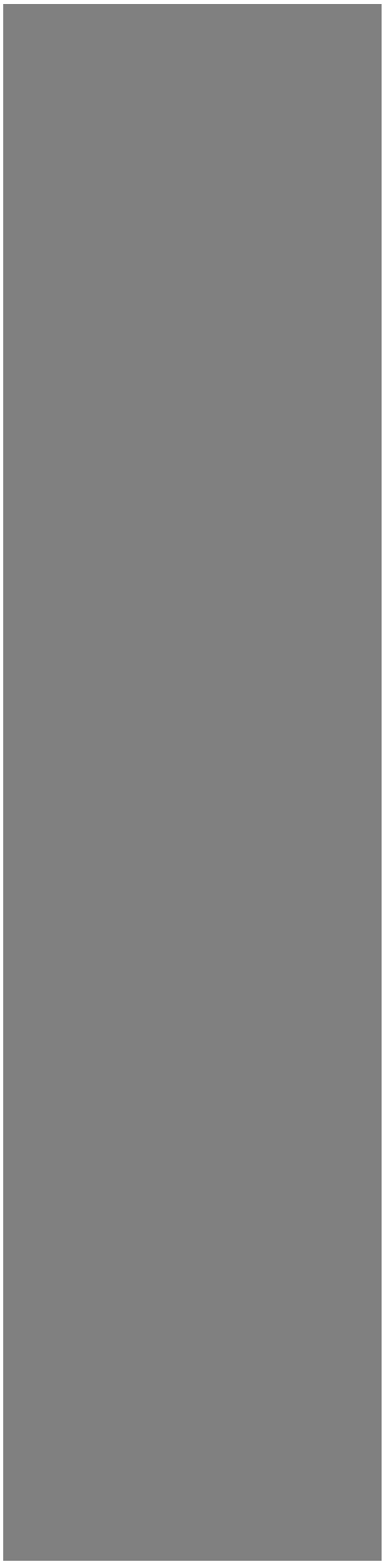


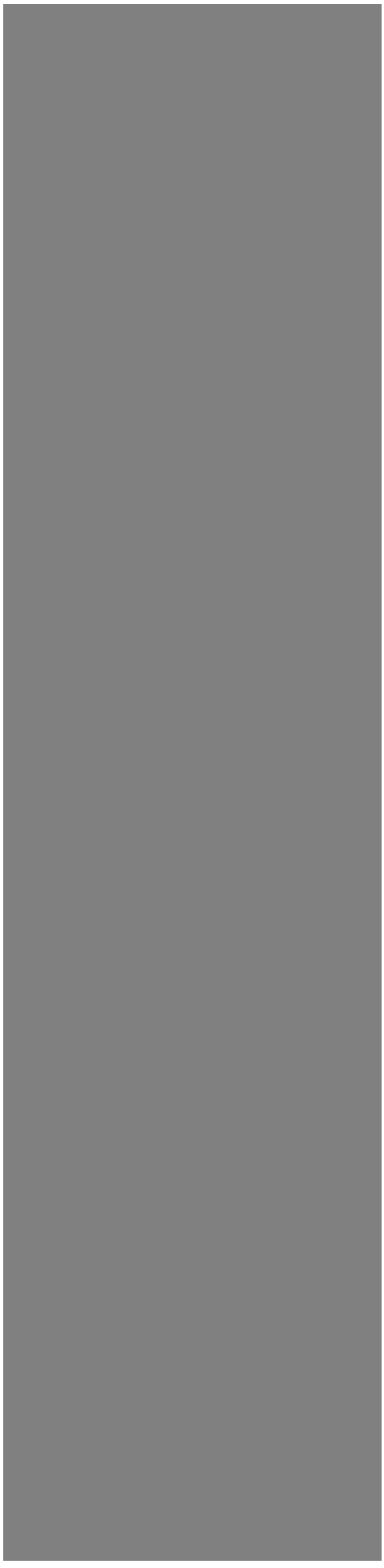


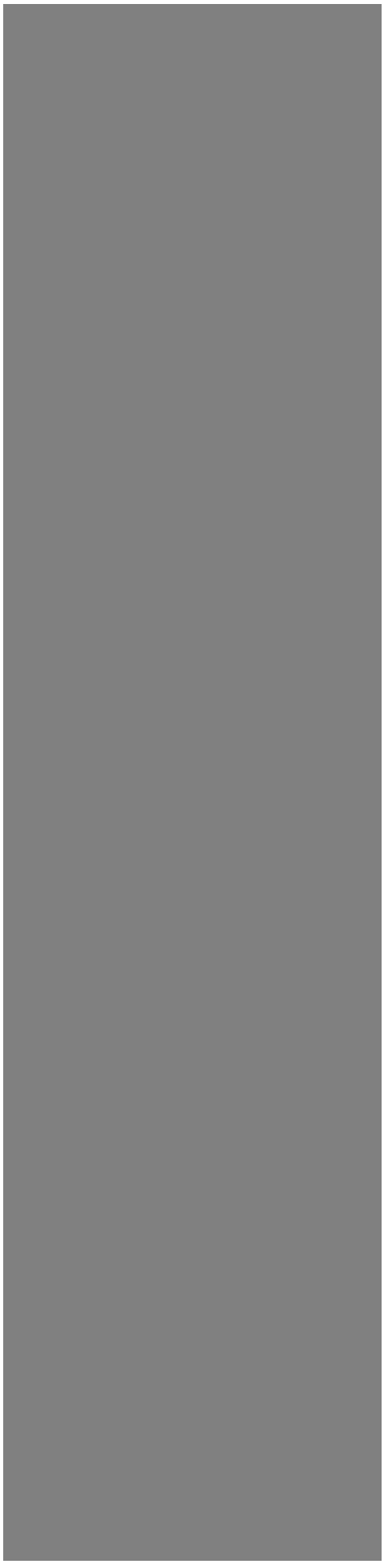


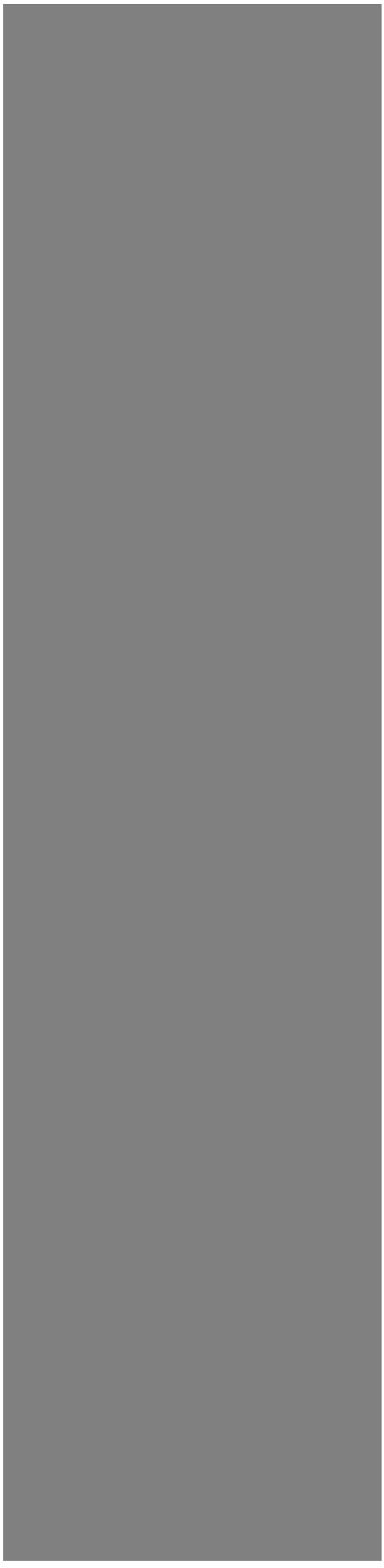


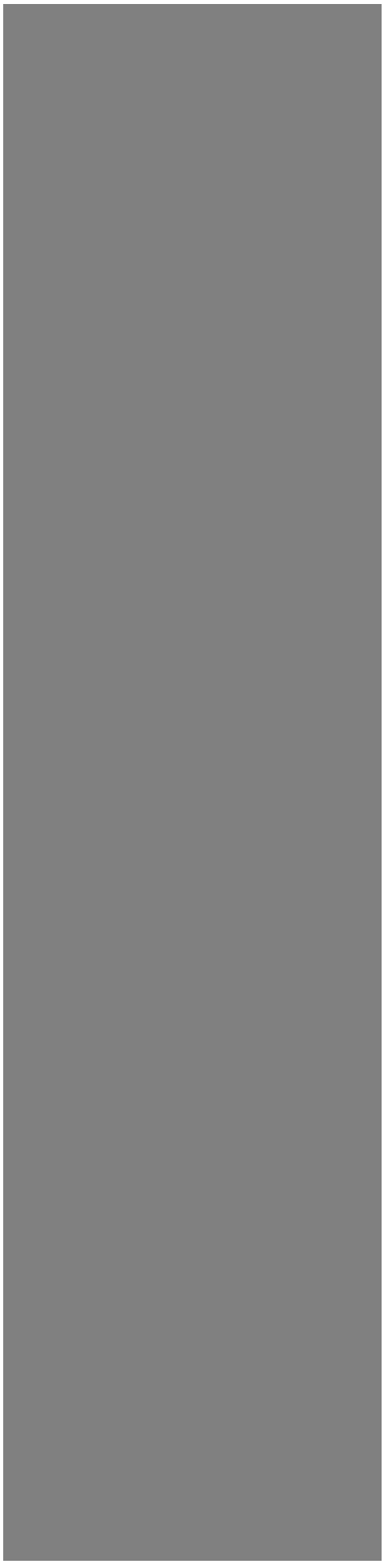


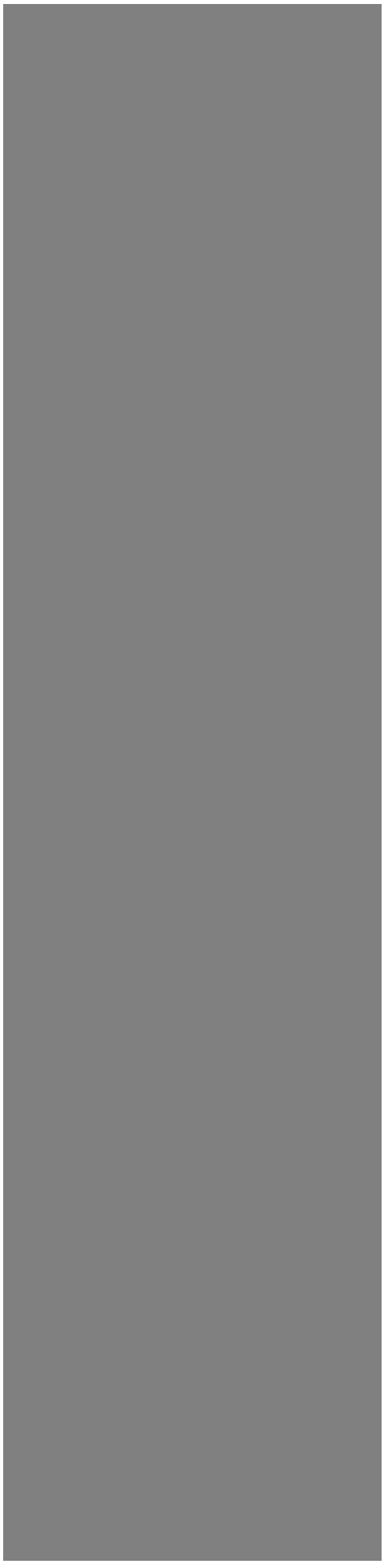














heet is designed for upload to the MCS Installation Database (MID).
ise you will be unable to upload the form to the MCS Installation Database. A value of N/A or

| GUIDANCE |
| --- |
| Enter the name of the owner. |
| Enter the address where the heating system is installed. |
| Enter the address of the owner. If the owner address is the same as the installation address |
| |
| Select 'intermittent' or 'continuous' as appropriate.<br><br>Intermittent heating means that the heating system has the ability to provide all the space heating requirement on the design day within a period of no more than 16 hours, without use of supplementary heaters. Continuous heating means that the heating system has the |
| Enter the design external temperature used in the heat loss calculation. Refer to 4.2.1b and |
| Enter the total heat loss of the building in kW. NOTE see 70kW guidance paper as this may be an area of the property as opposed to the whole building. |
| |
| Referring to the emitter types listed in the Heat Emitter Guide, list all heat emitters installed. Note, it is only necessary to list the types of heat emitter installed in the property. **It is not necessary** to list the type and number of emitters installed in each room. |
| The maximum water temperature setting for water leaving the heat pump in heating mode in accordance with the design. This is likely to be less than the maximum the heat pump could achieve. |
| Confirm Yes or No. |
| |
| The maximum water temperature setting for water leaving the heat pump when heating sanitary hot water. This should be as high as possible to maximise the stored temperature and reduce the need for direct electric immersion heaters to reduce bacterialogical |
| Select Yes or No. |
| |

For GSHP installations, enter the type of ground heat exchanger used. For horizontal, also enter the minimum depth; for vertical, also enter the maximum depth e.g (horizontal, 2m). For other heat pump installations, enter N/A.

This is the figure used in the calculations to size the ground array and should ideally be established using eirher a geotechnologist, specific experience from nearby projects or a site thermal test or combination thereof

Enter the EPC number if the premises is entitled to a domestic EPC, otherwise enter N/A.

This figure normally appears at the bottom left hand side of the document and is the sum of the services heated by the heat pump e.g. heating and hot water energy figure added

Select Yes or No

Select Yes or No

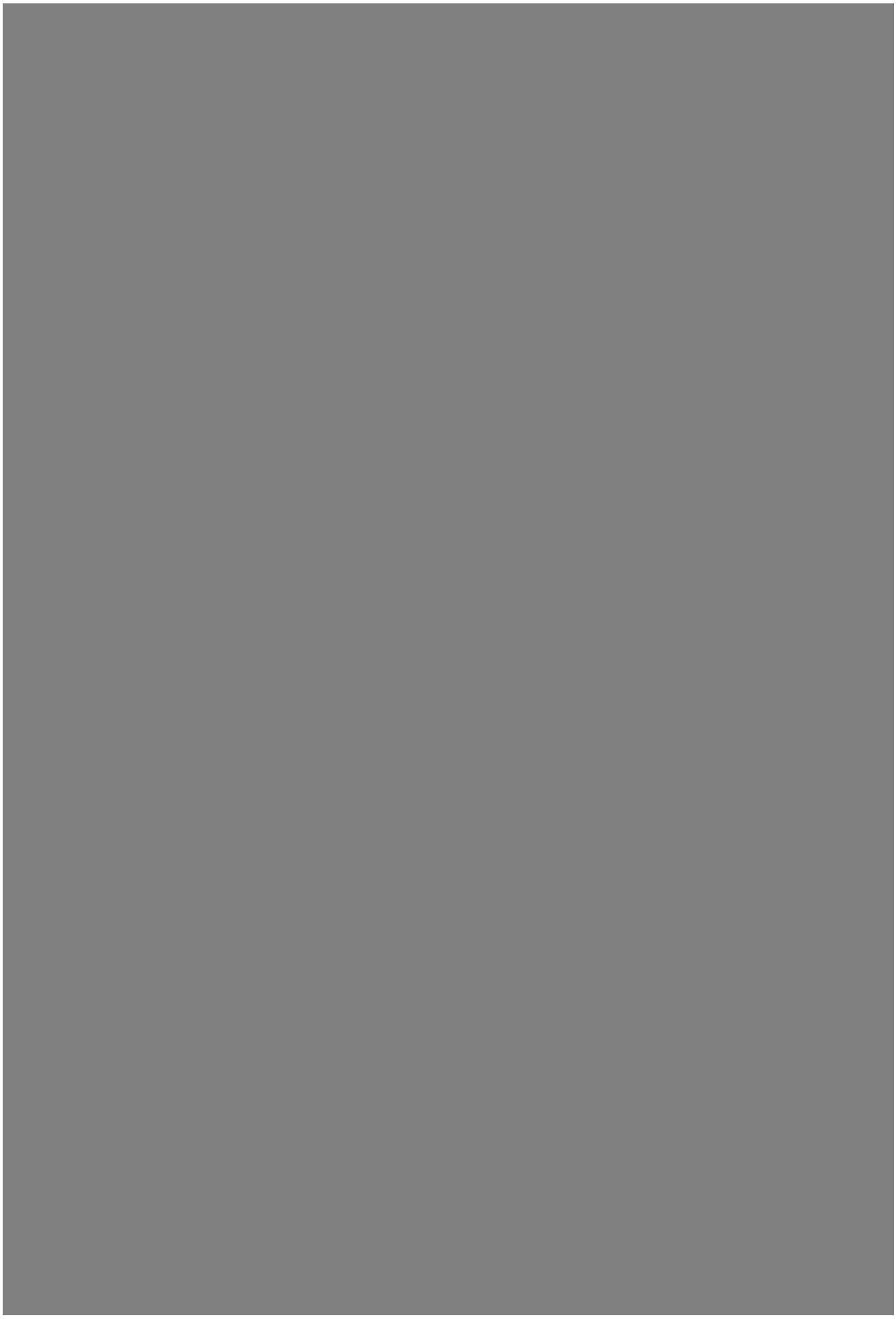
Select the Issue of MIS 3005 that has been used. This version of the Compliance Certificate
Select Yes or No

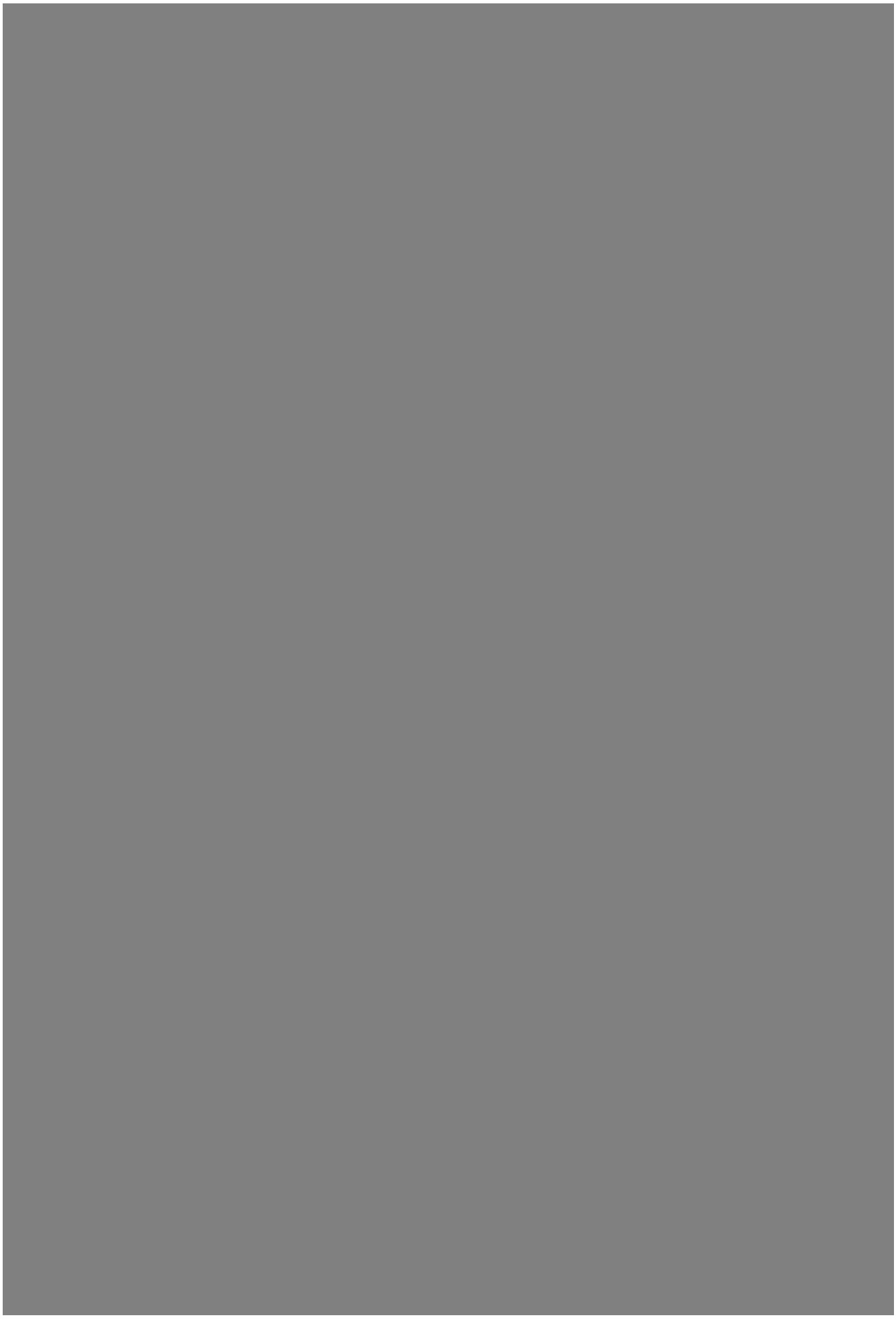
Enter organisation name of the MCS Contractor responsible for the installation.

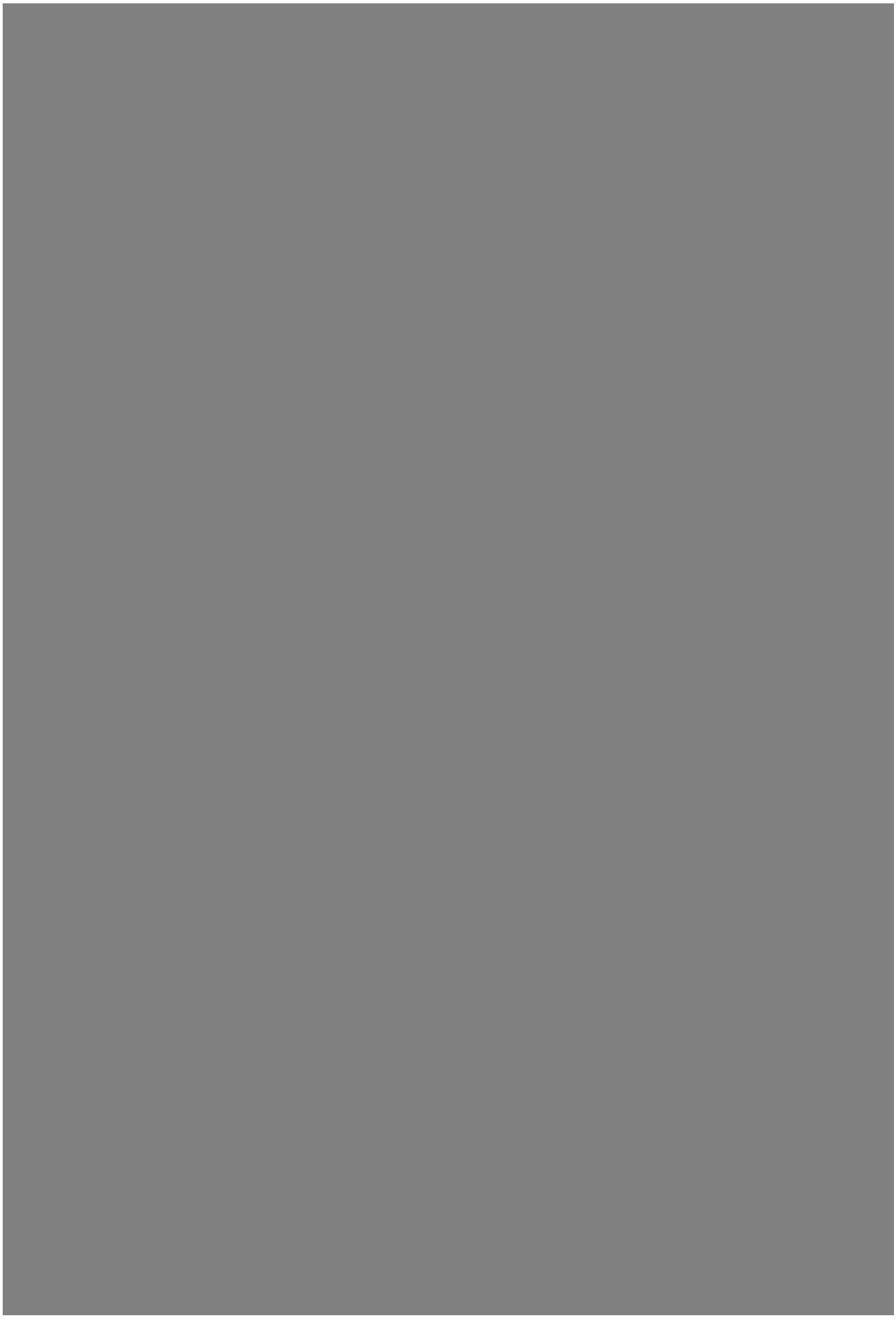
State full name and job title of the person completing the compliance certificate.

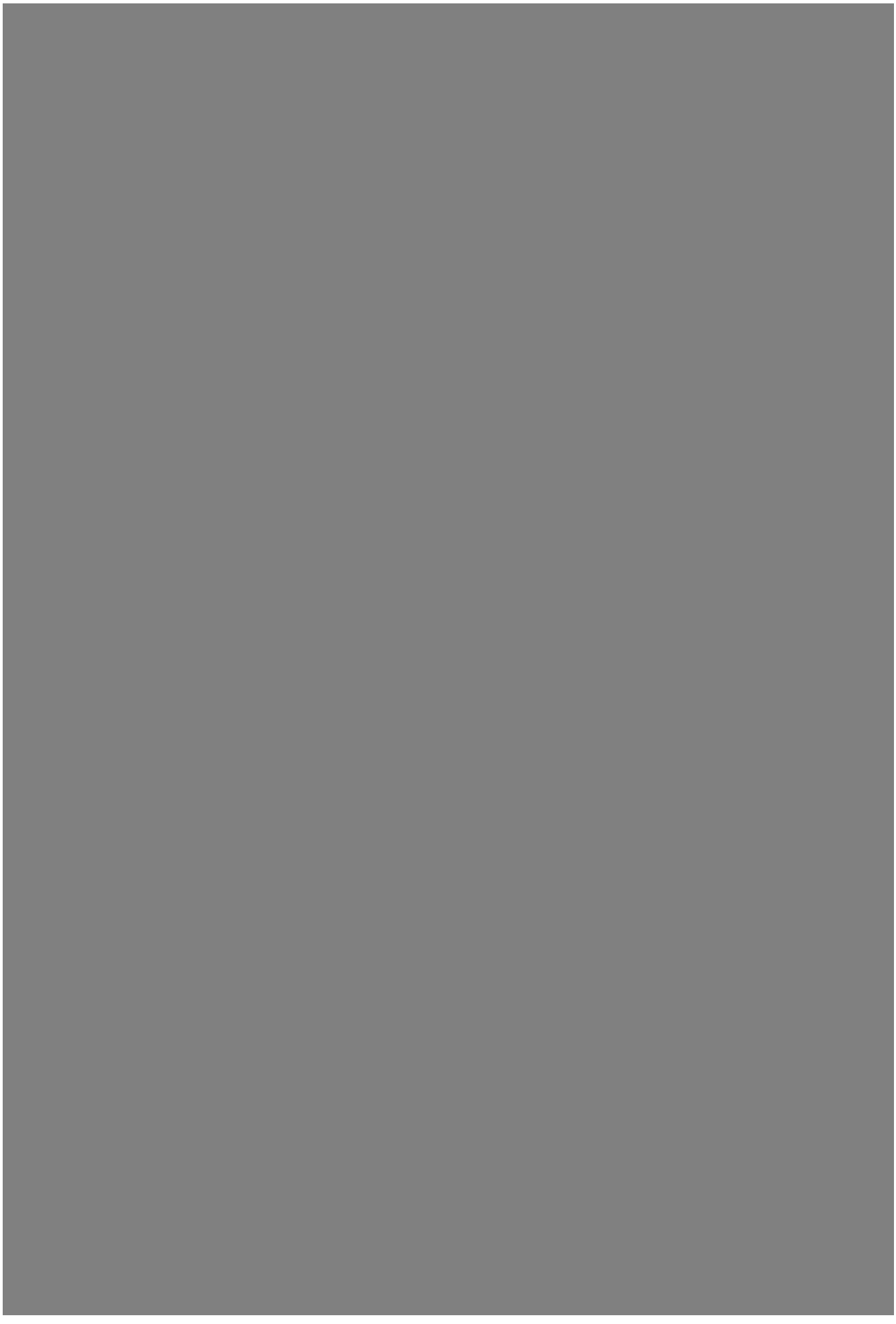
State the date that the compliance certificate was completed.

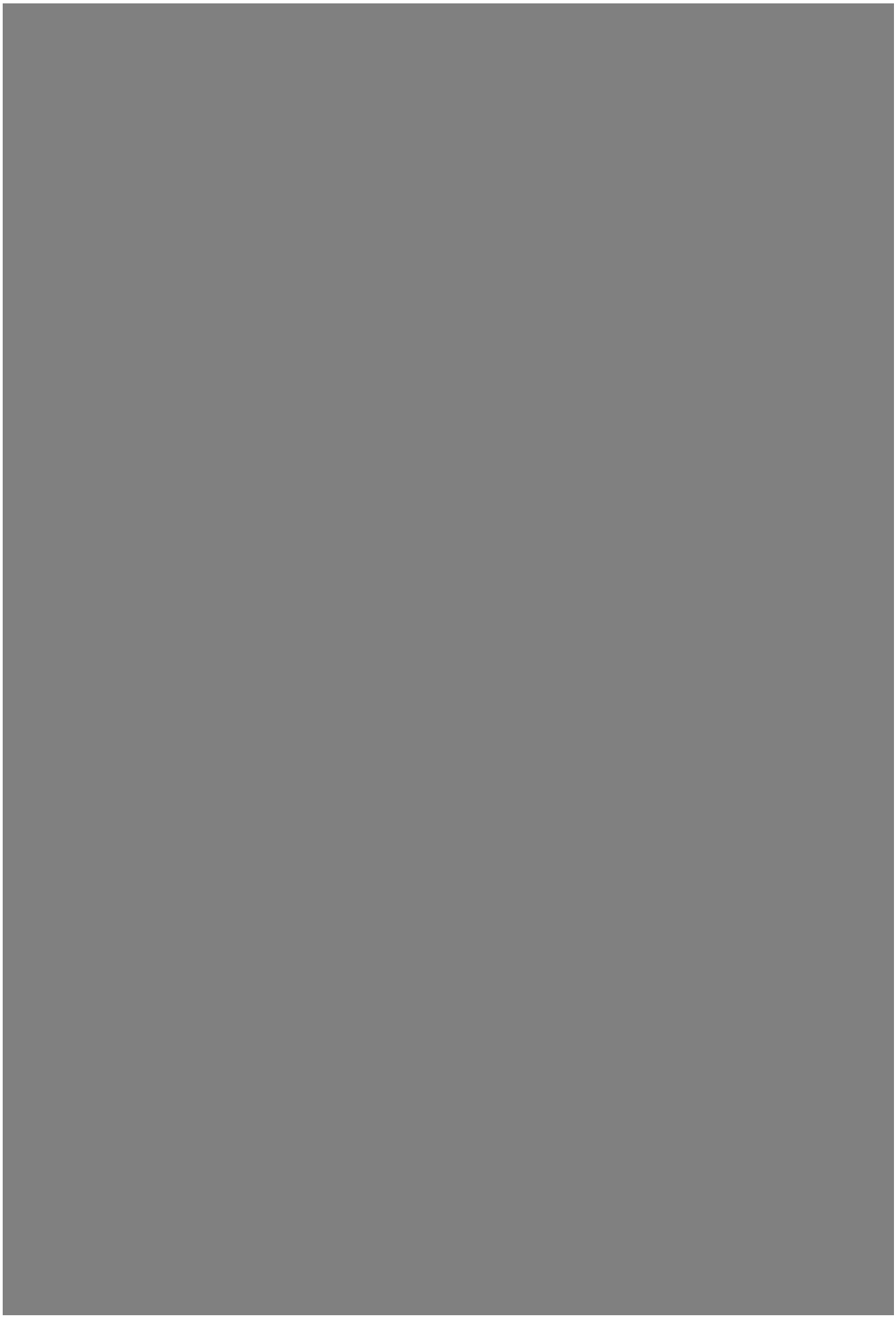
Insert the signature of the person completing the certificate.

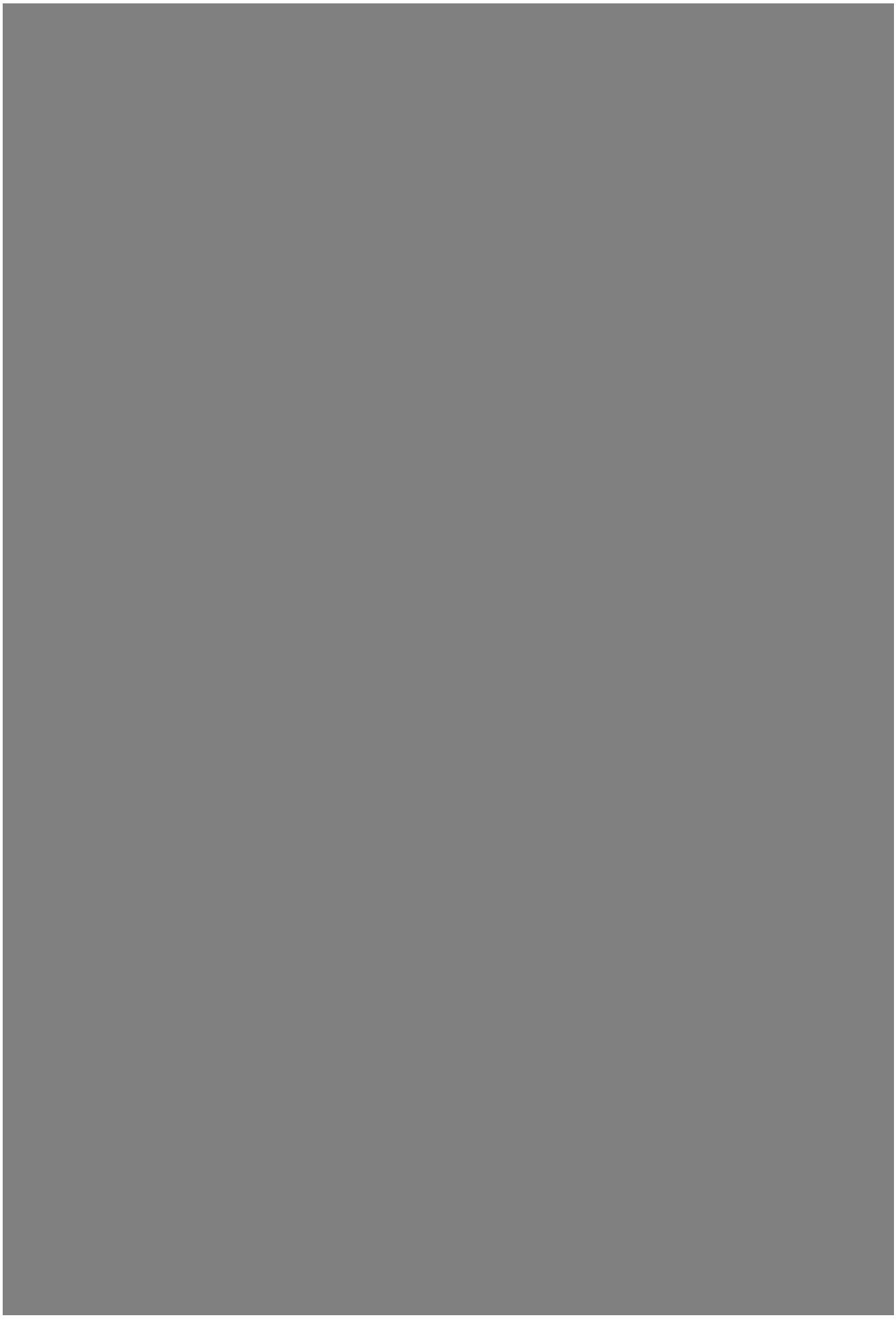


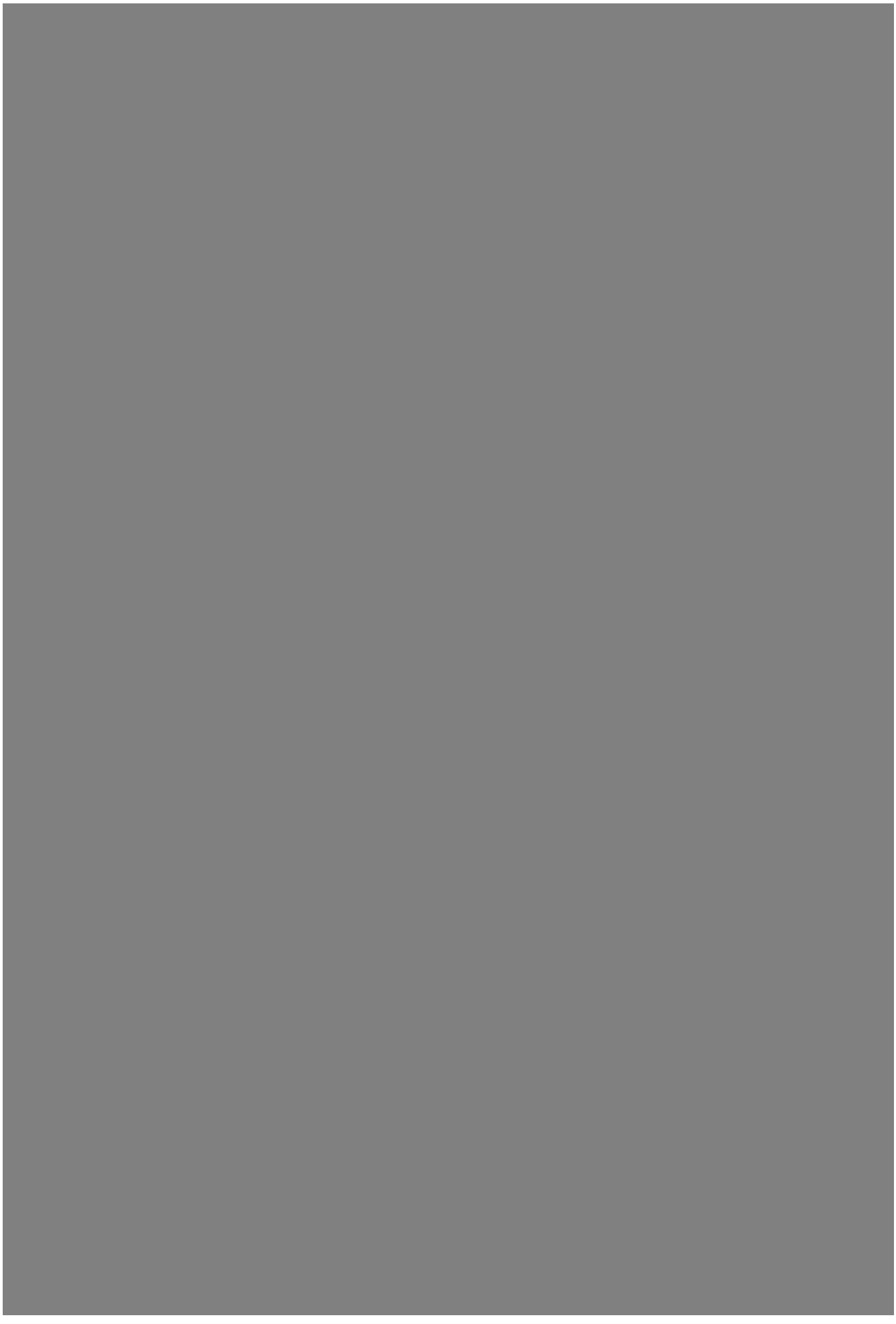


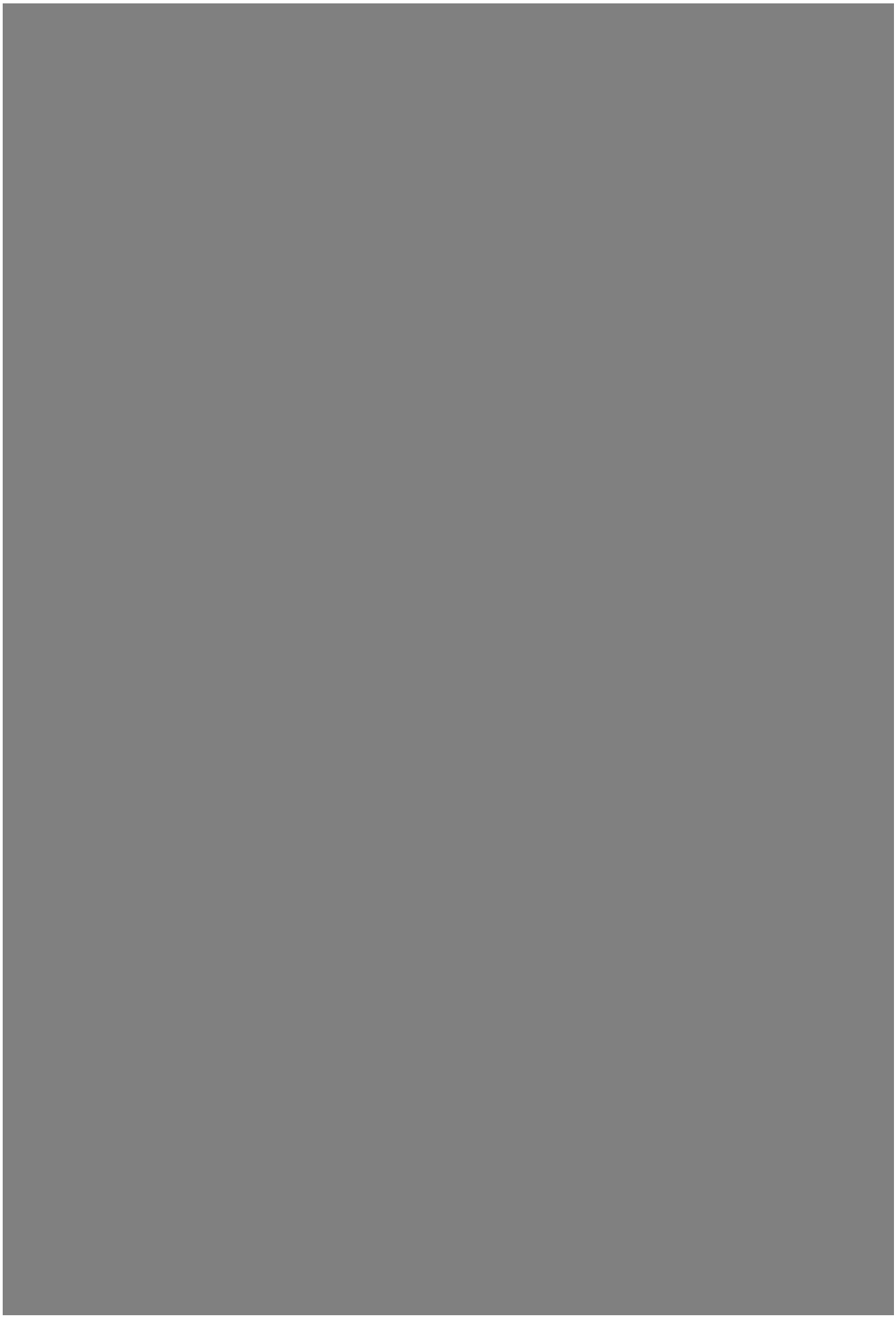


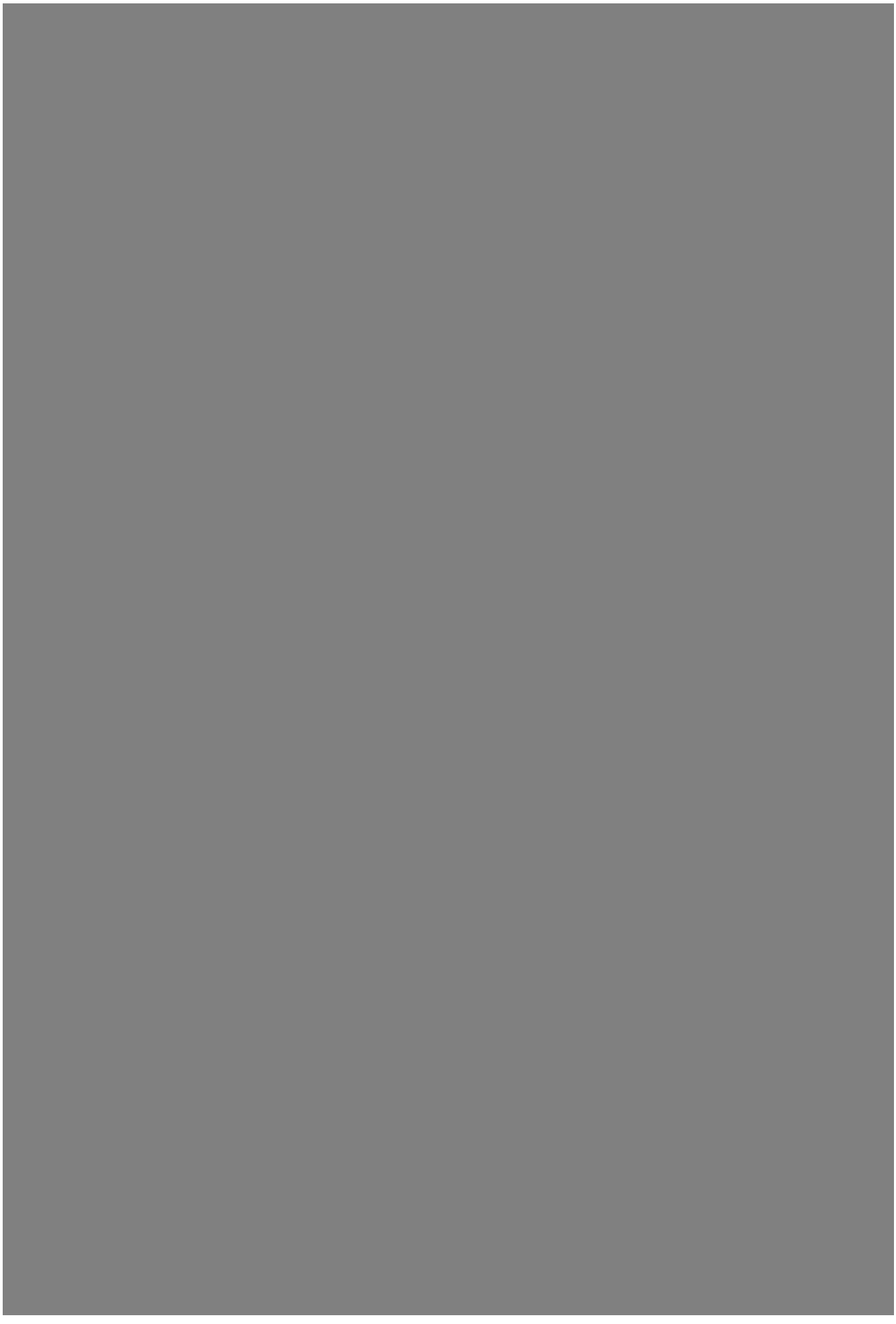


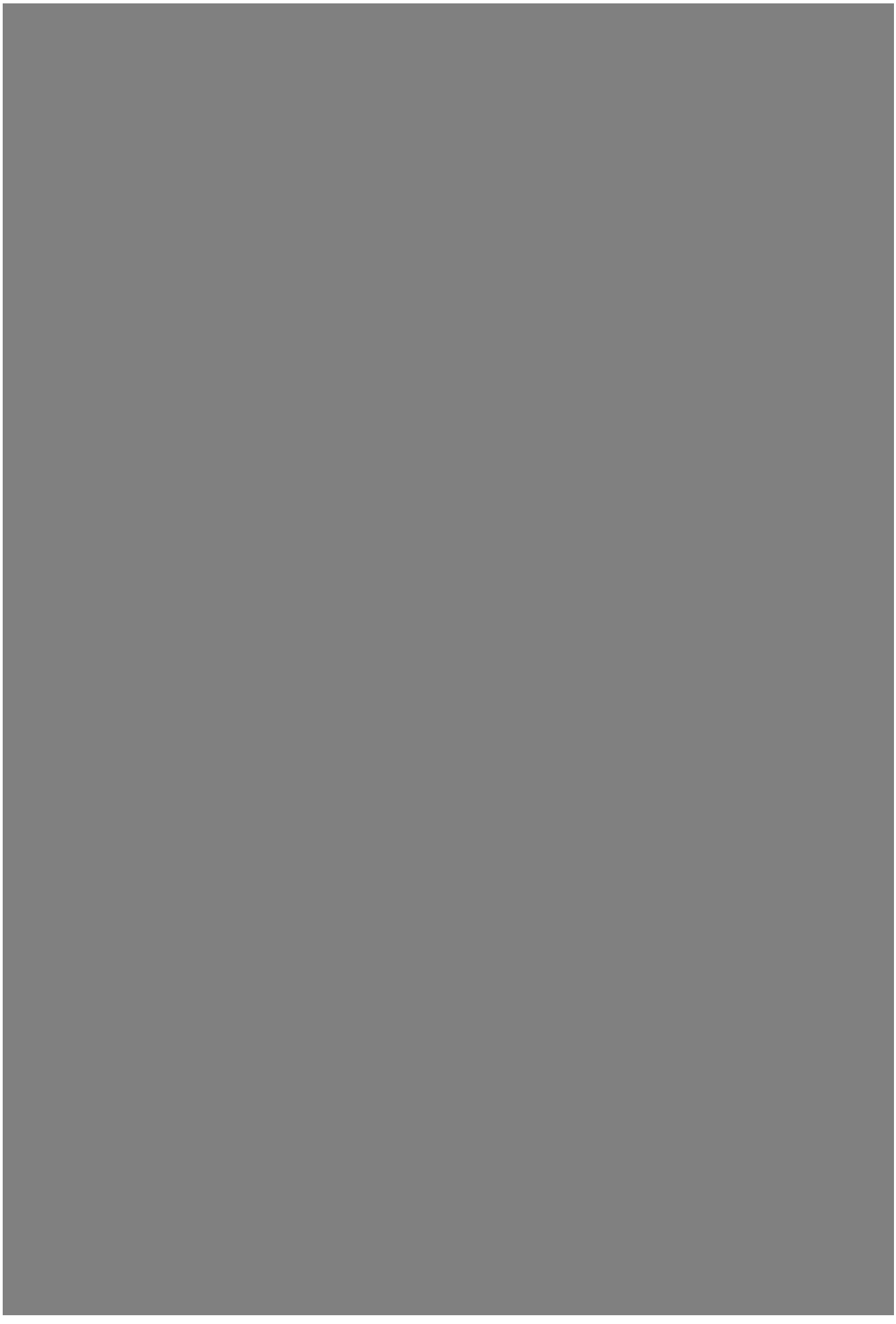


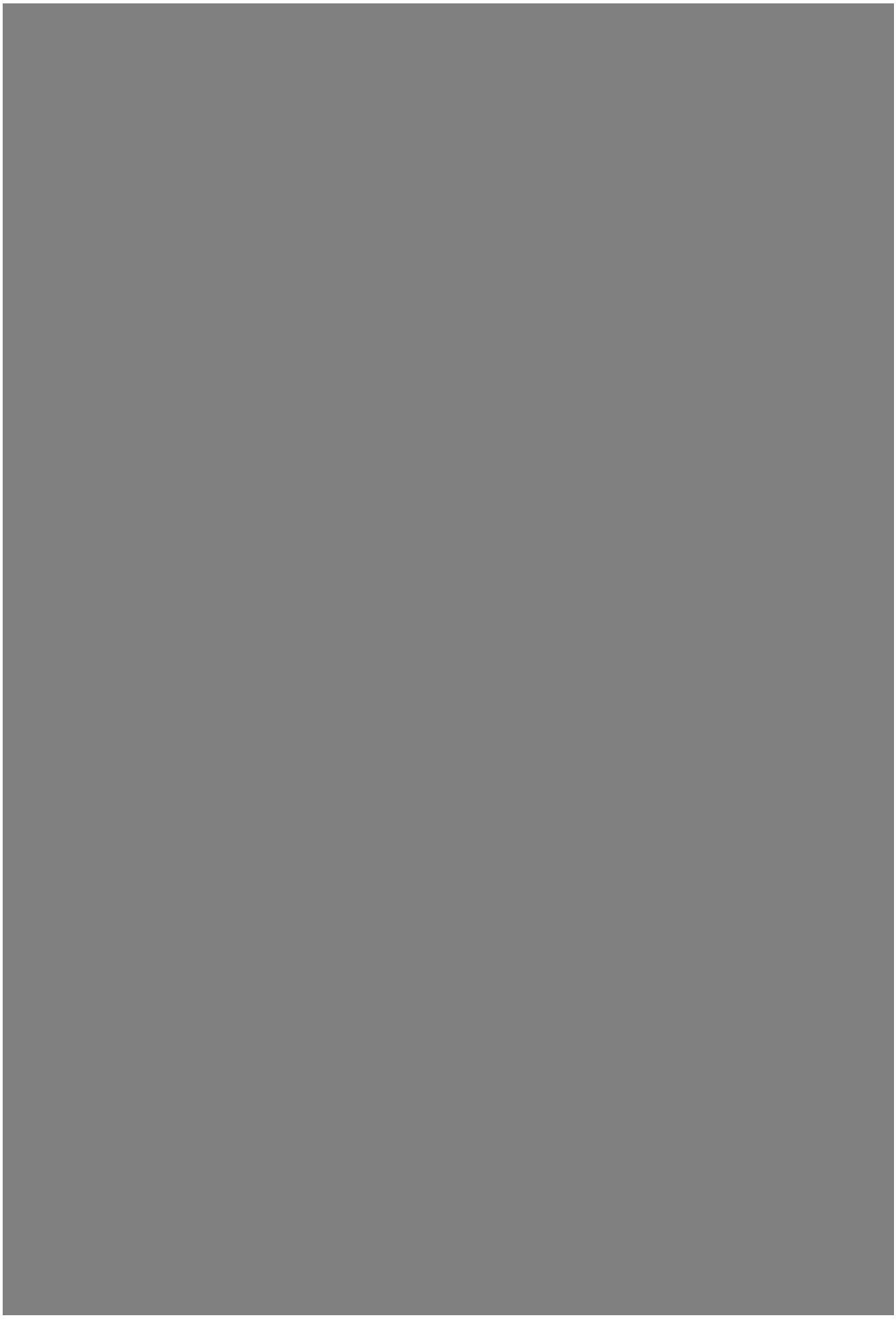


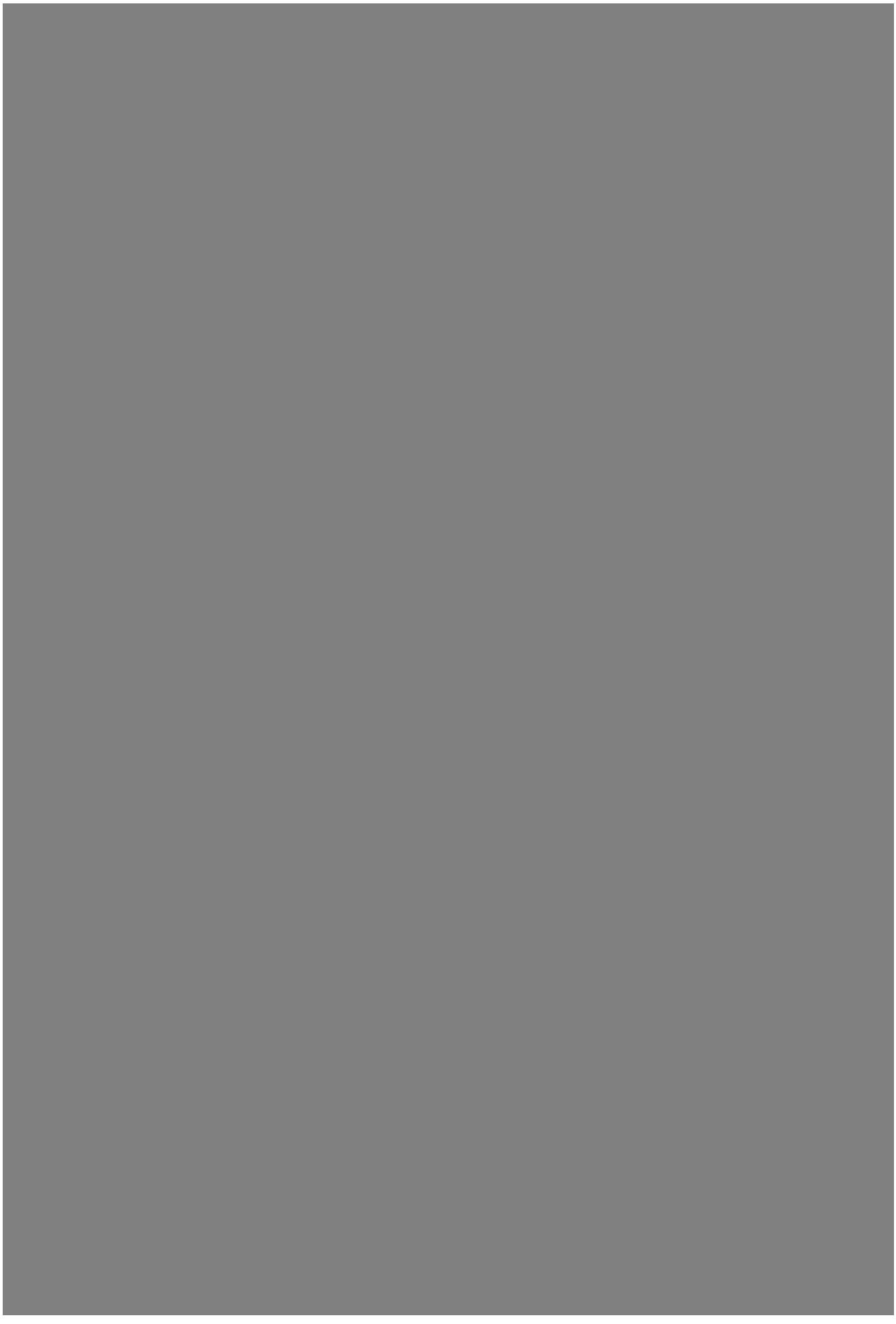


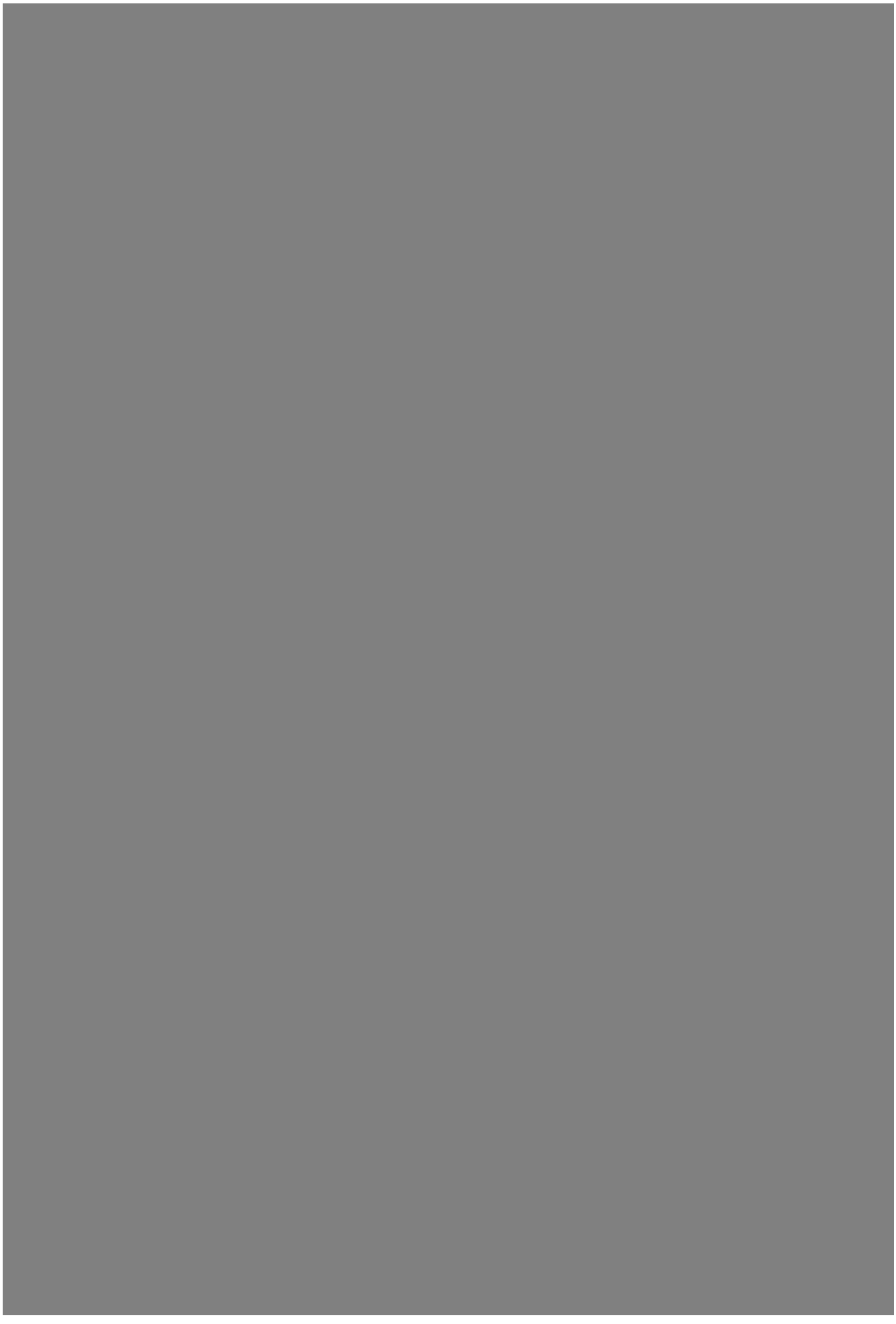


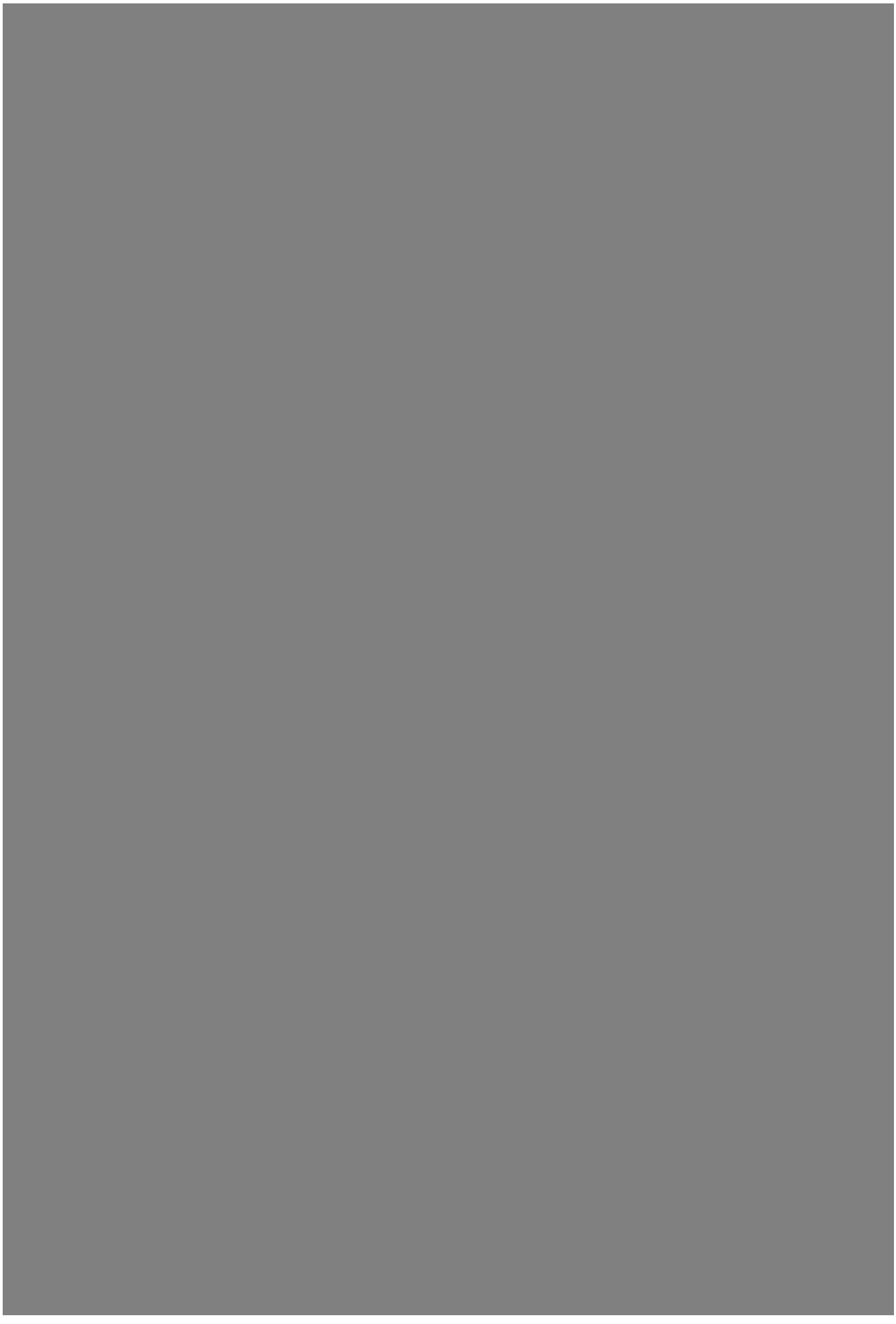


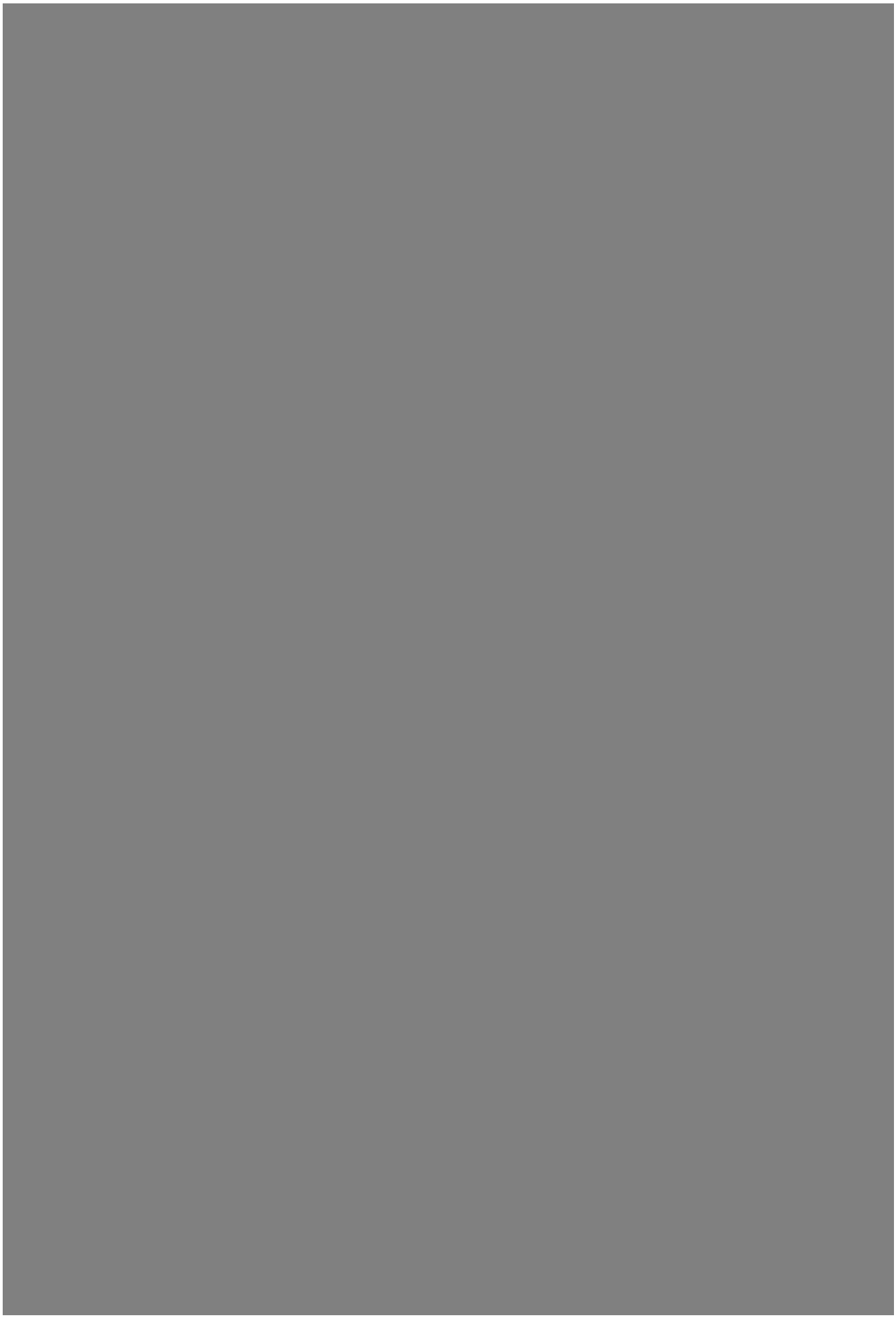


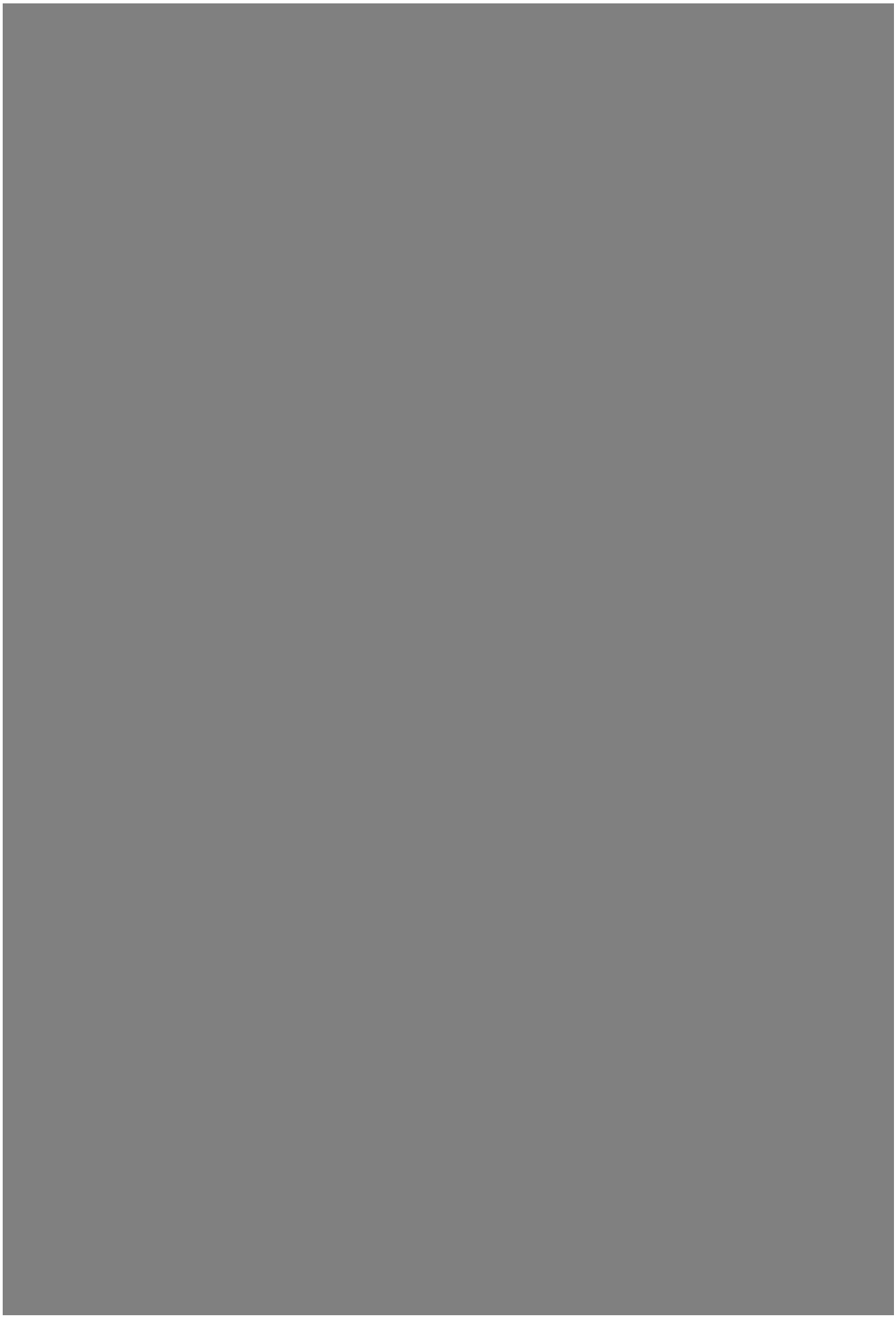




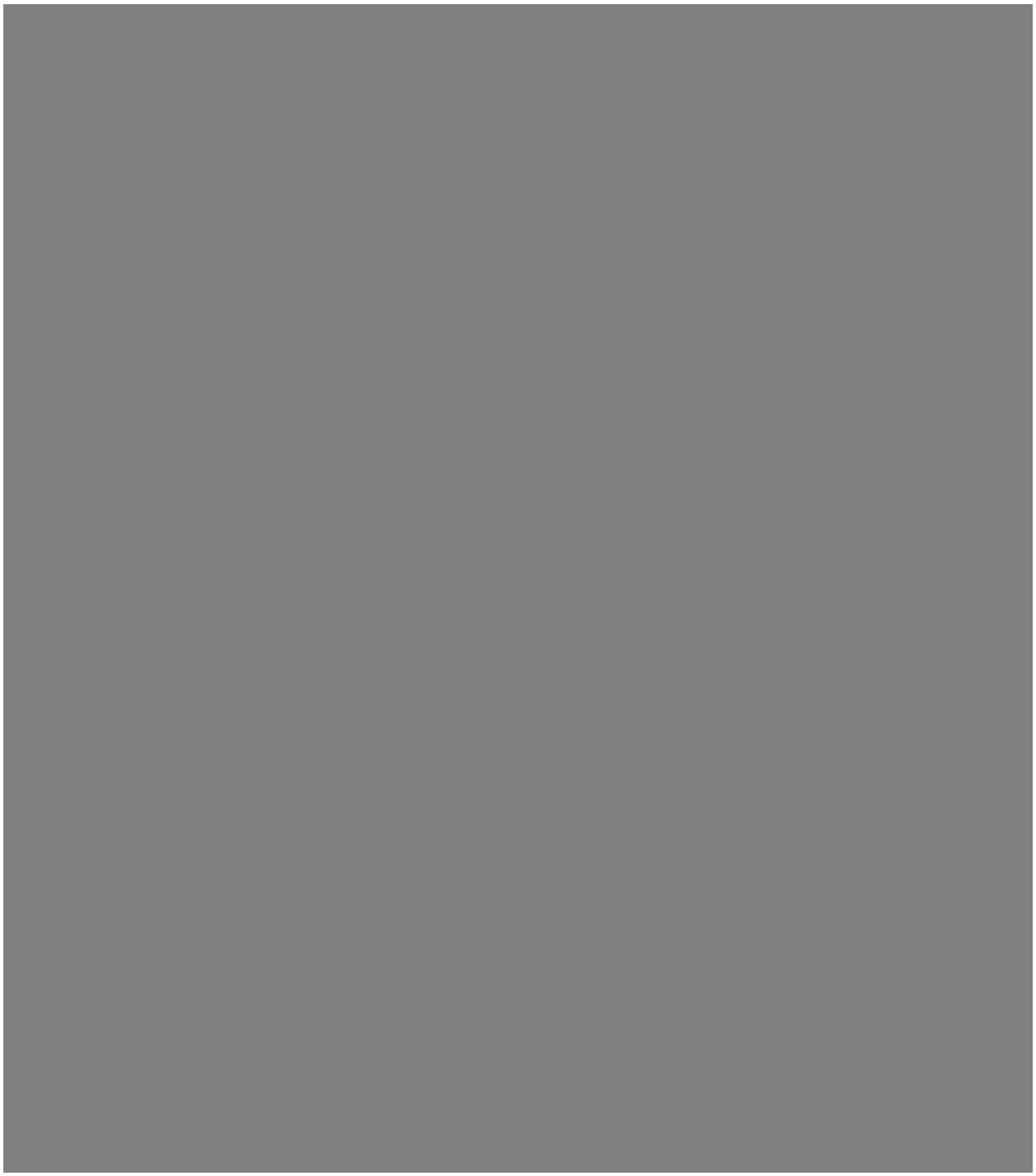


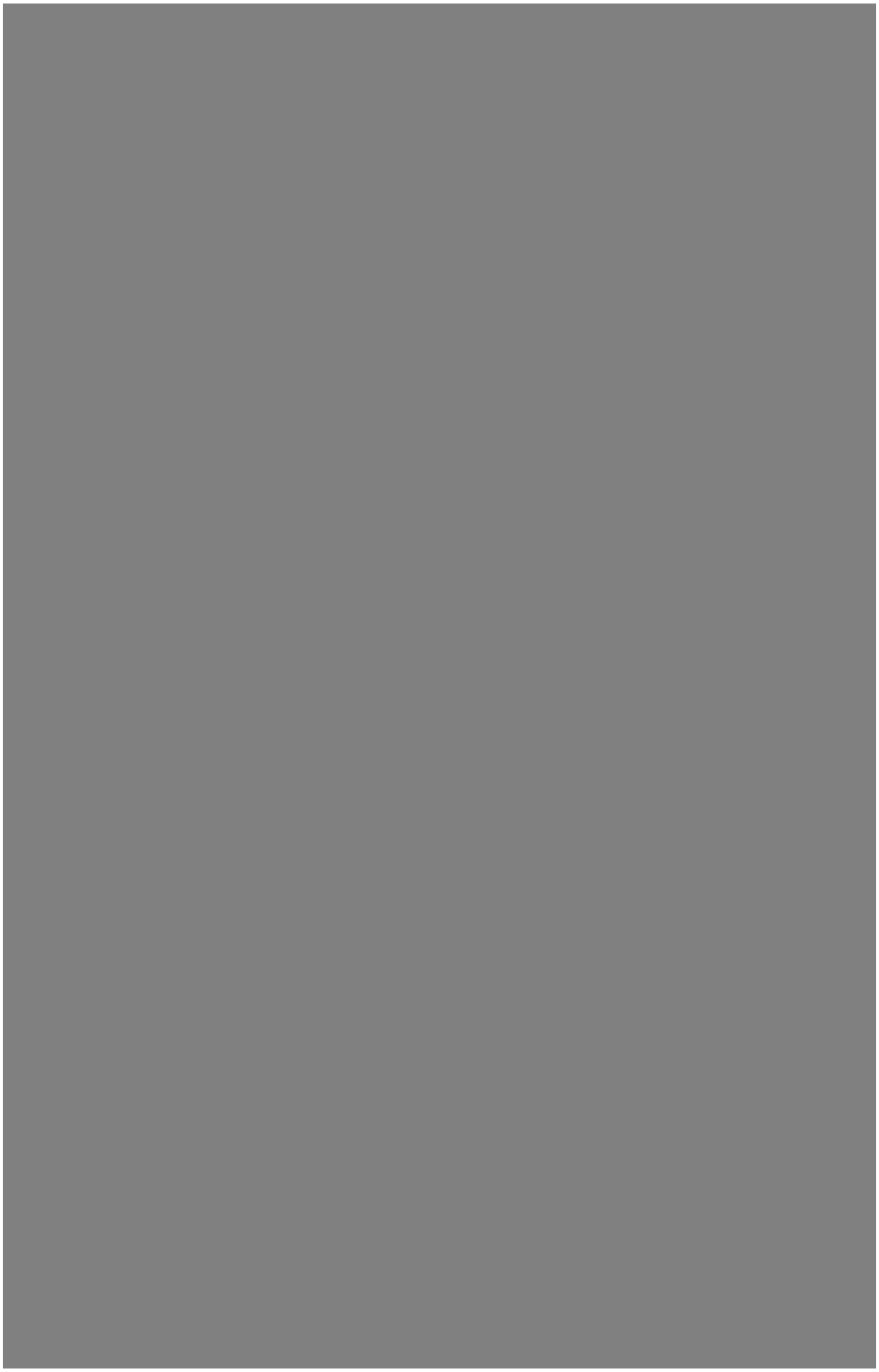


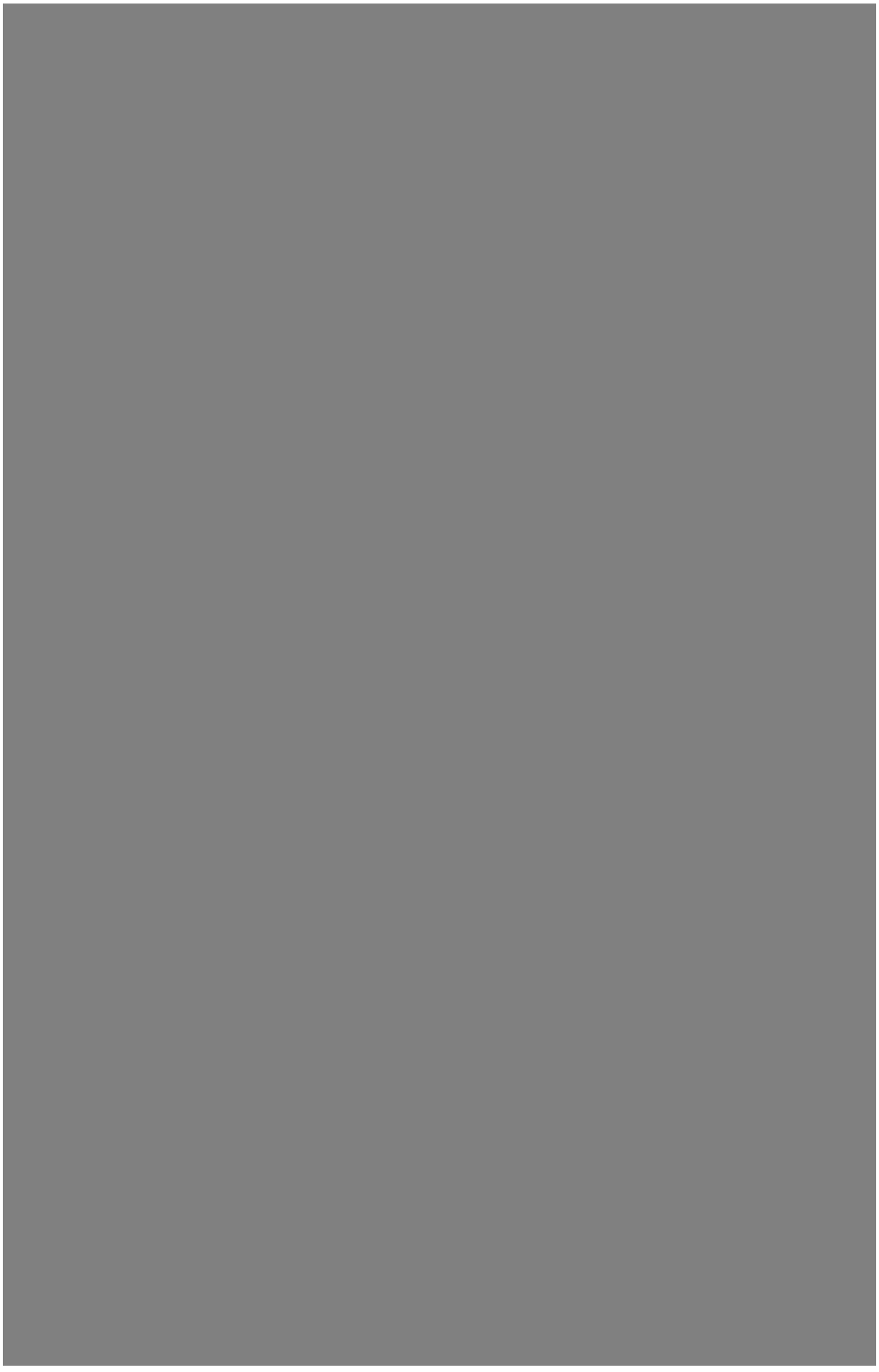


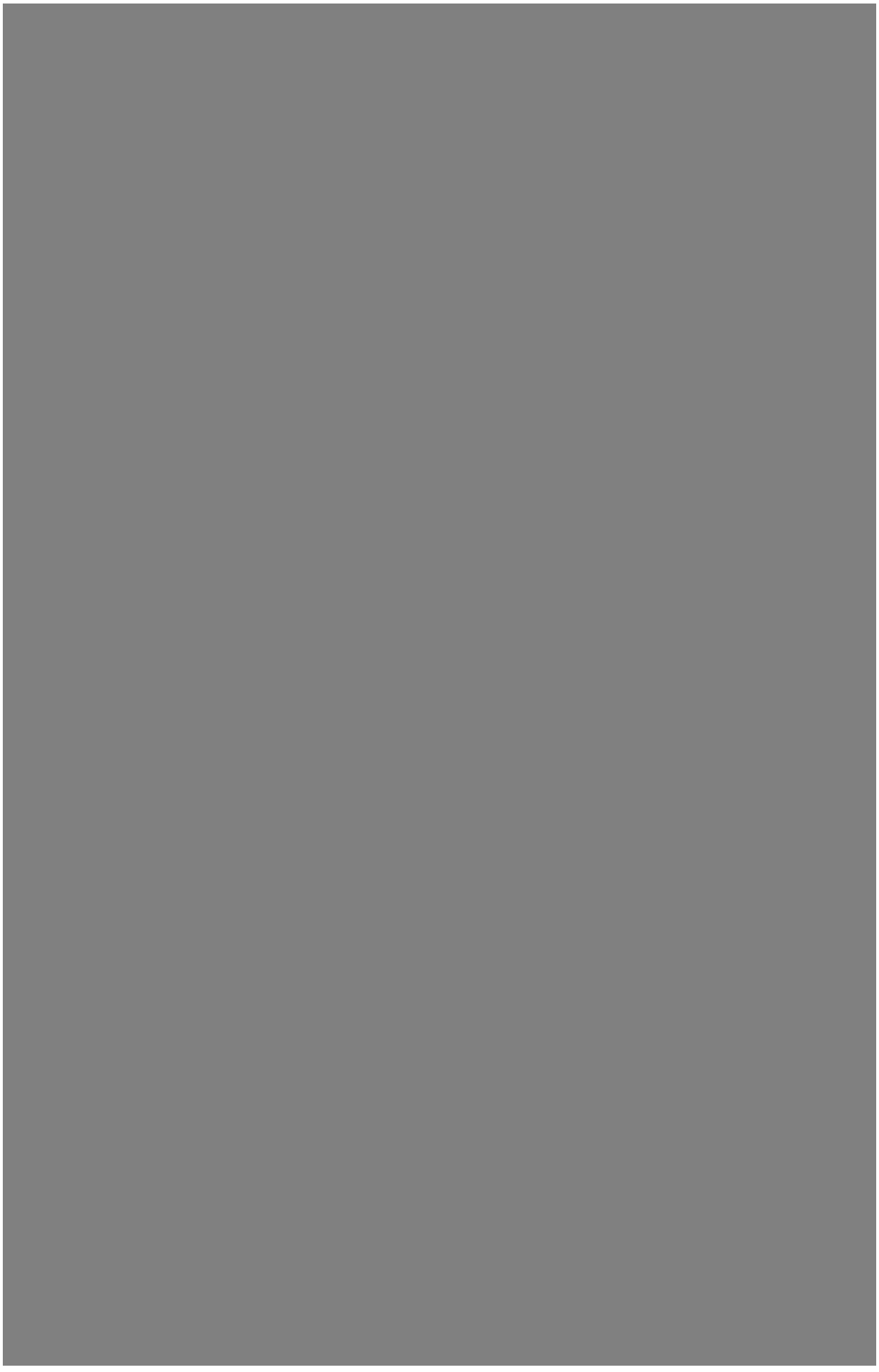


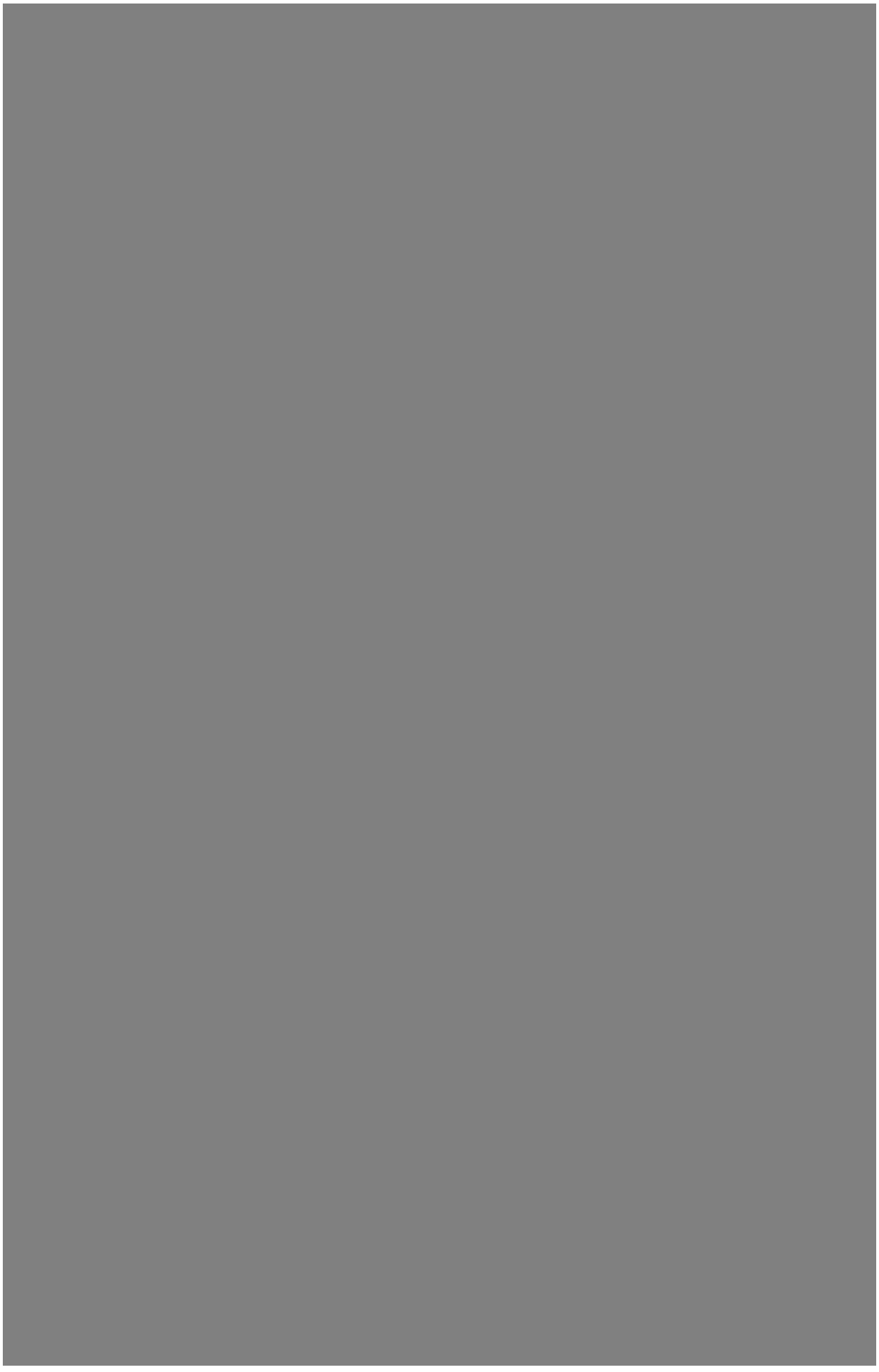


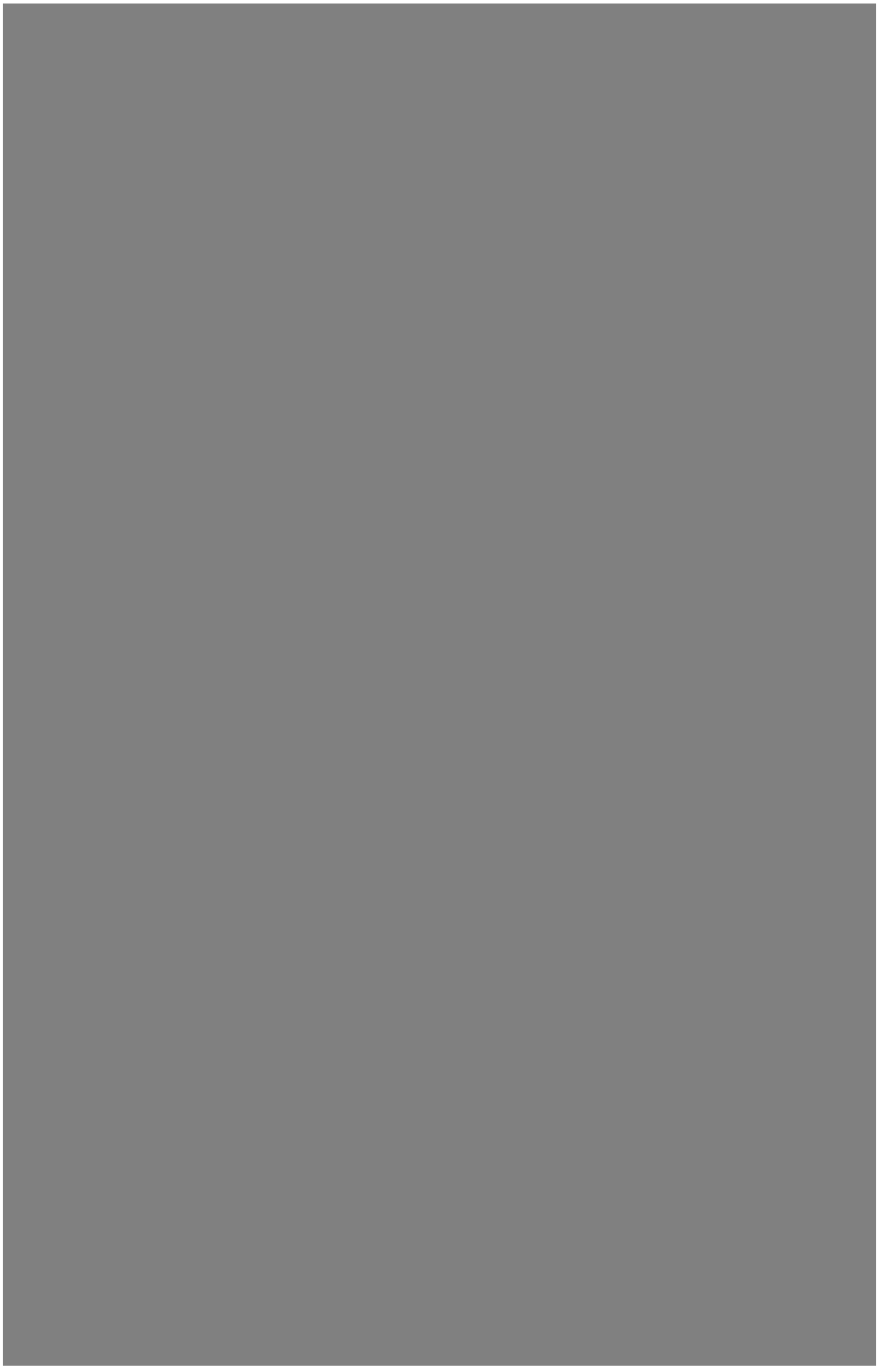


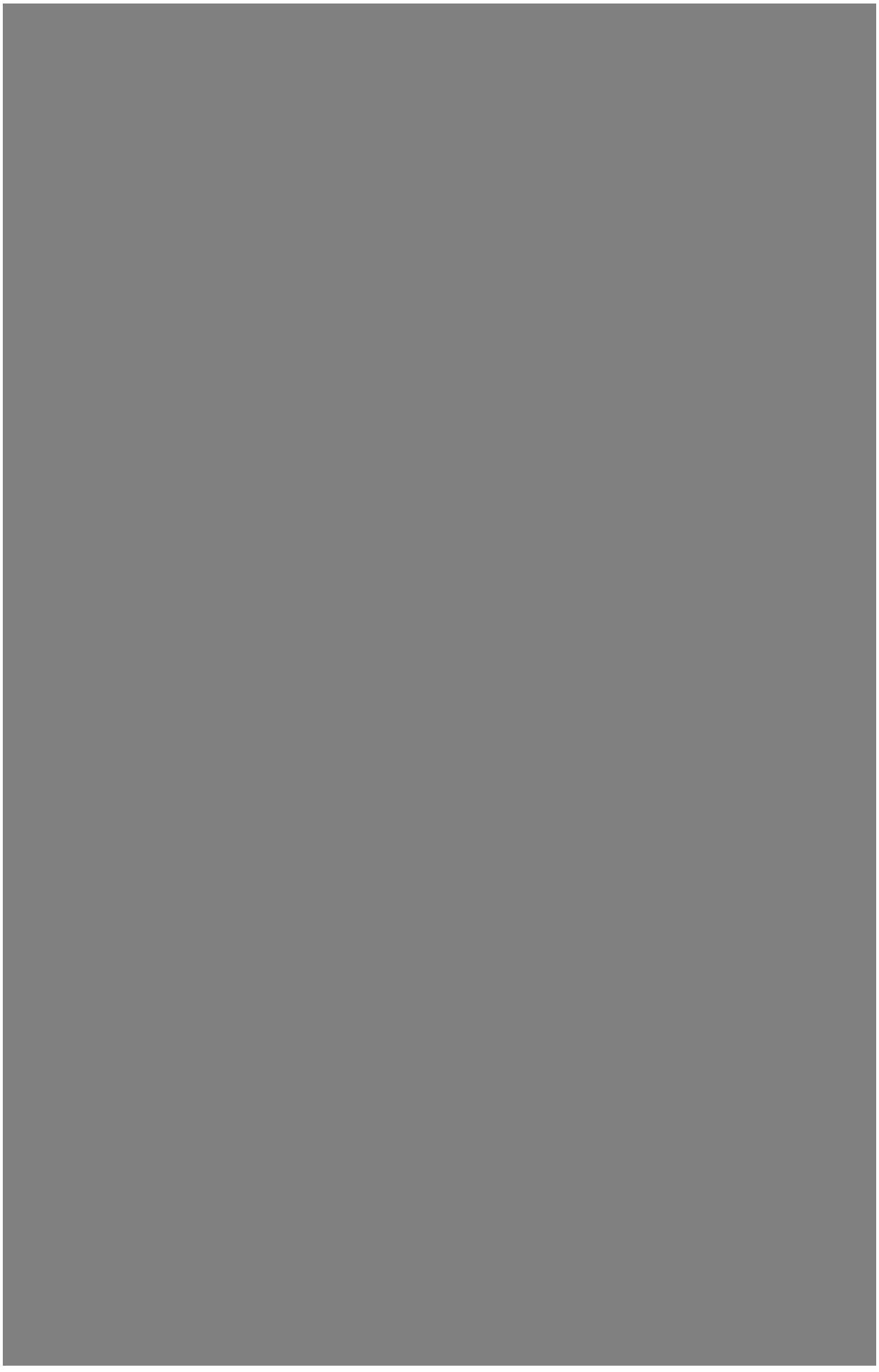


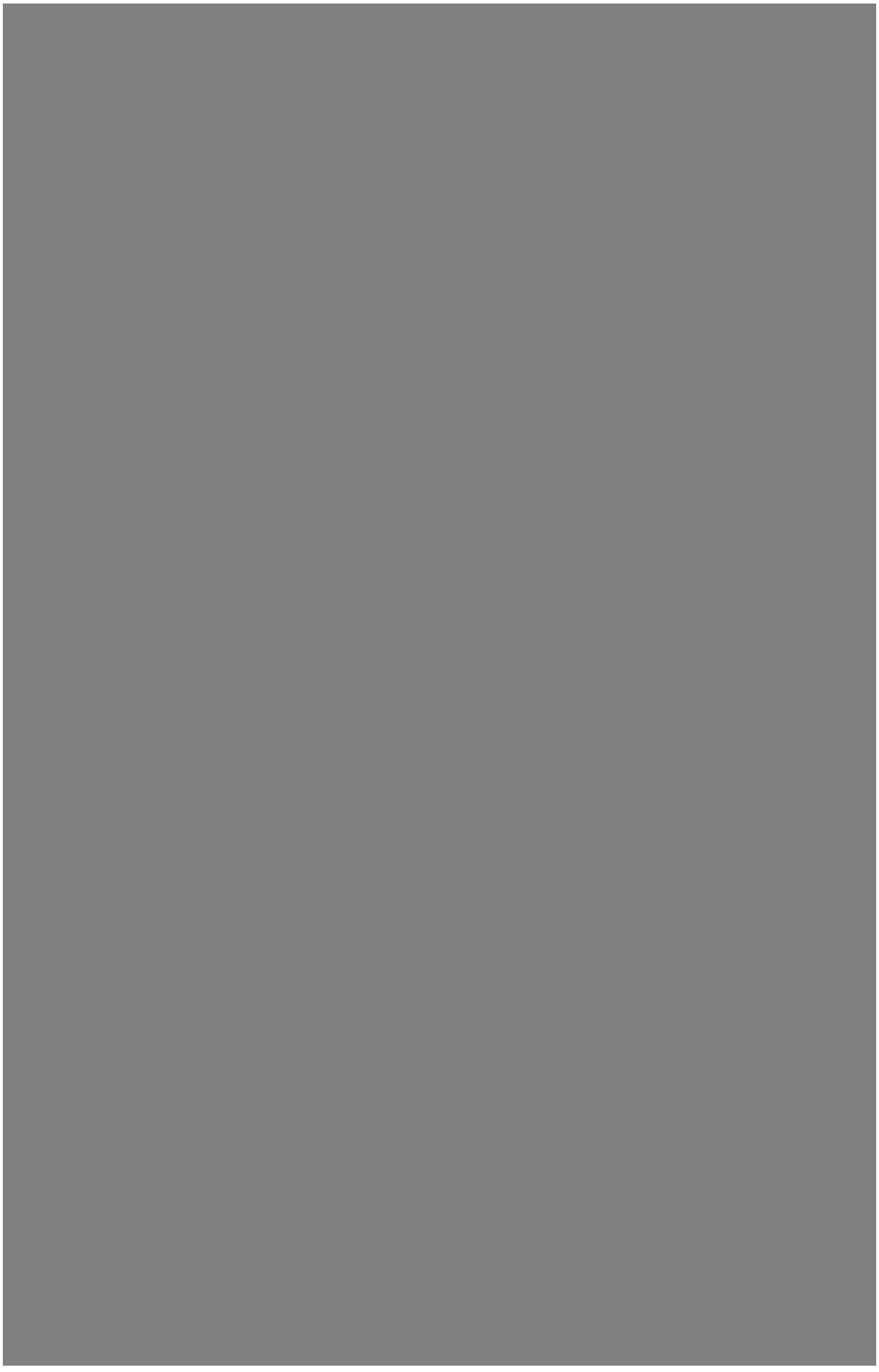


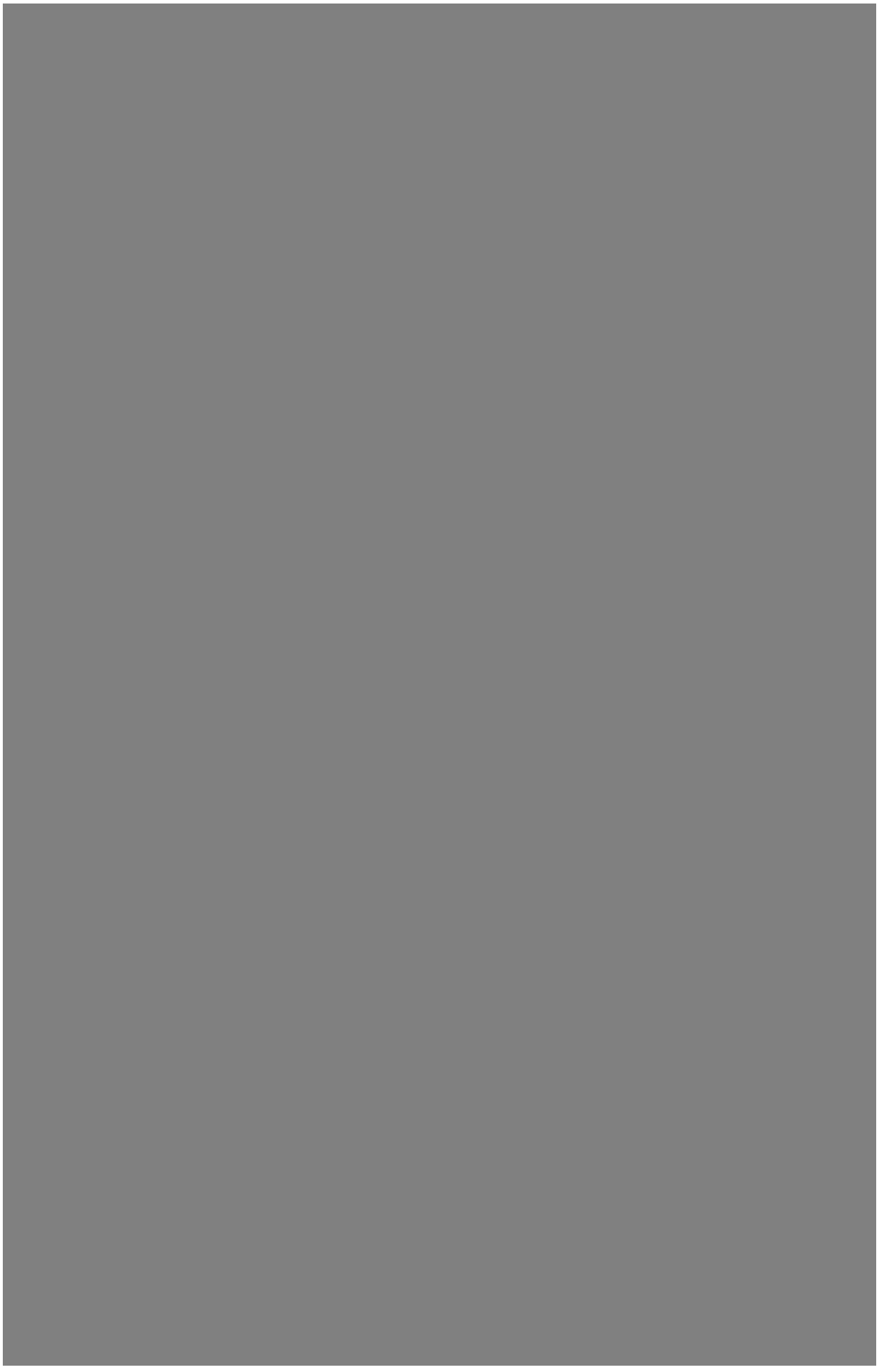


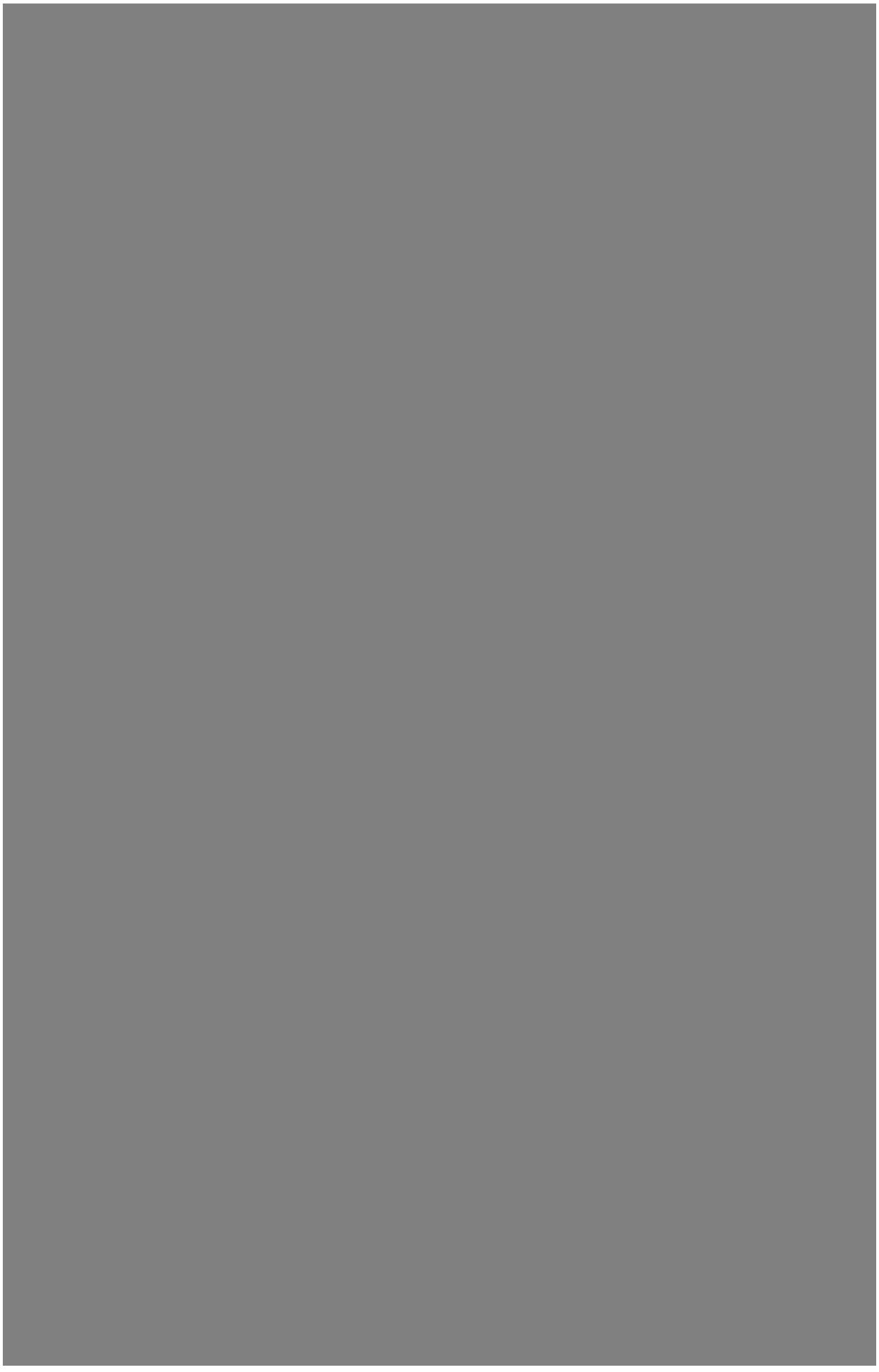


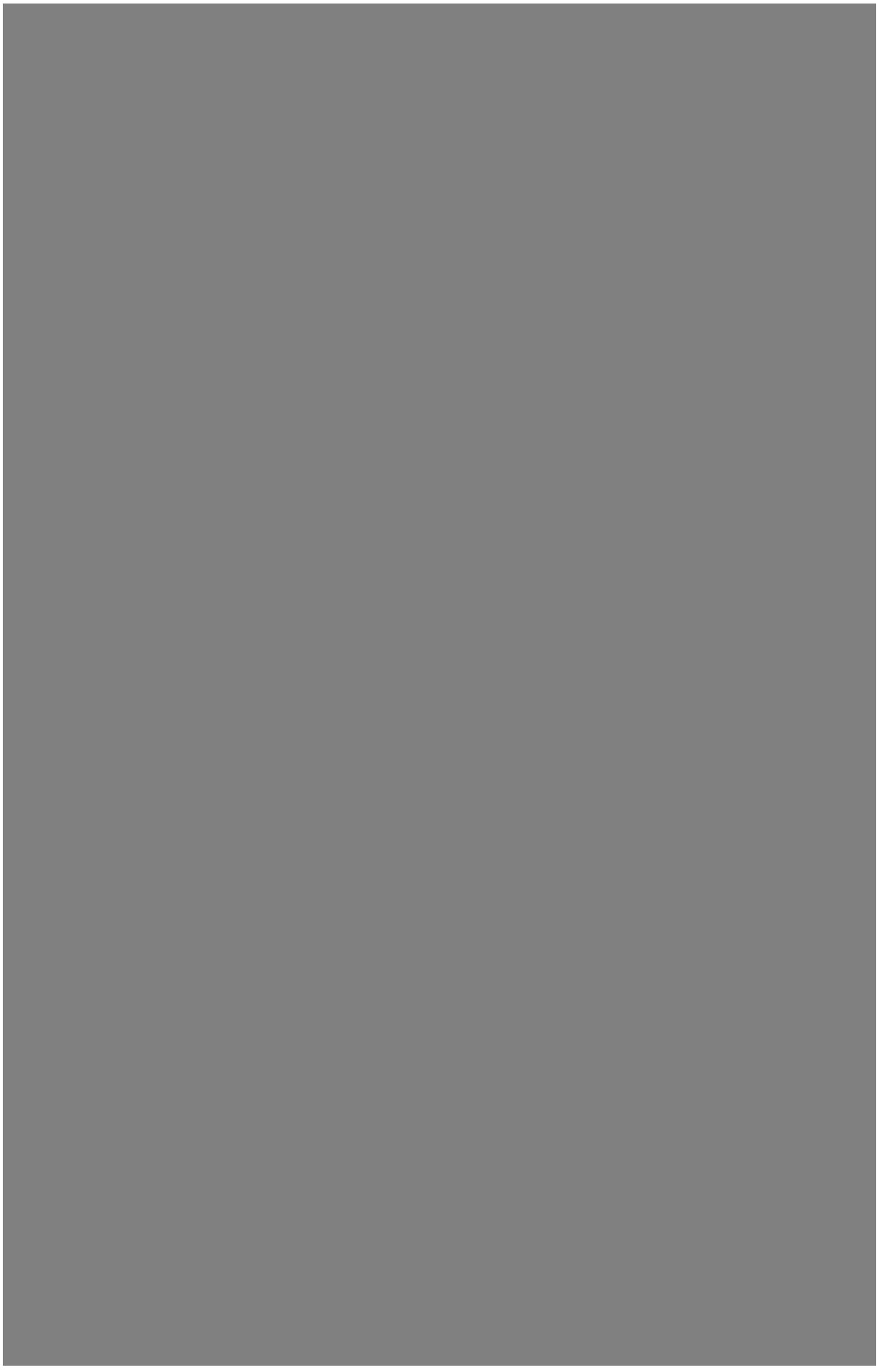


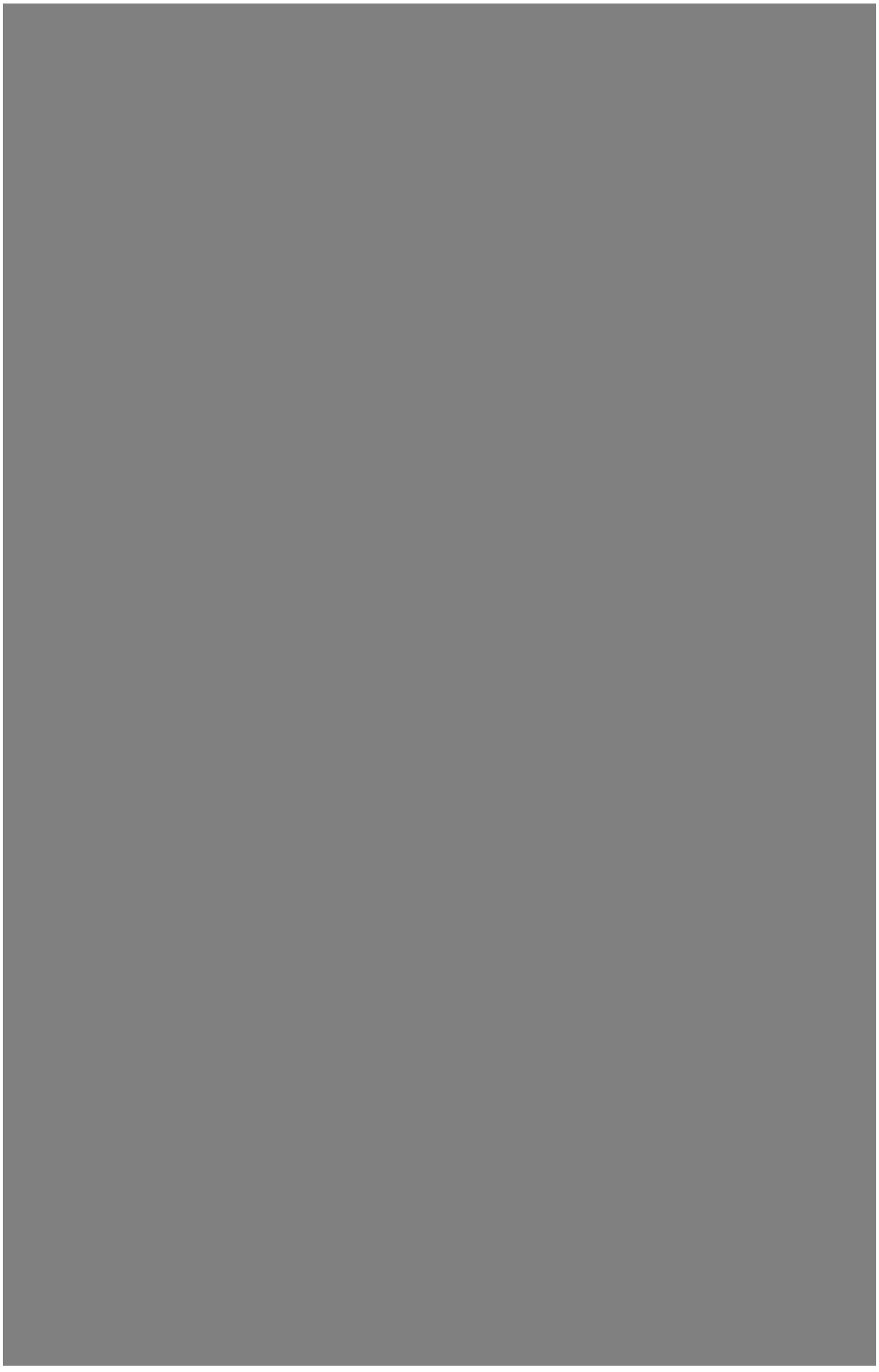


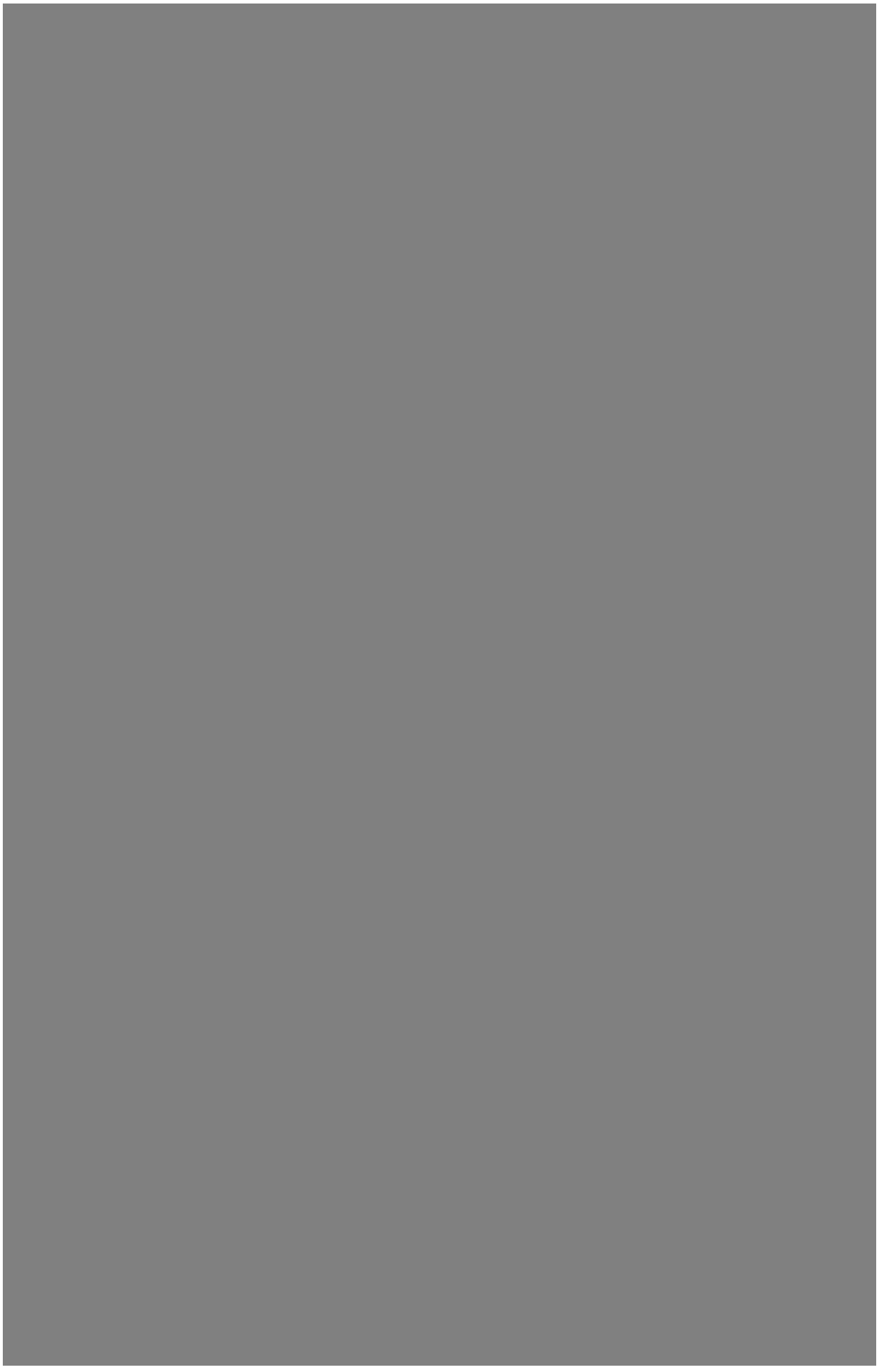


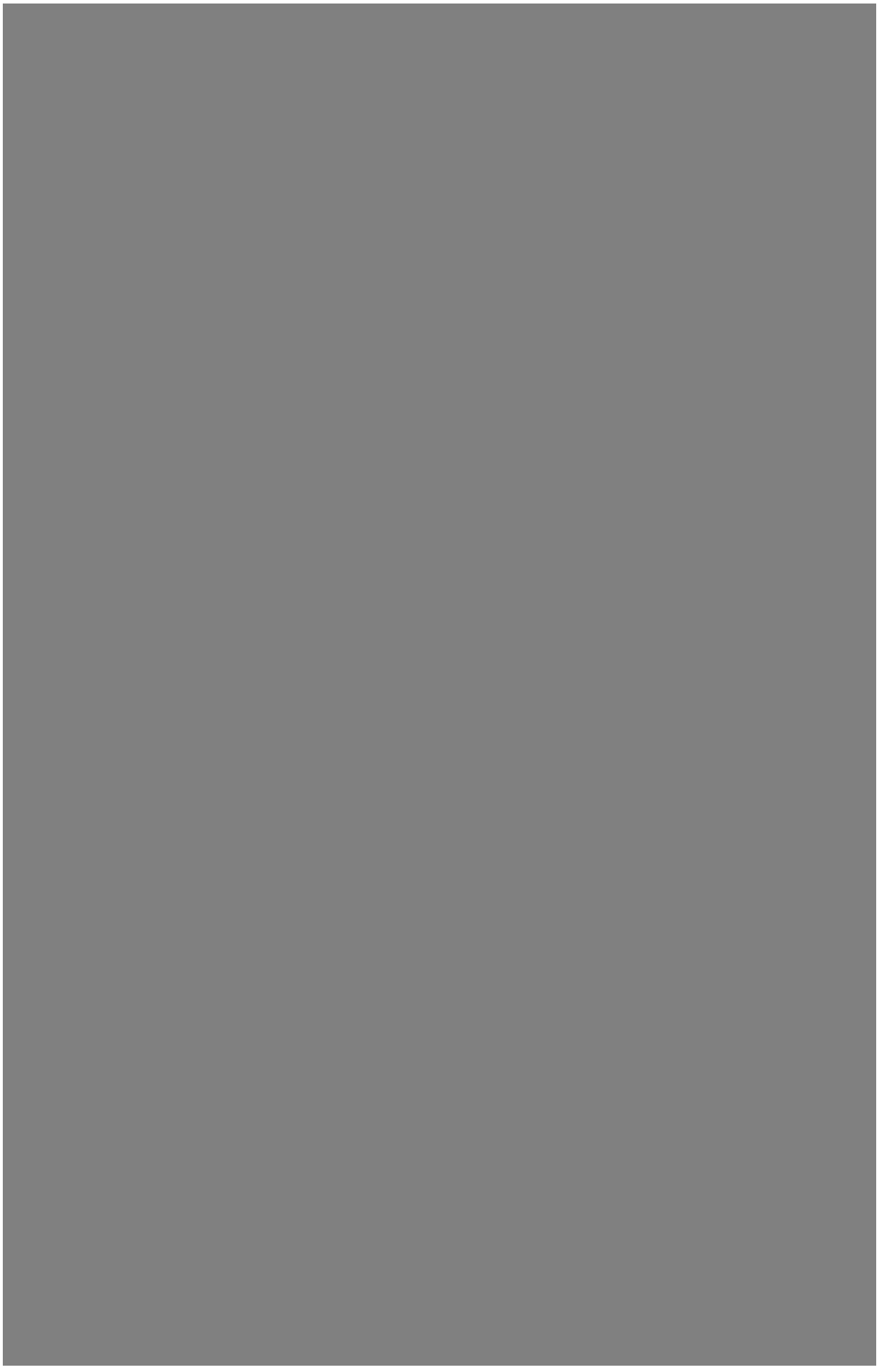


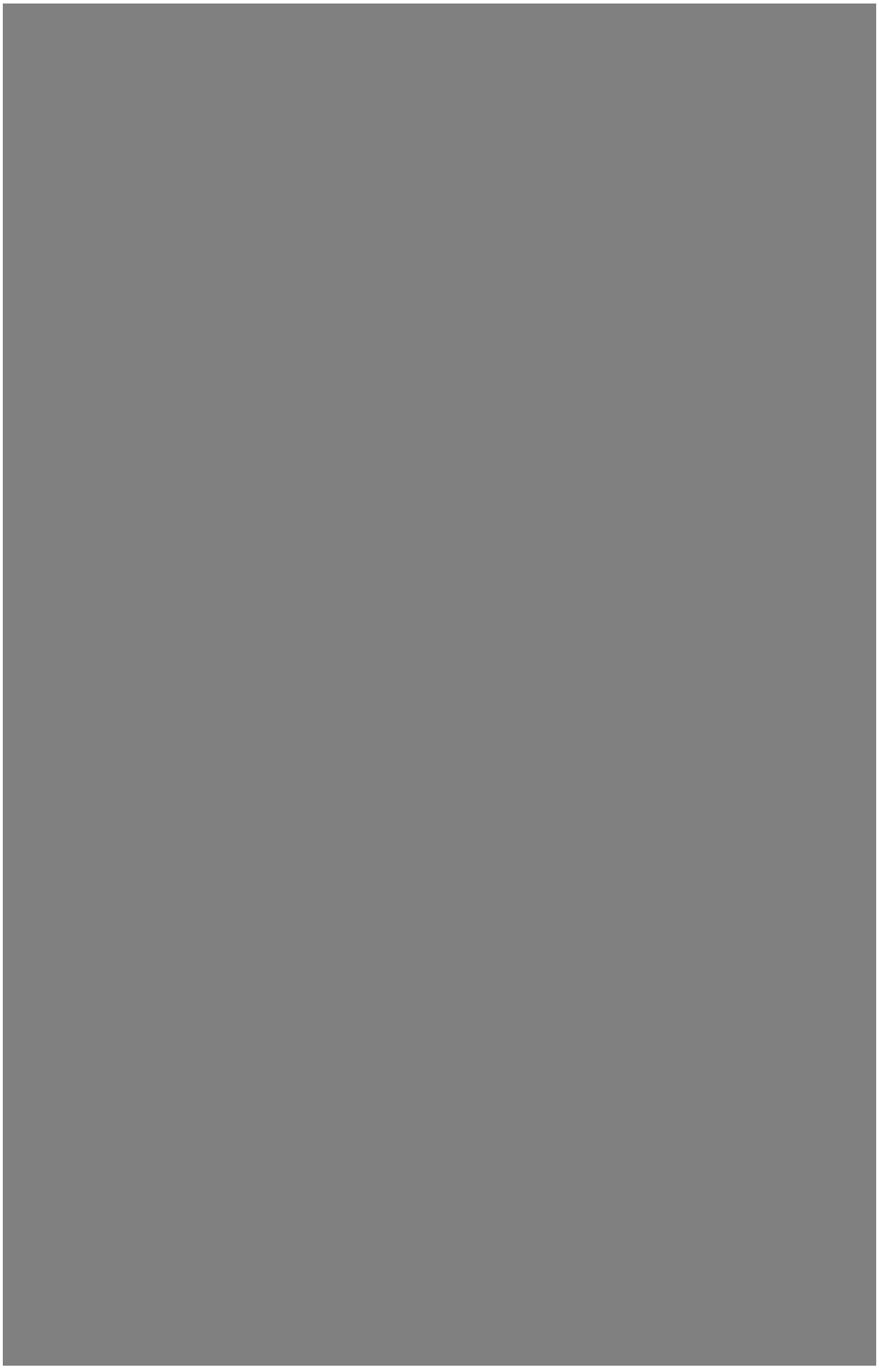


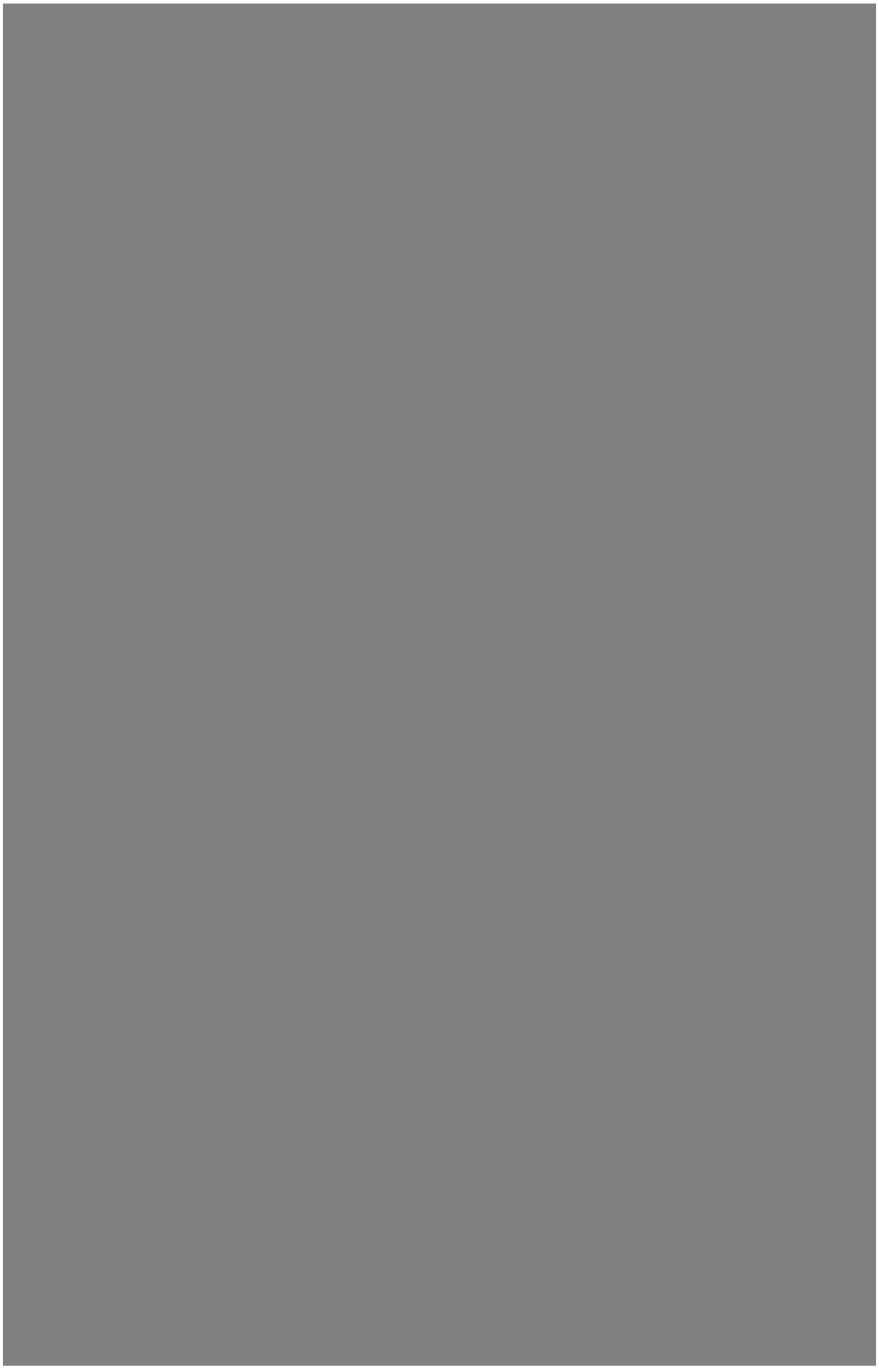


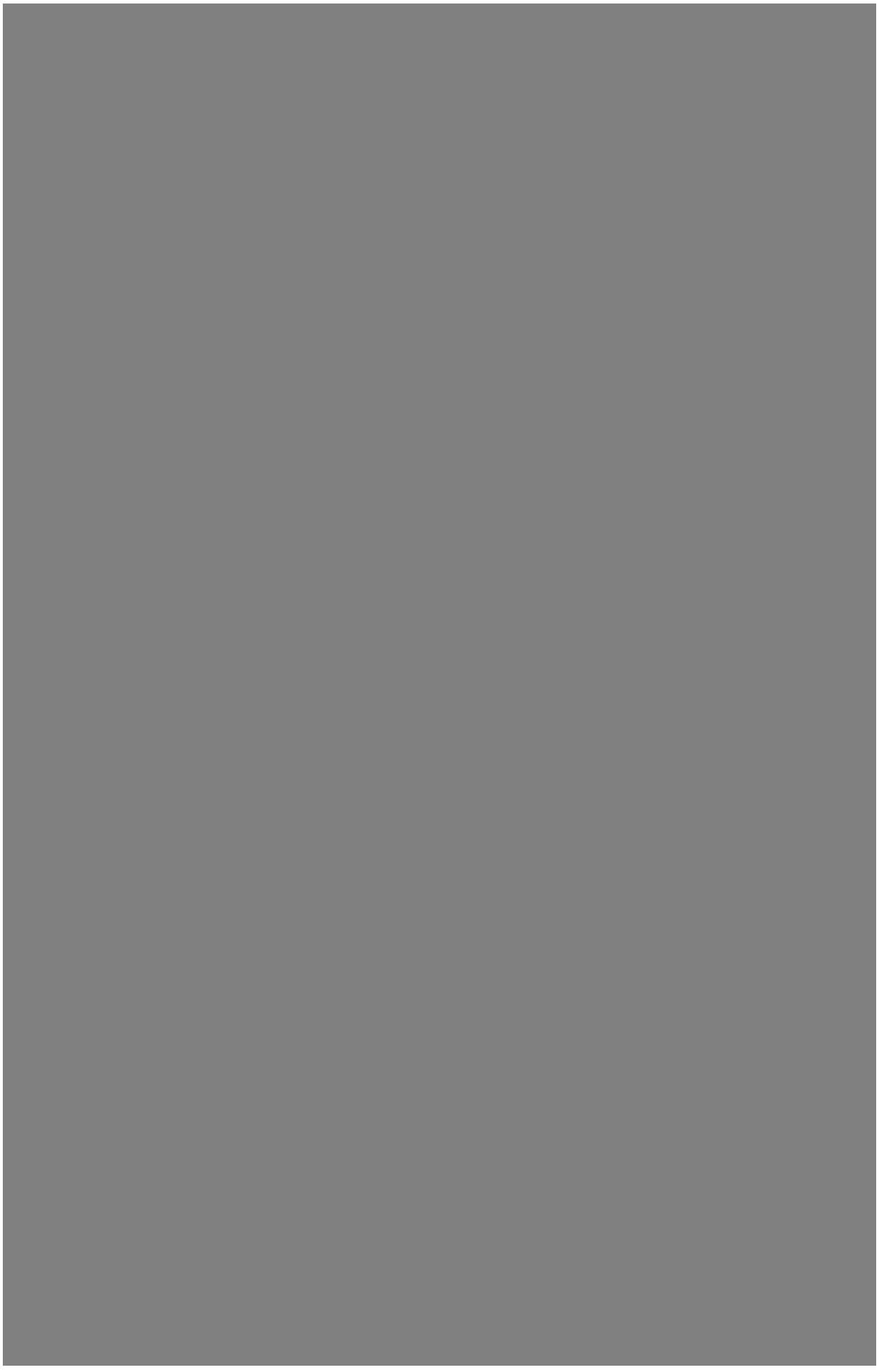


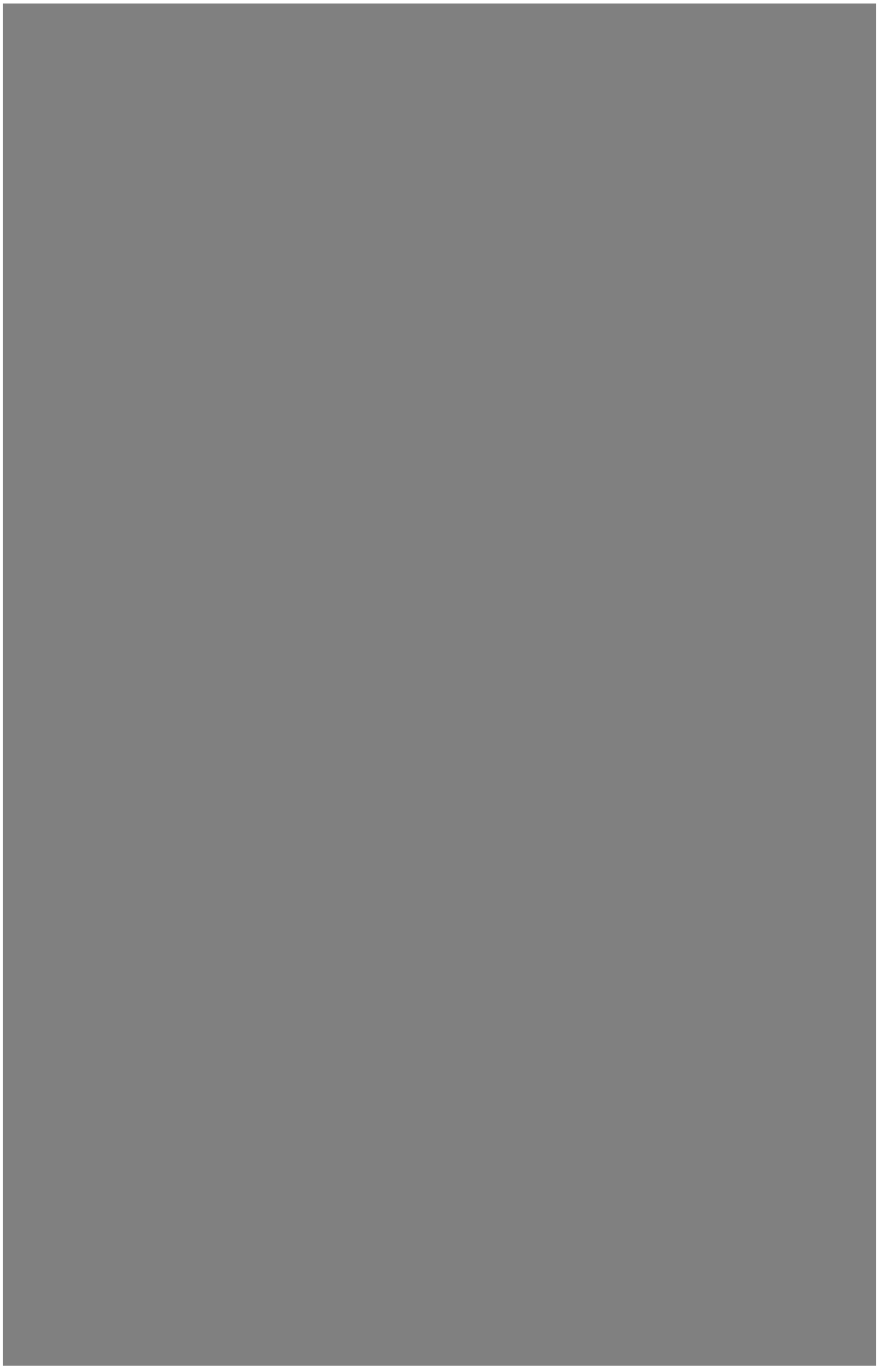




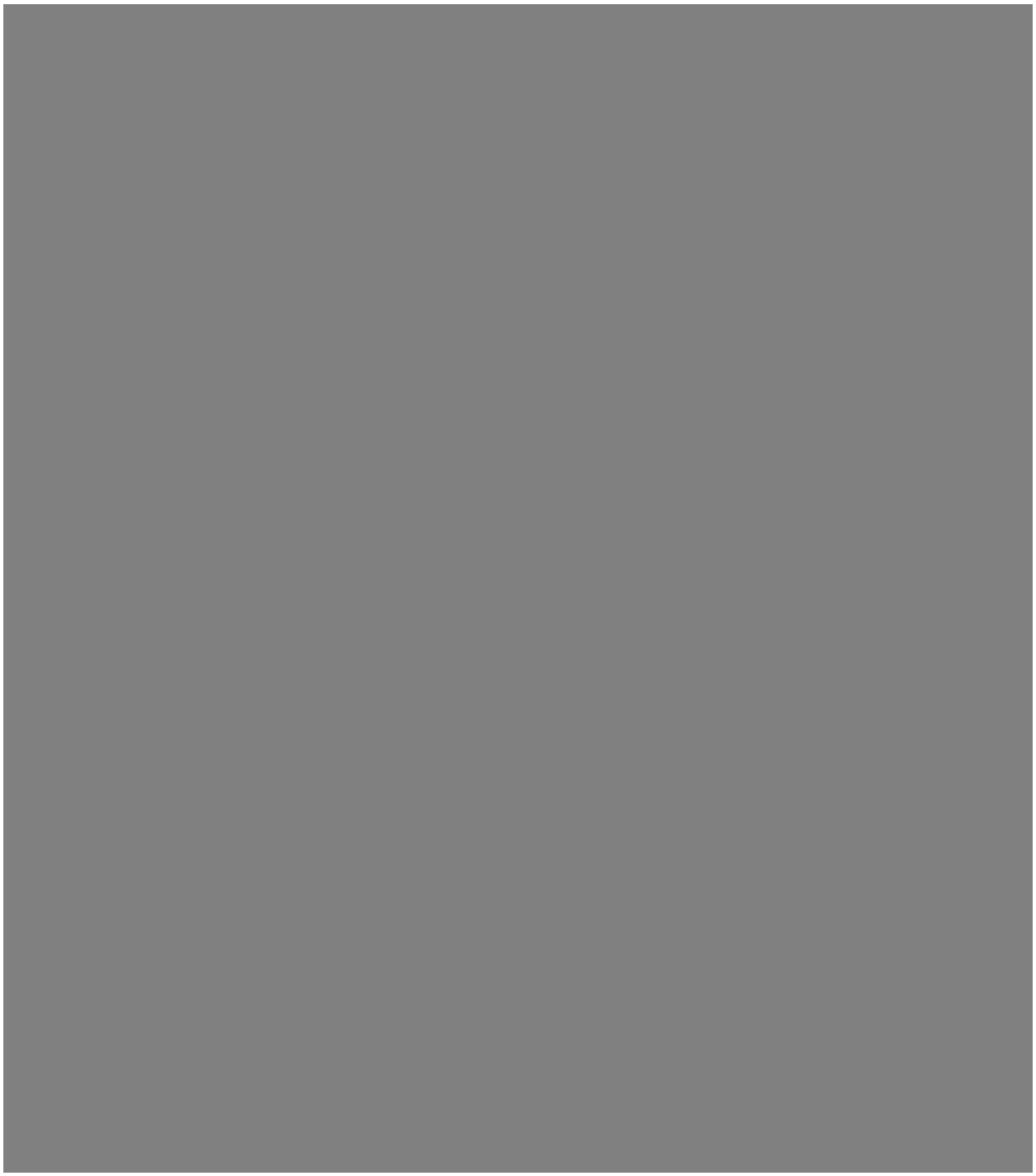


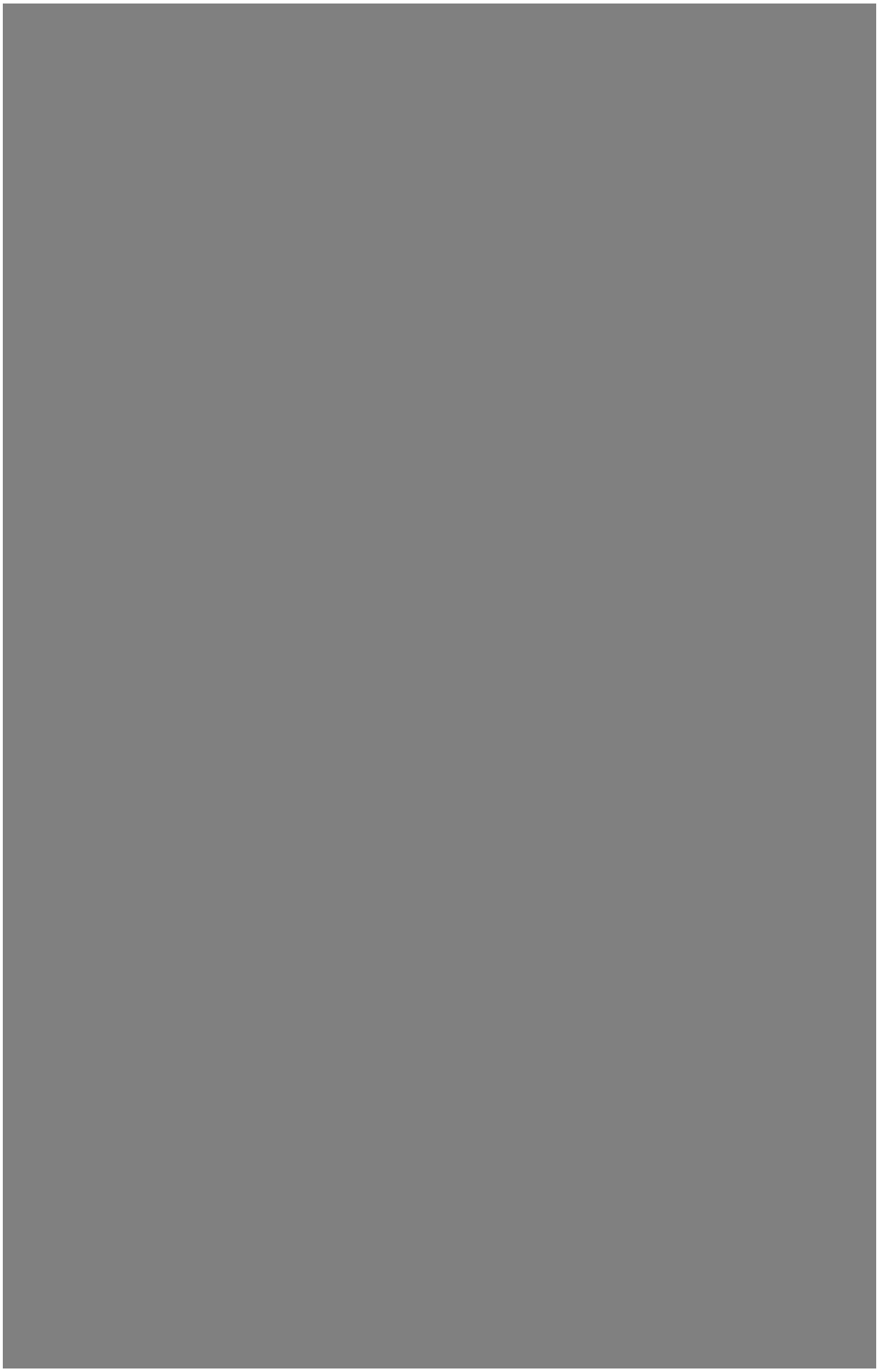


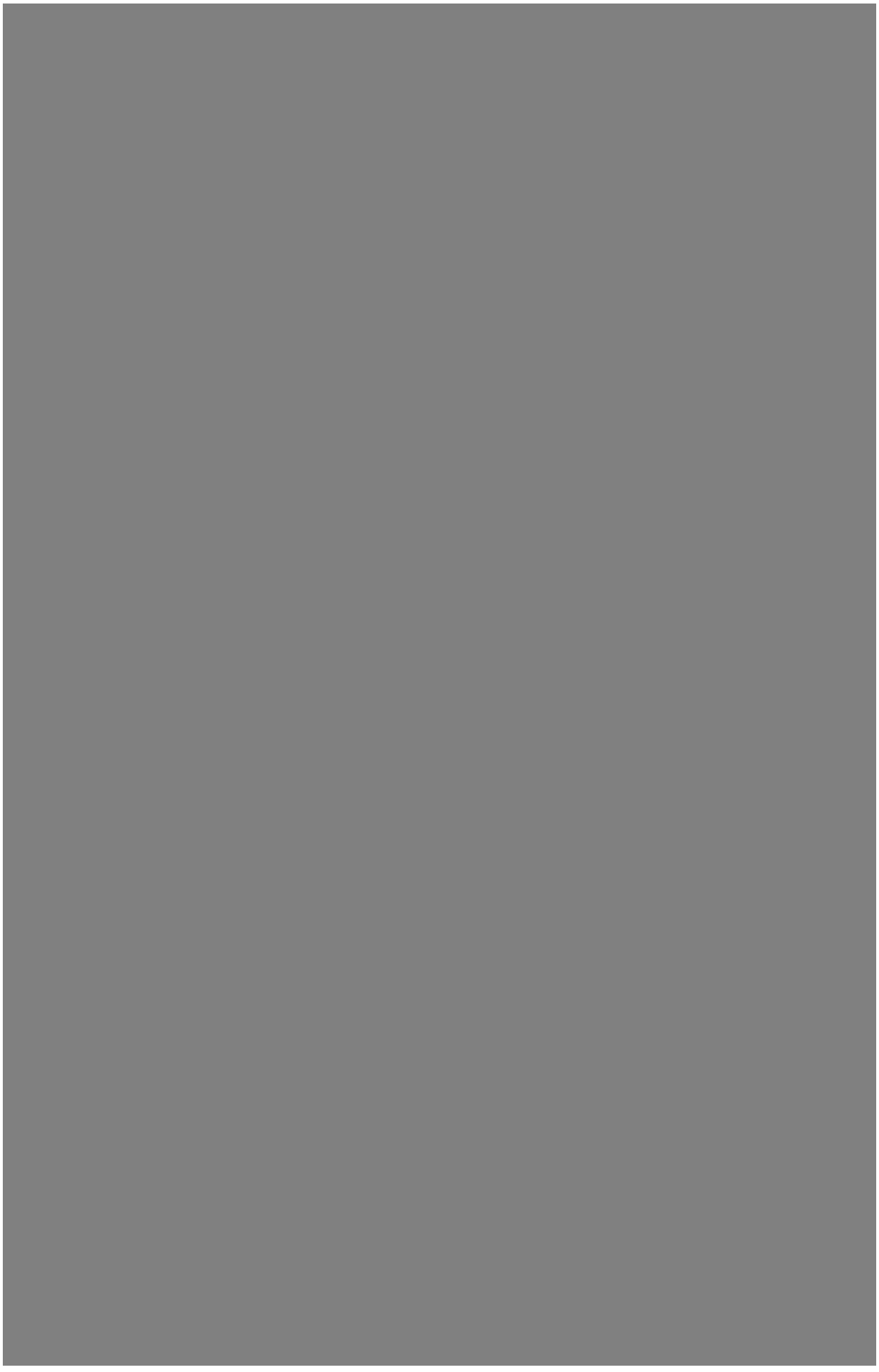


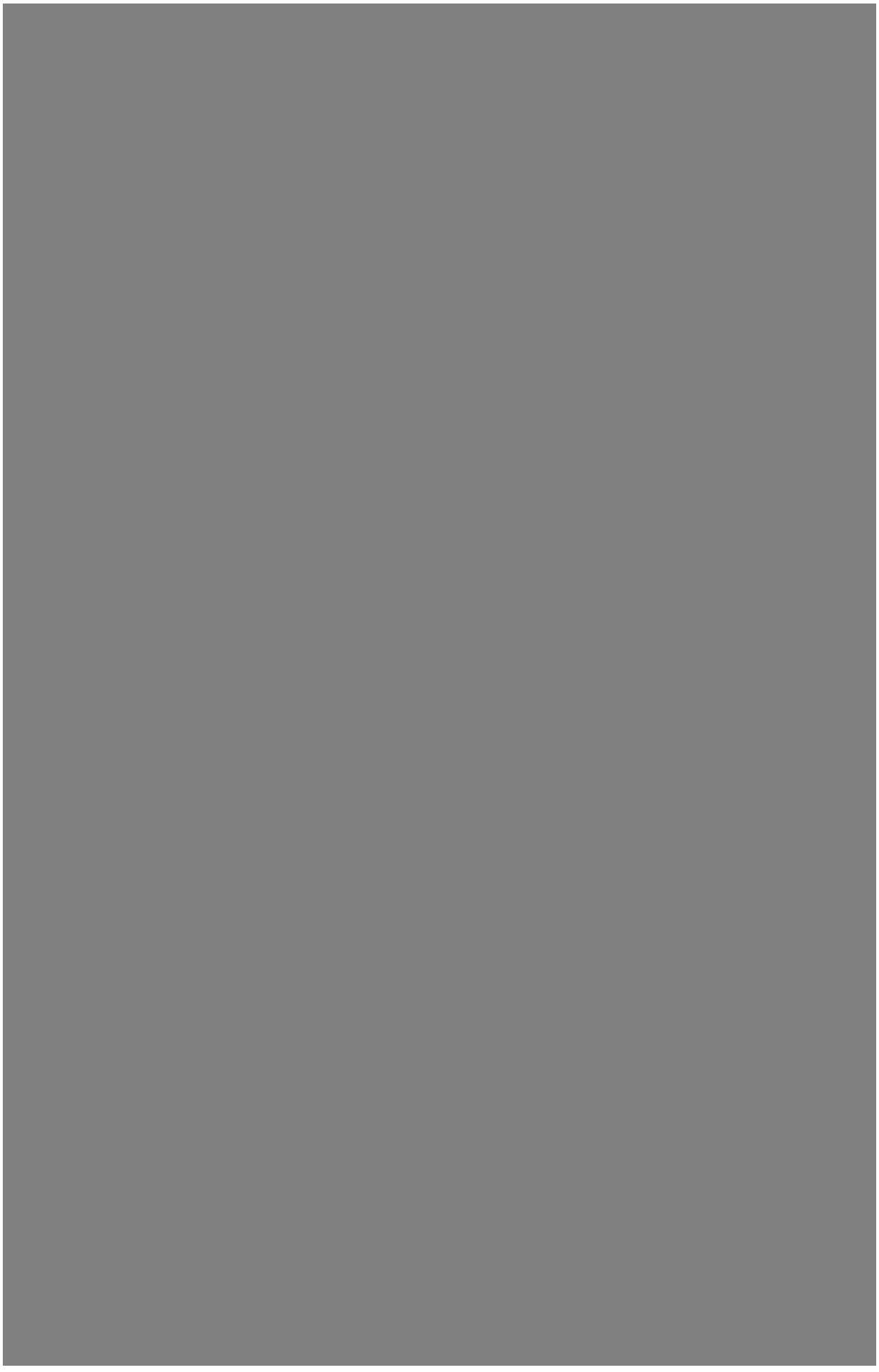


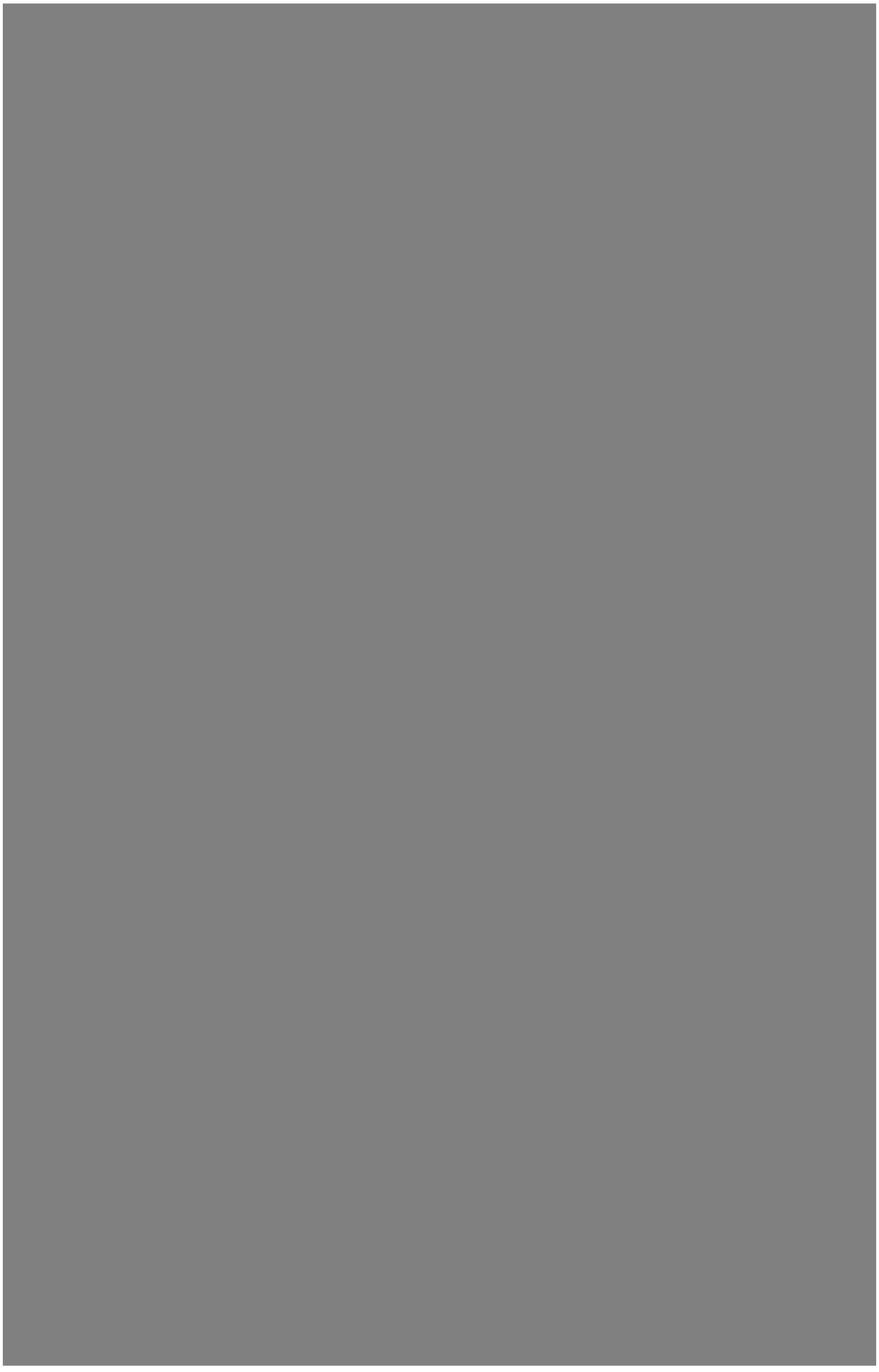


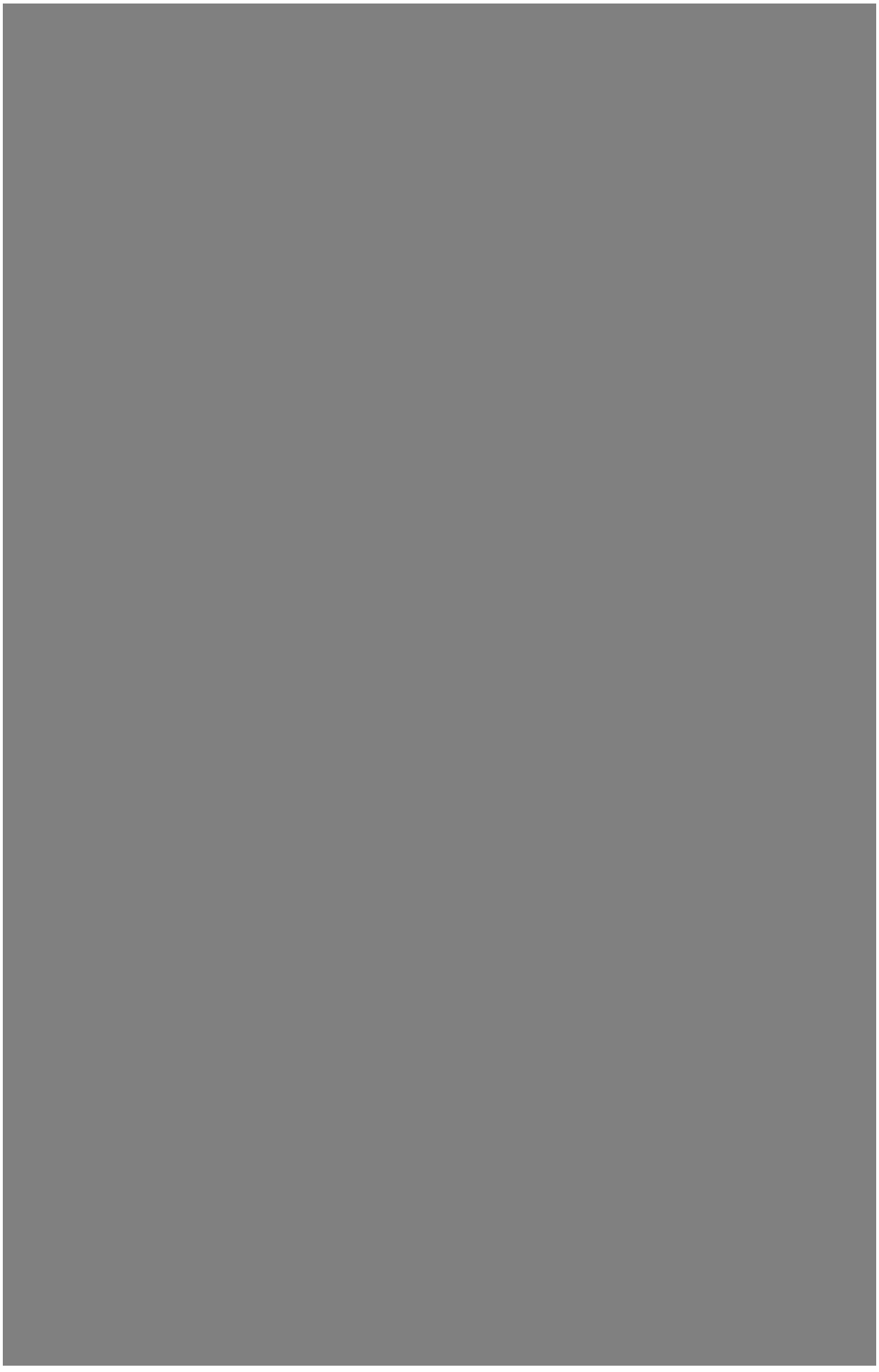


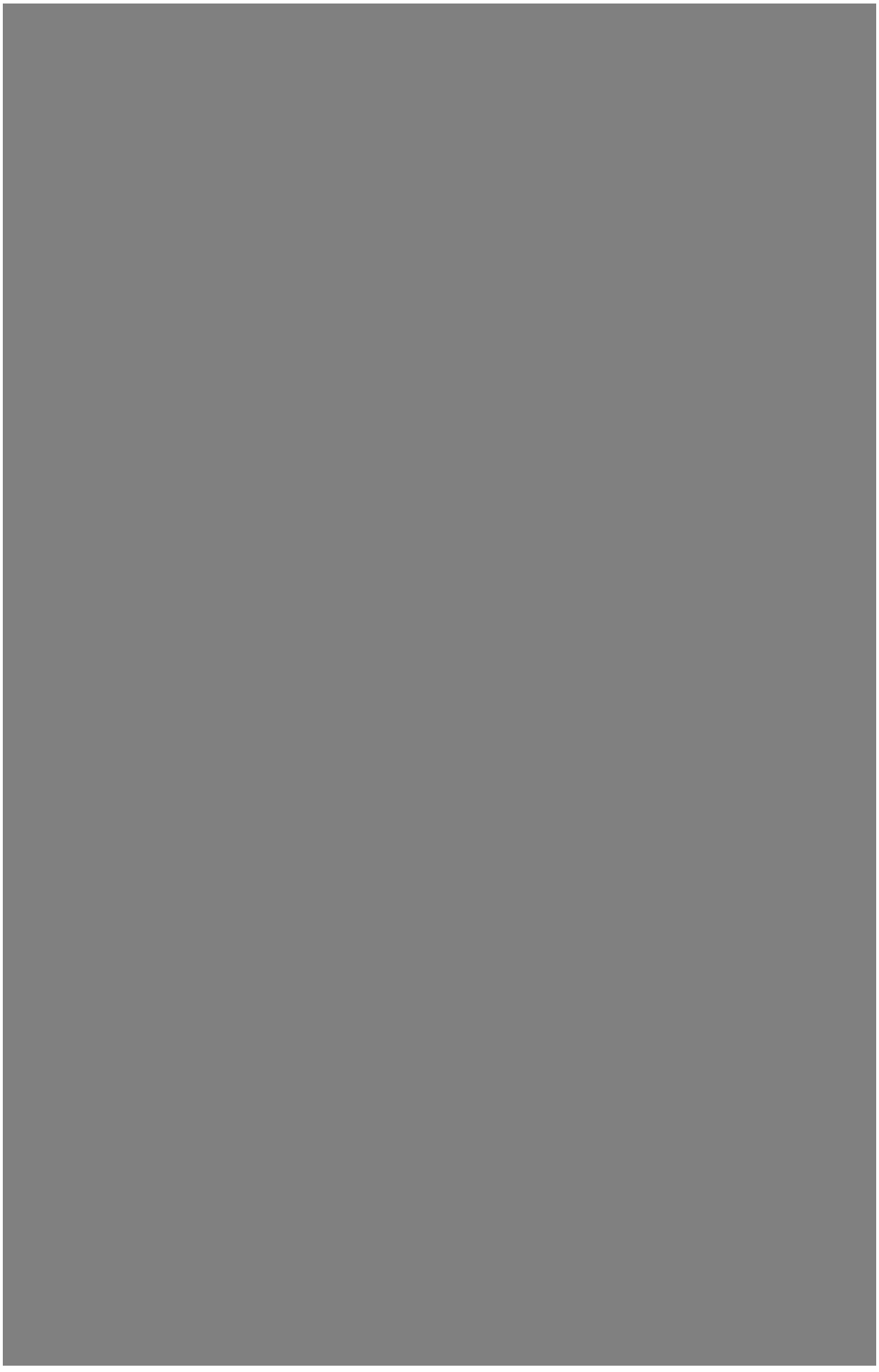


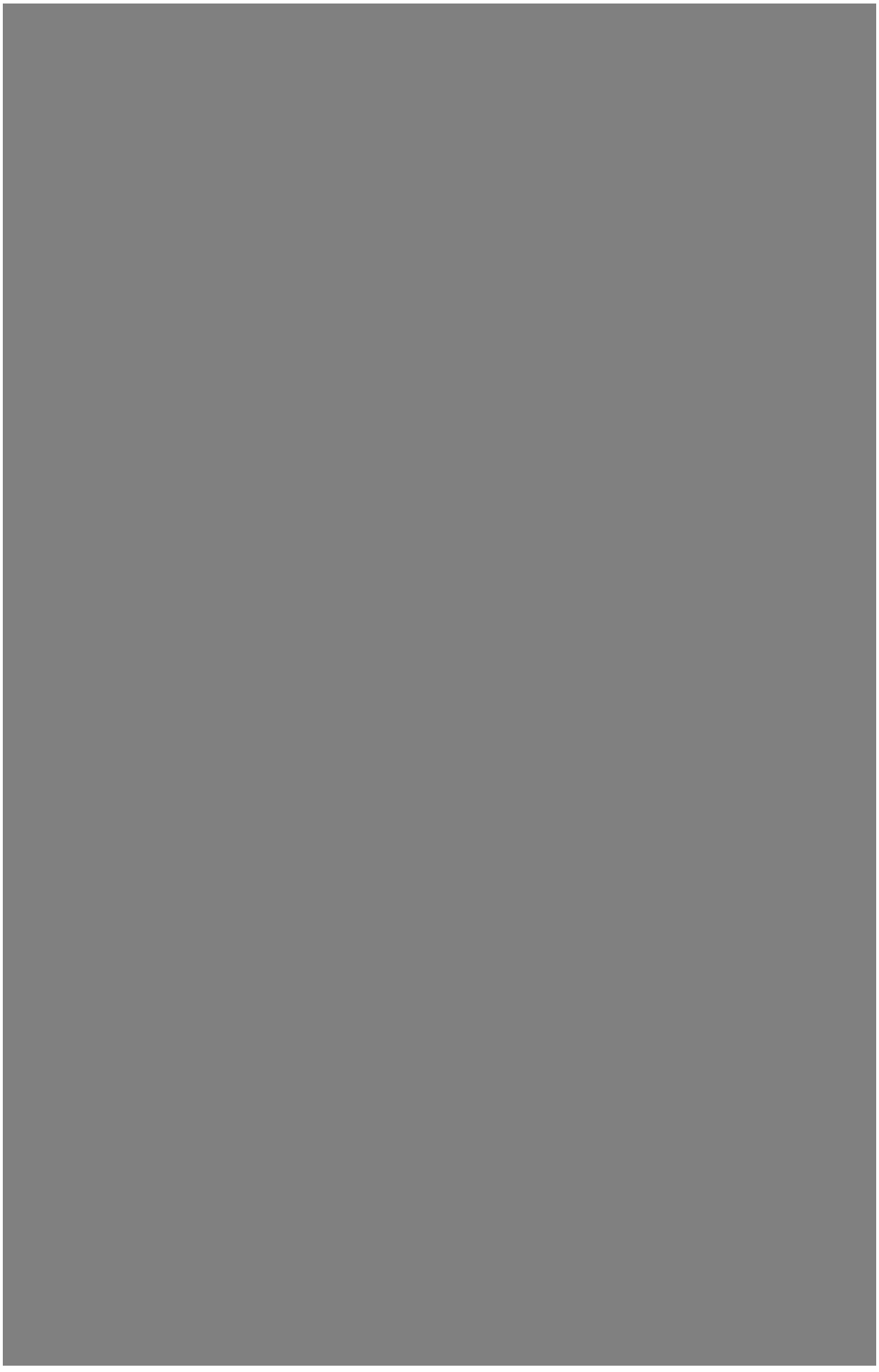


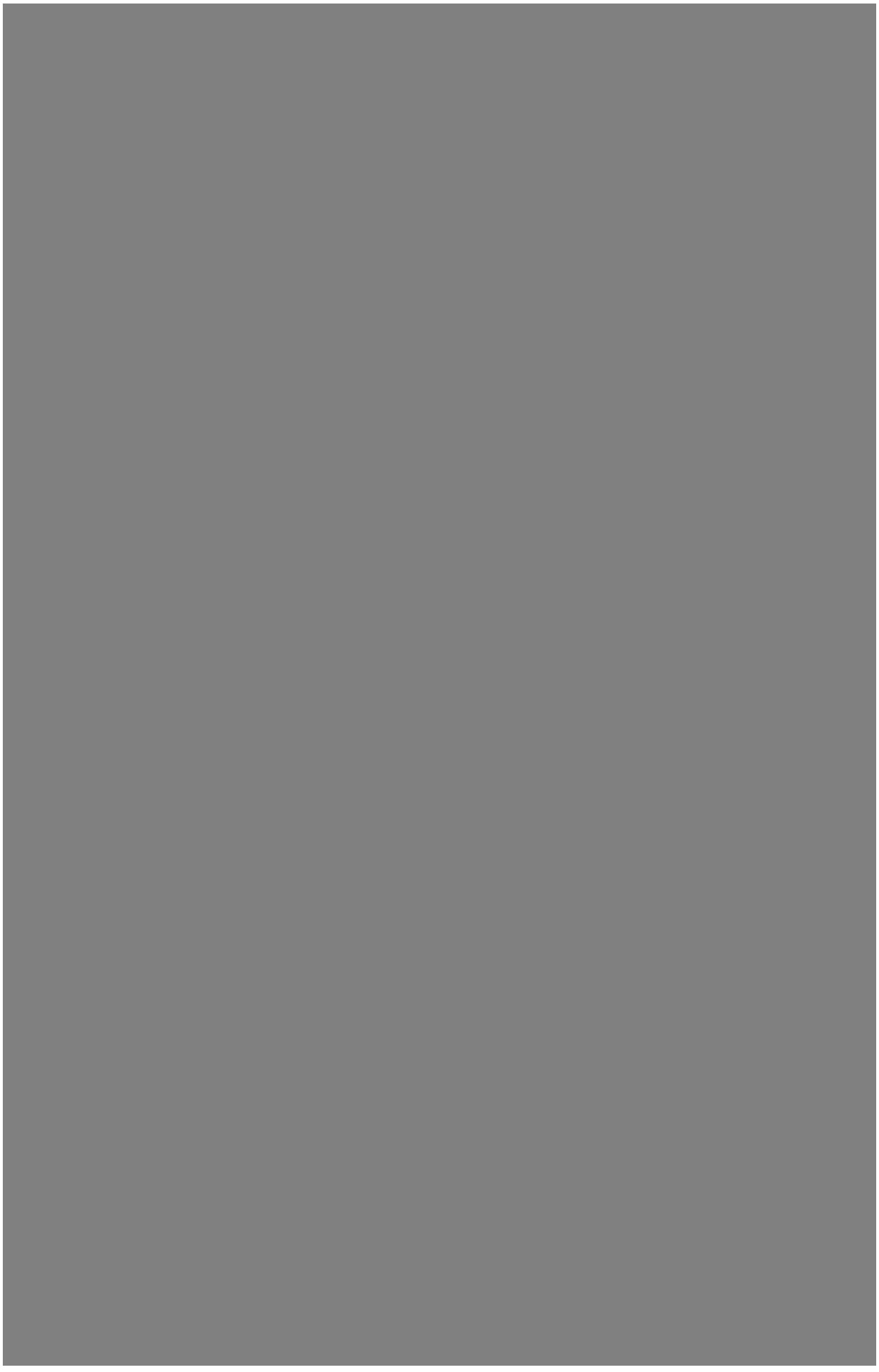


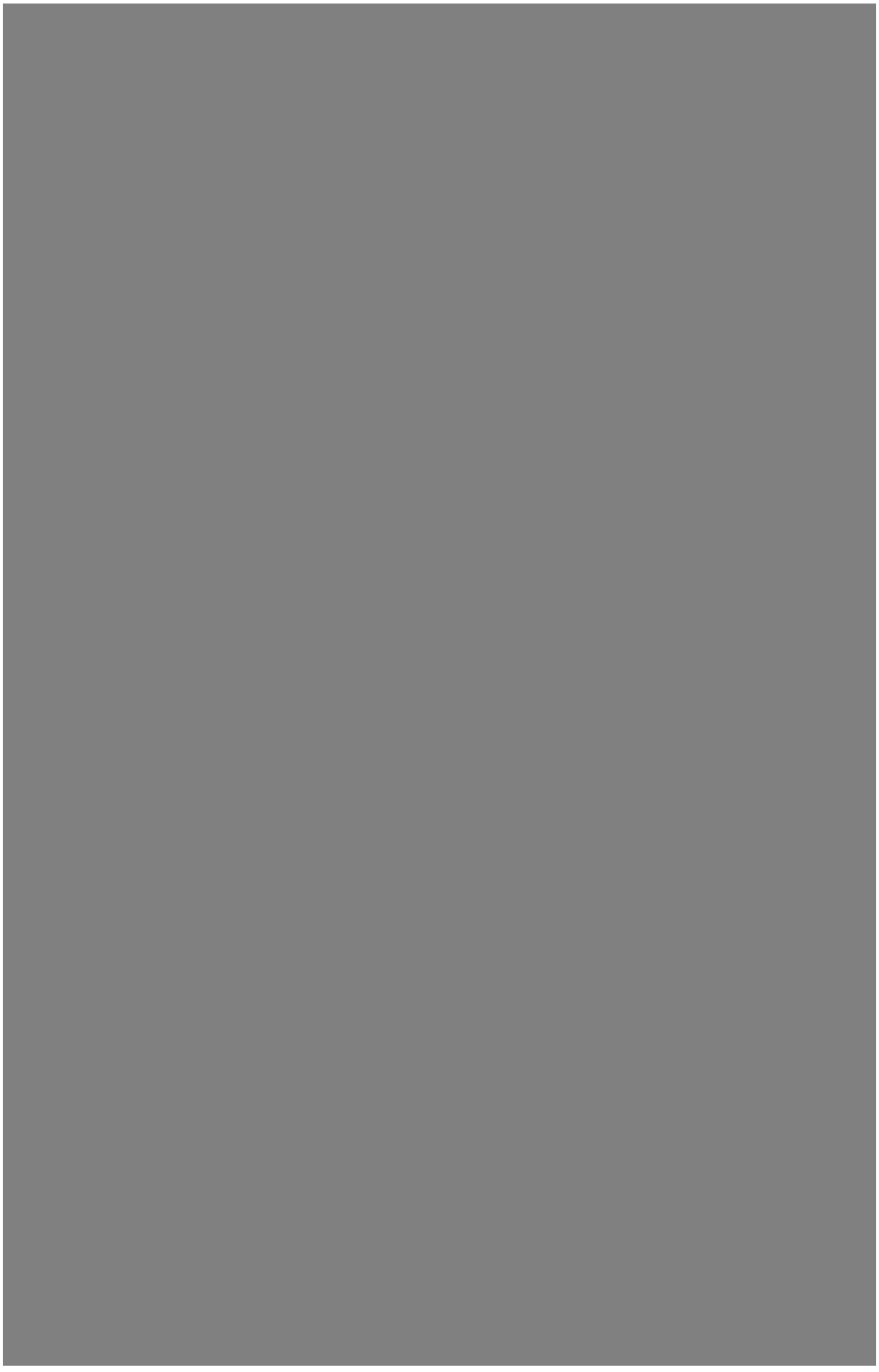


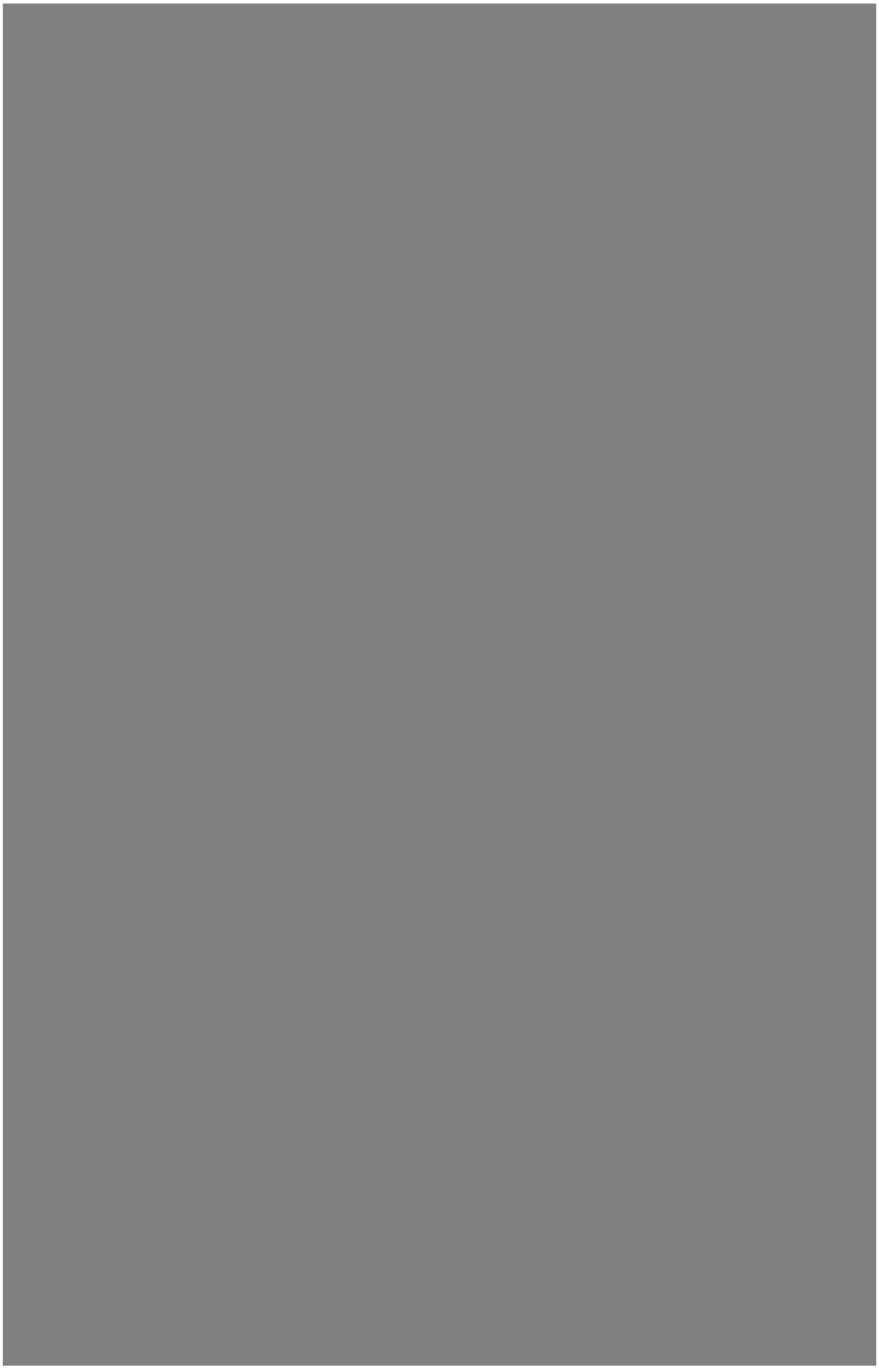


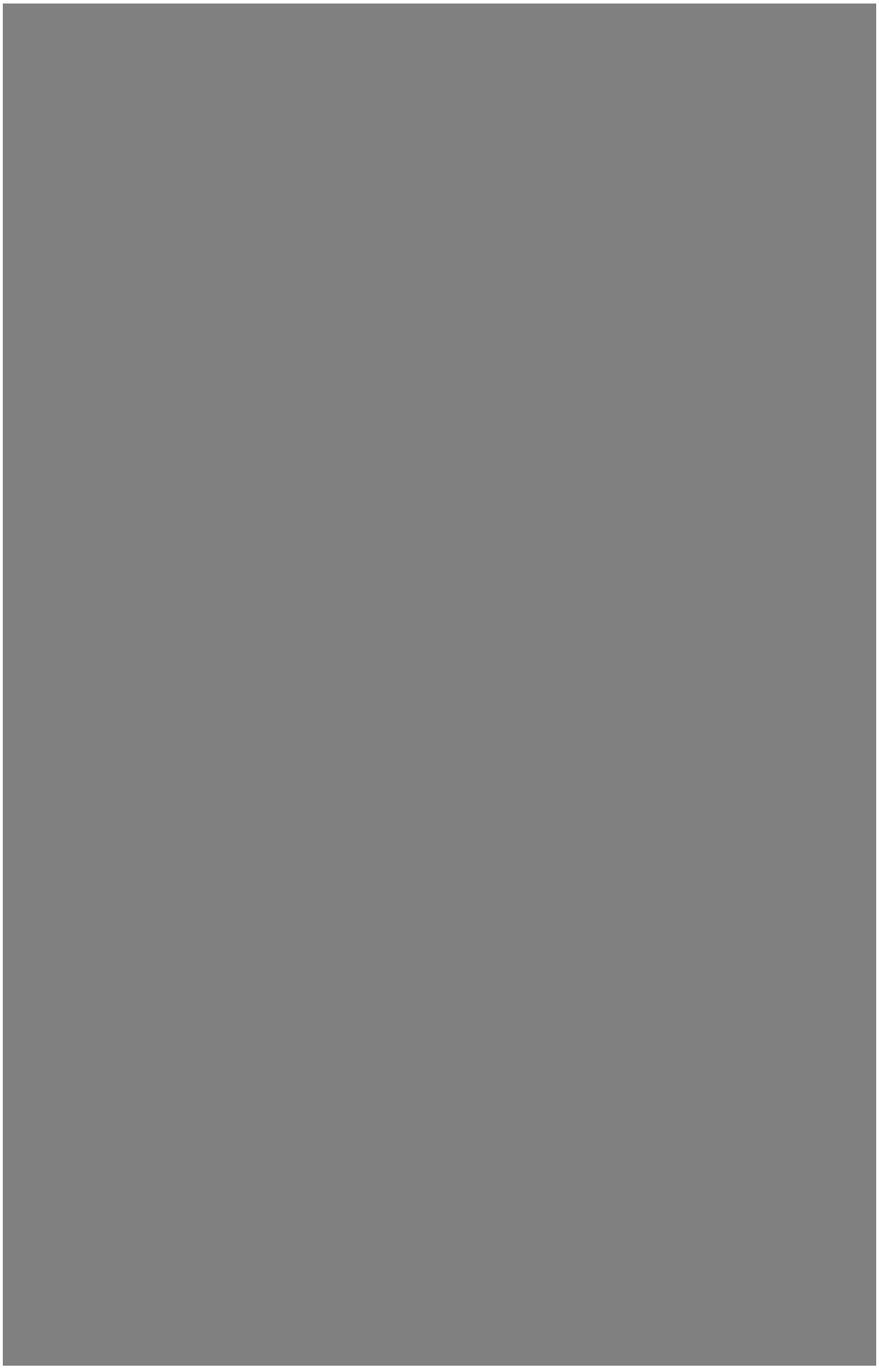


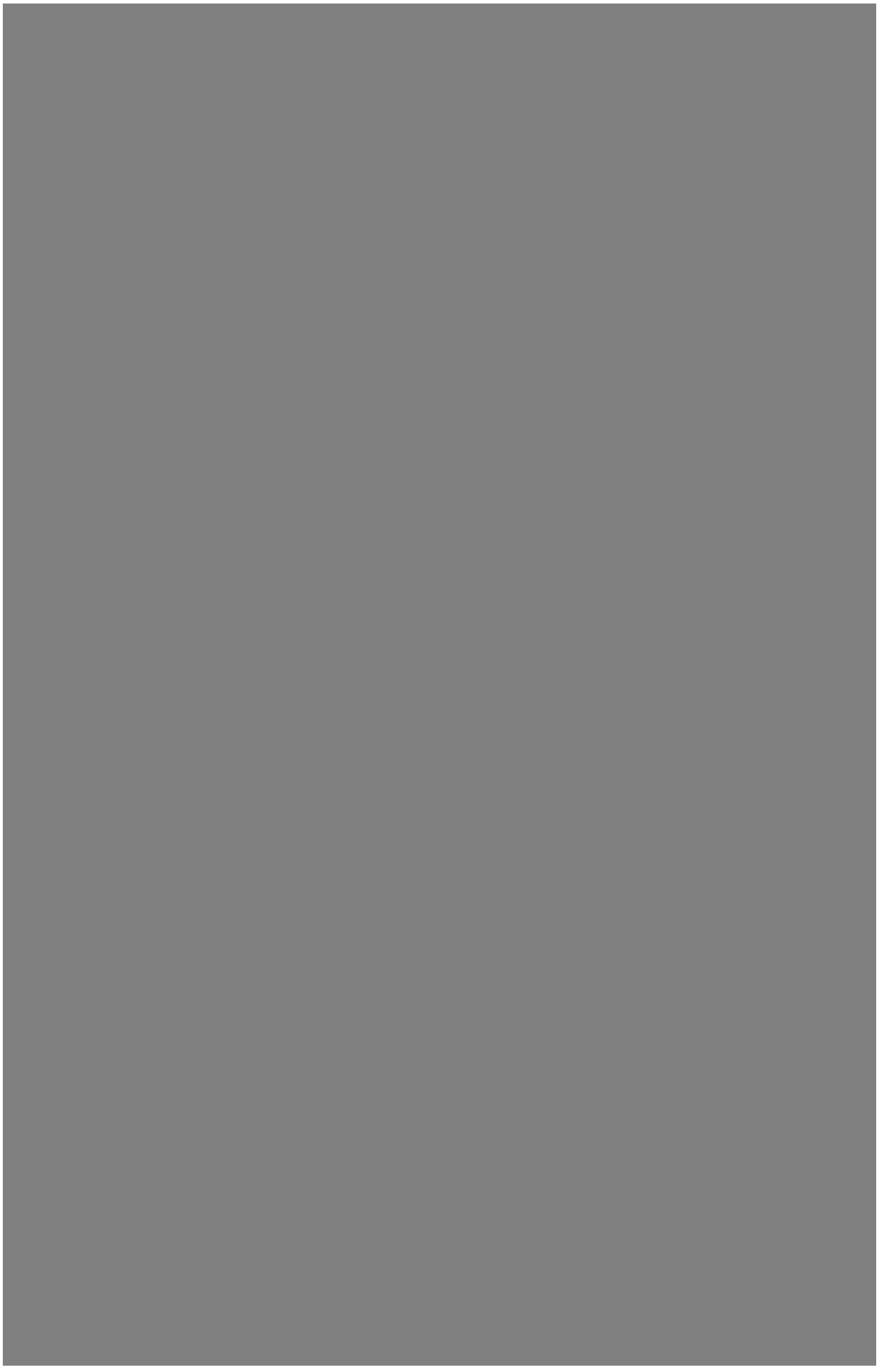


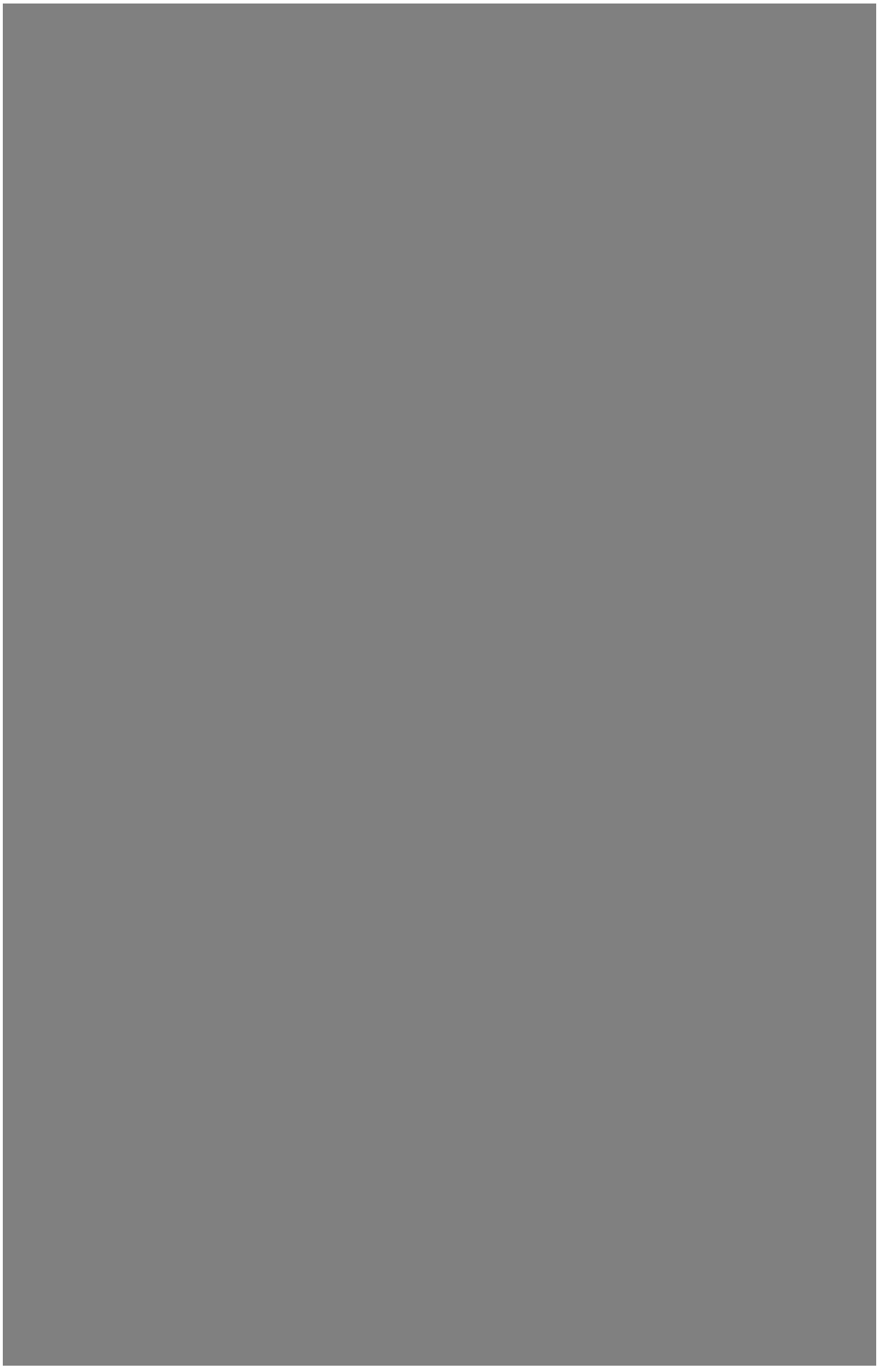


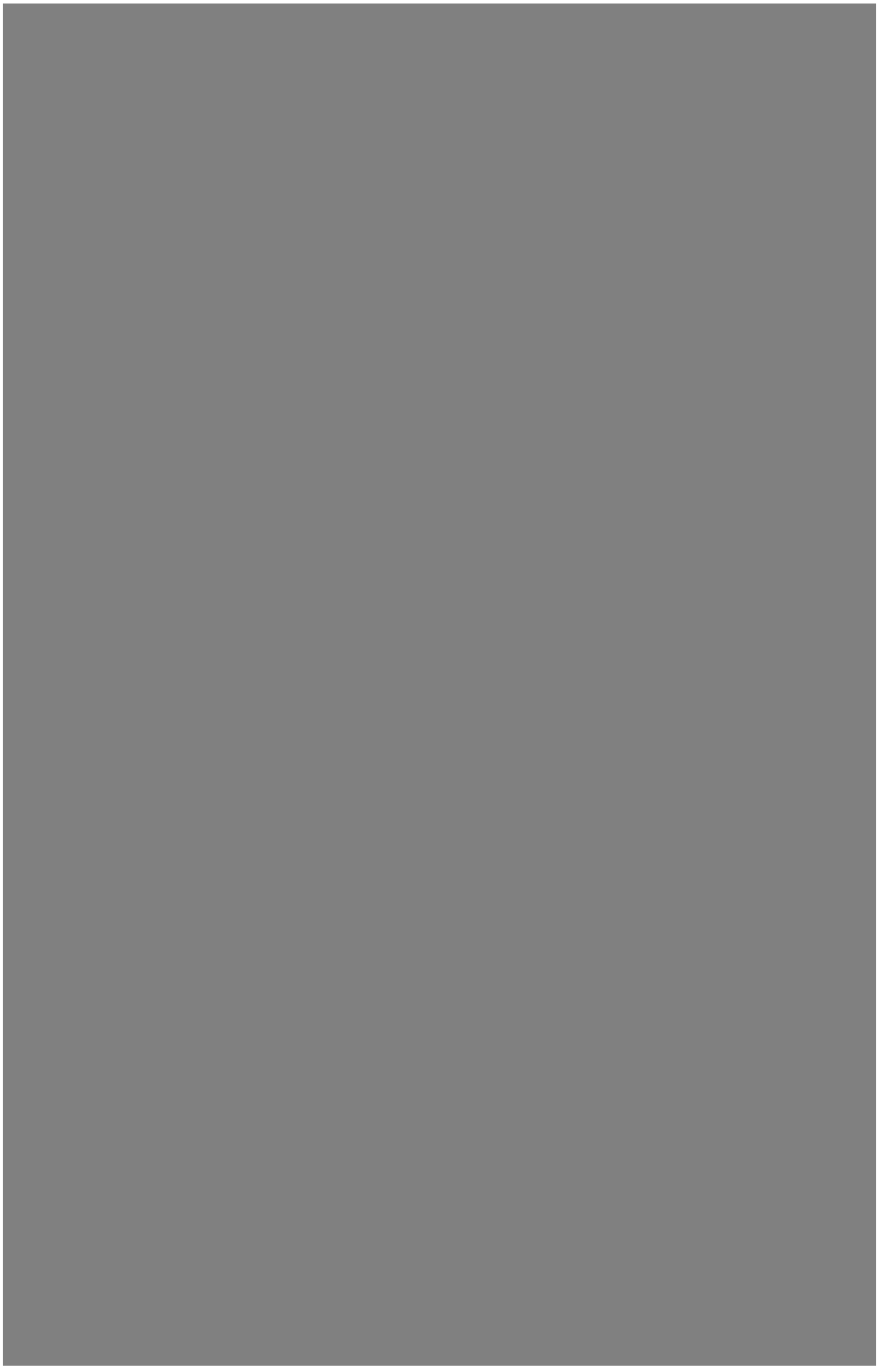


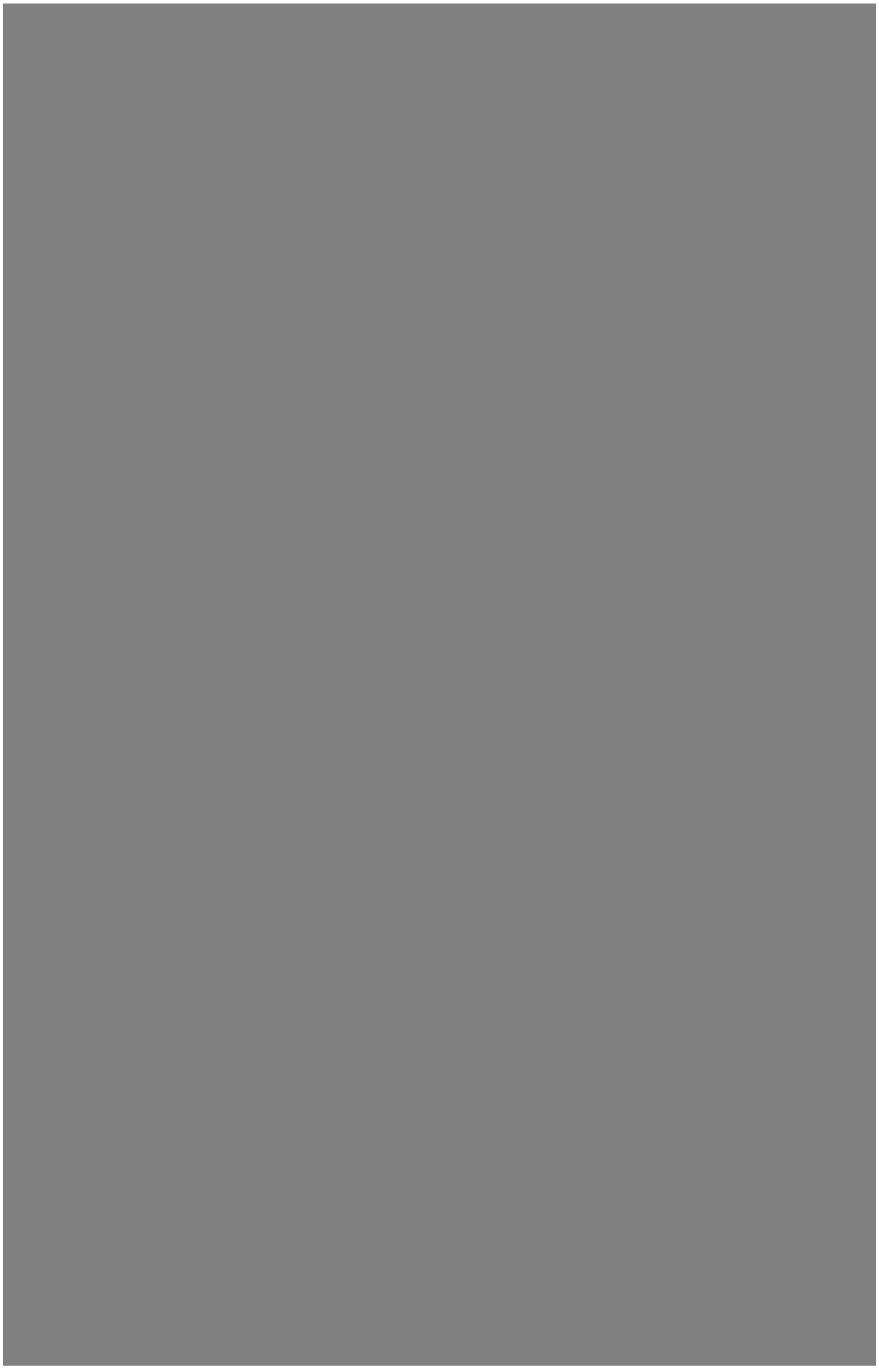


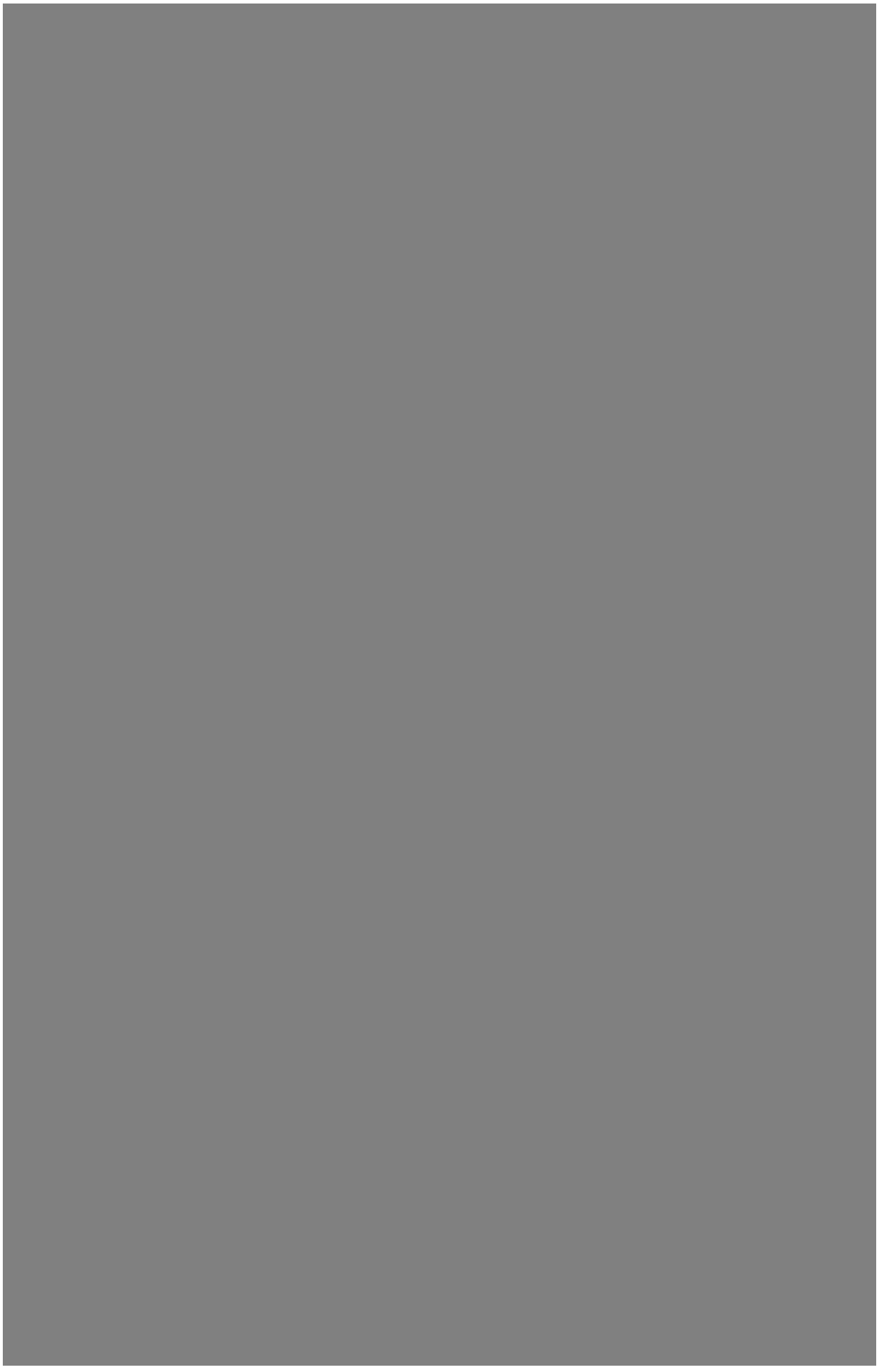


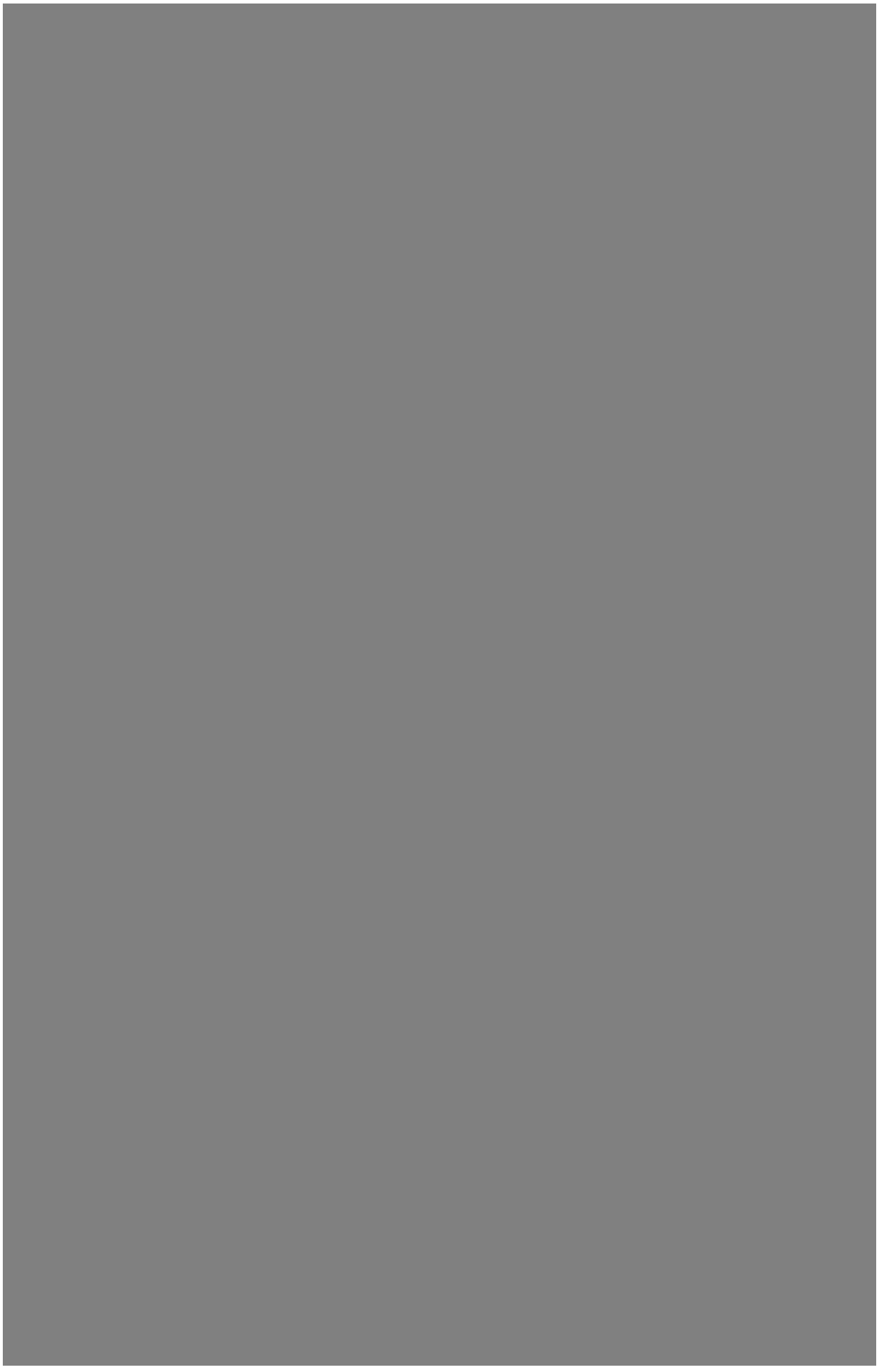




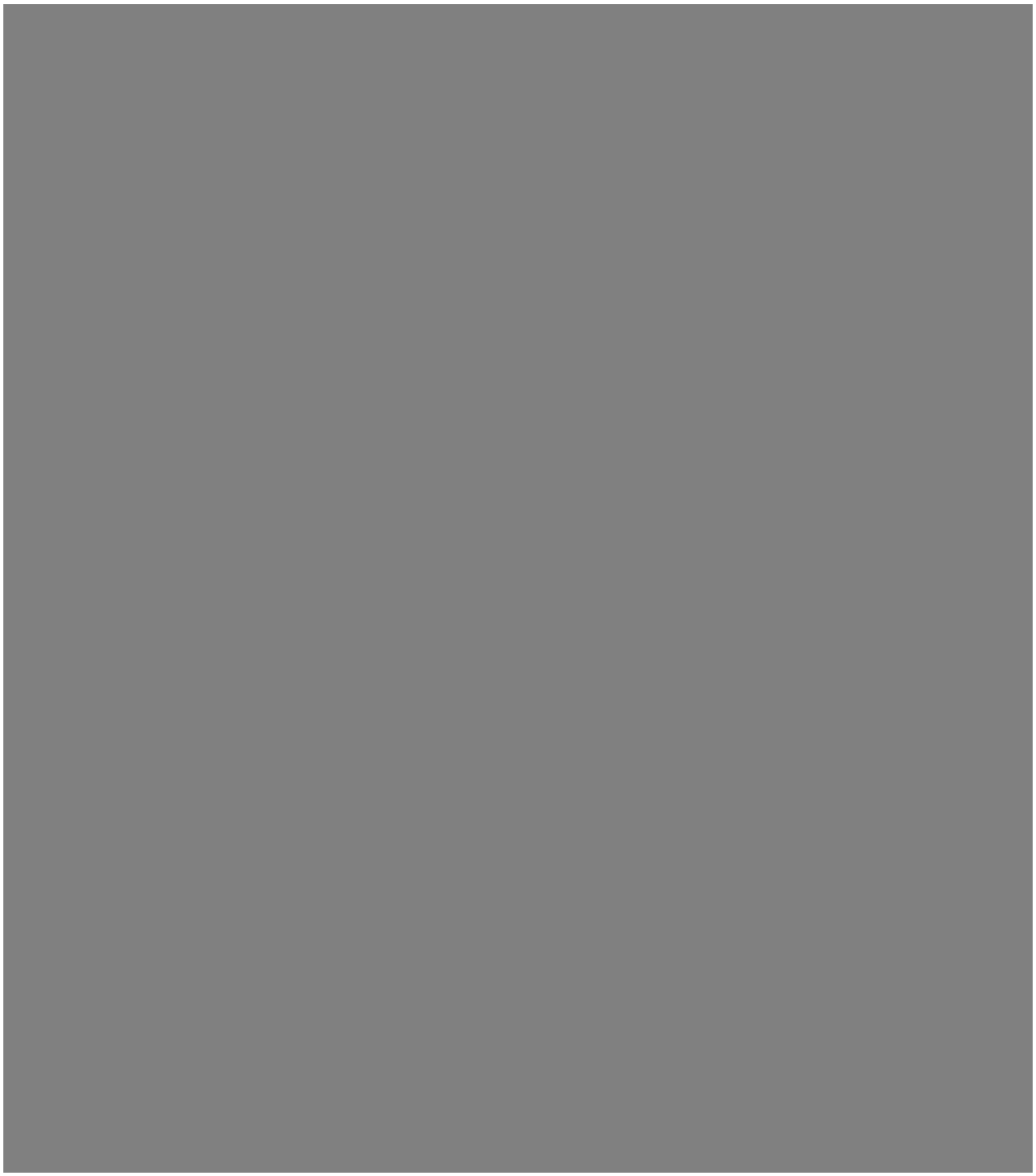


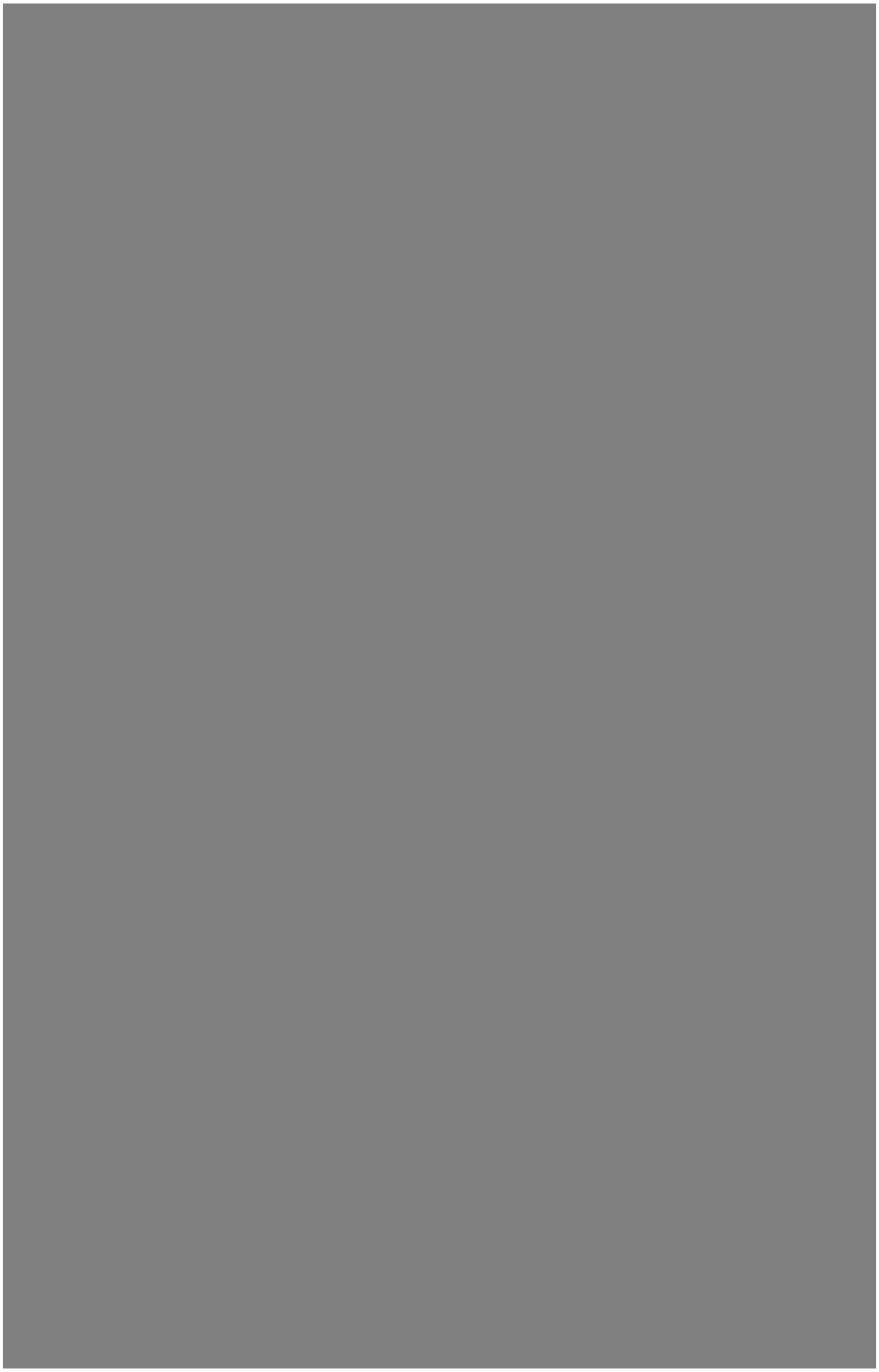


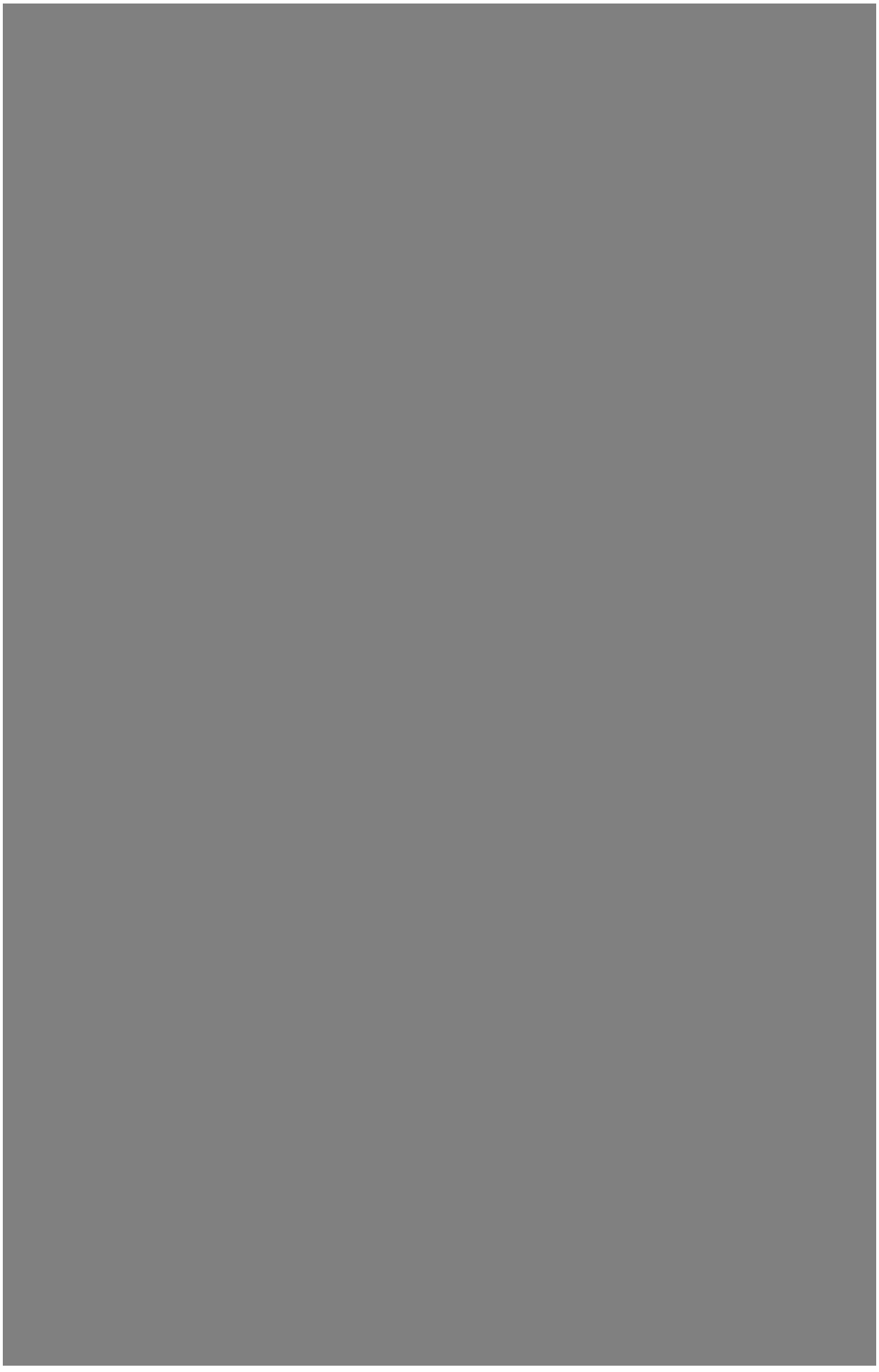


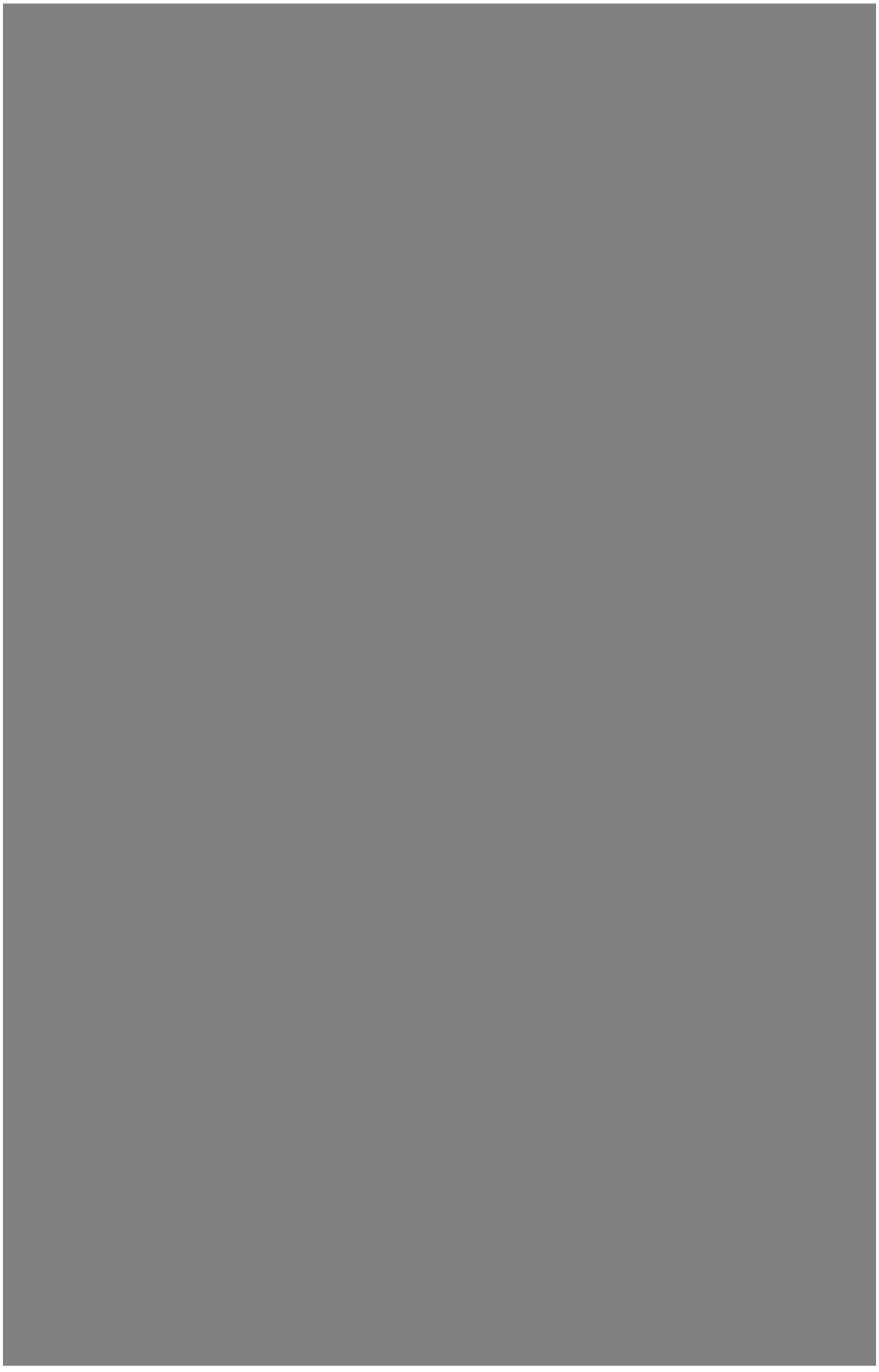


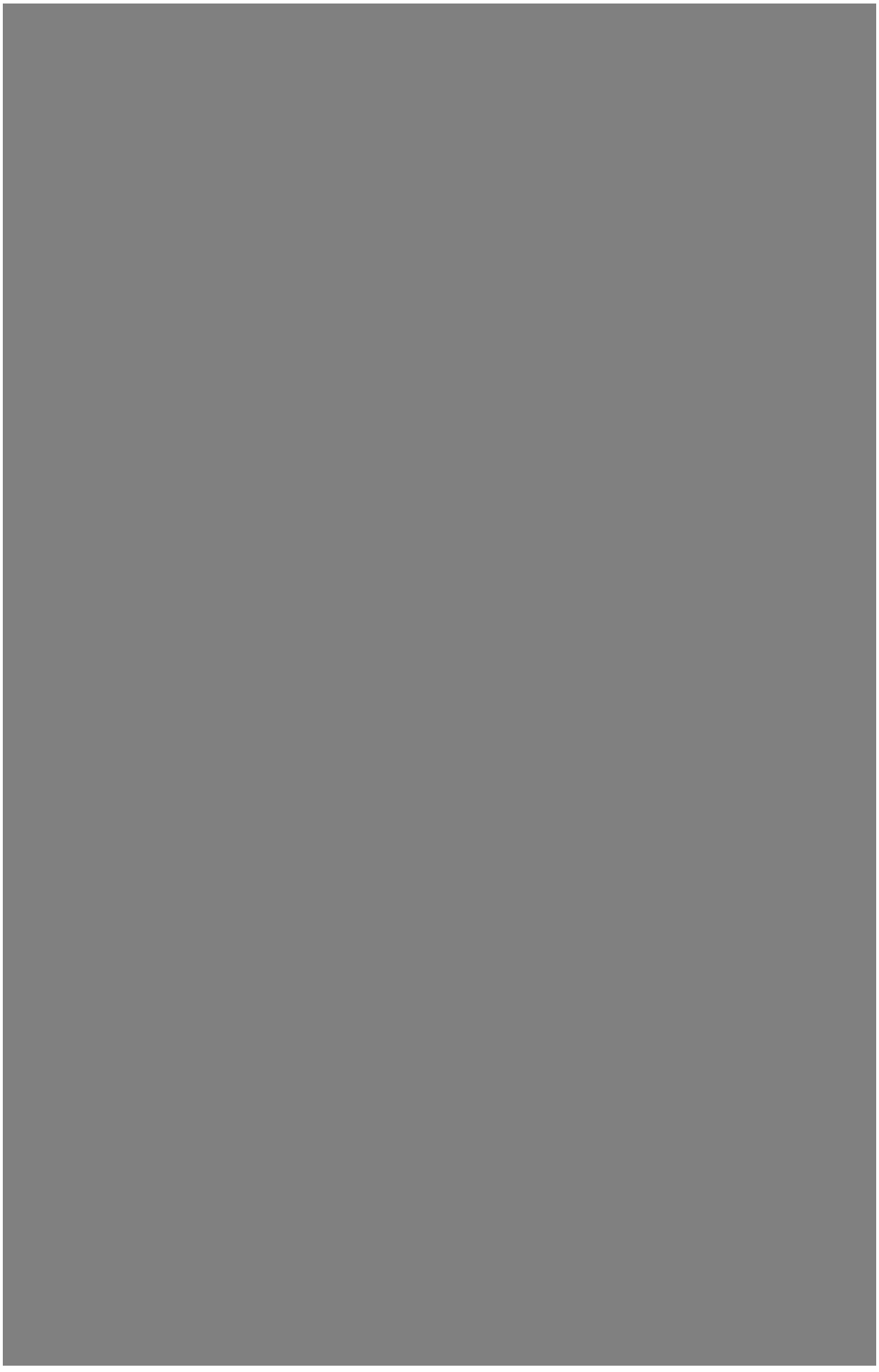


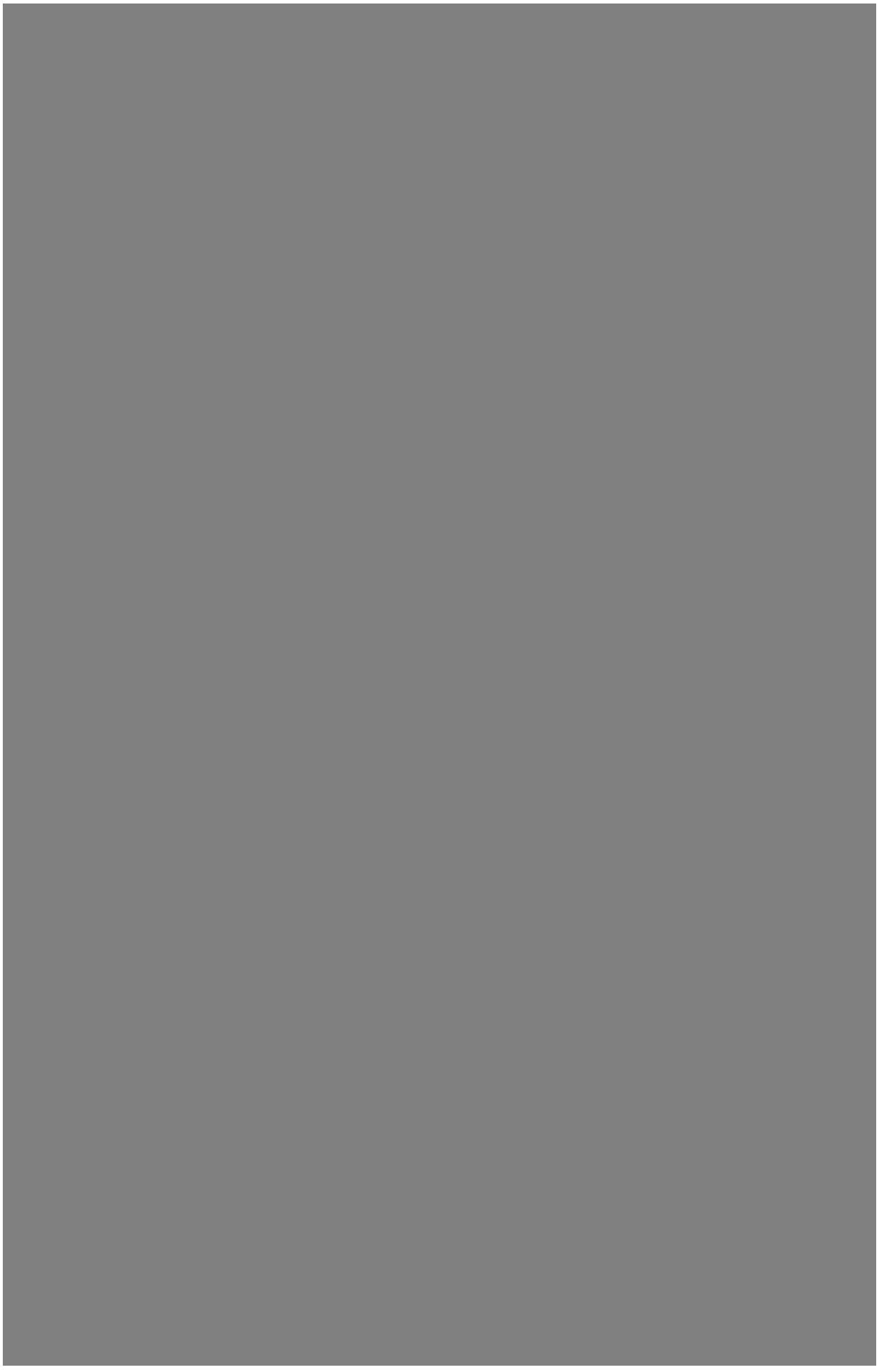


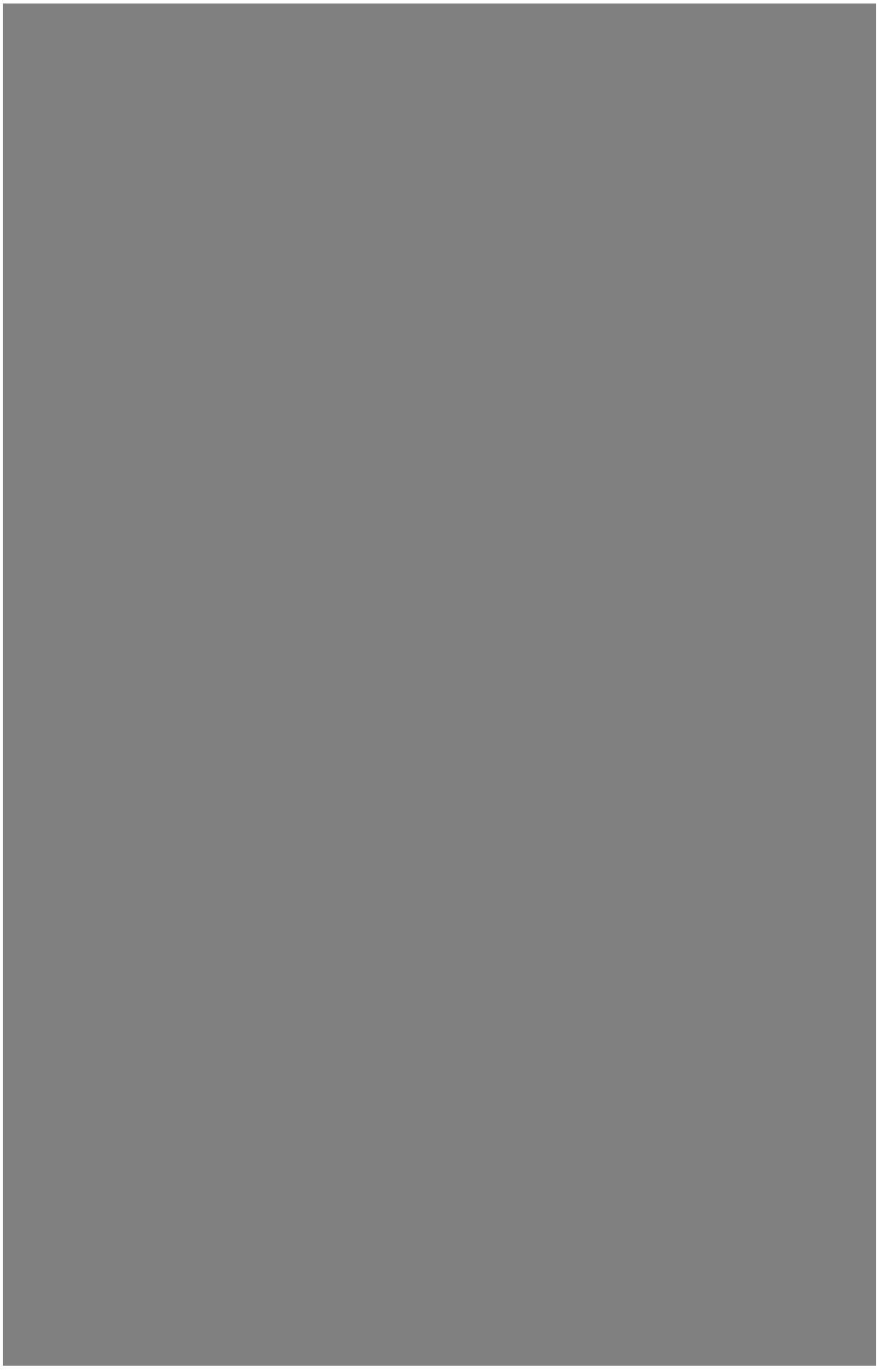


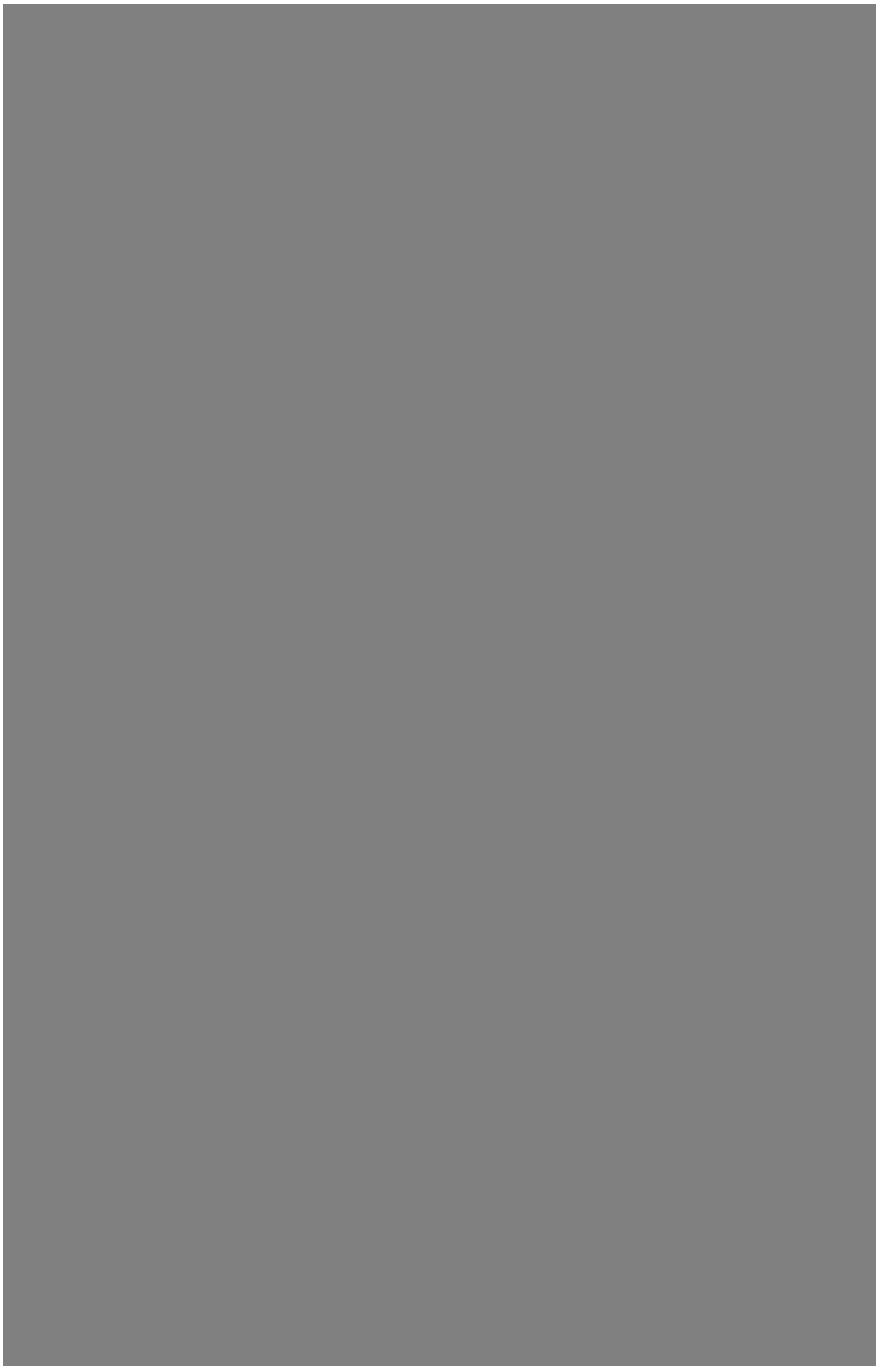


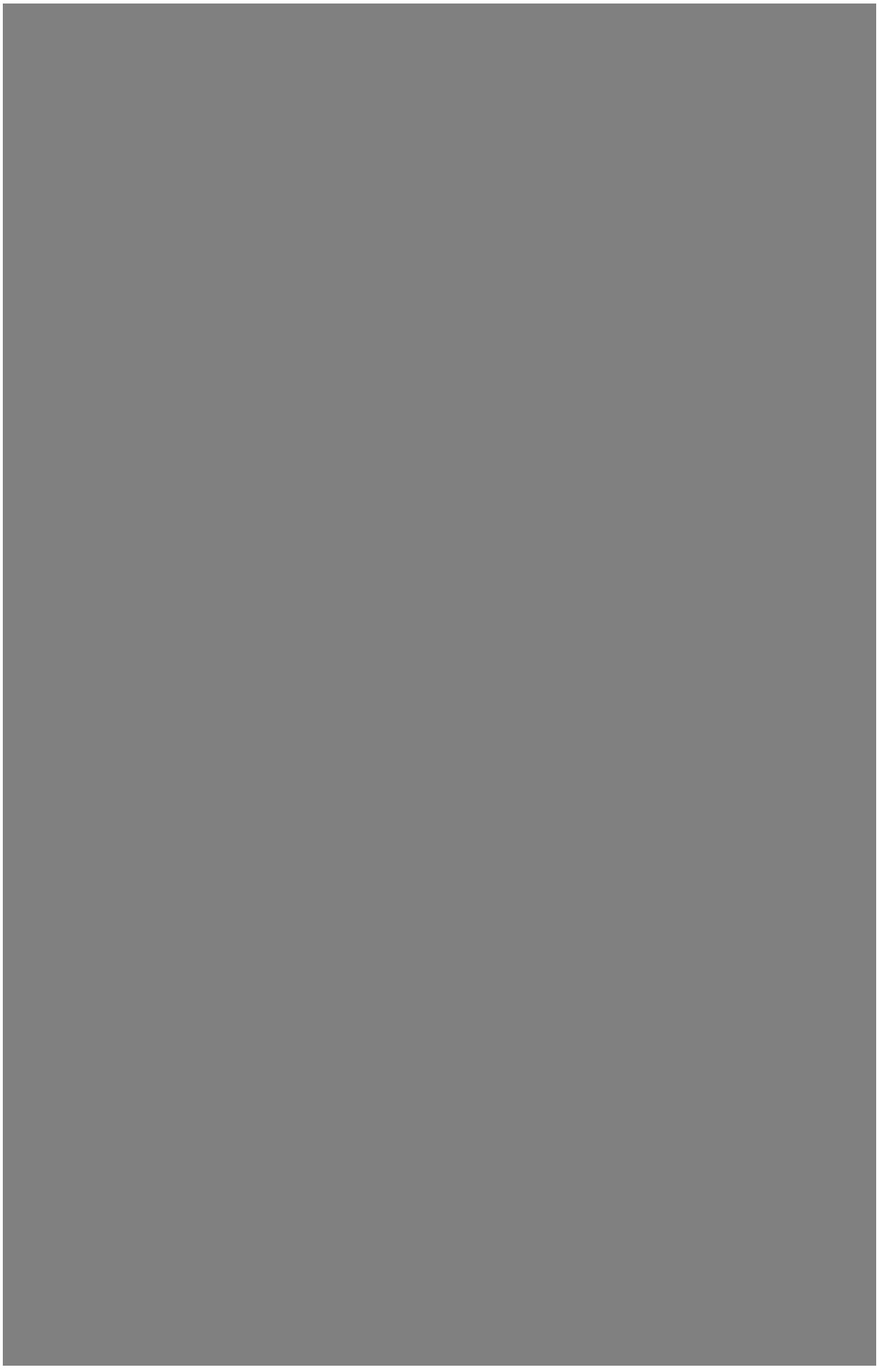


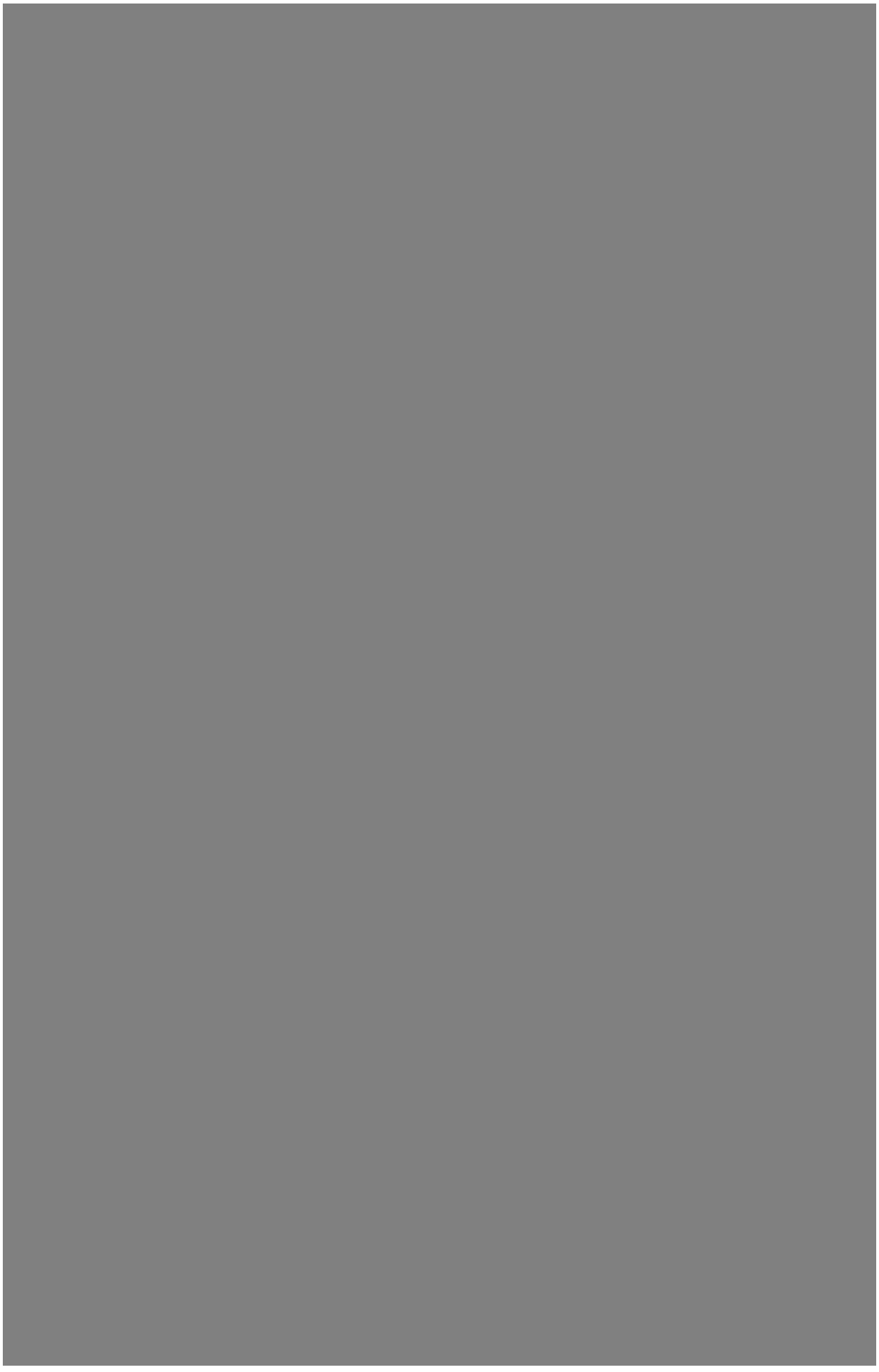


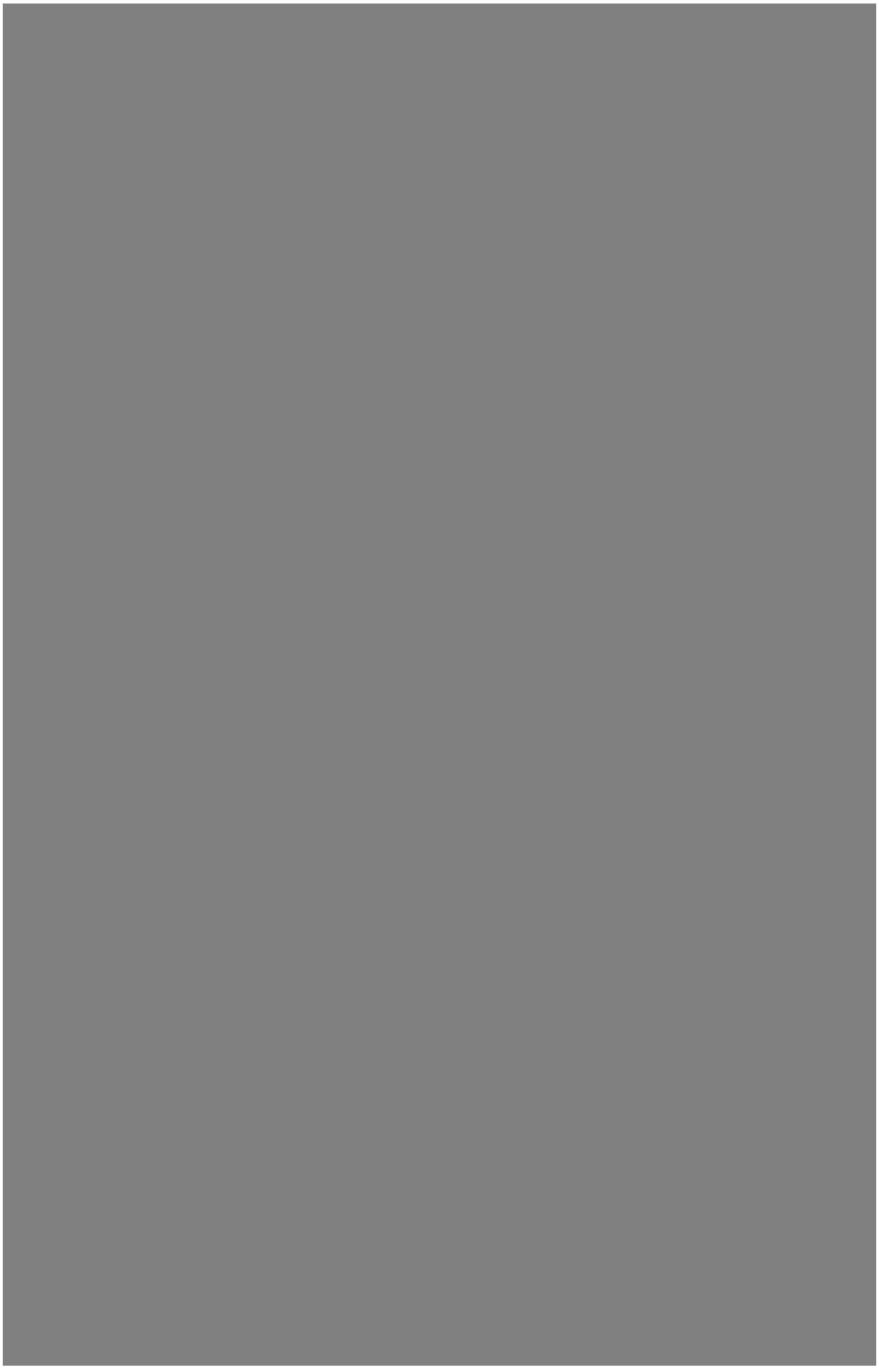


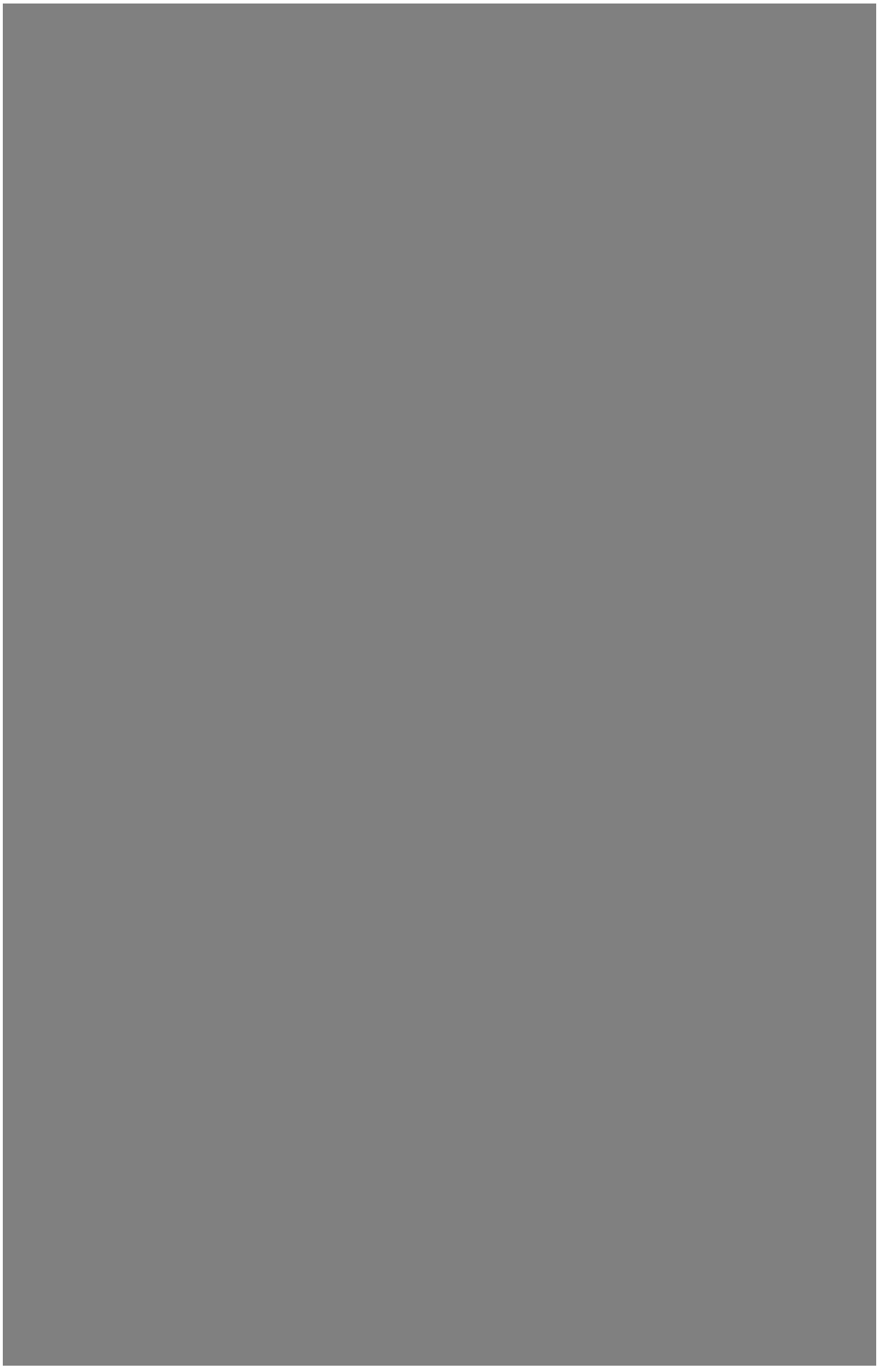


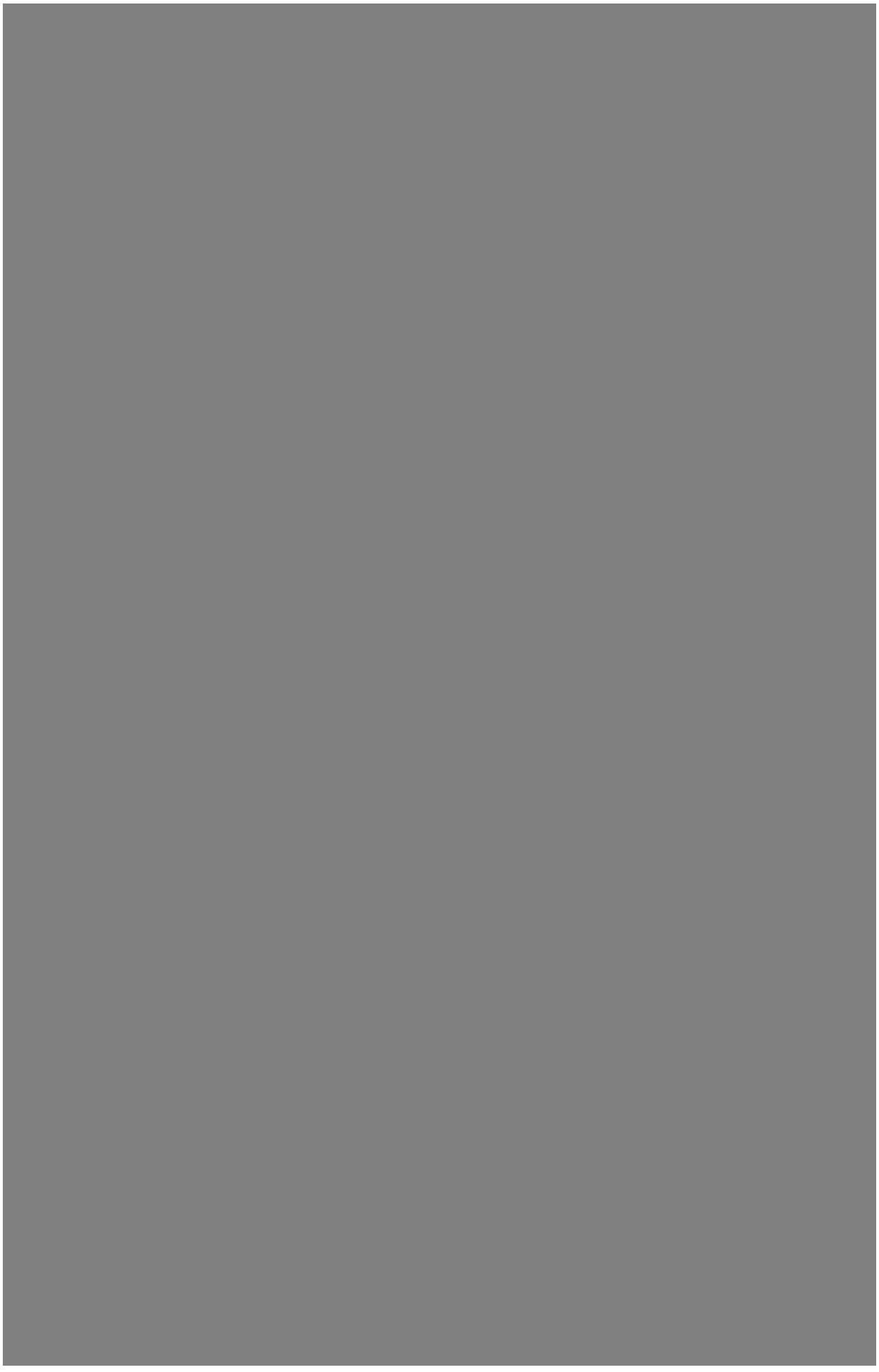


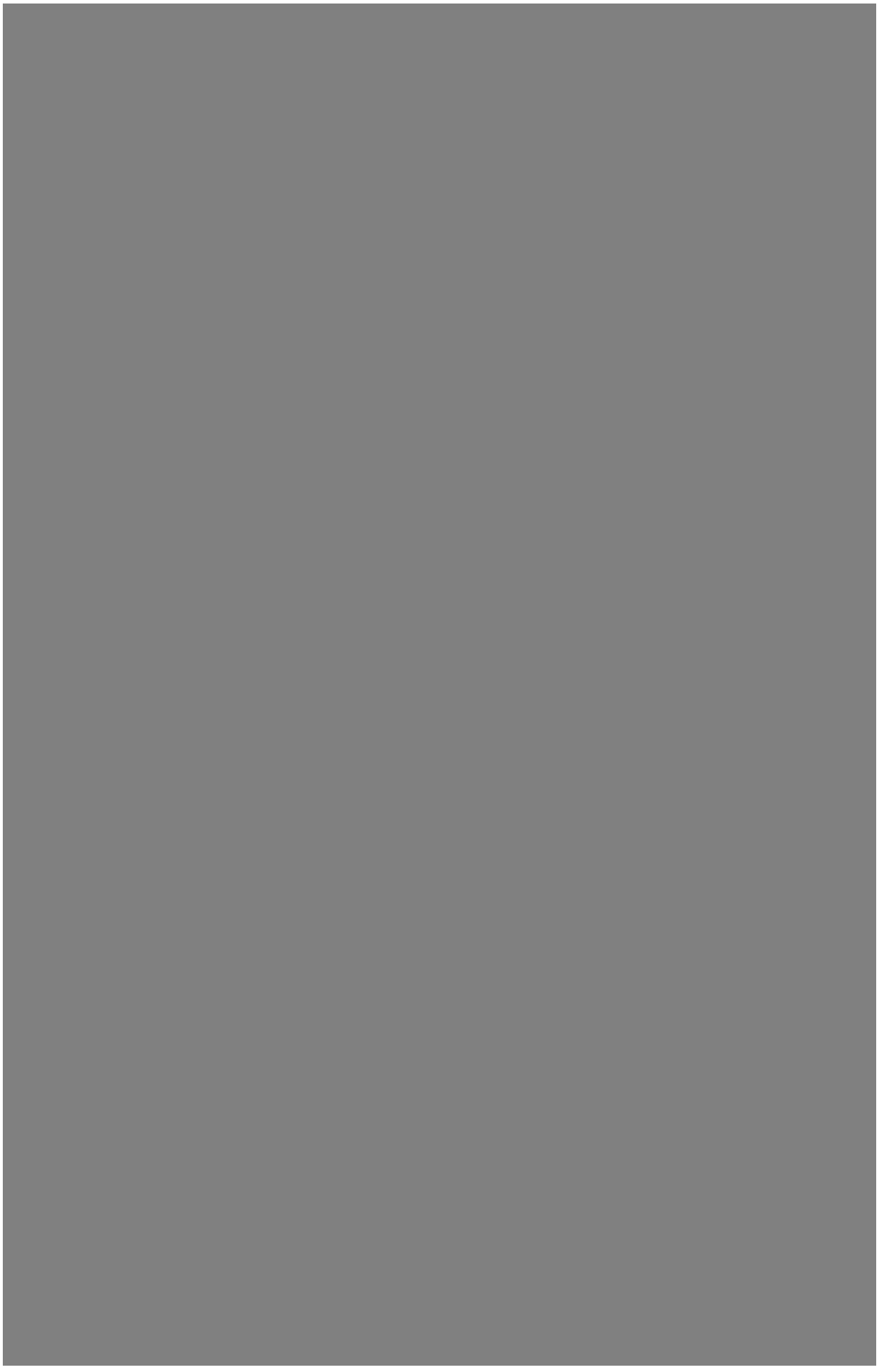


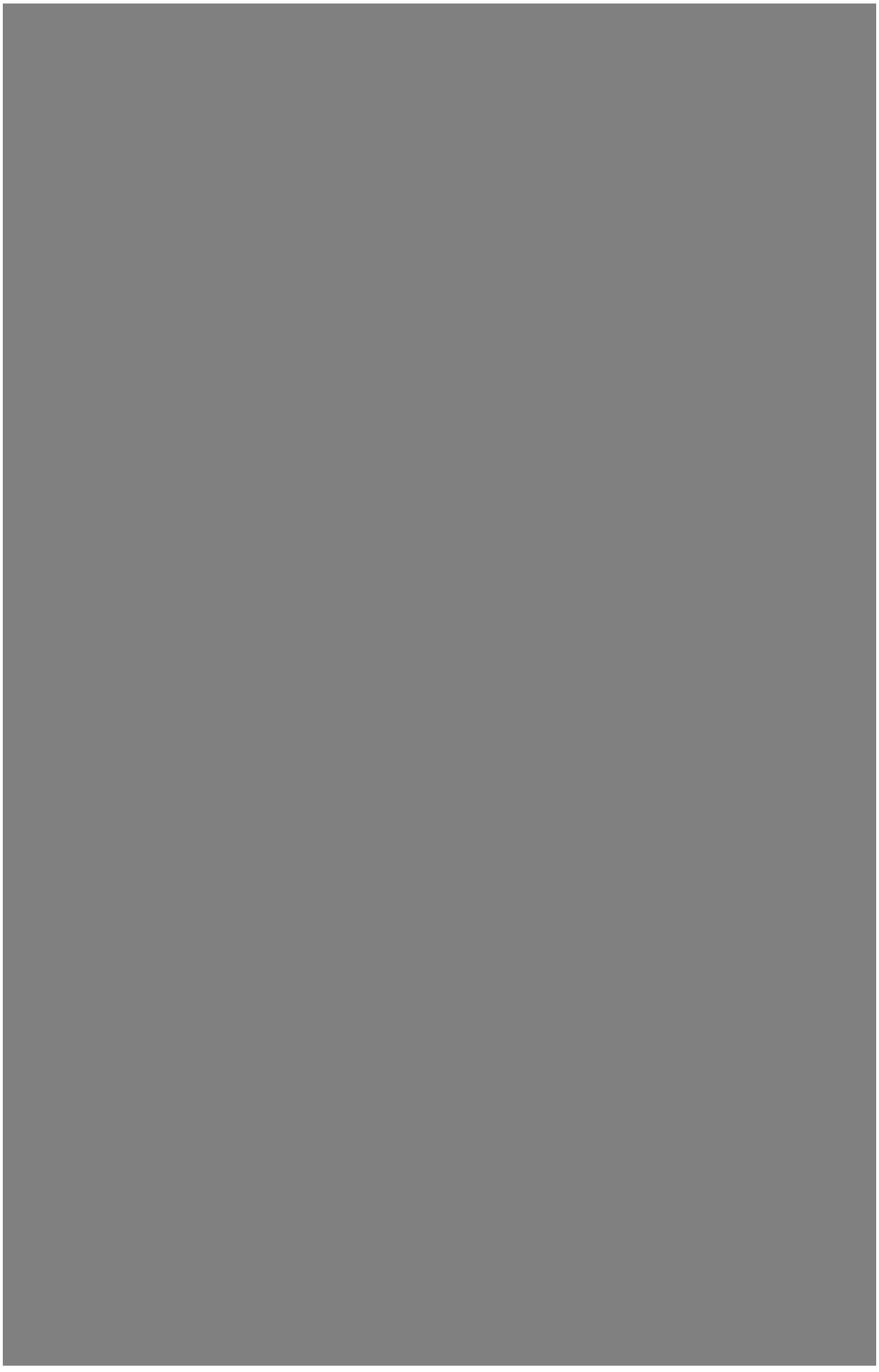


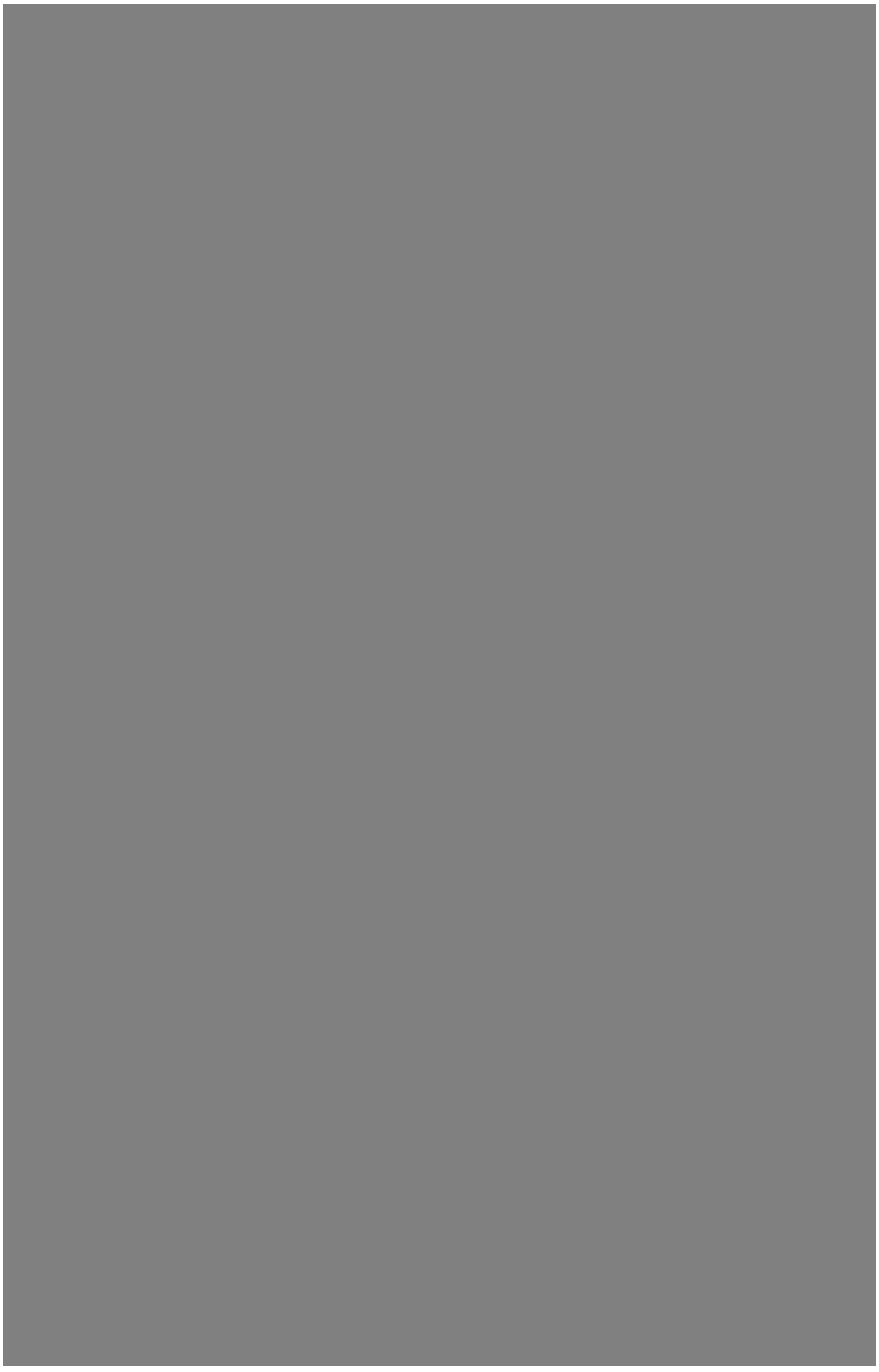


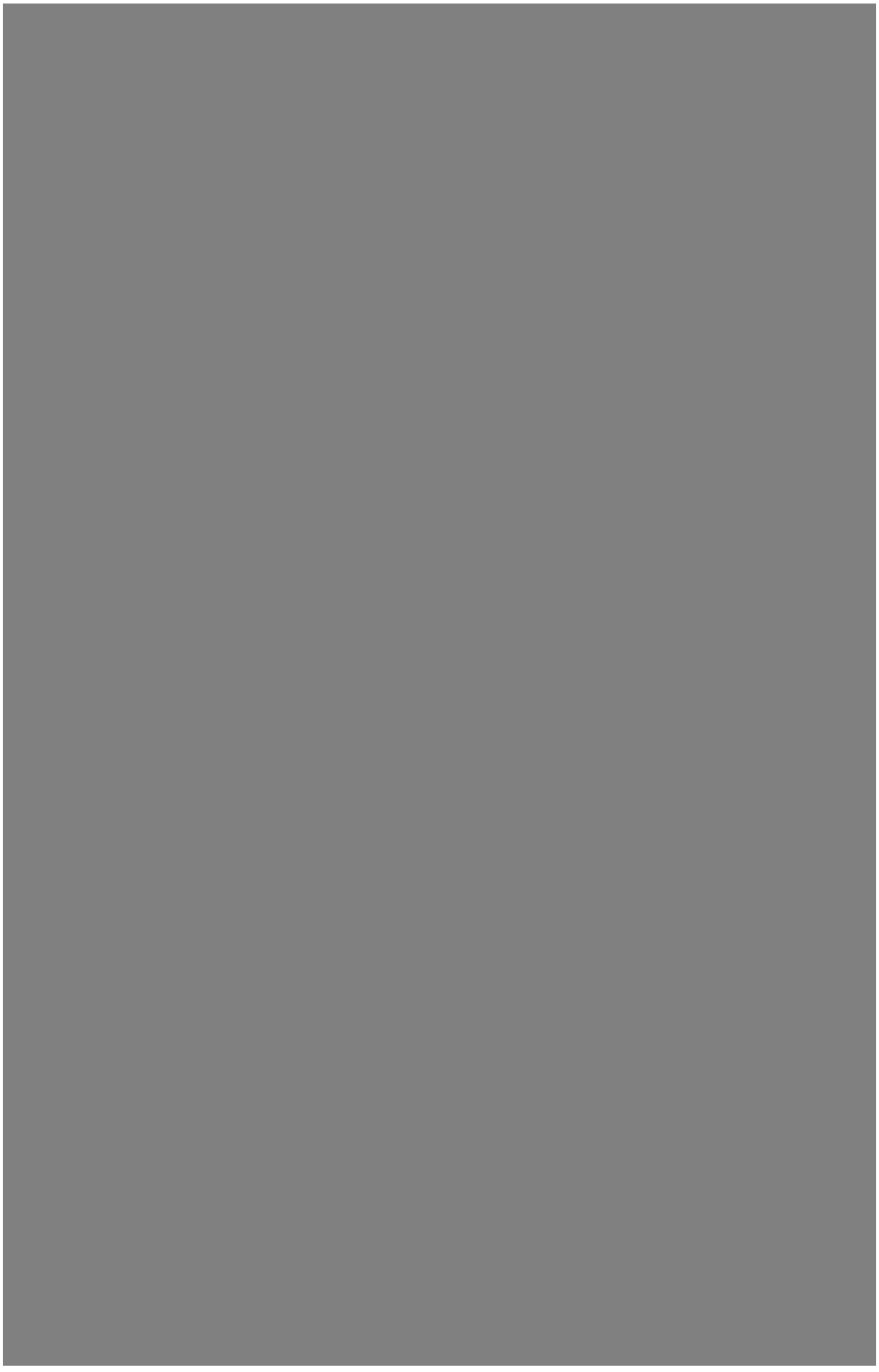


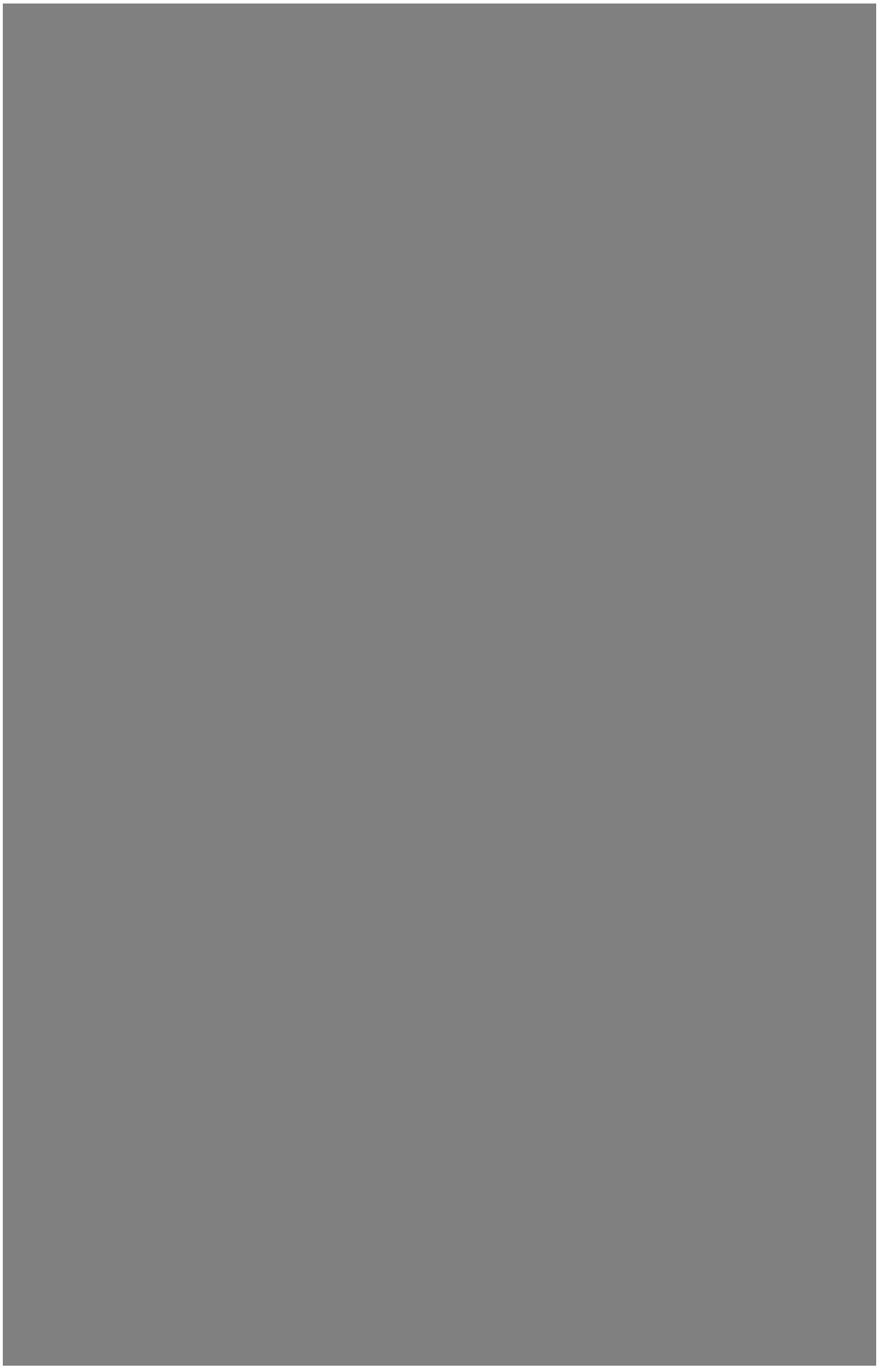




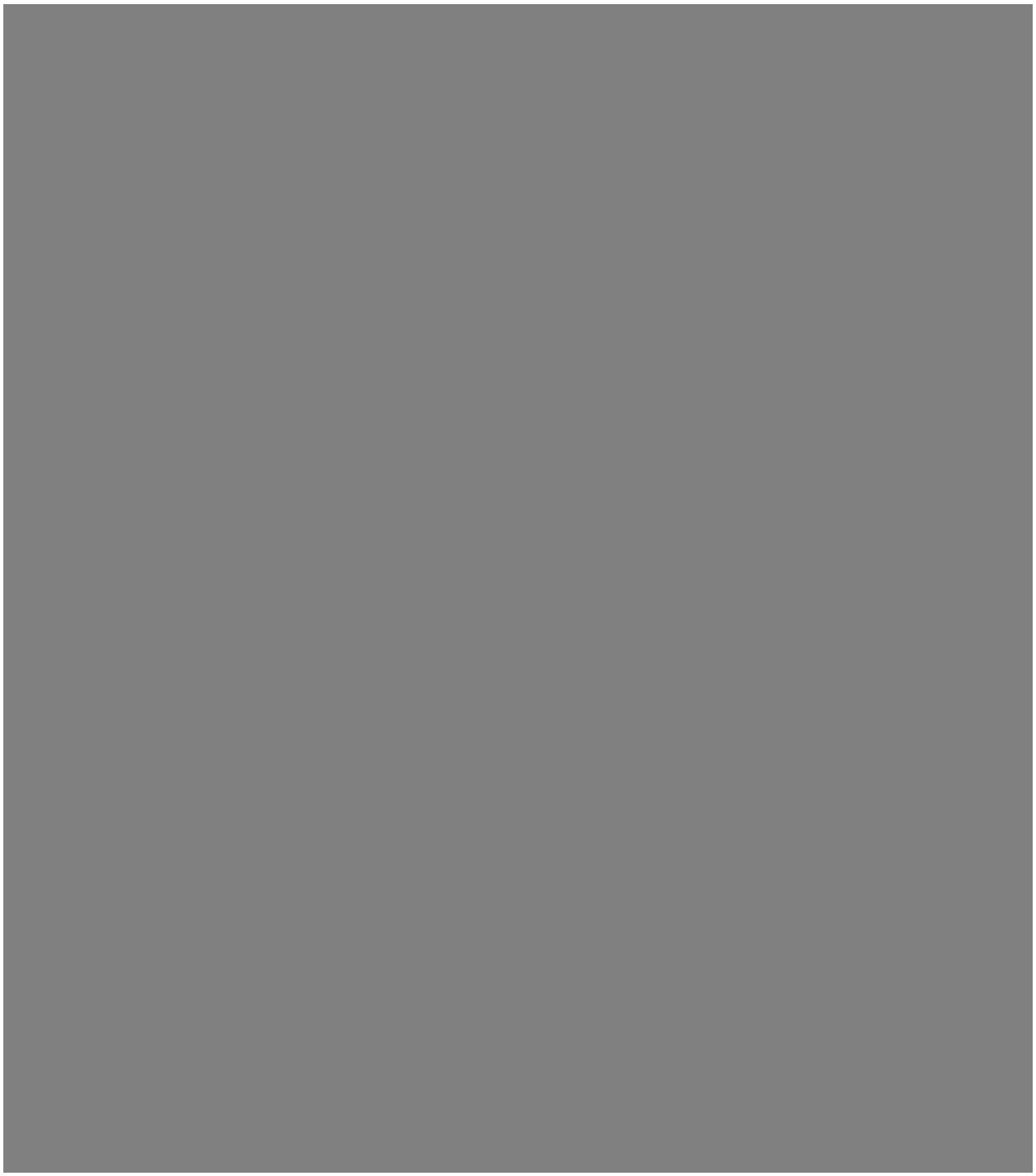


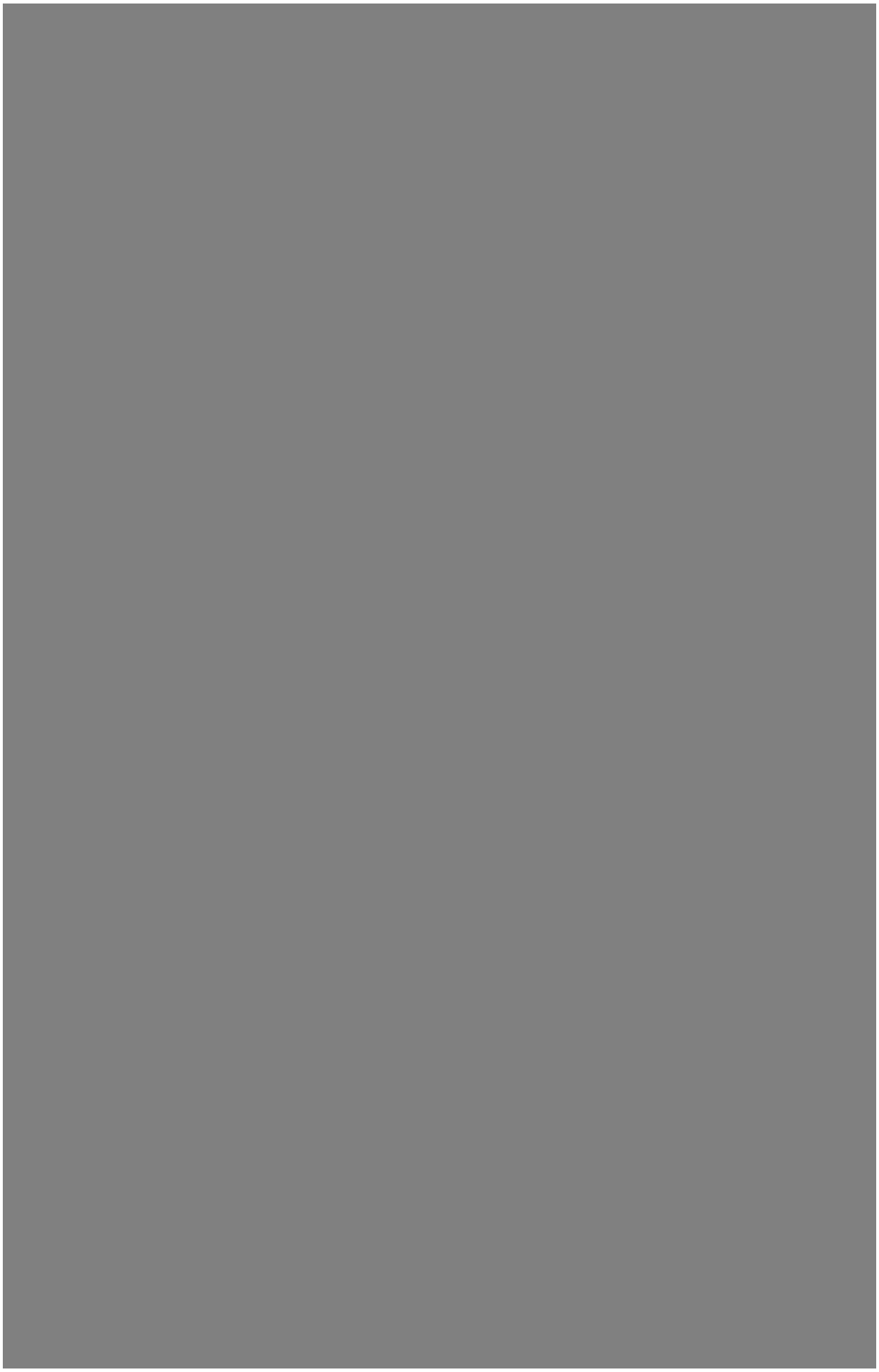


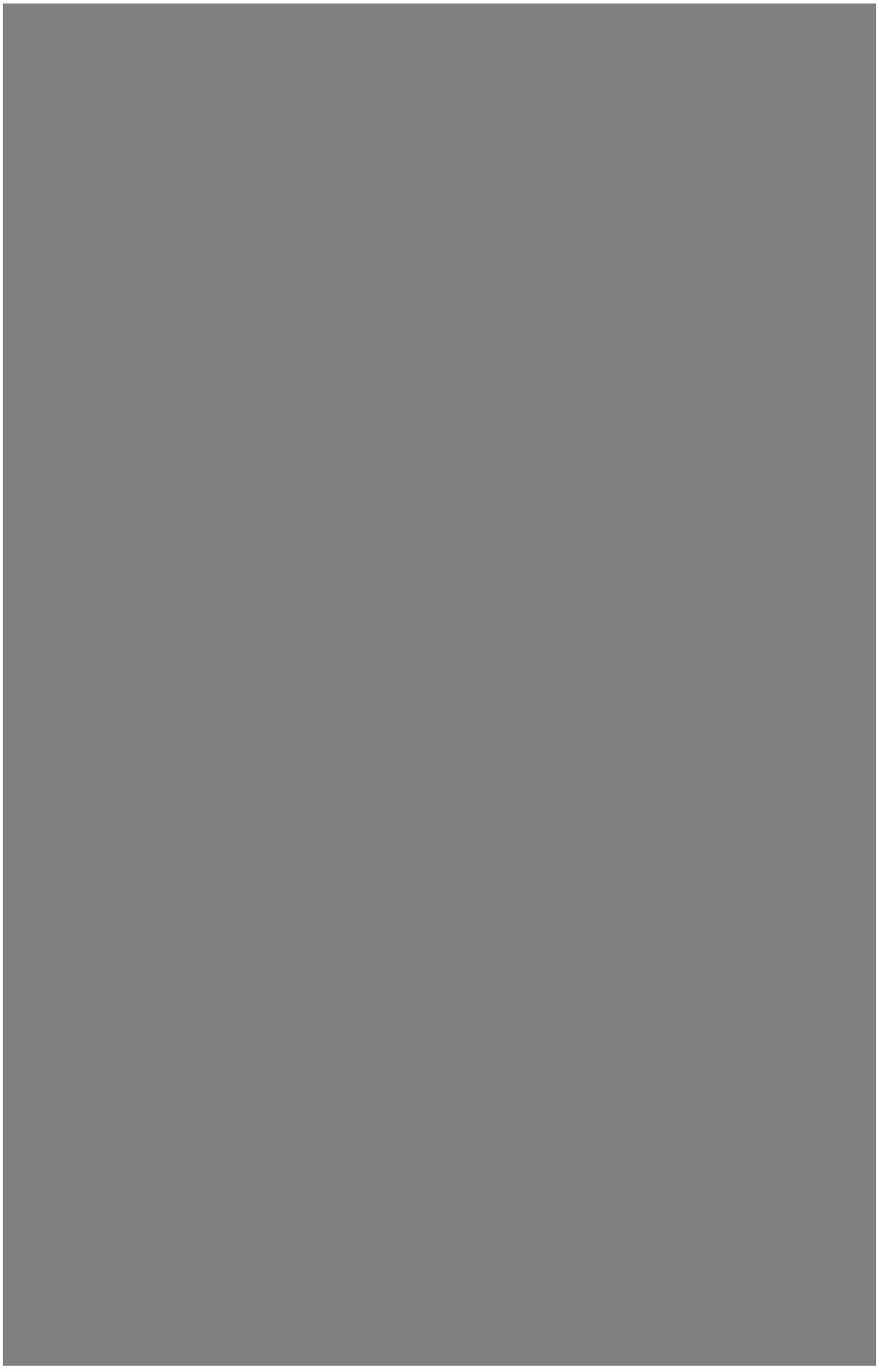


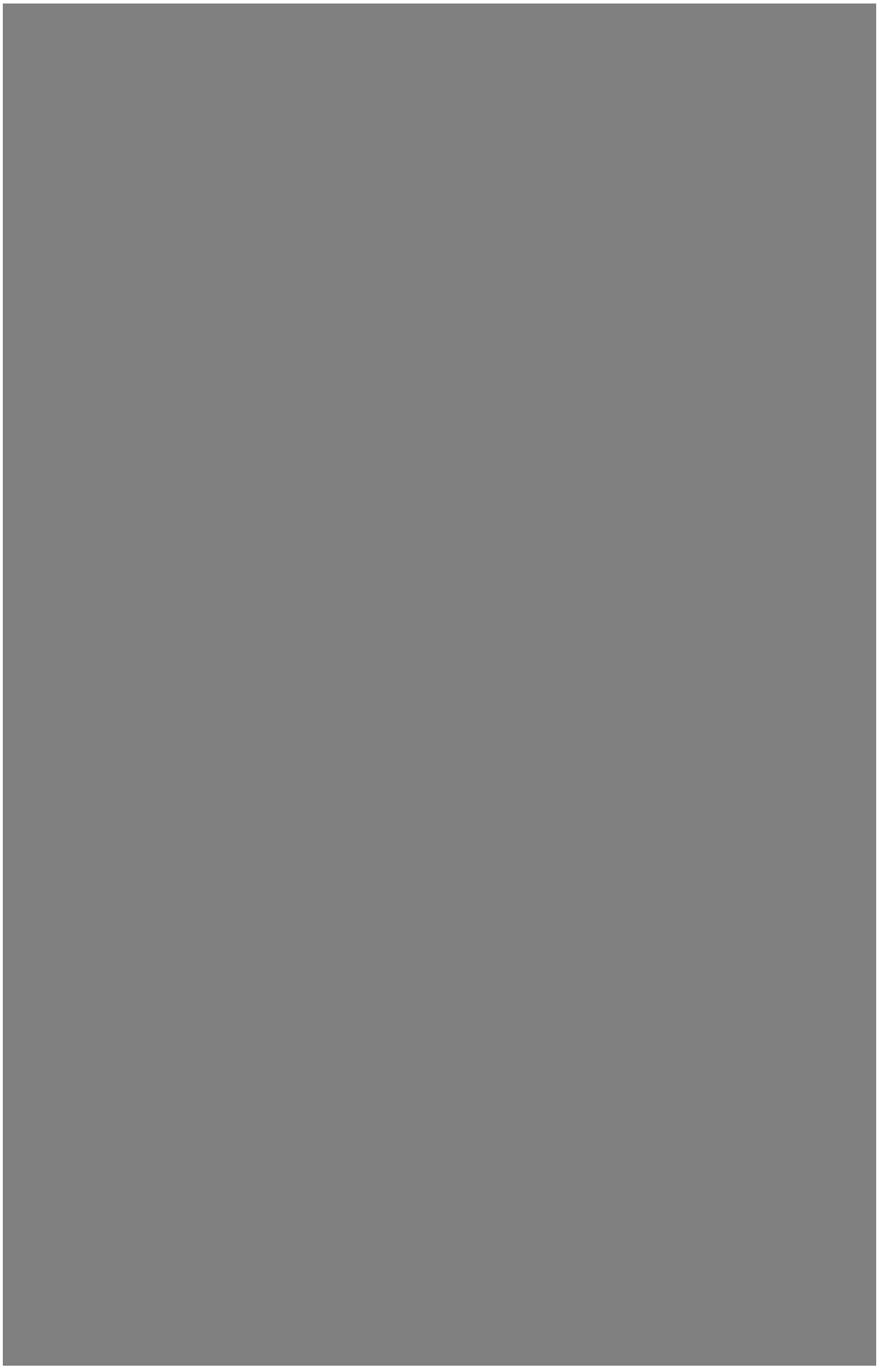


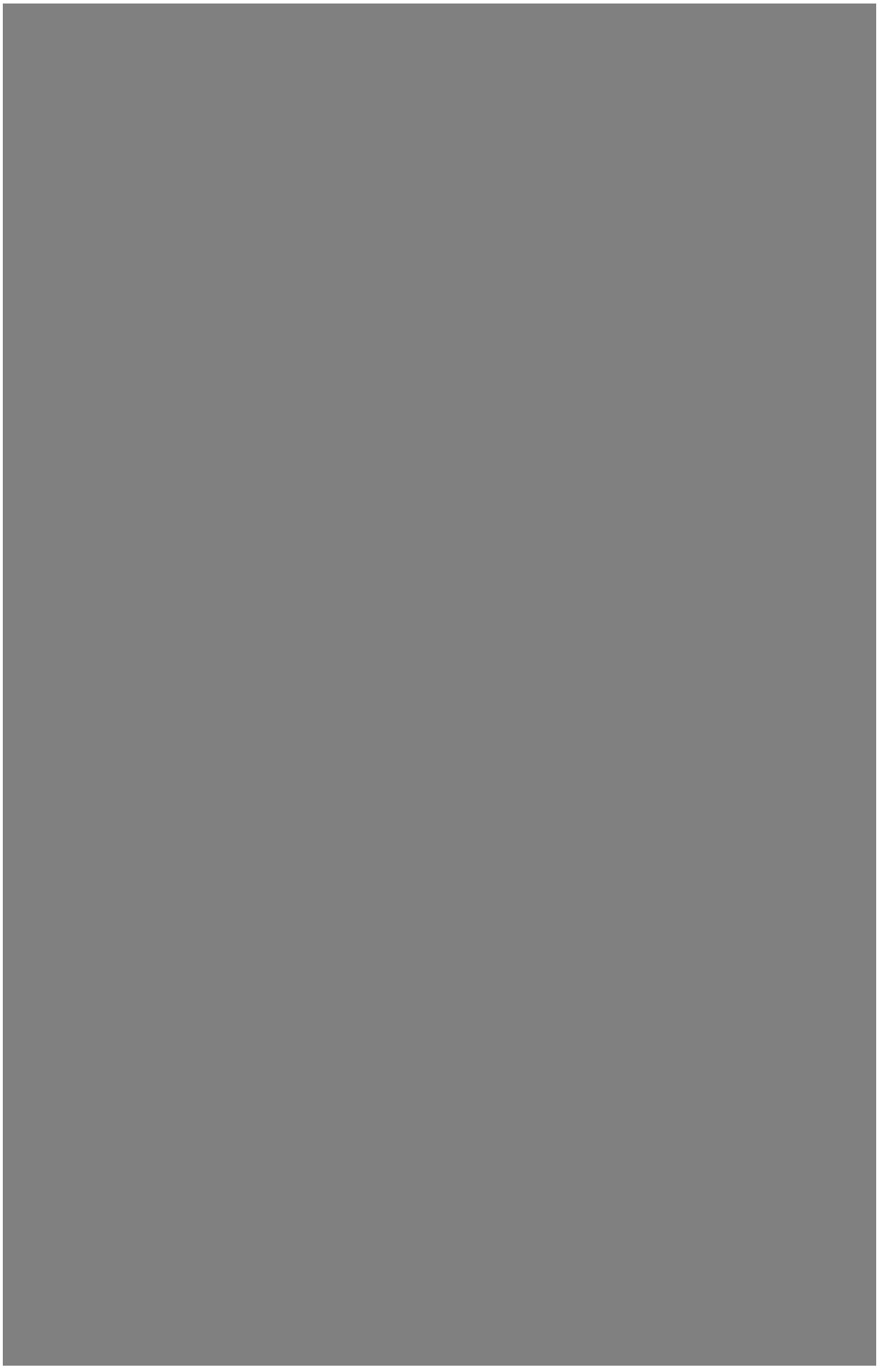


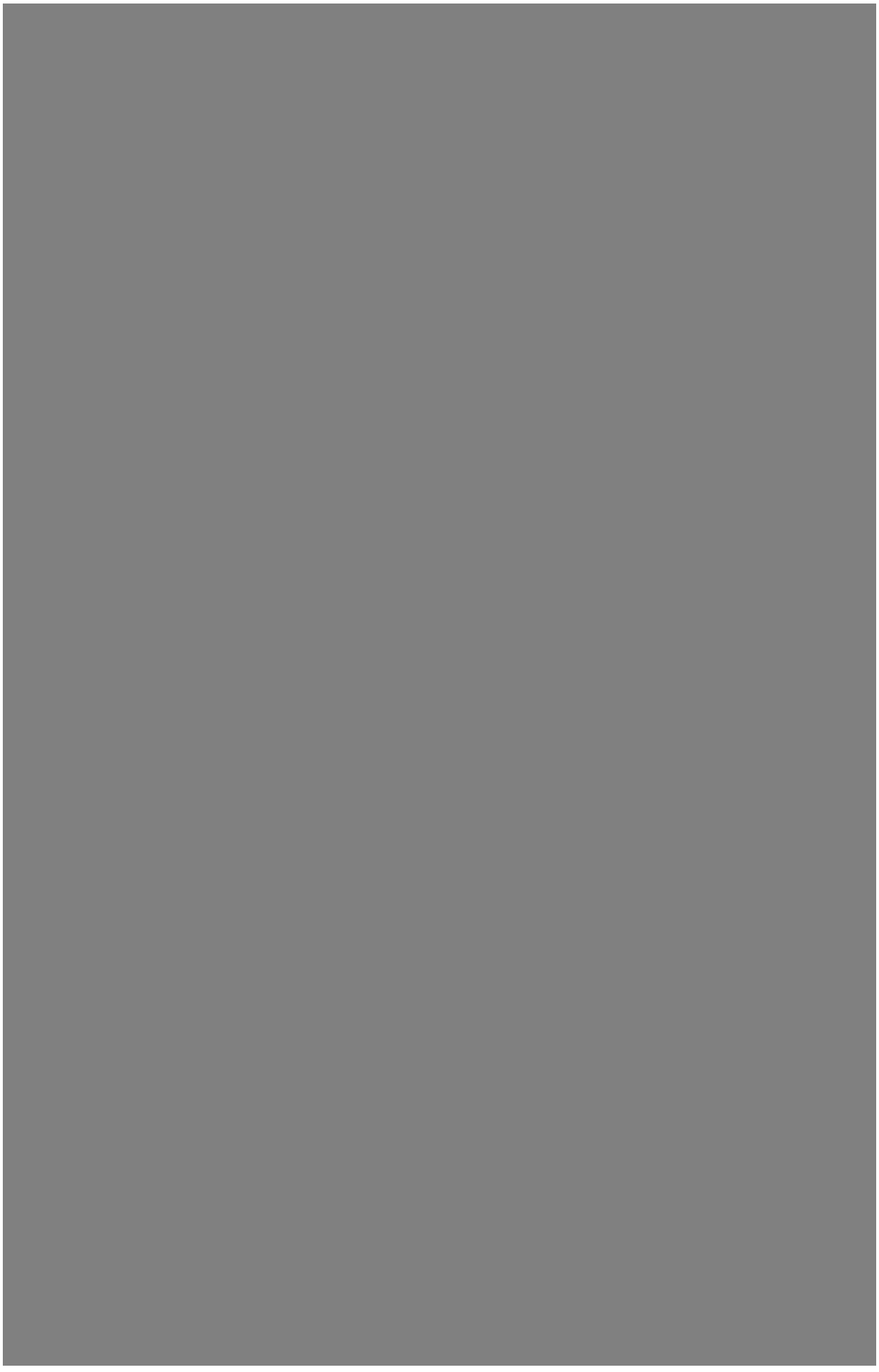


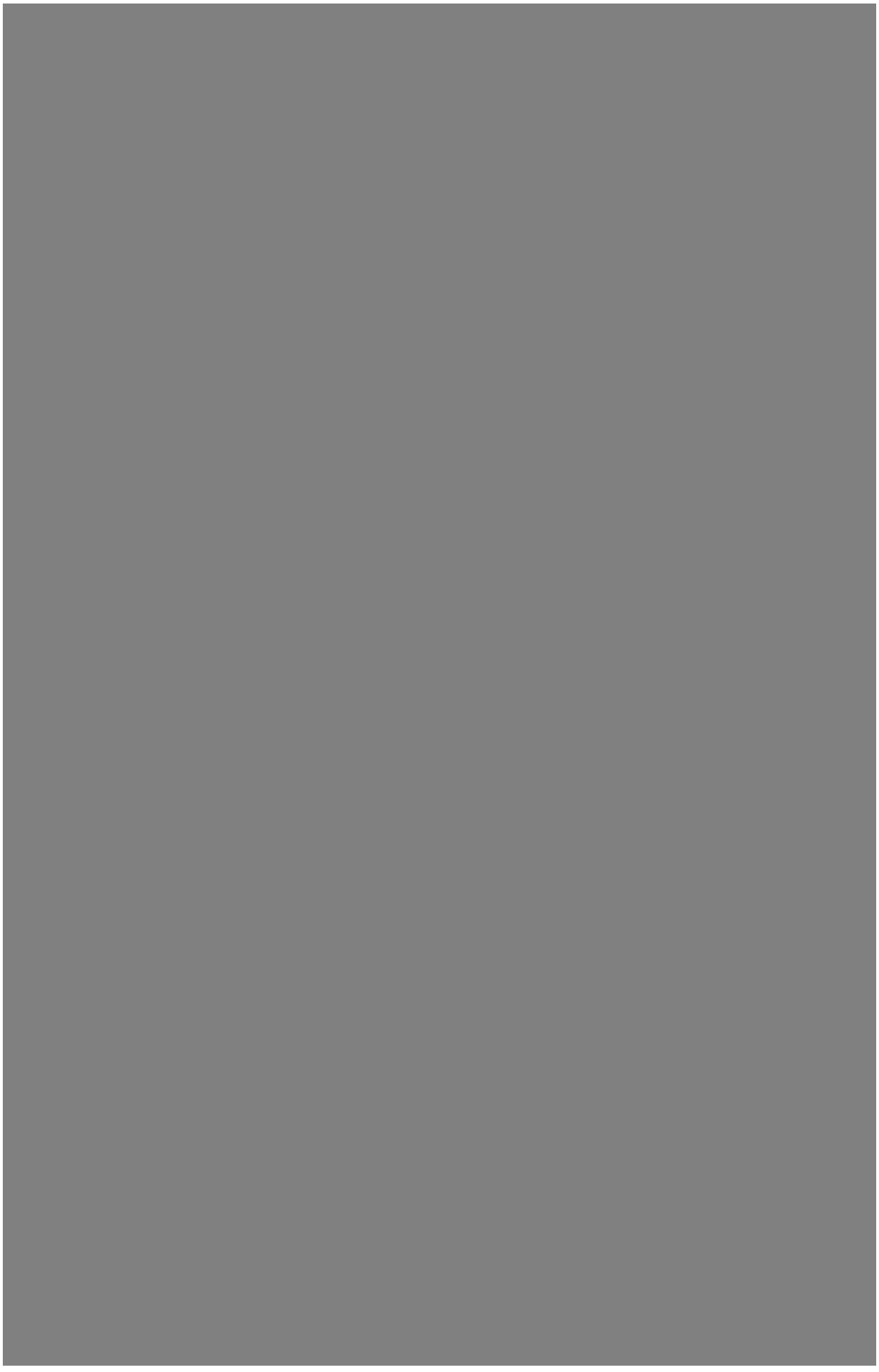


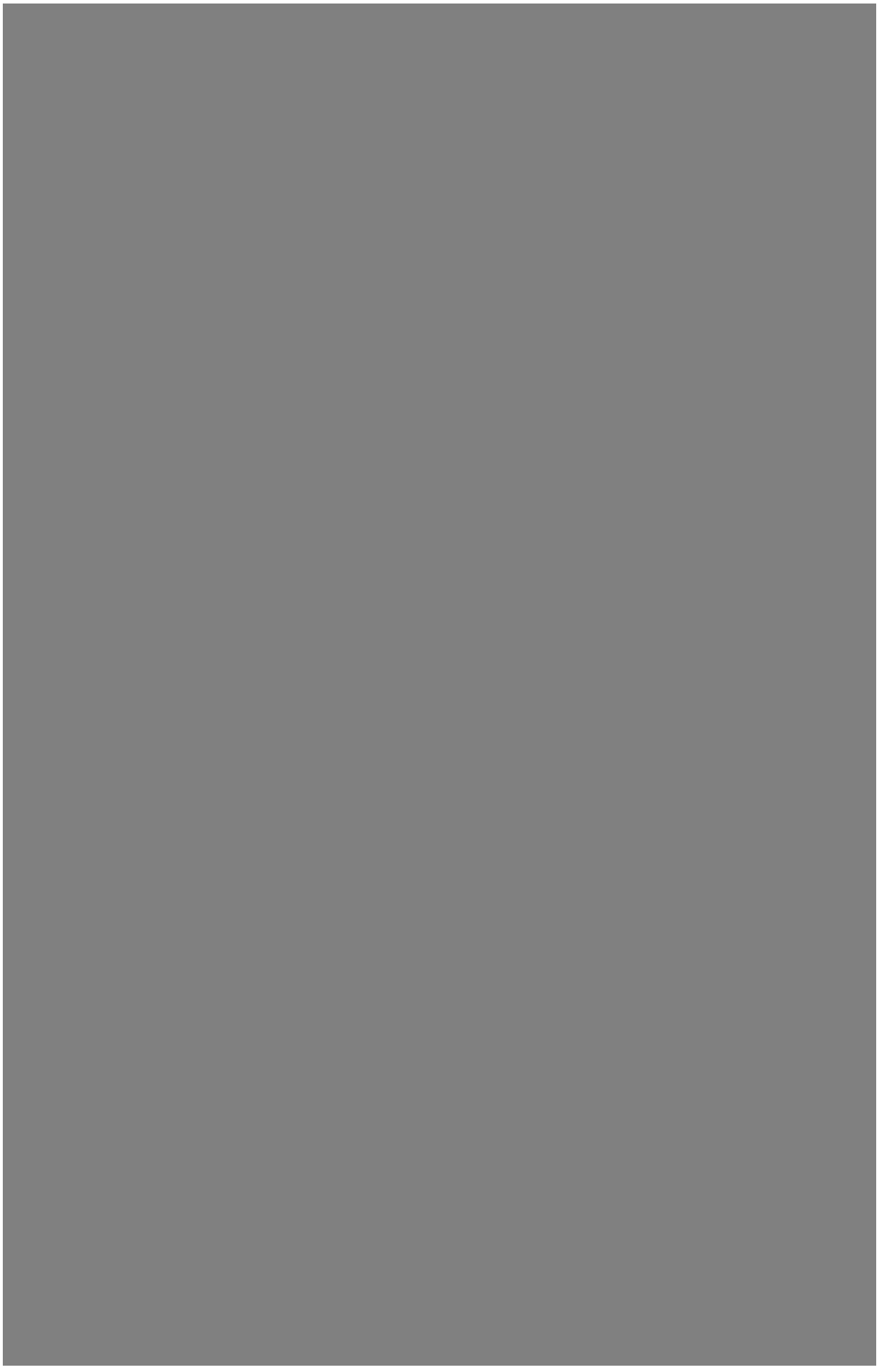


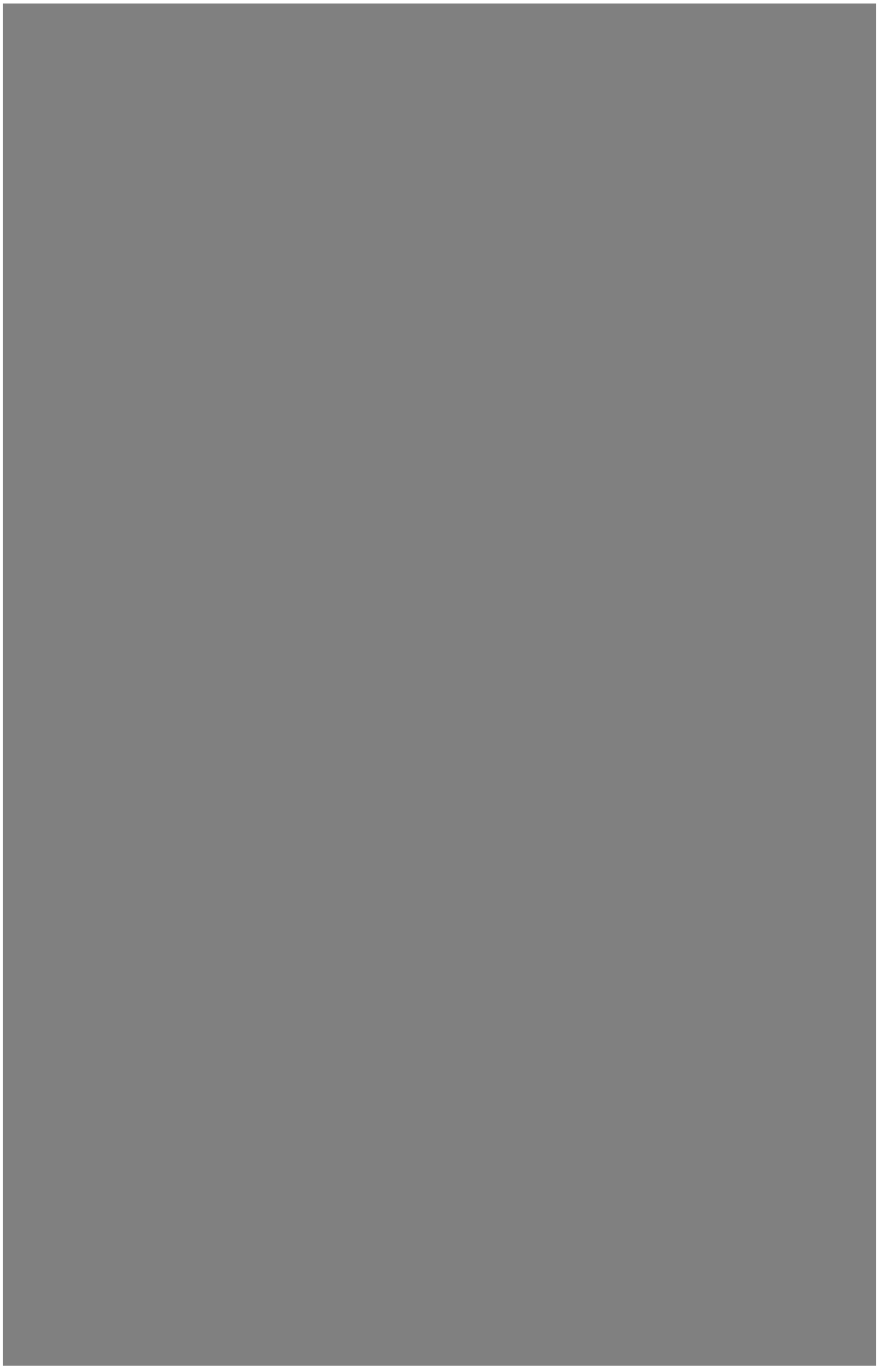


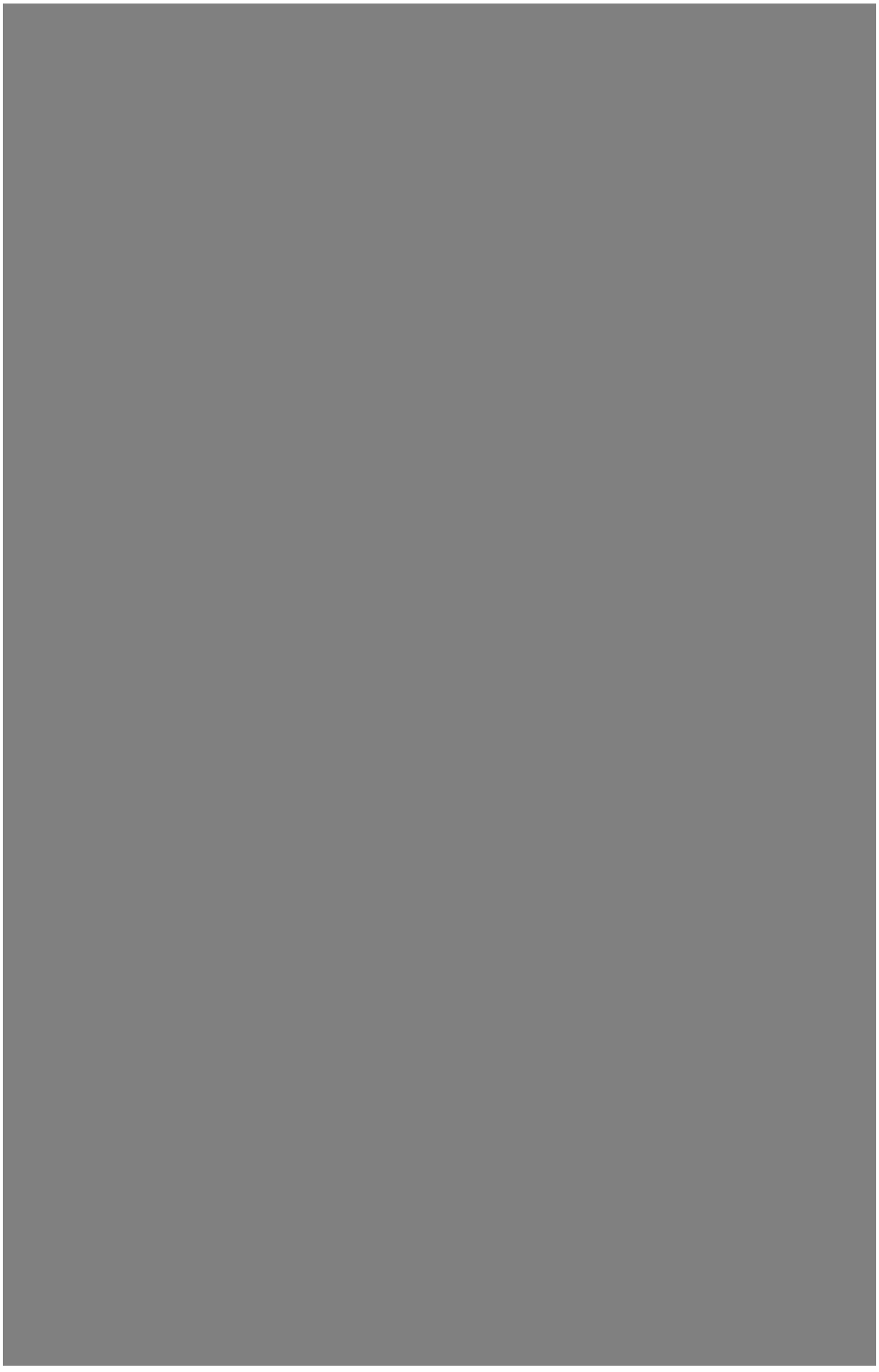


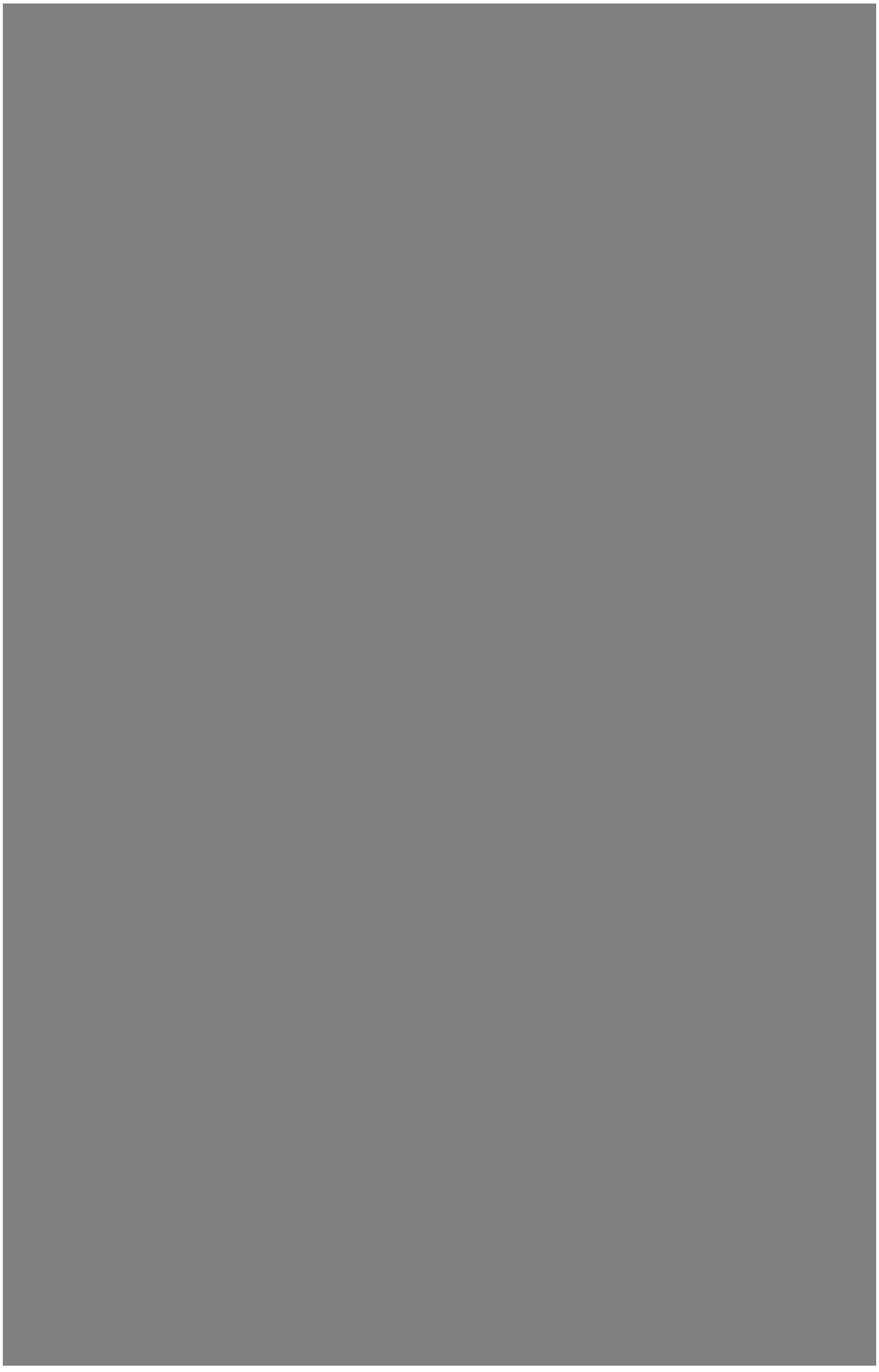


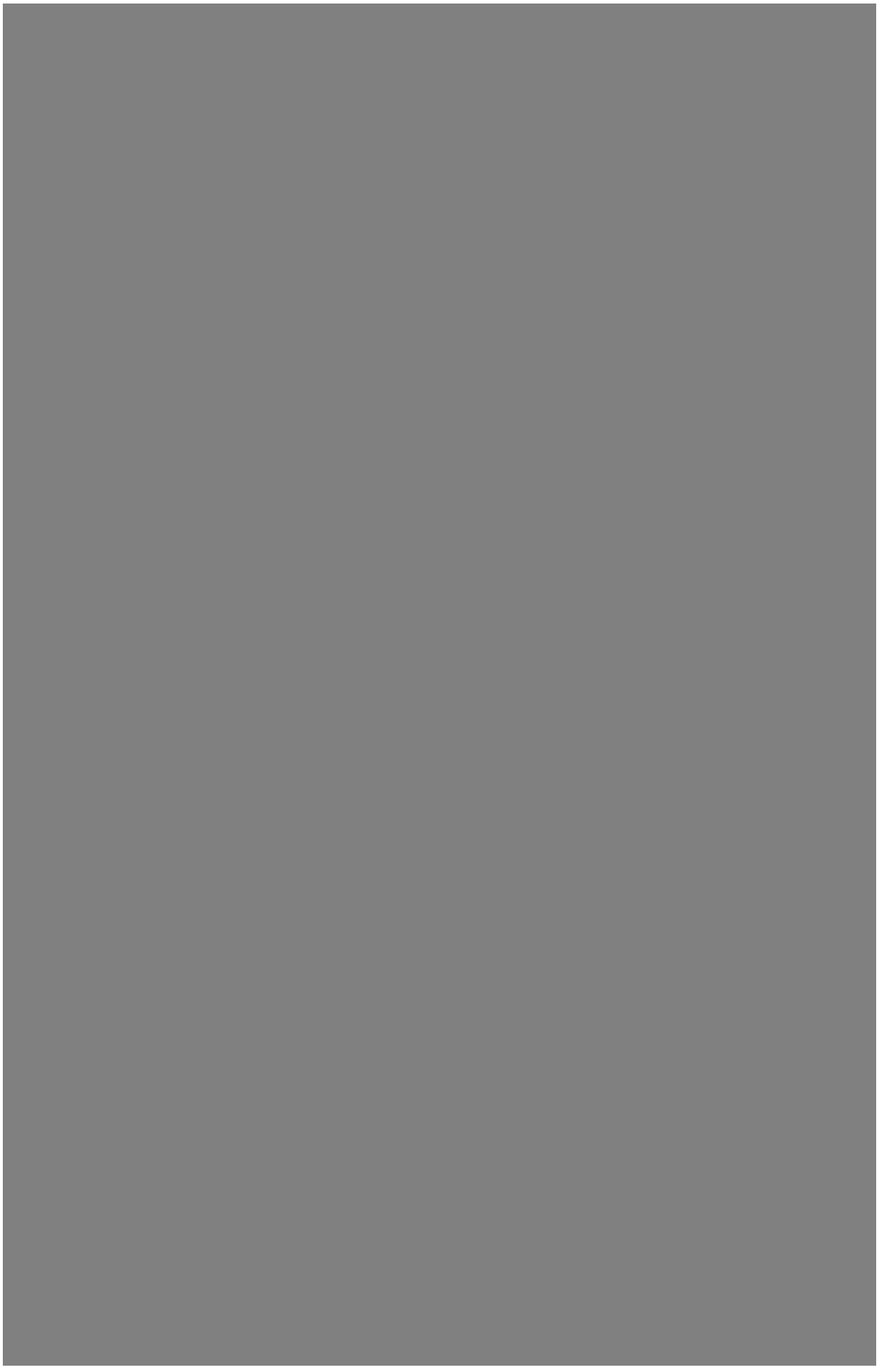


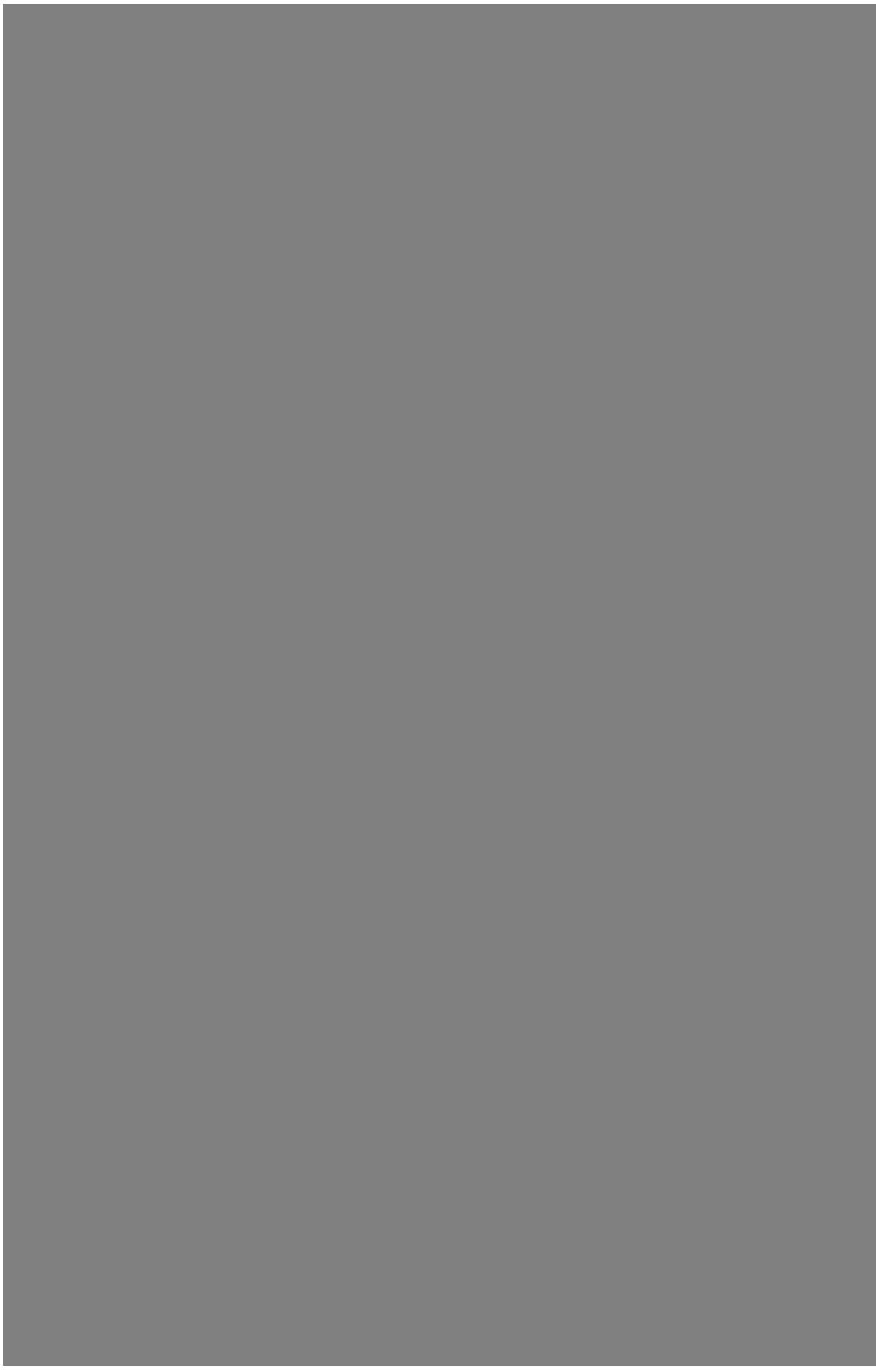


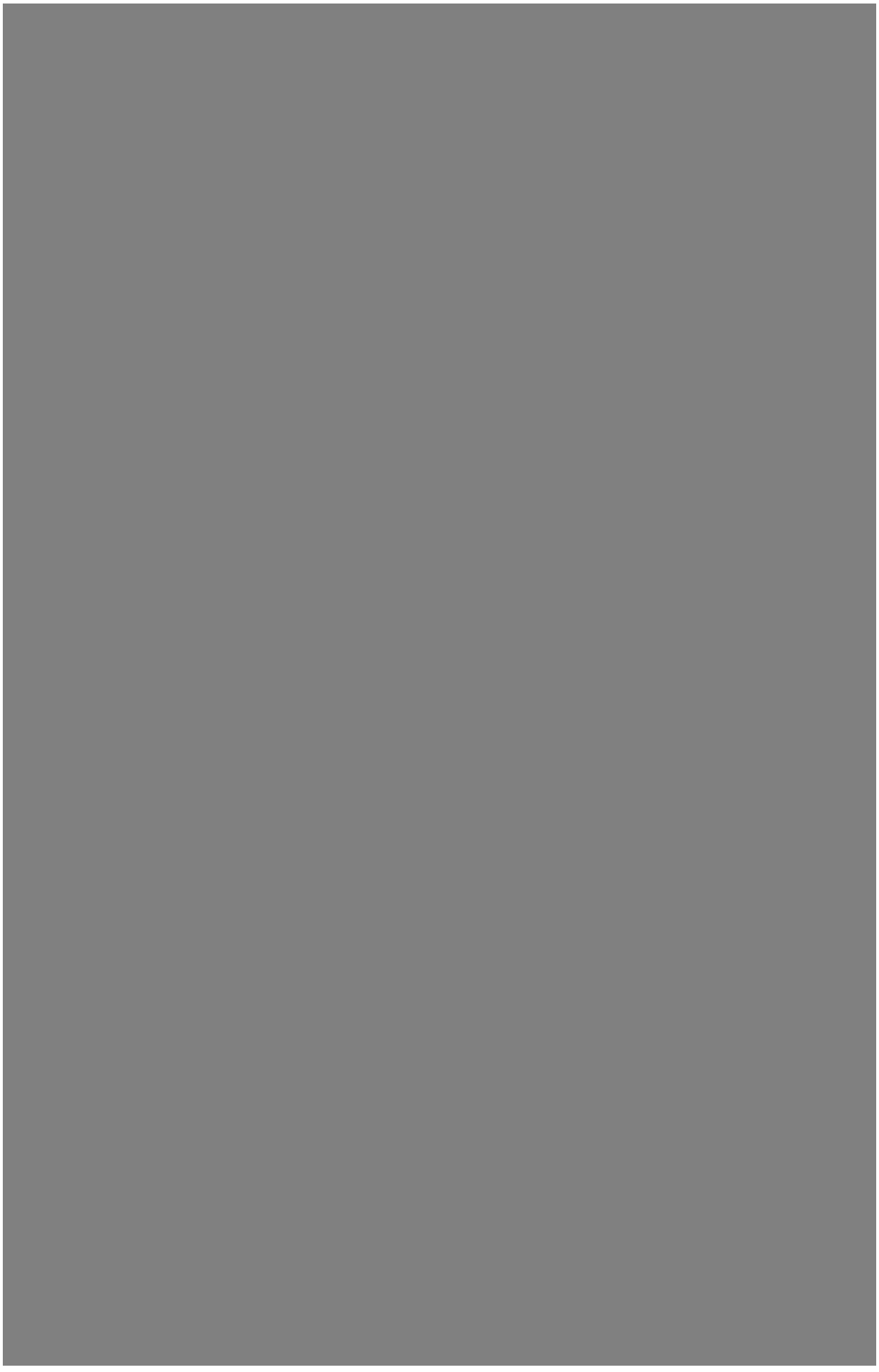


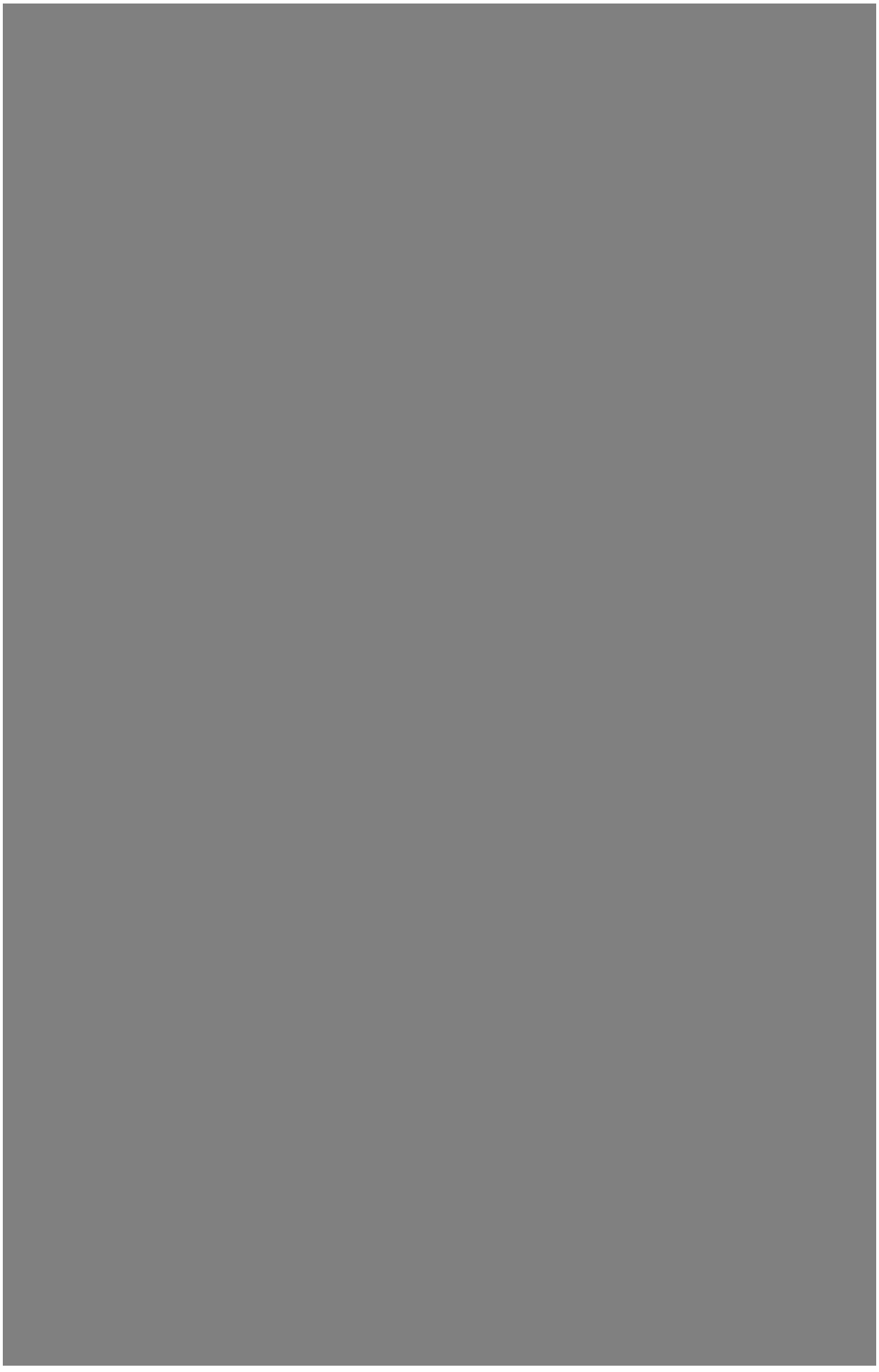


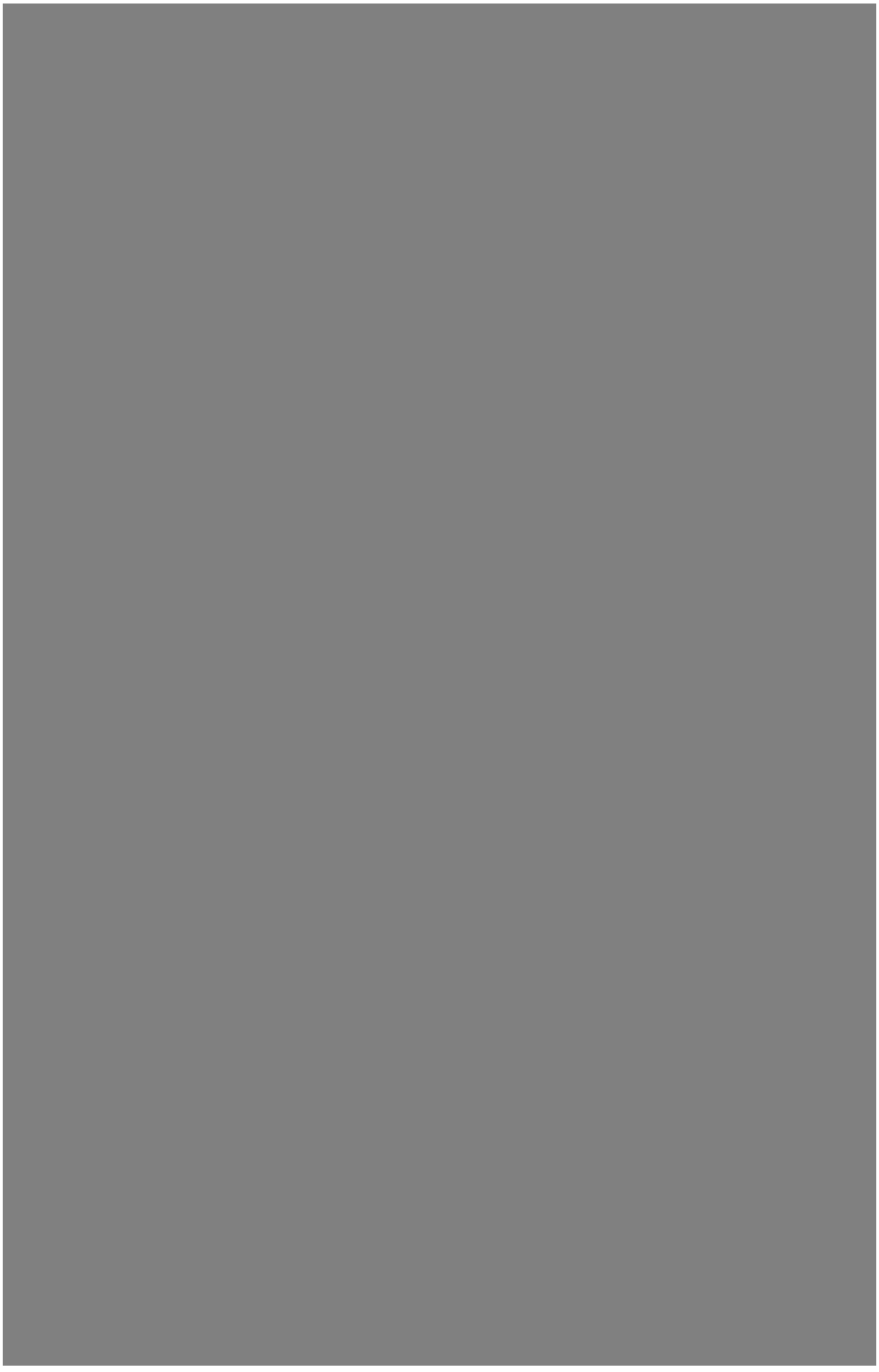


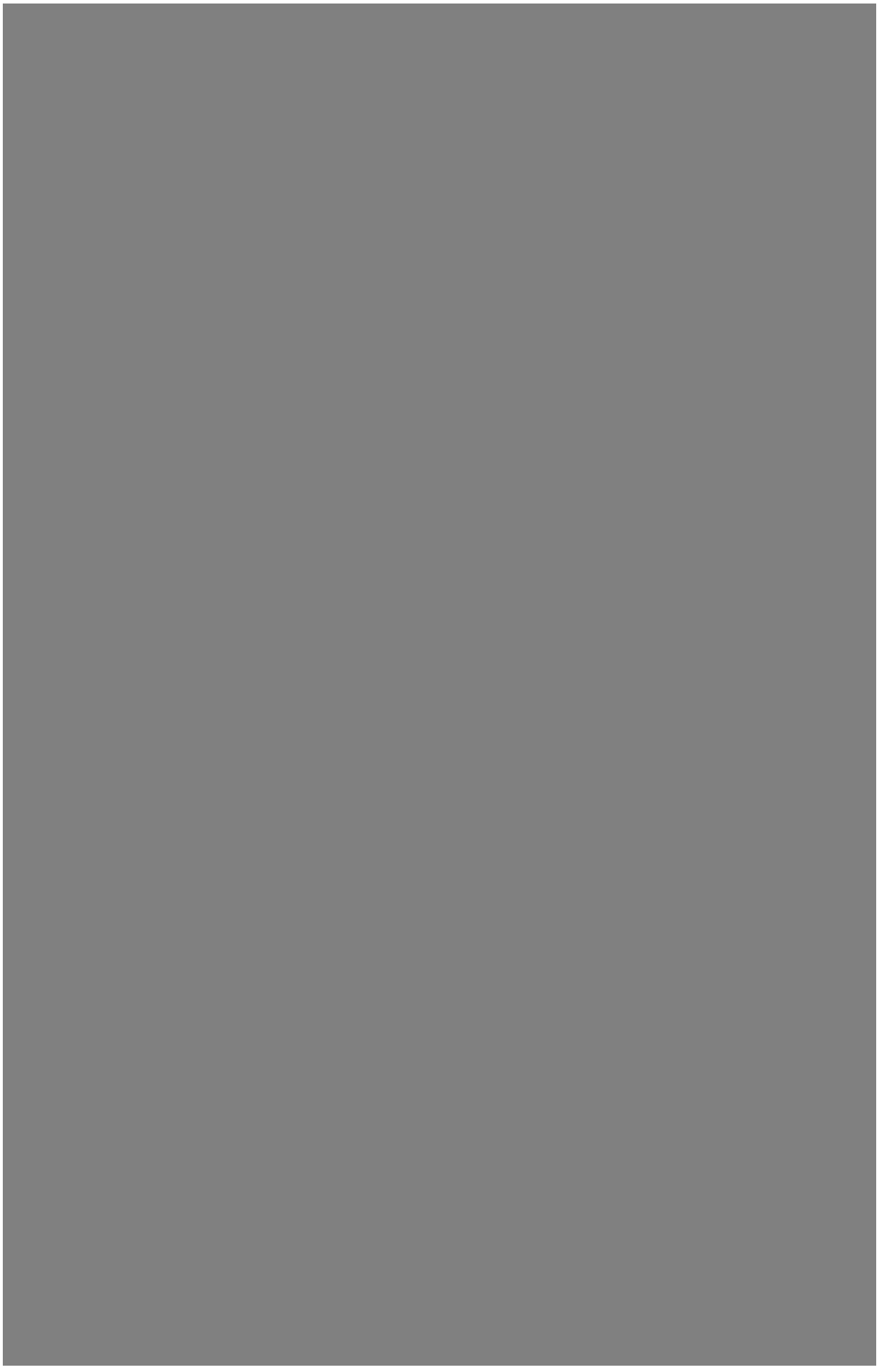


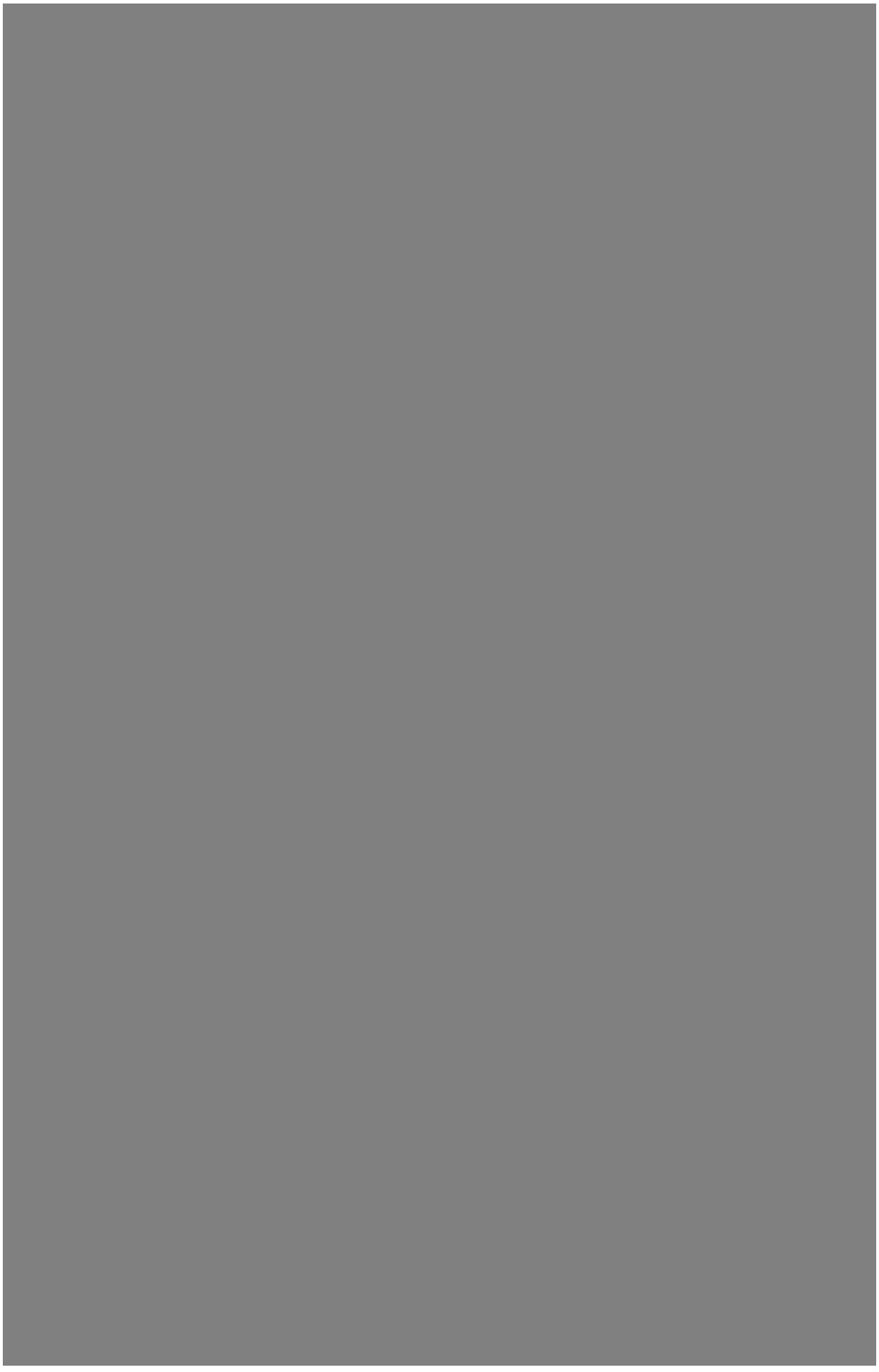




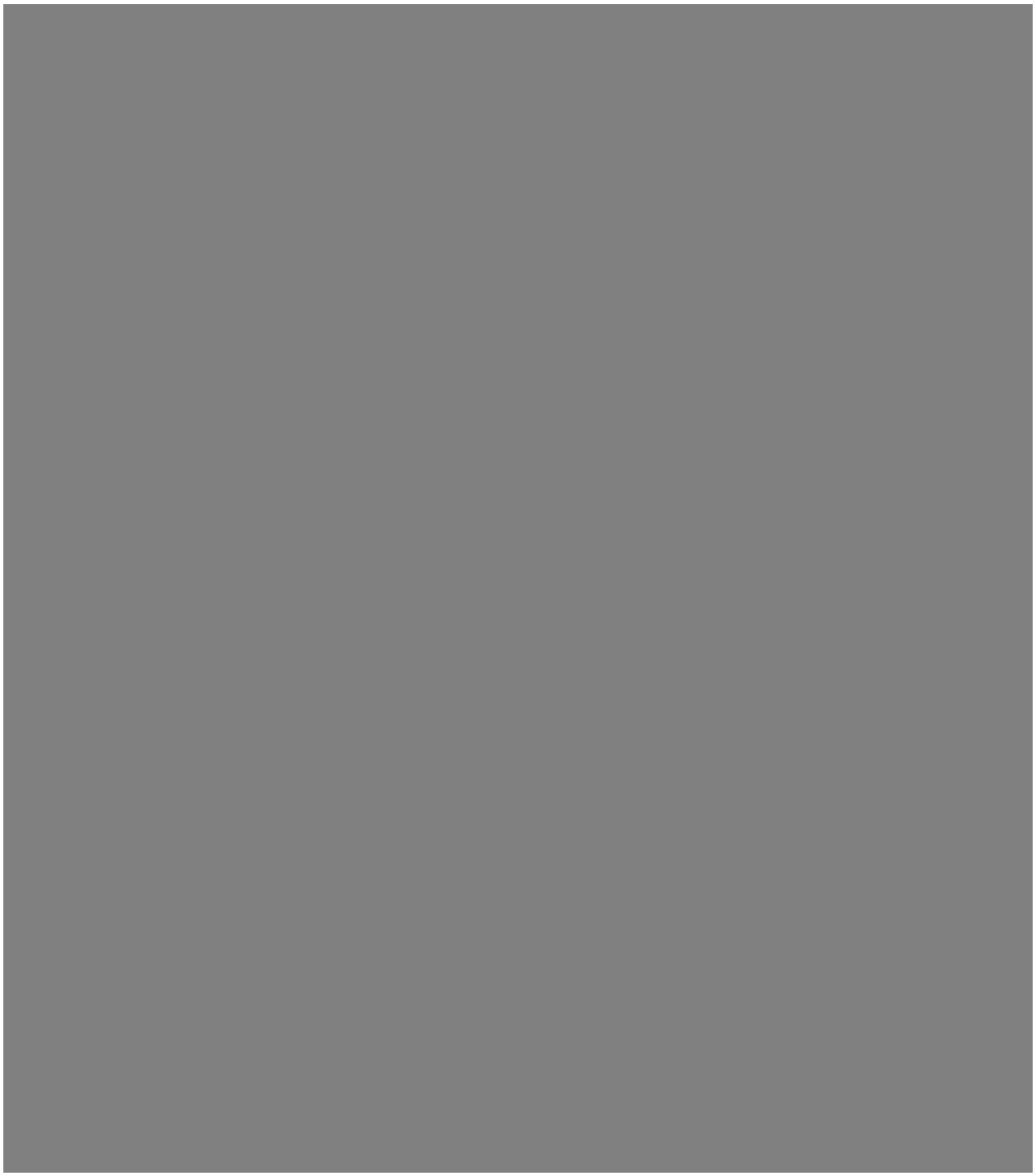


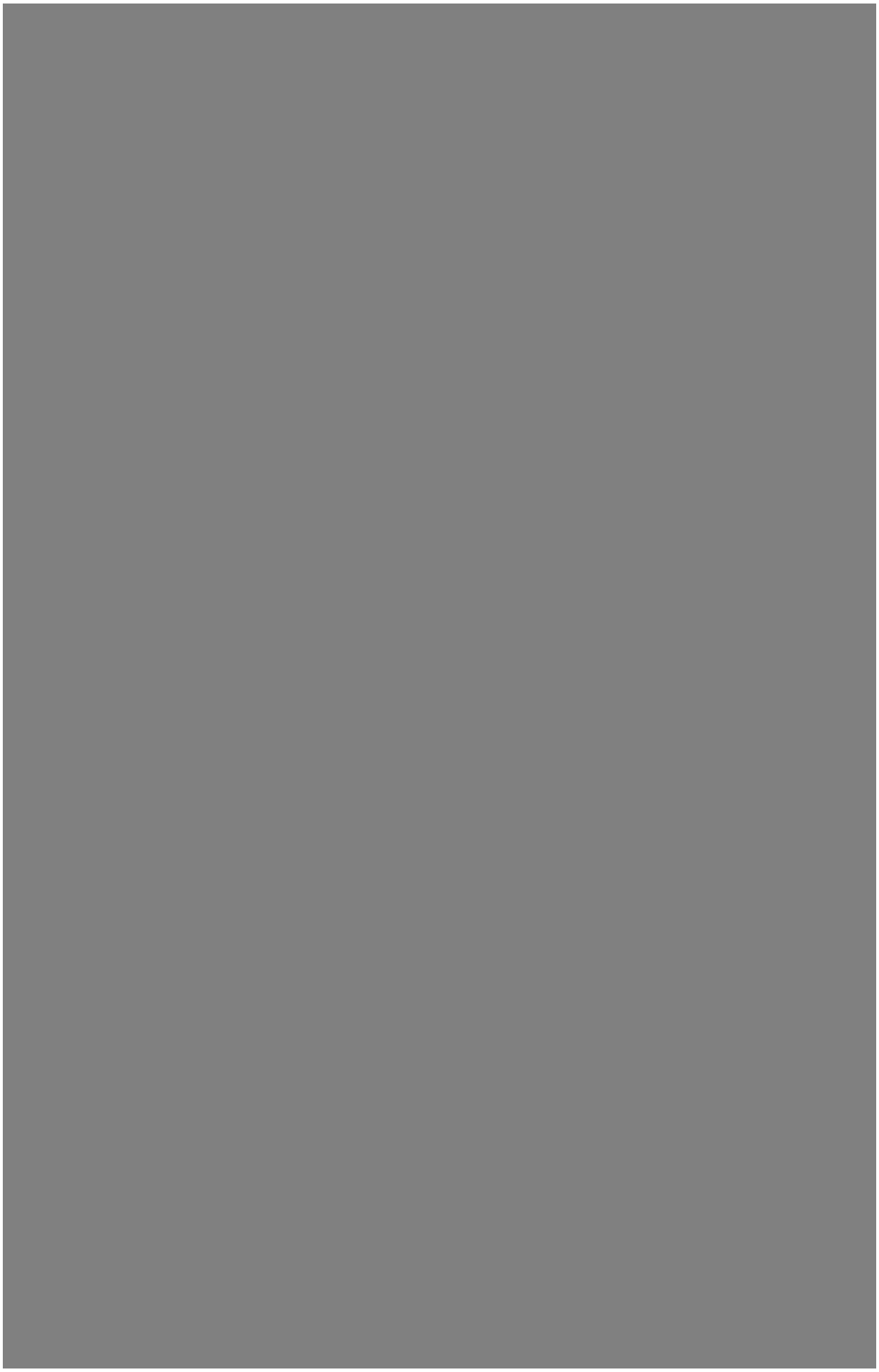


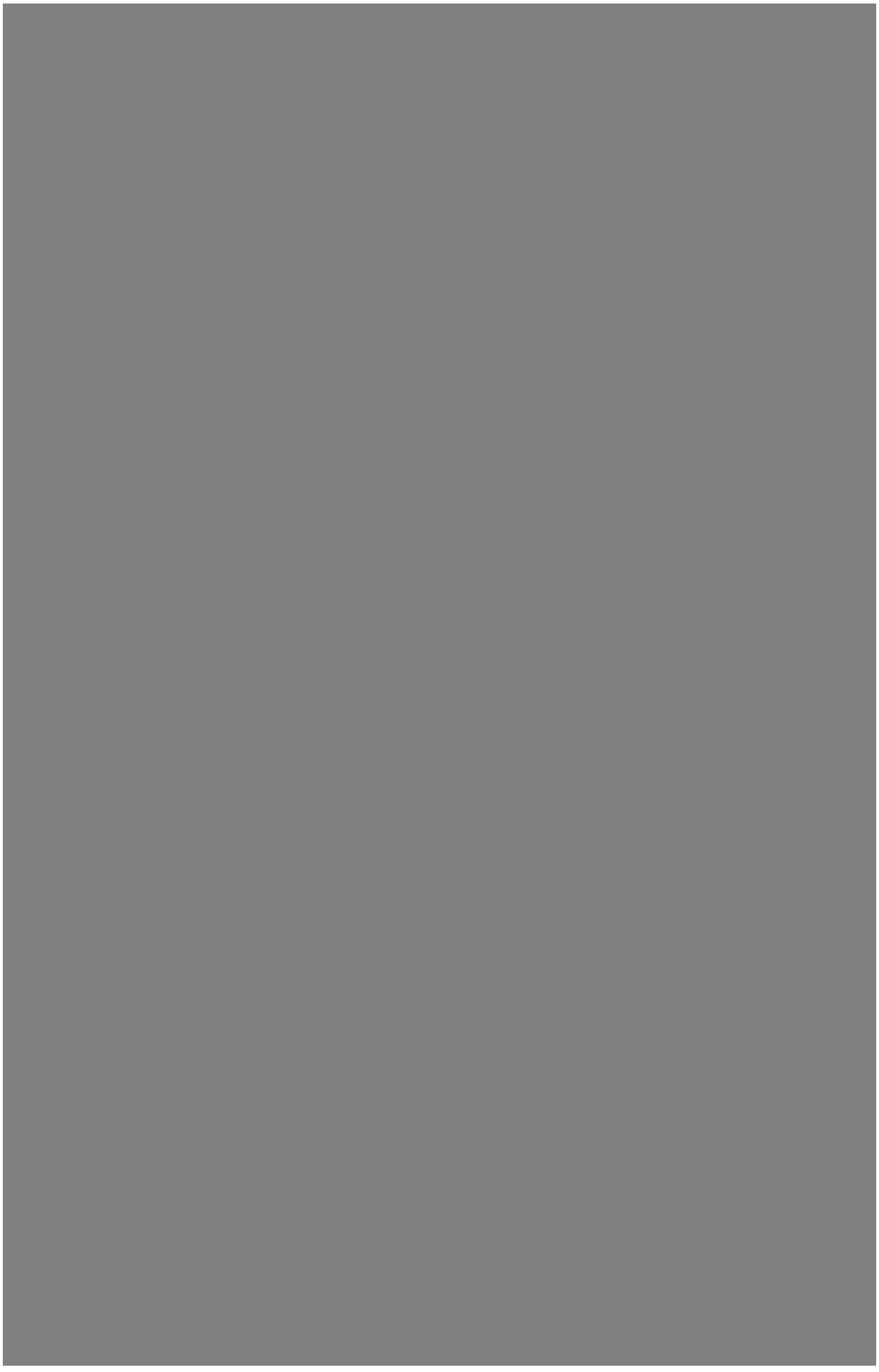


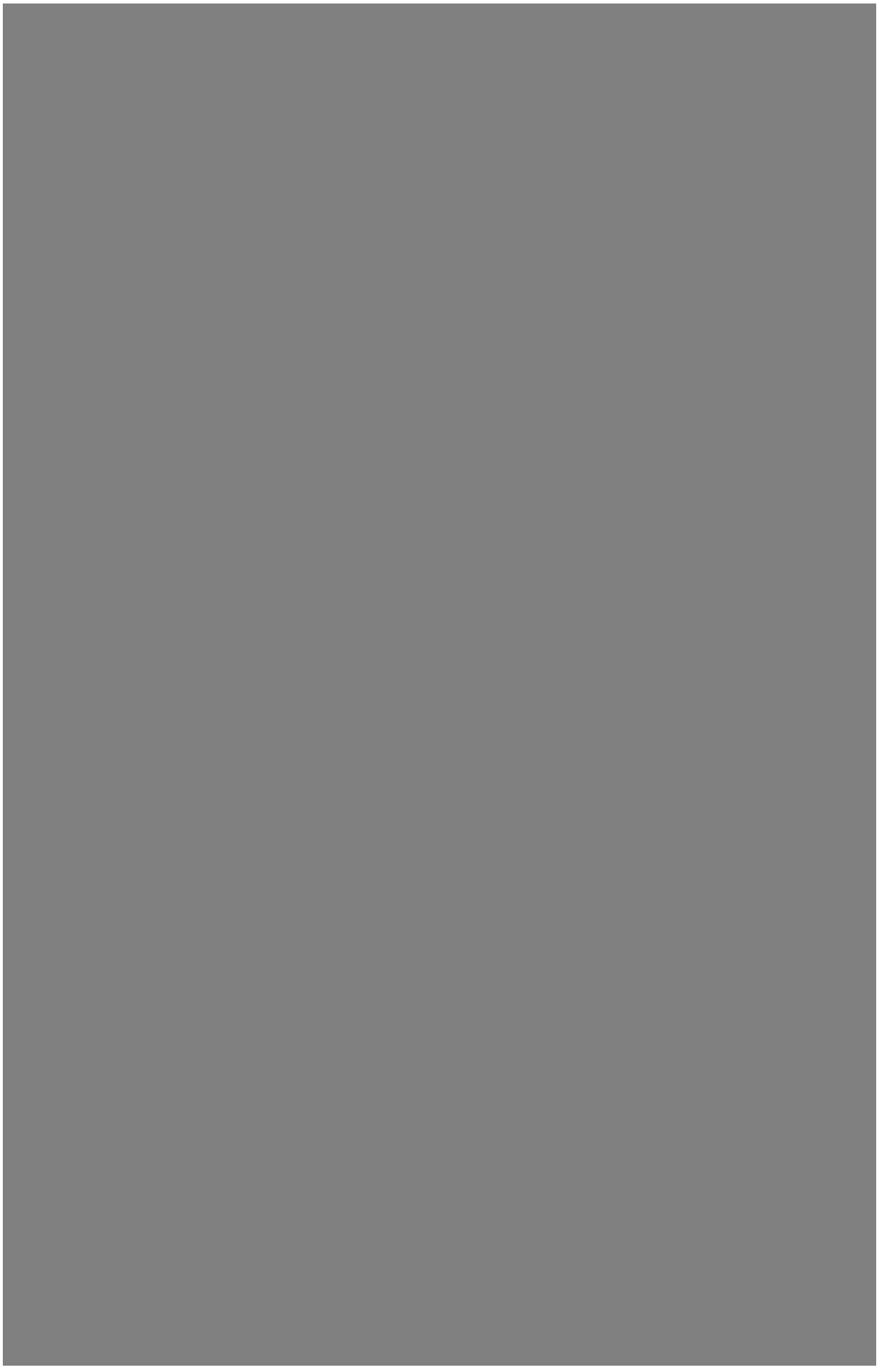


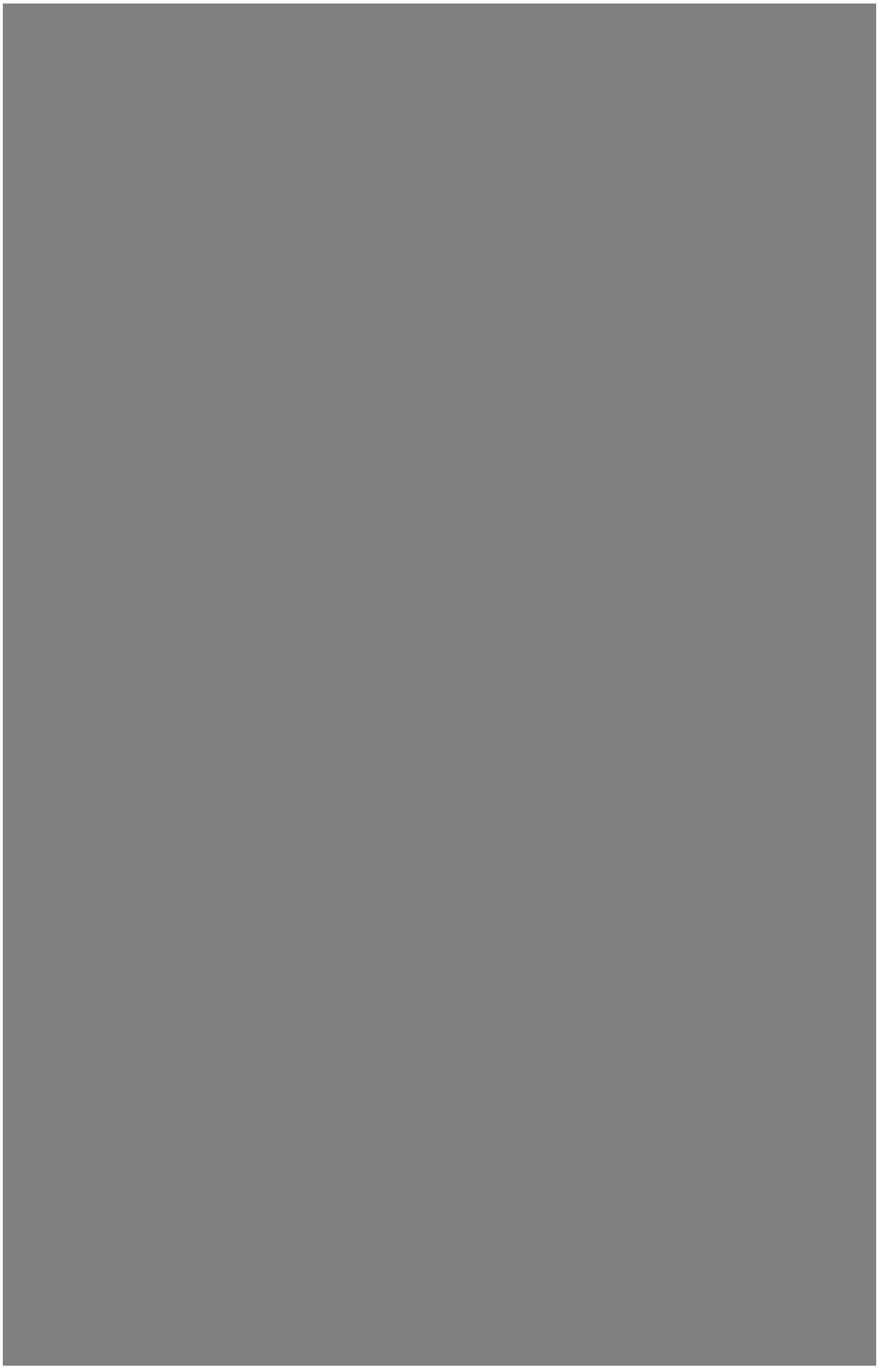


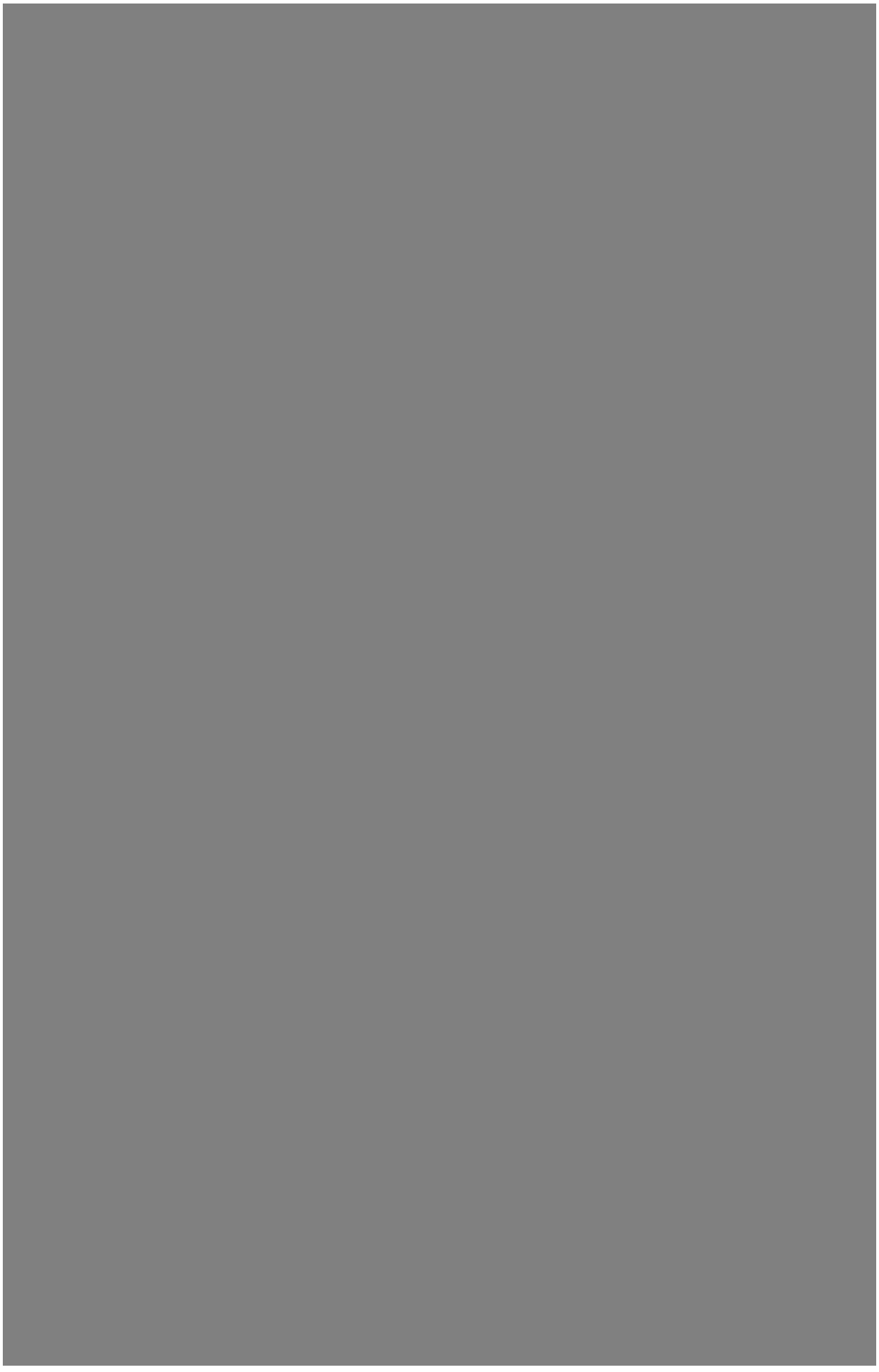


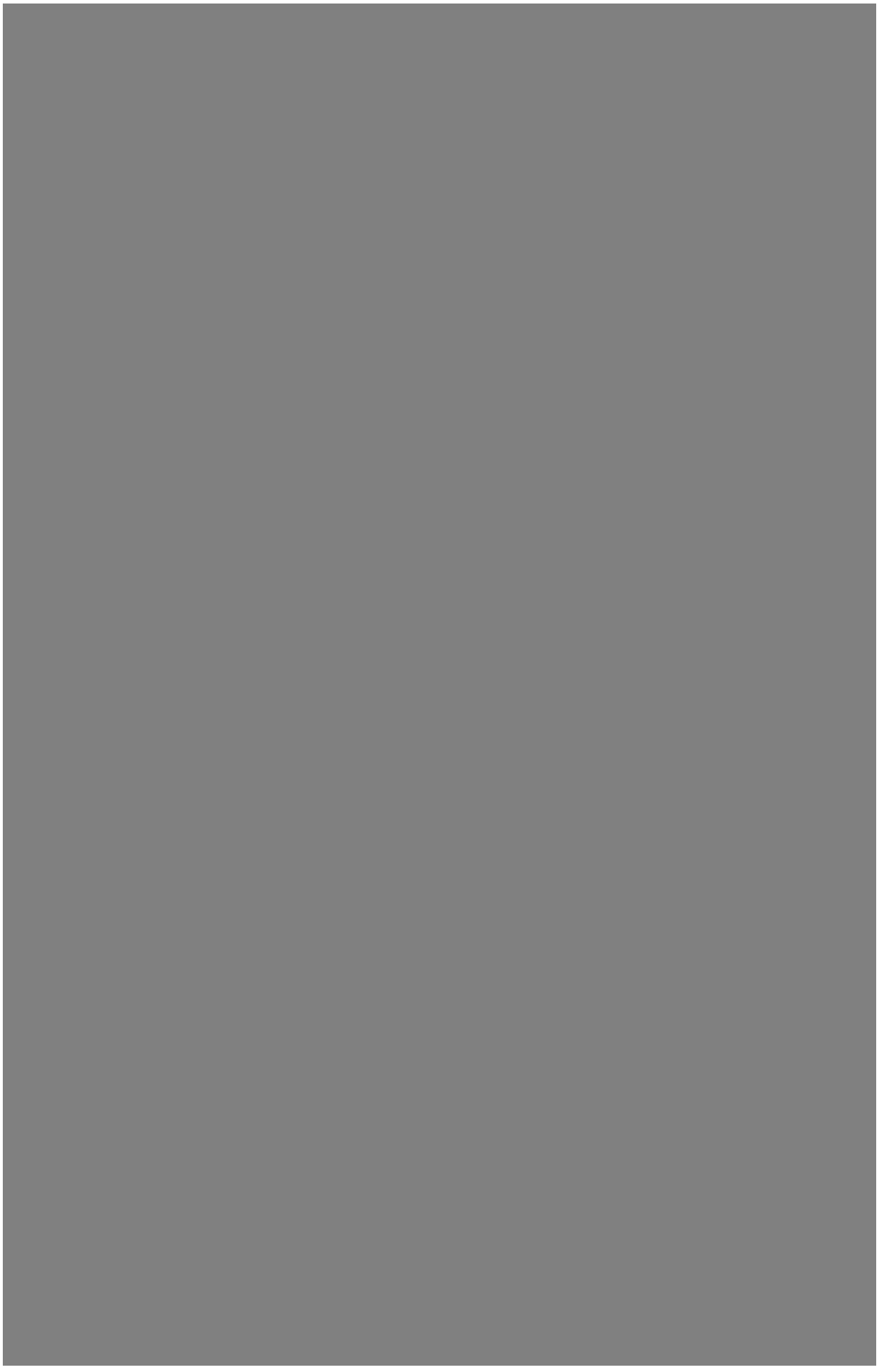


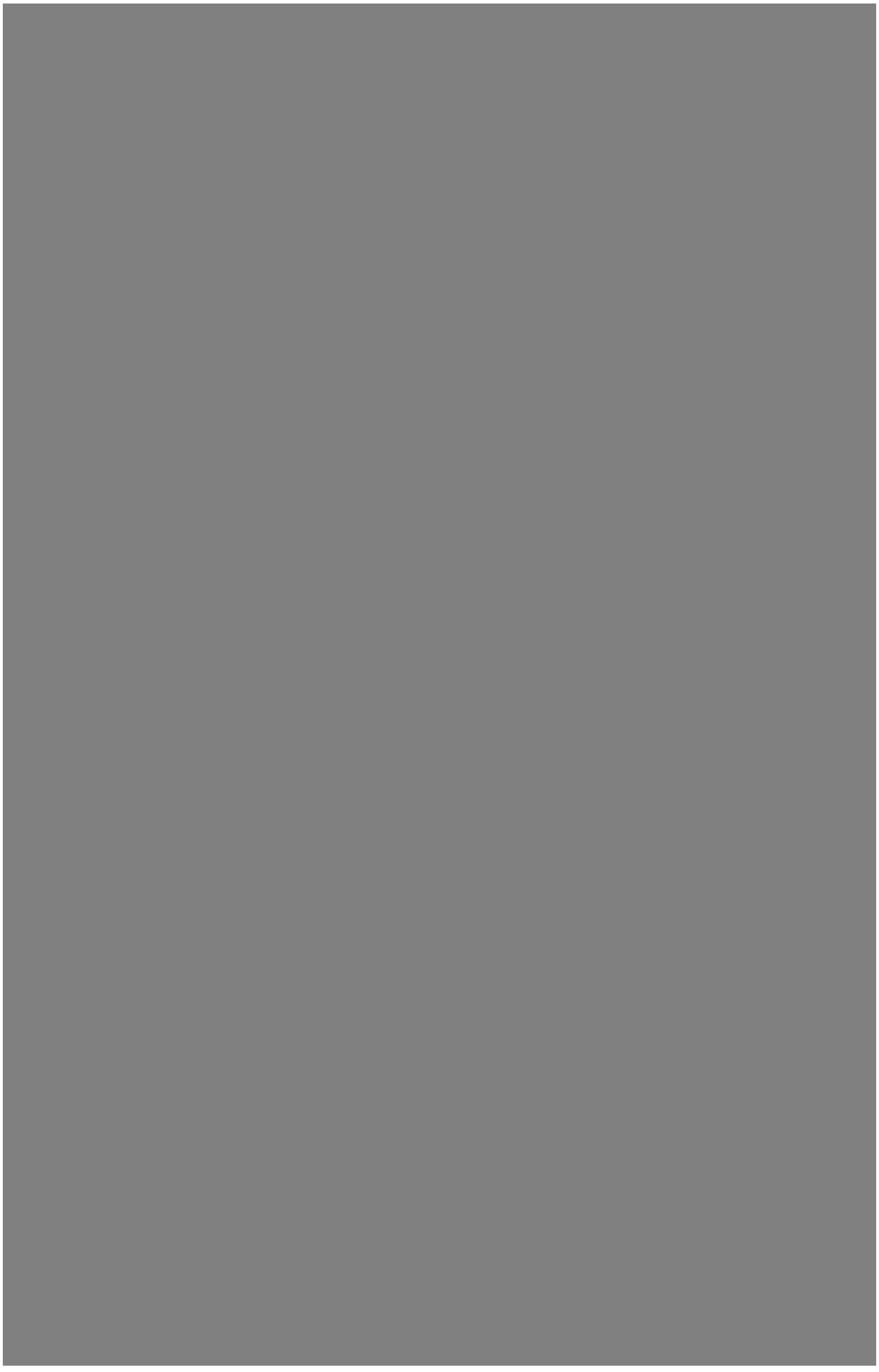


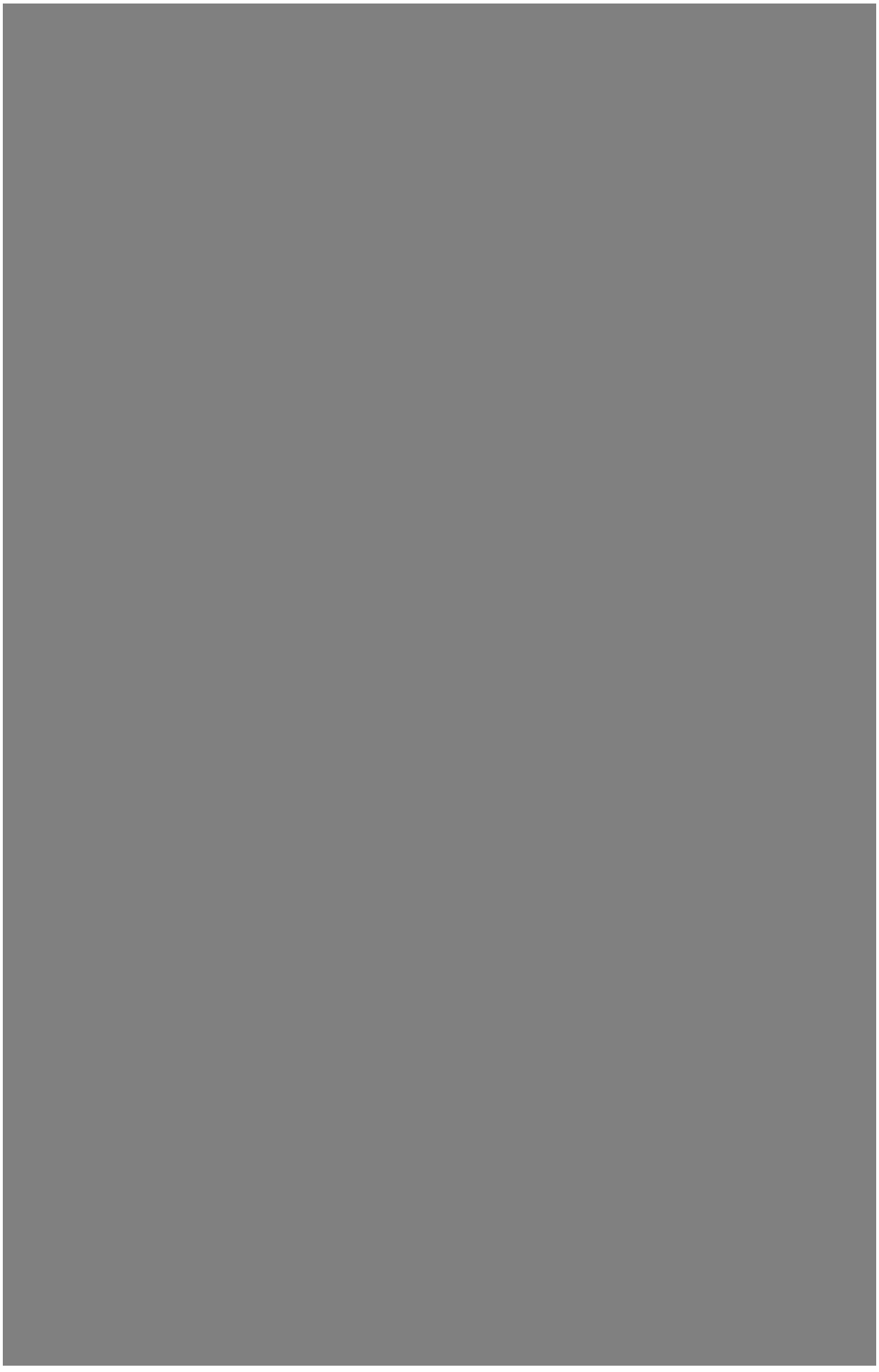


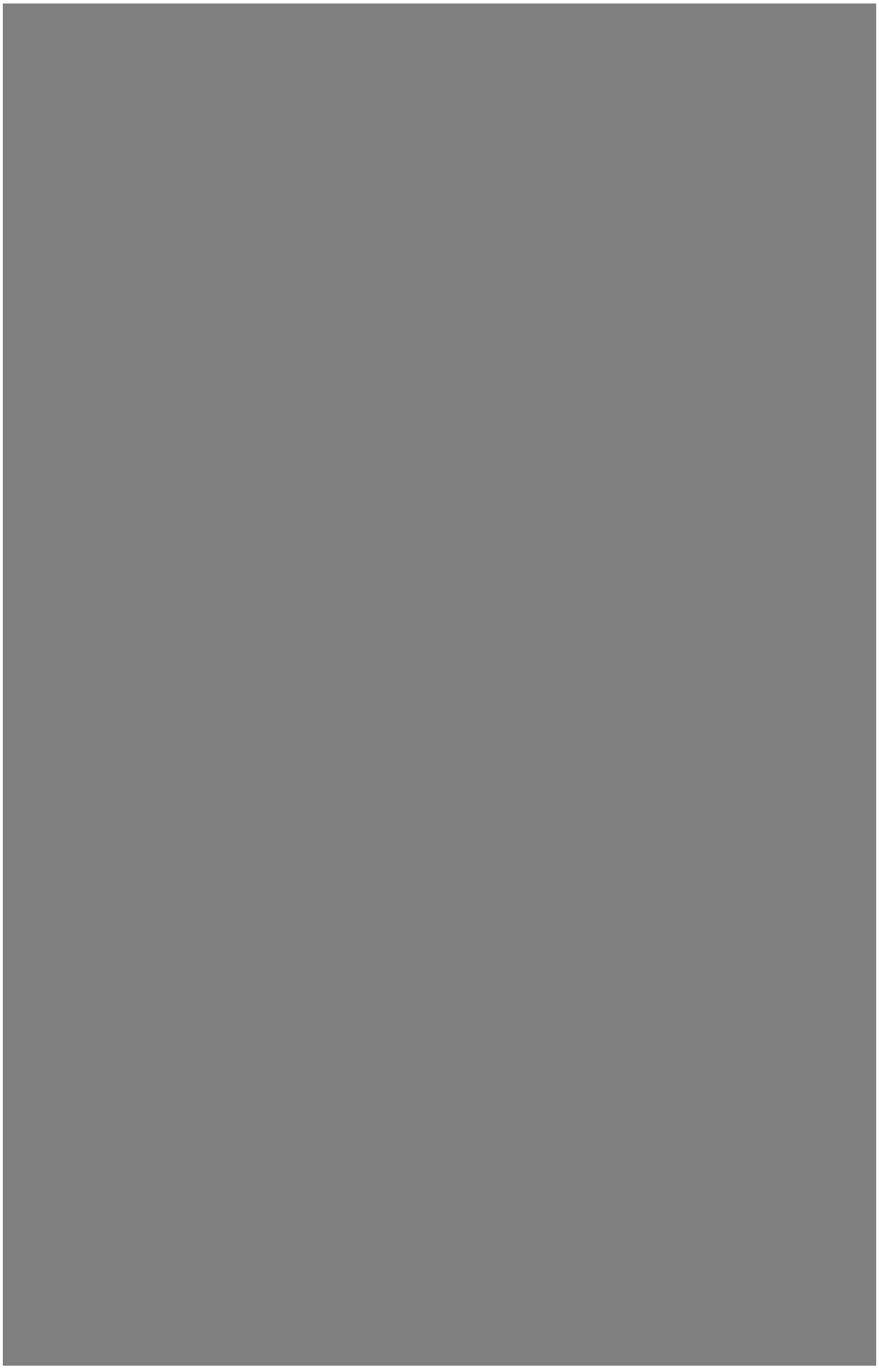


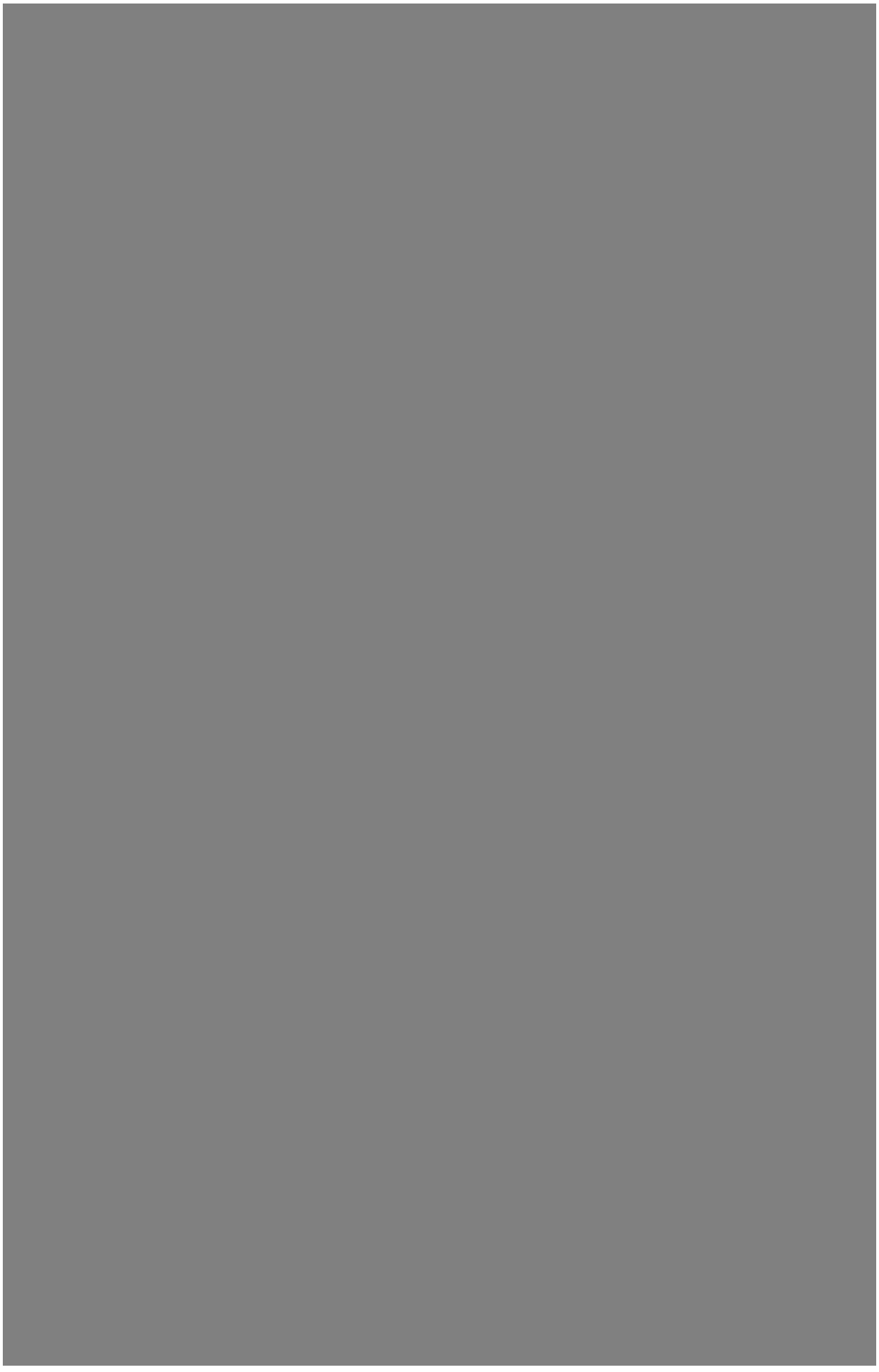


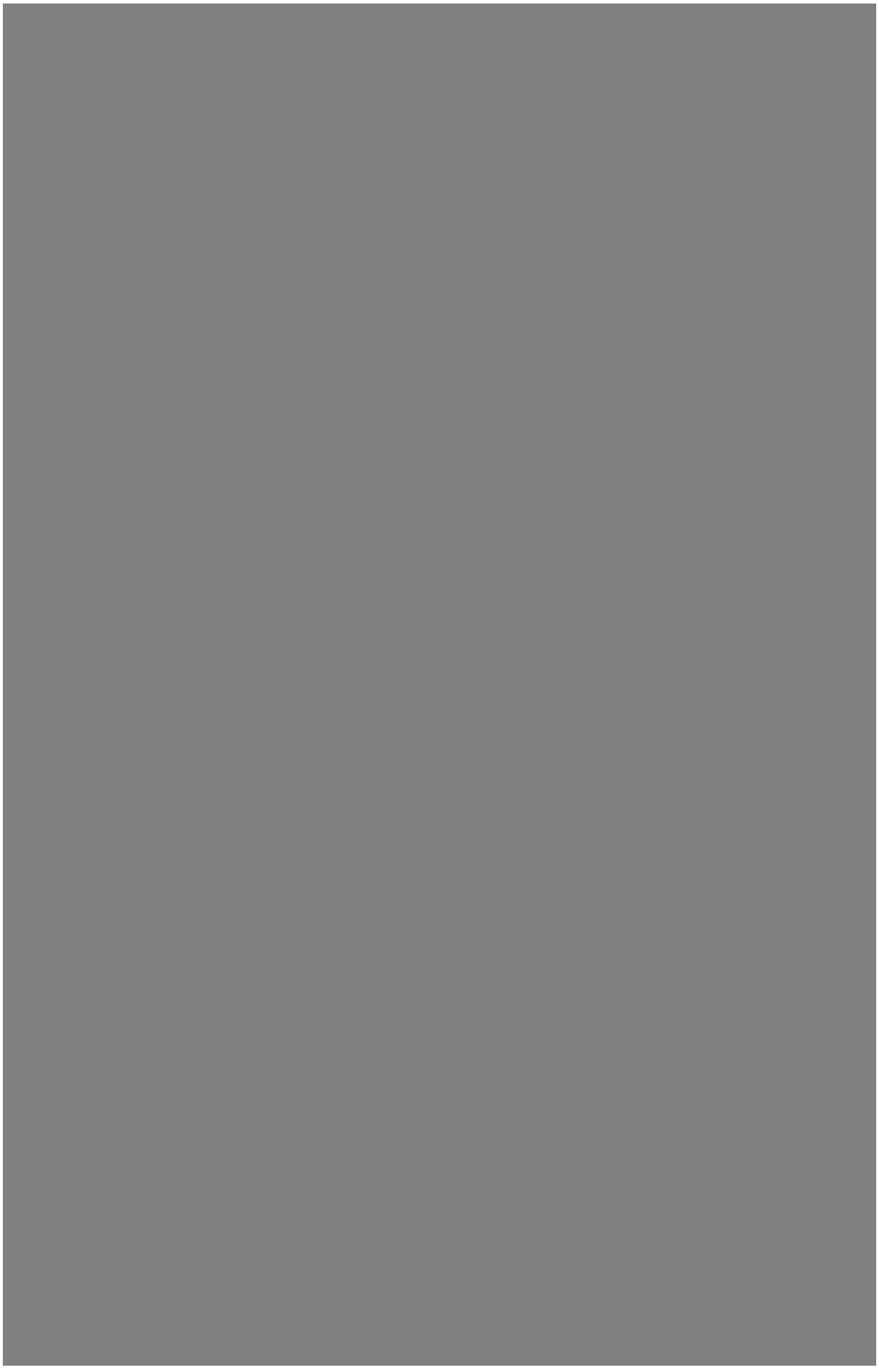


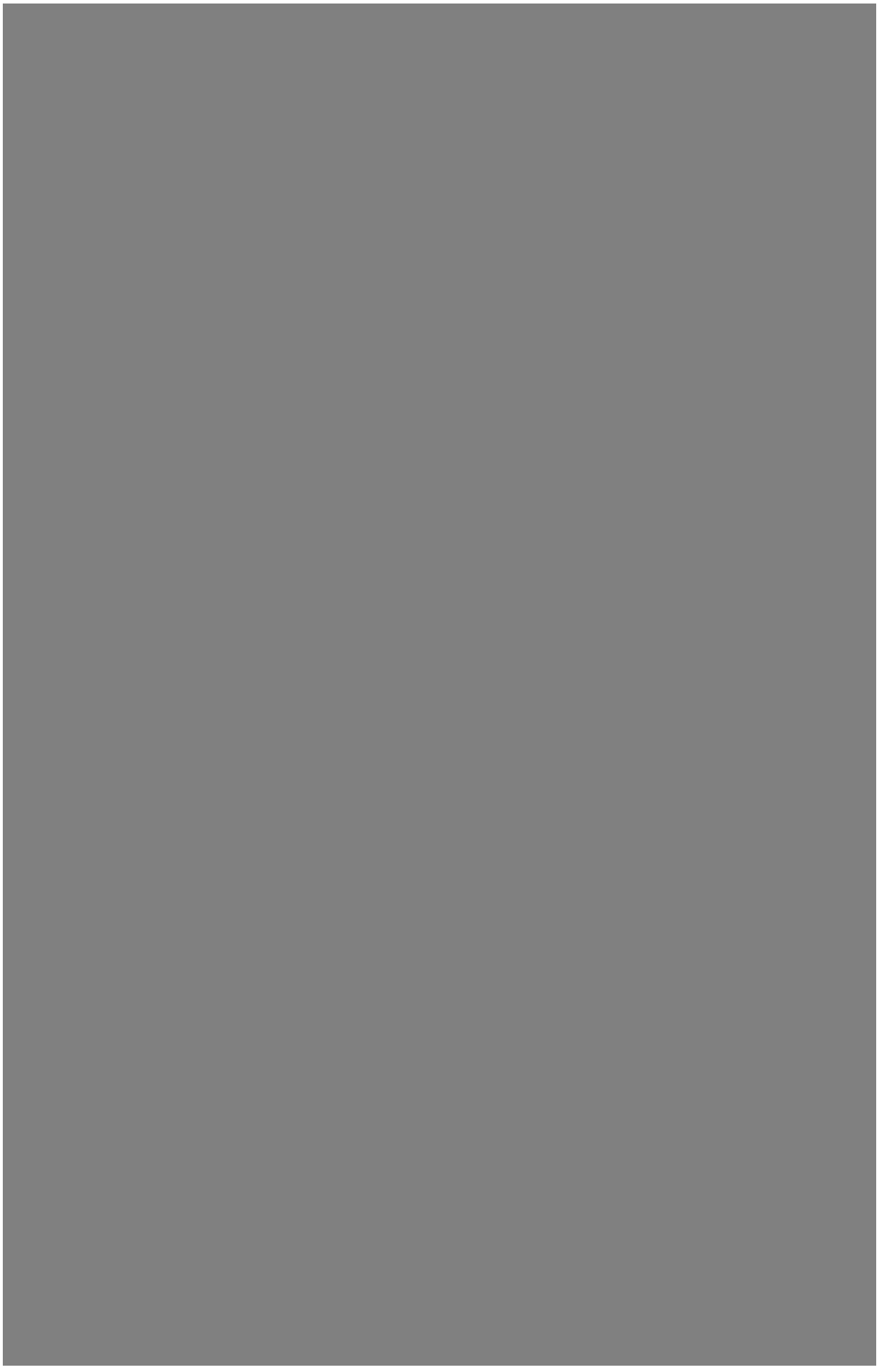


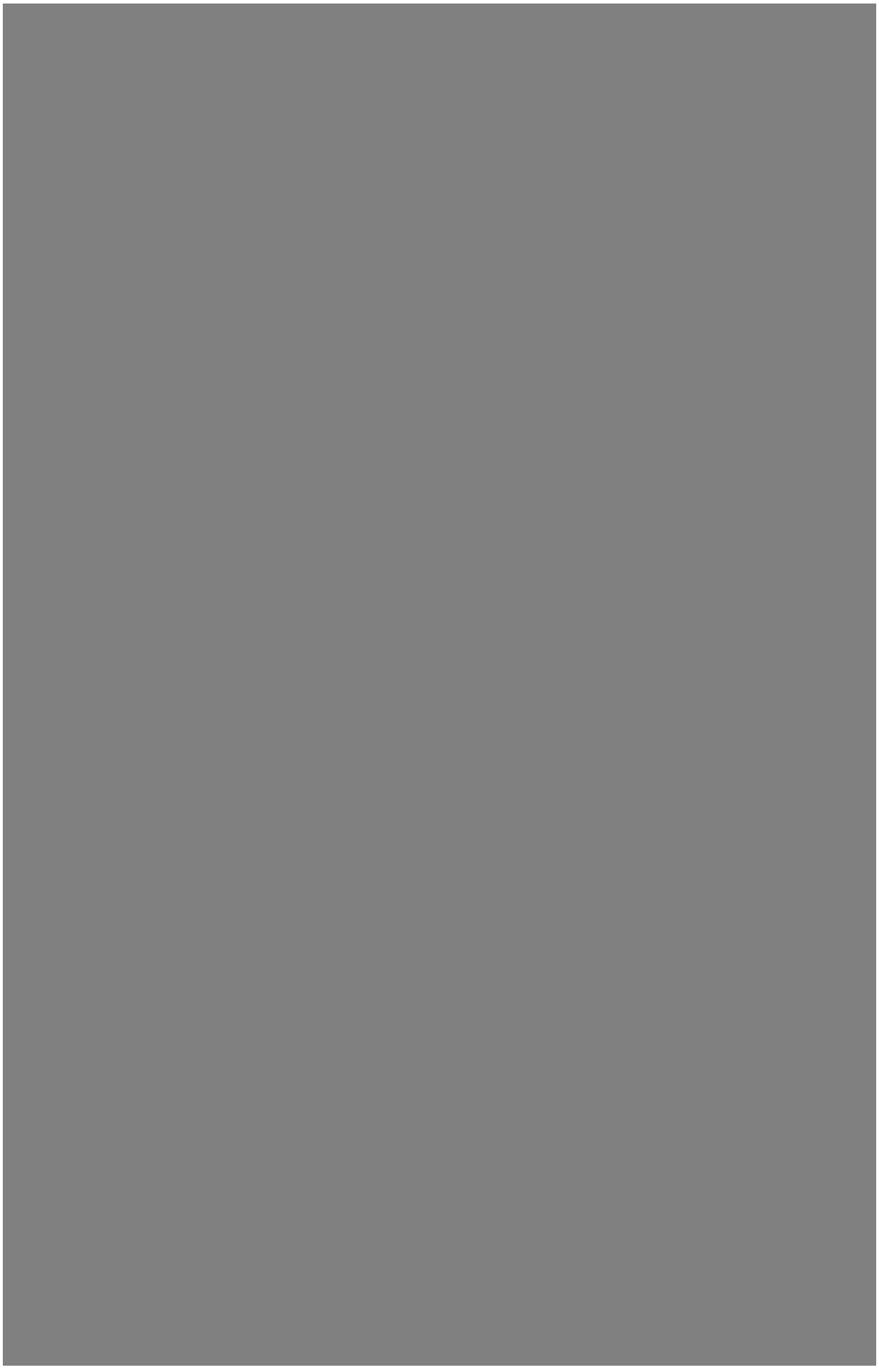


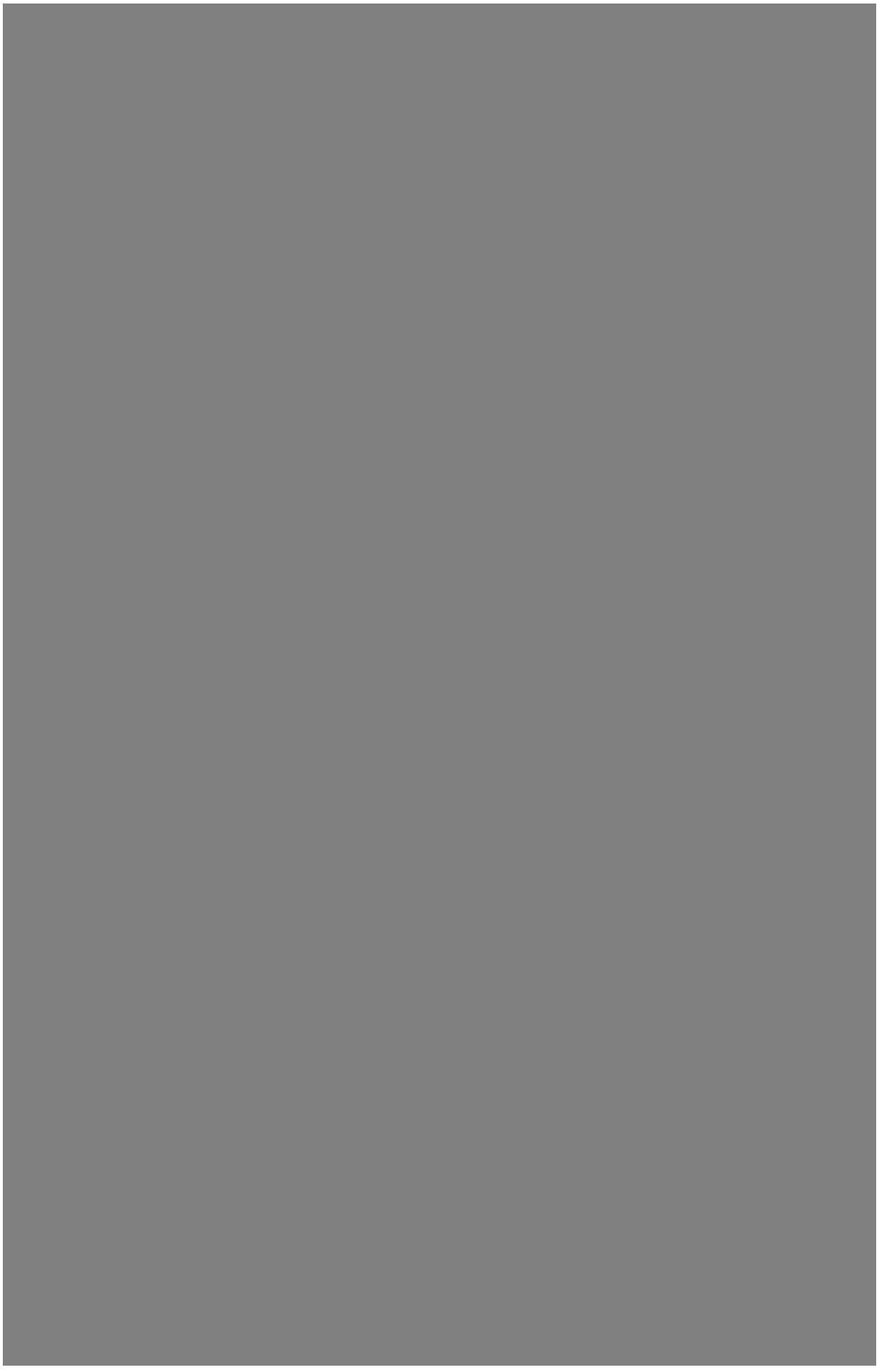


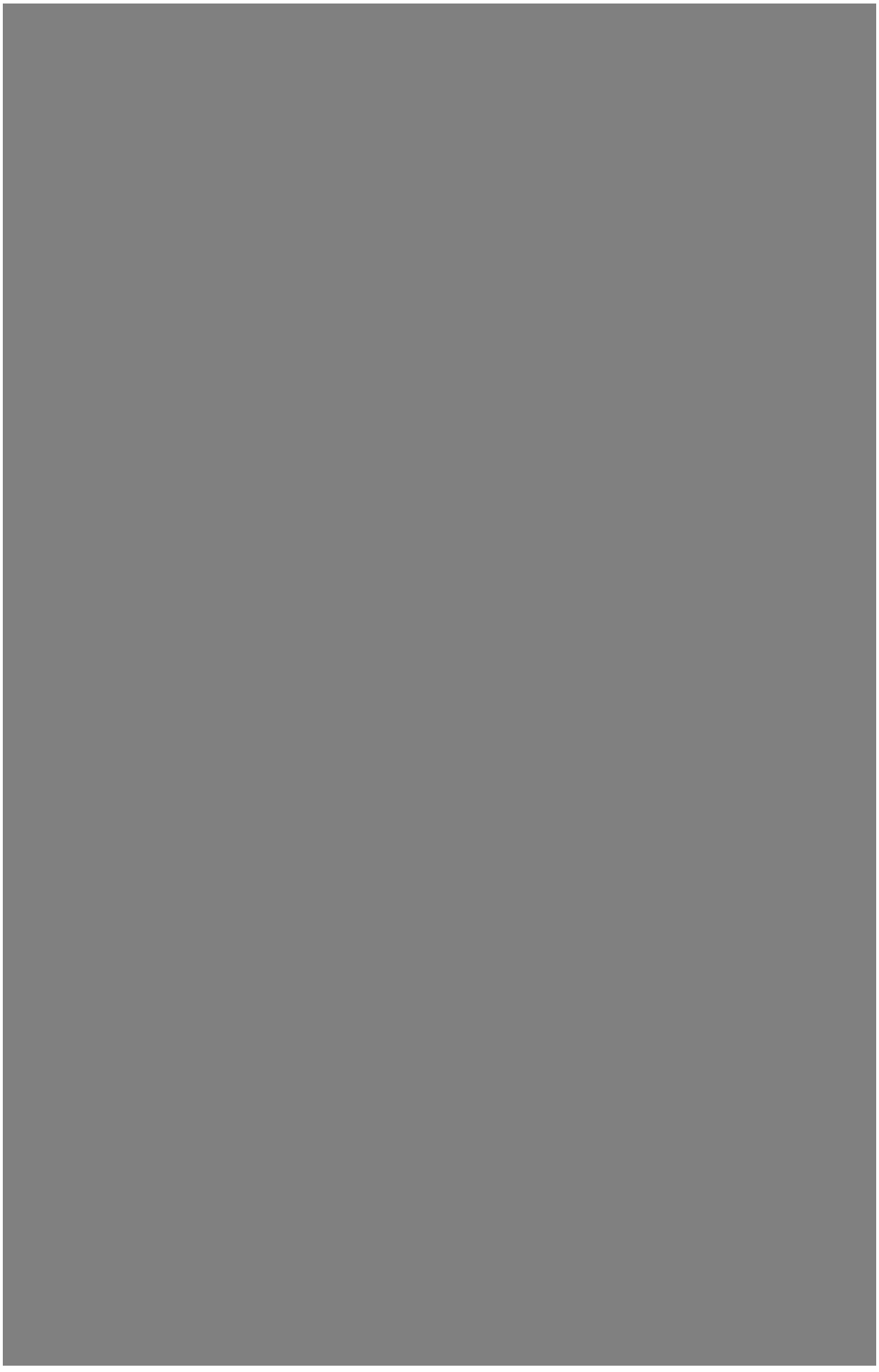


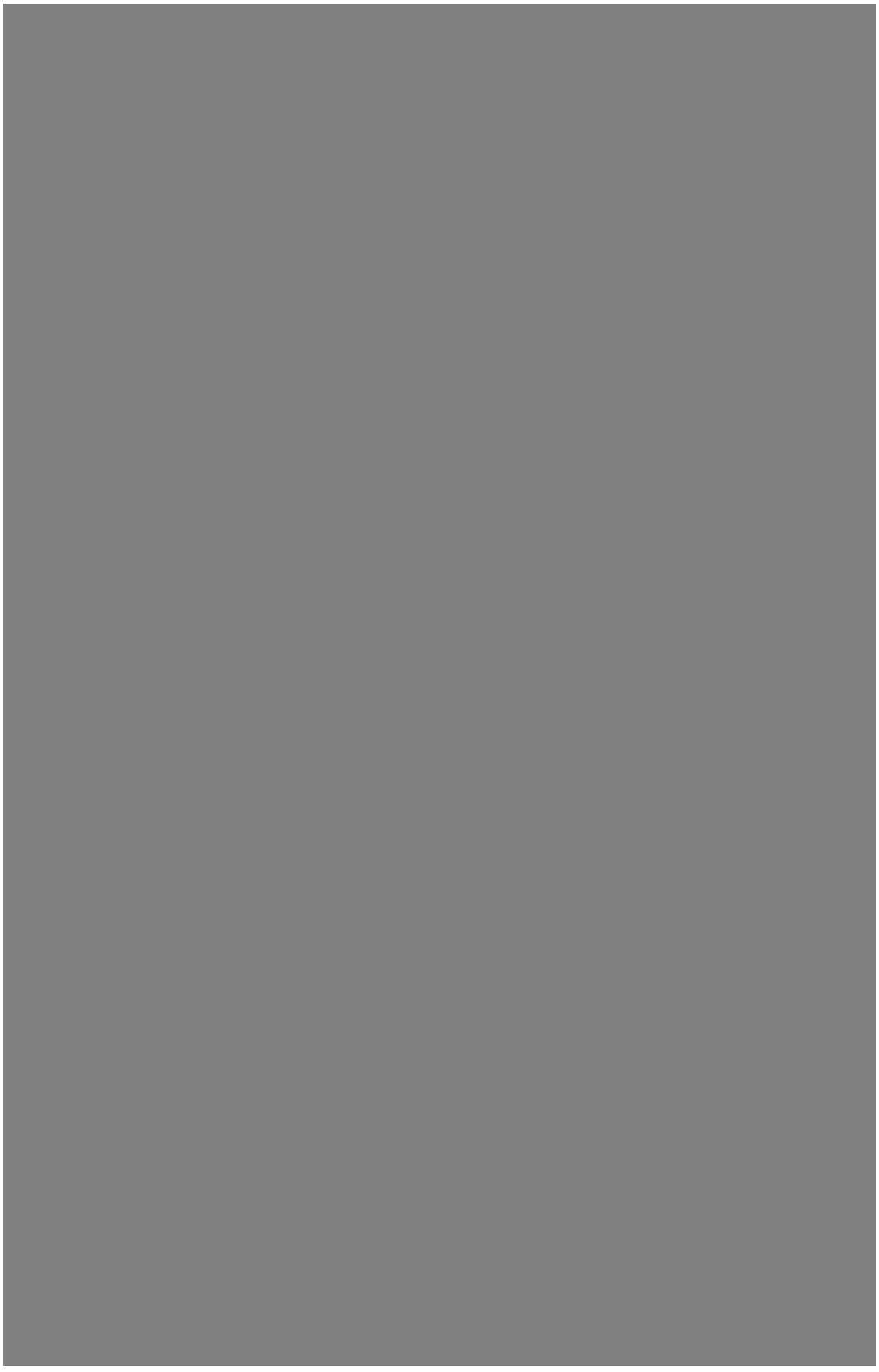


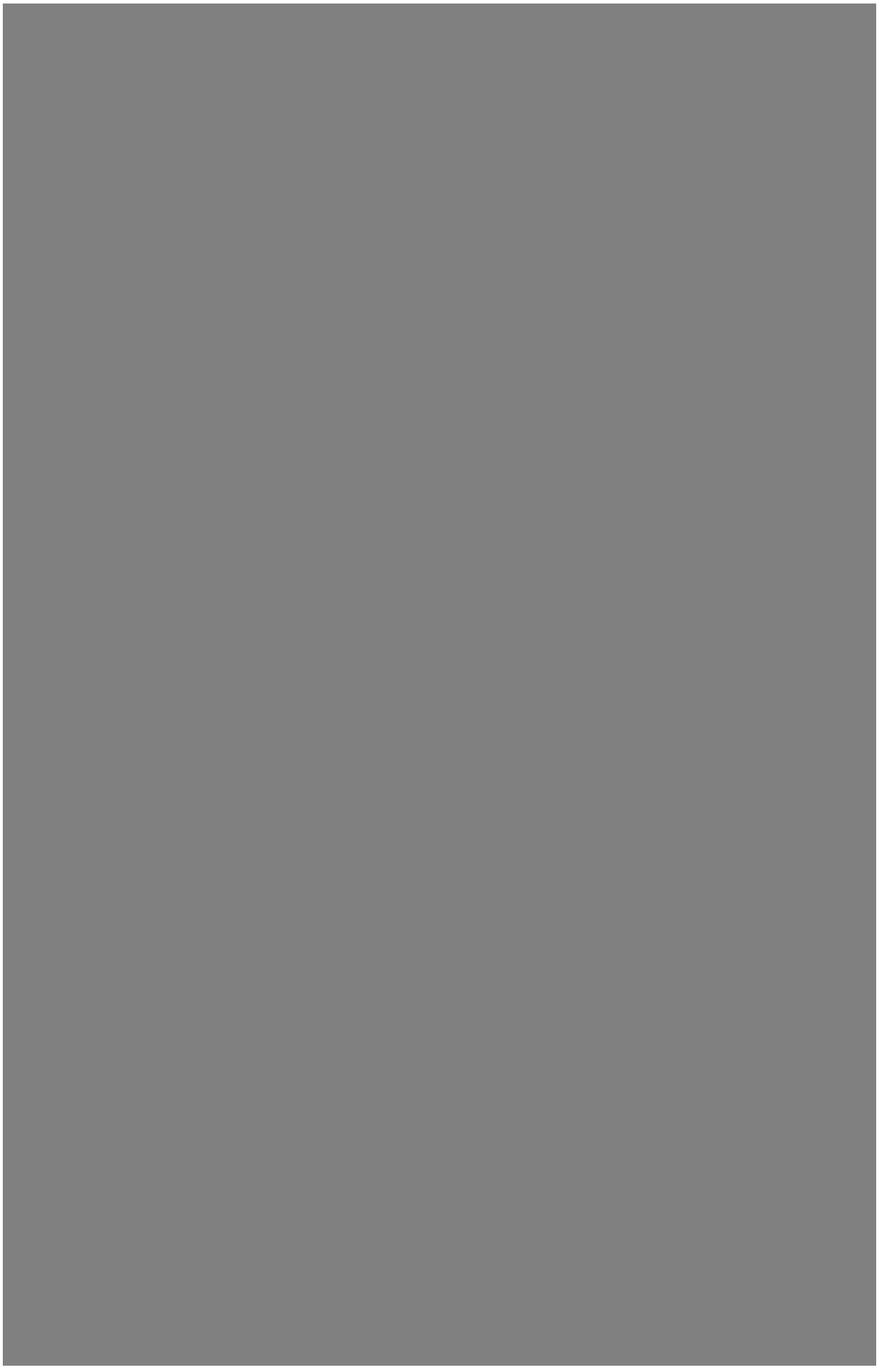




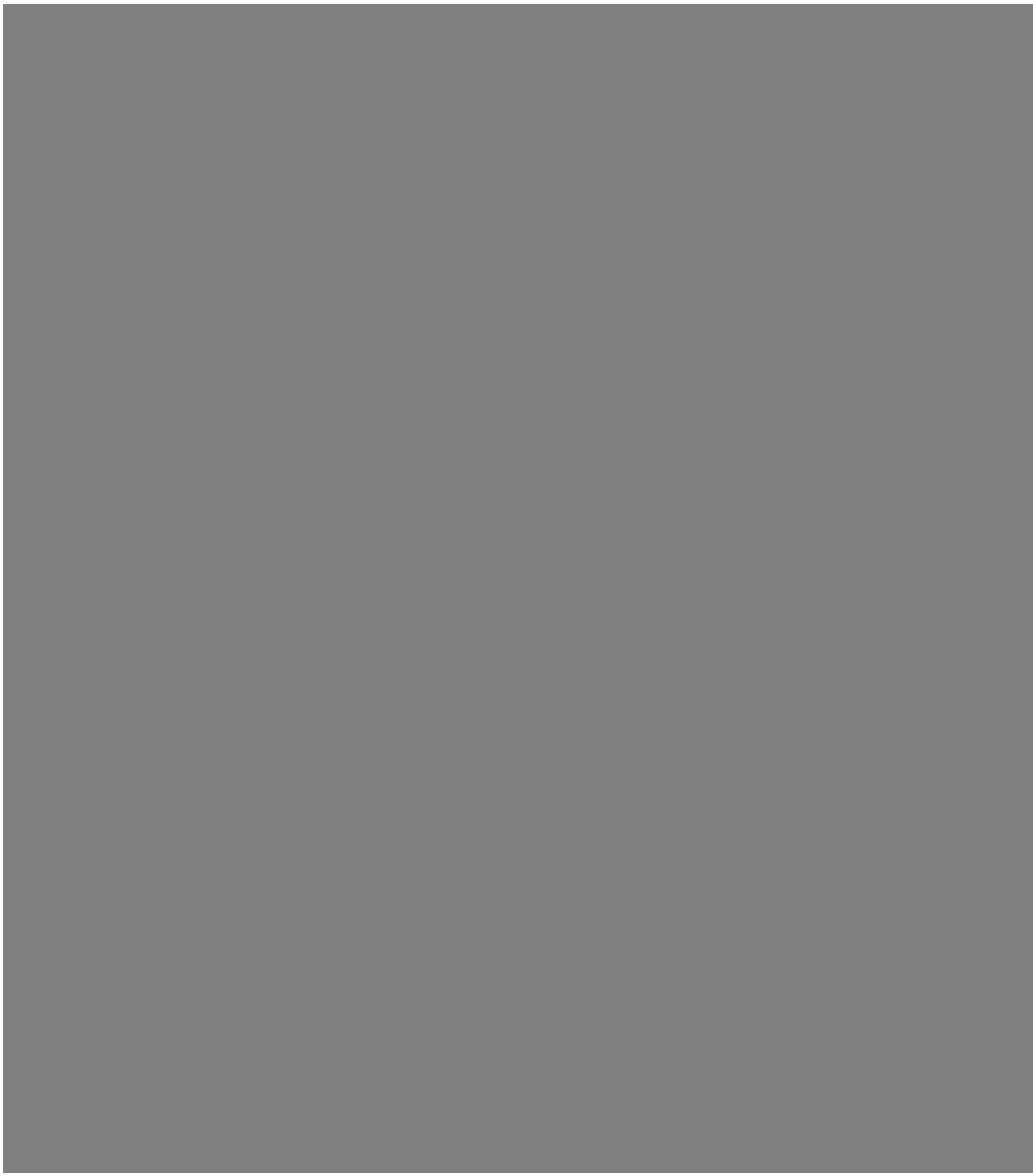


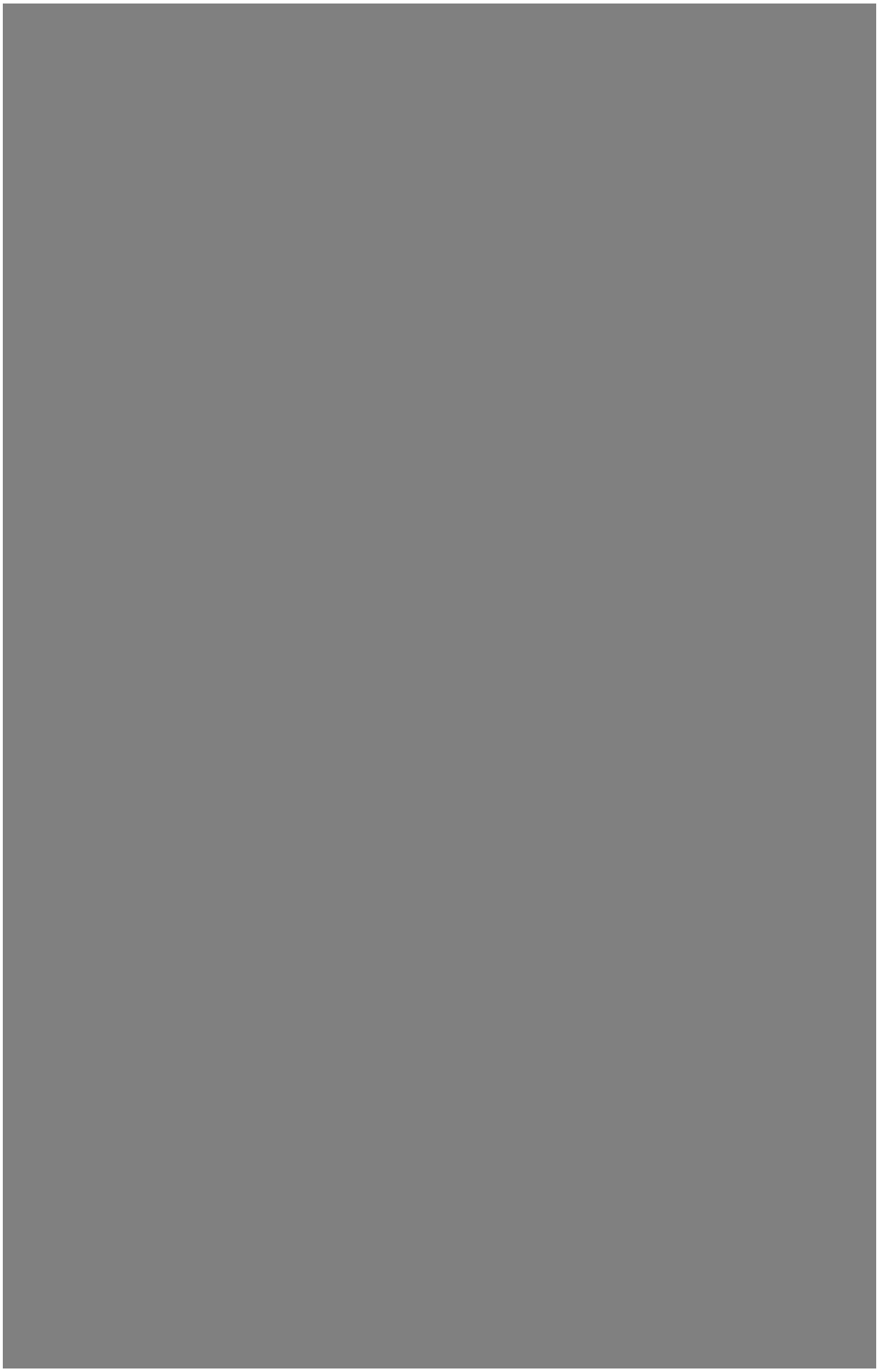


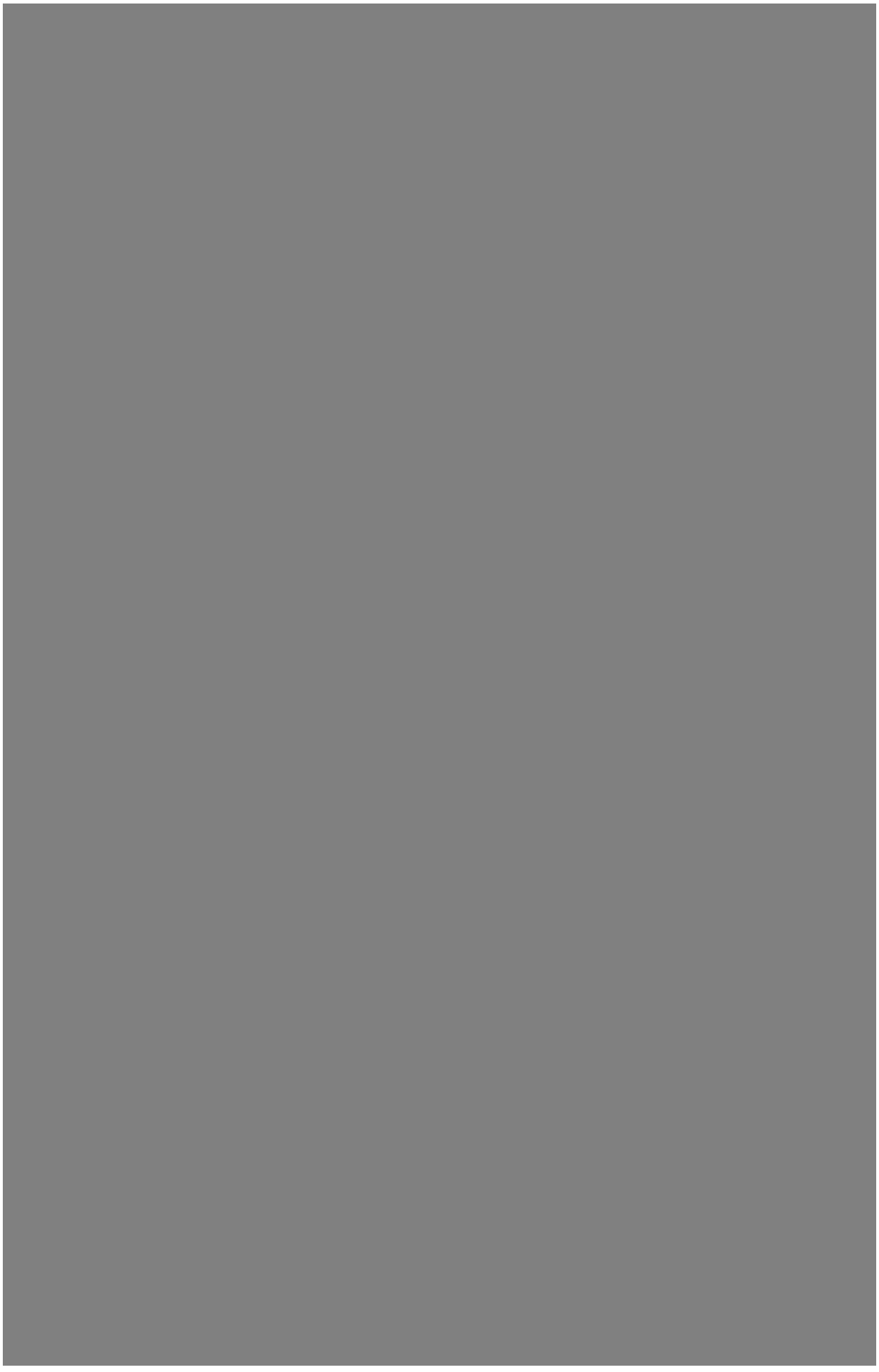


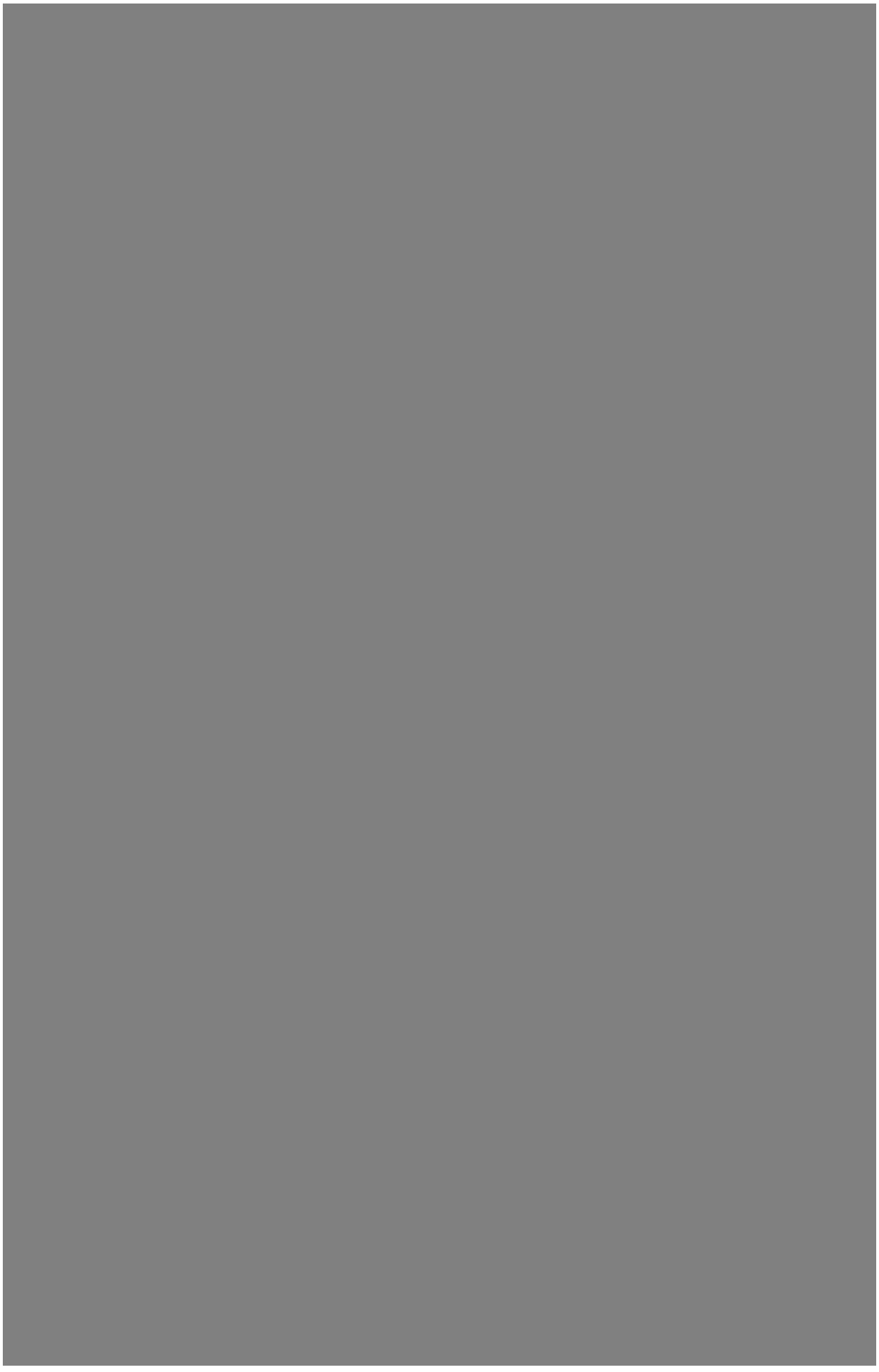


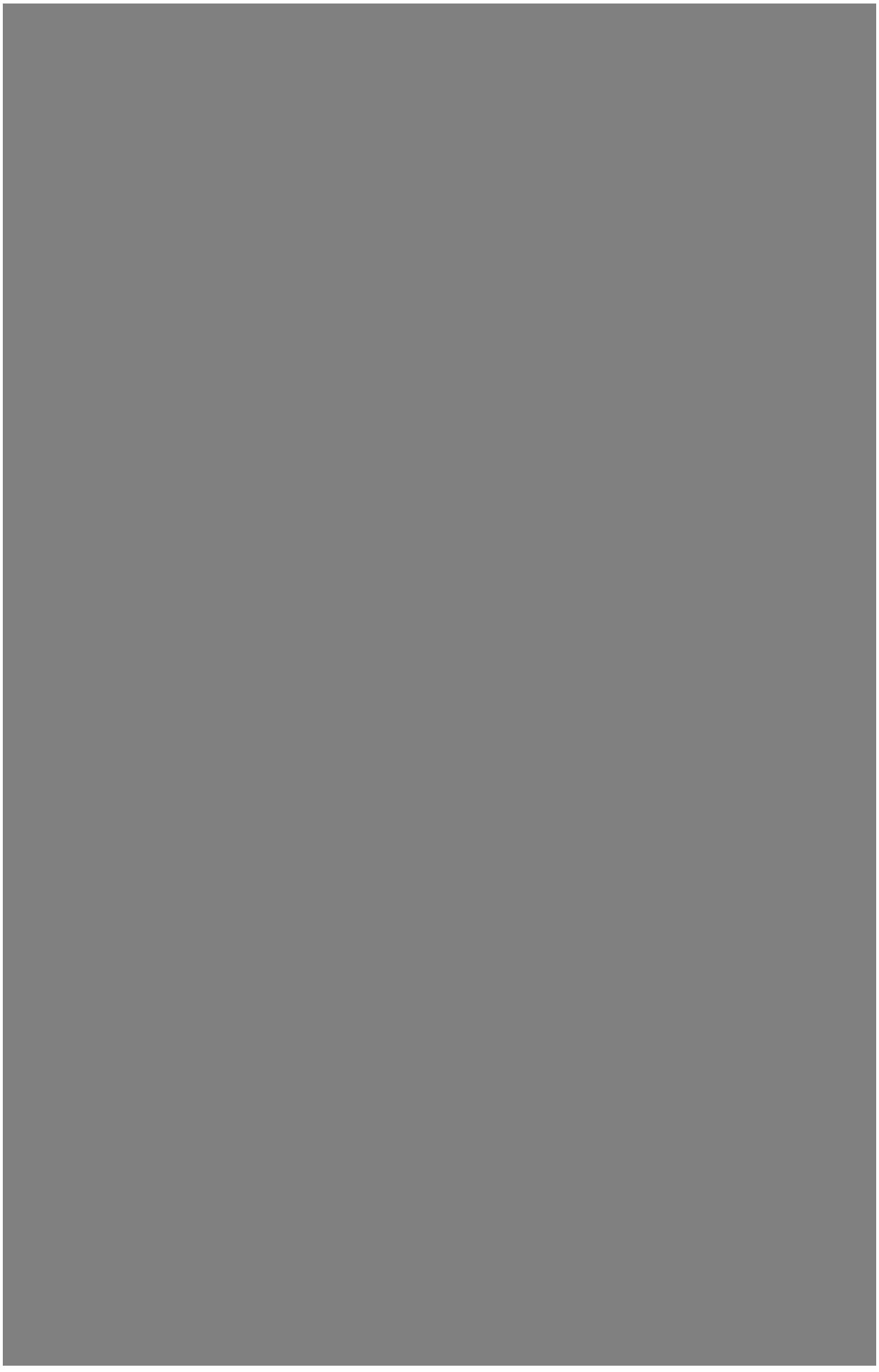


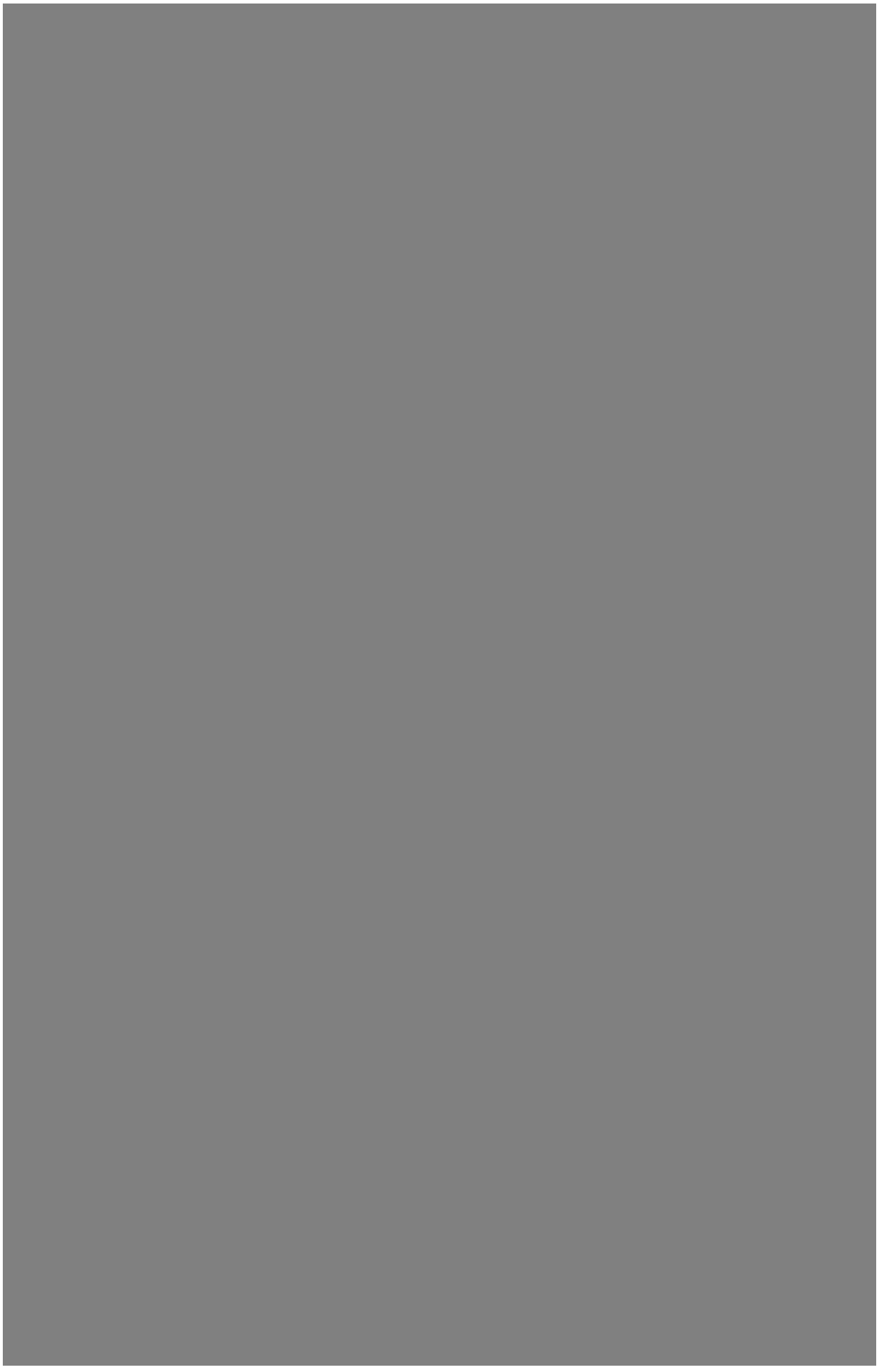


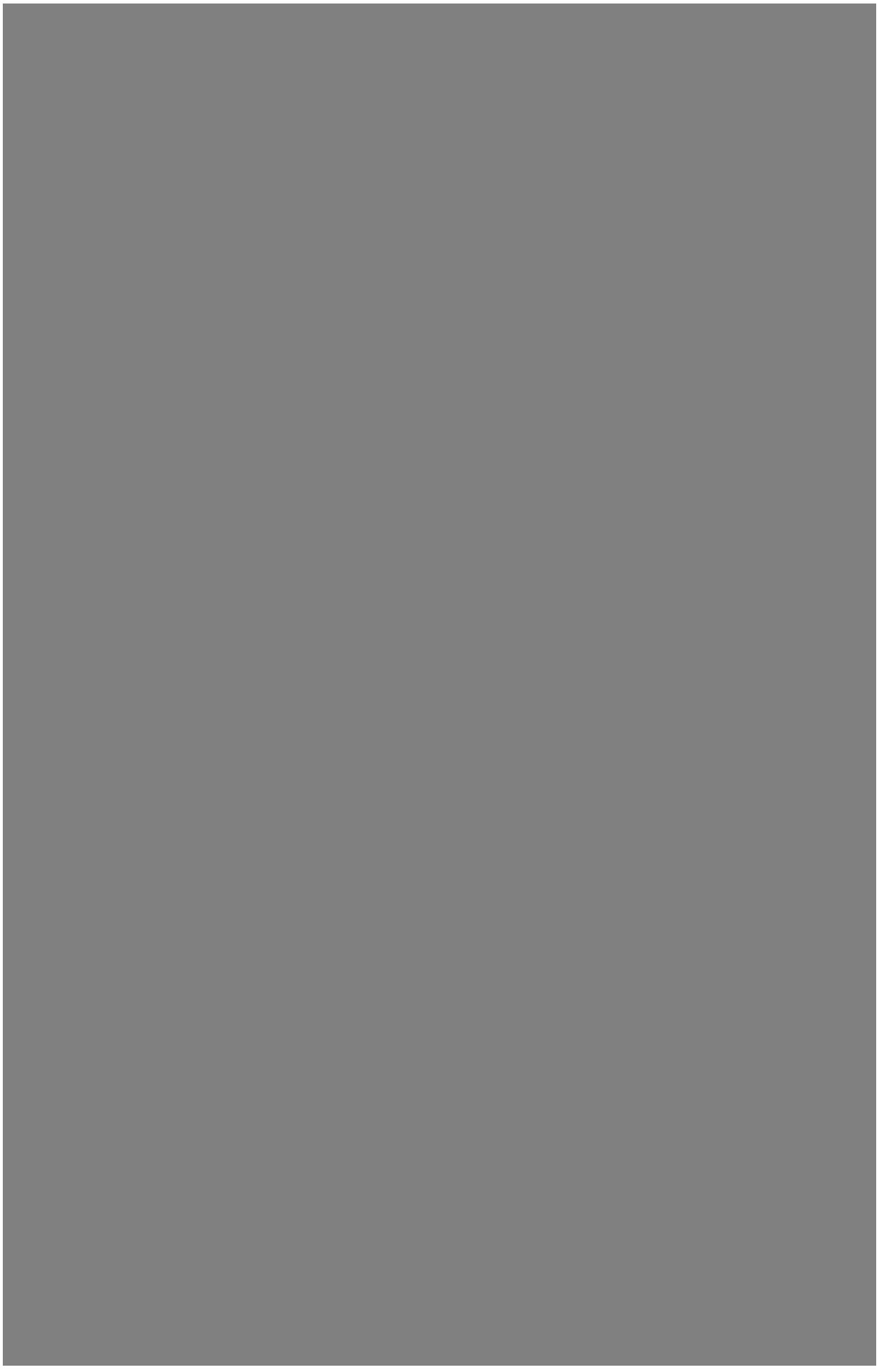


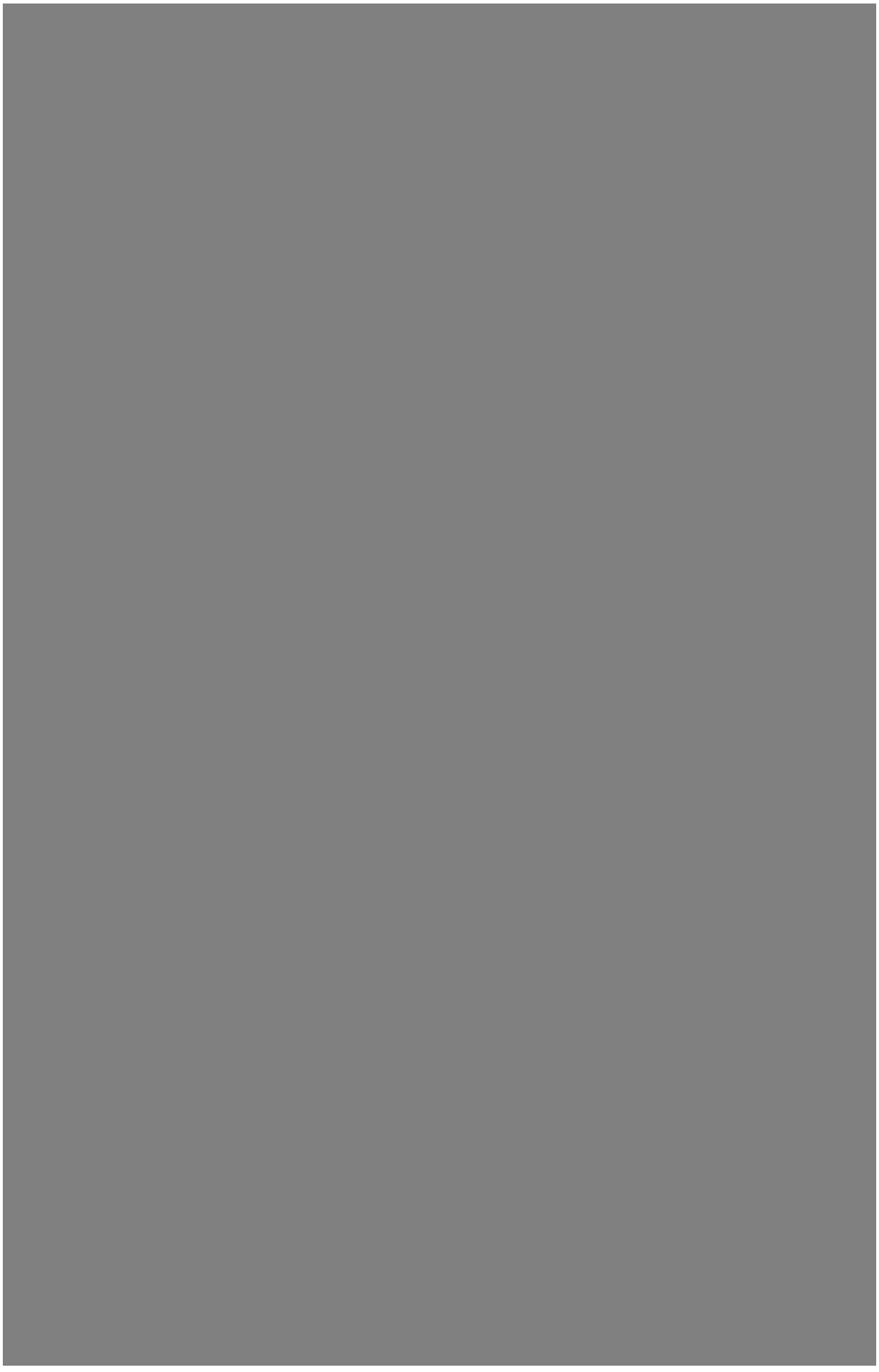


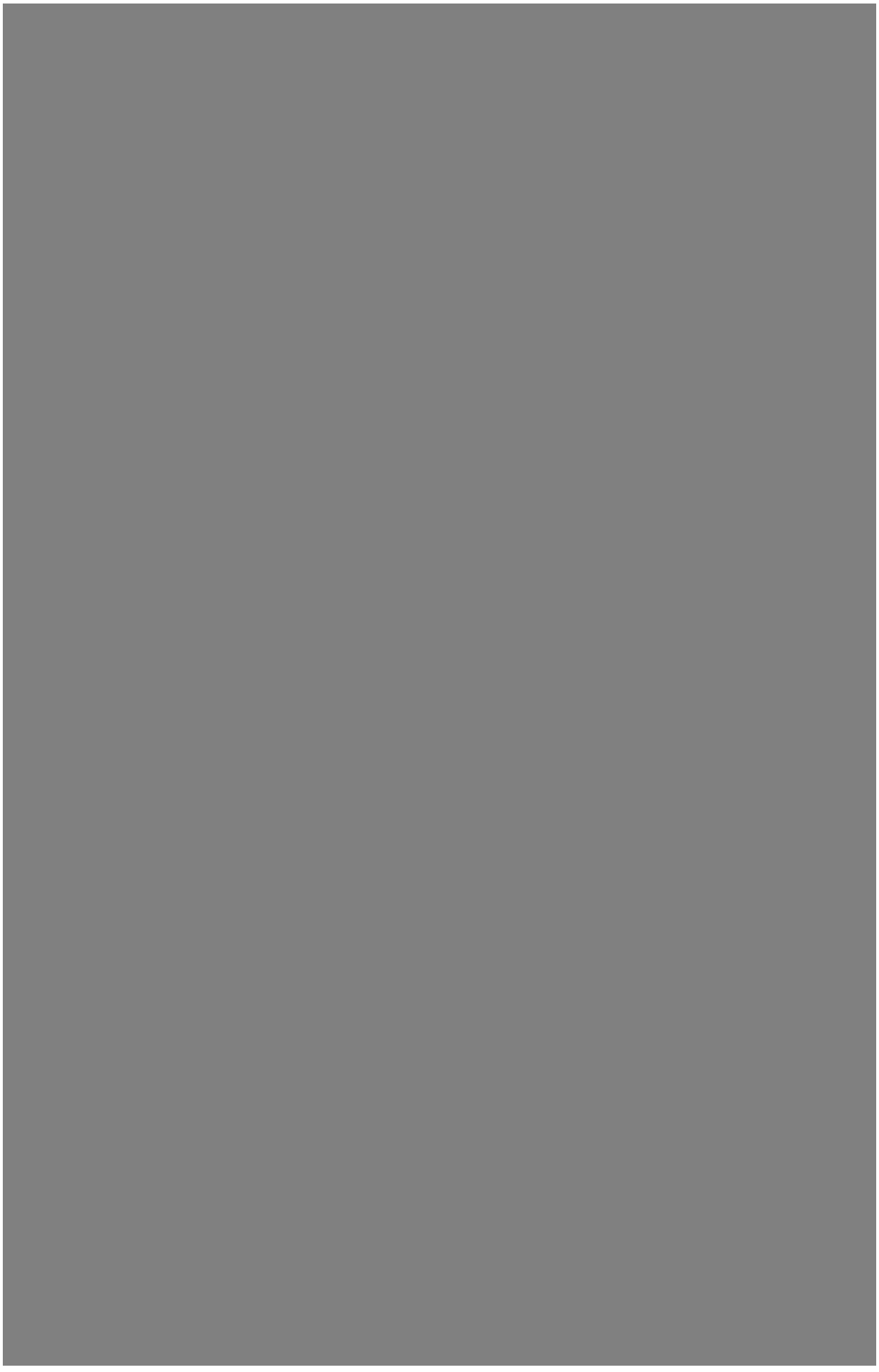


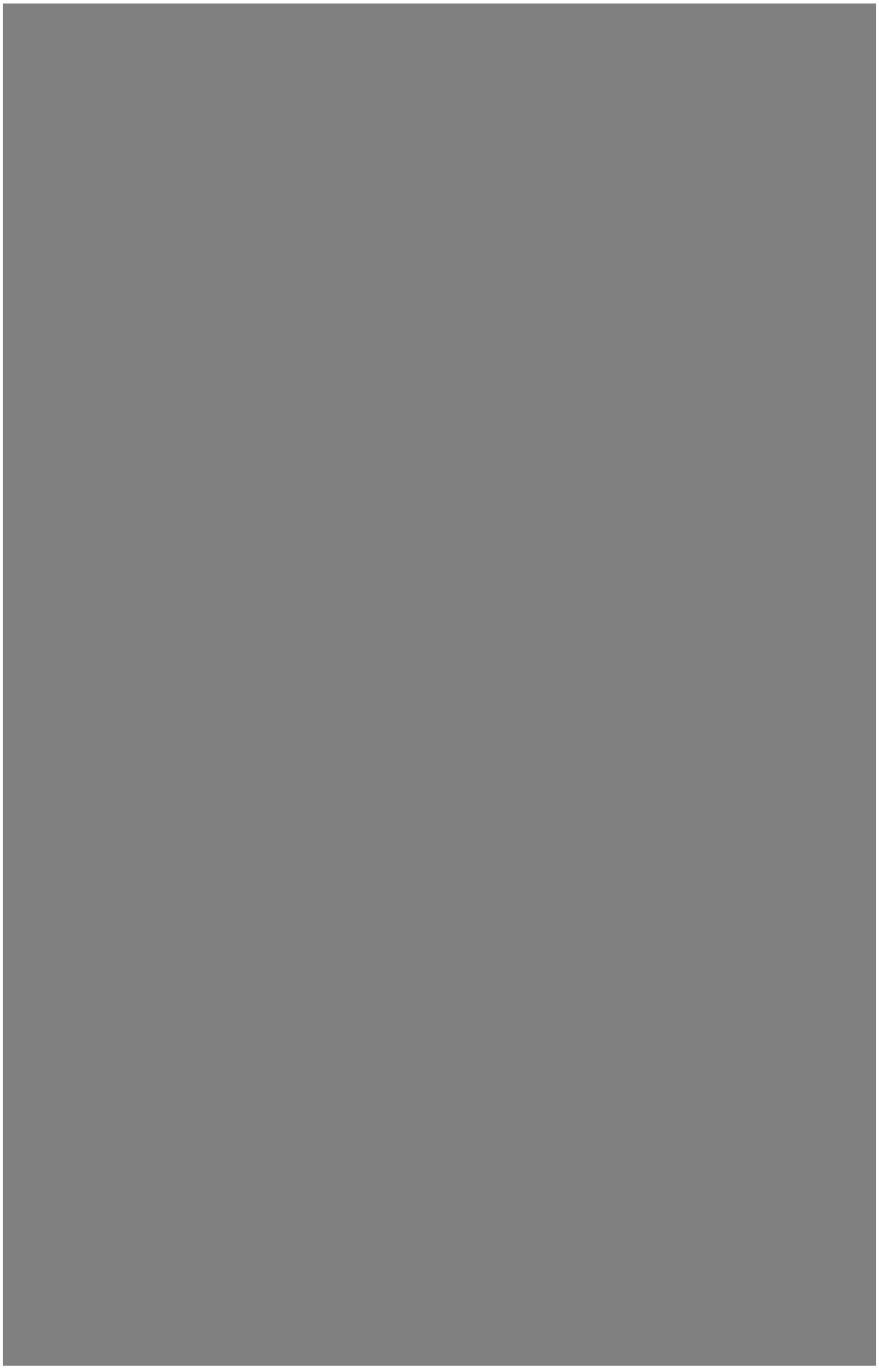


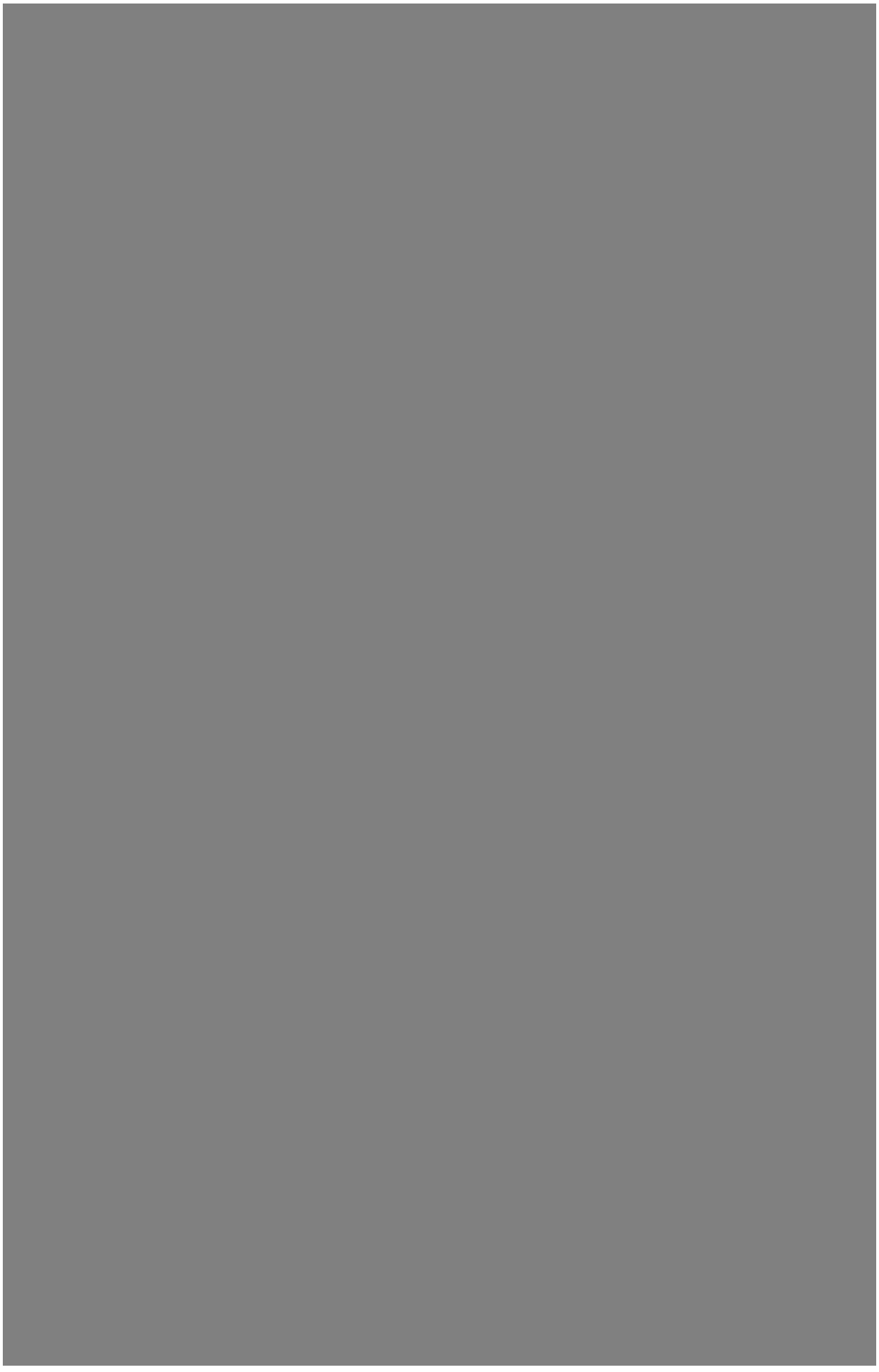


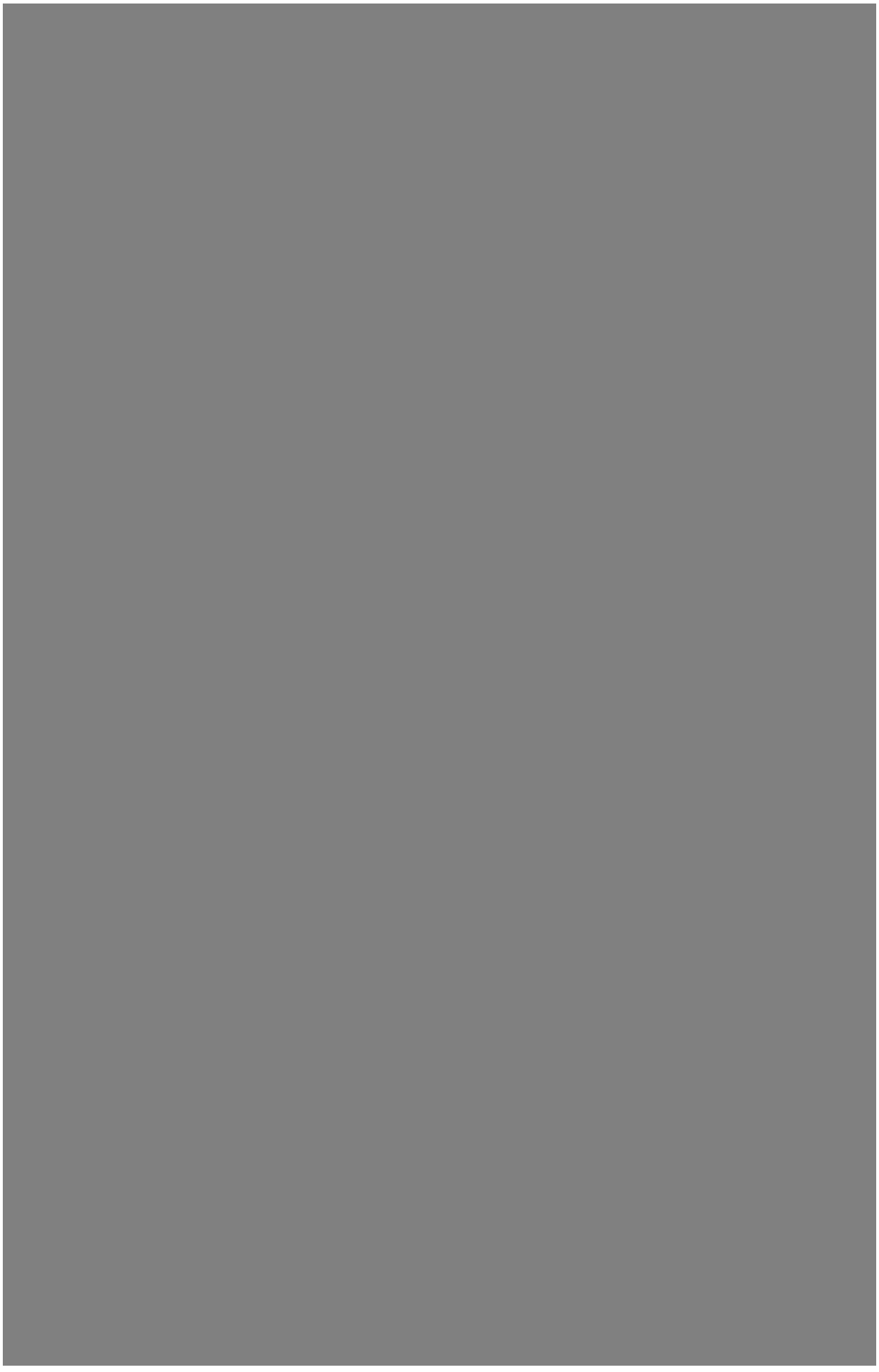


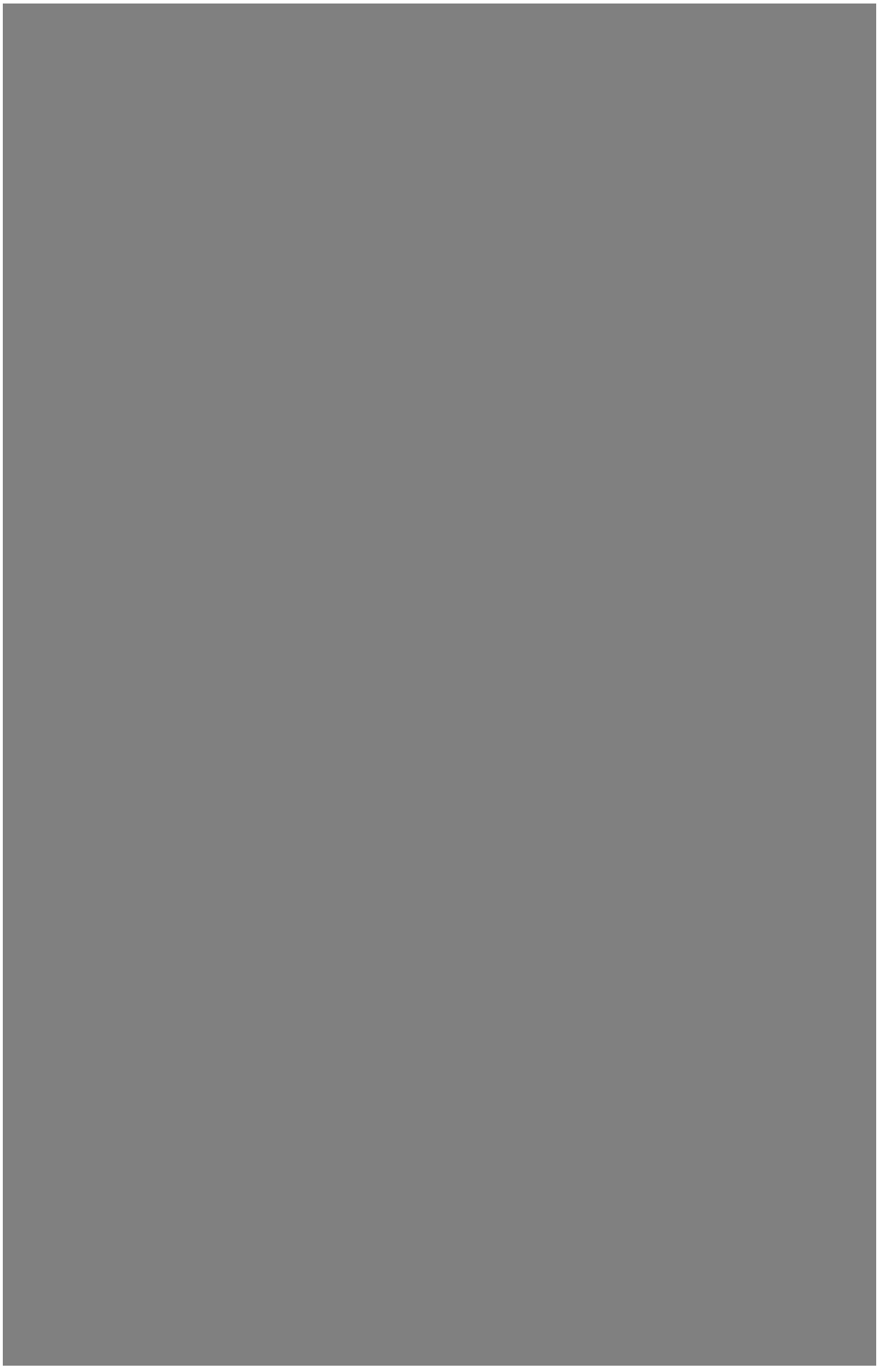


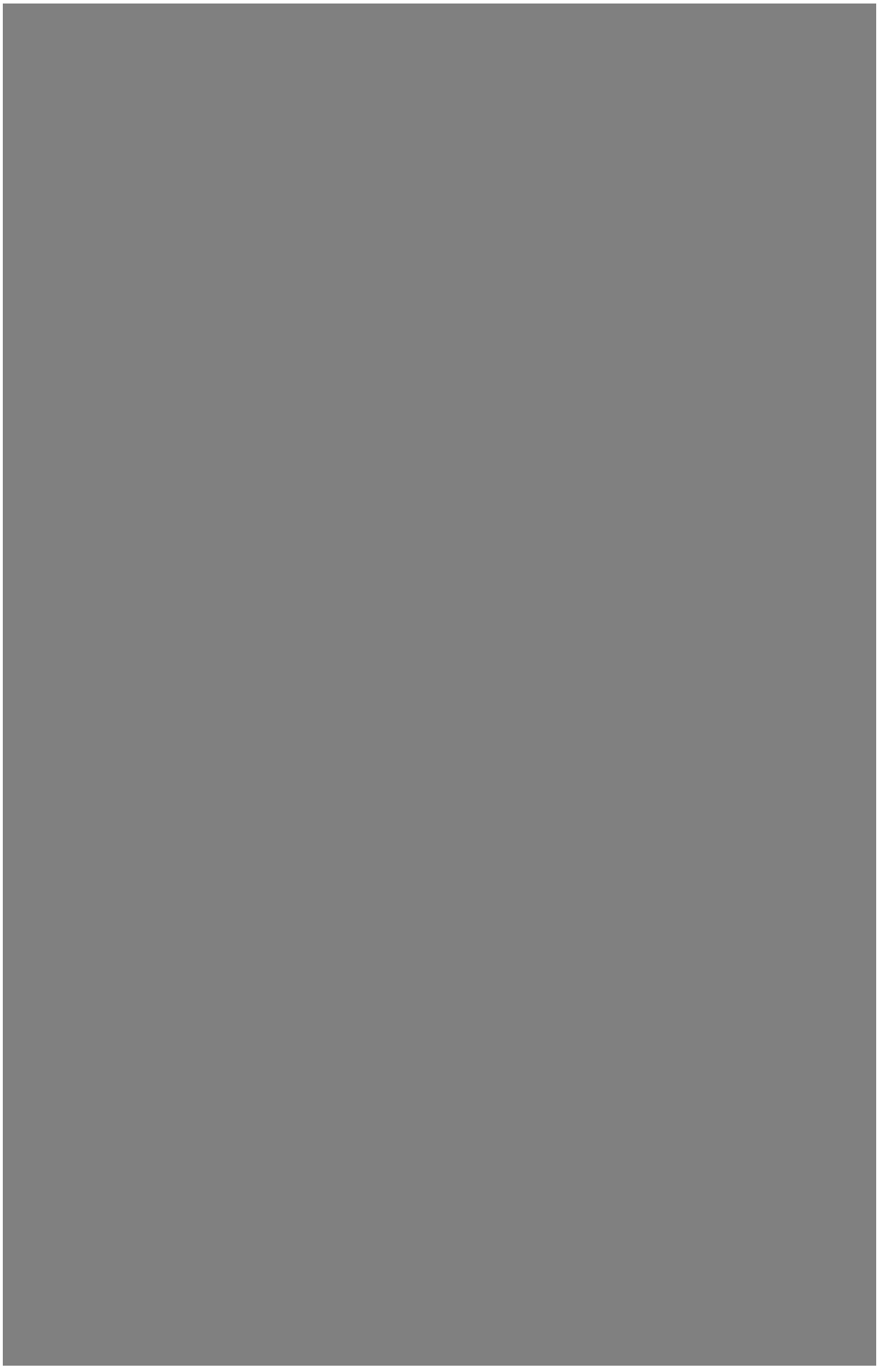


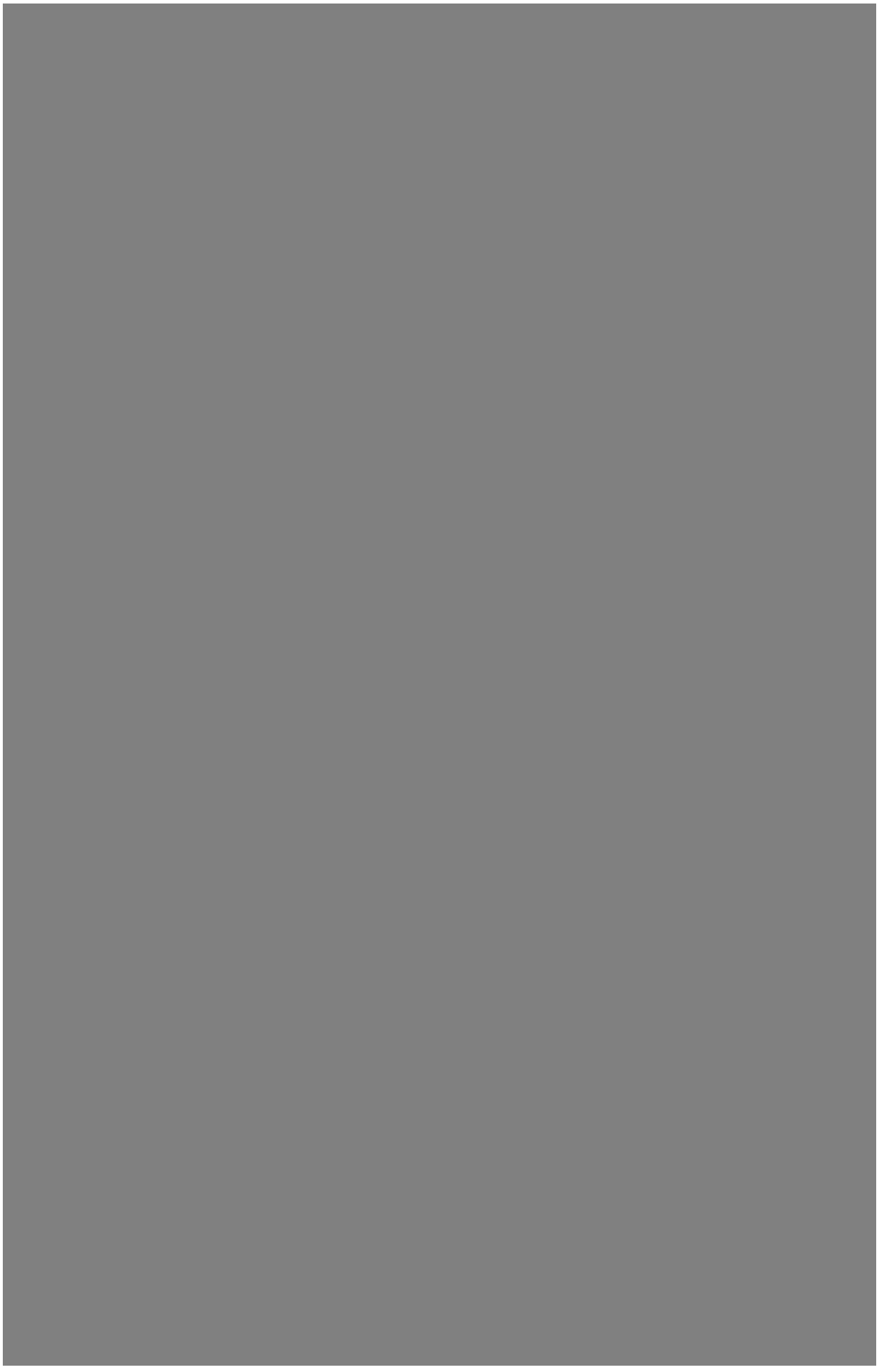


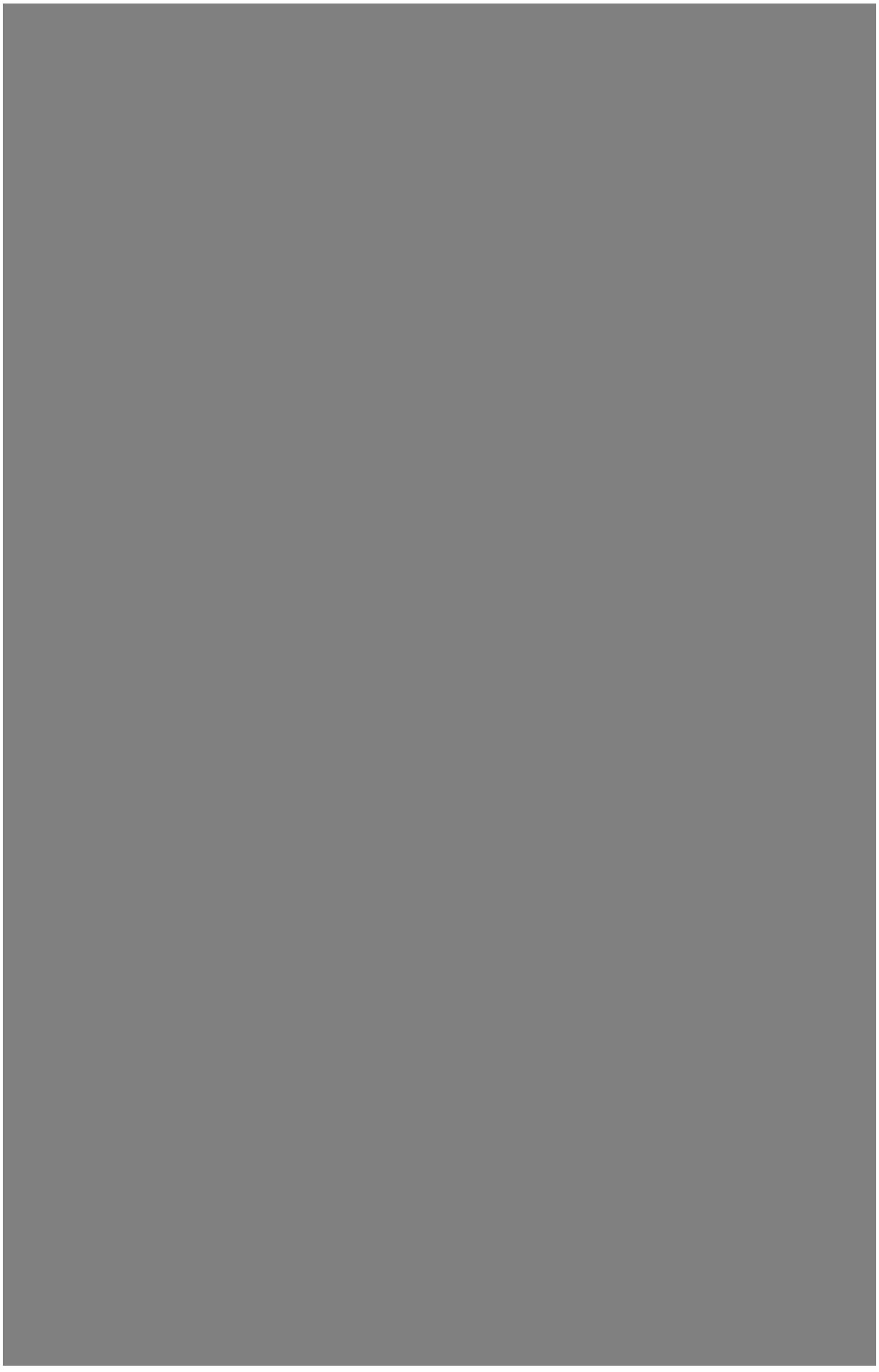


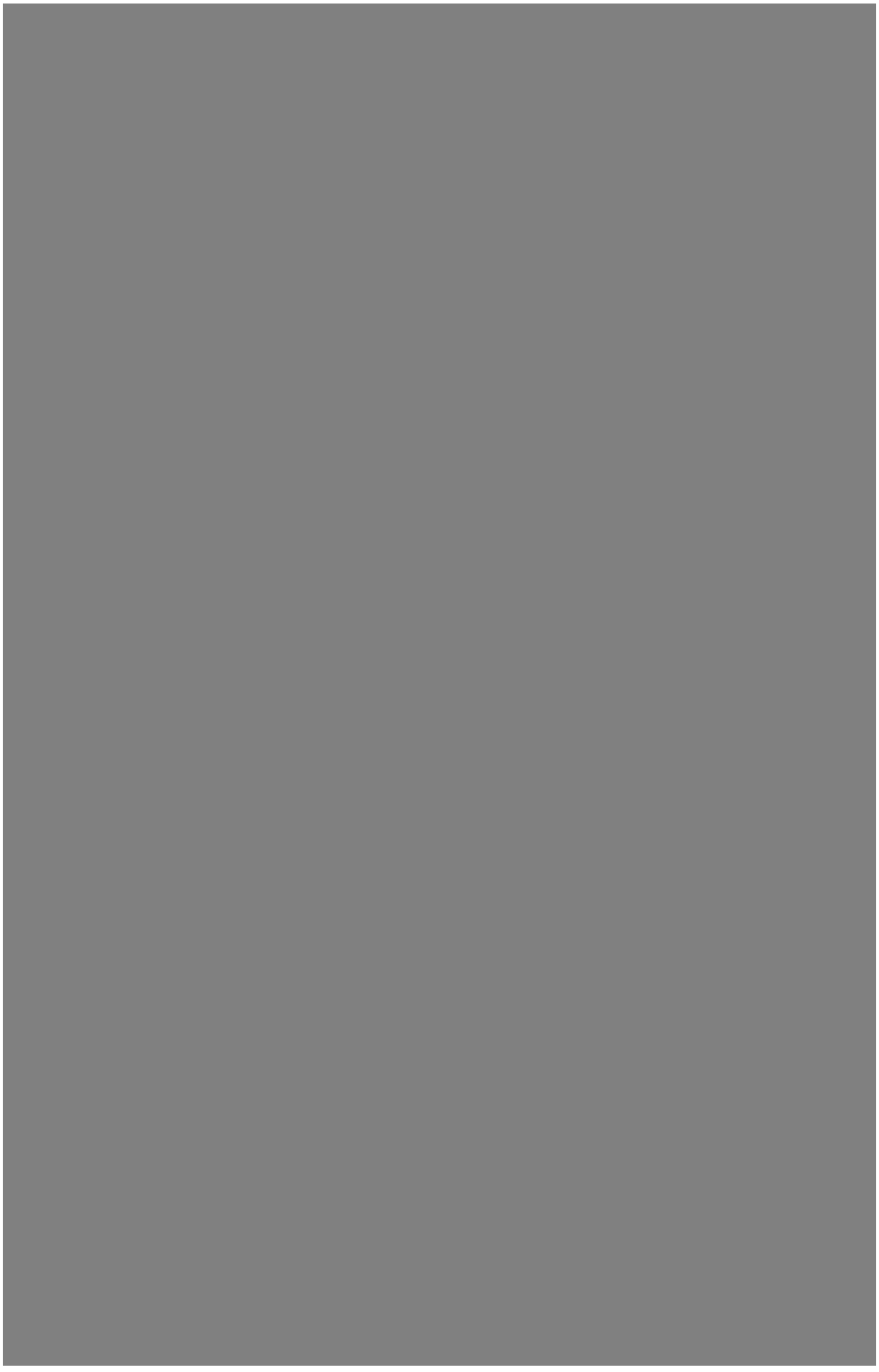


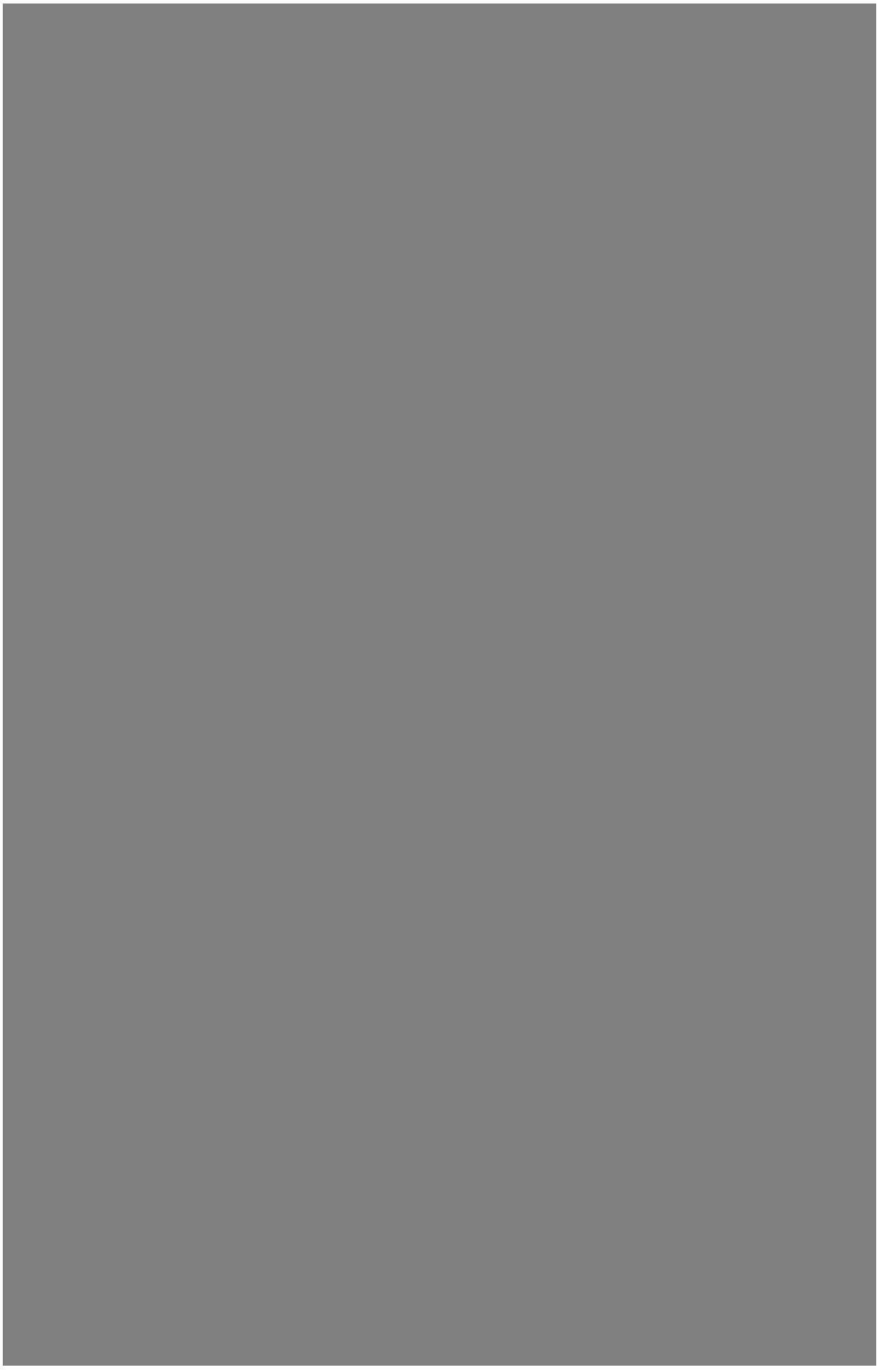




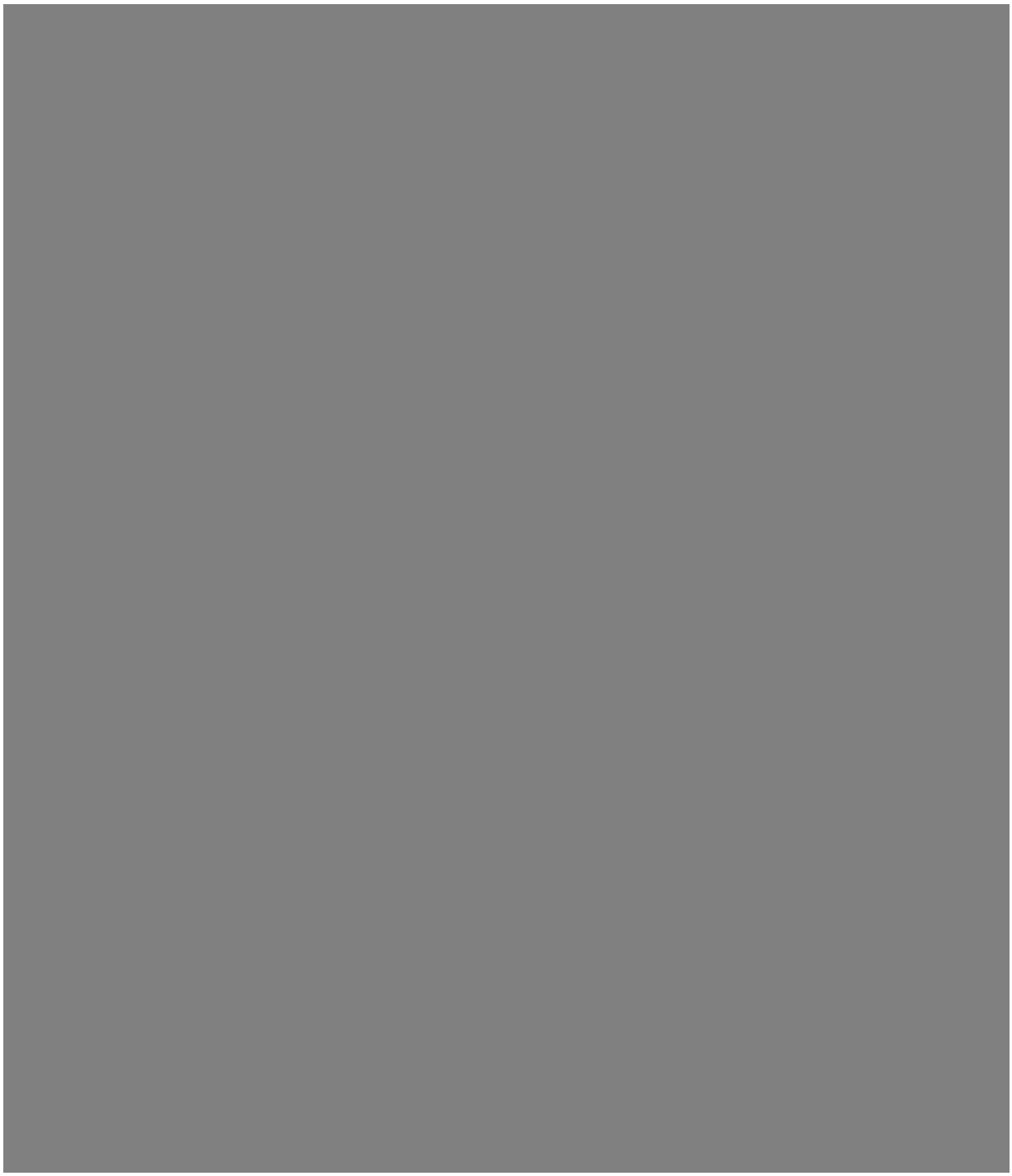


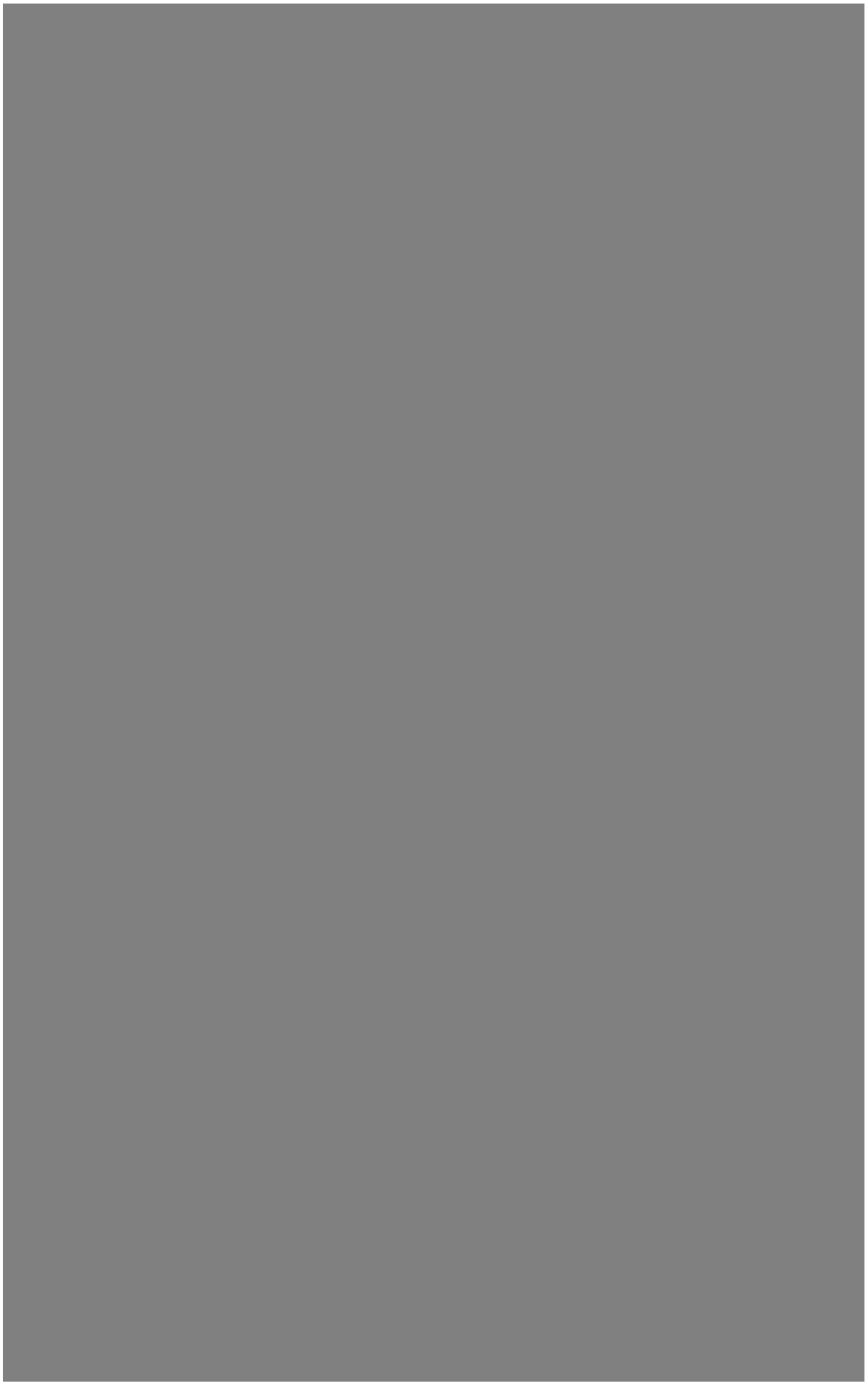


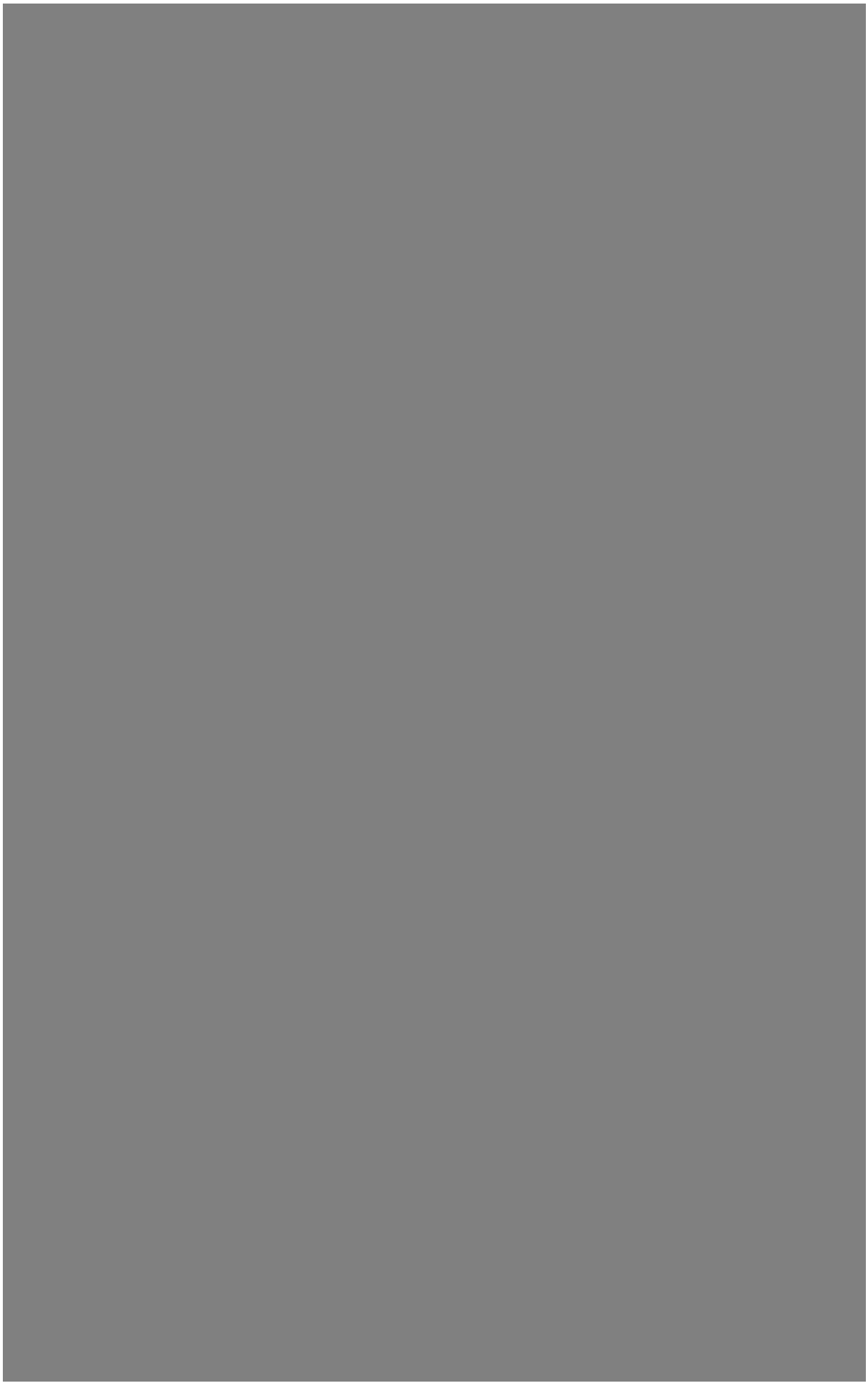


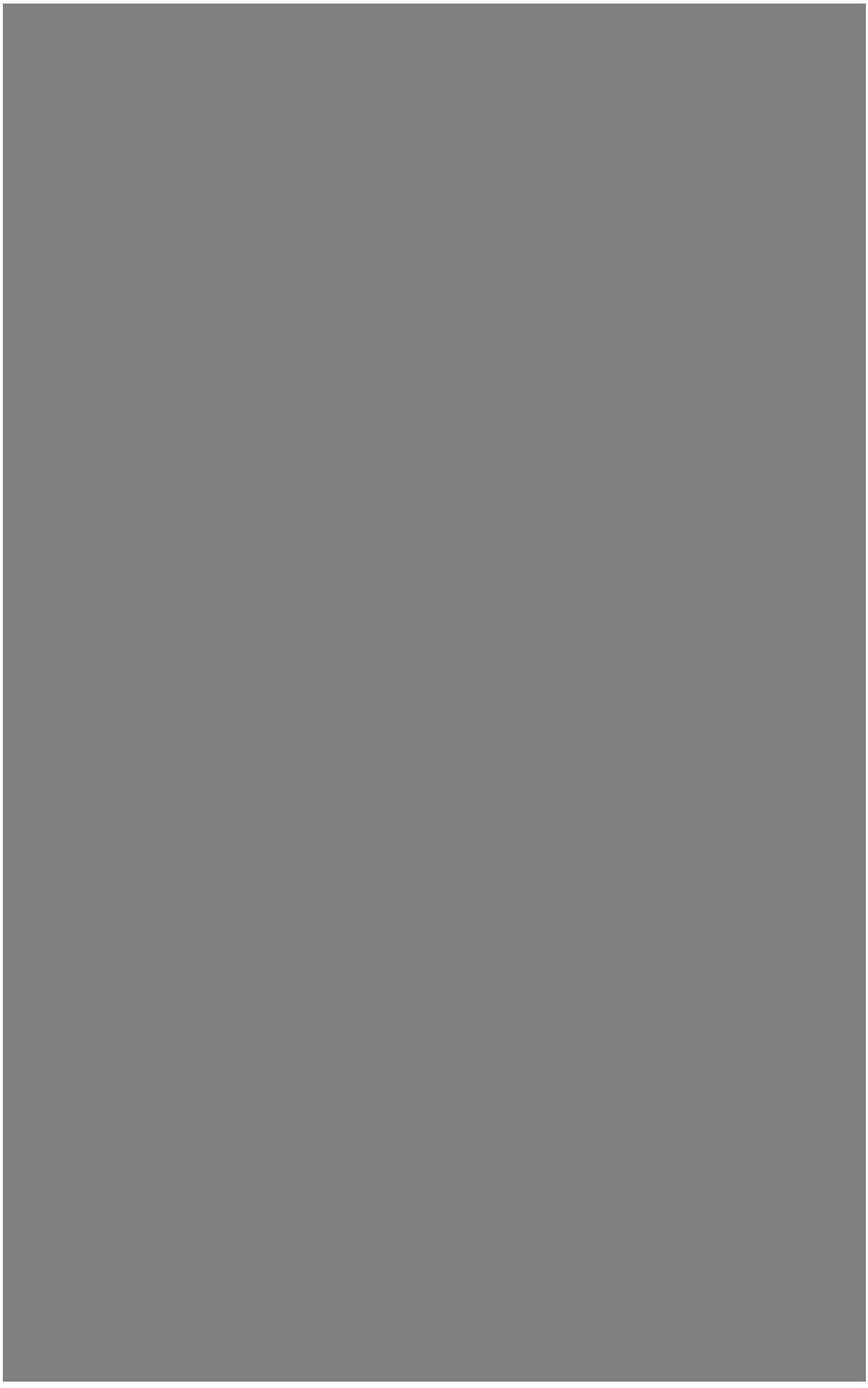


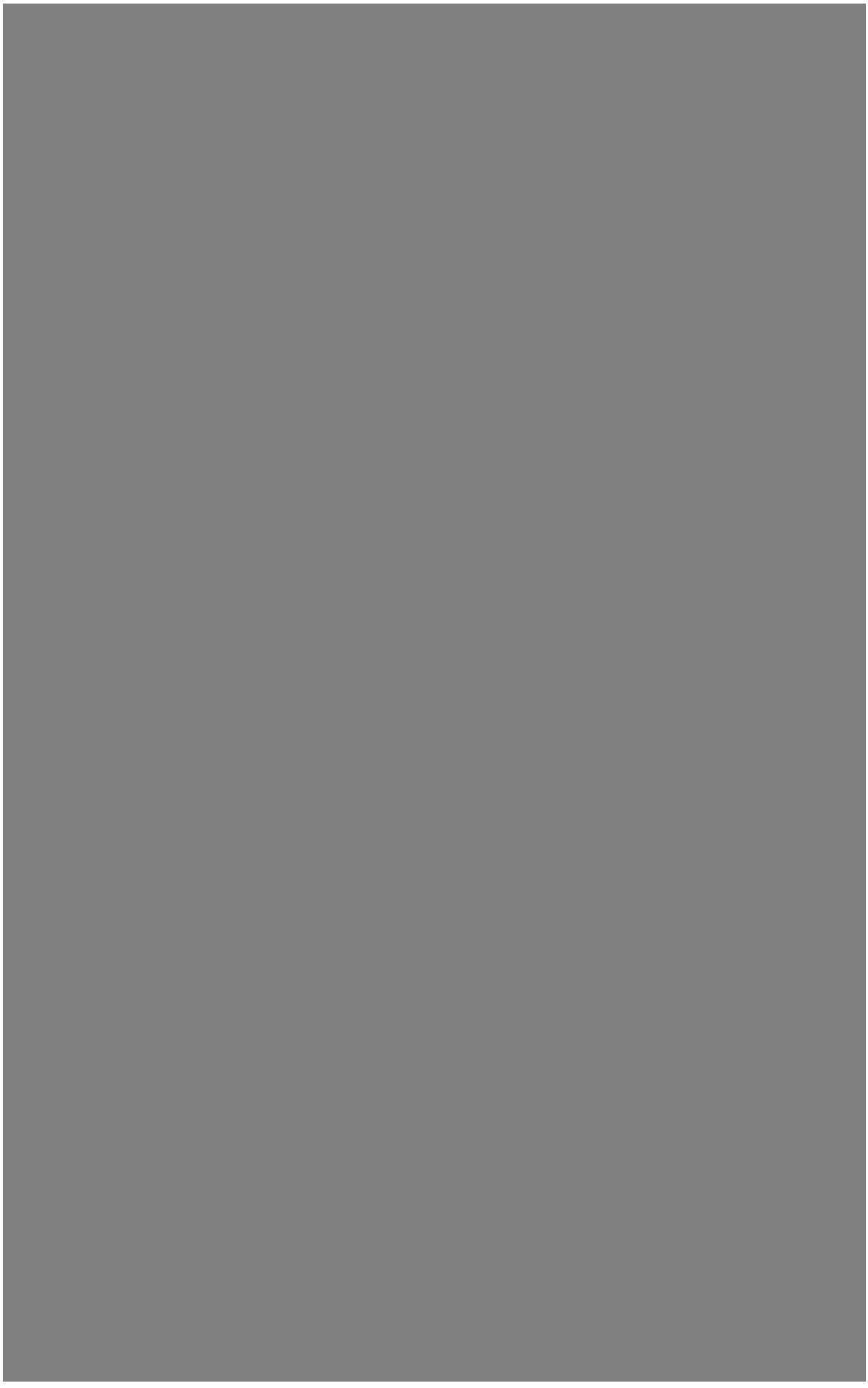


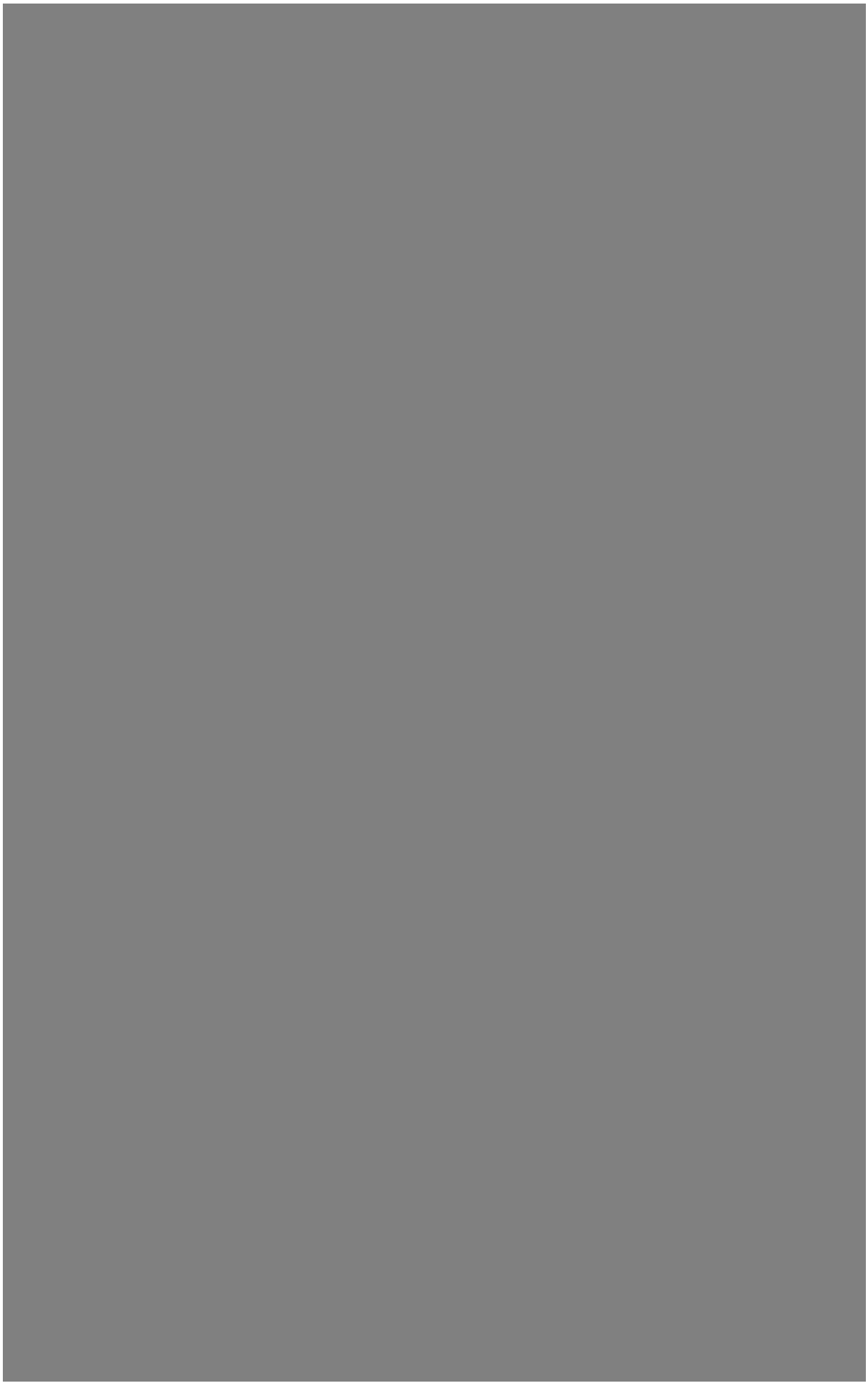


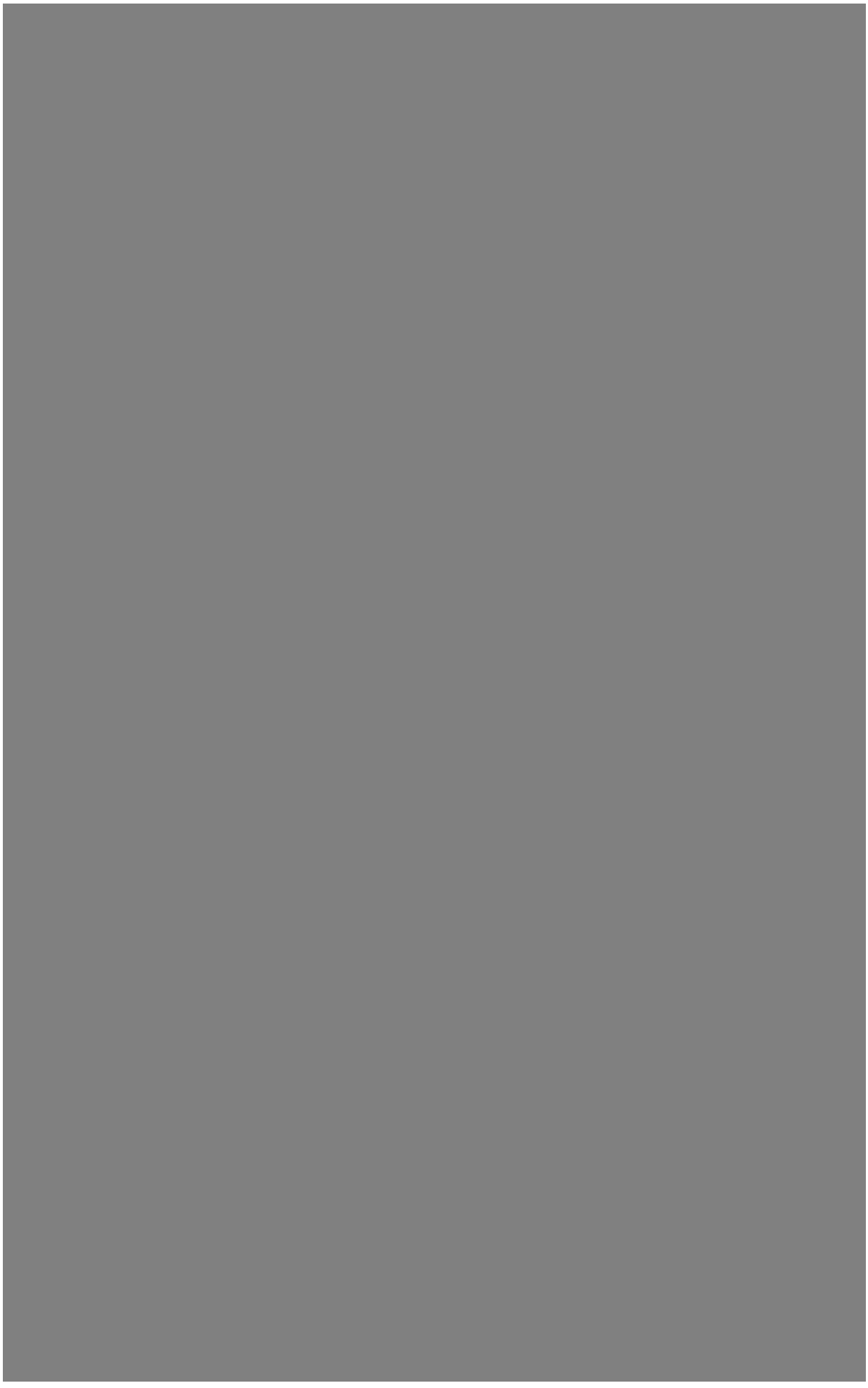


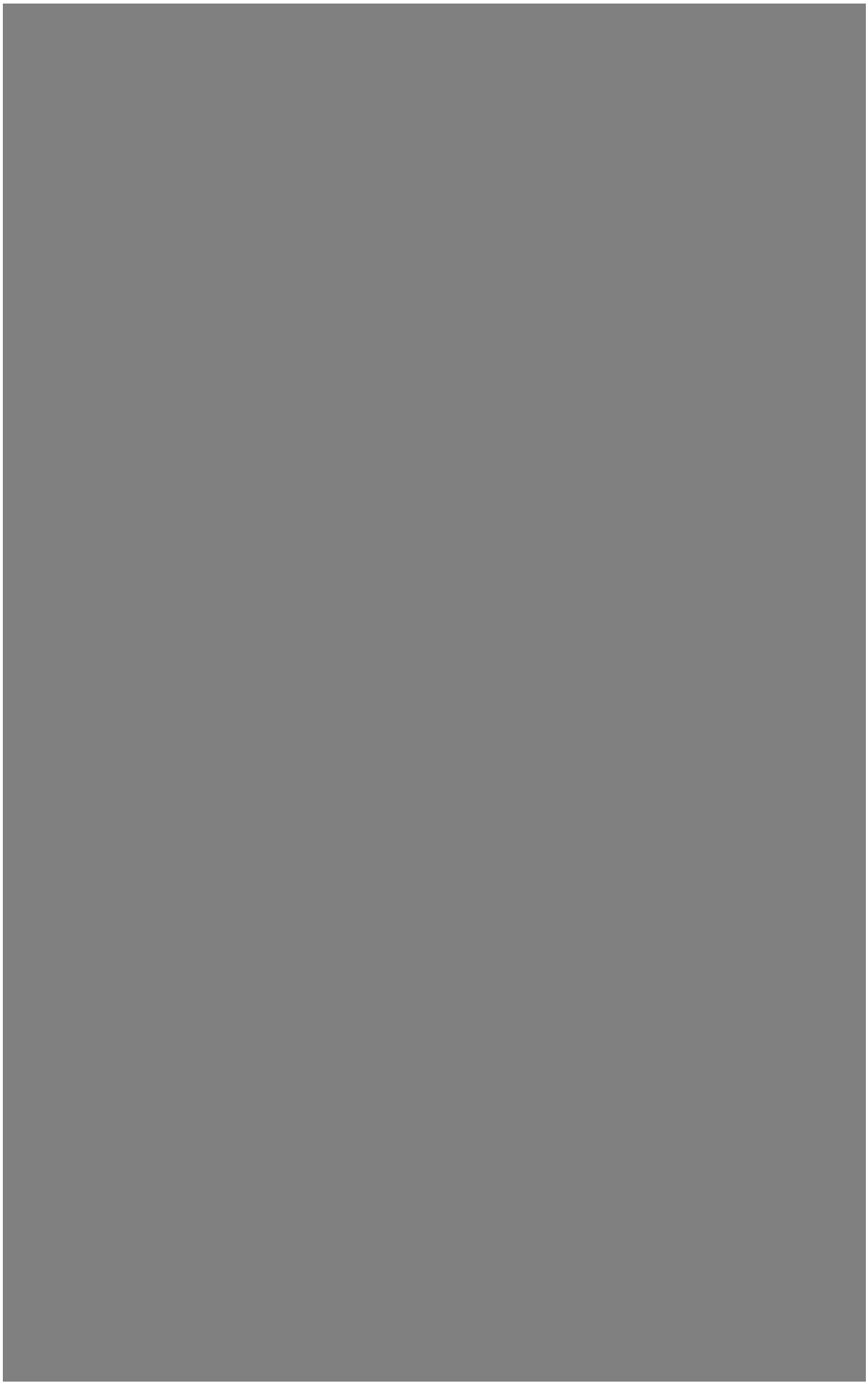


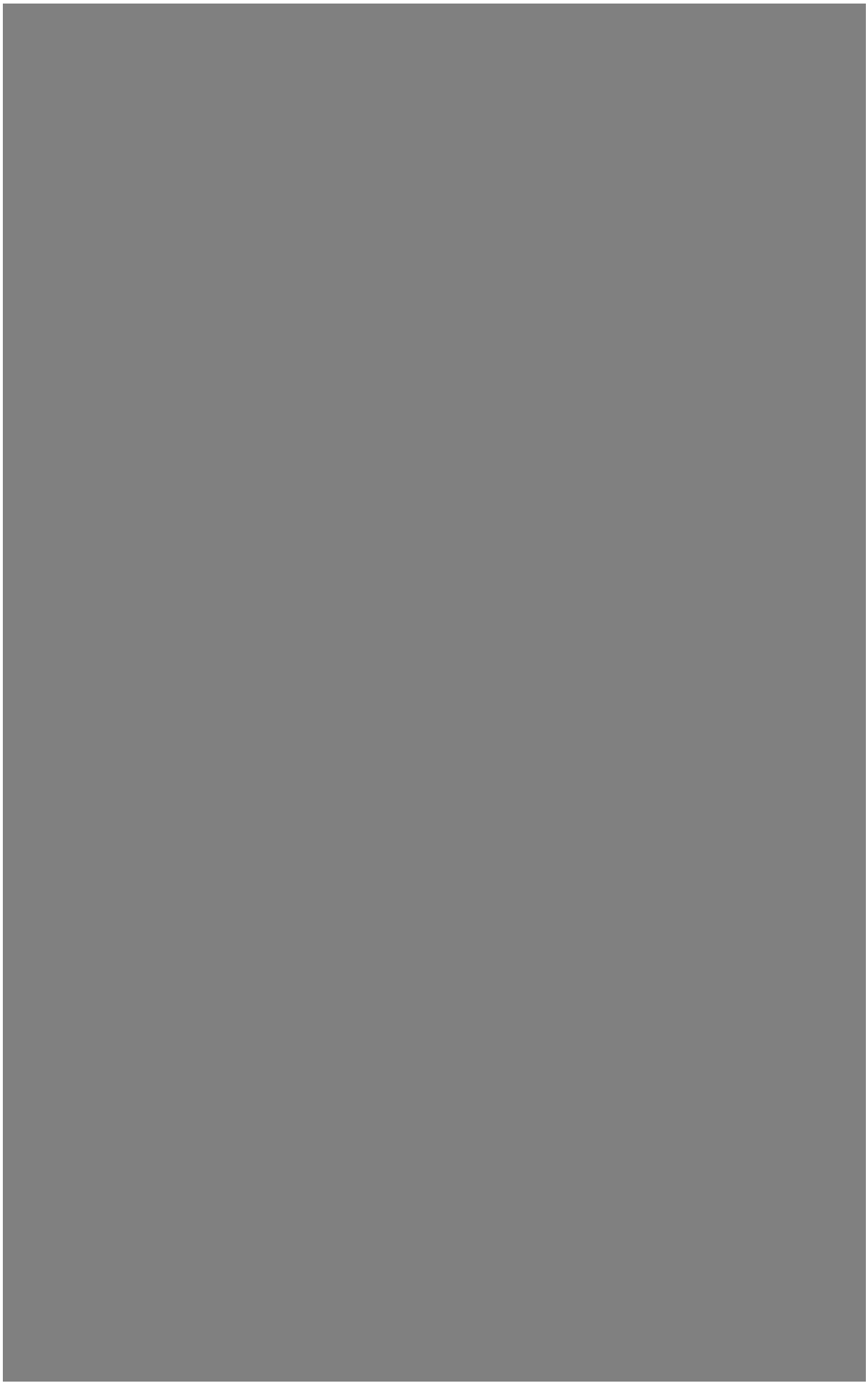


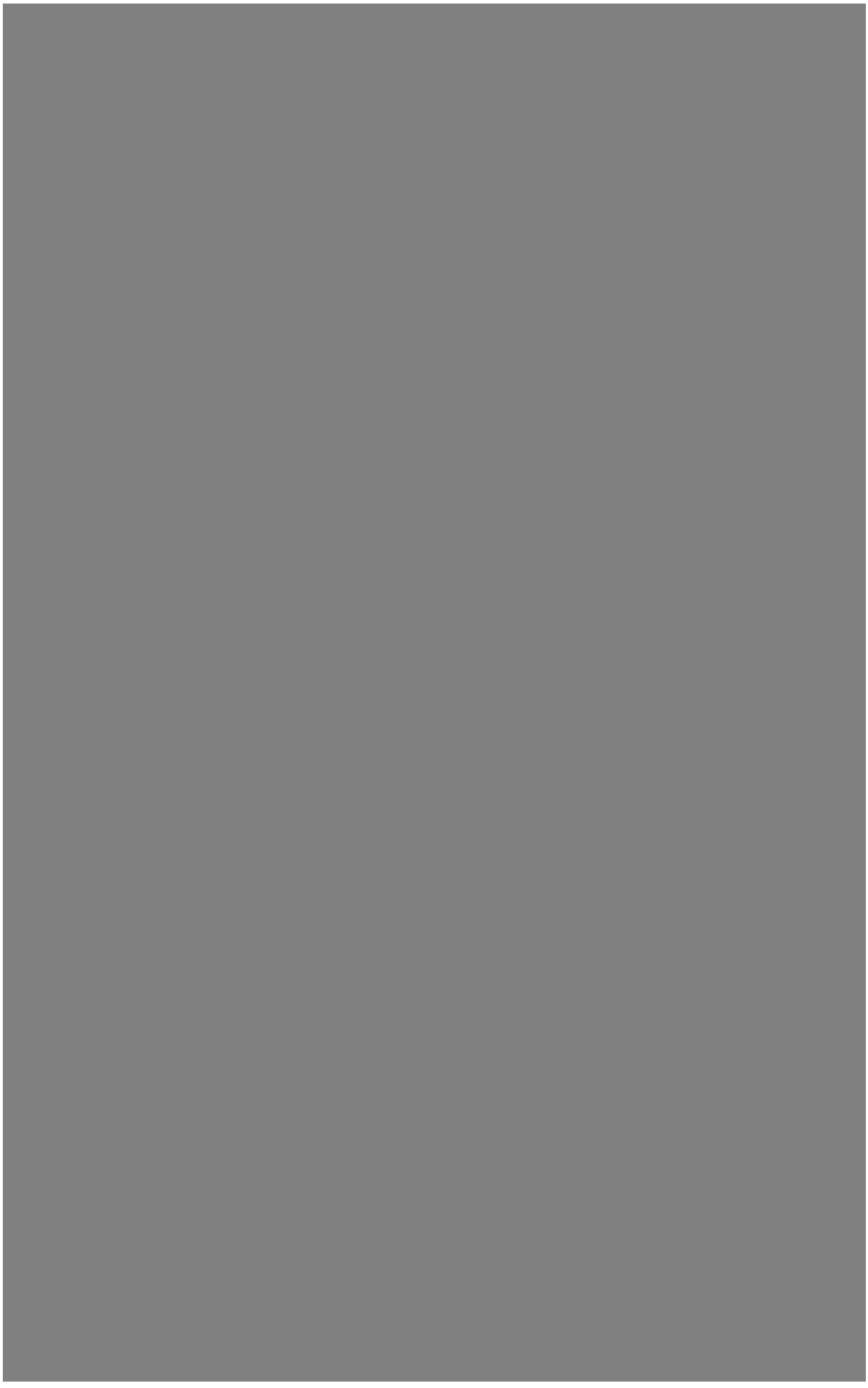


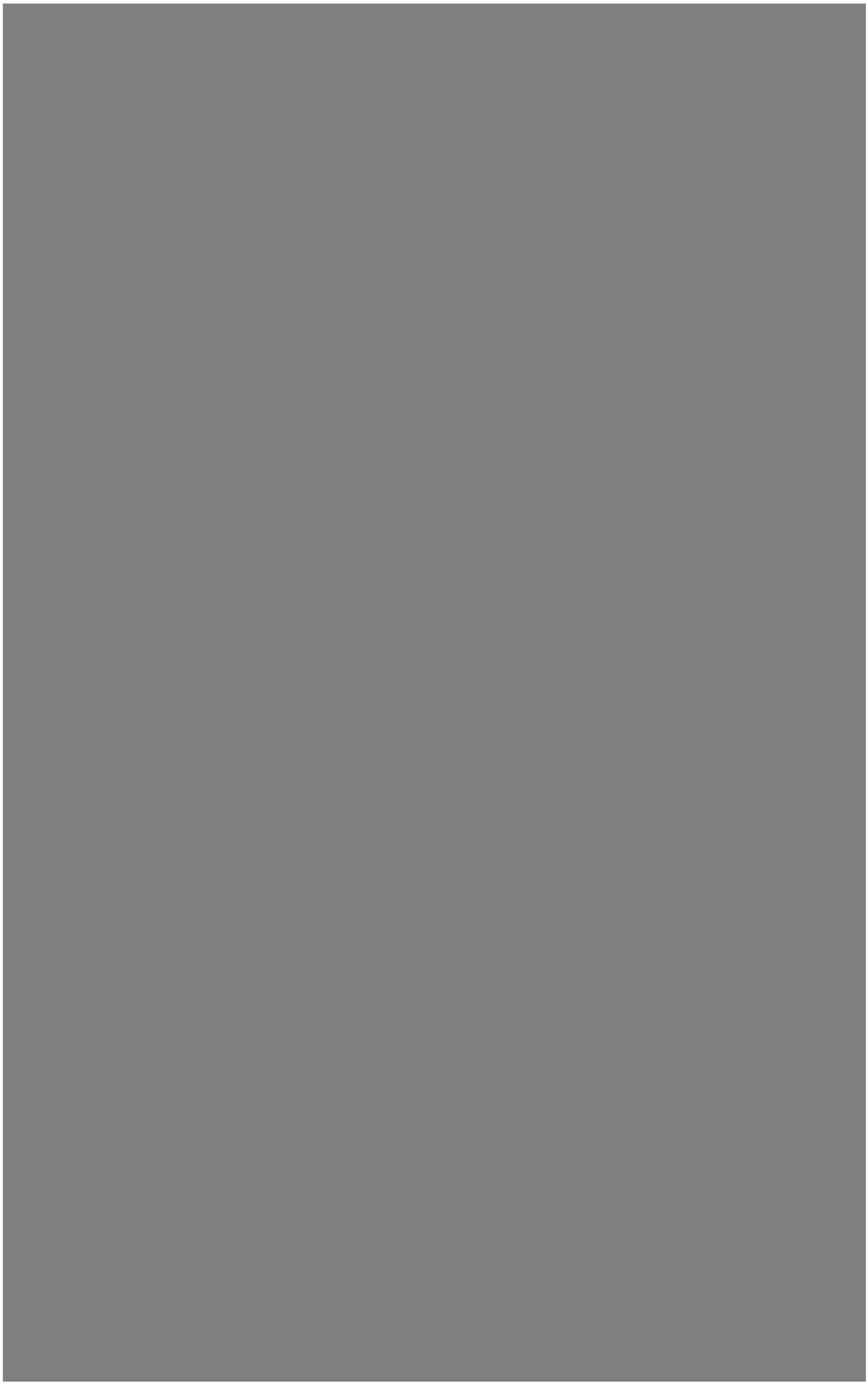


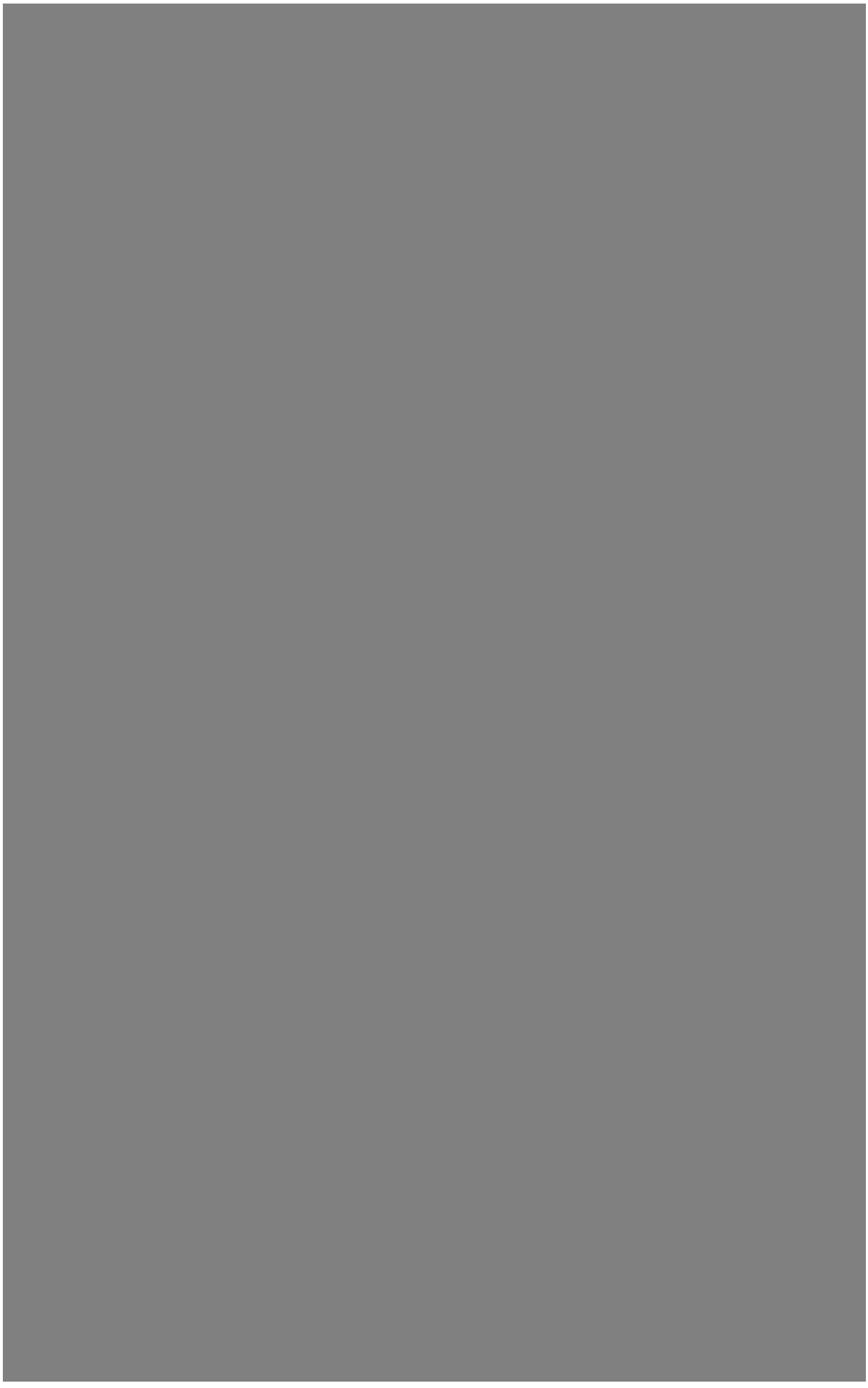


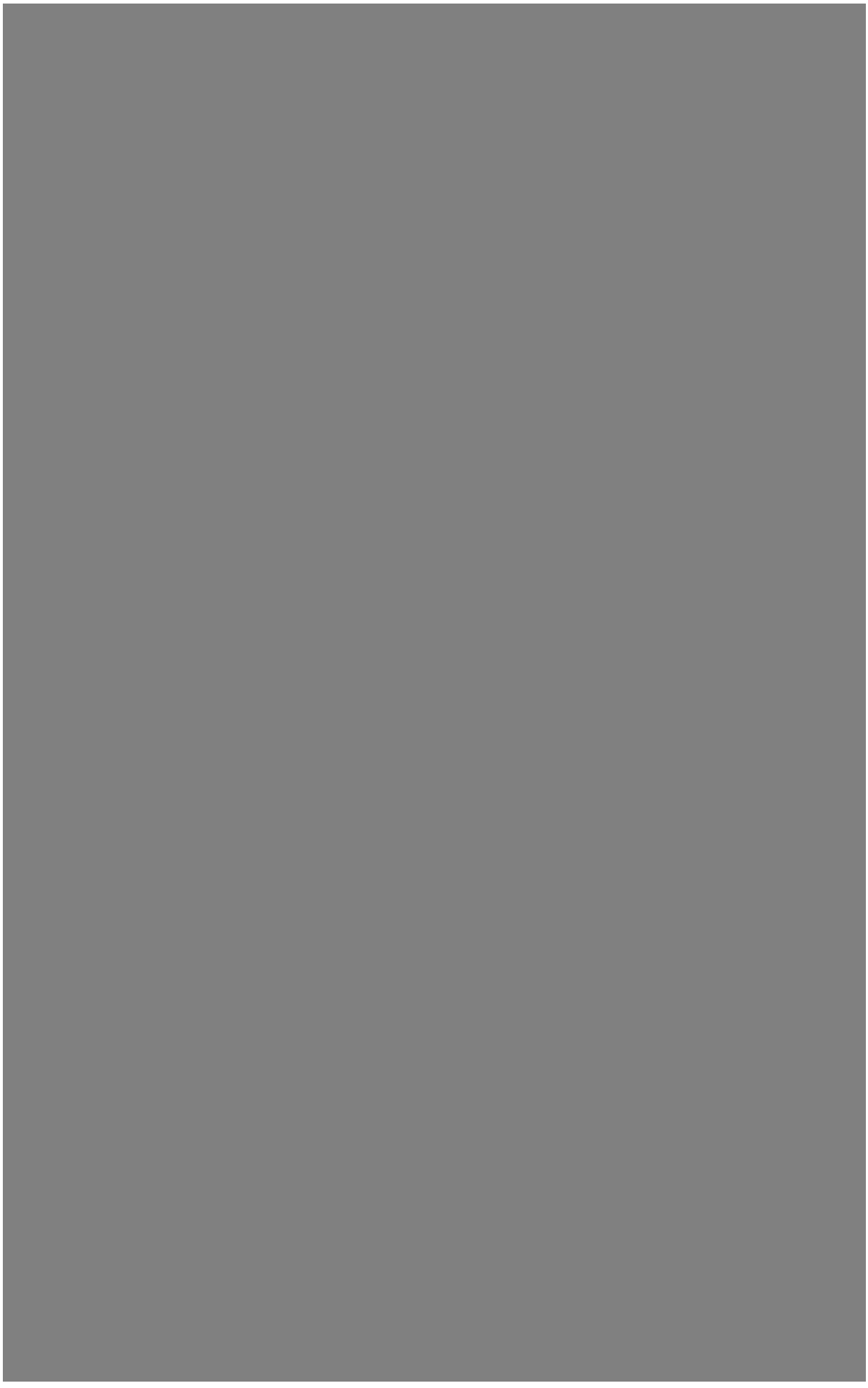


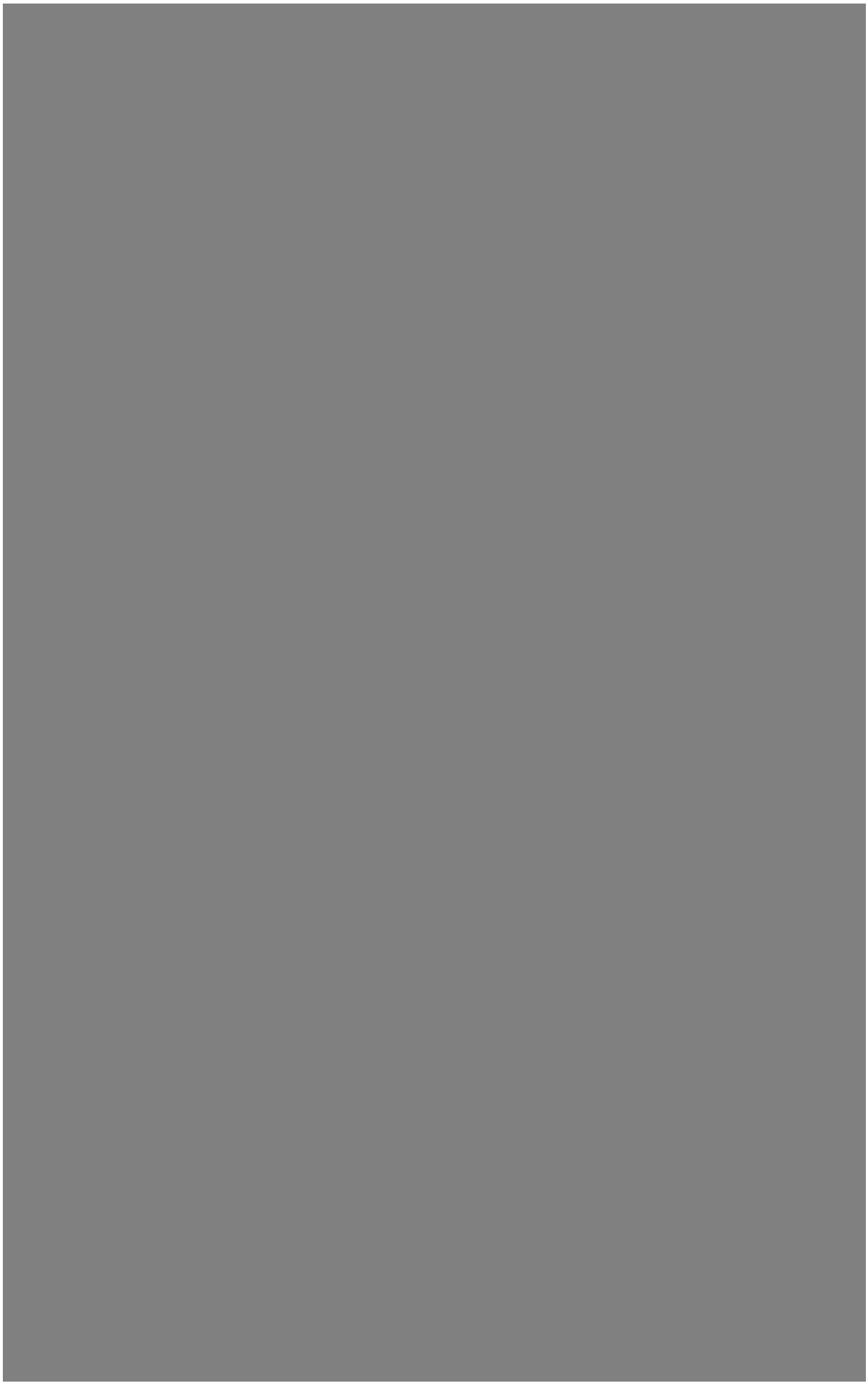


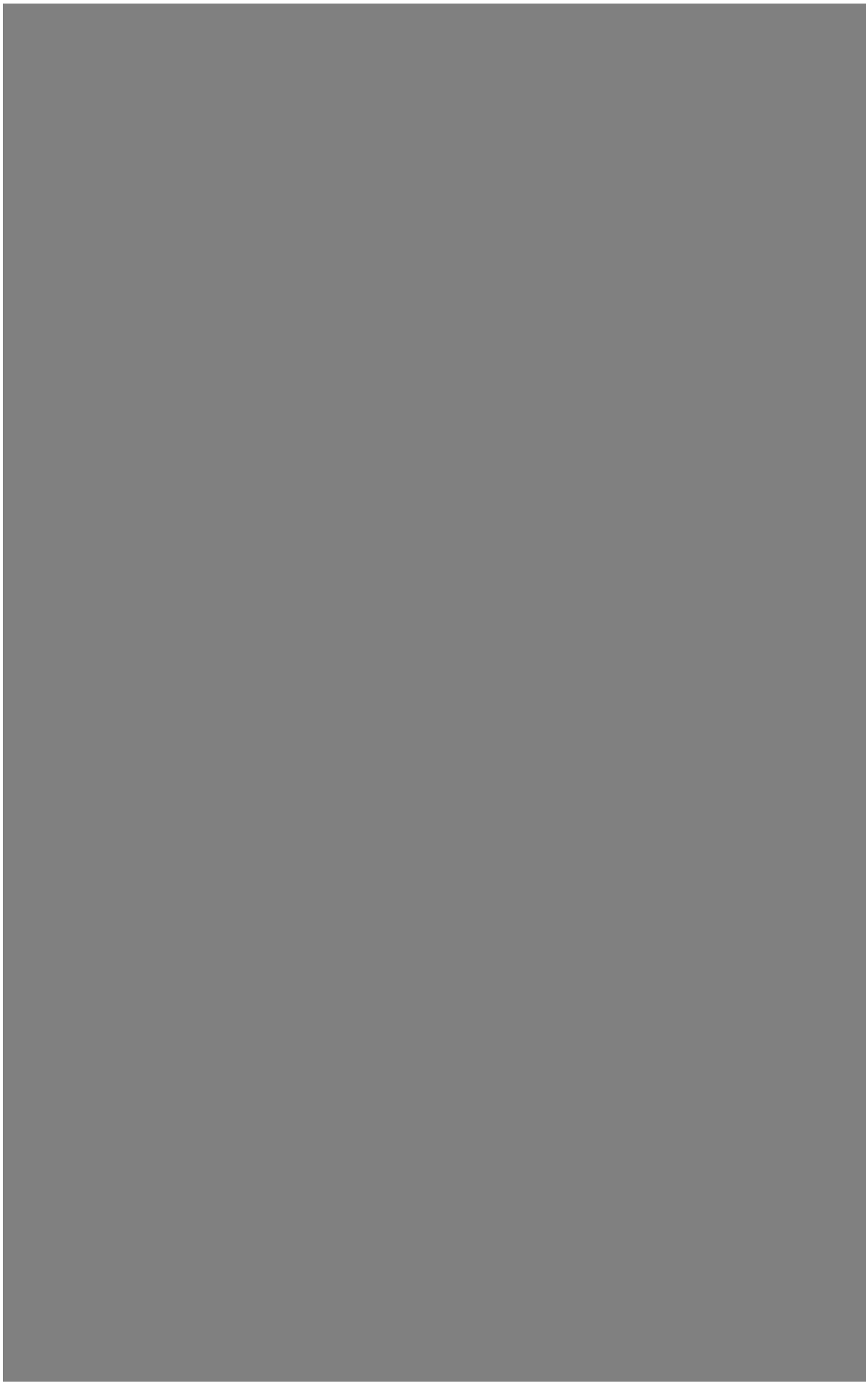


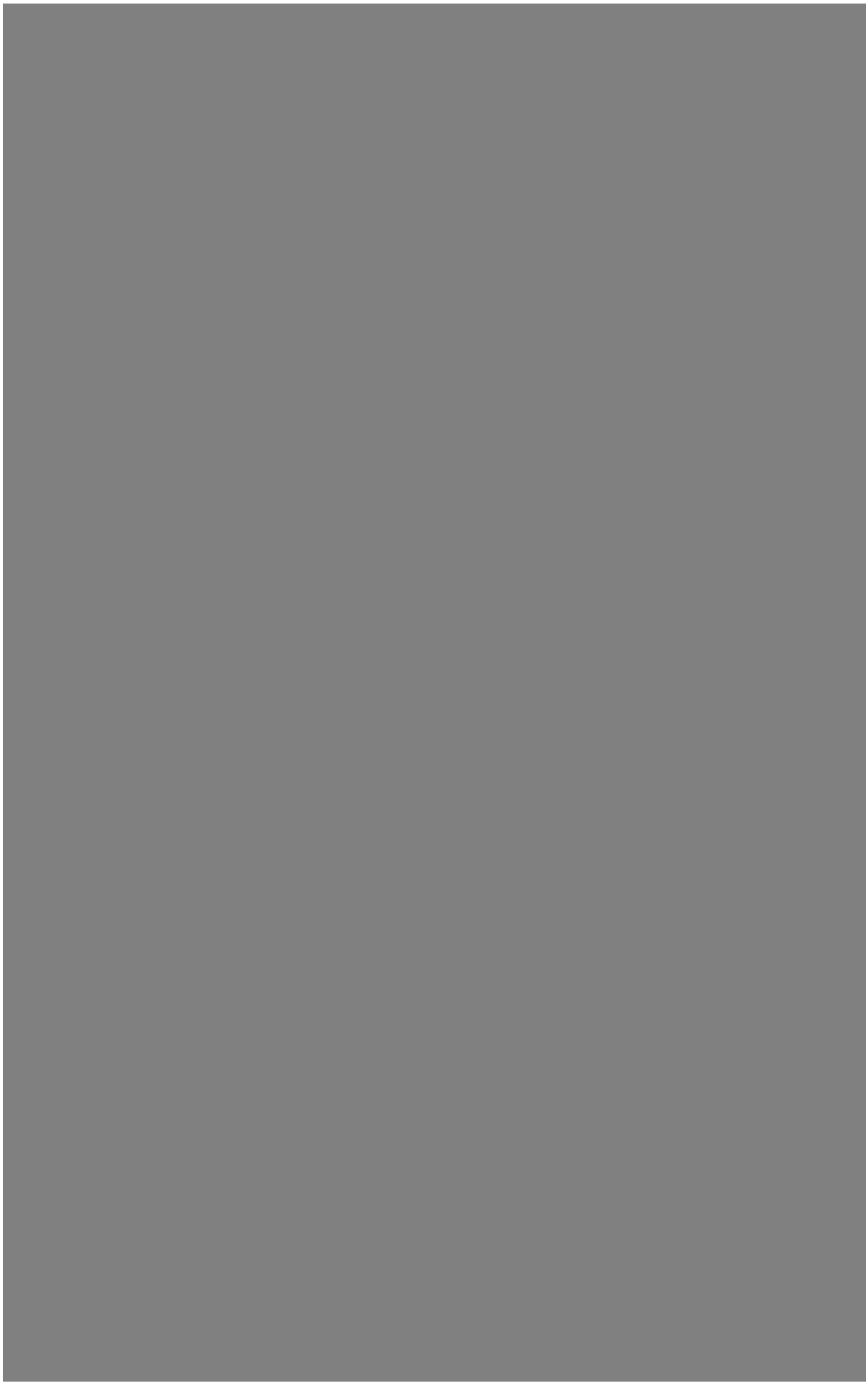


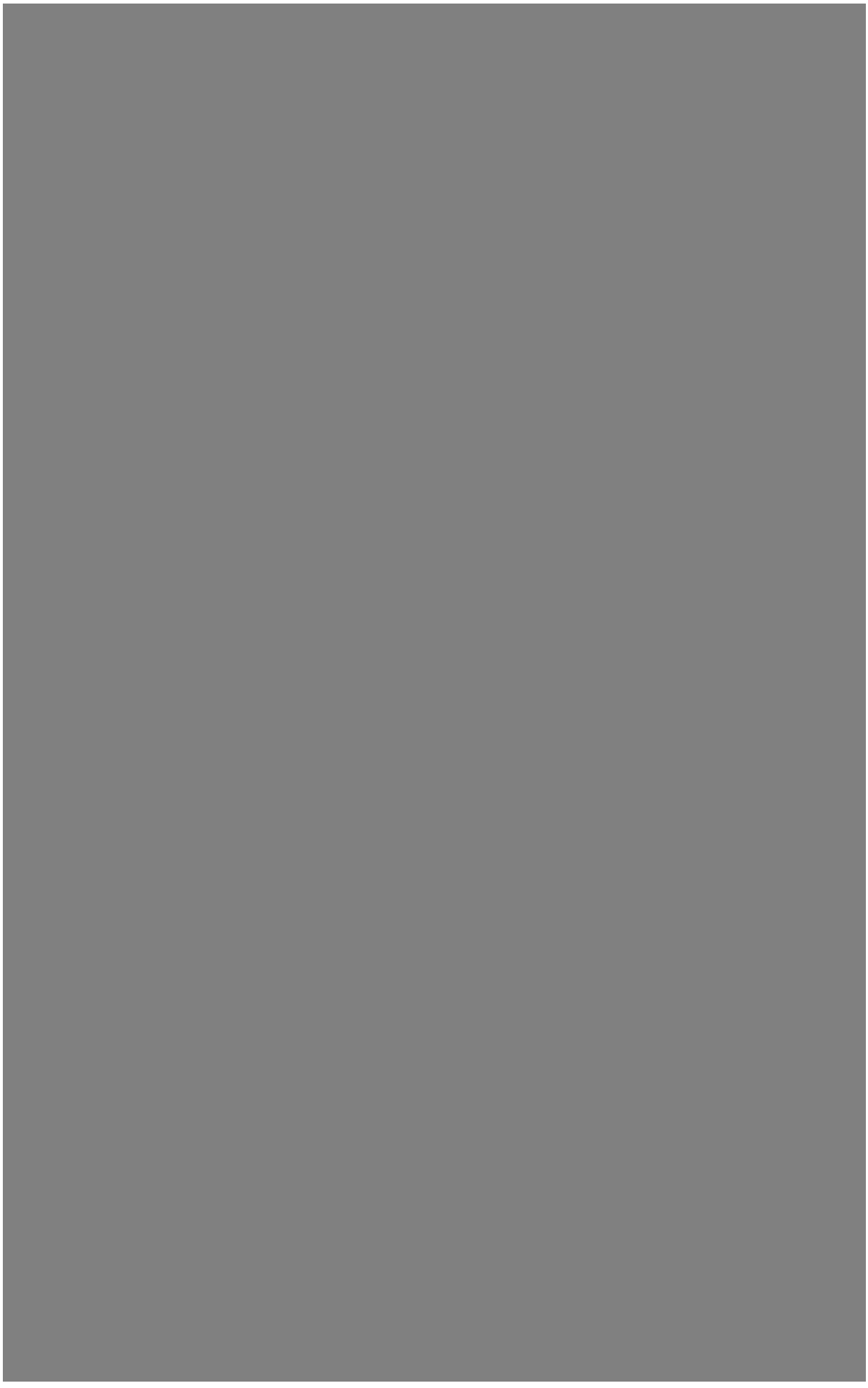


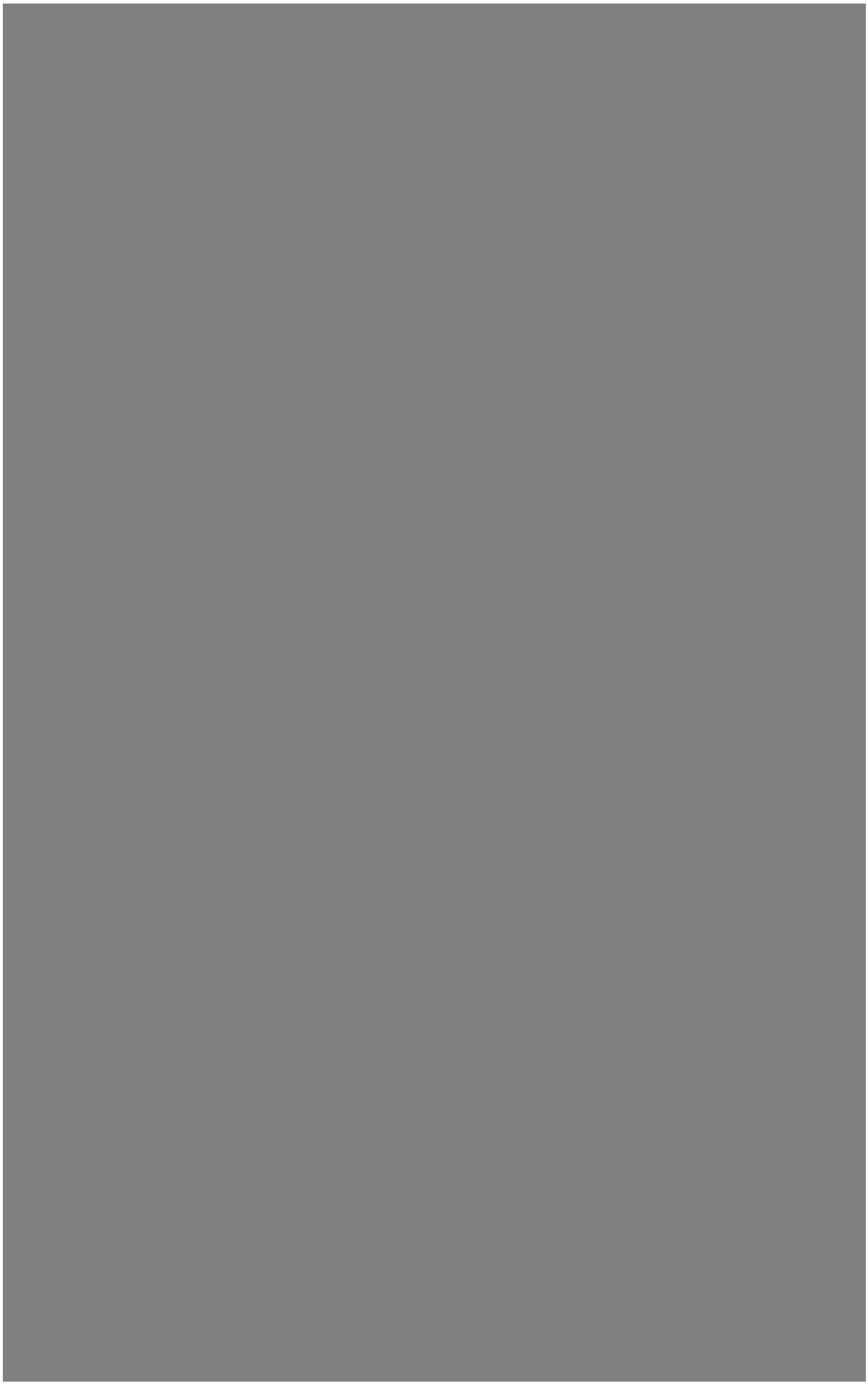




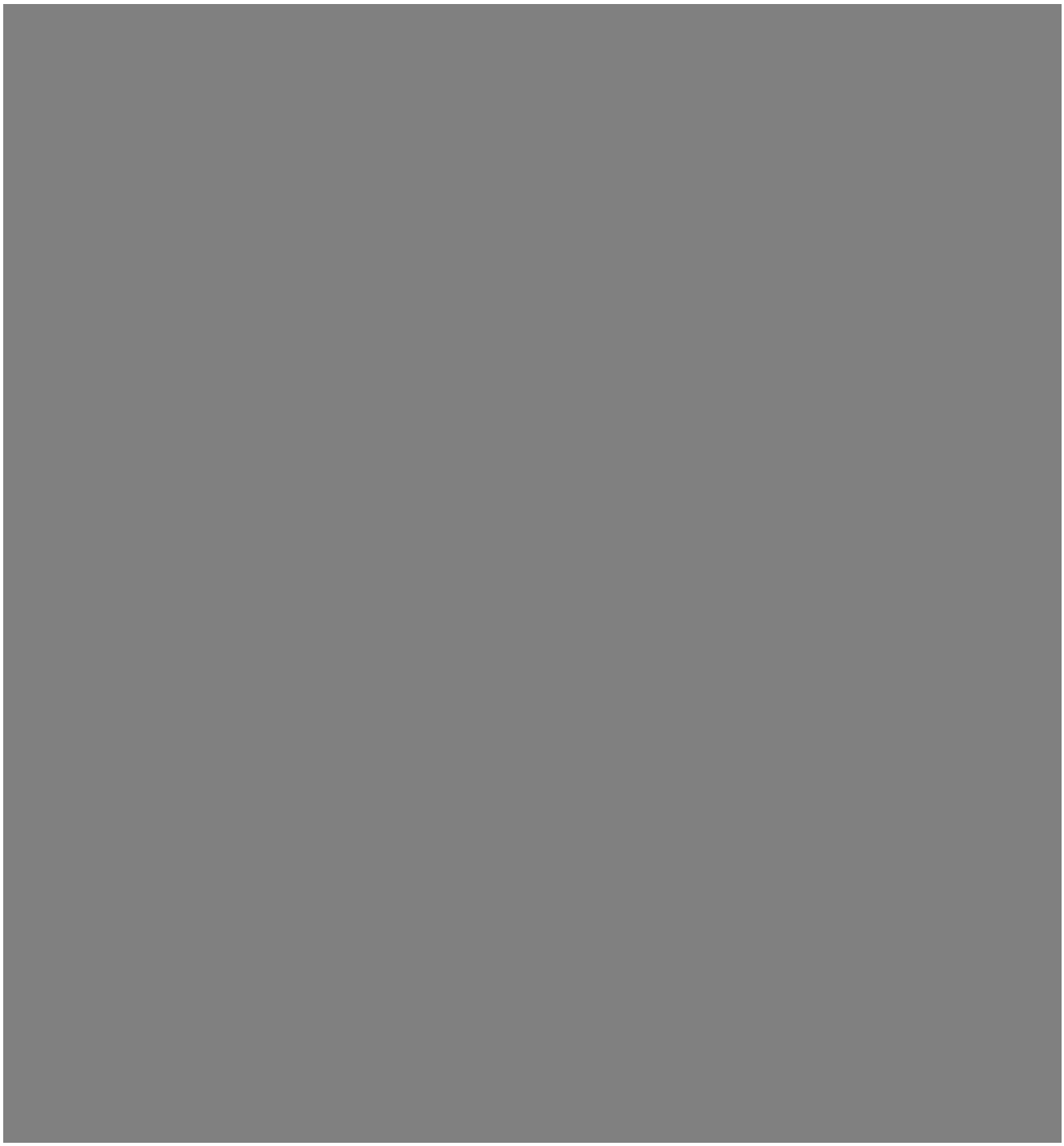


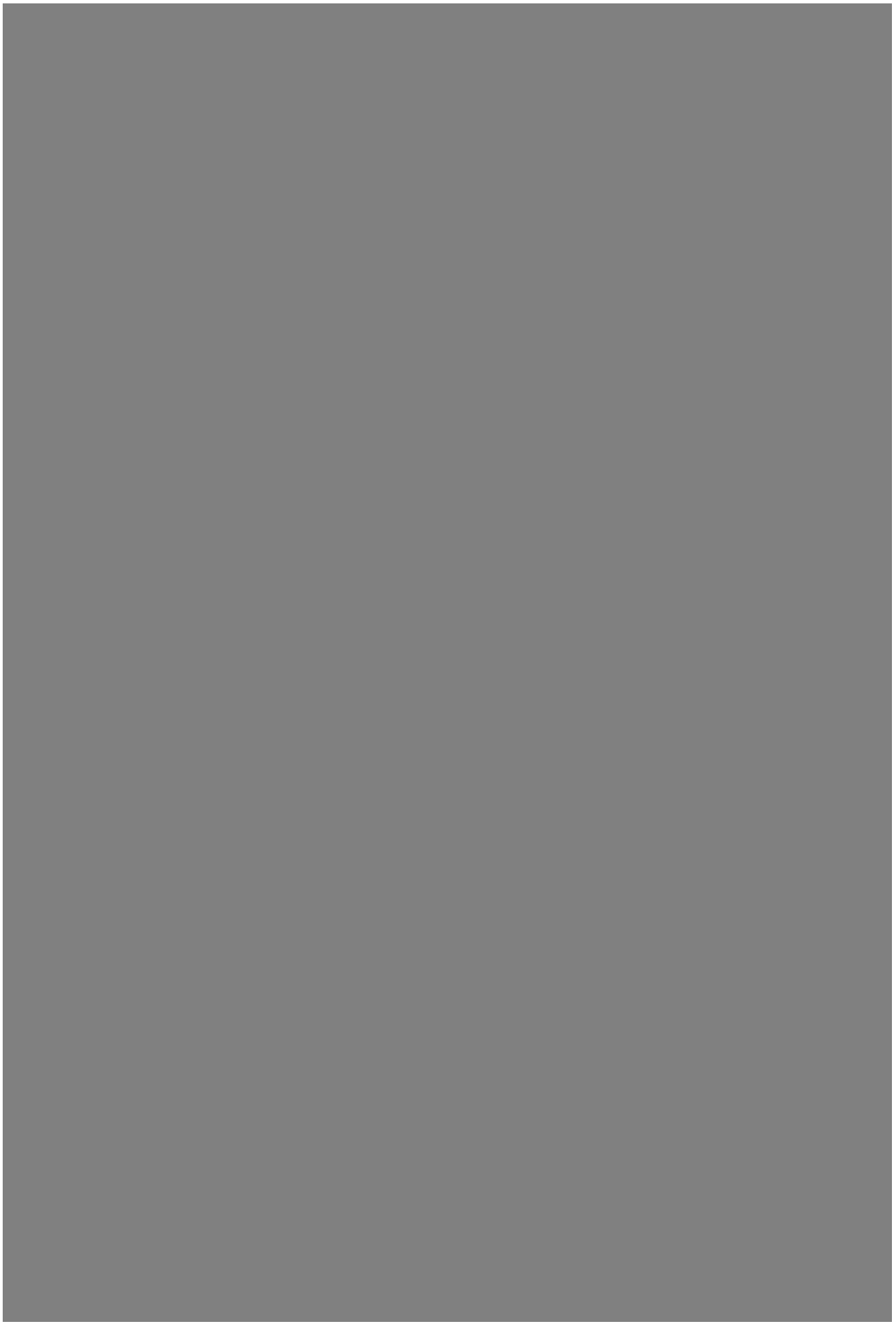


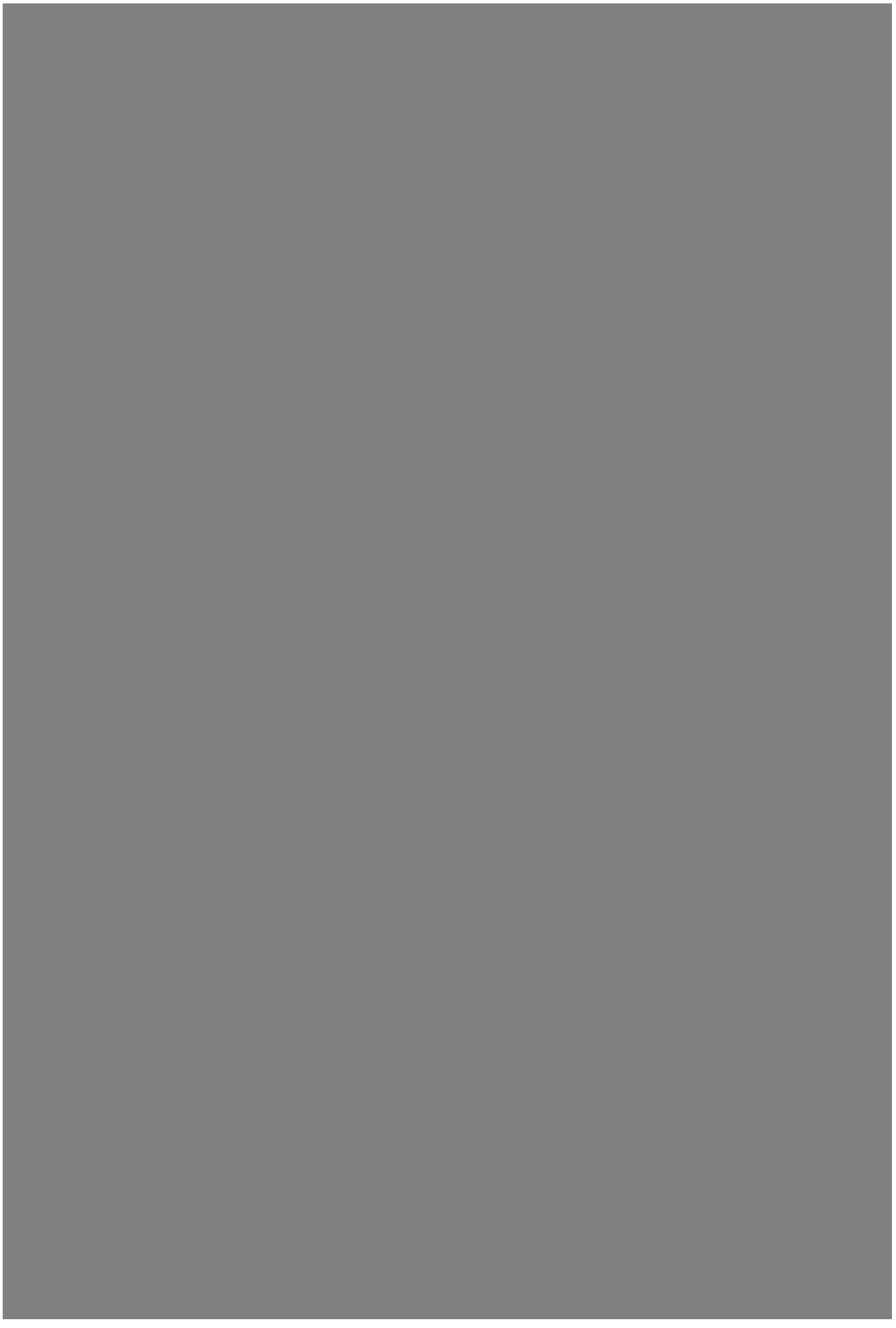


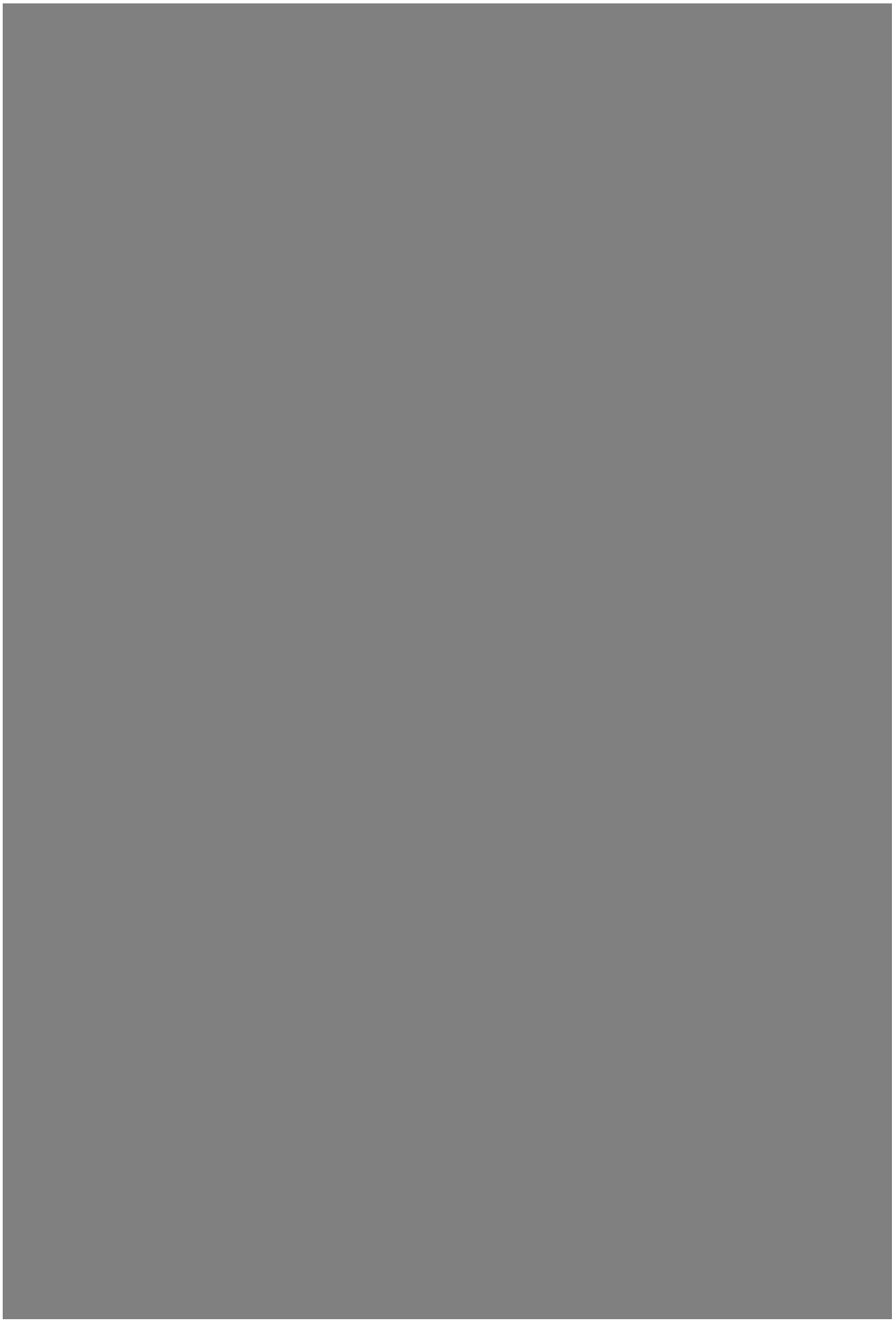


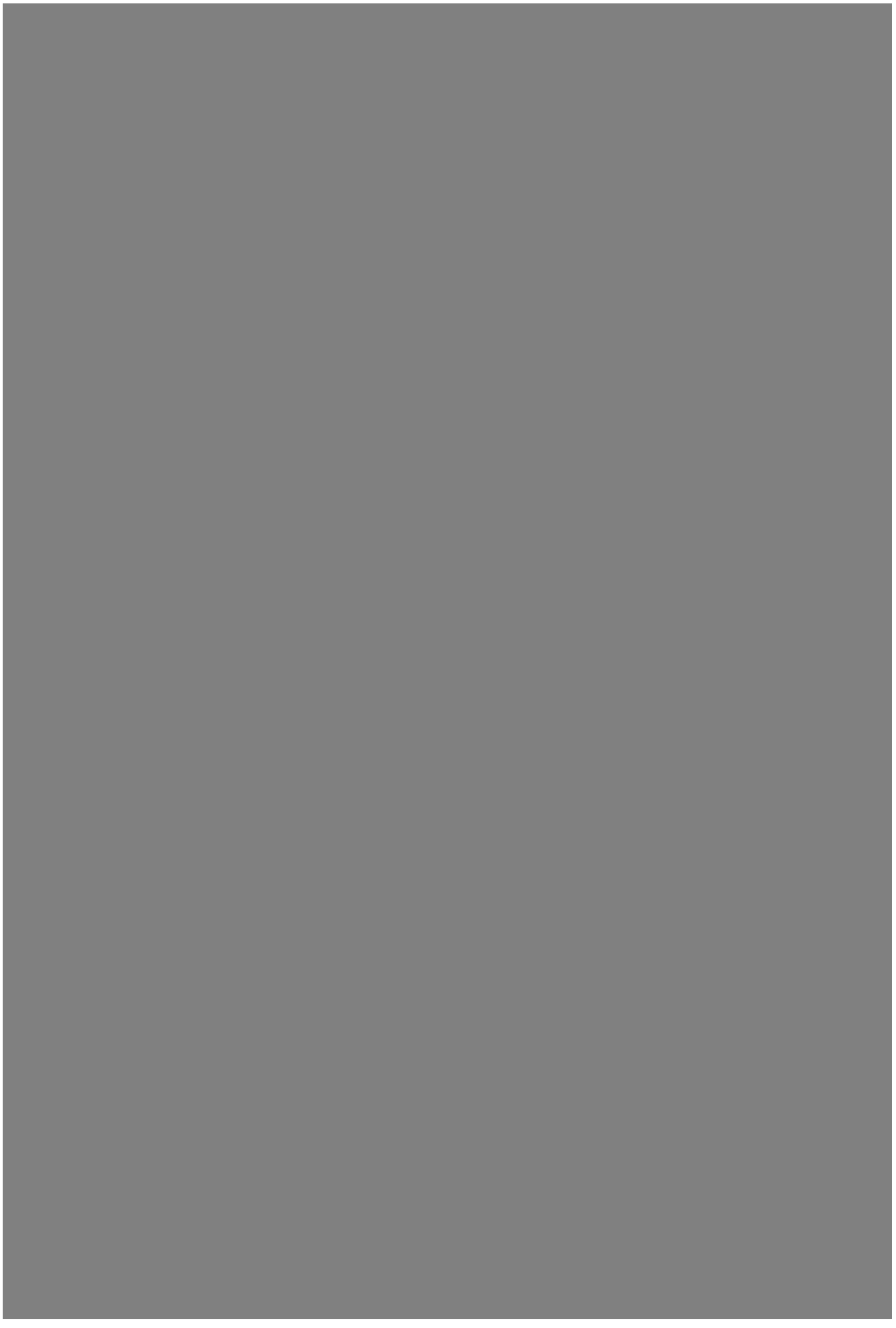


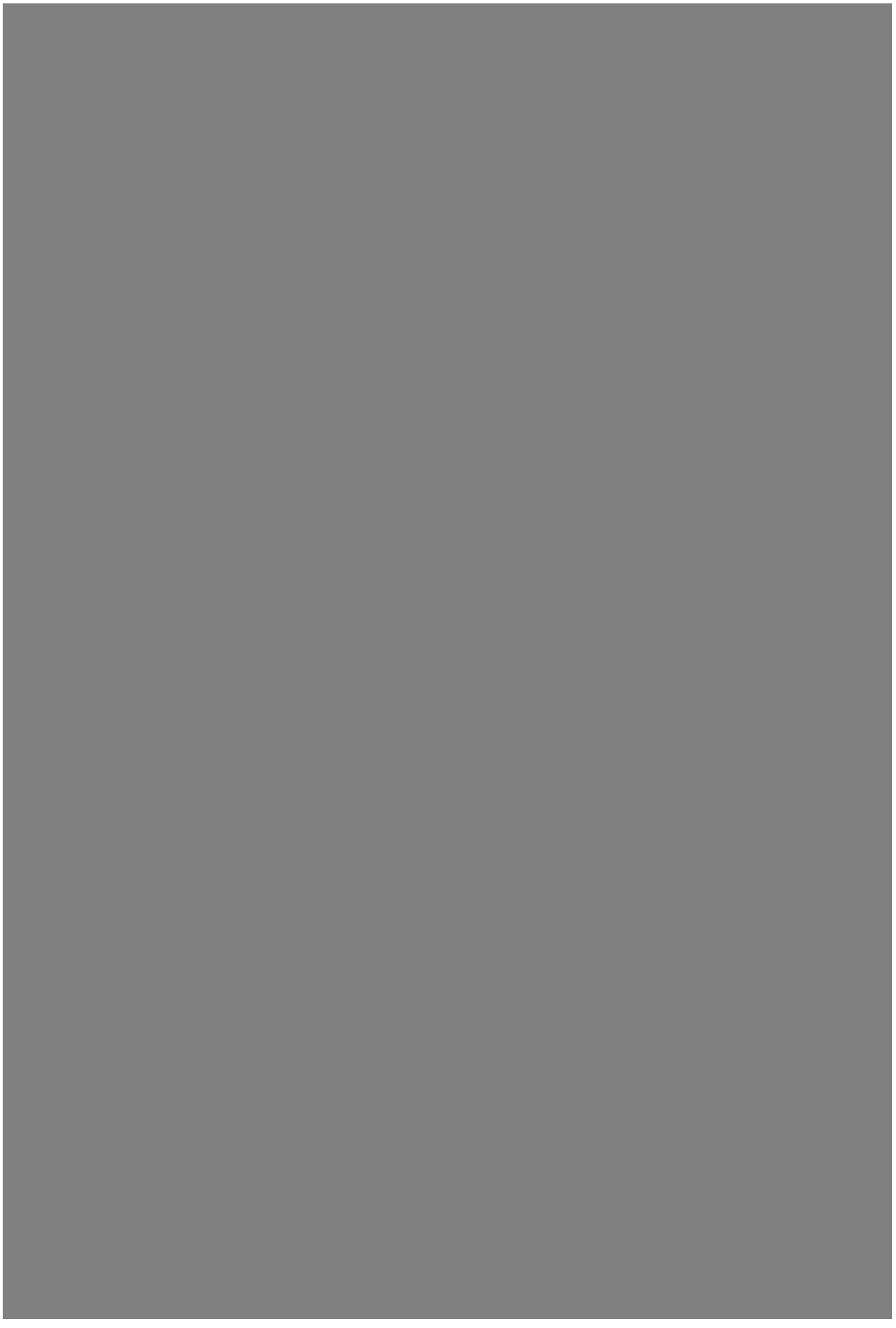


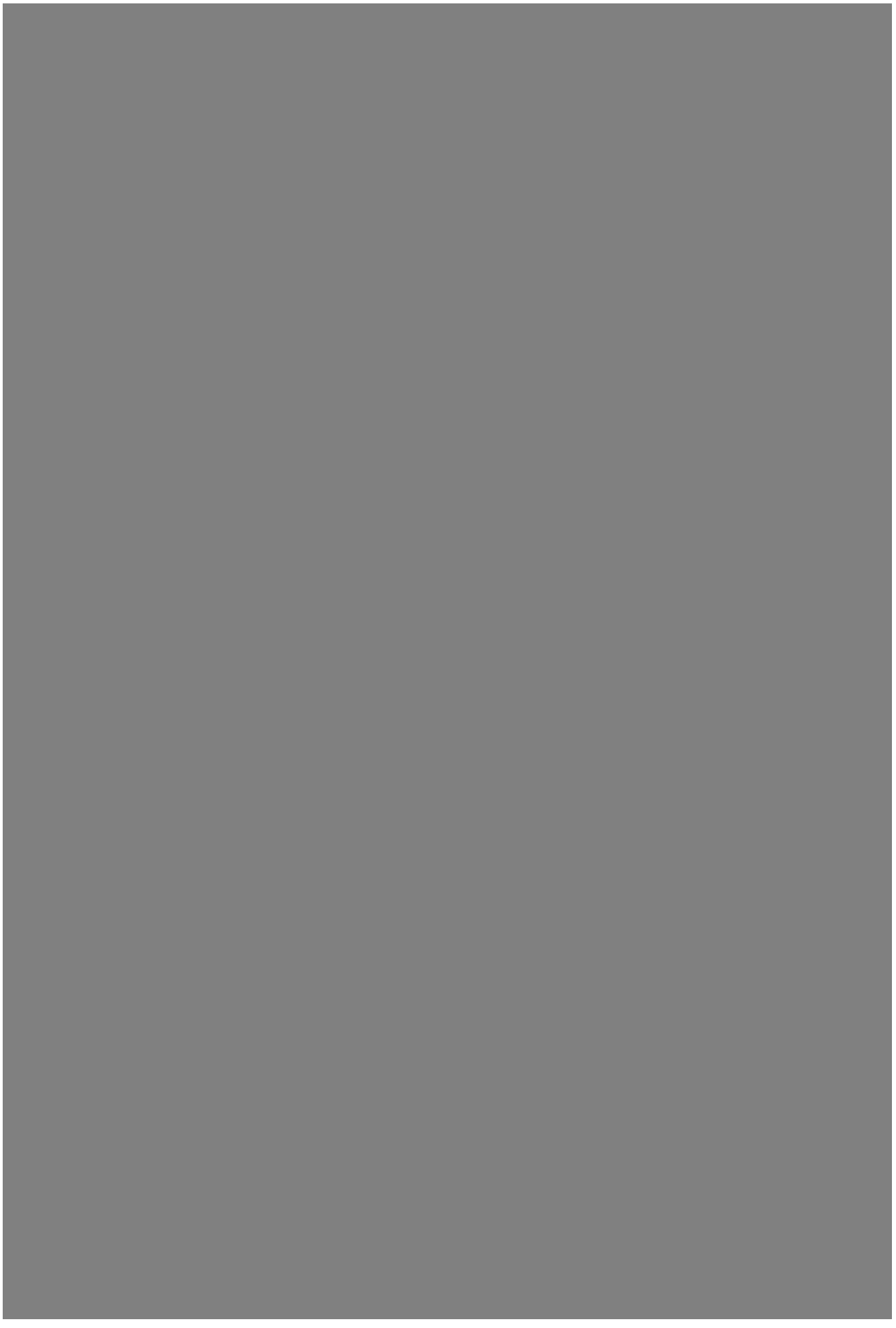


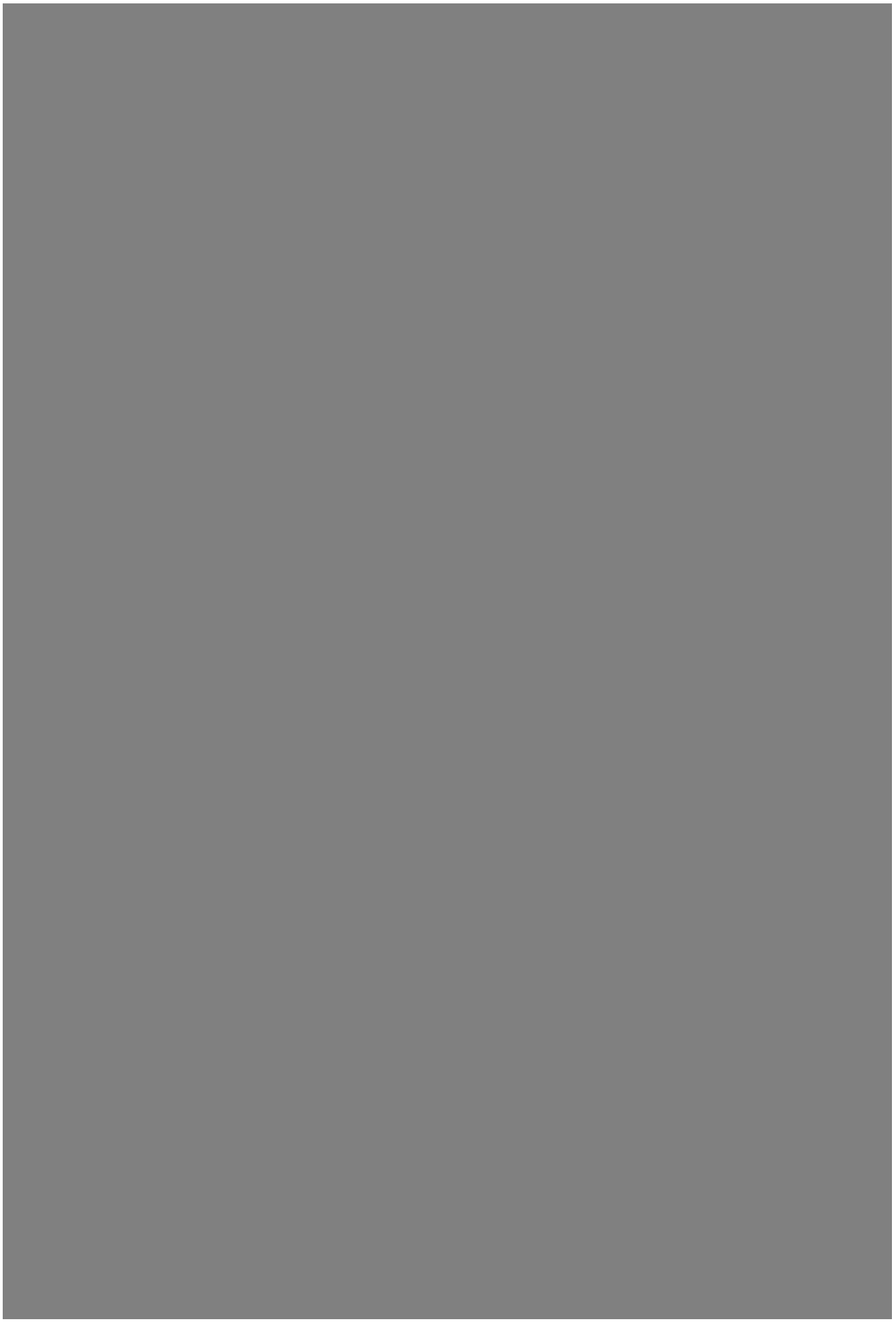


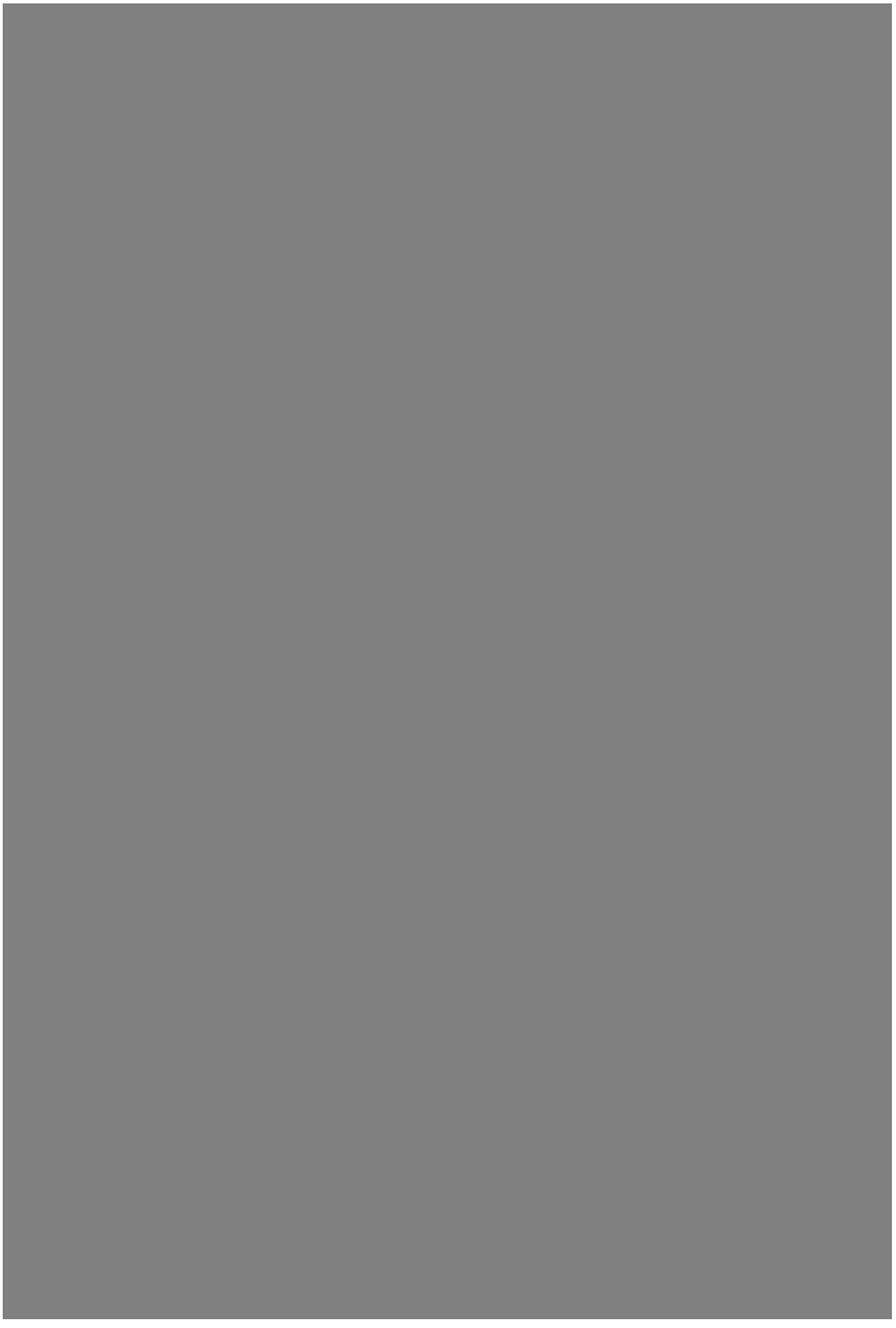


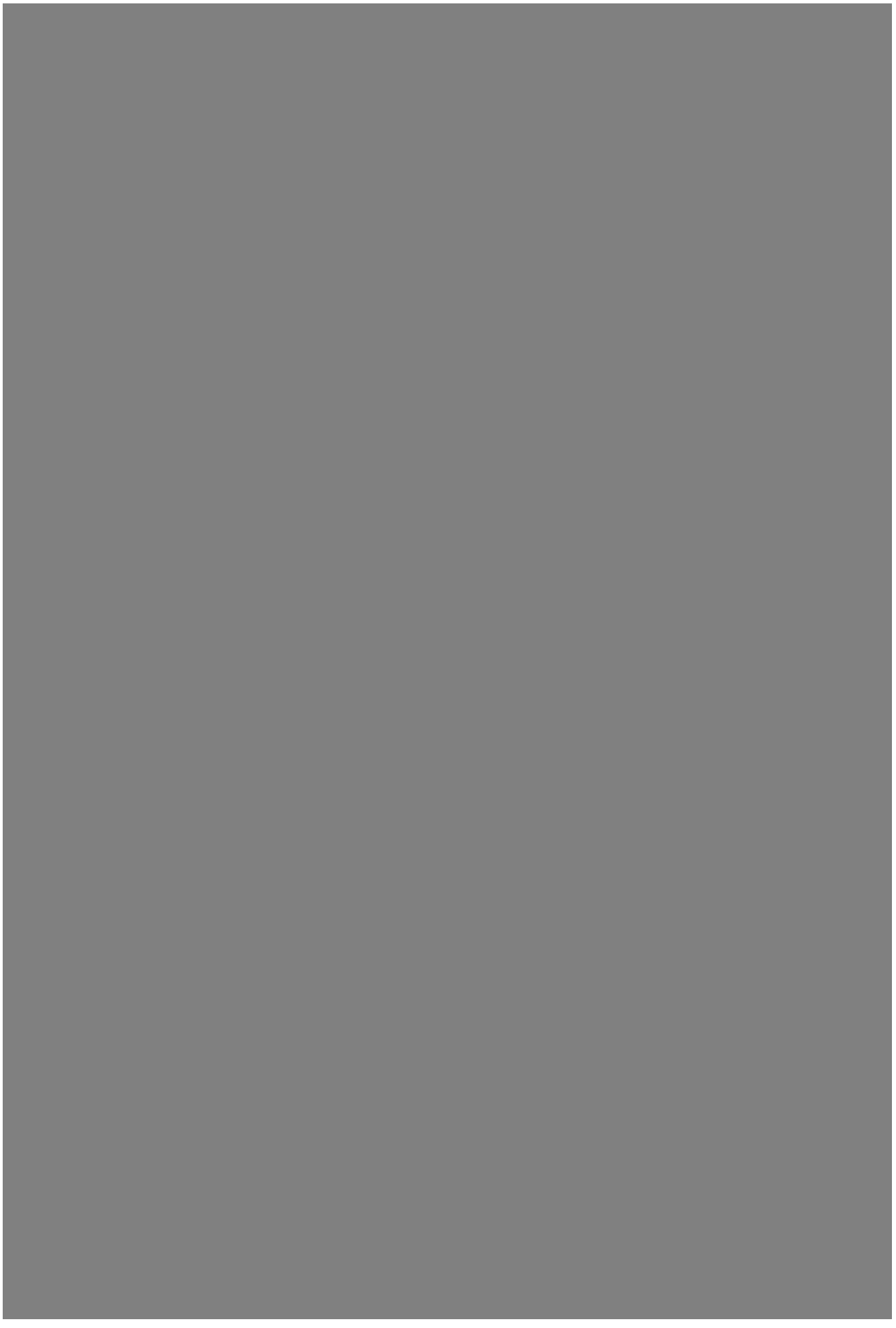


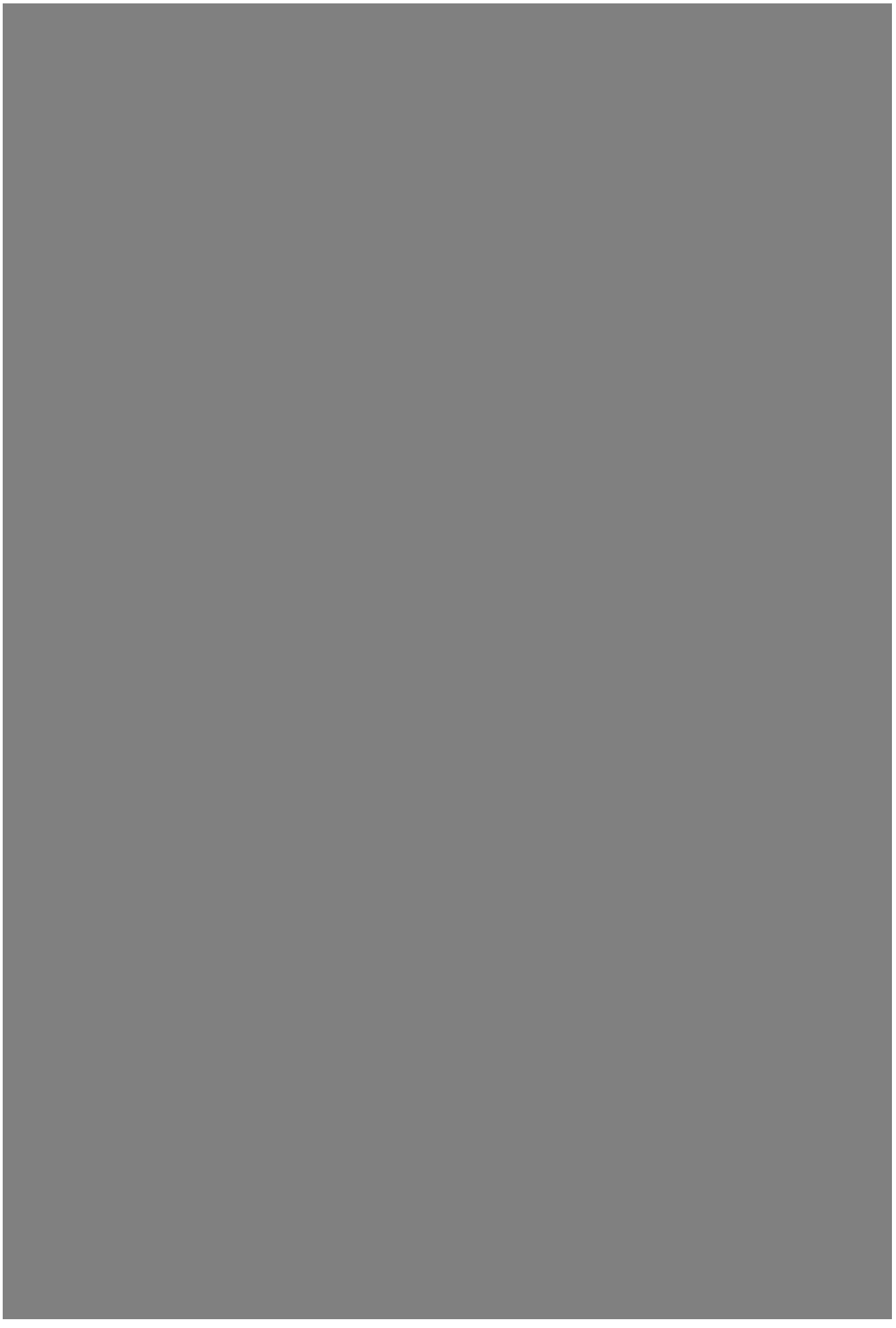


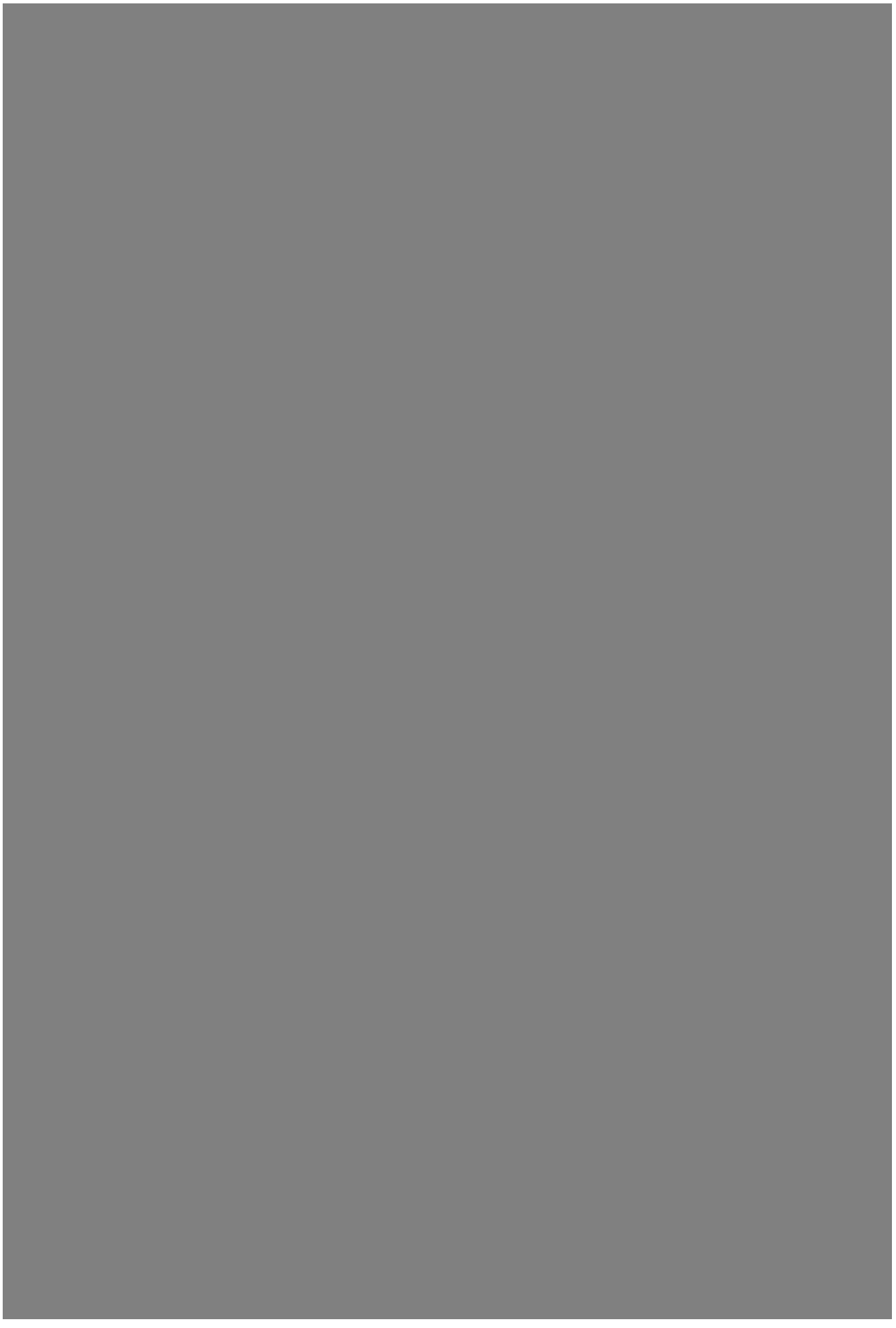


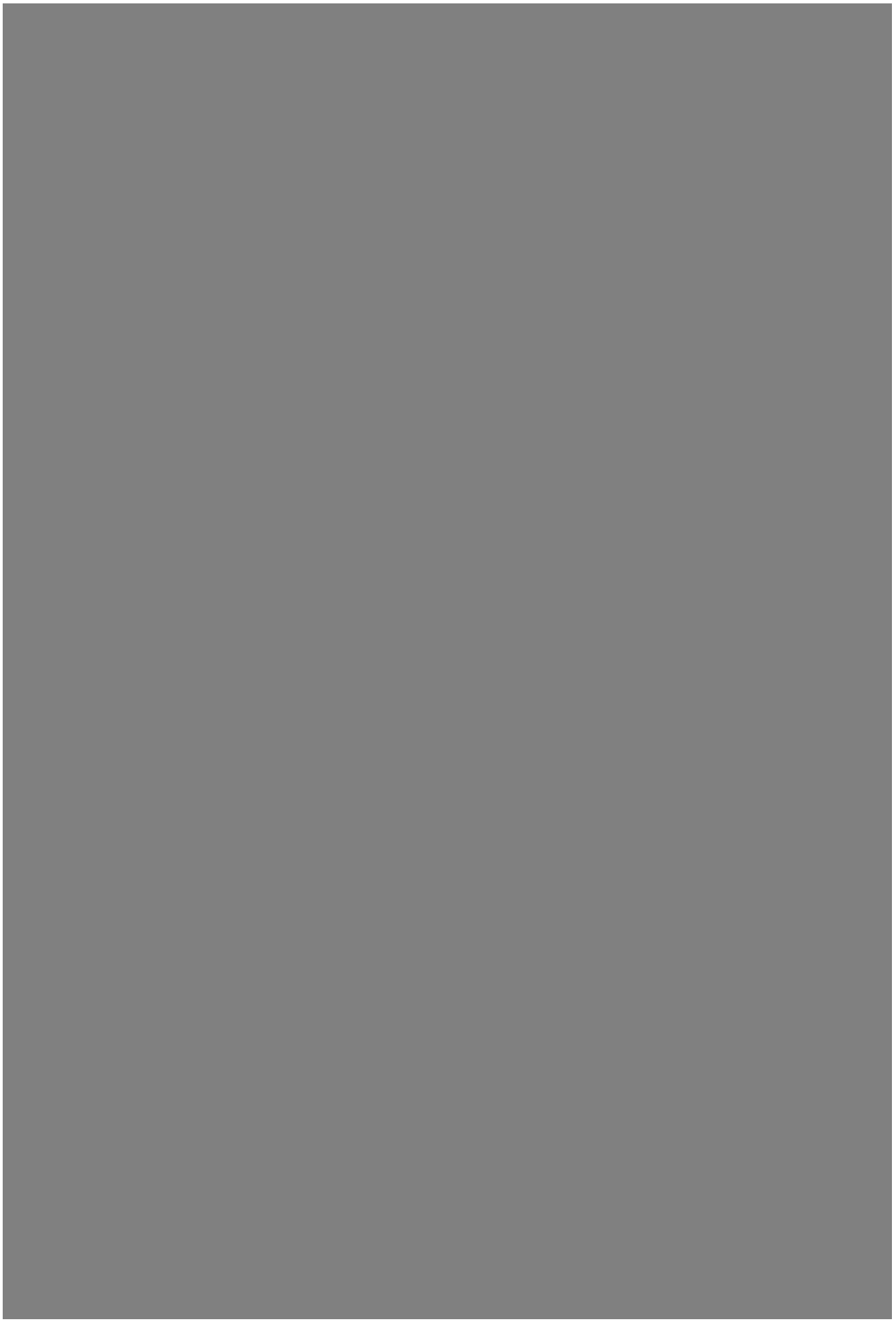


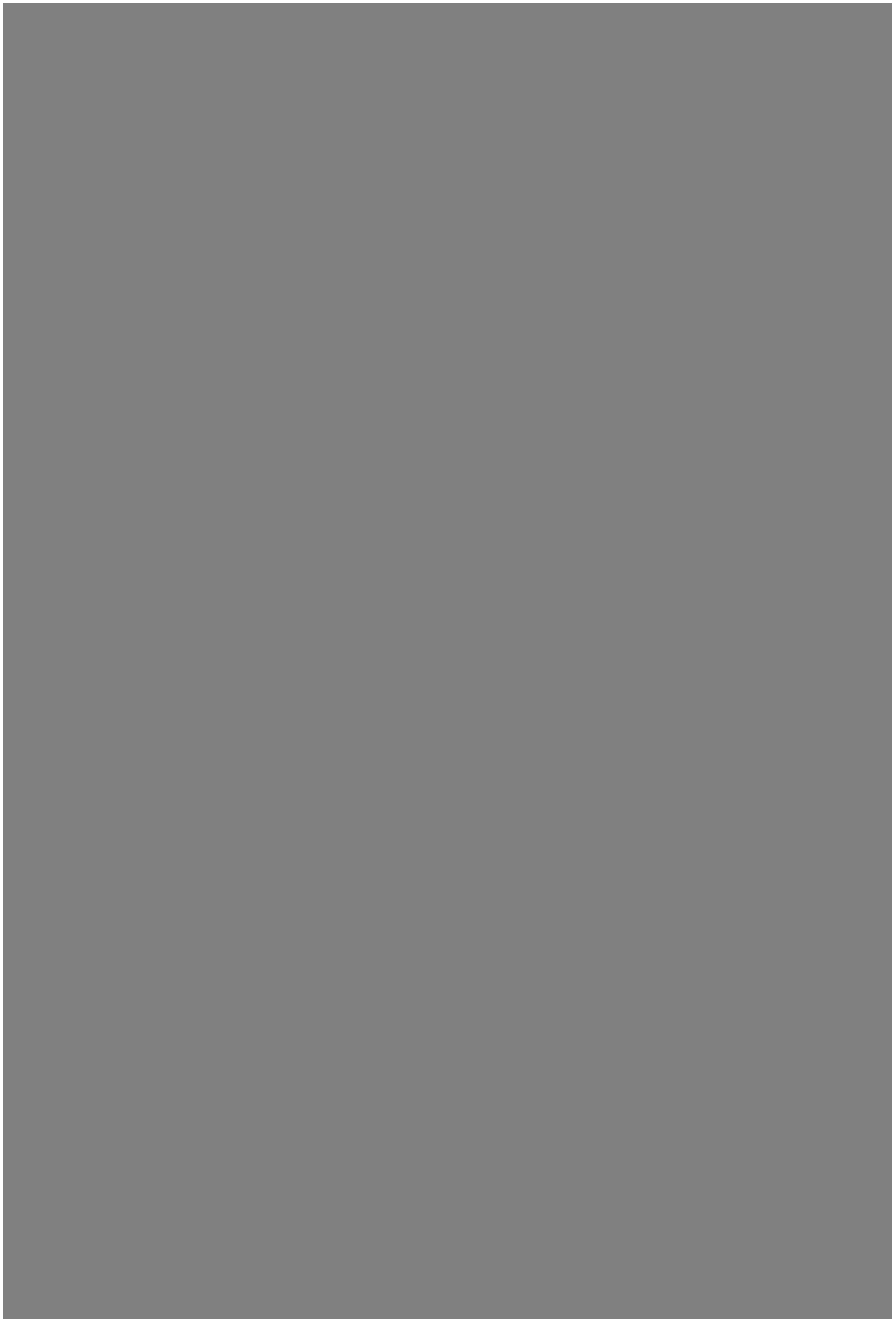


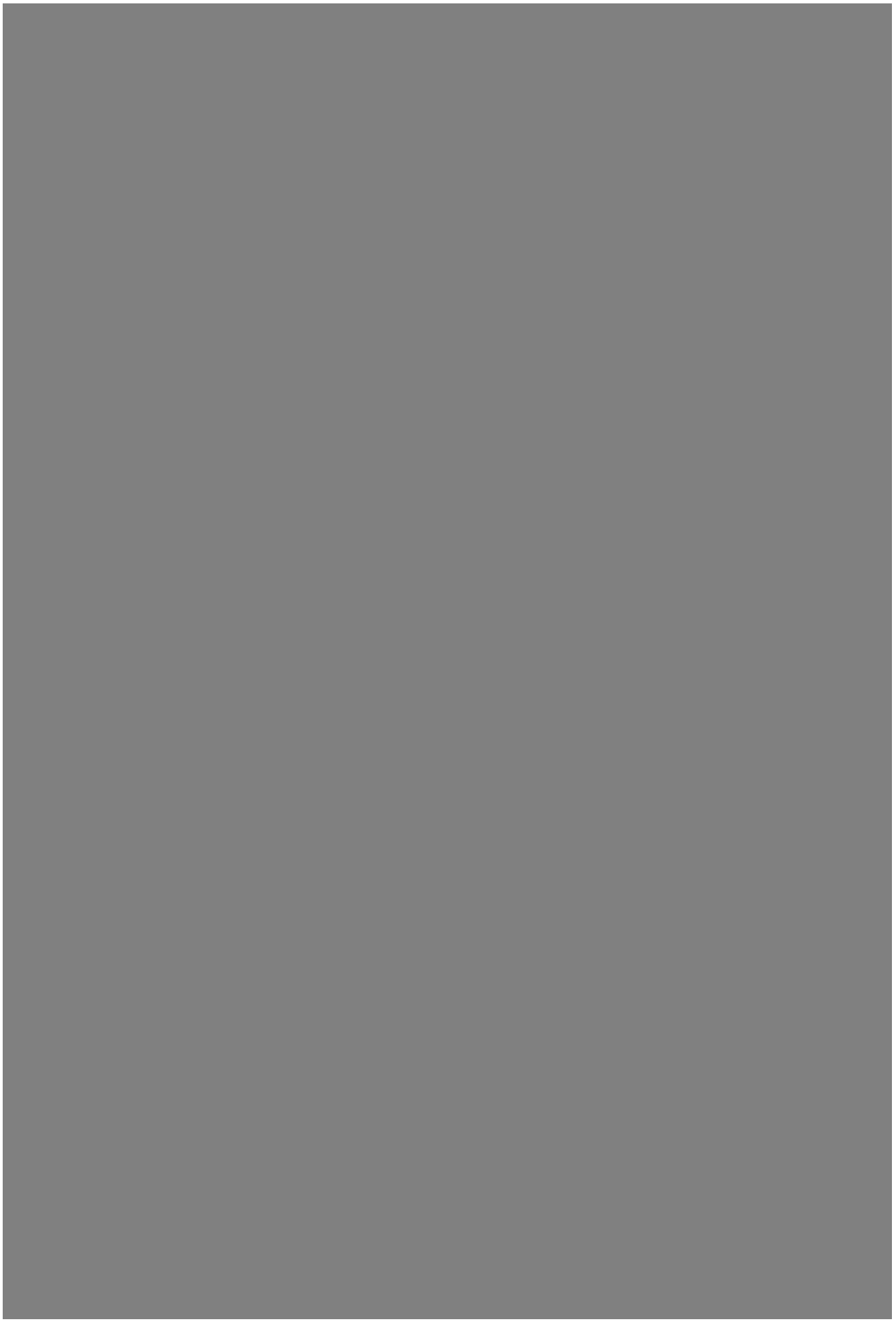


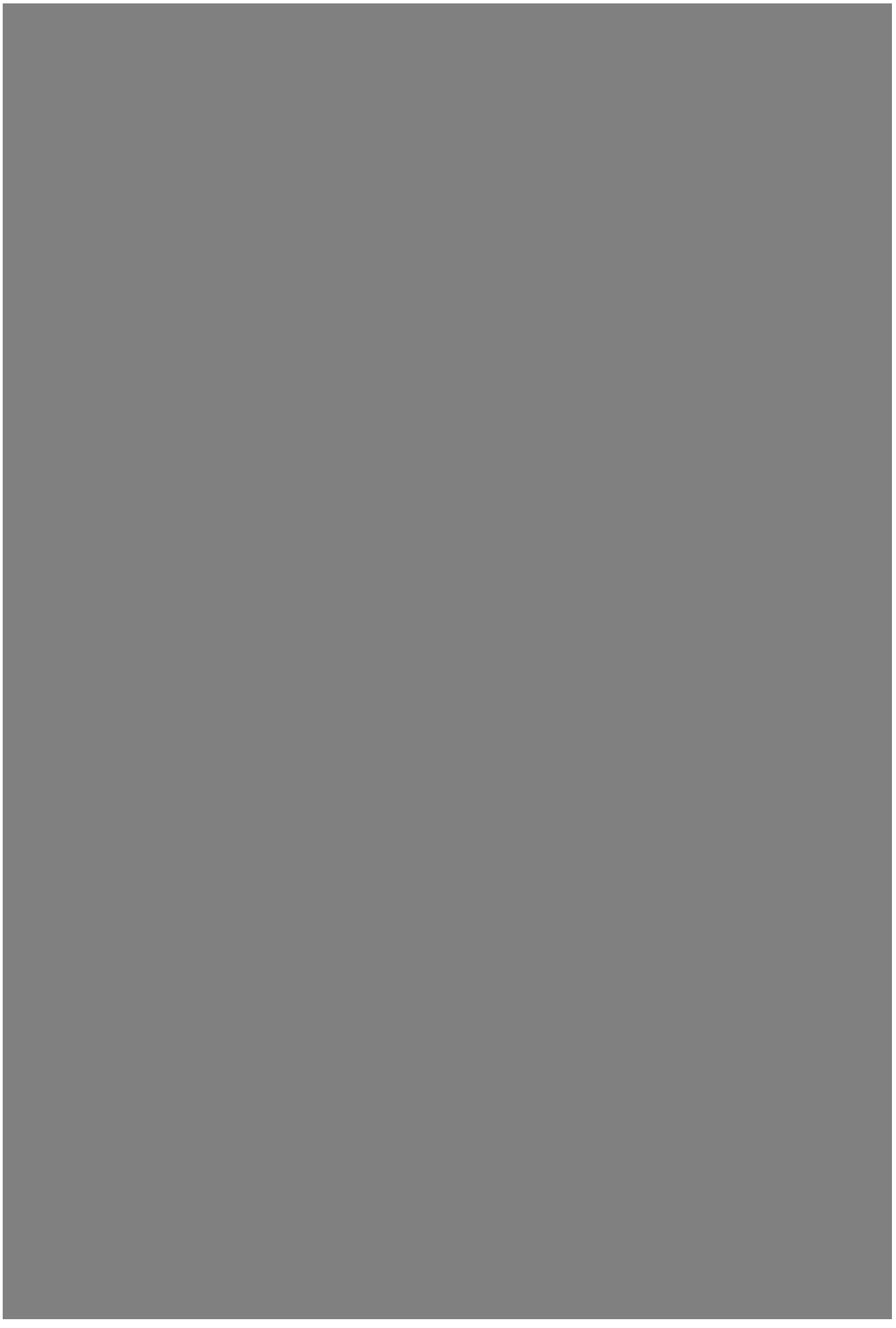


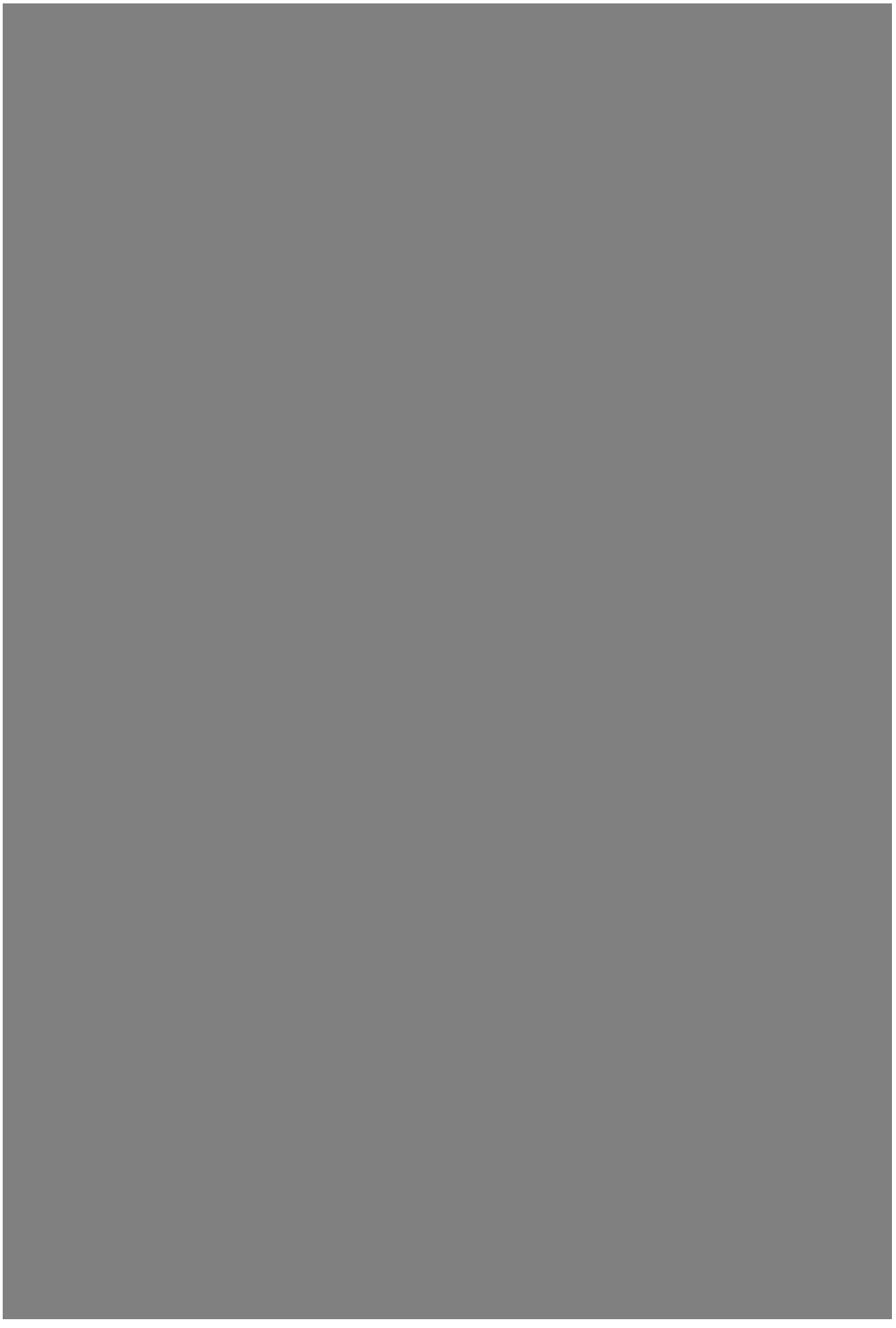


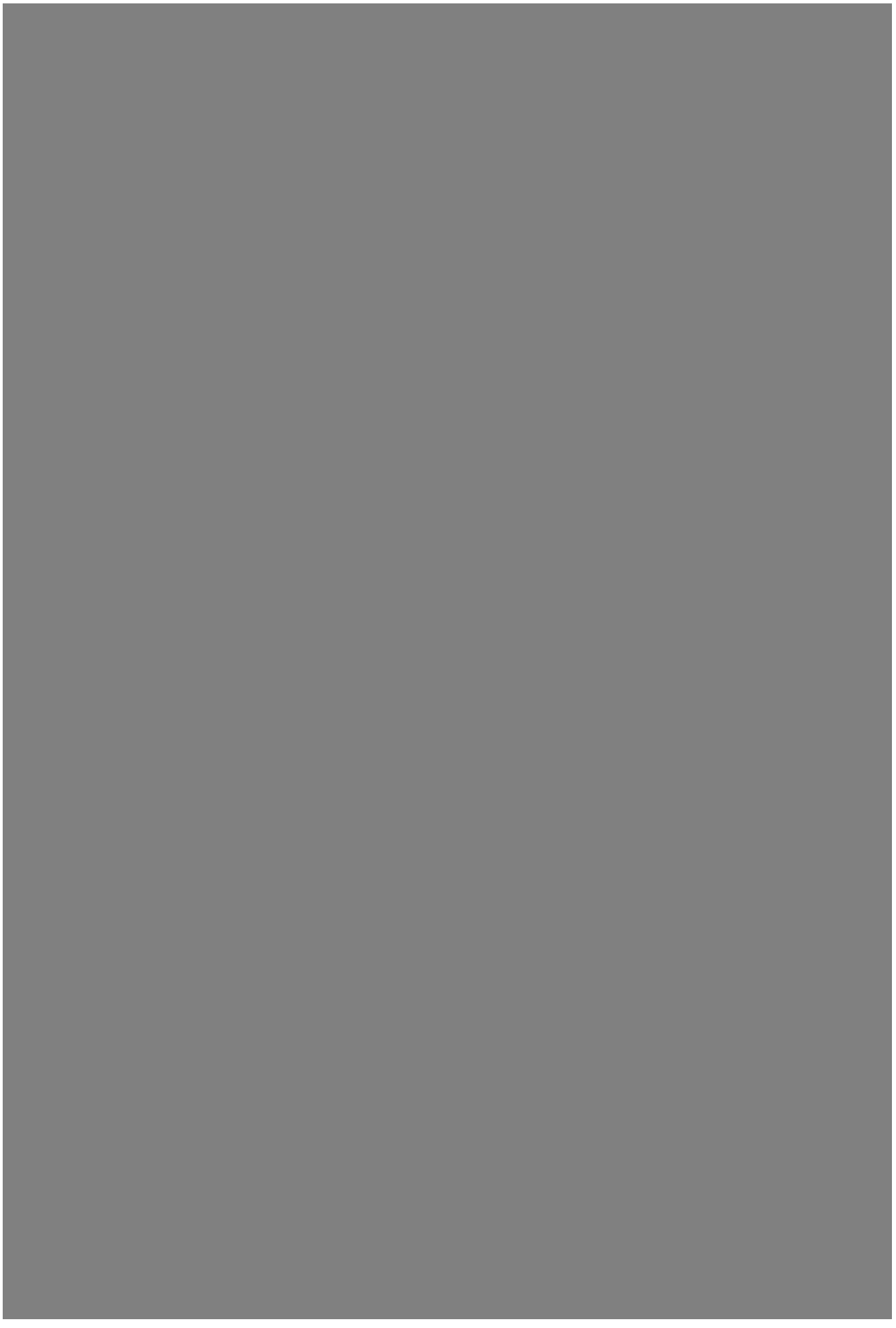




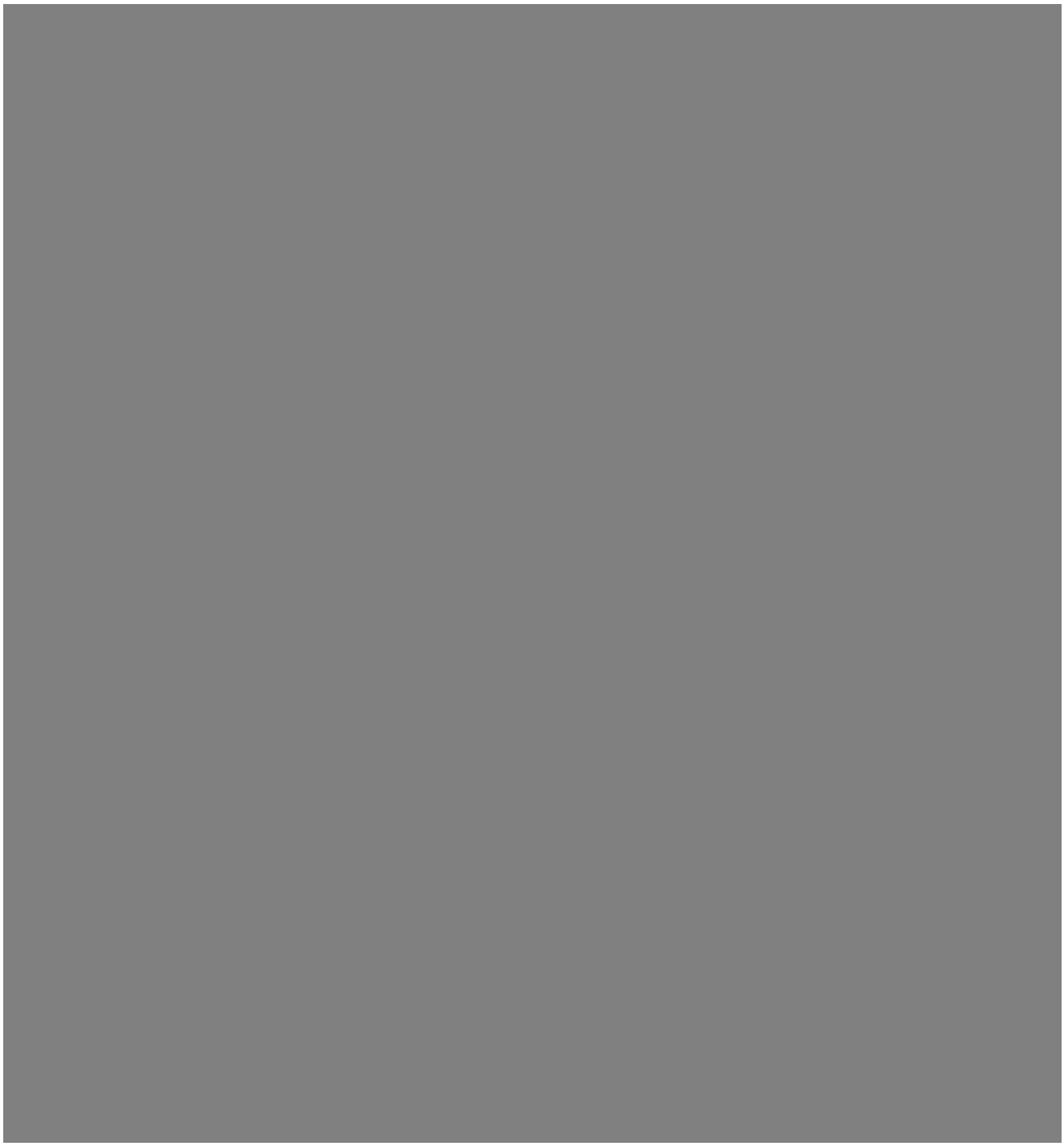


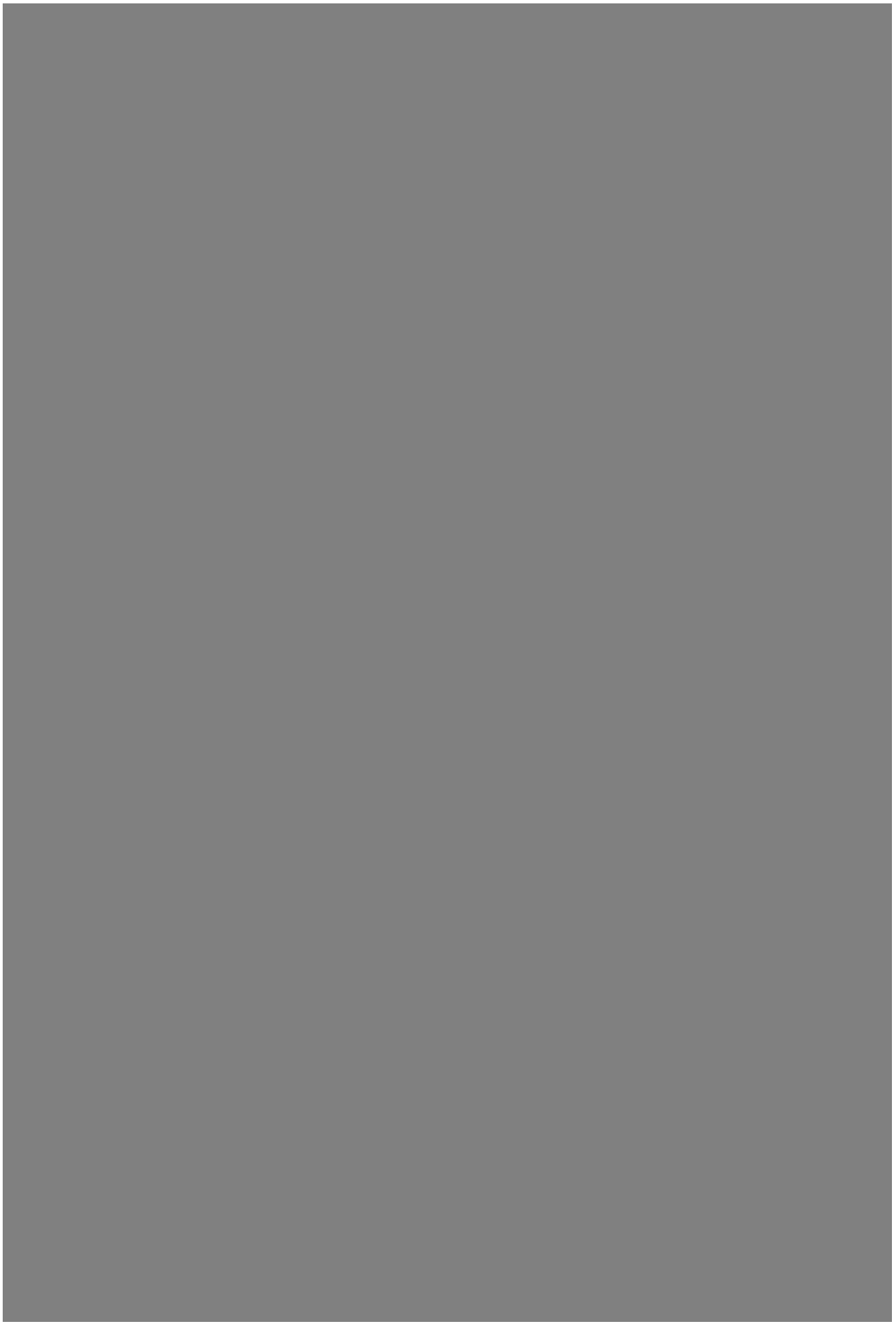


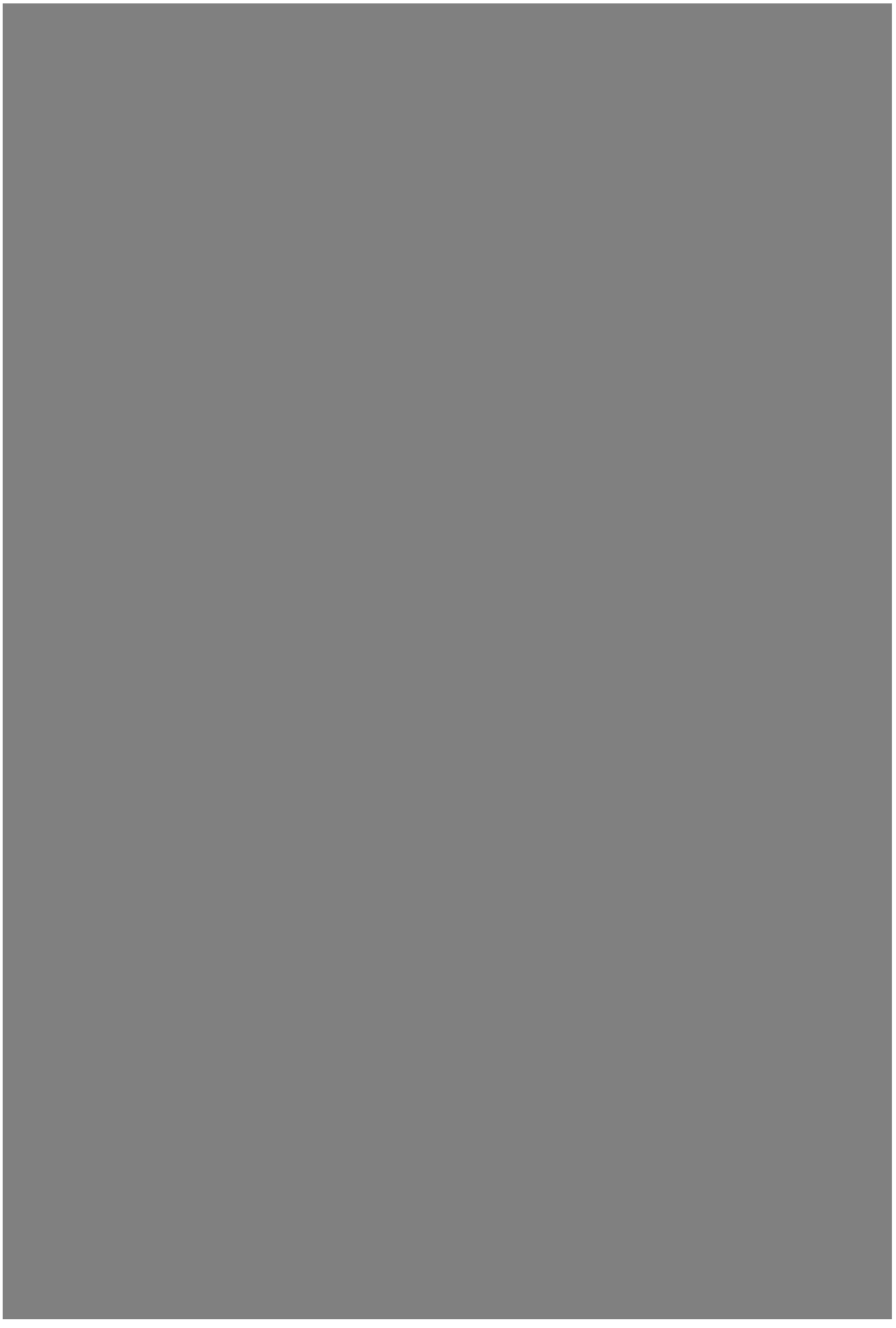


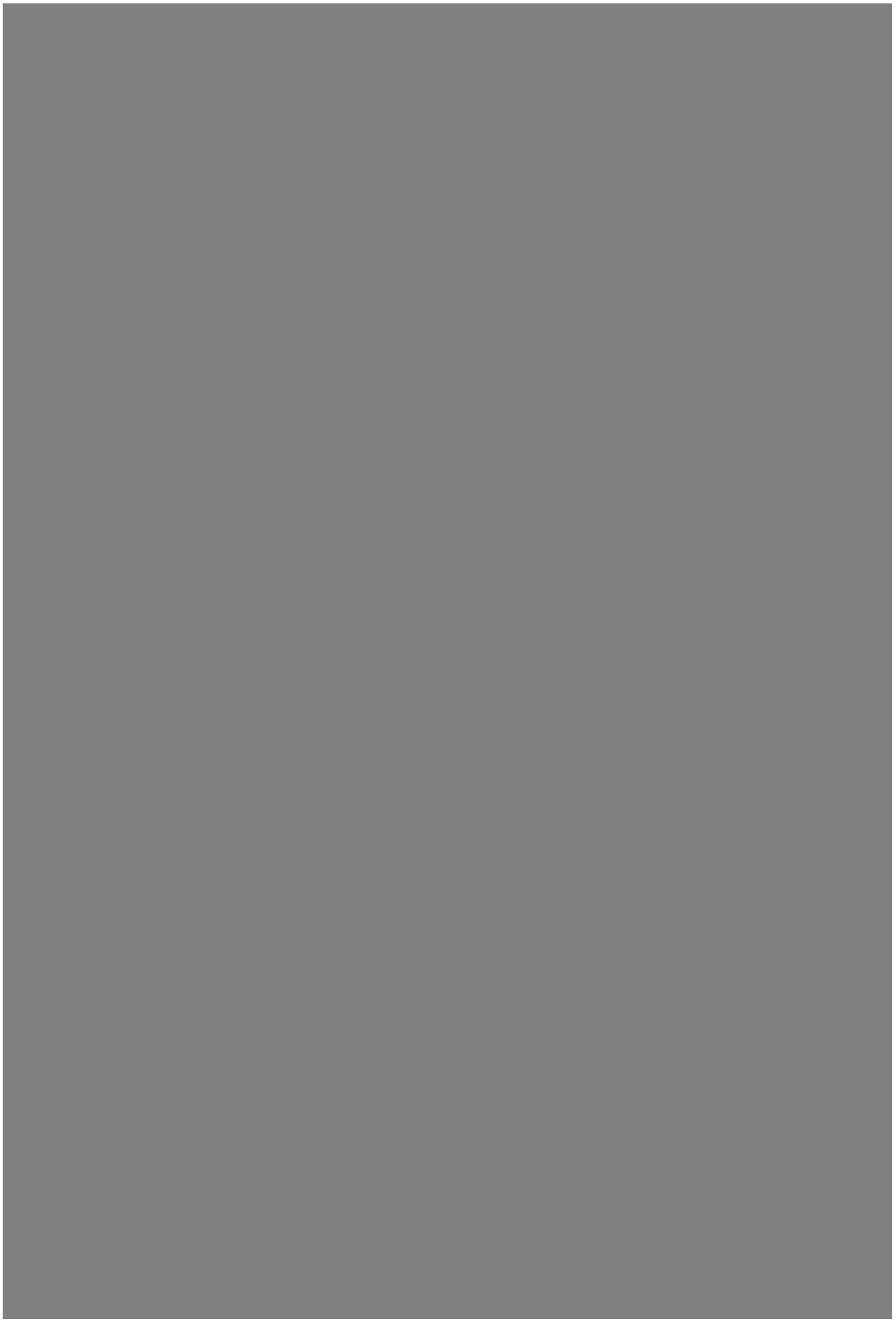


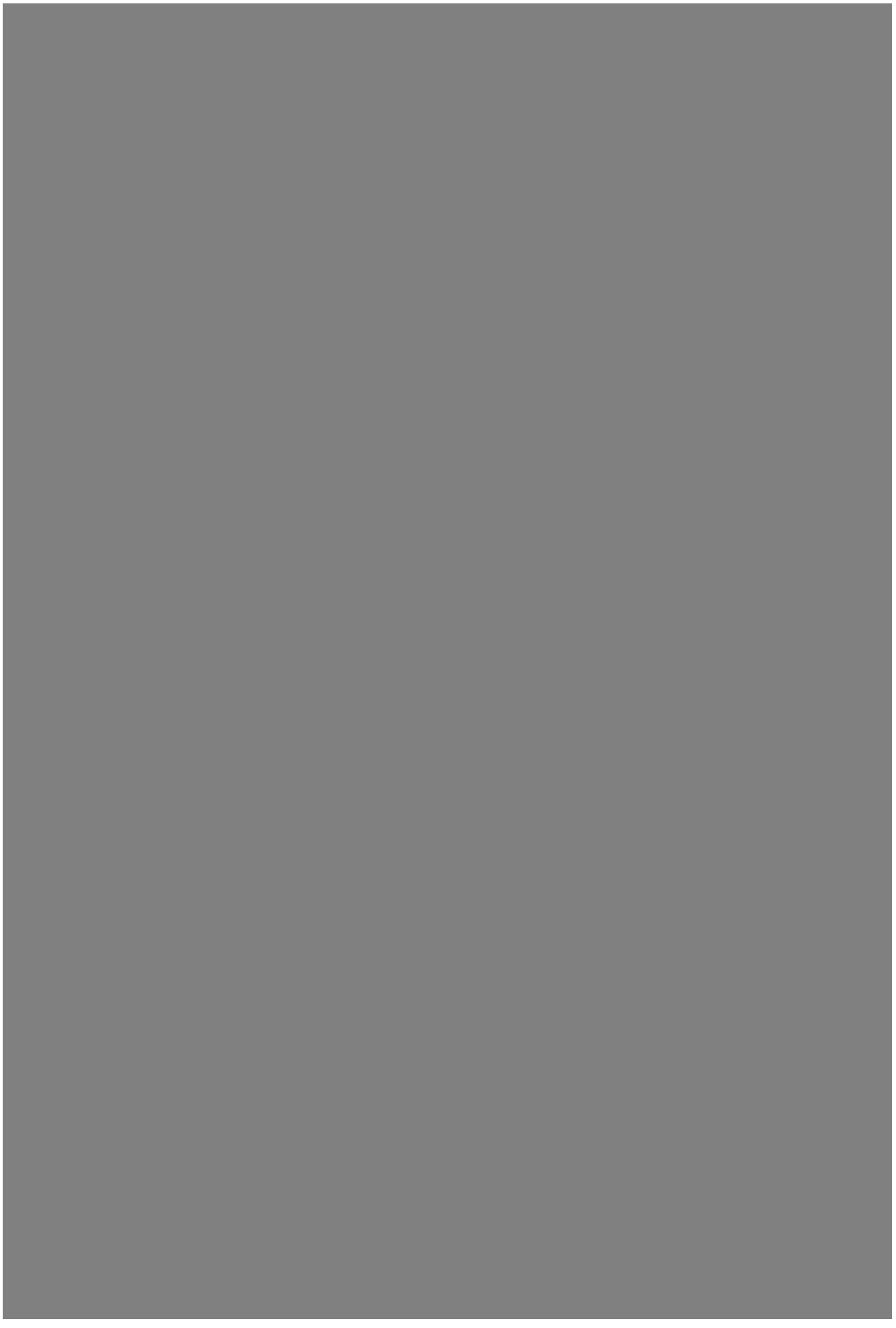


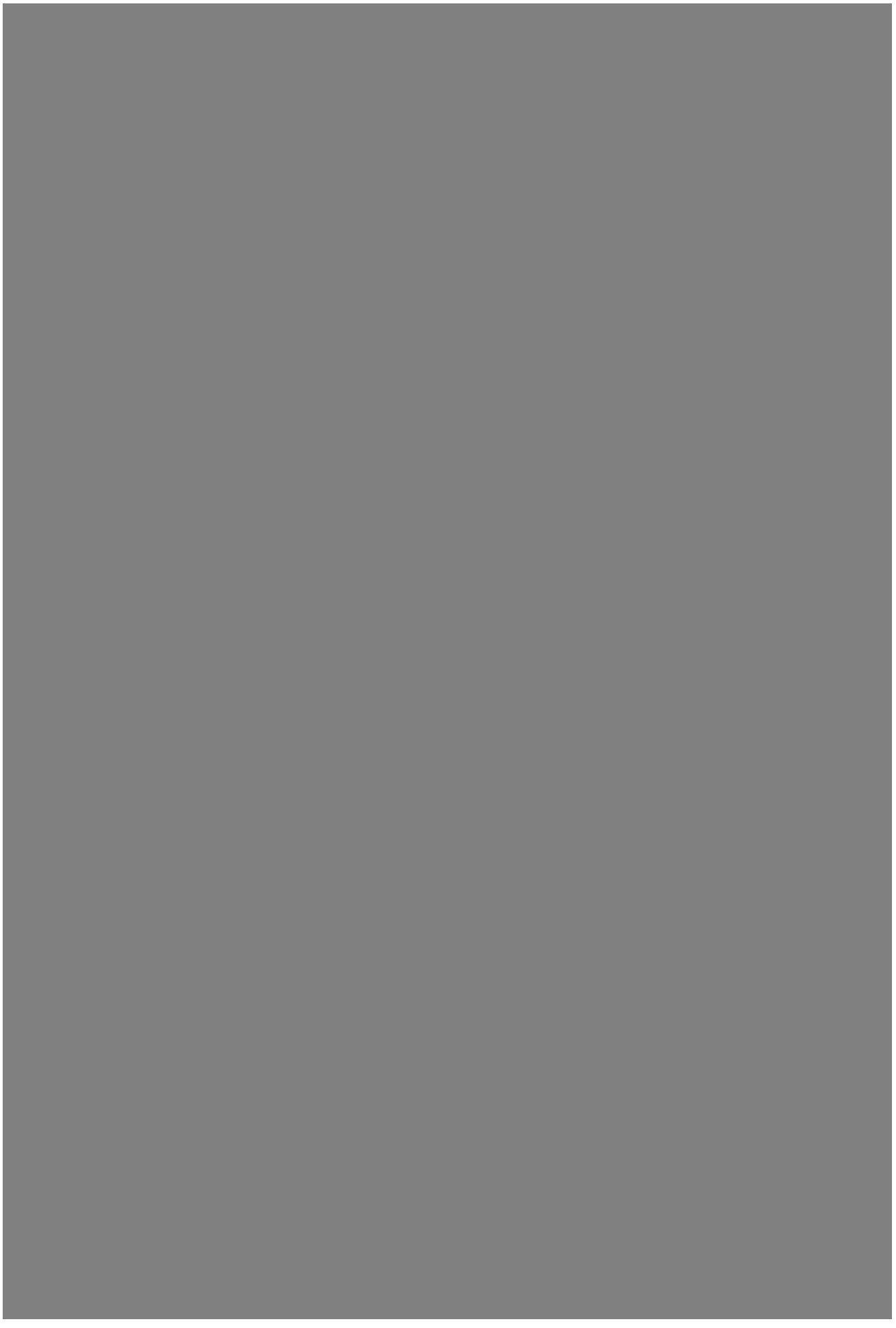


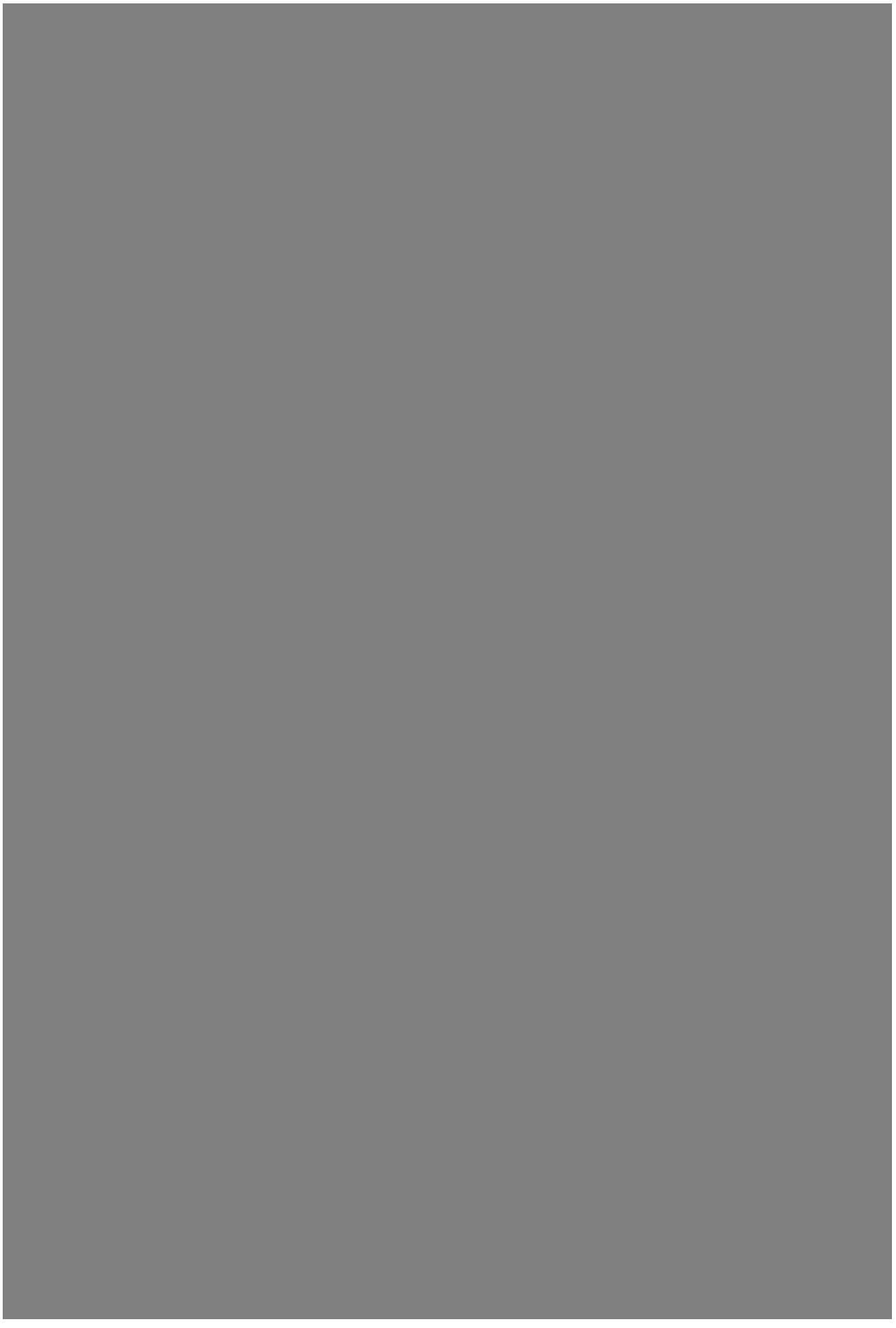


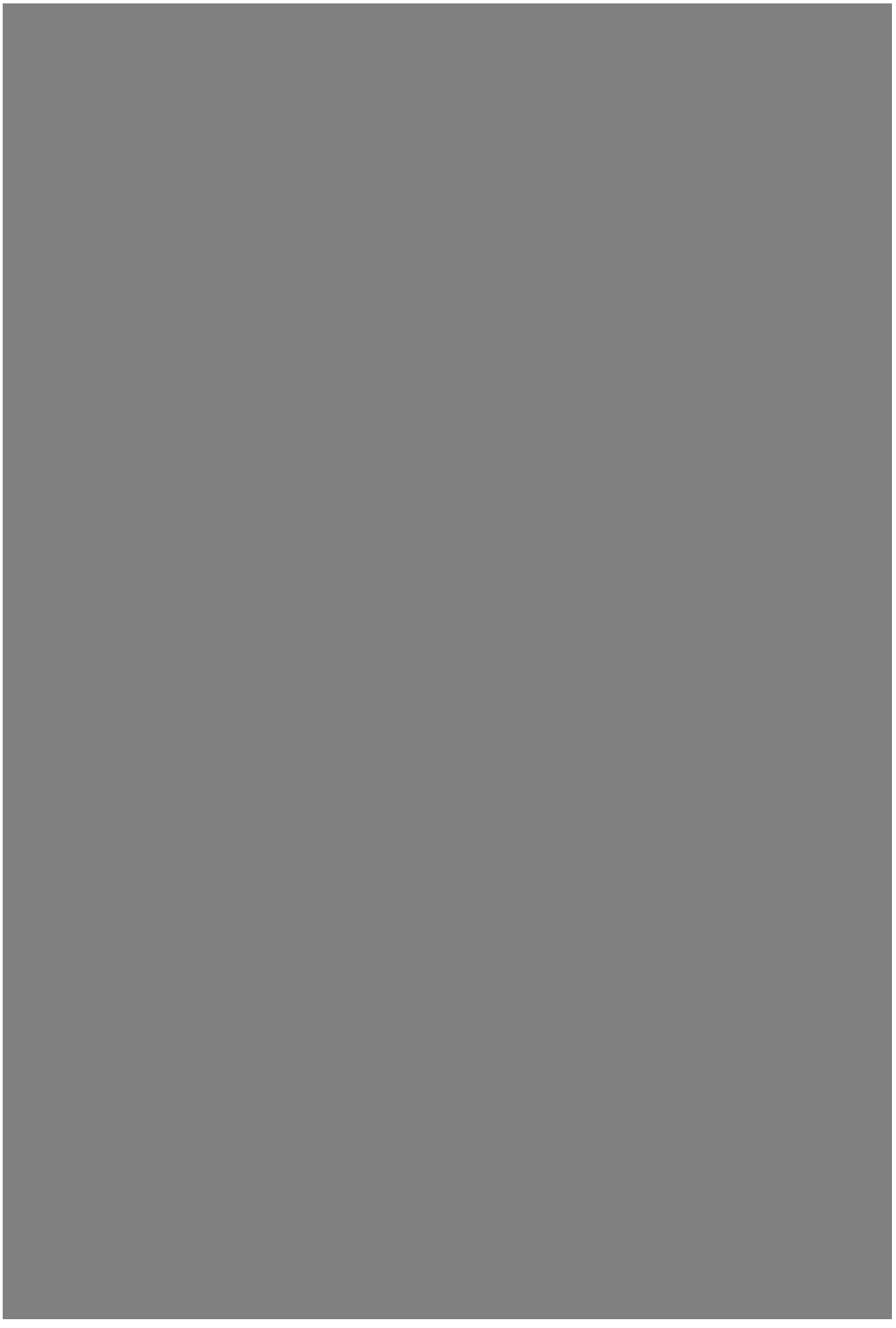


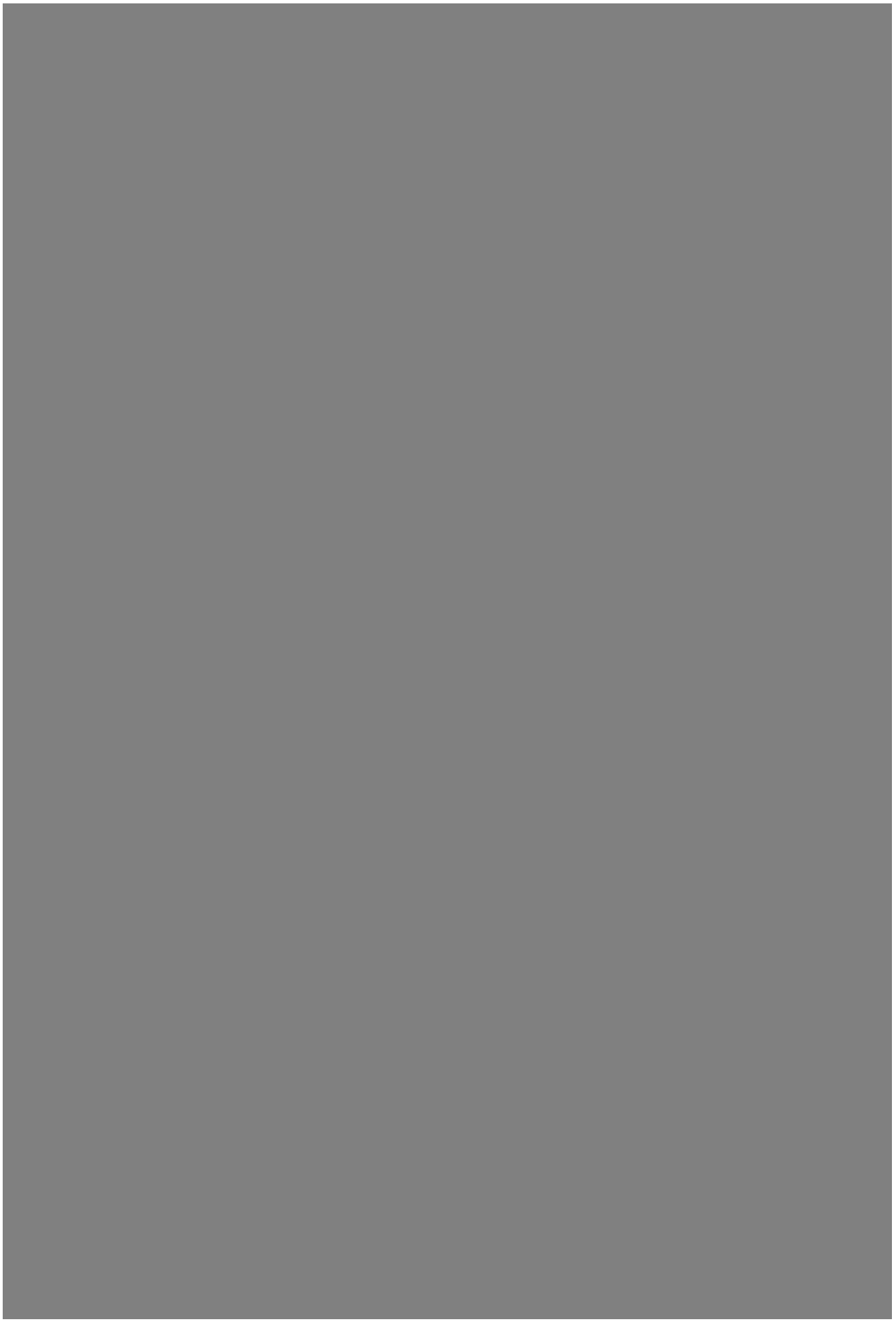


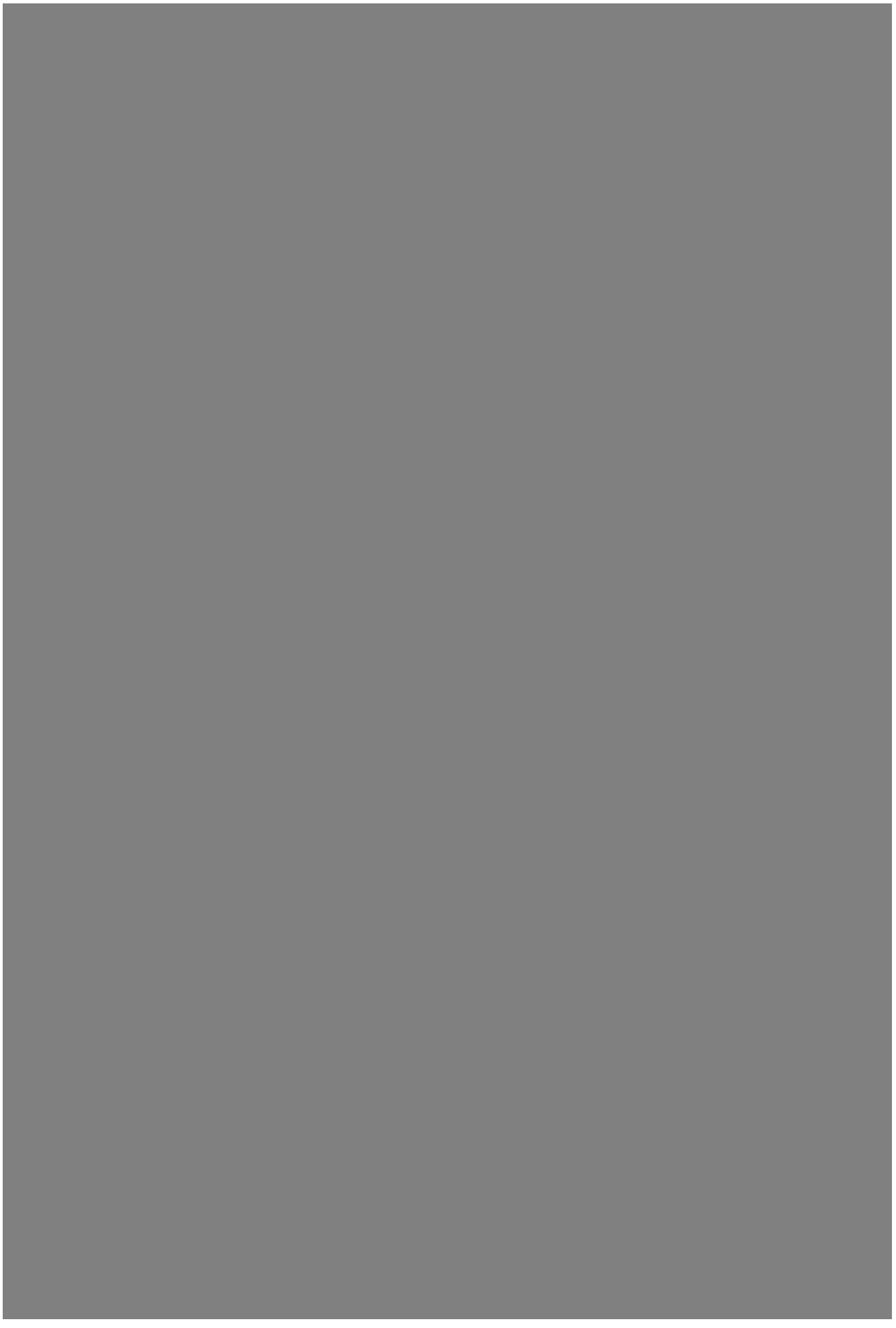


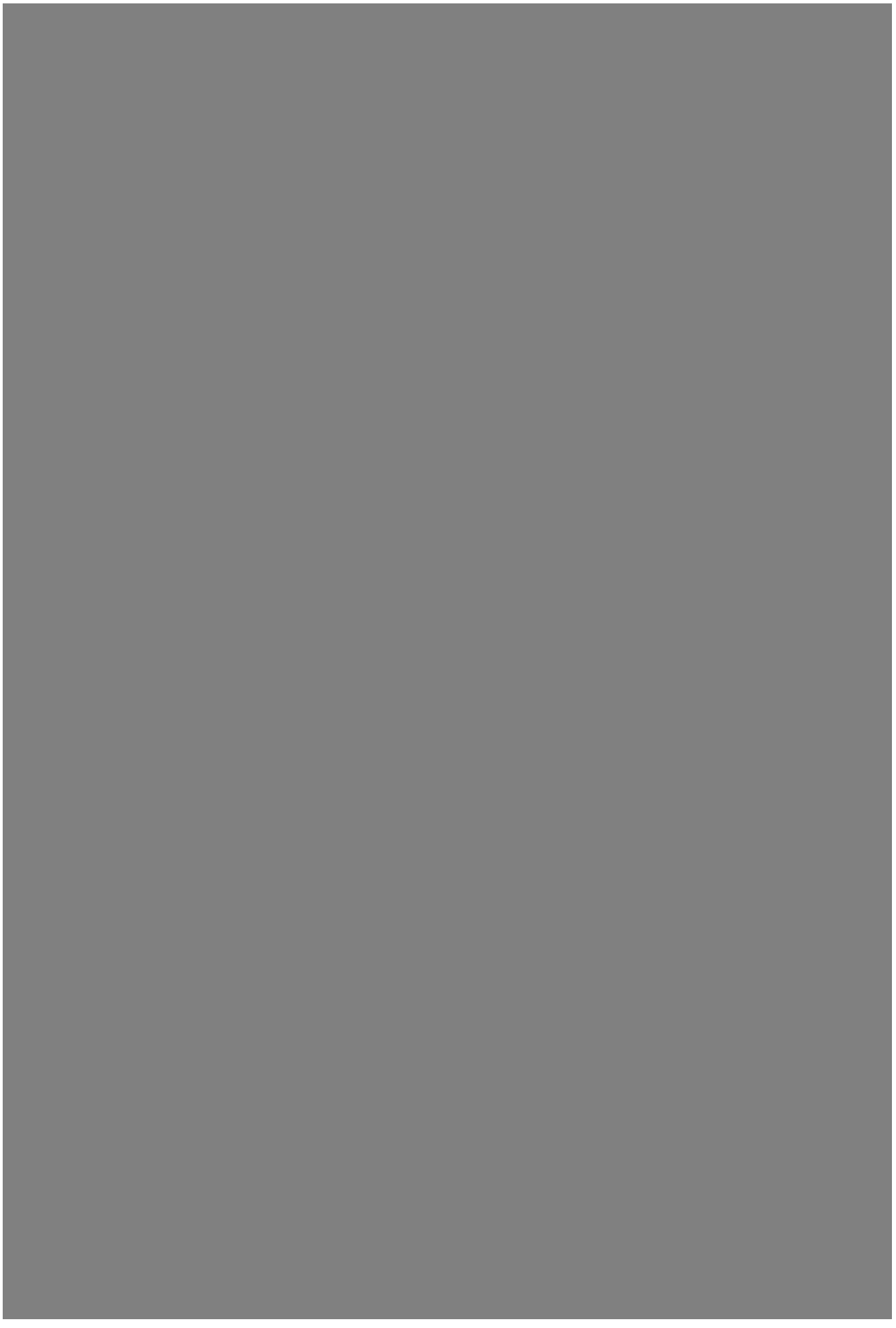


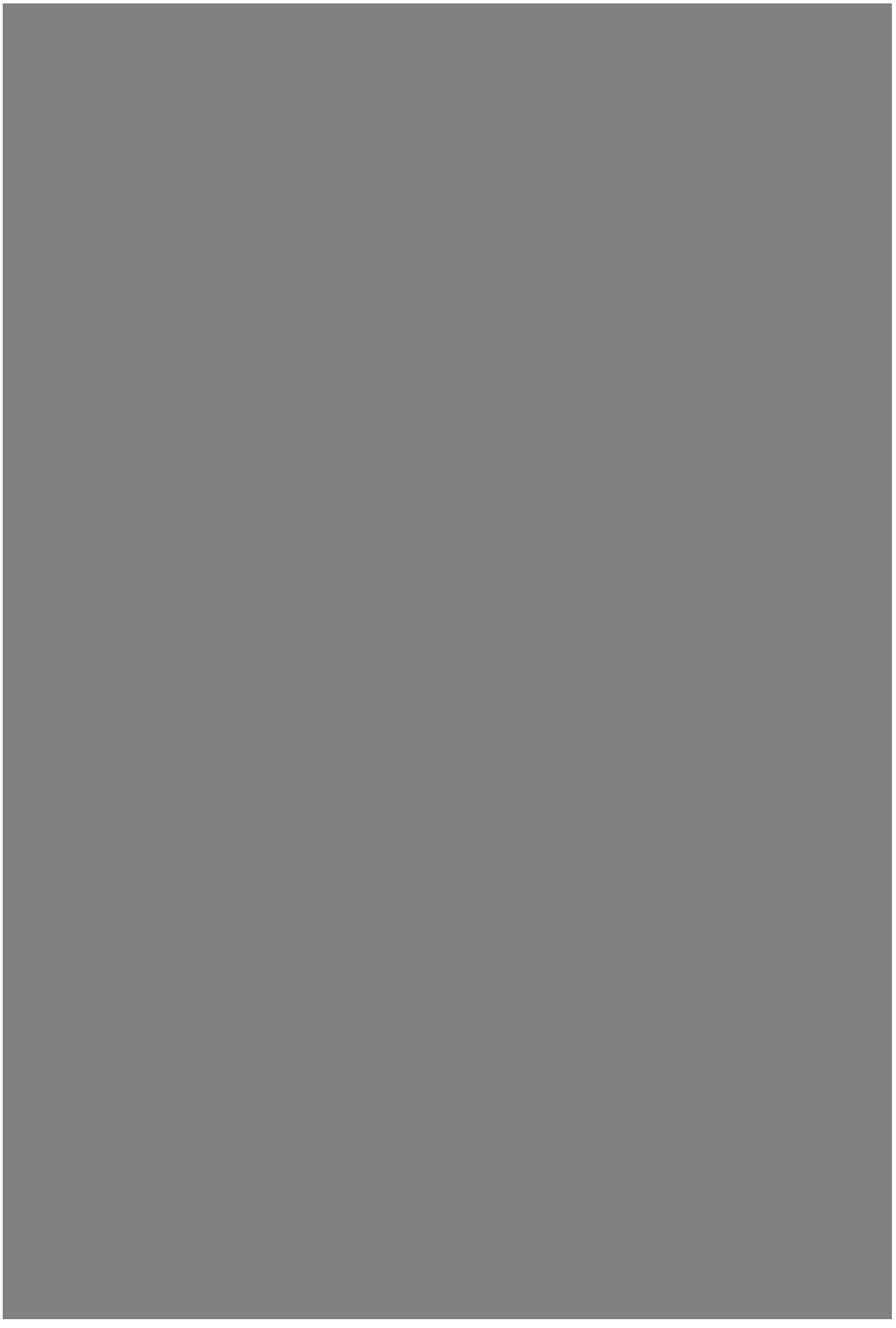


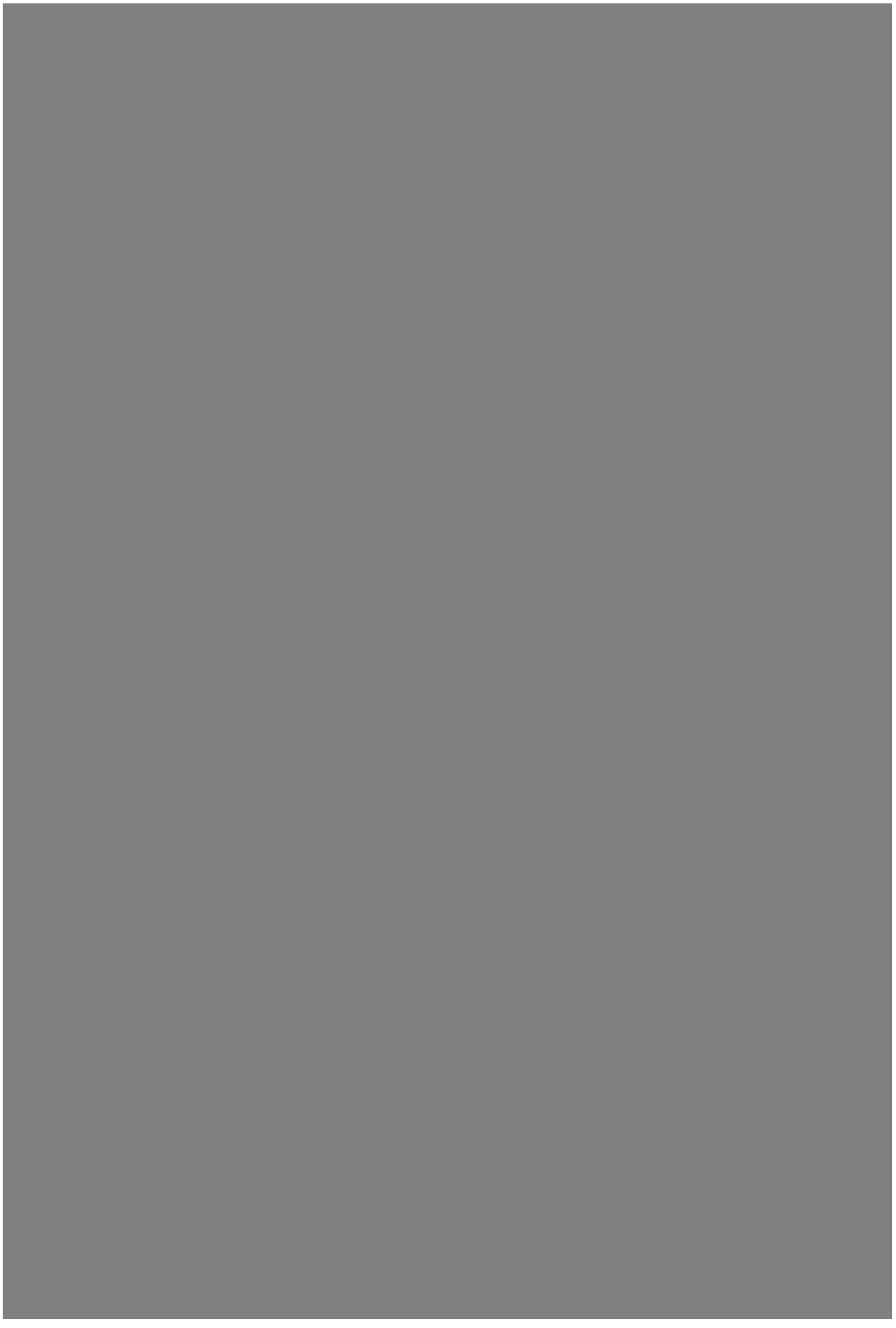


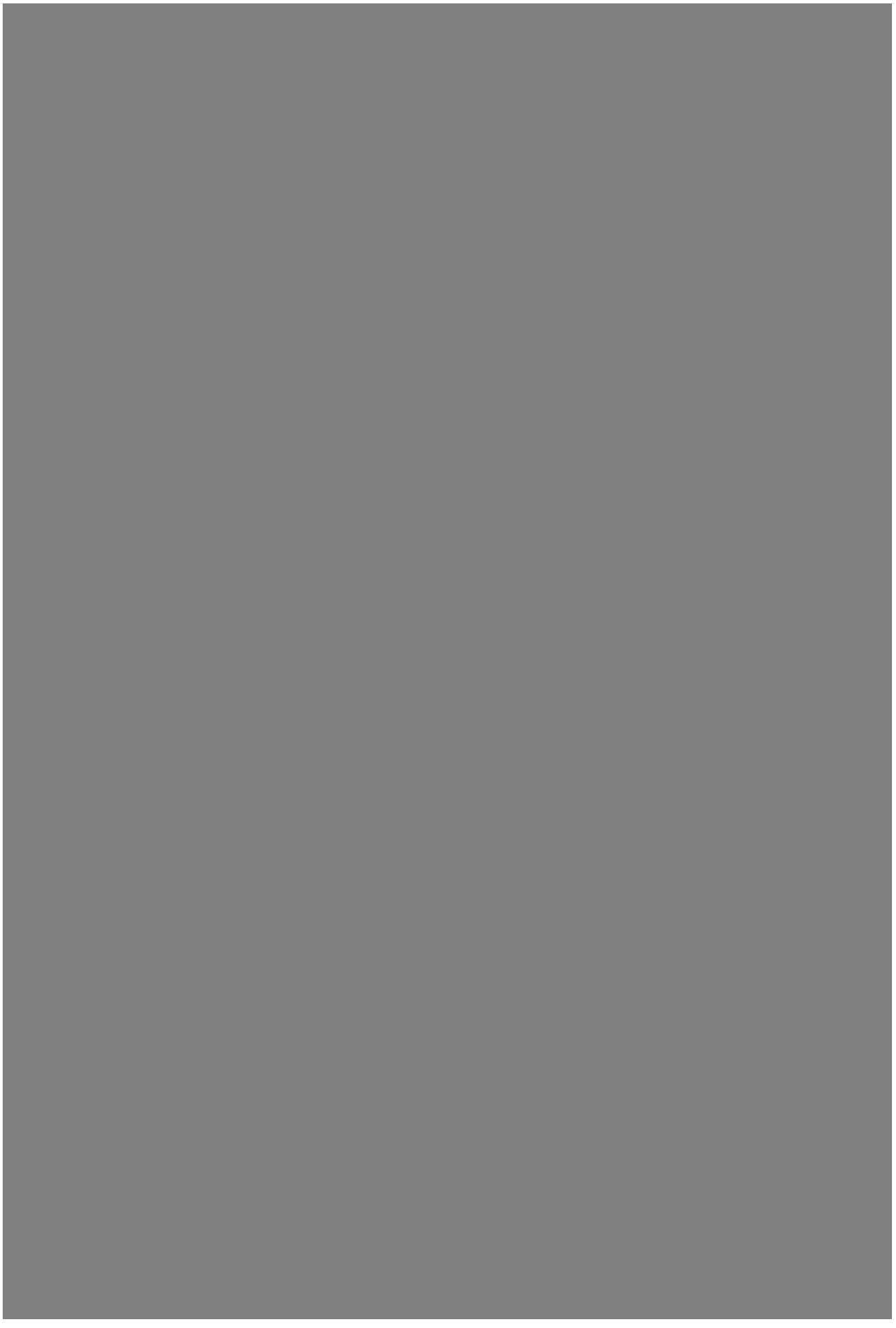


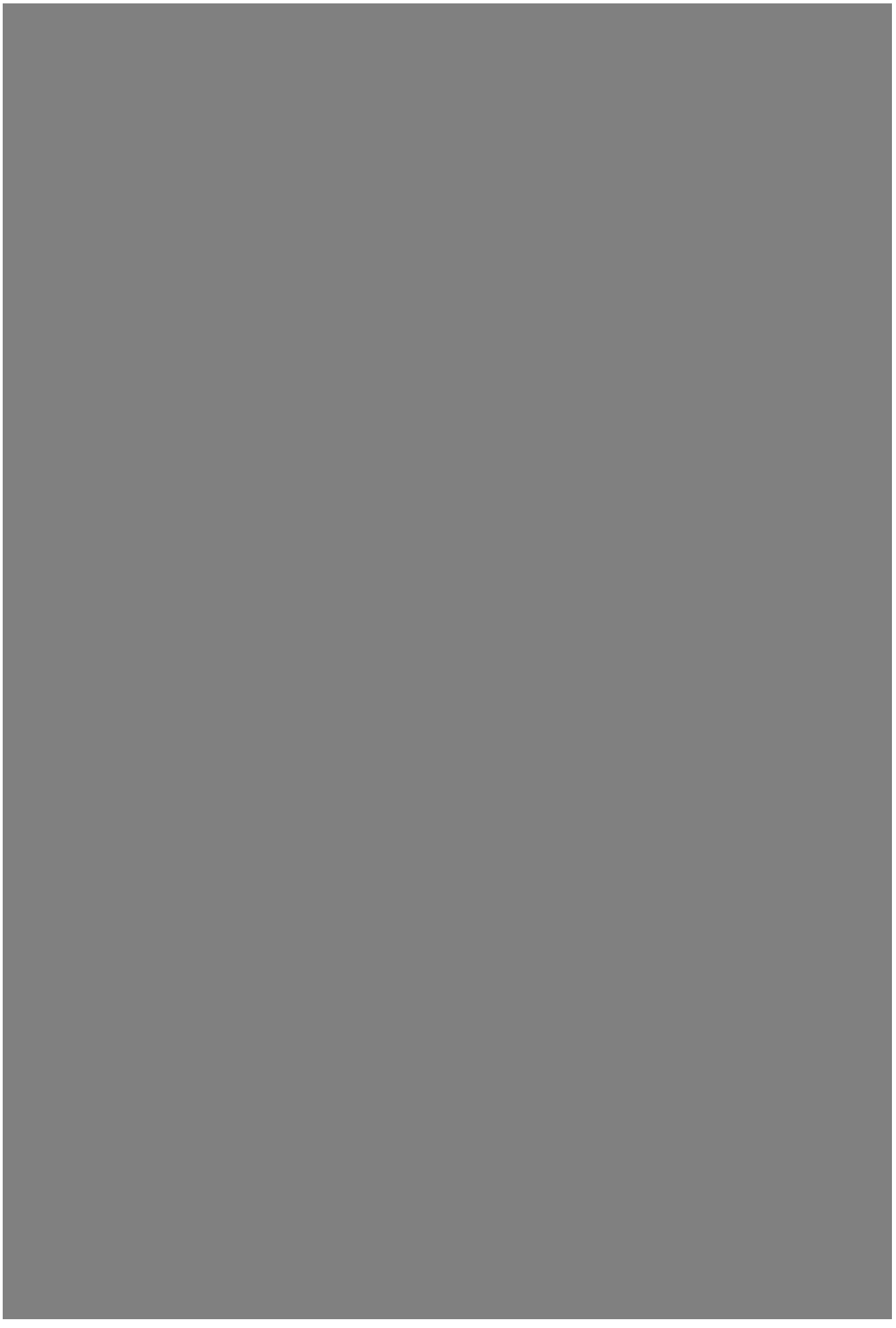


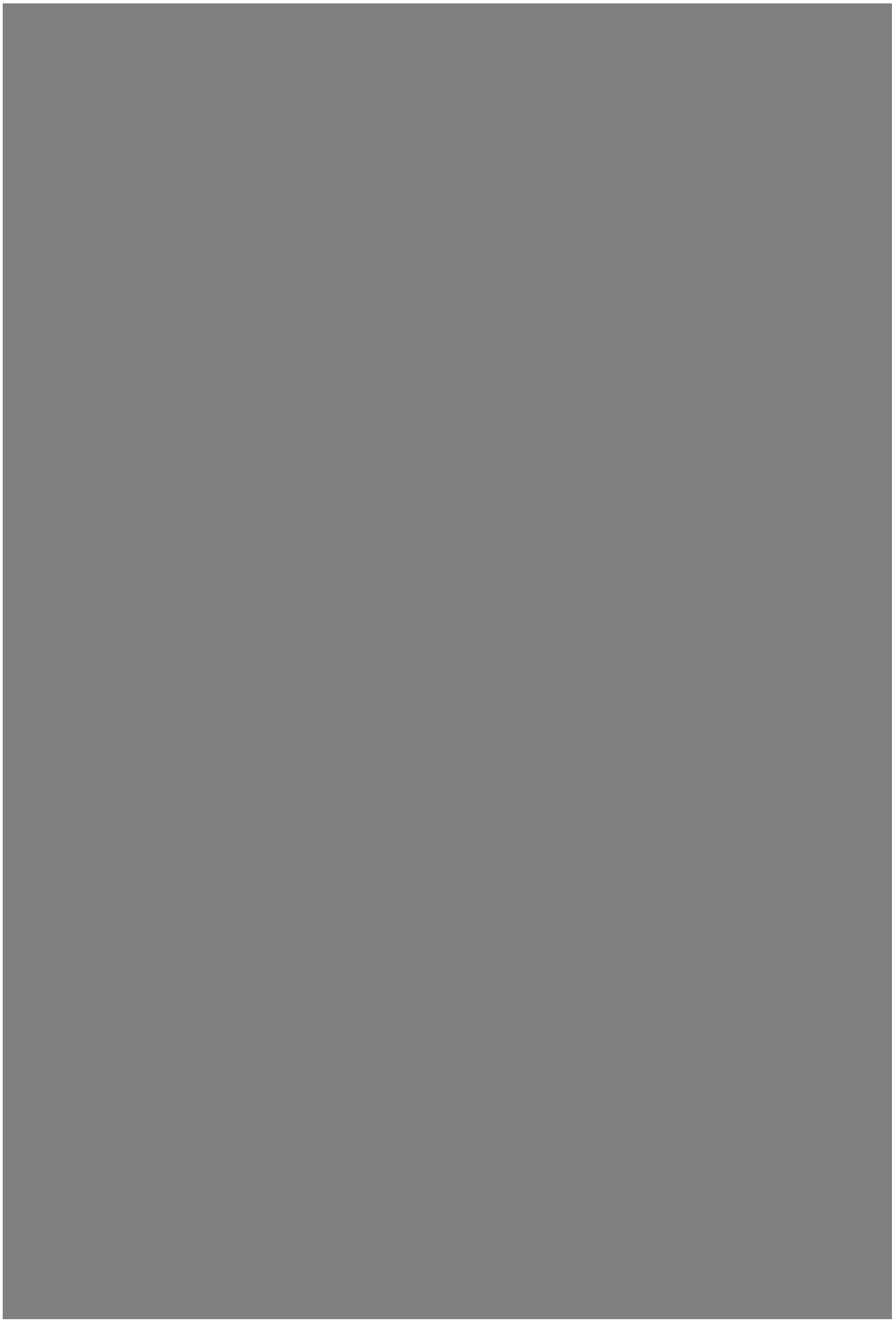


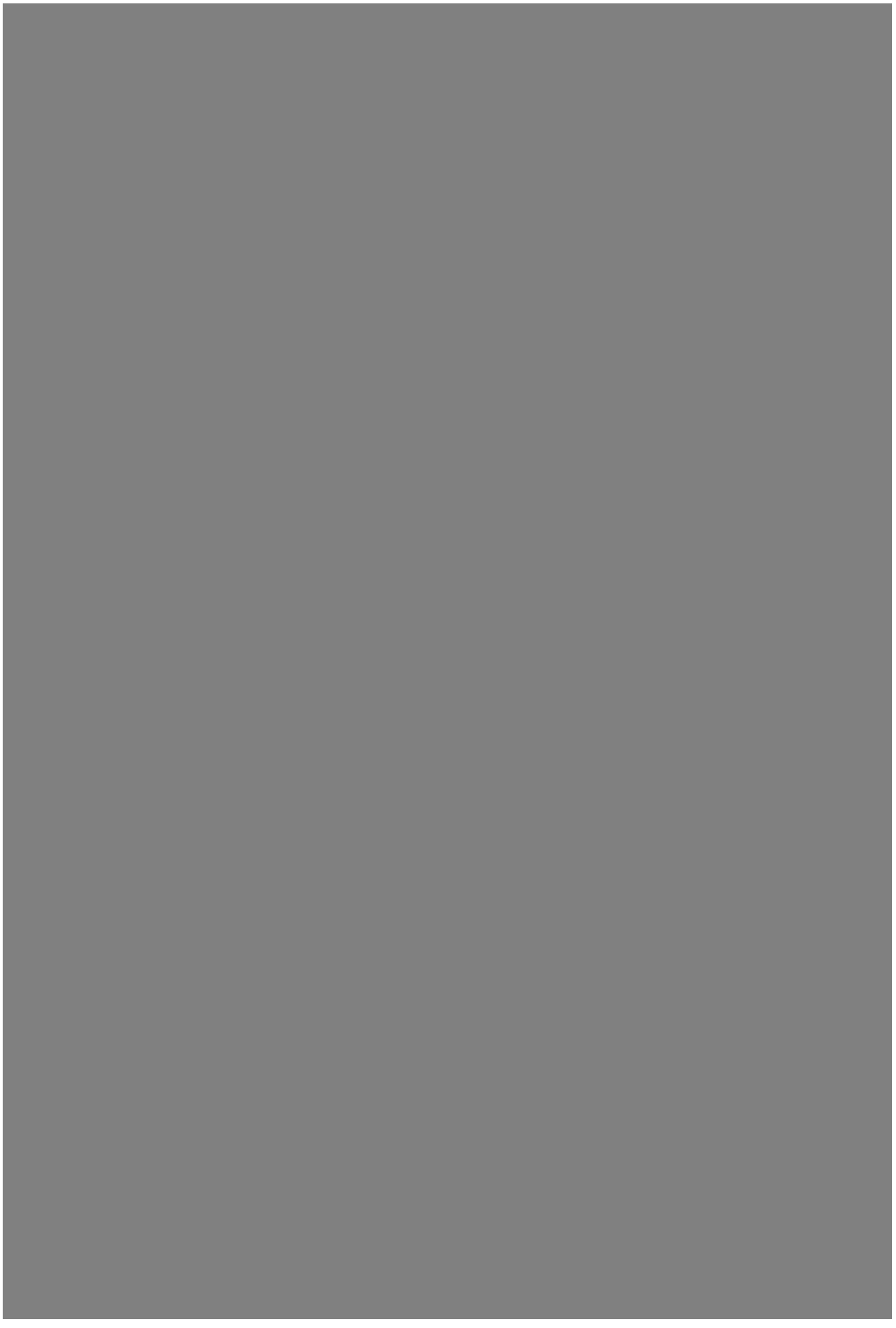


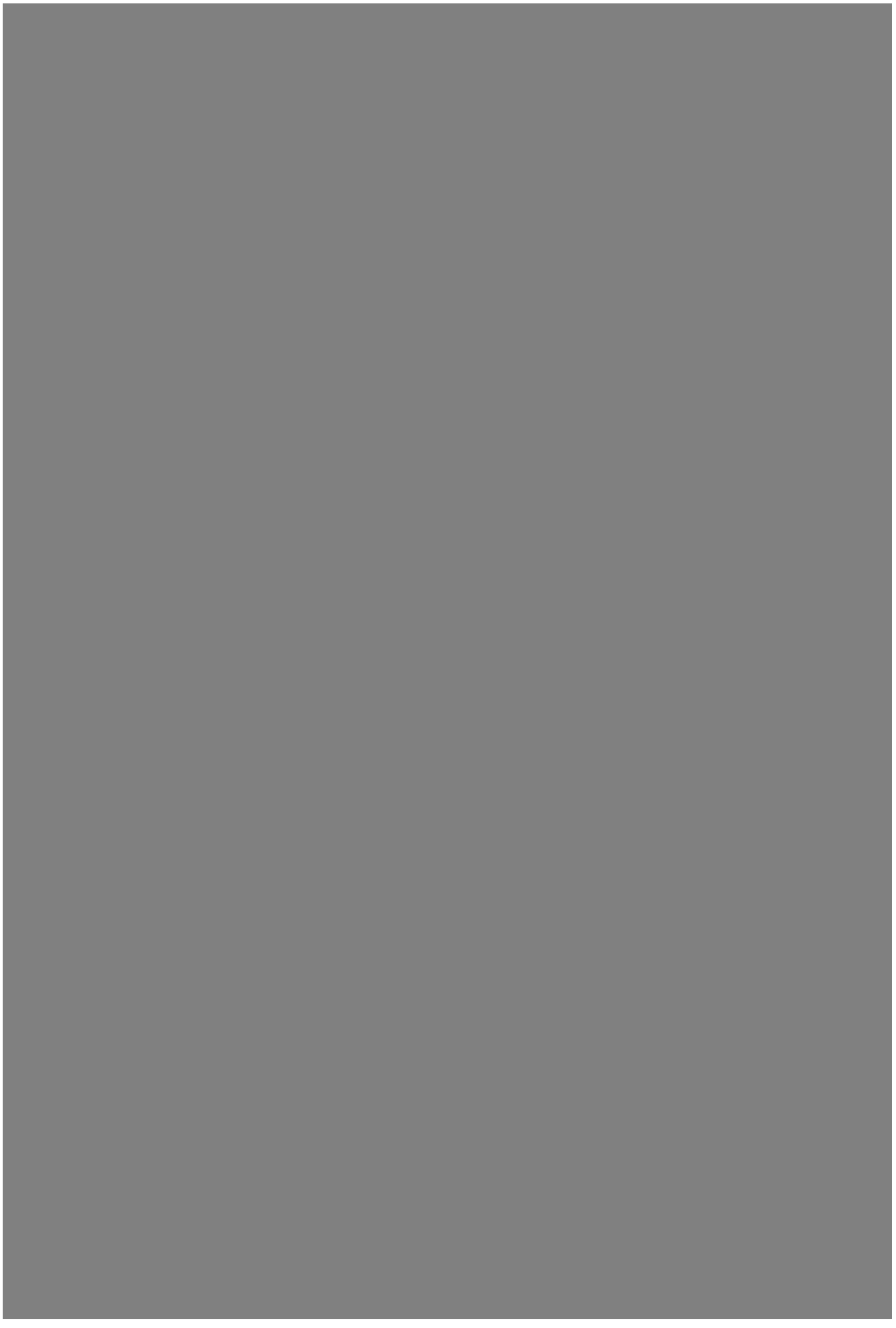




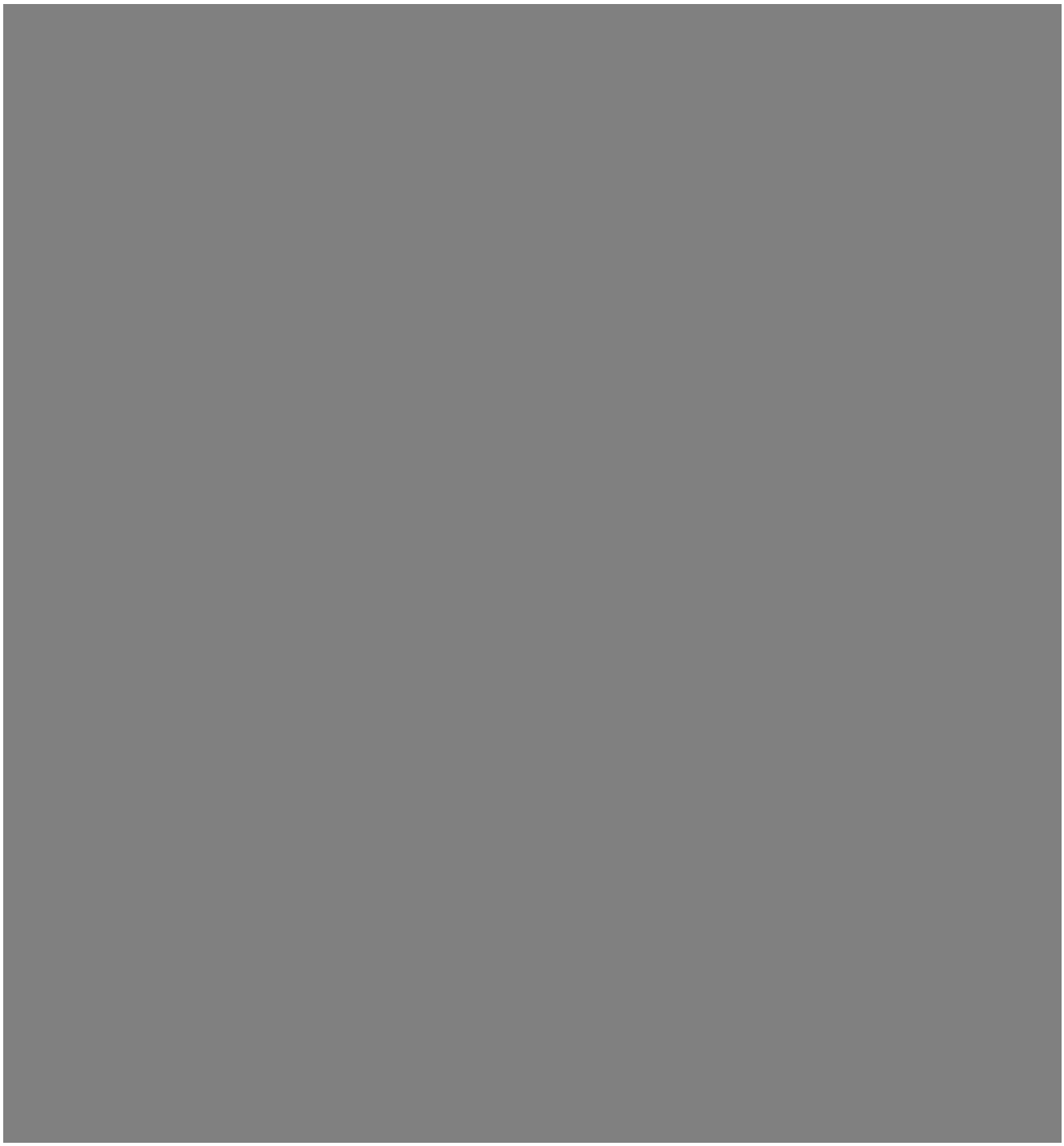


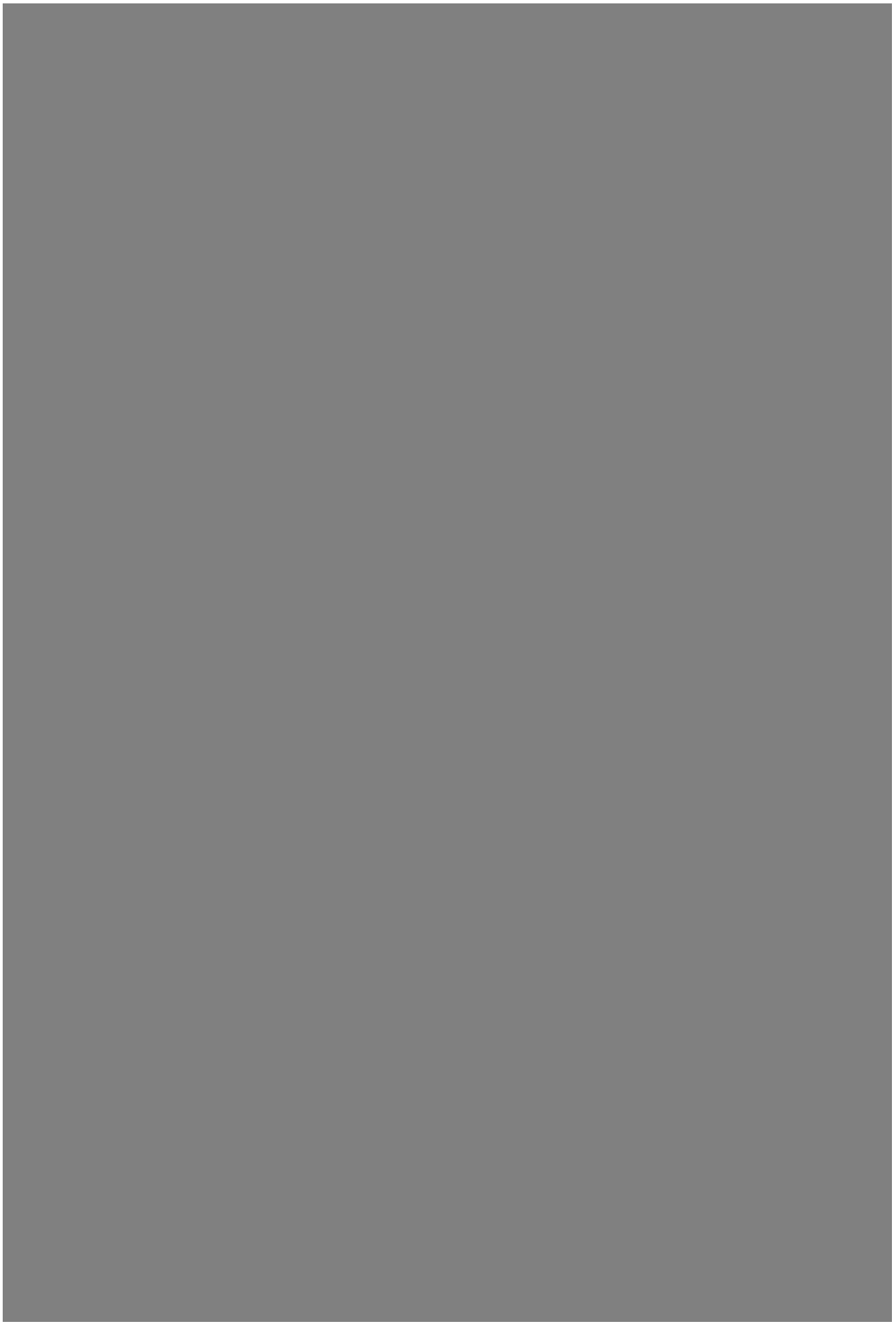


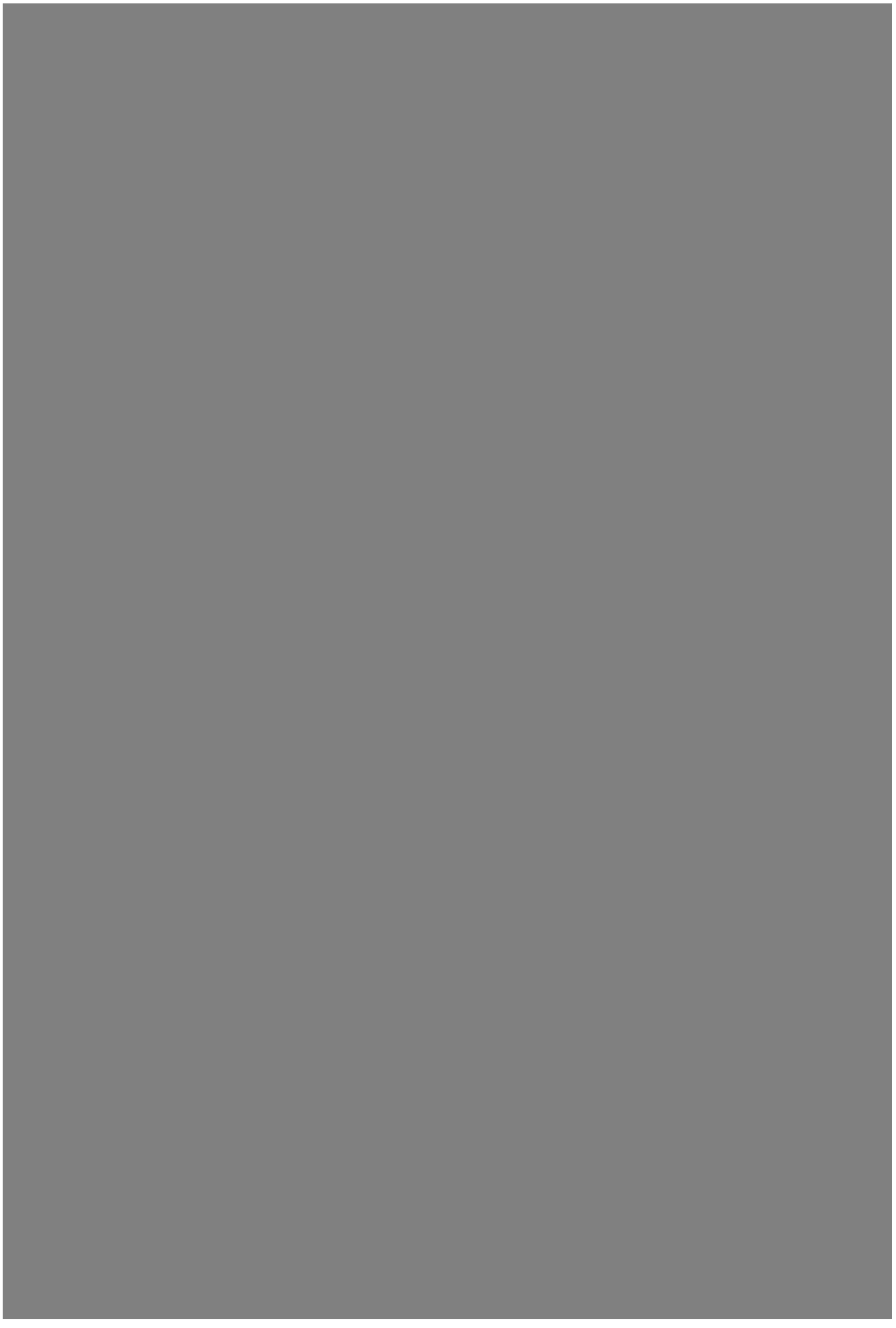


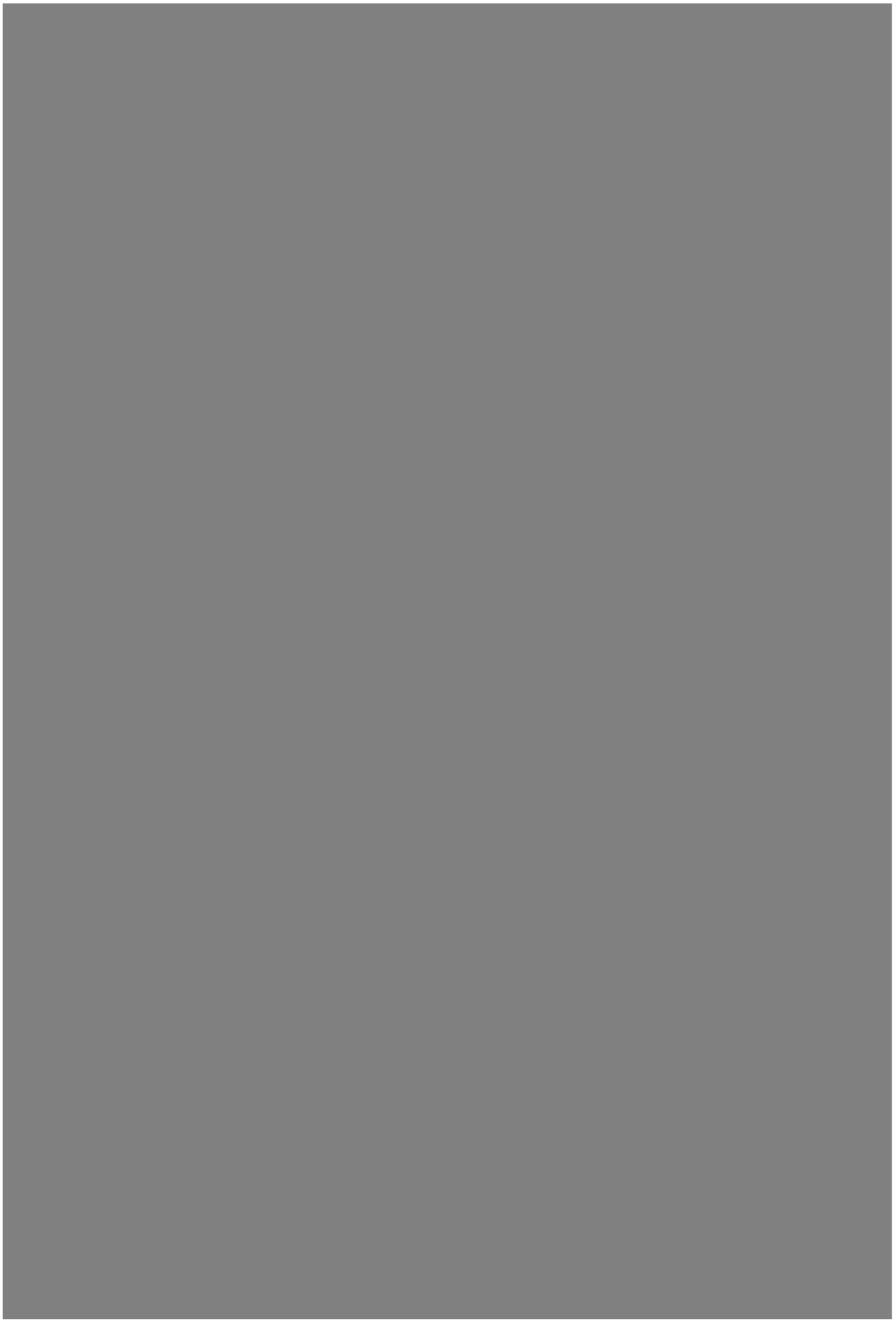


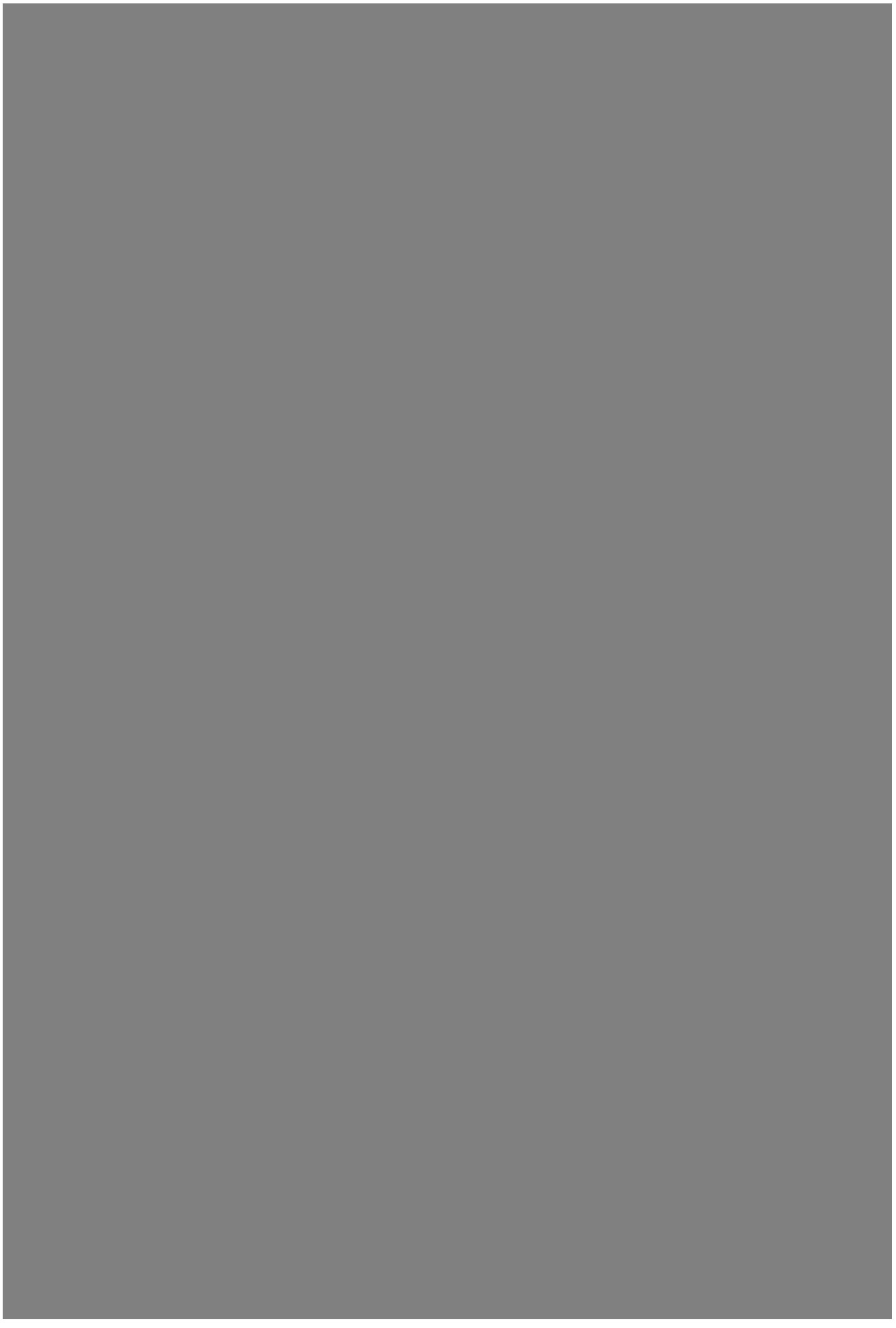


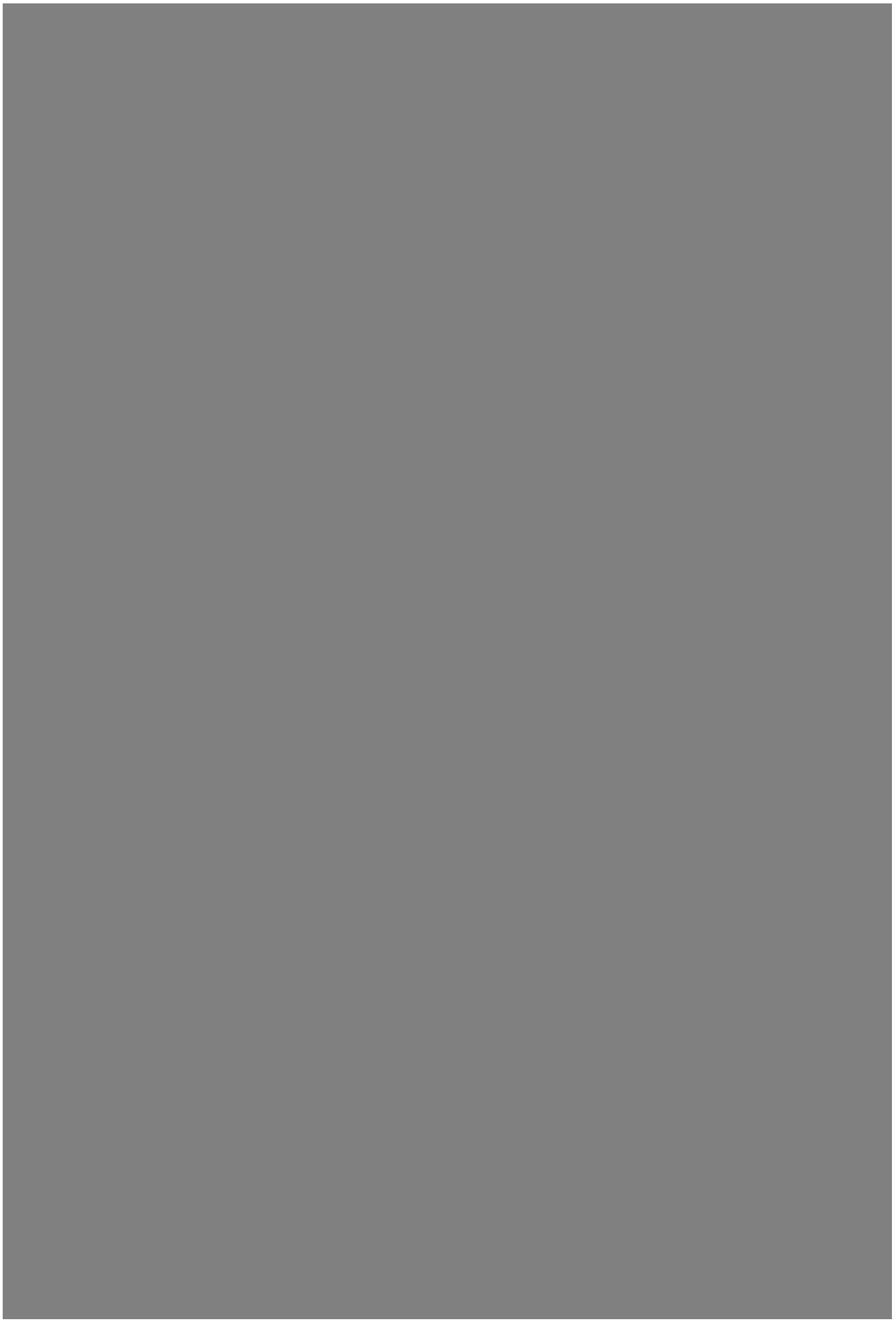


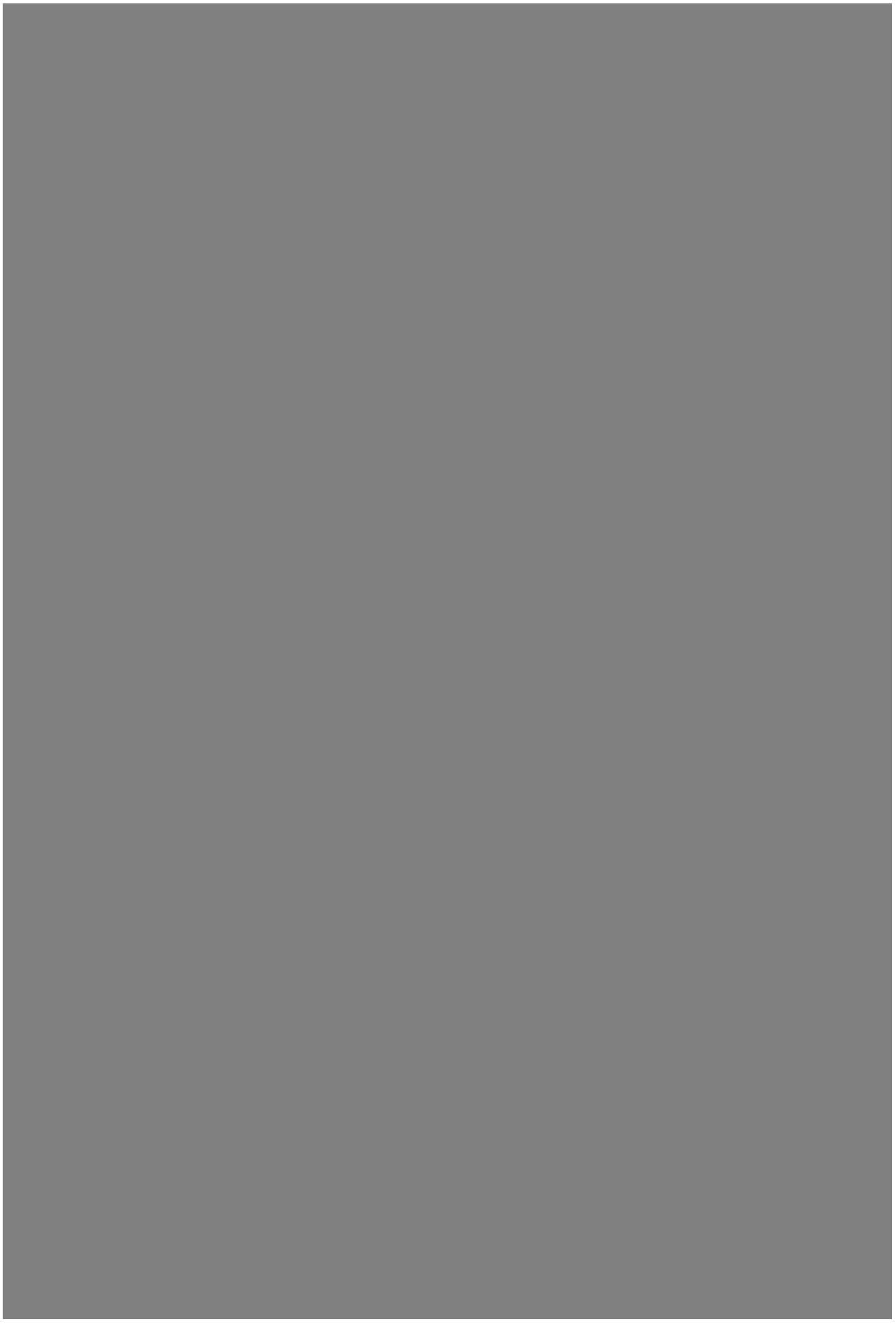


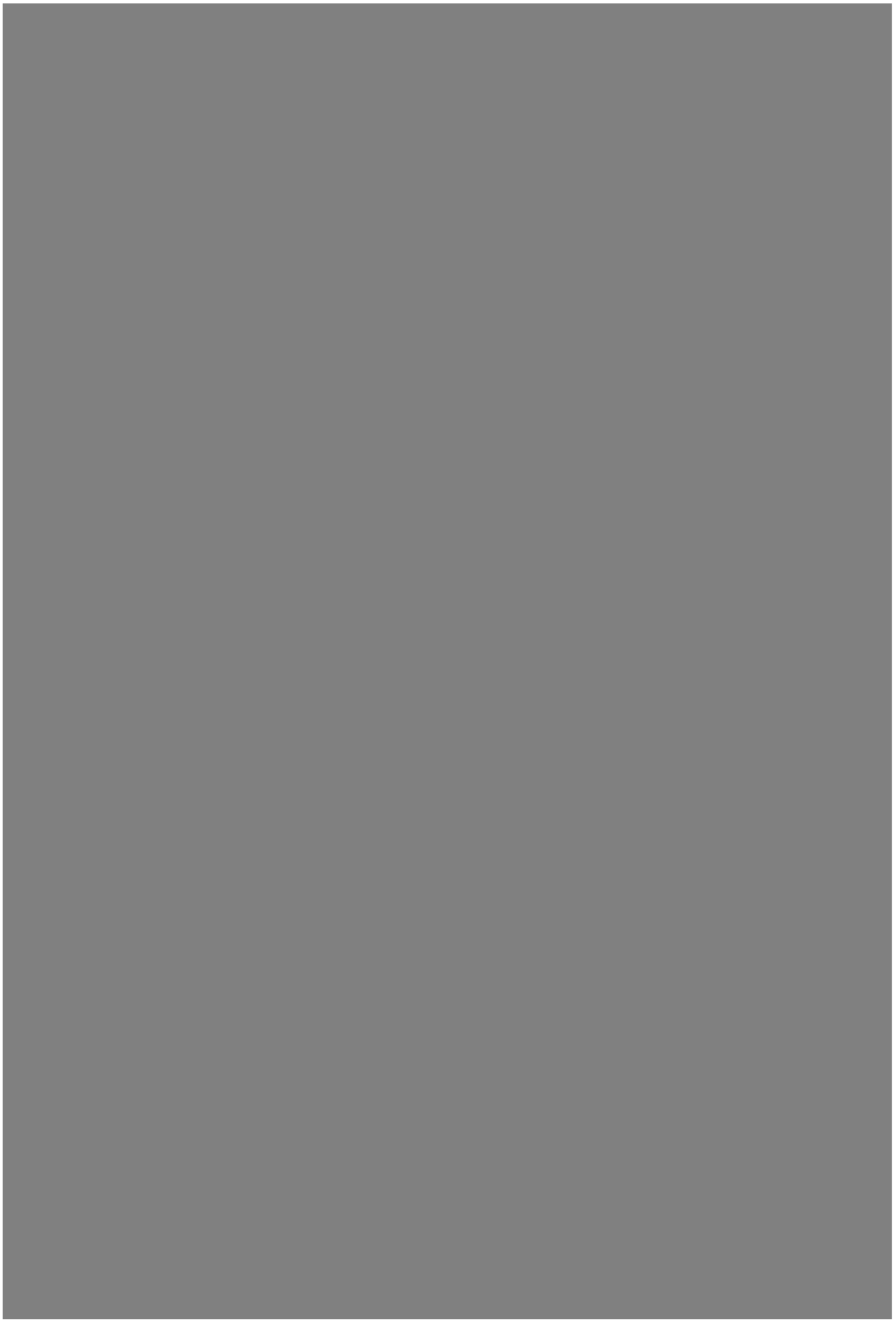


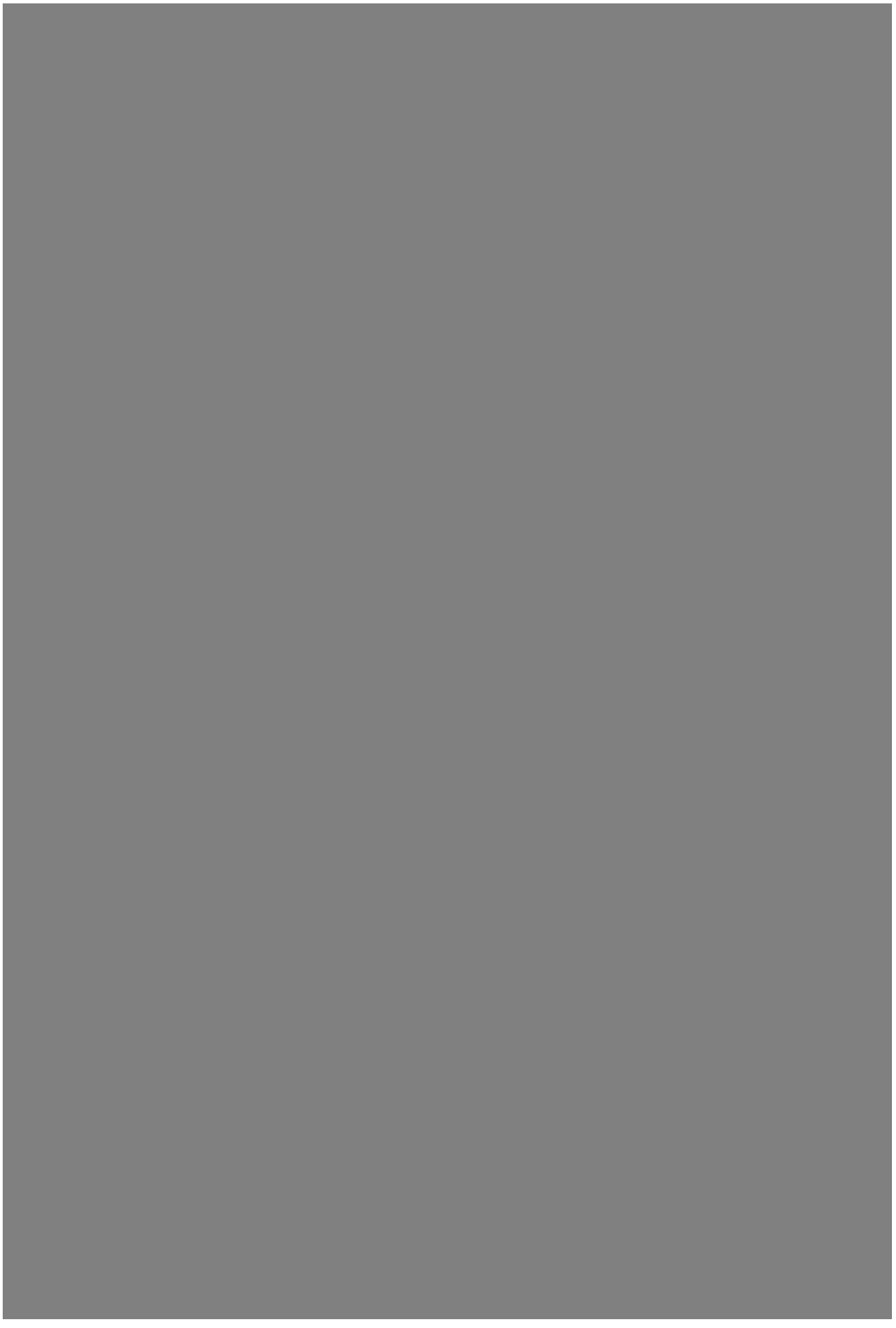


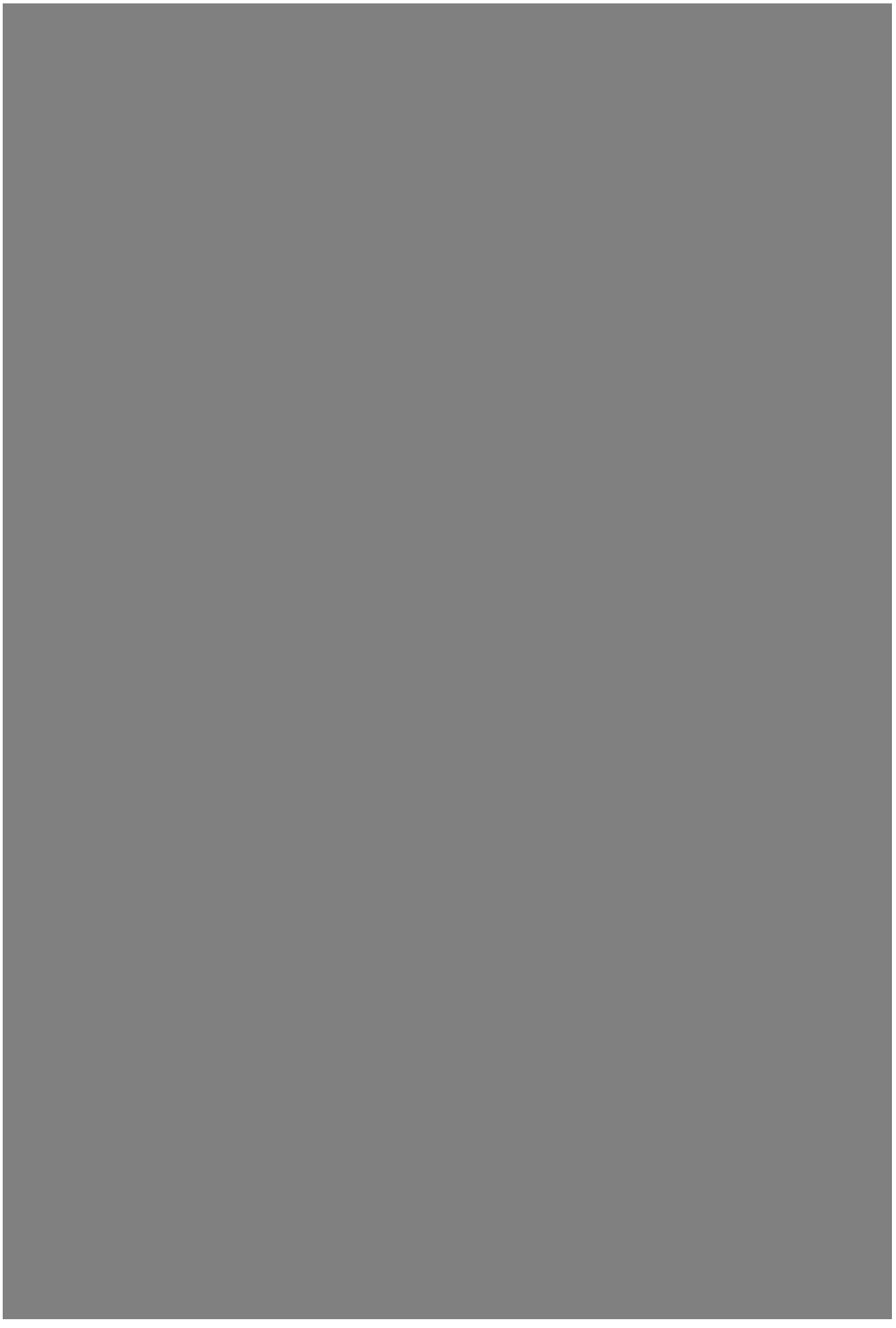


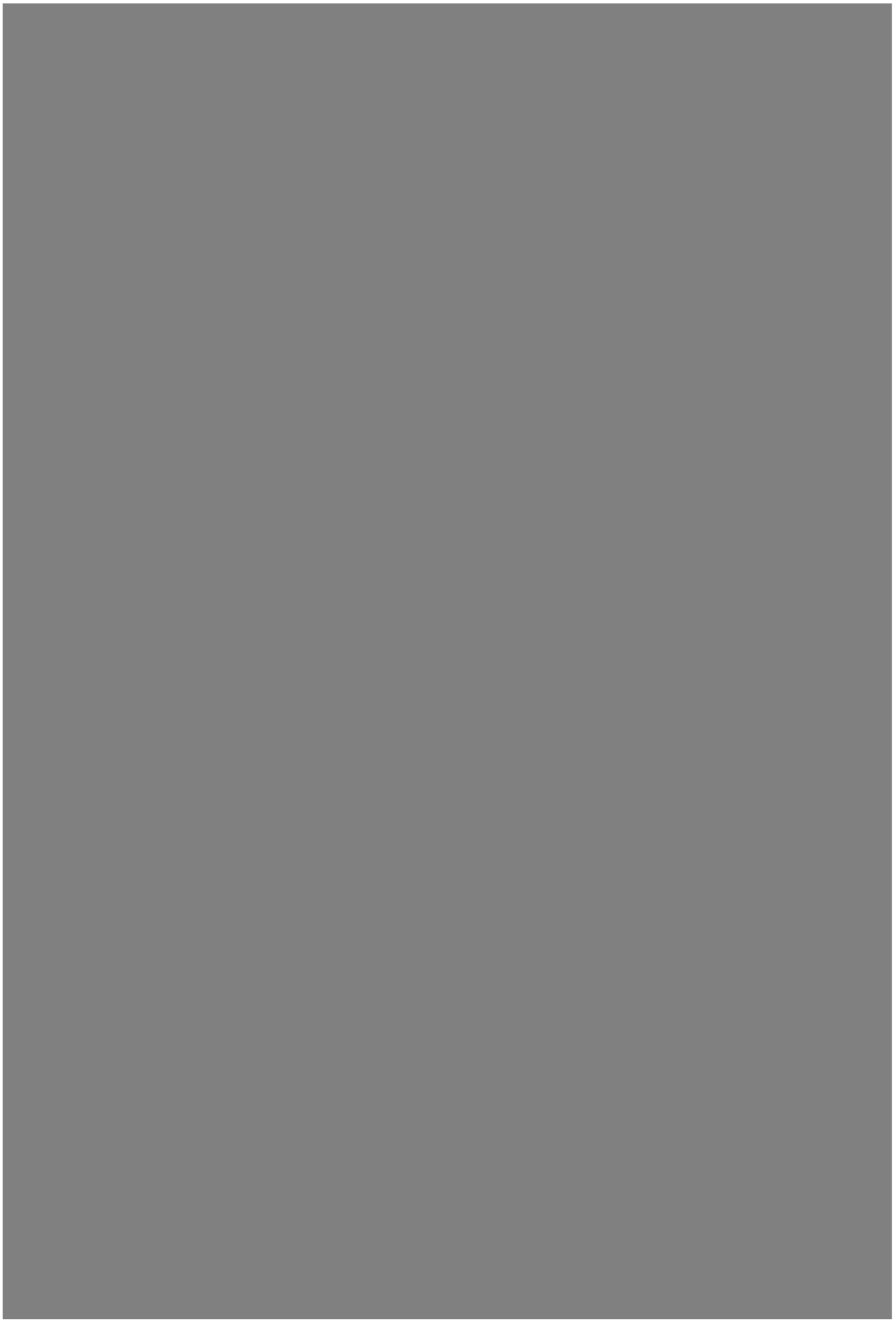


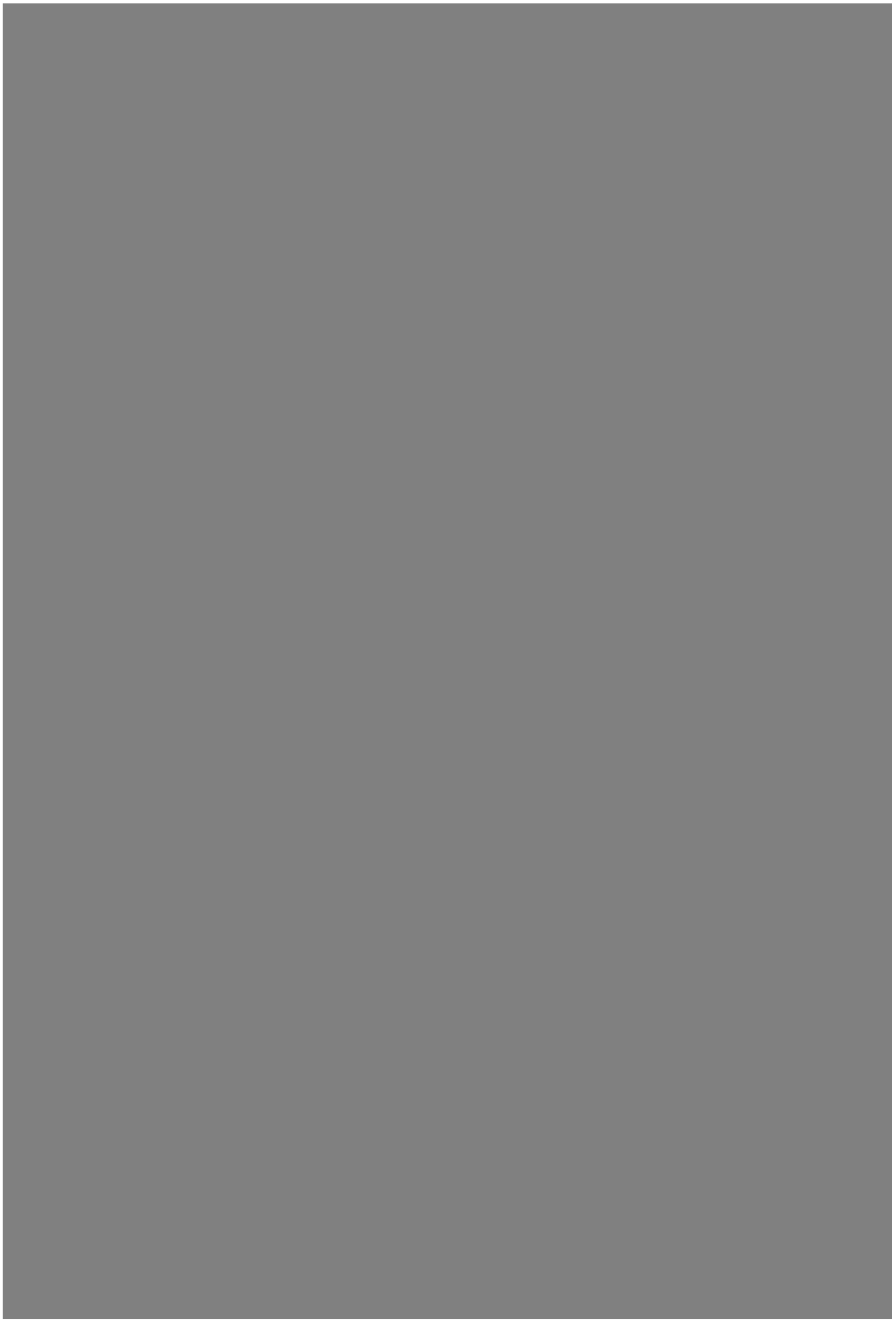


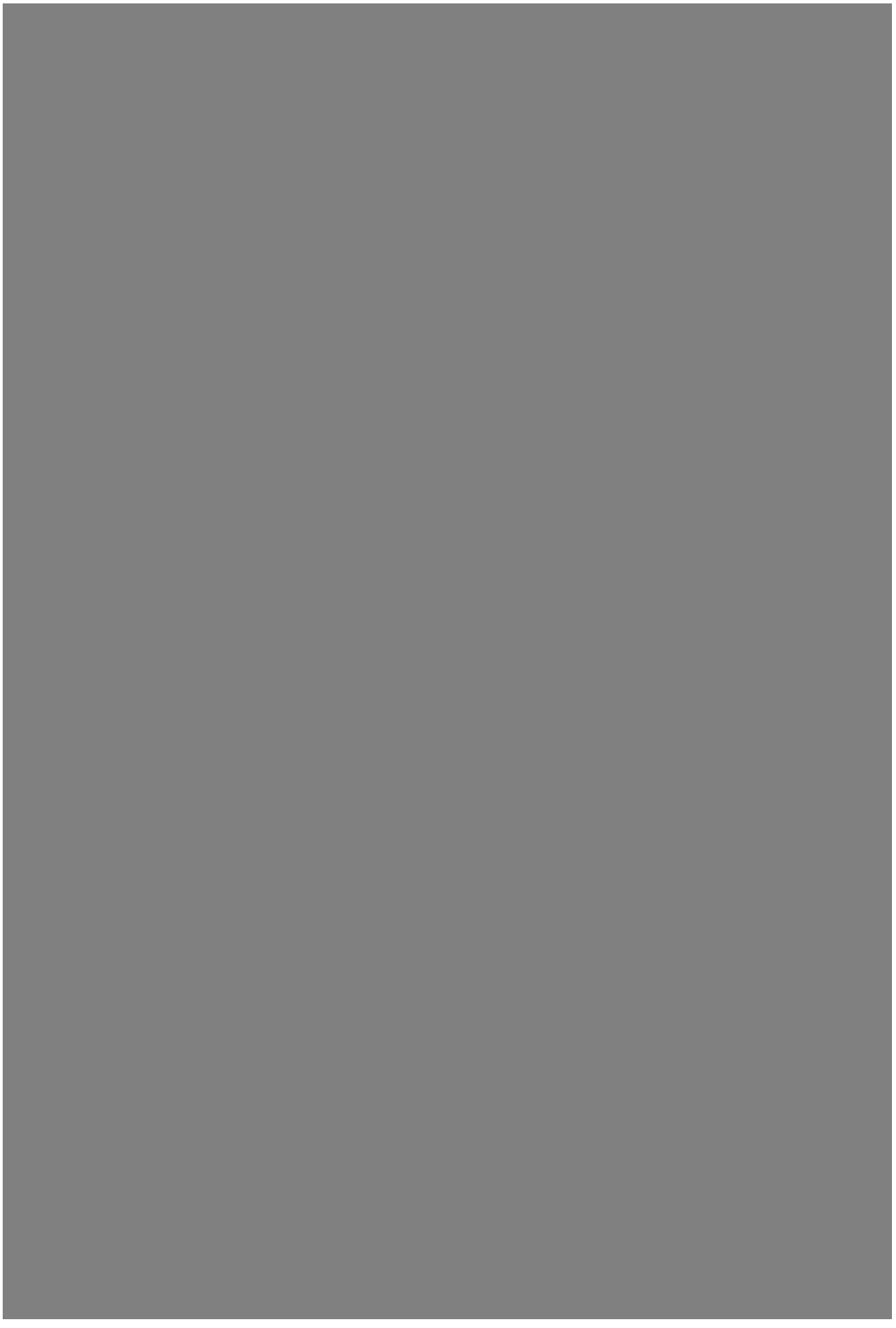


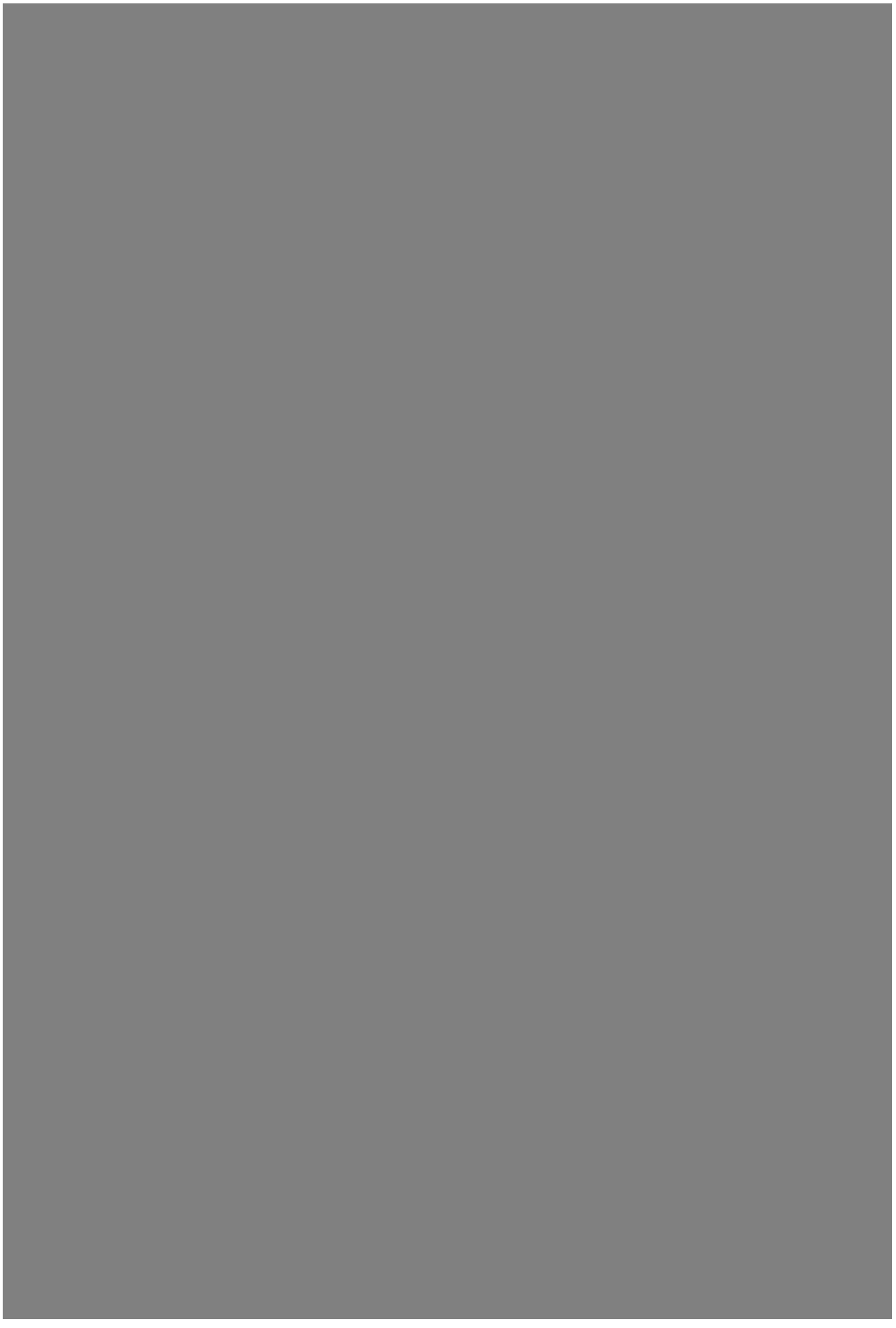


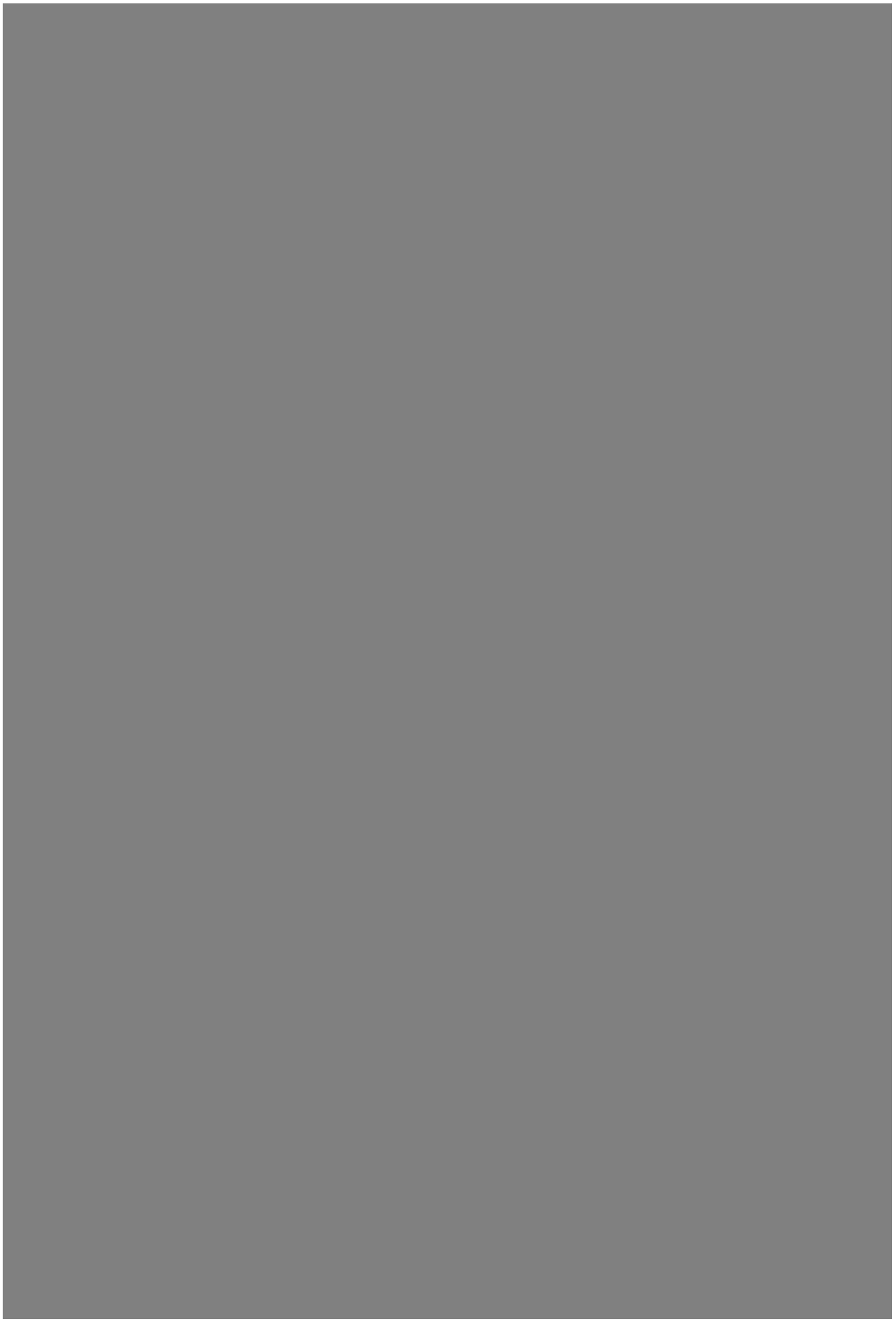


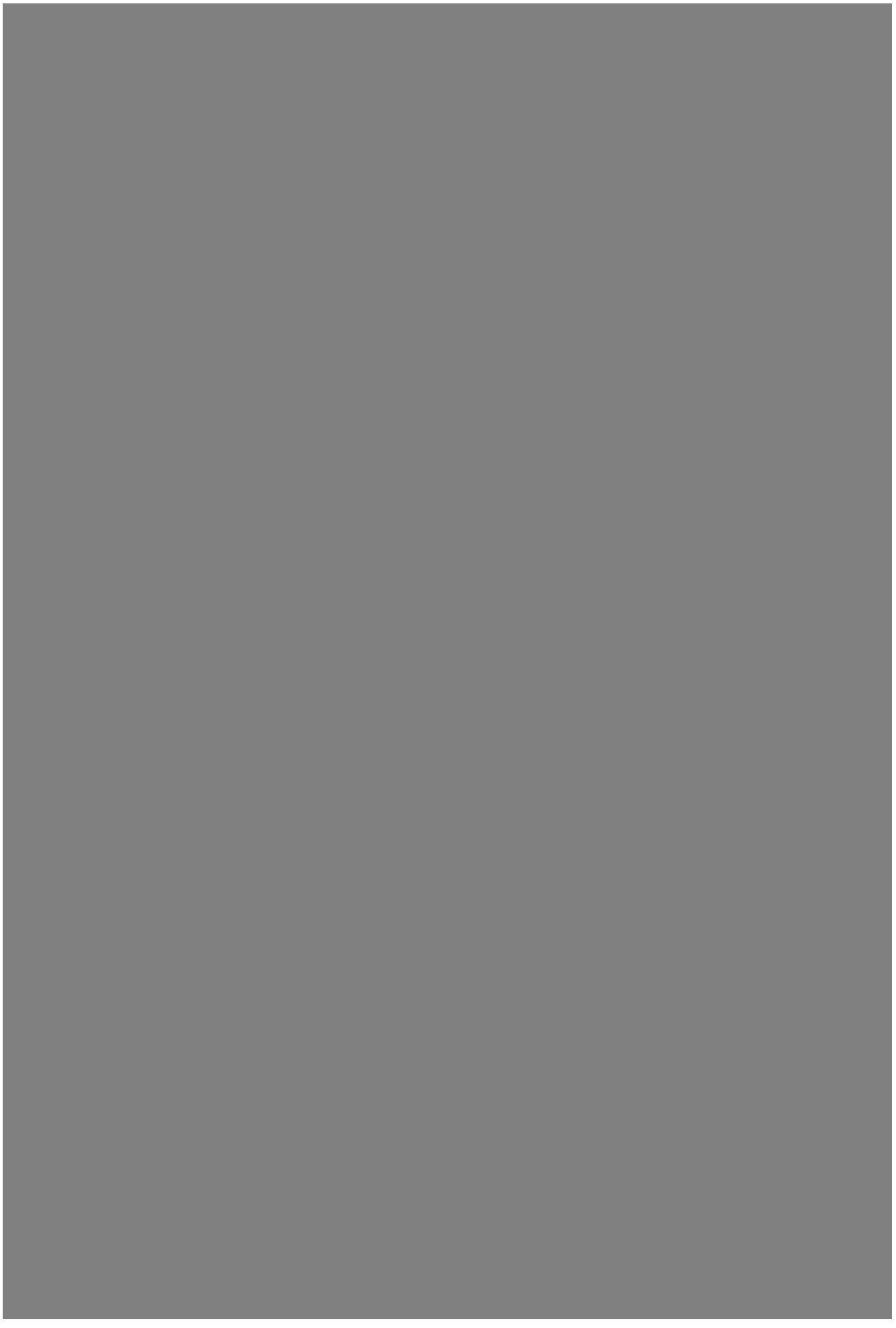


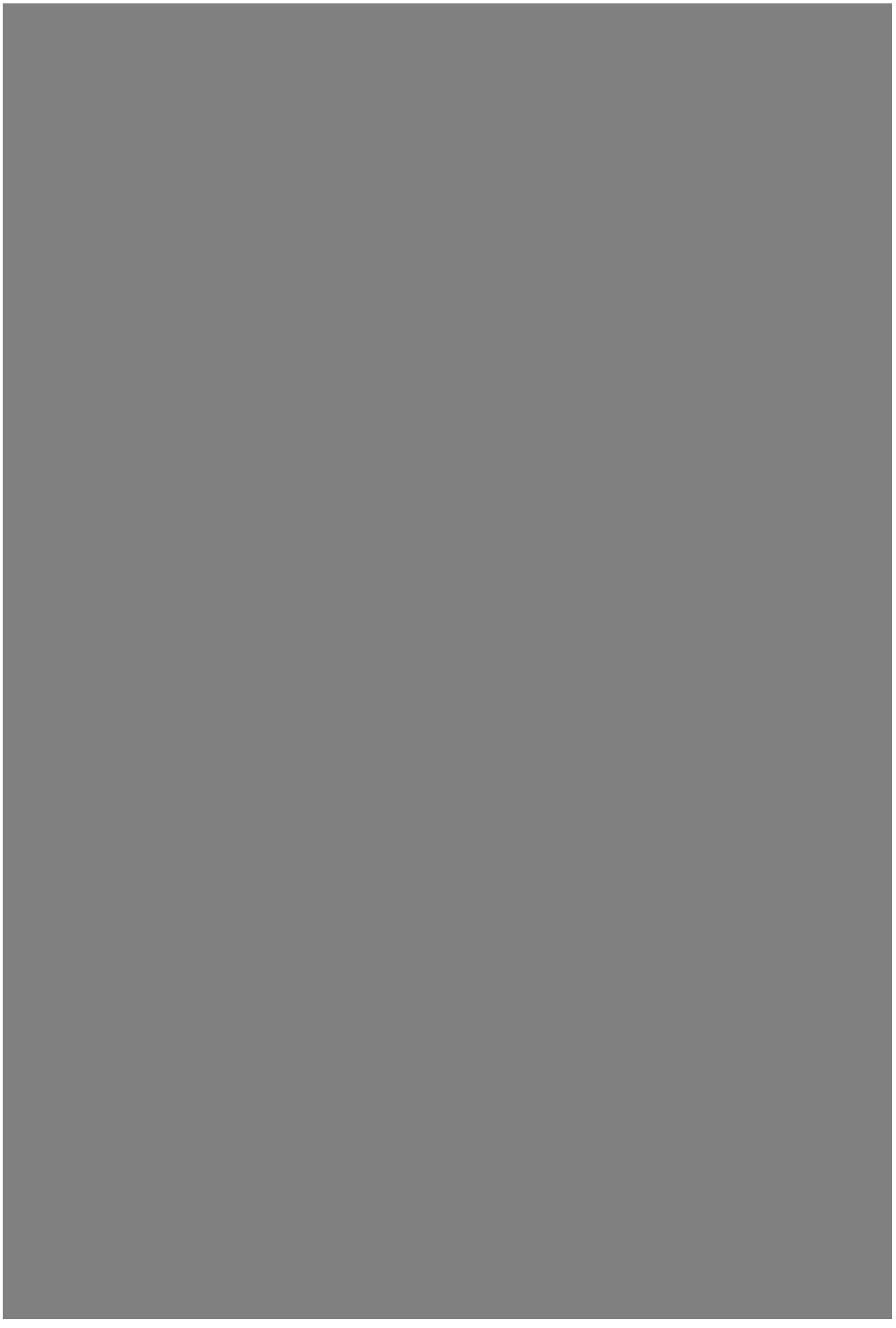


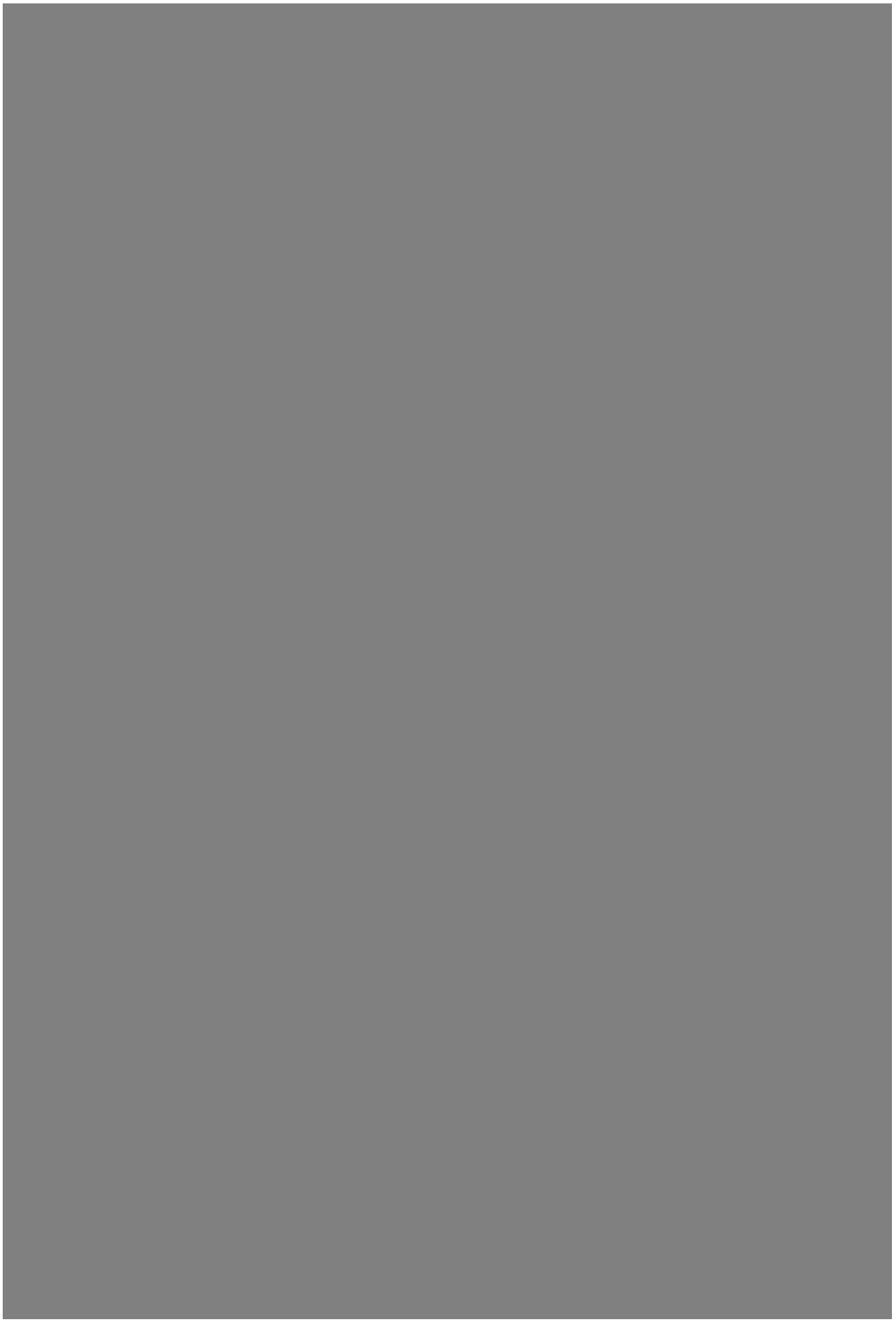




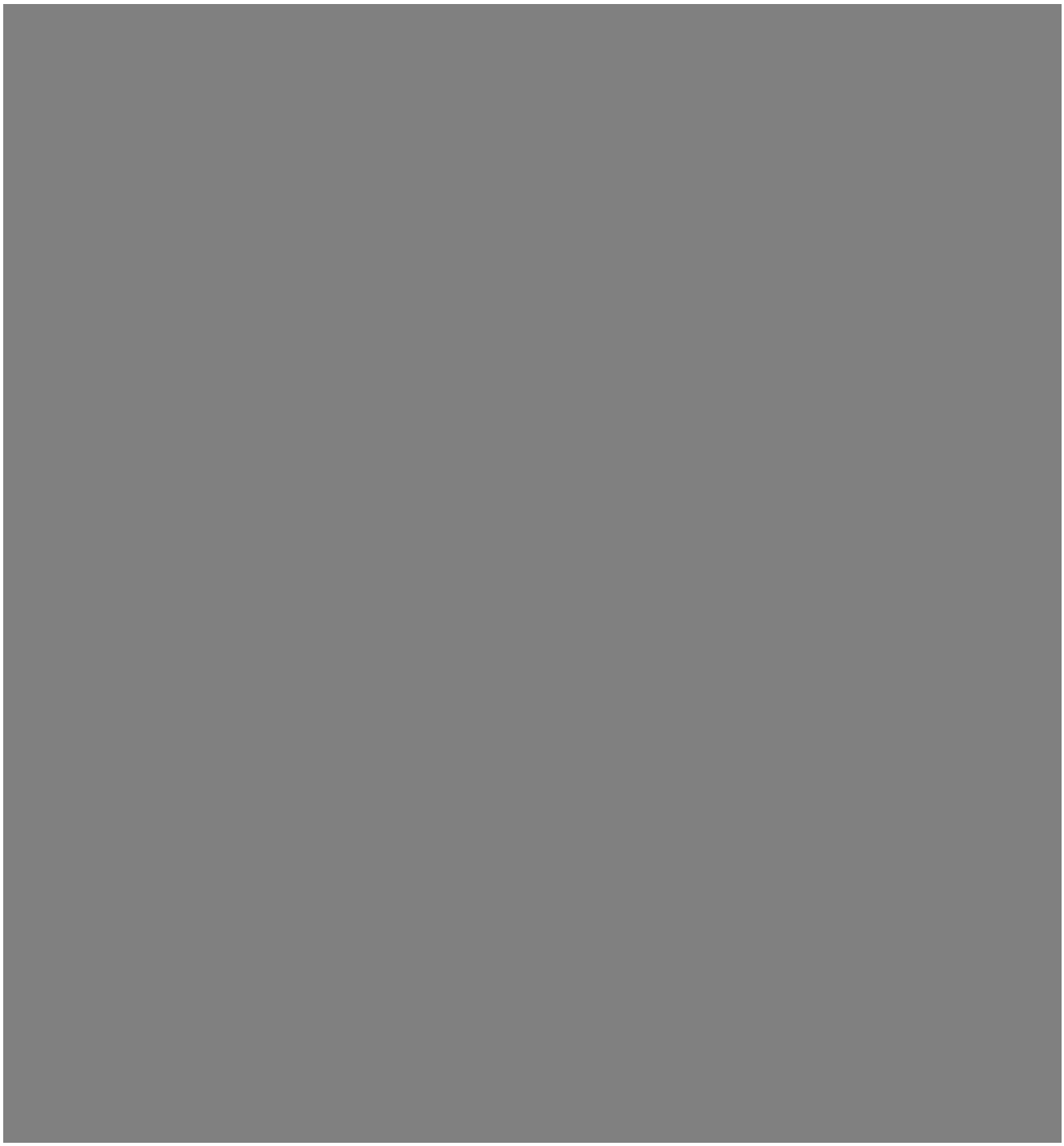


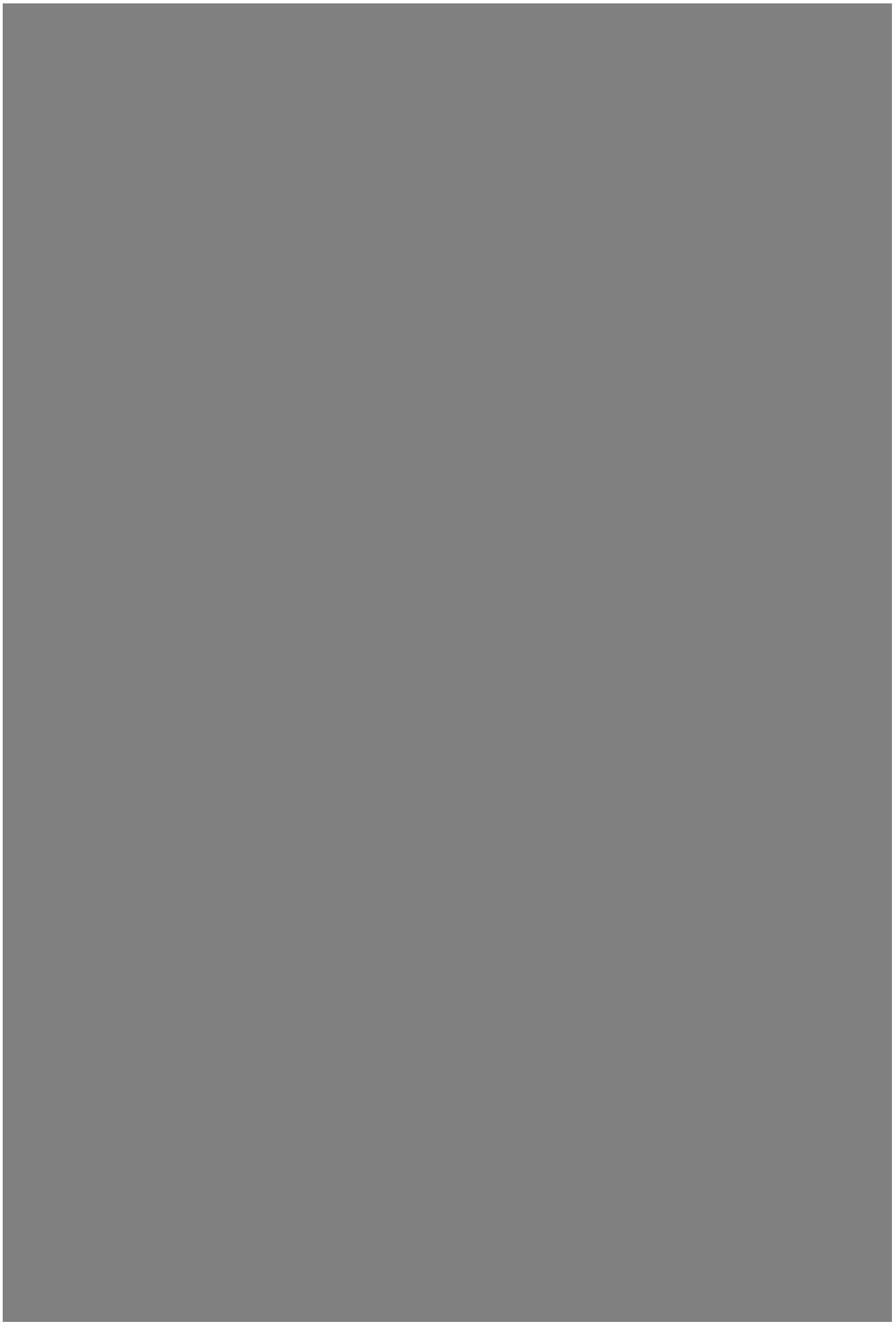


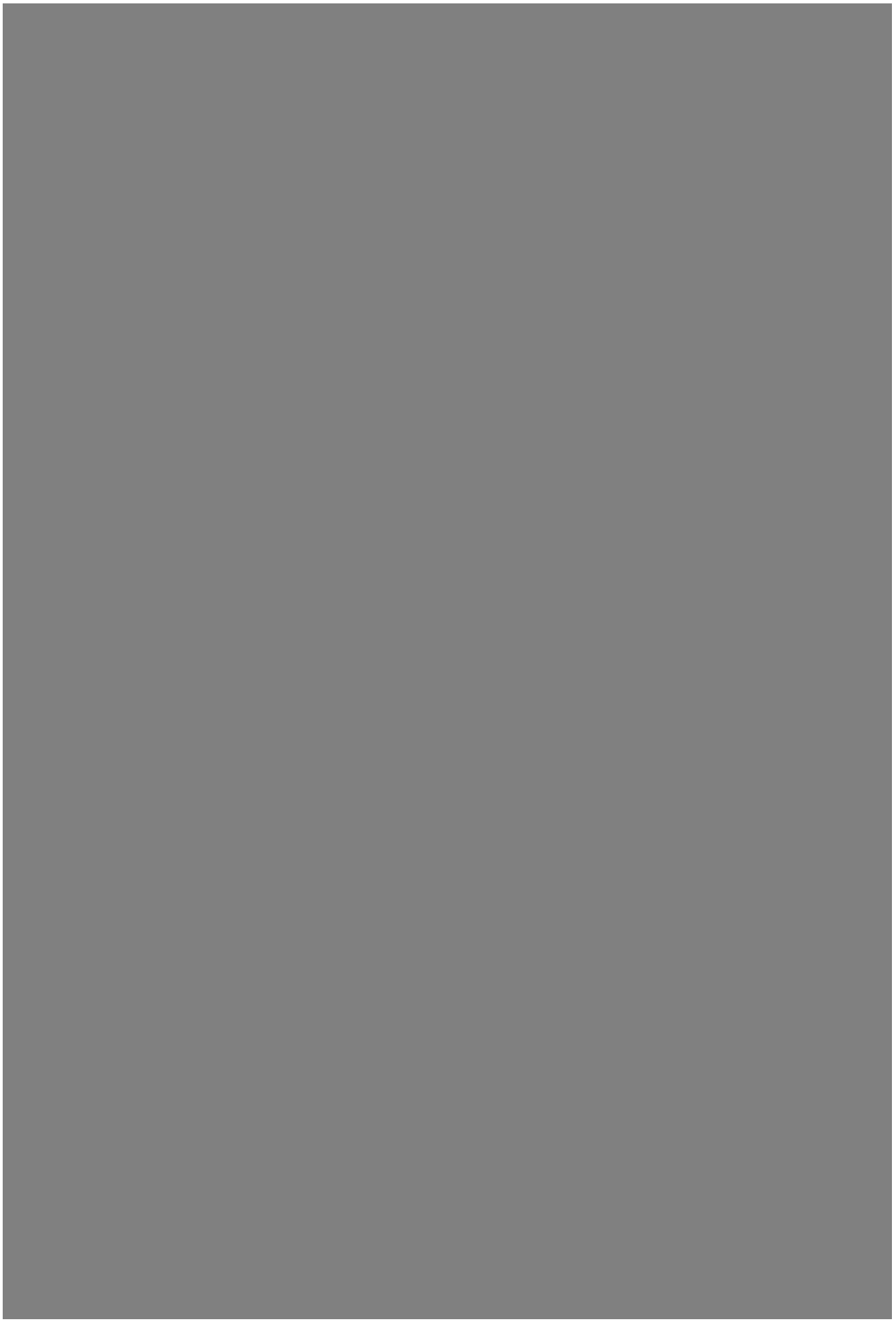


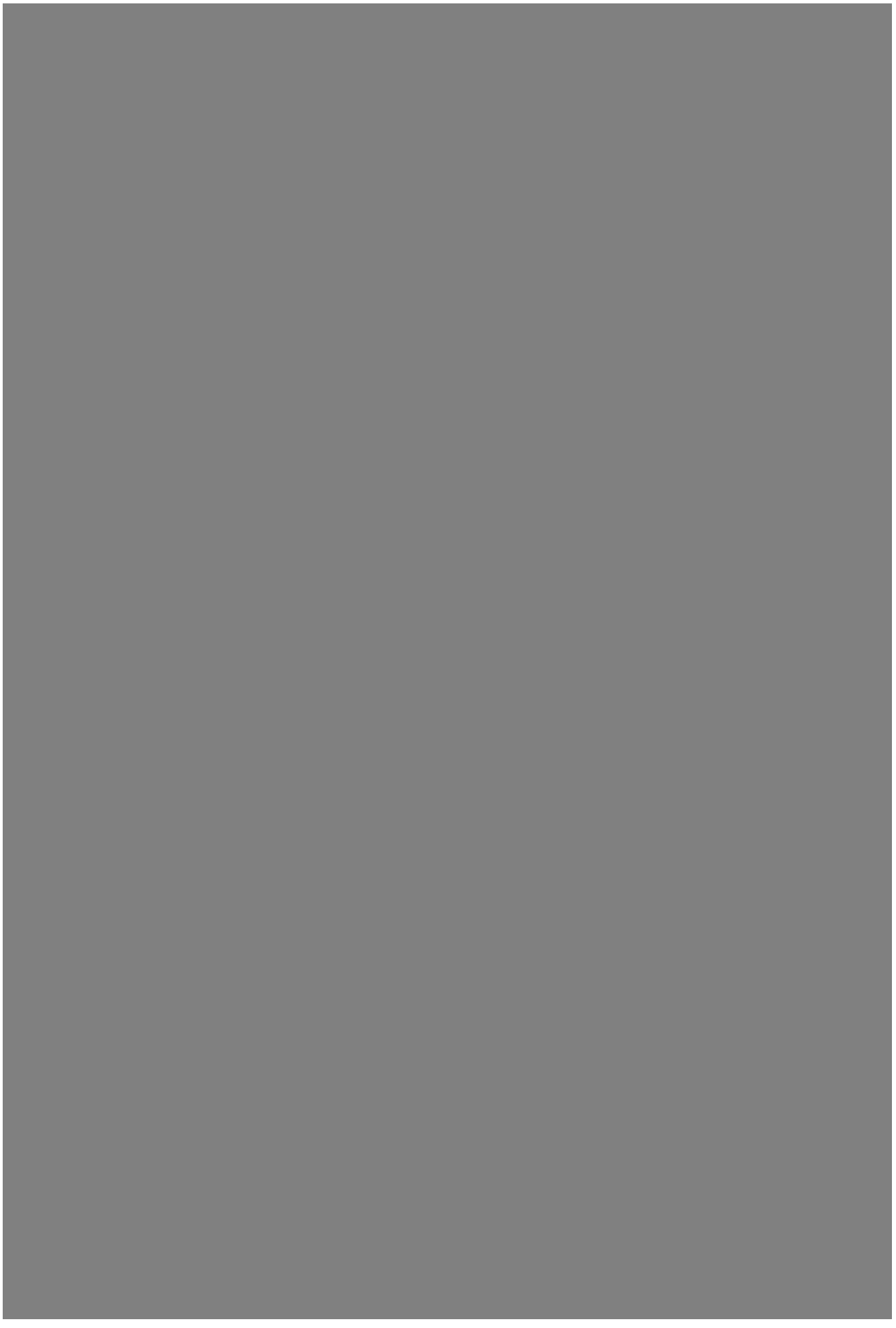


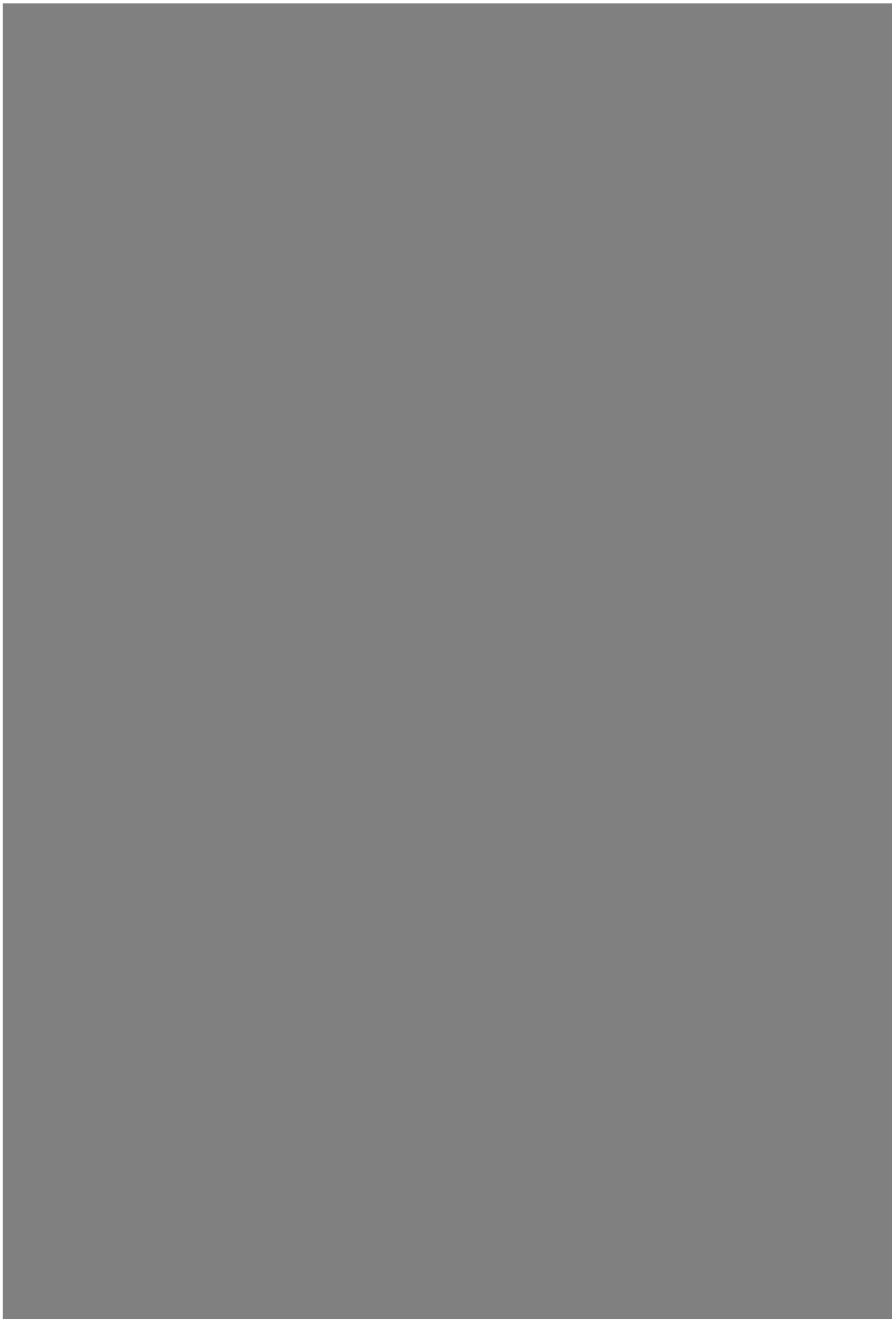


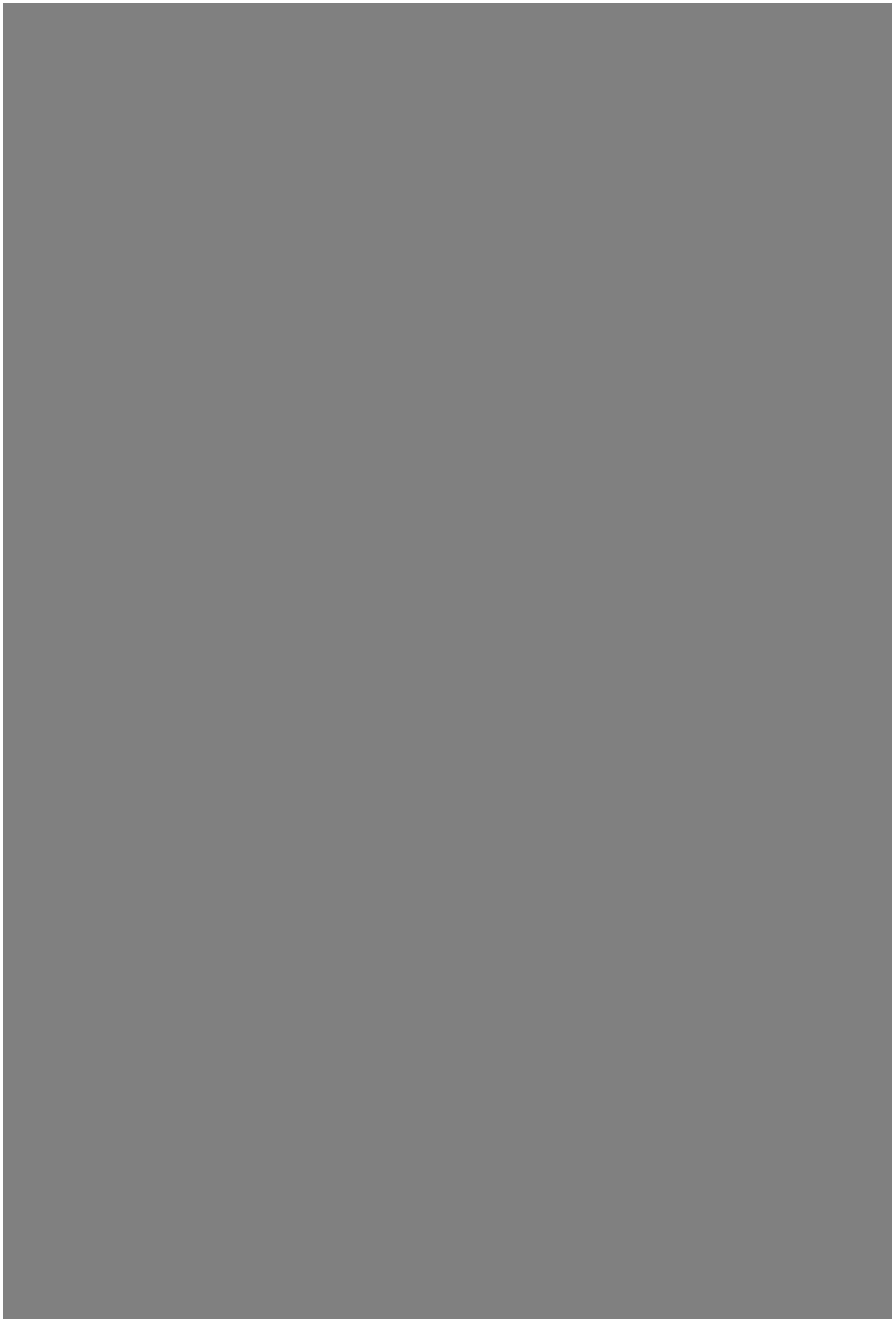


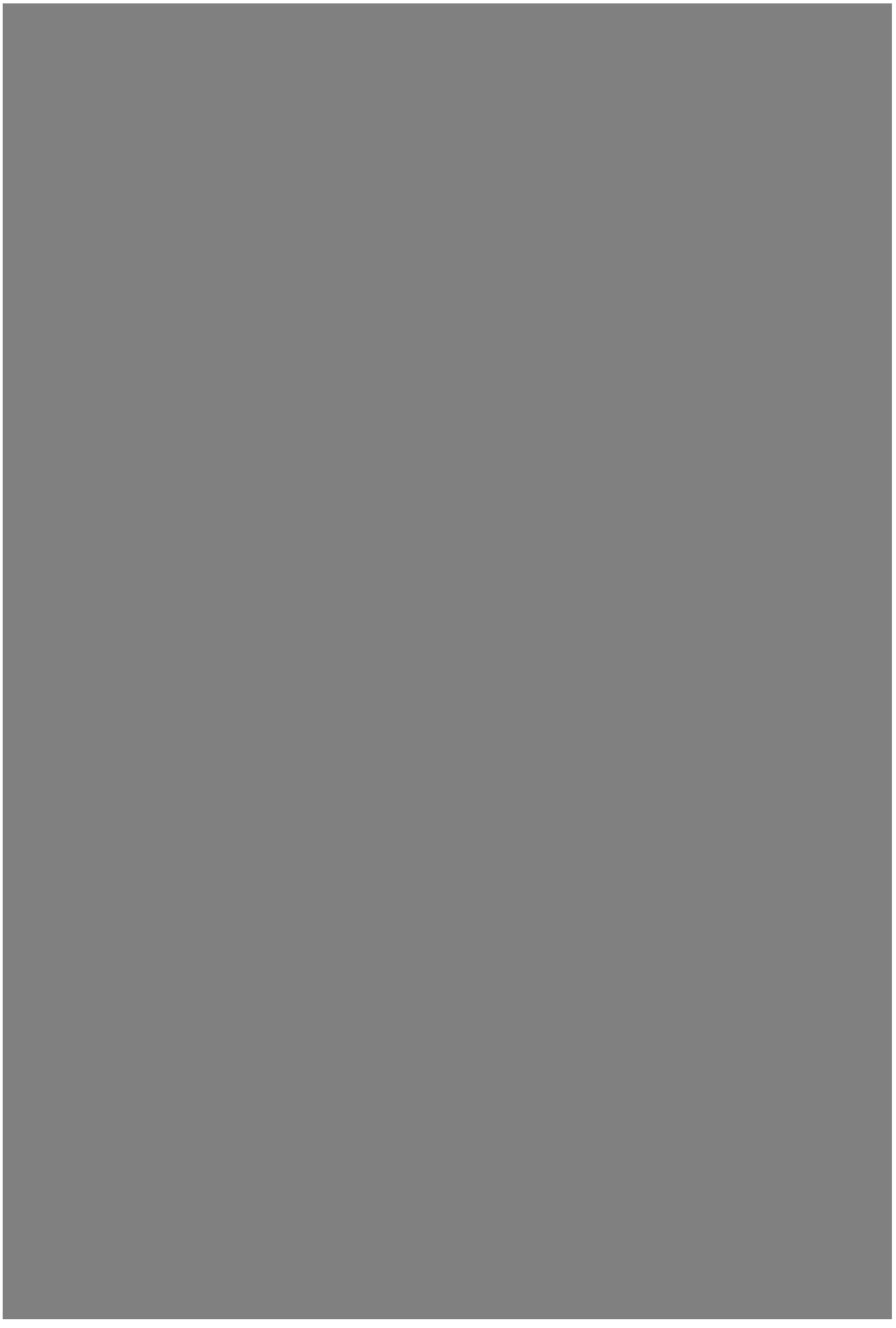


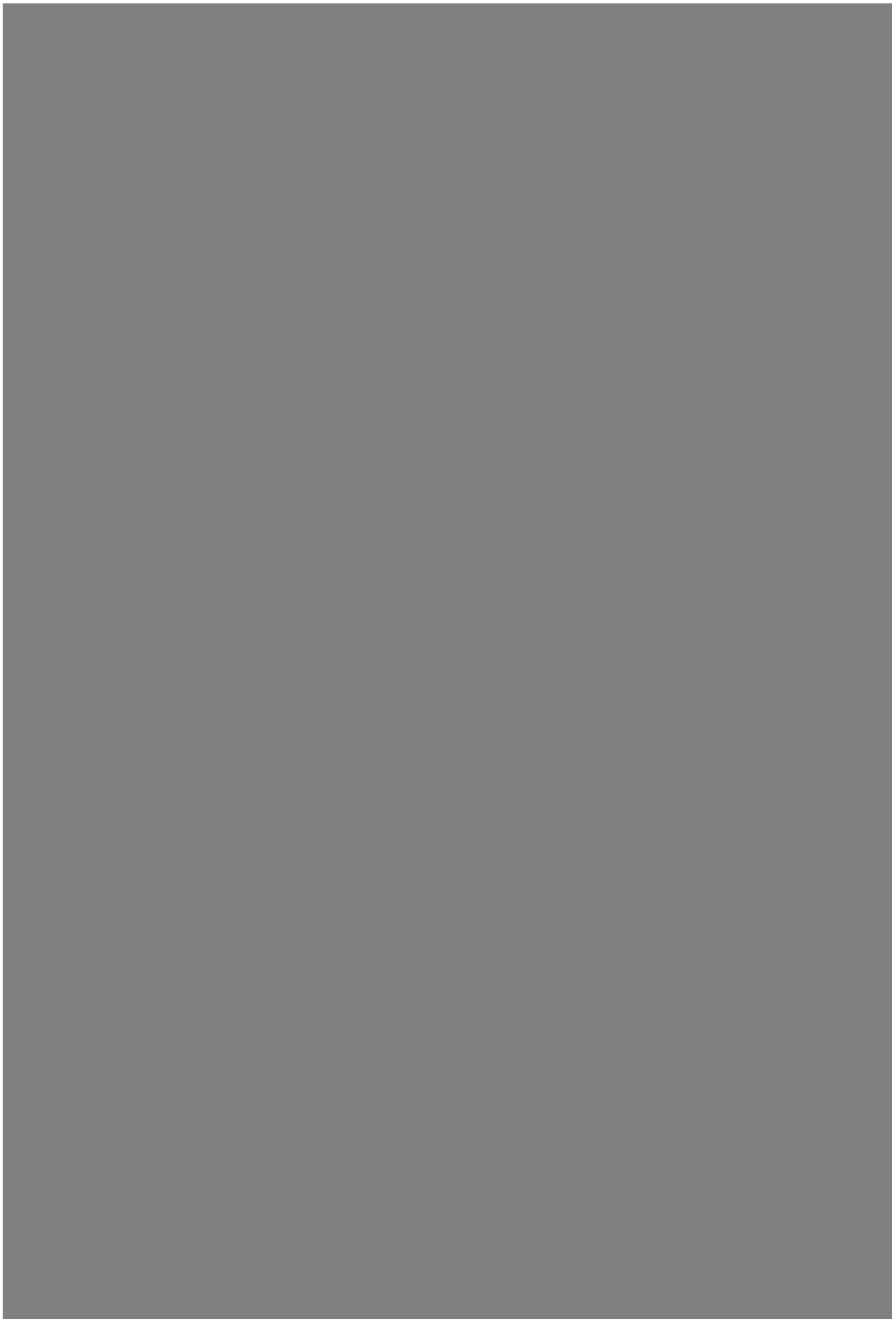


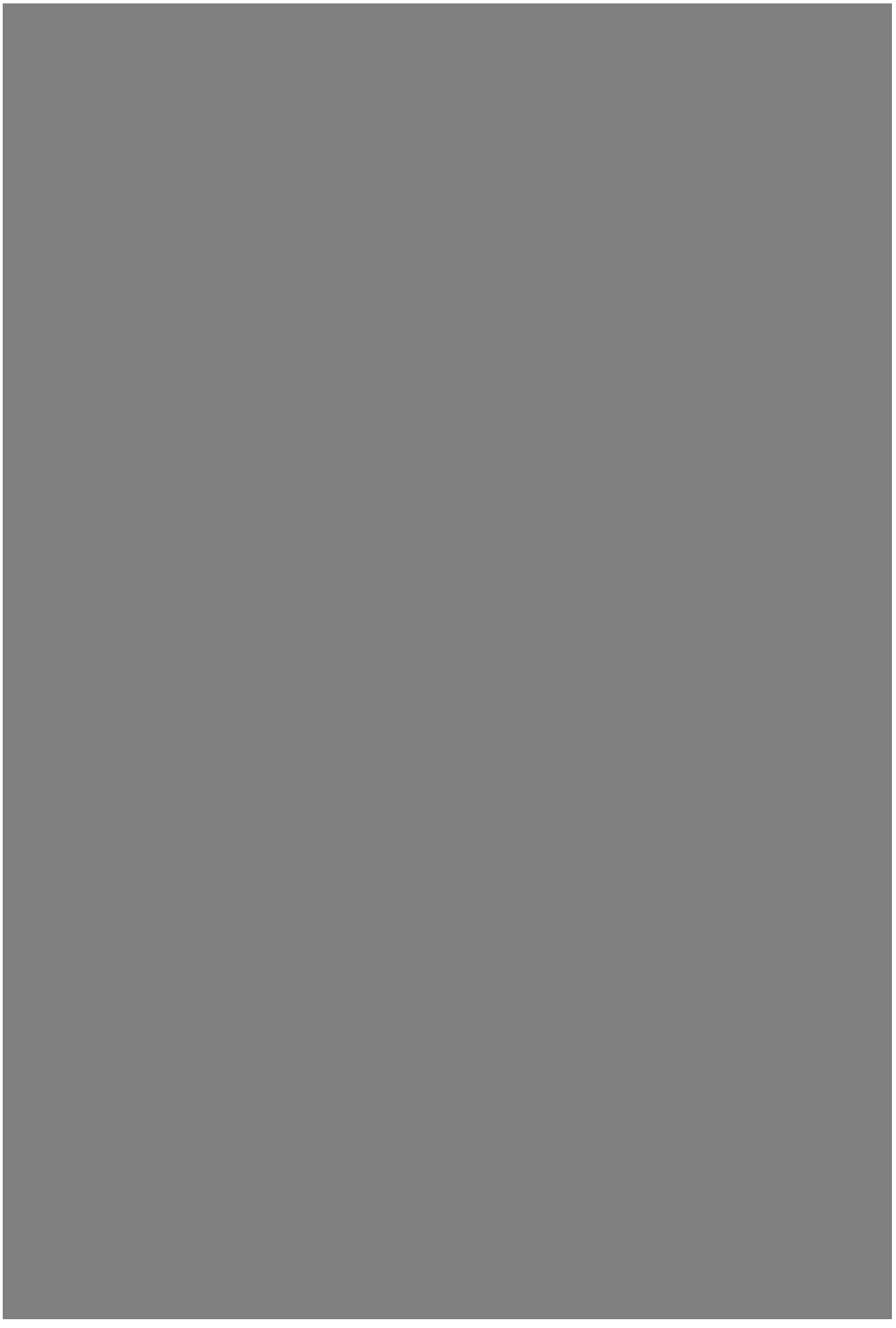


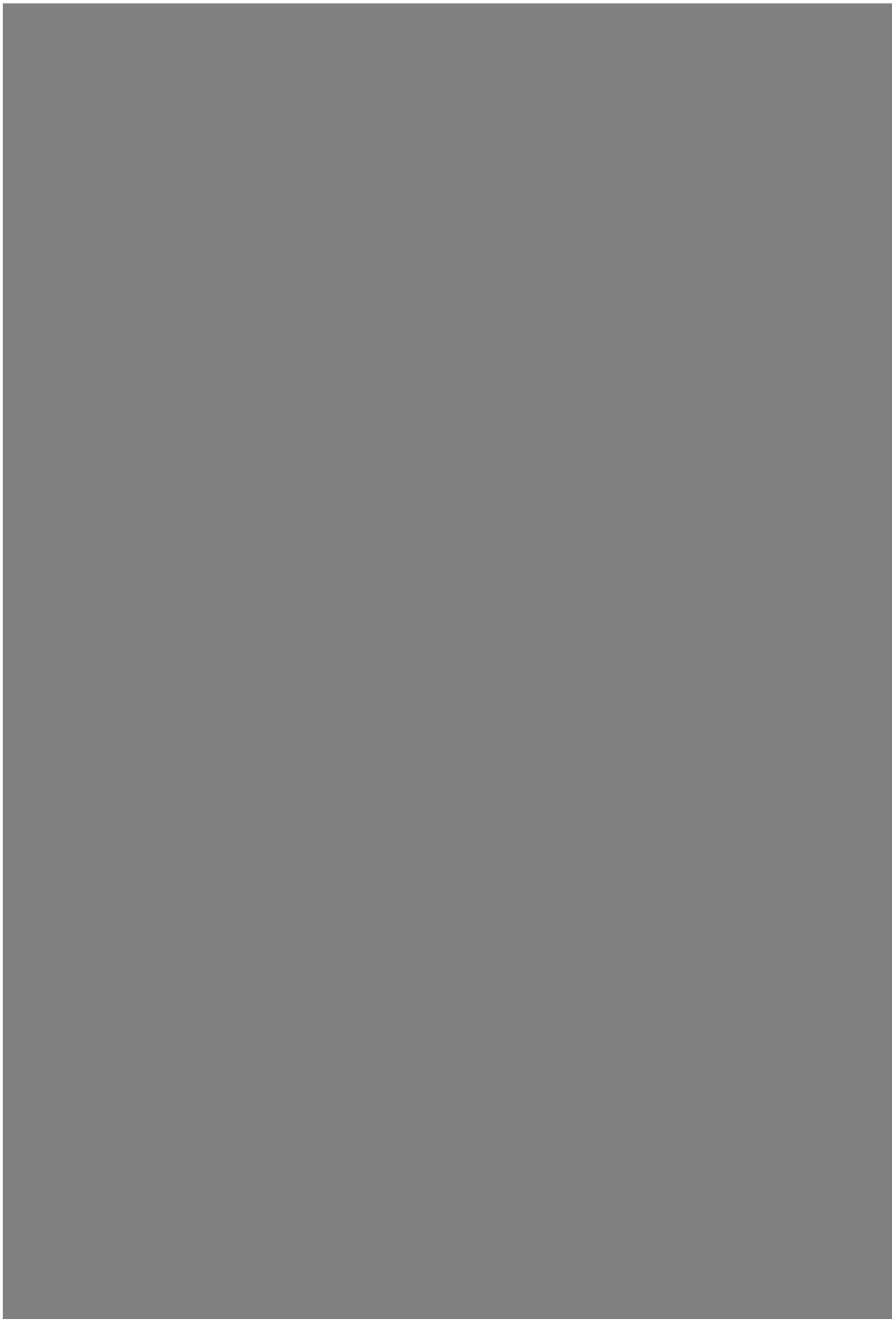


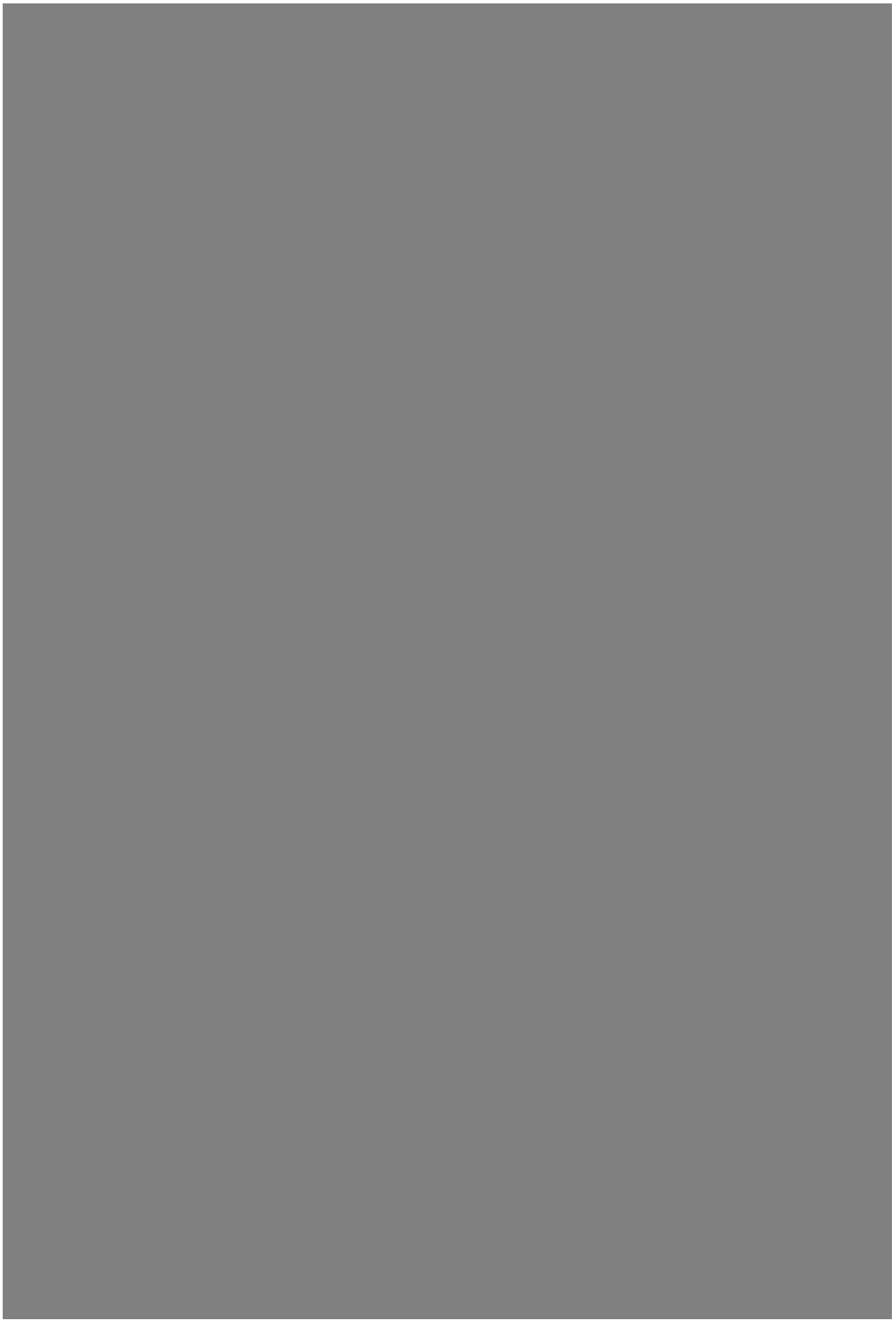


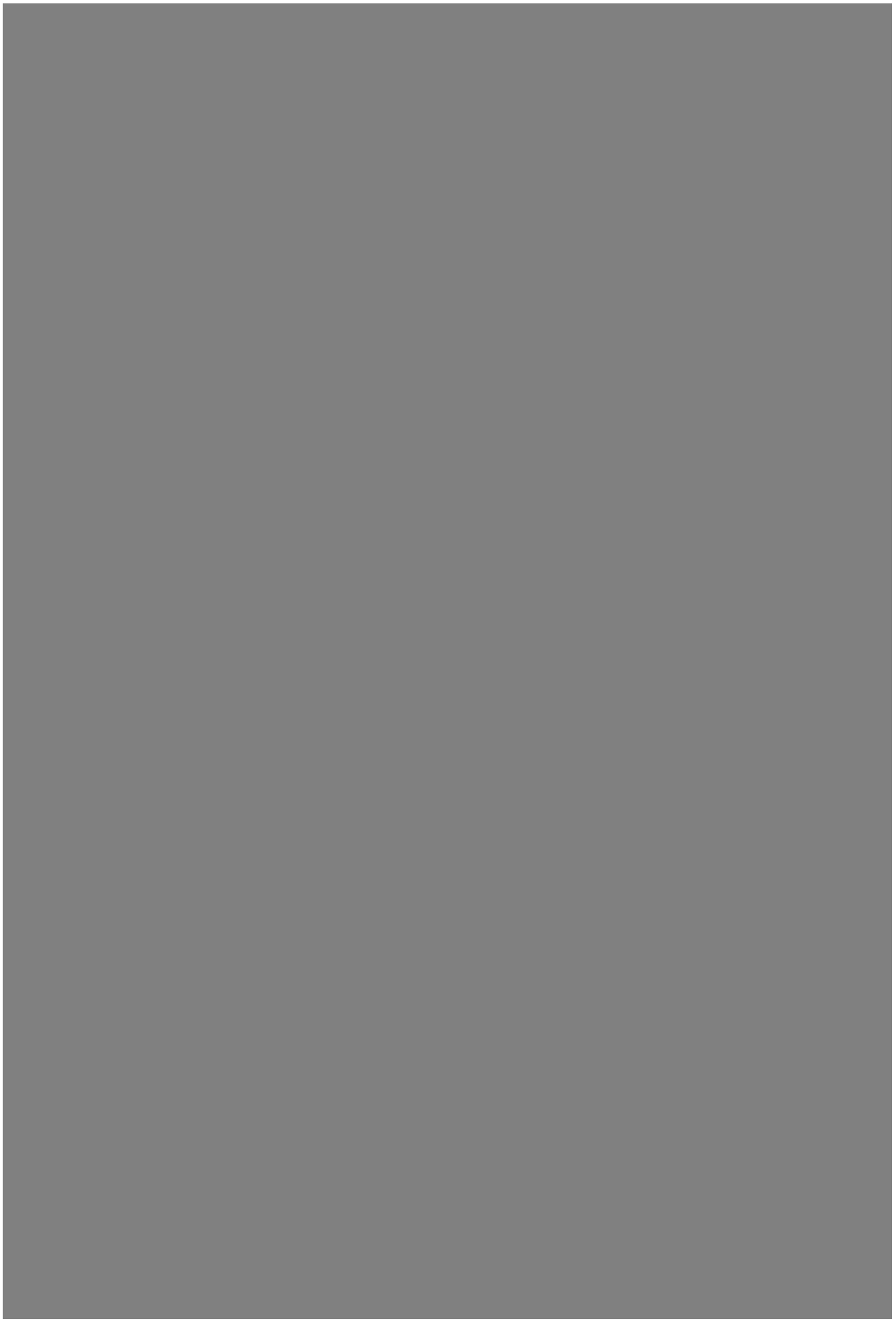


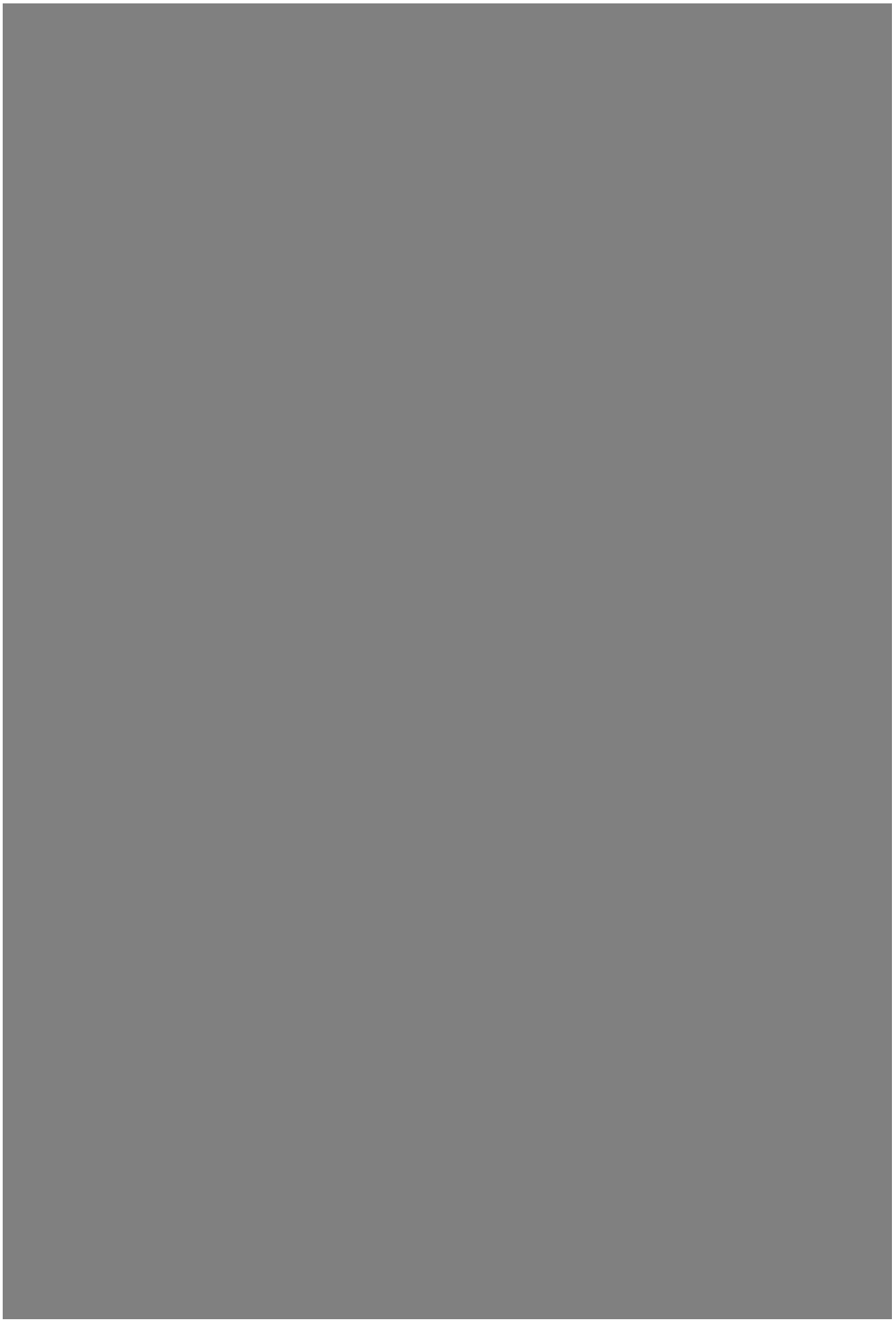


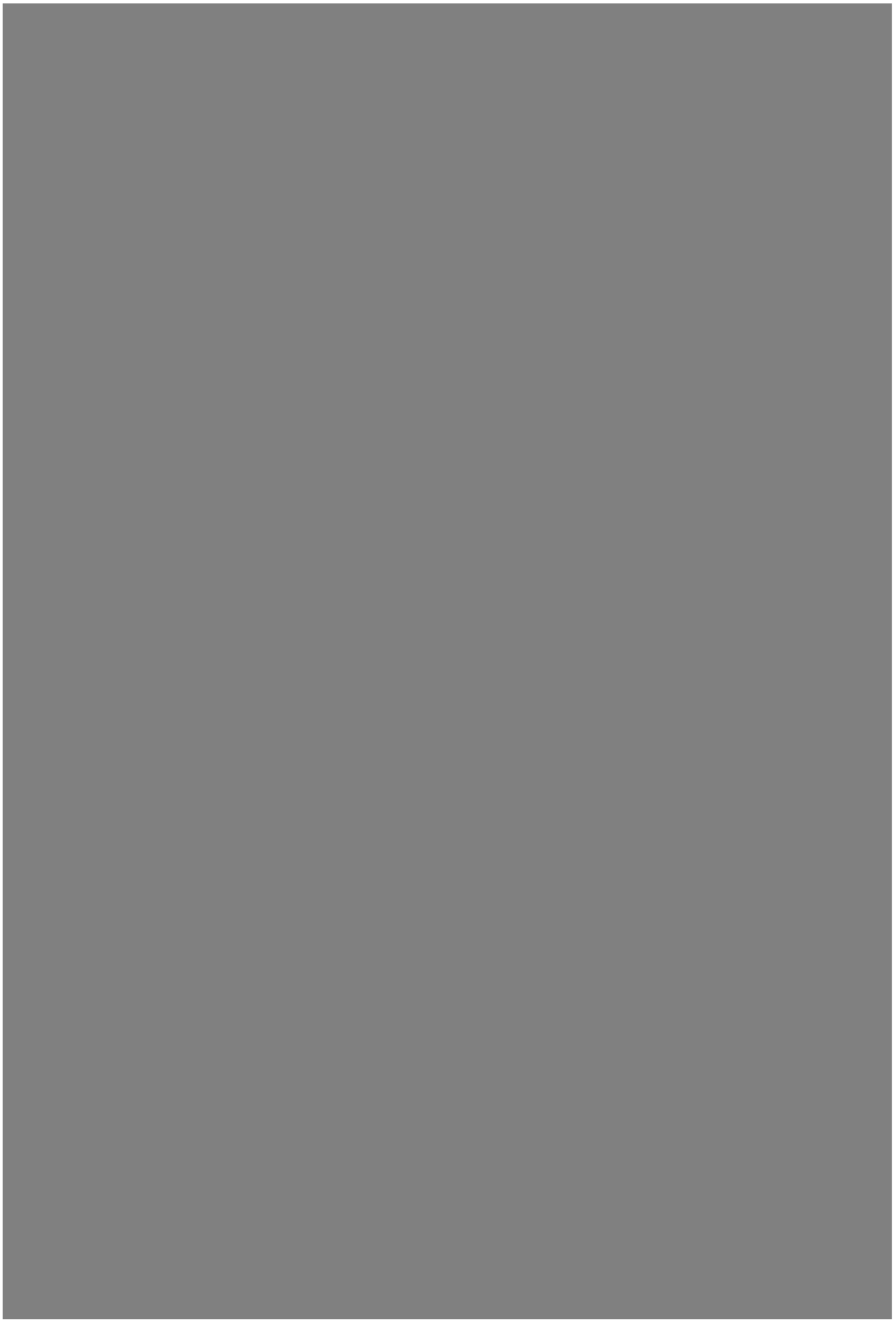


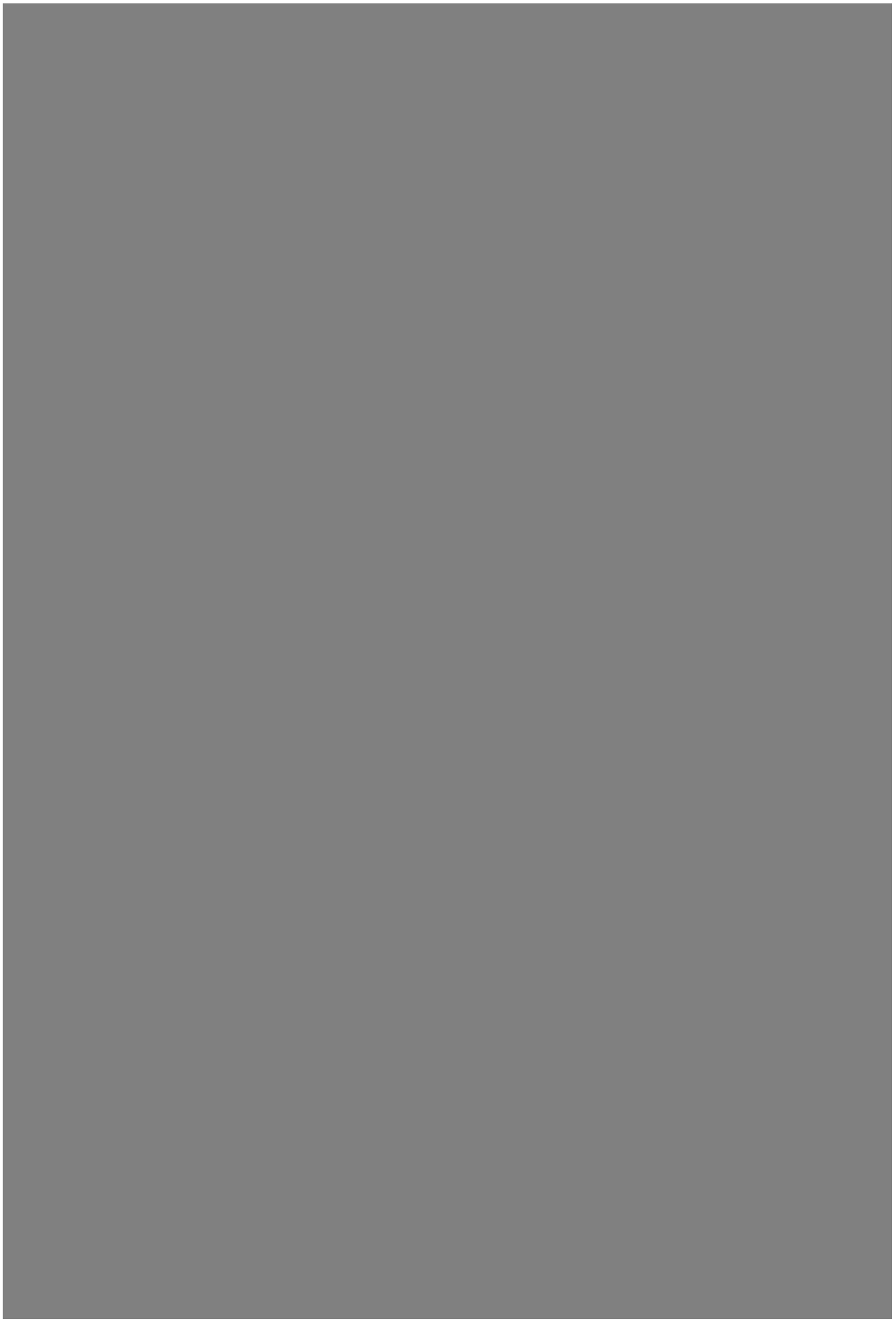


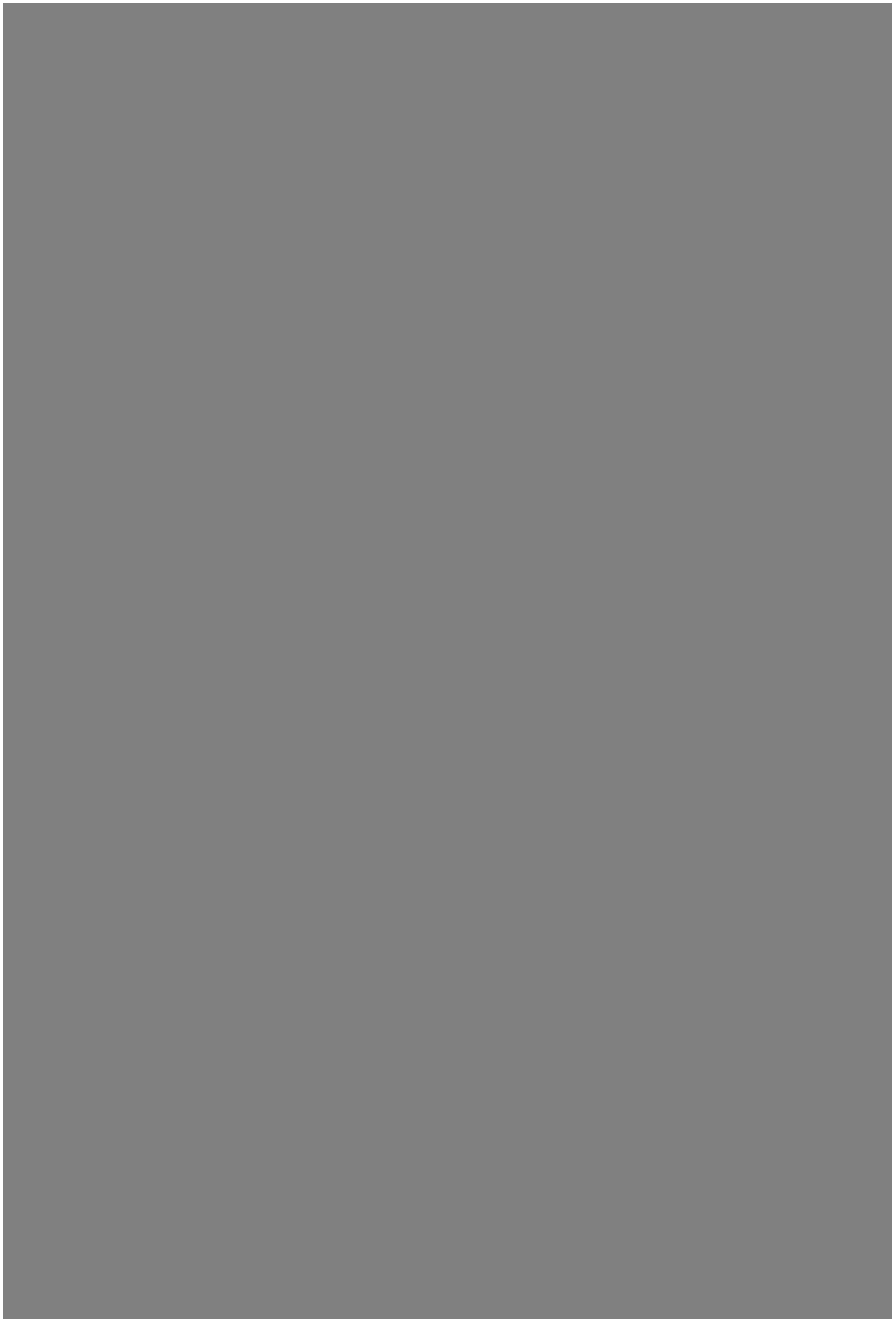


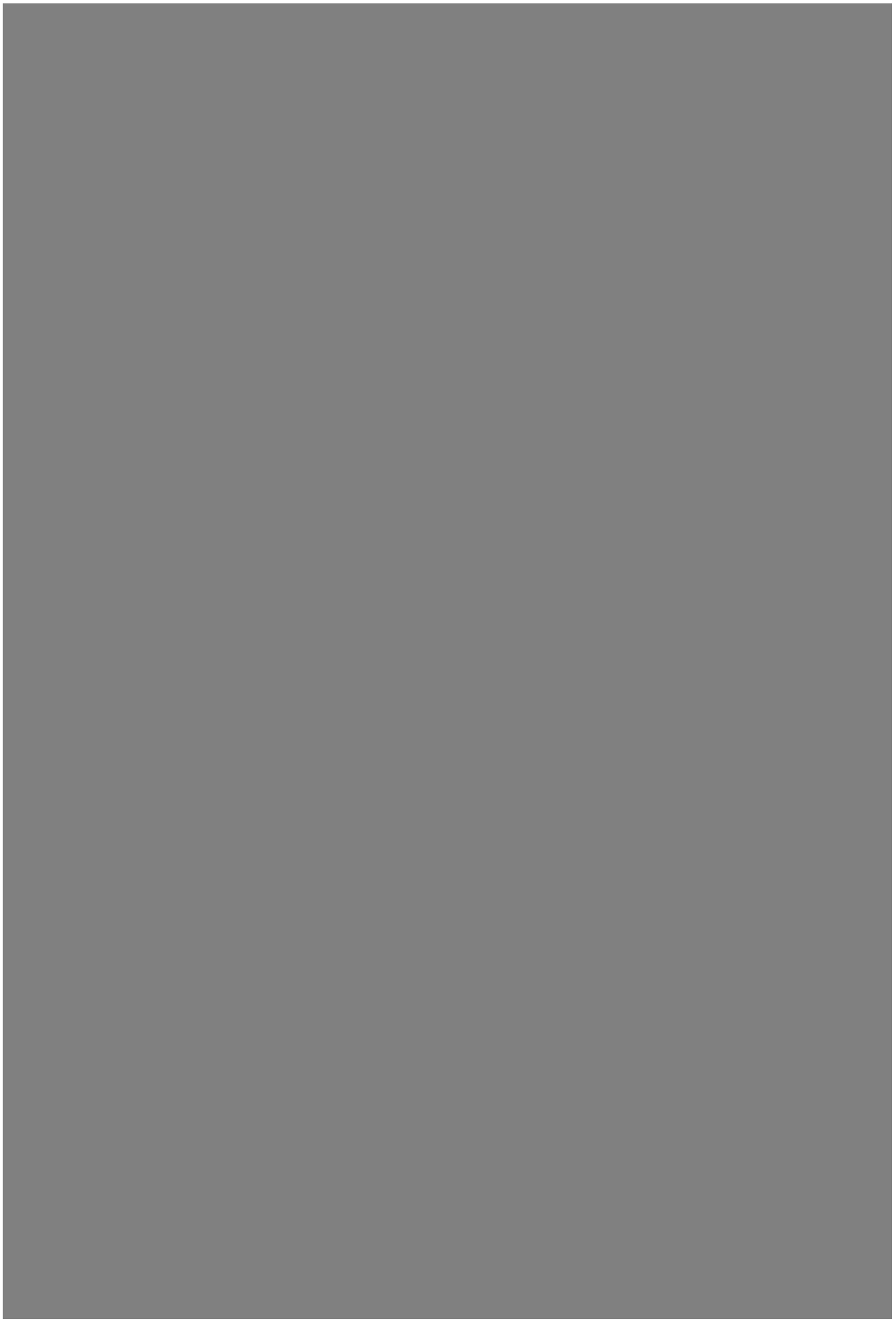


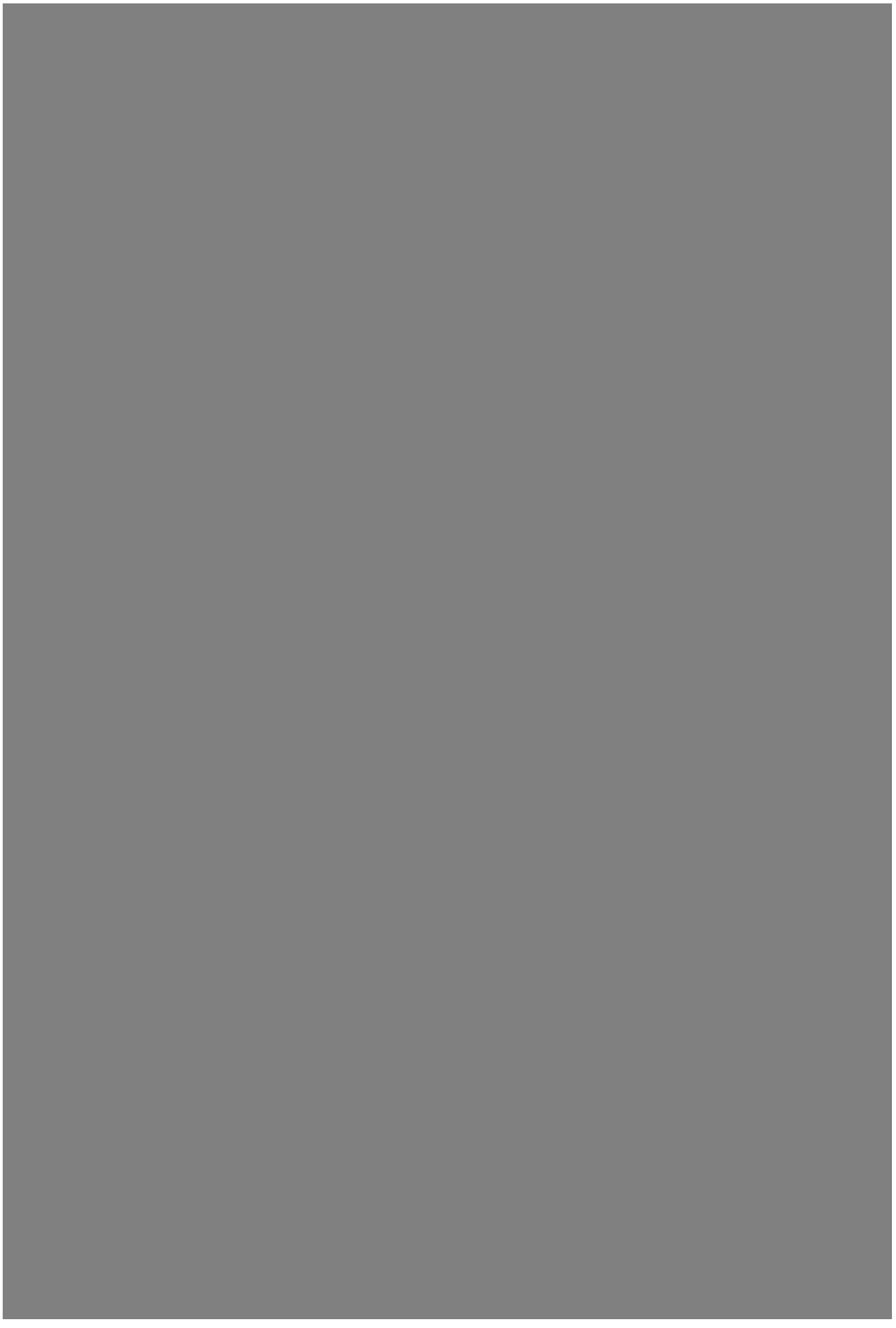




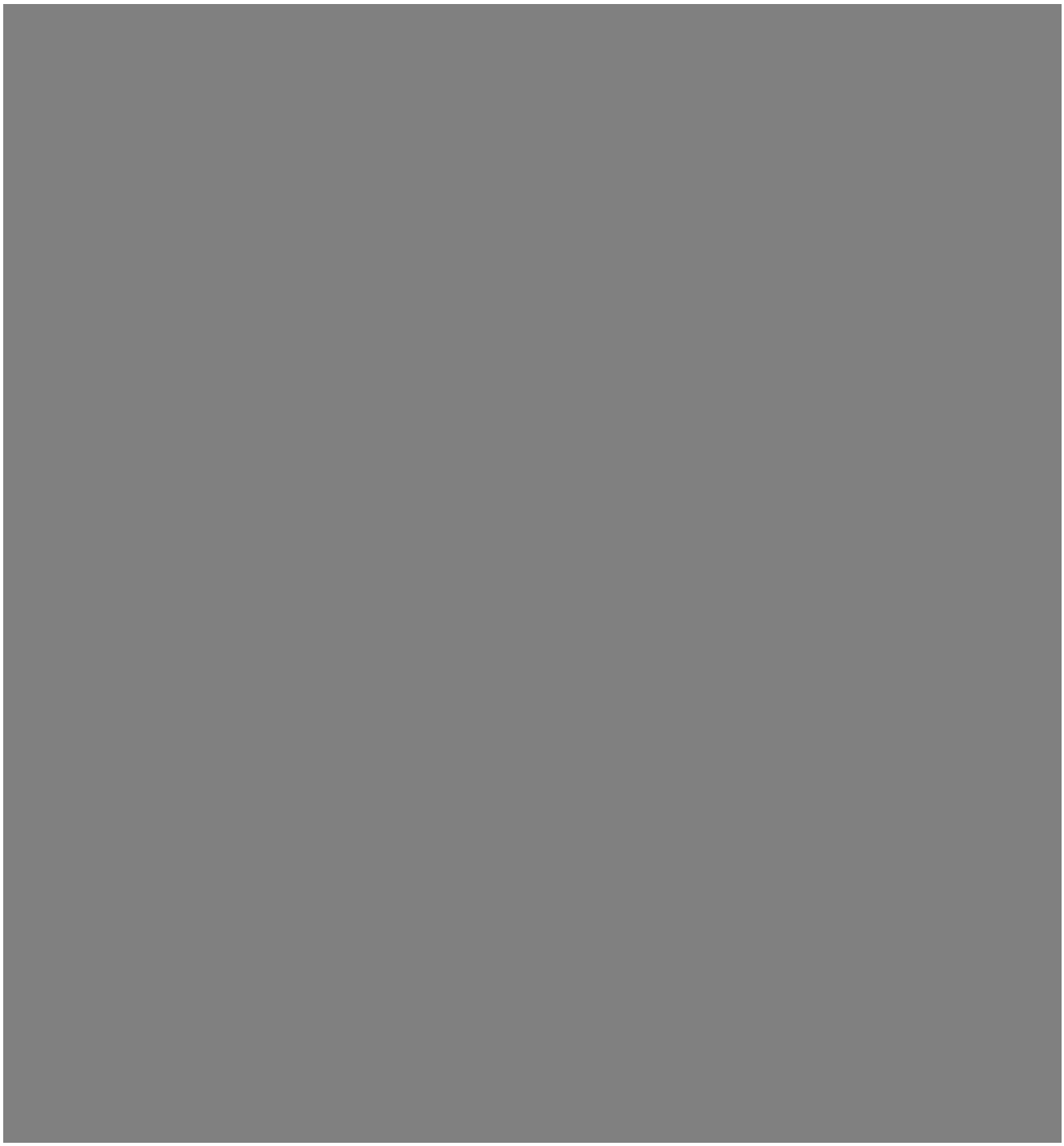


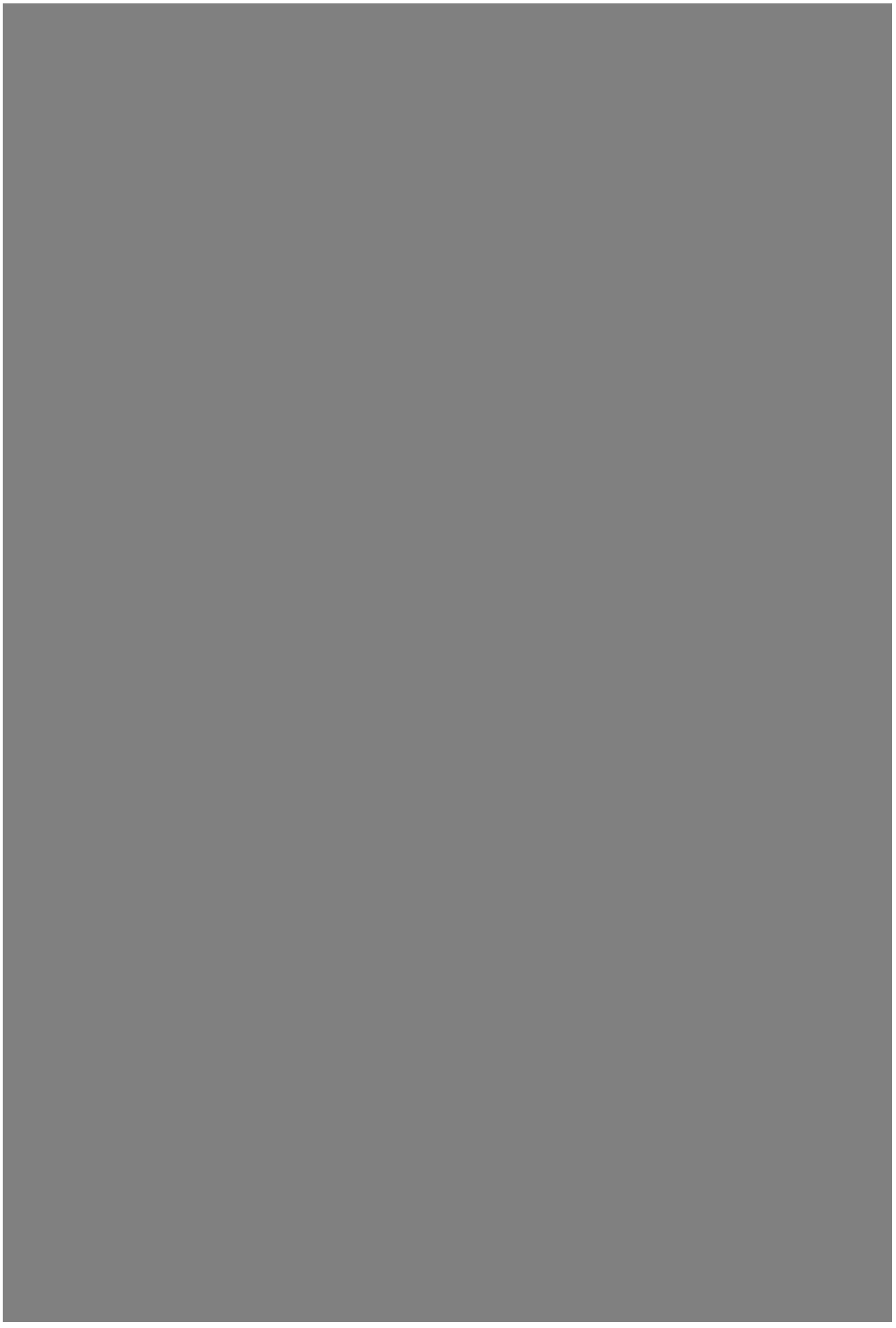


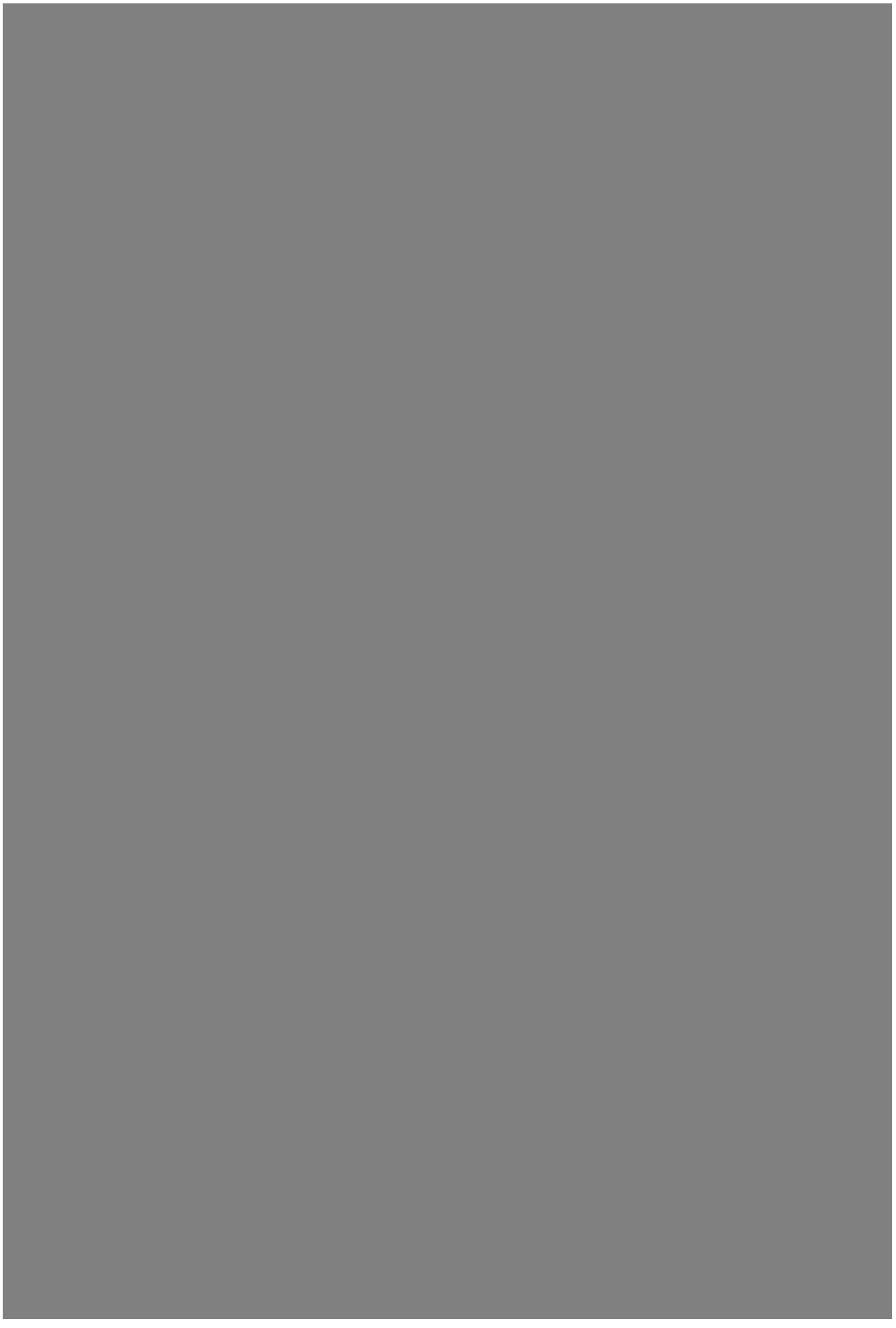


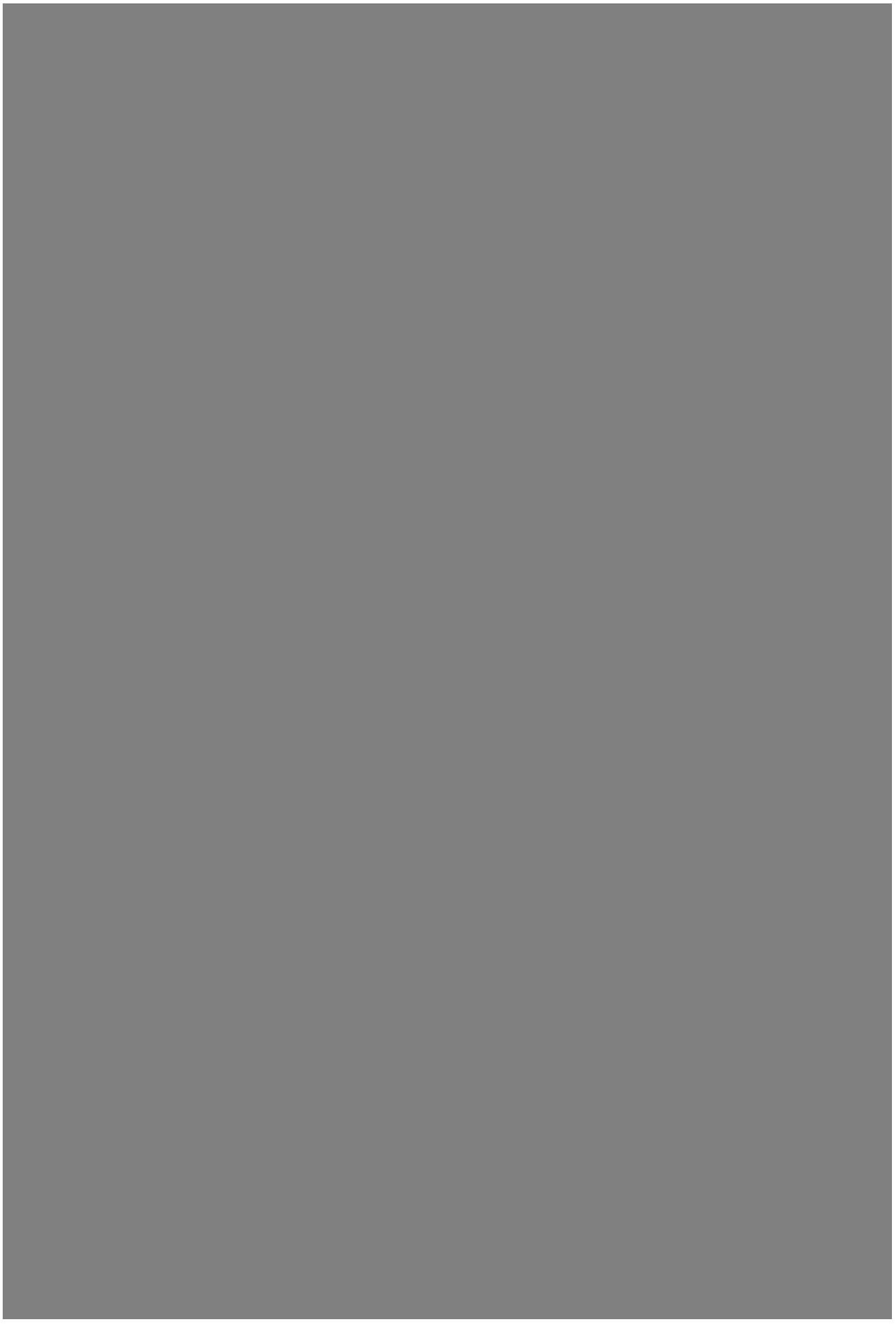


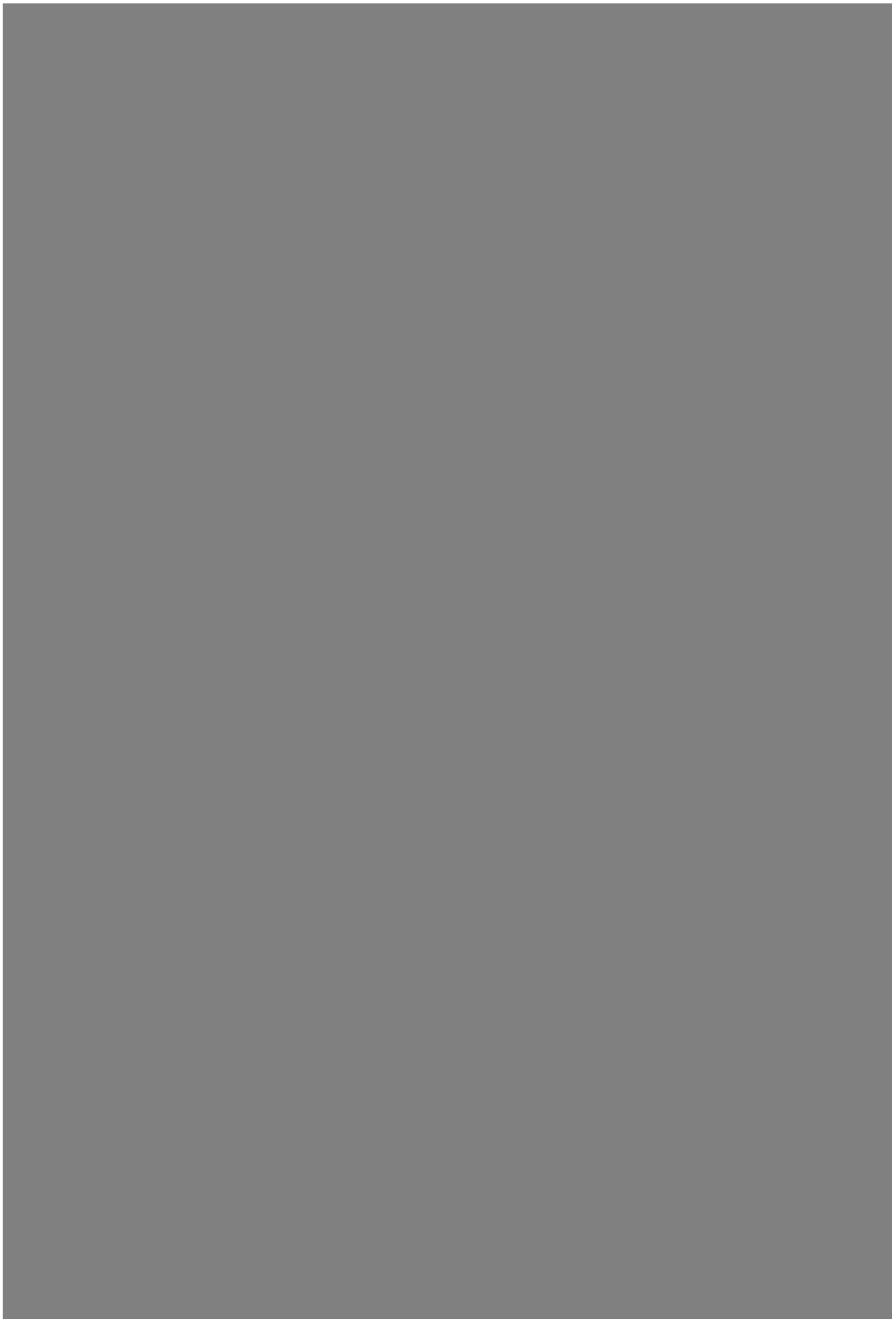


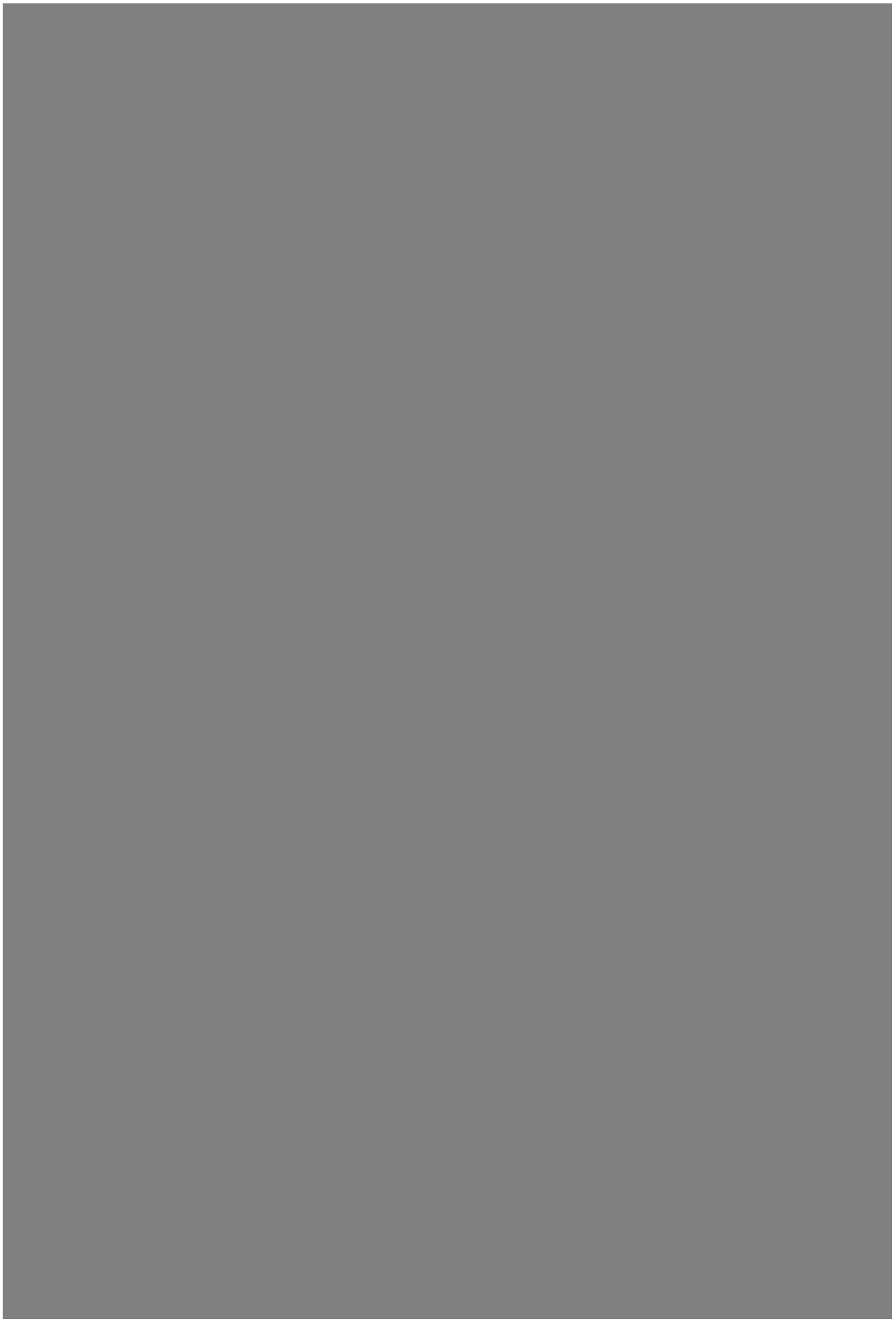


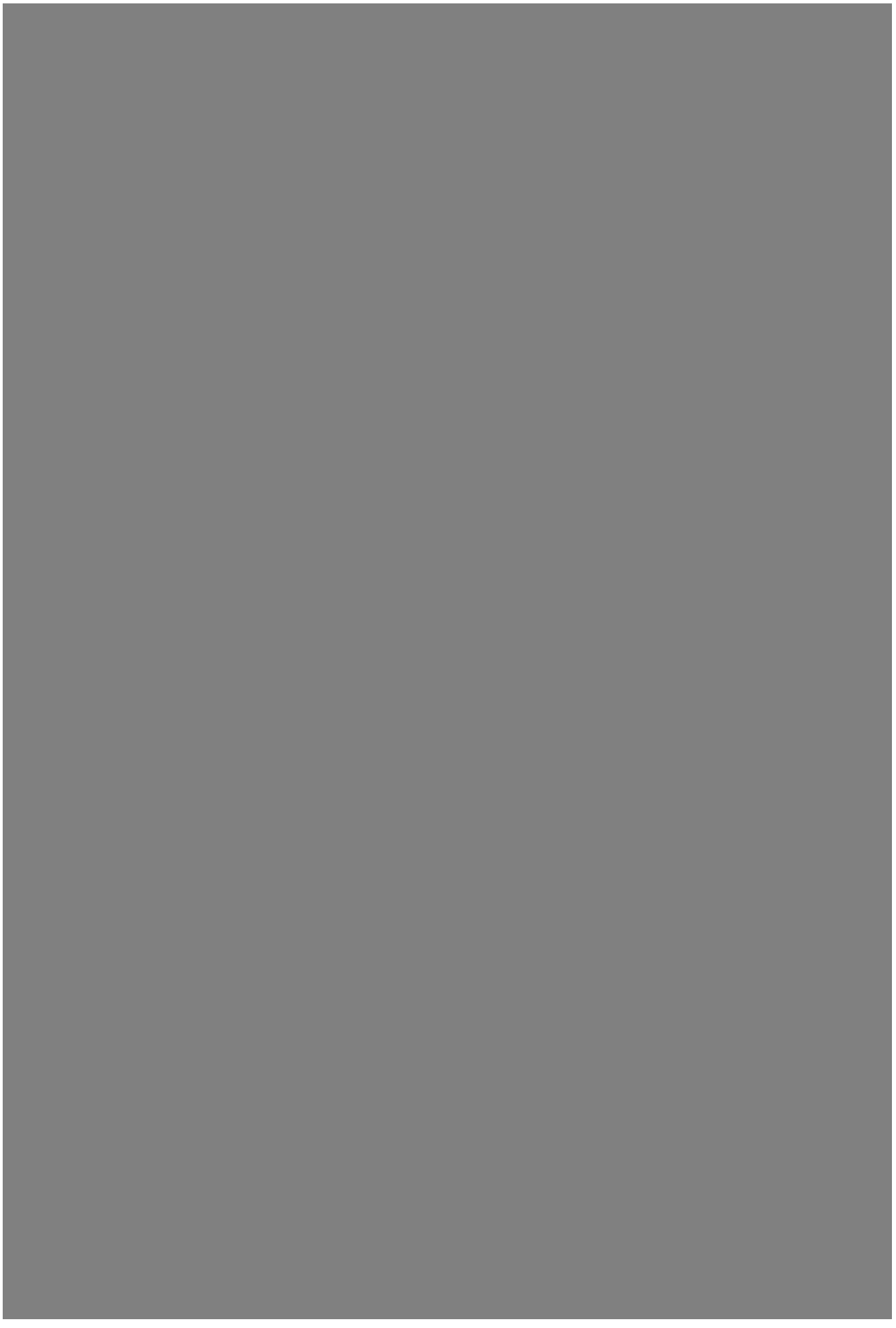


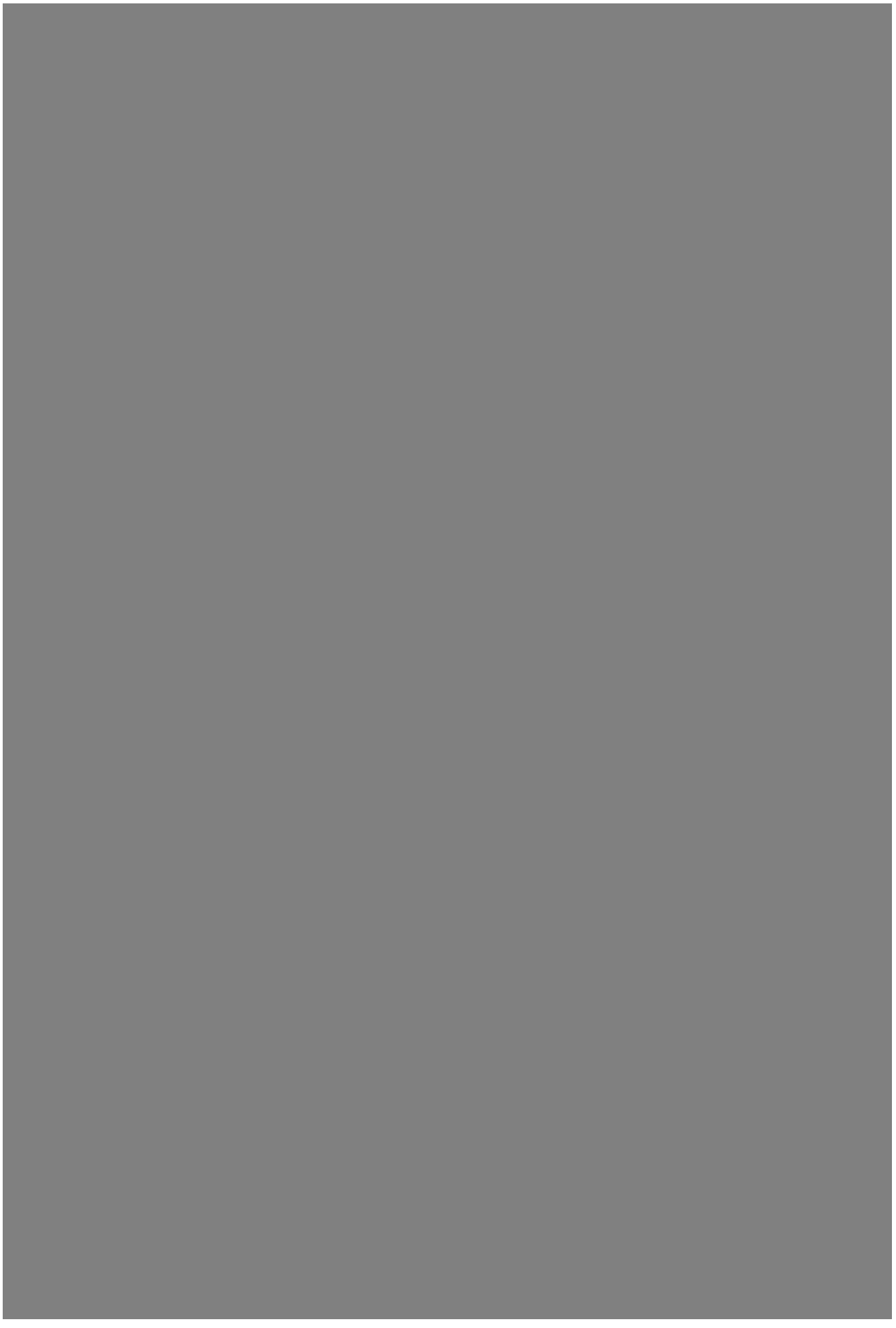


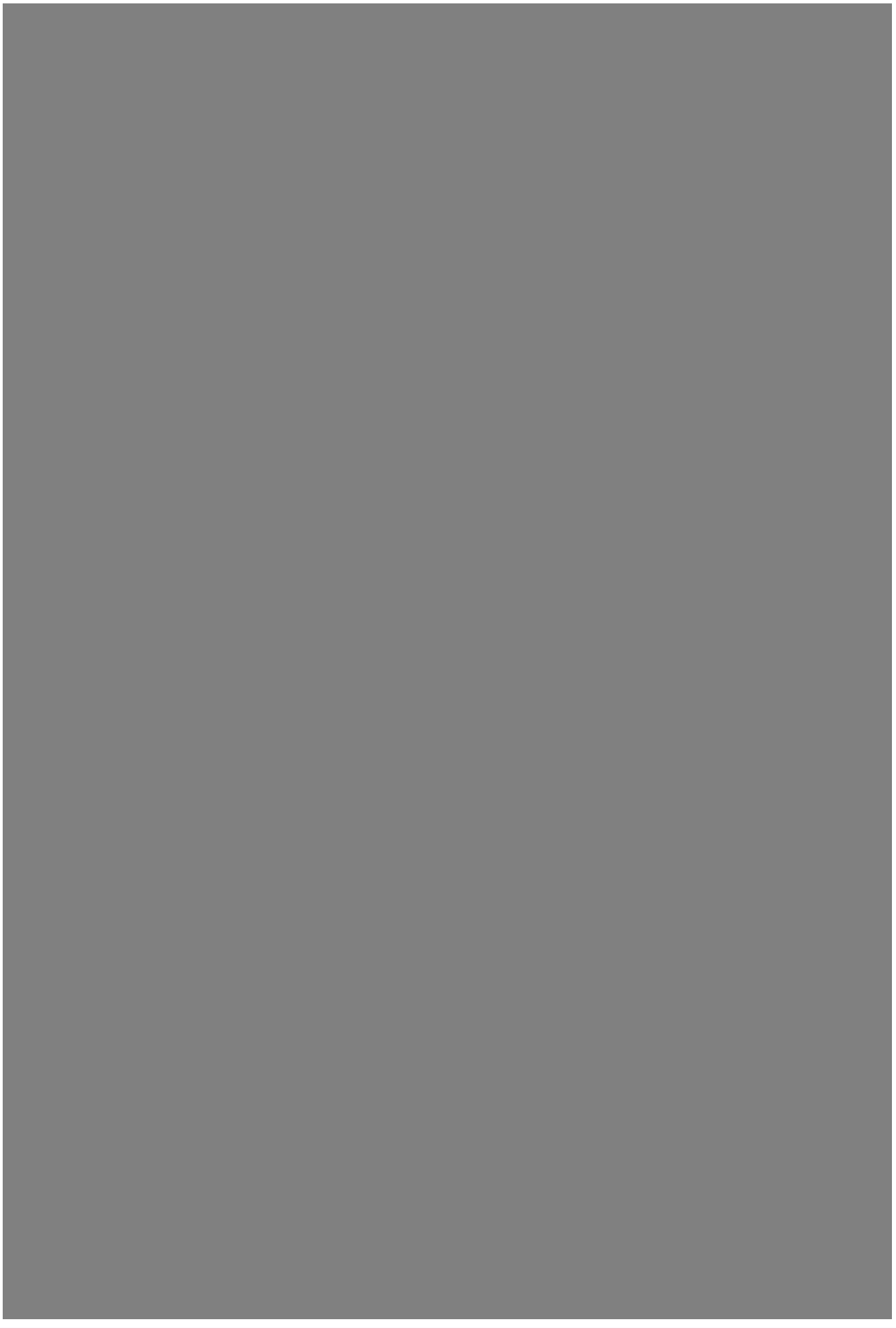


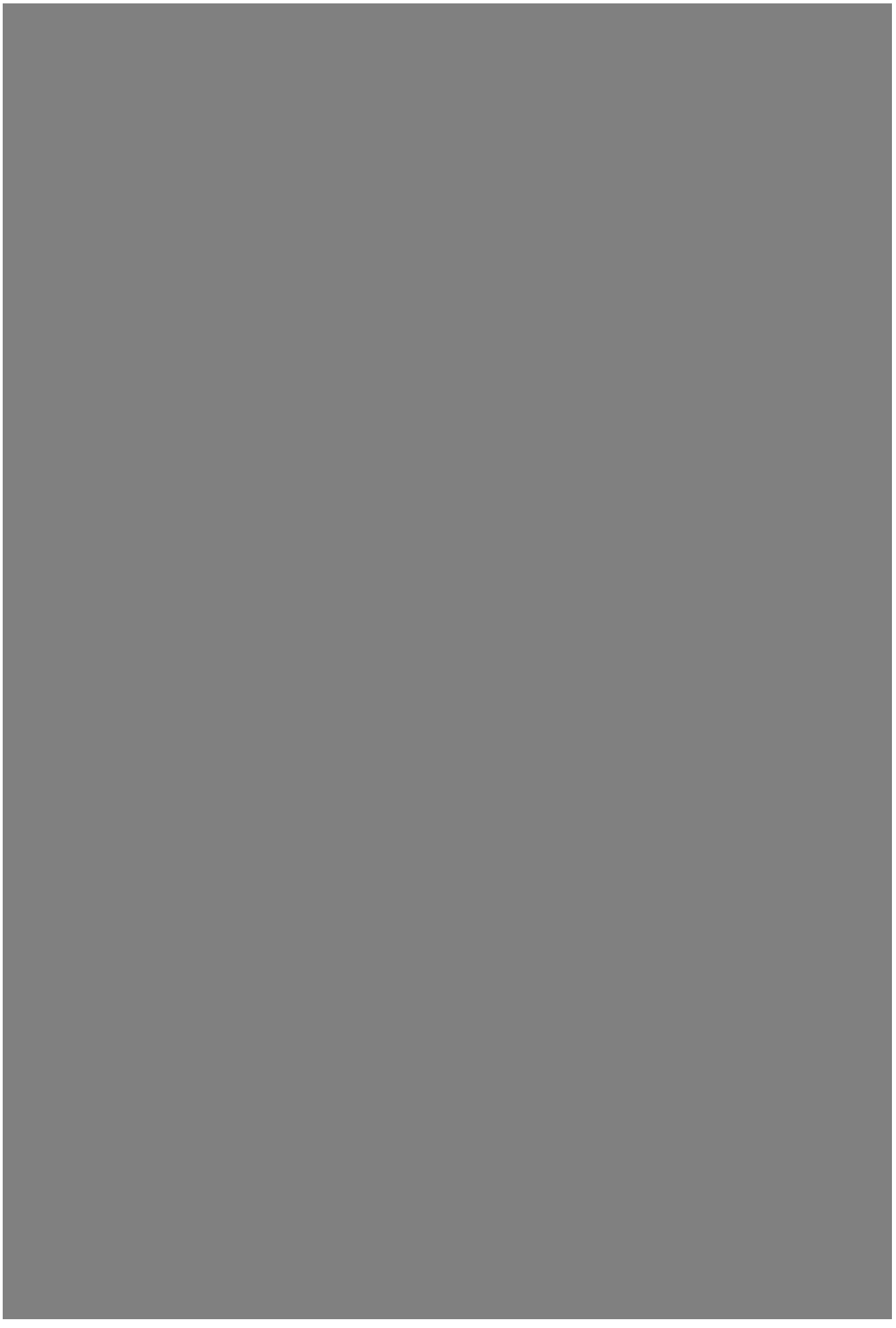


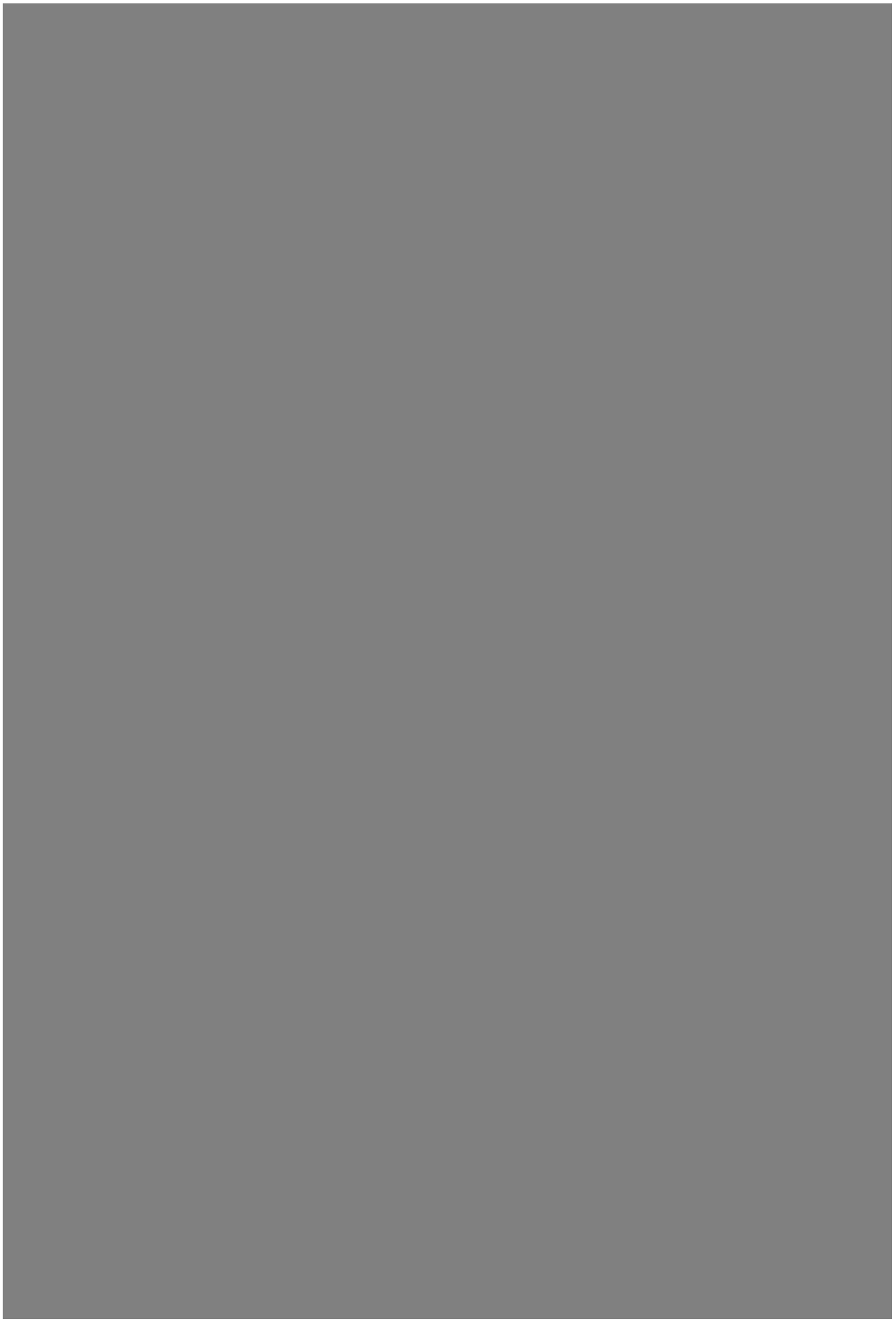


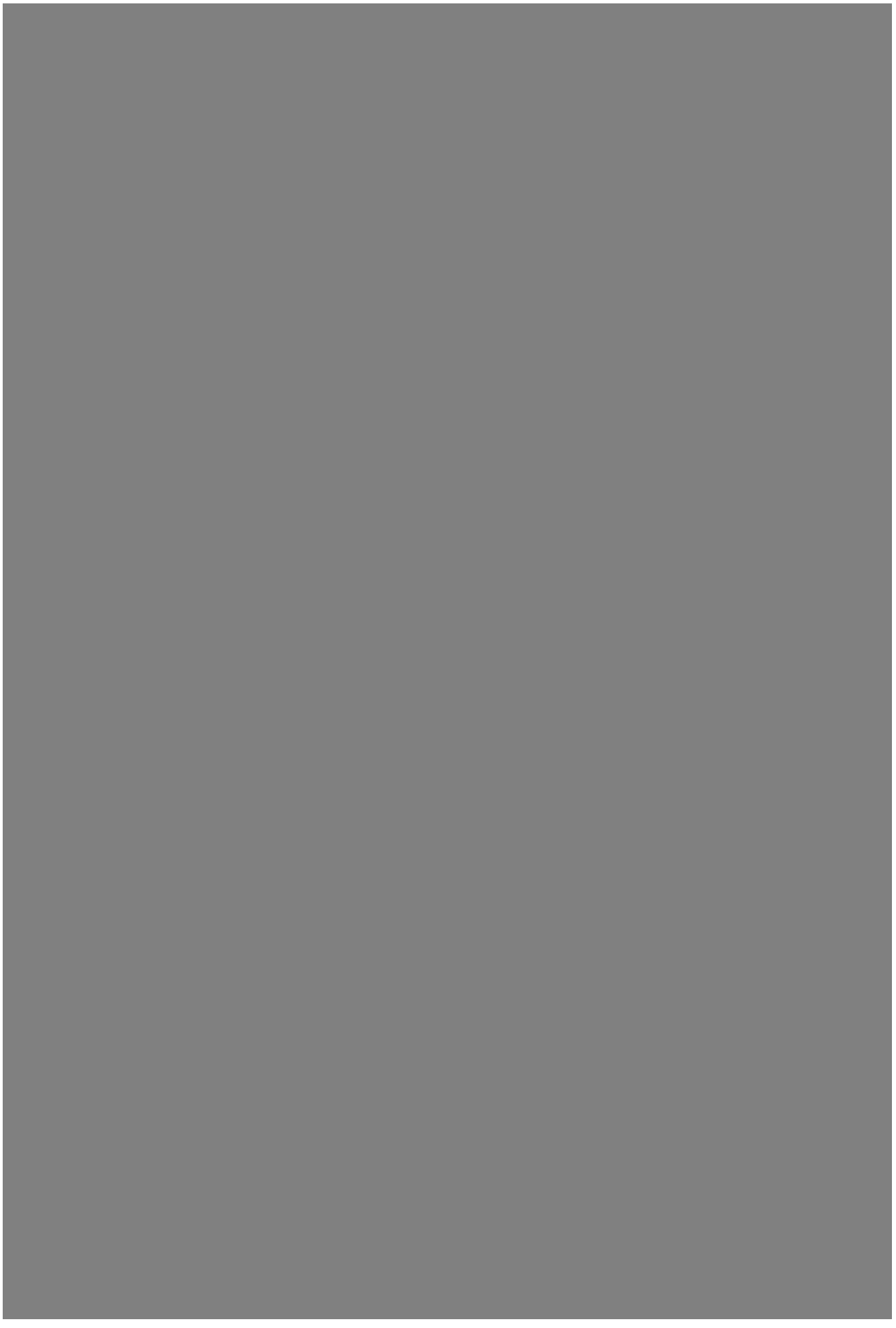


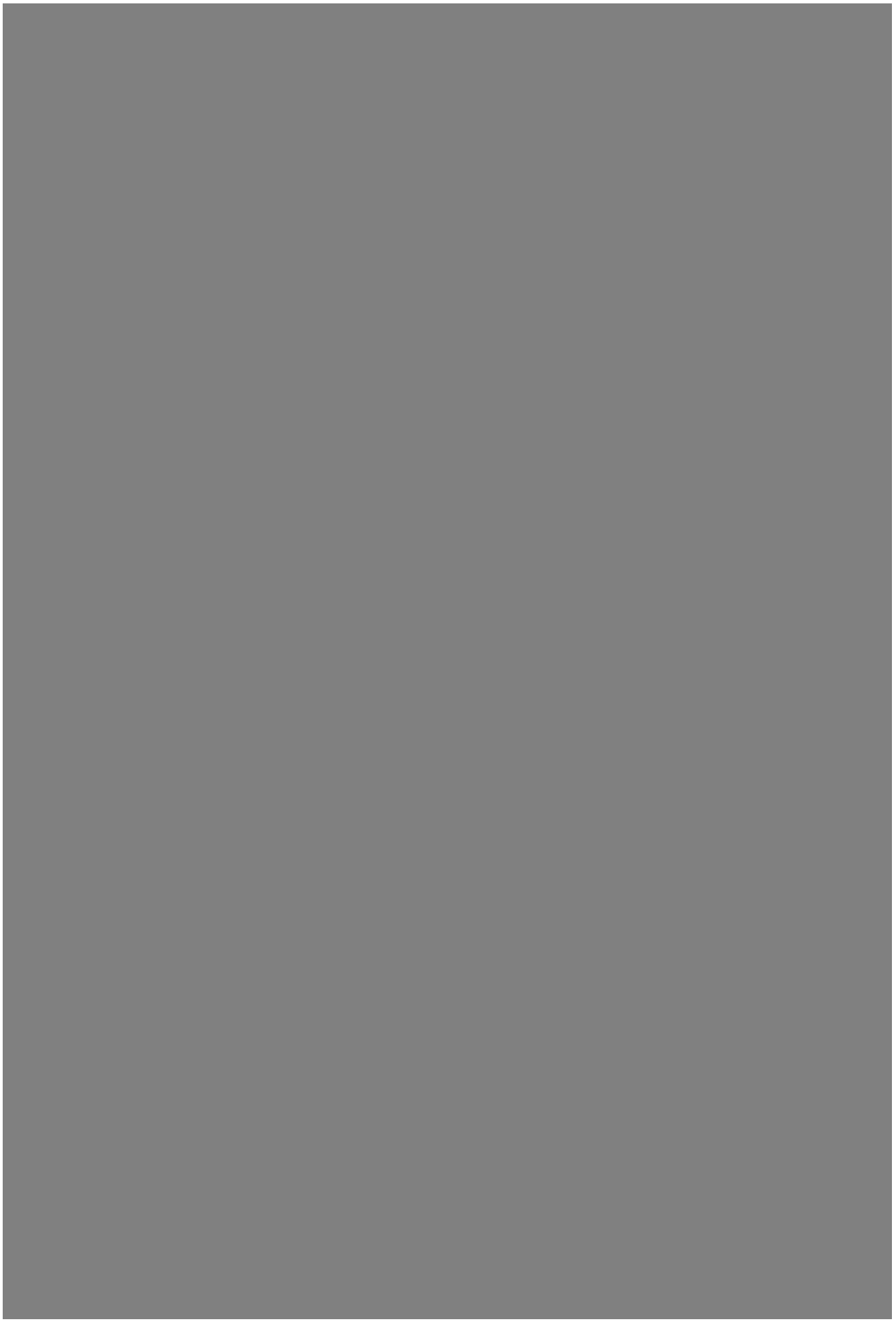


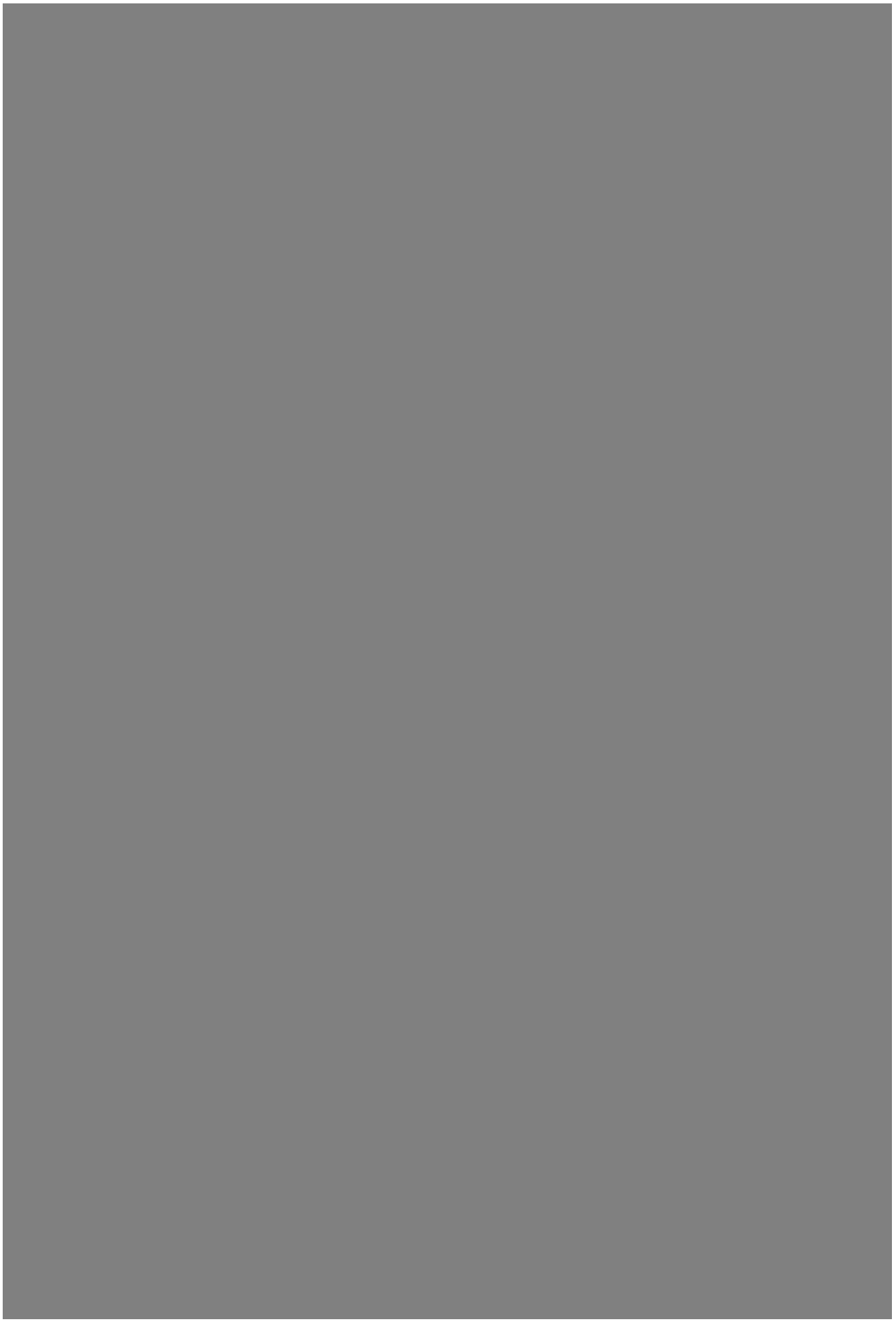


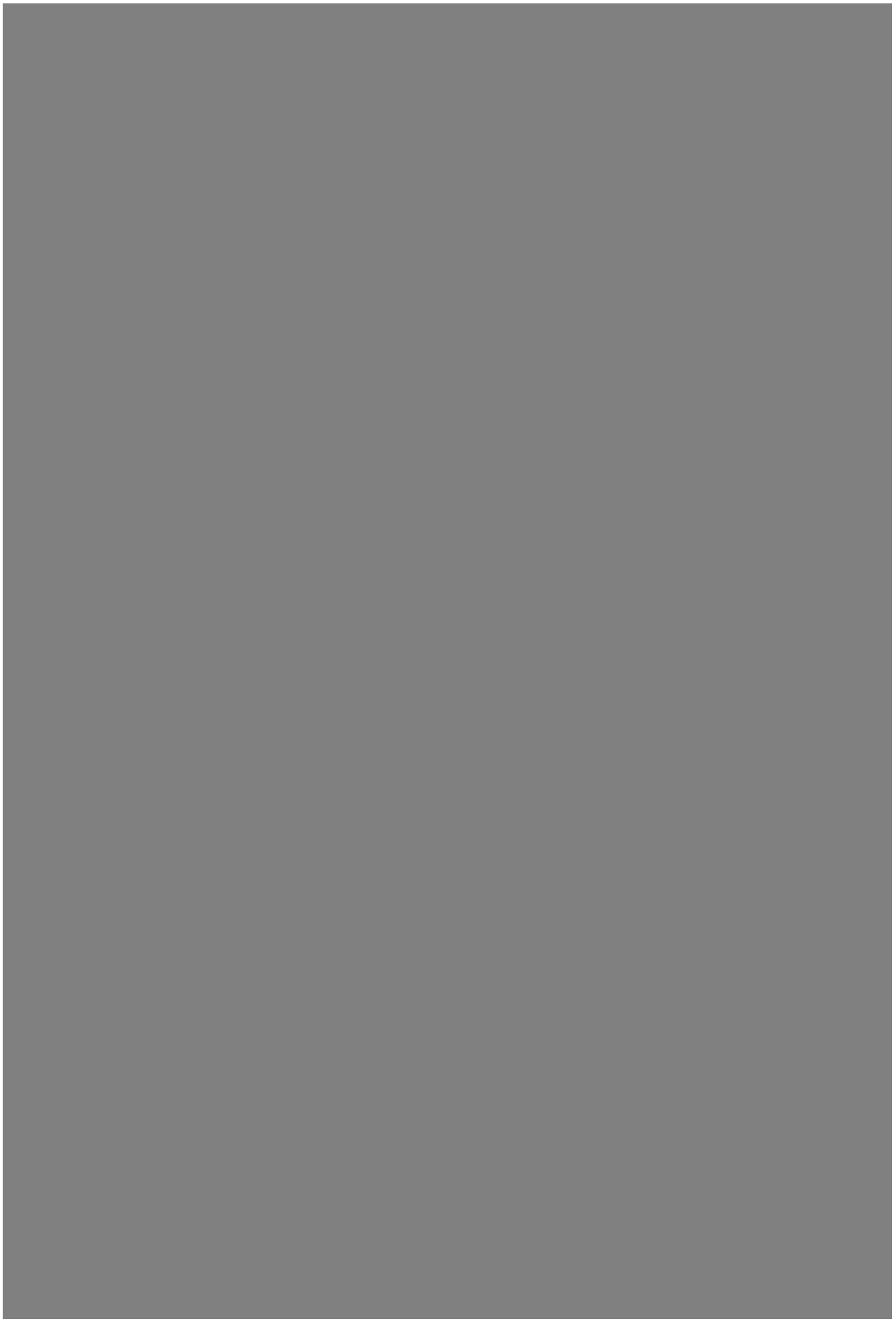


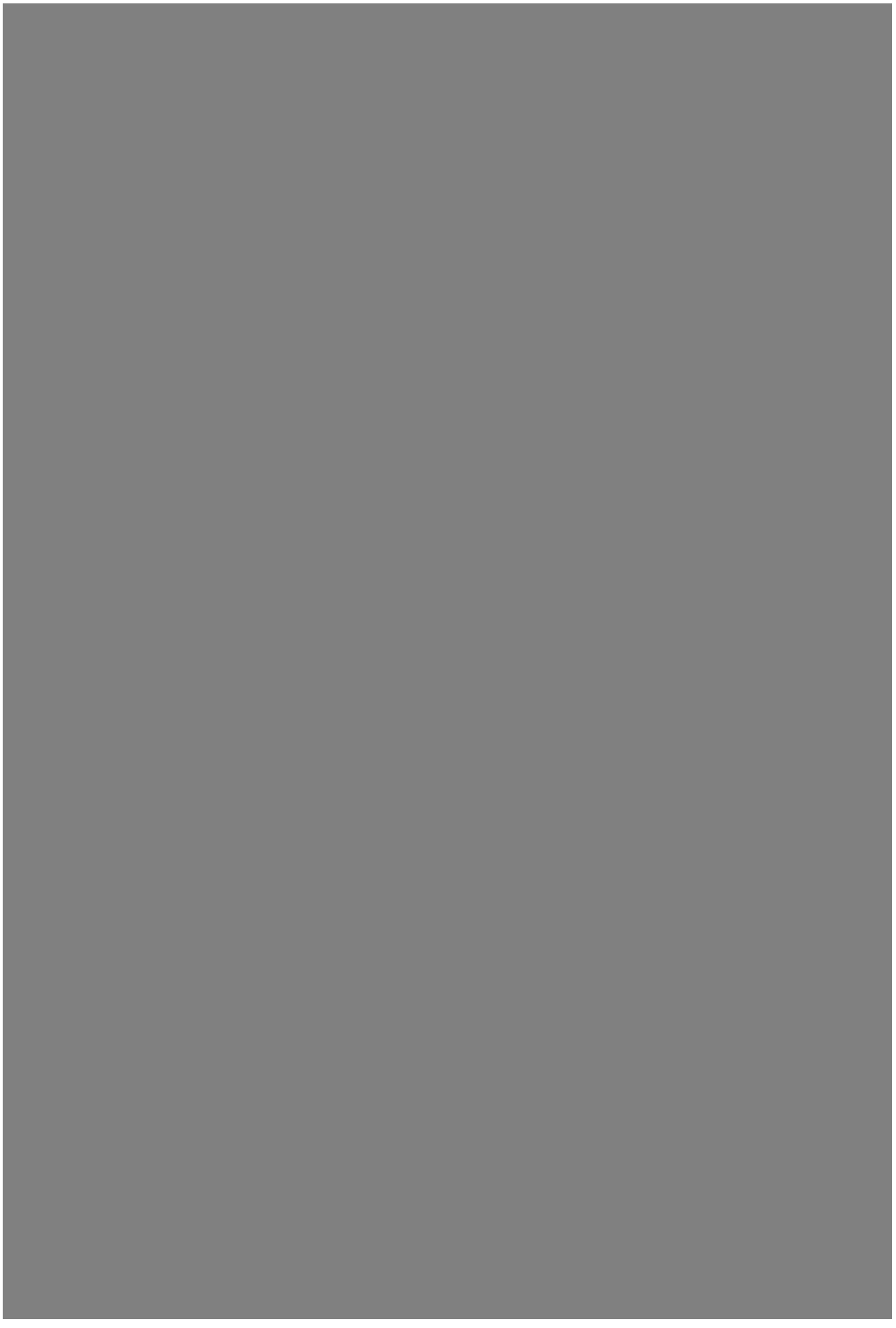


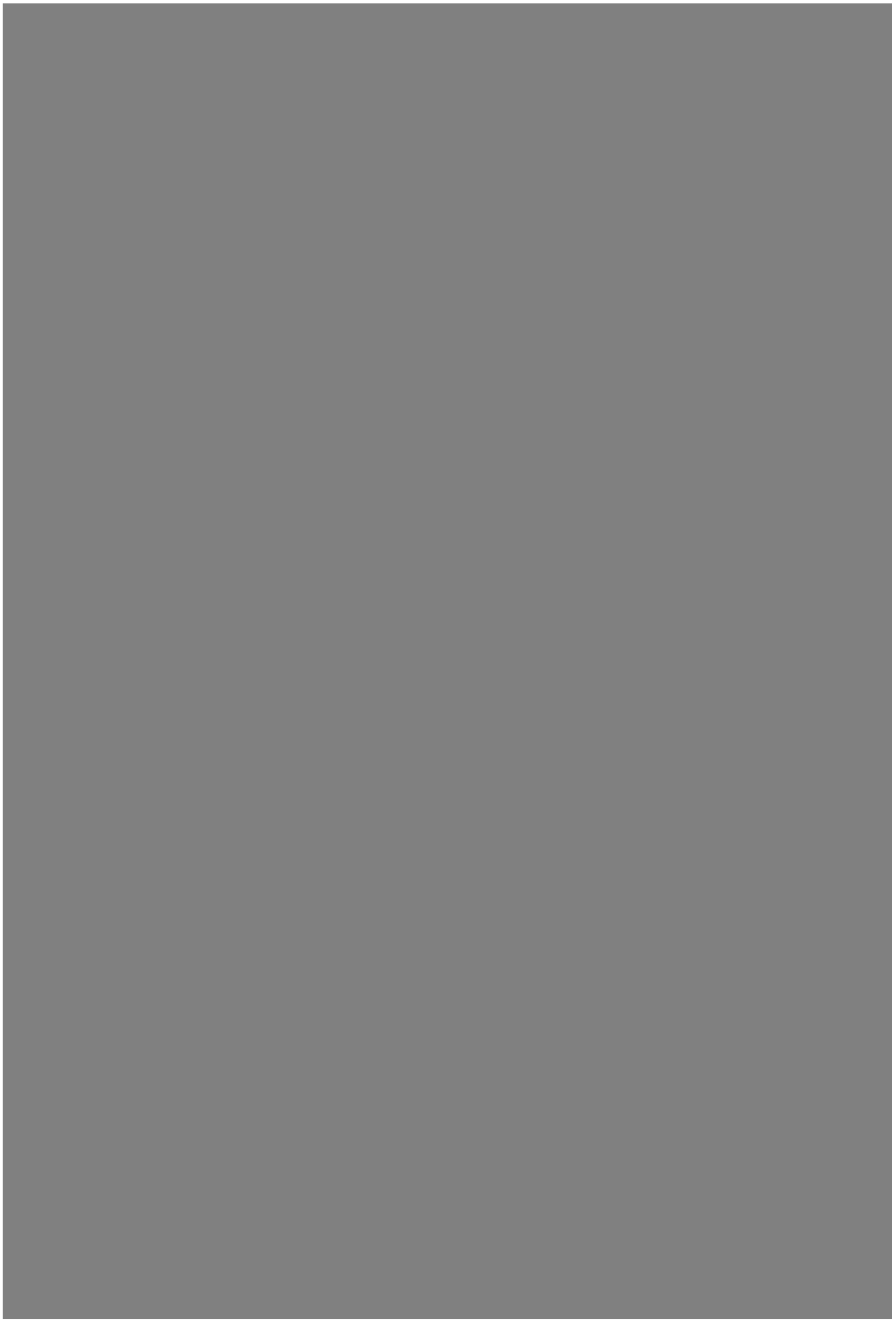


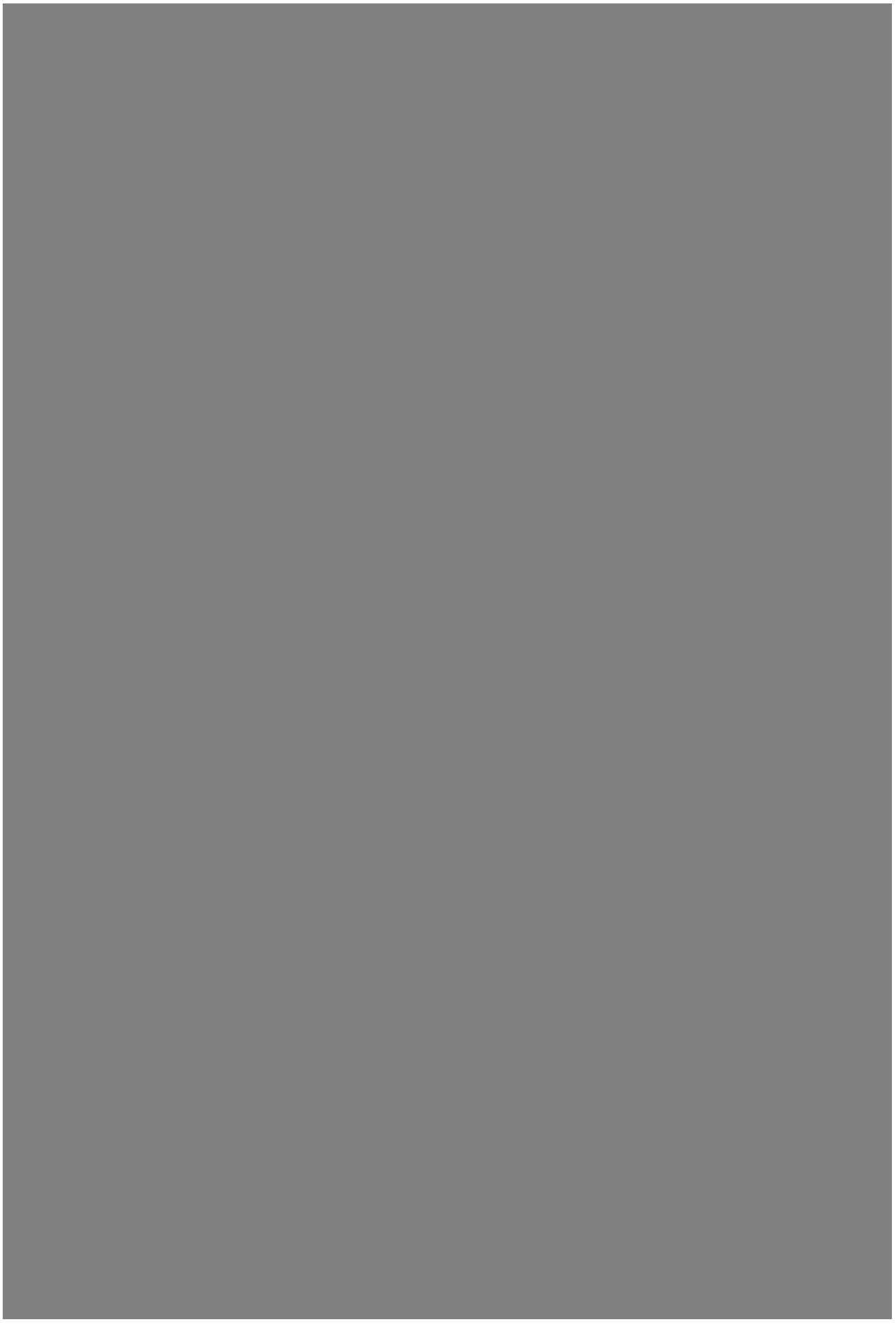




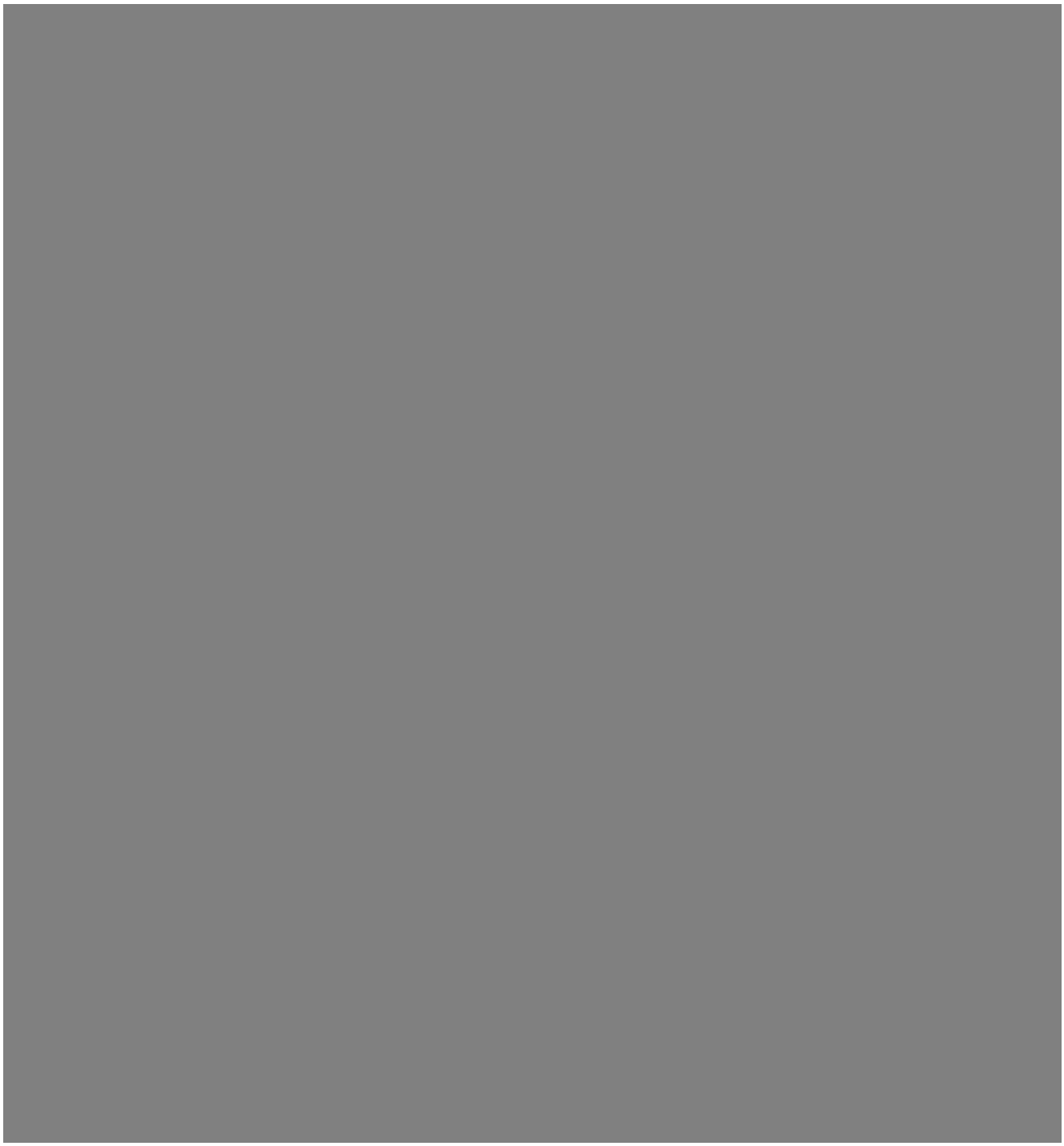


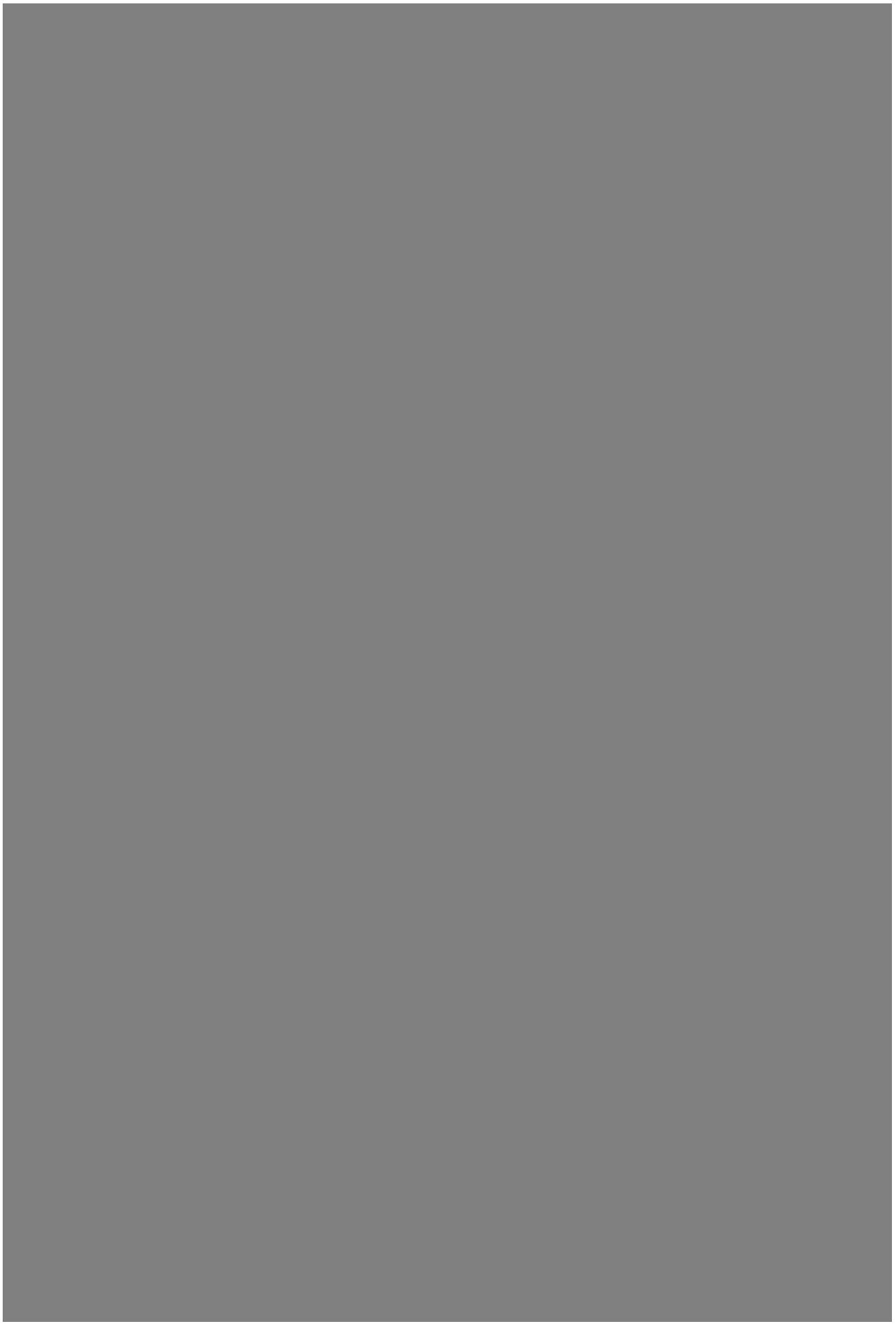


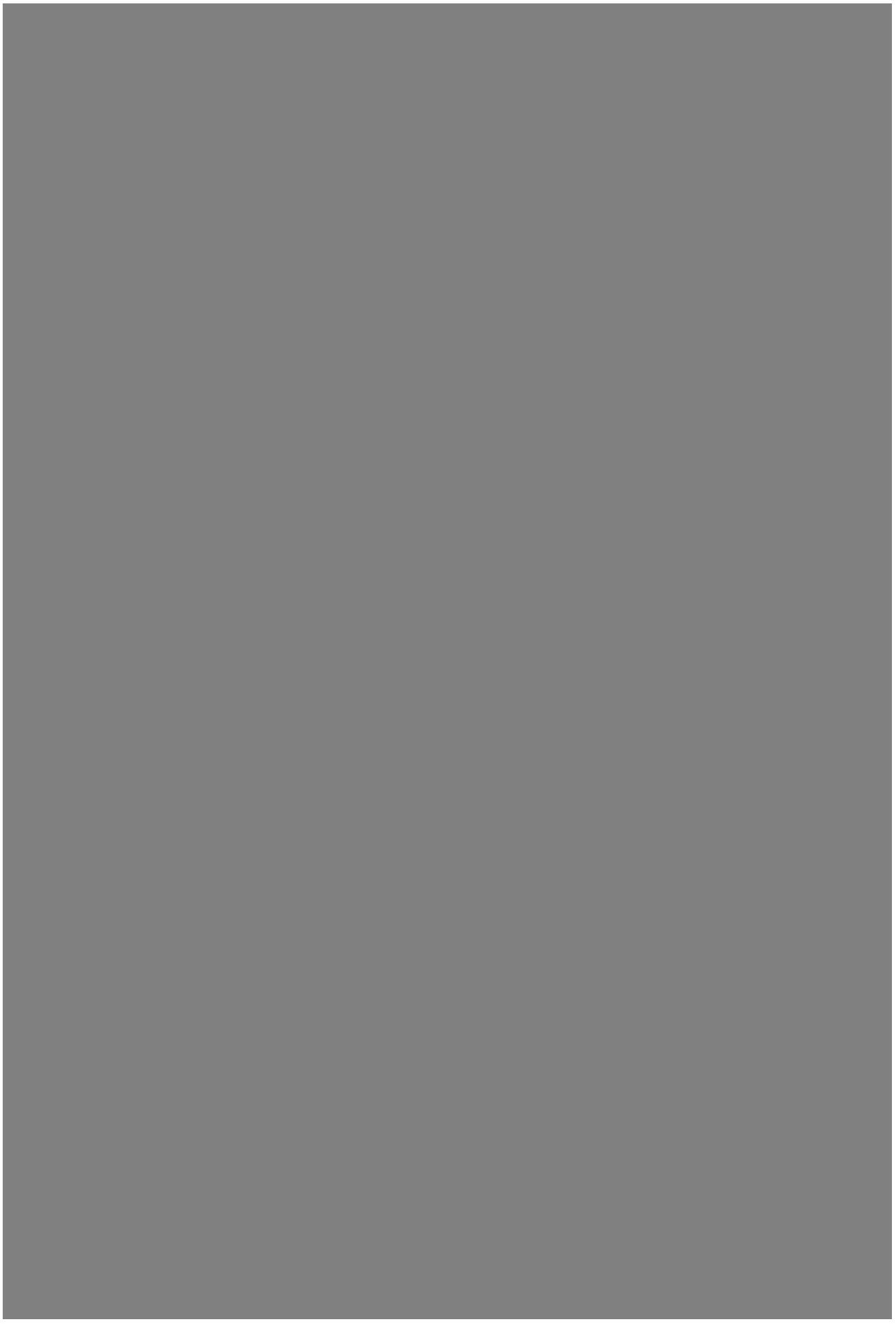


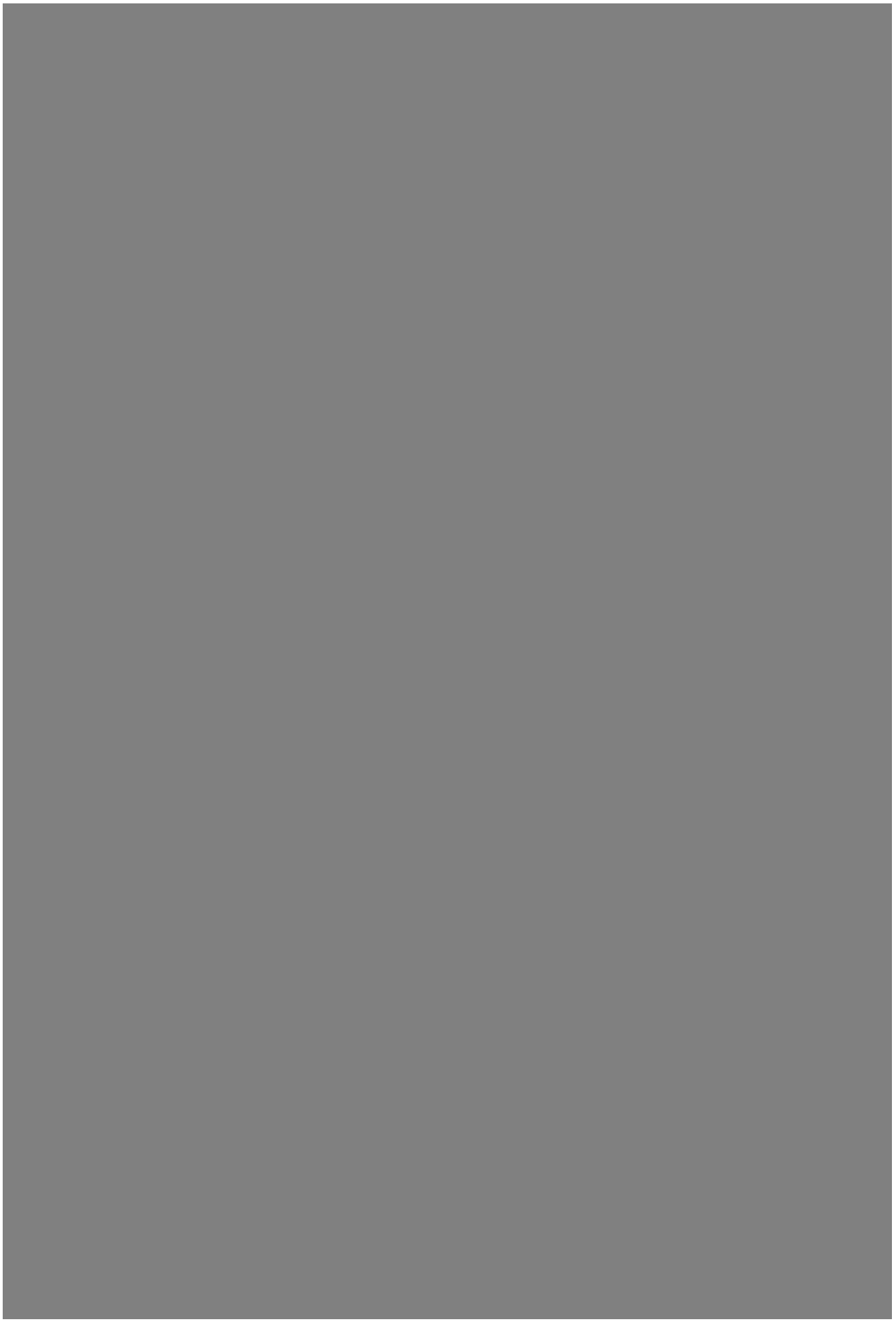


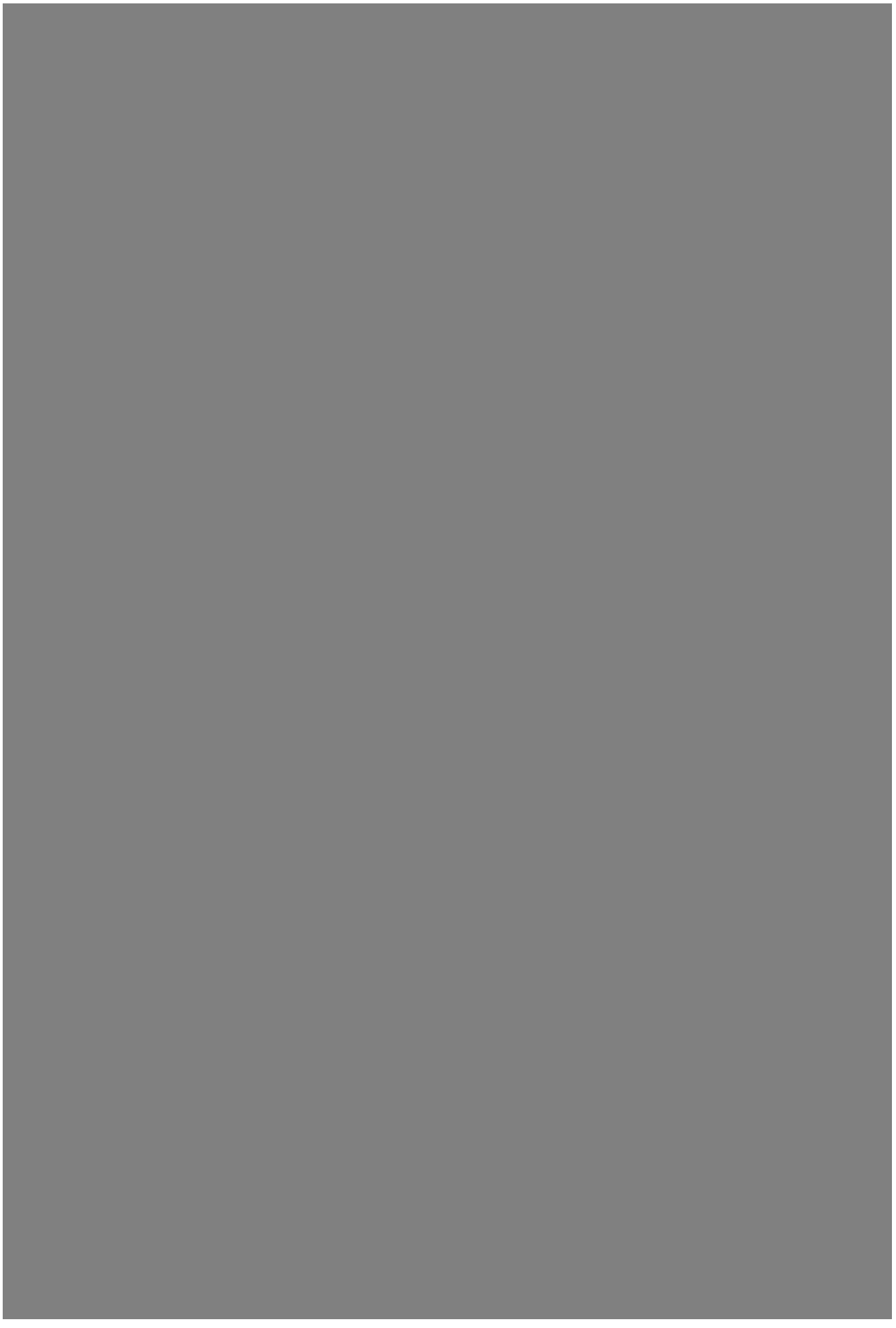


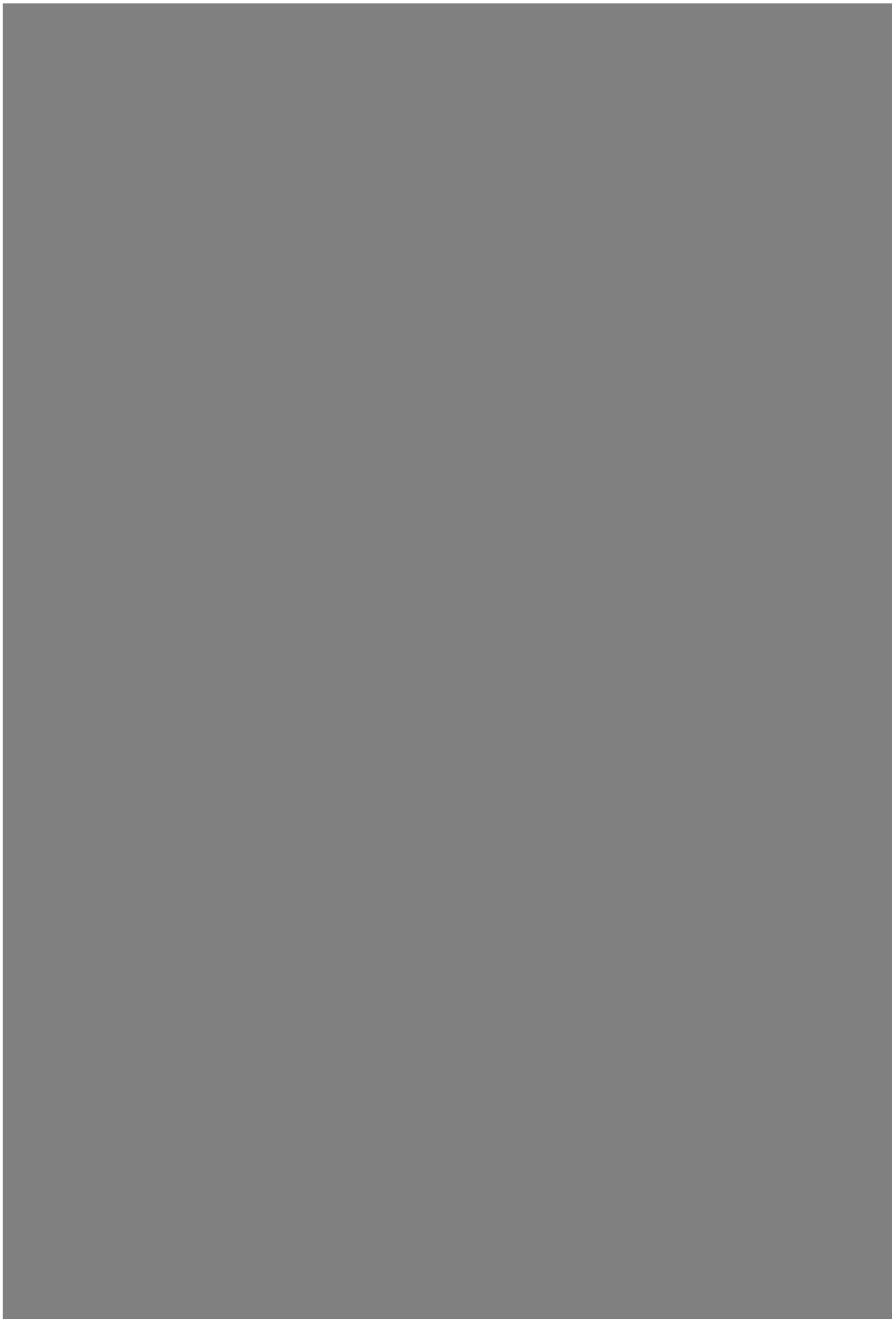


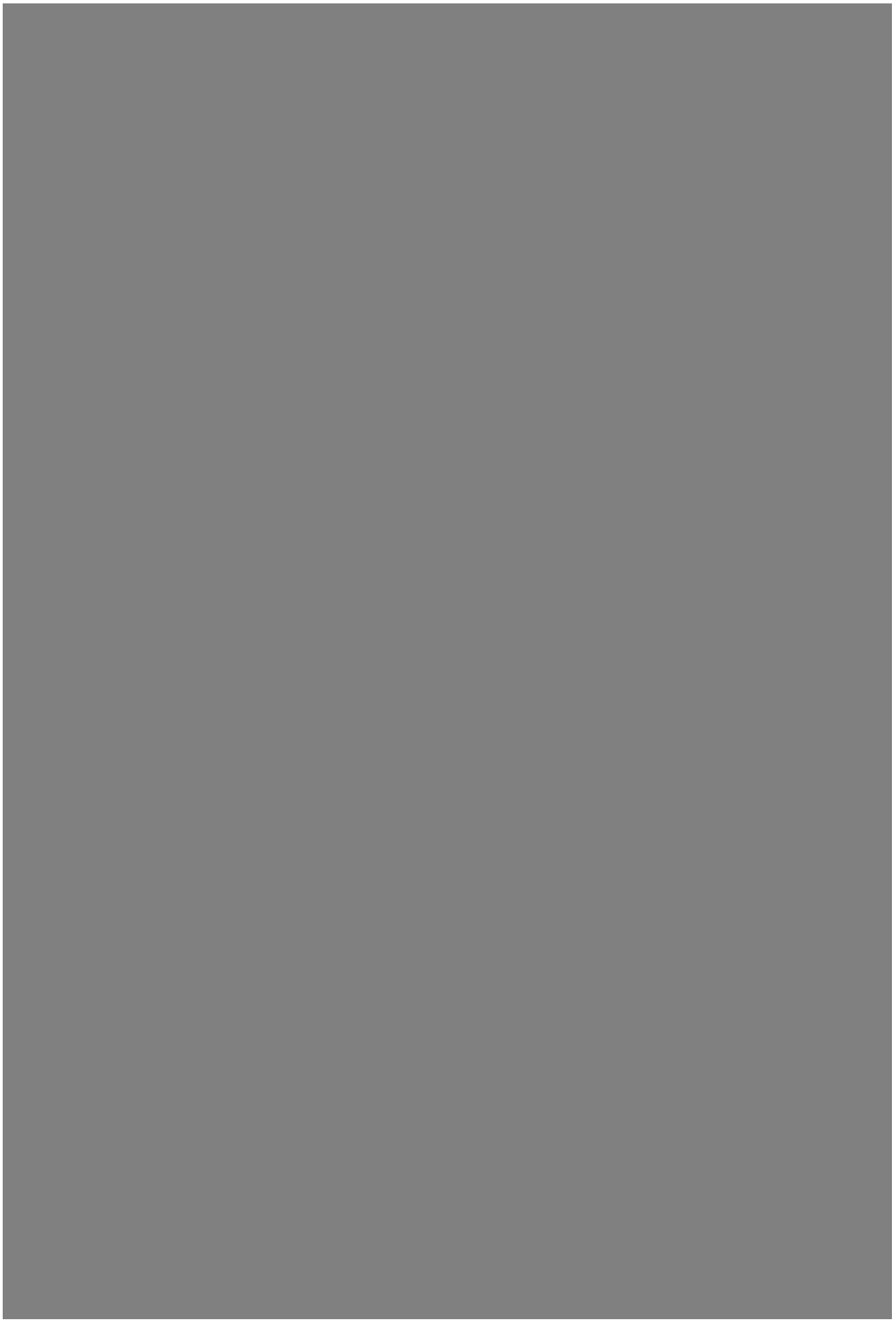


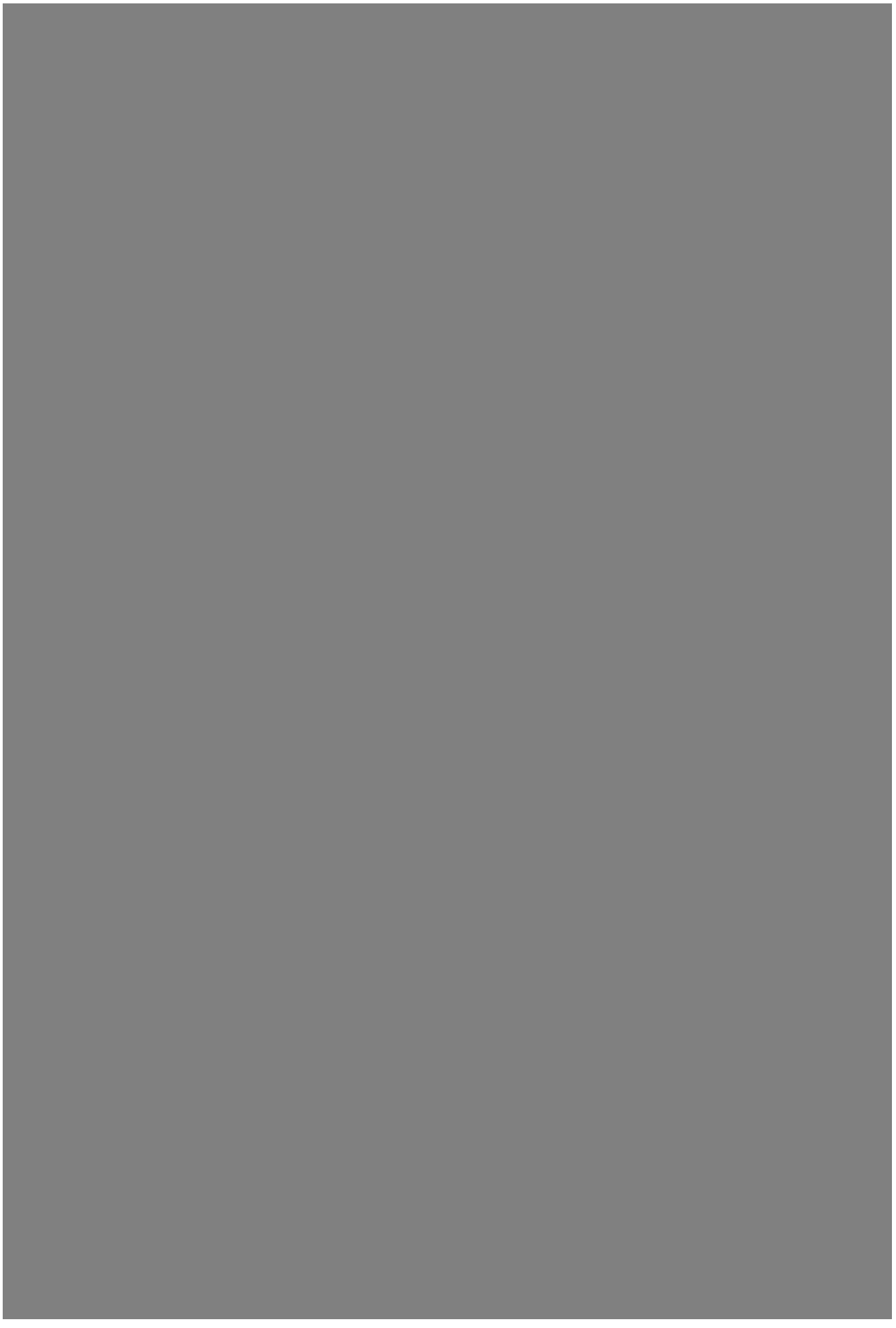


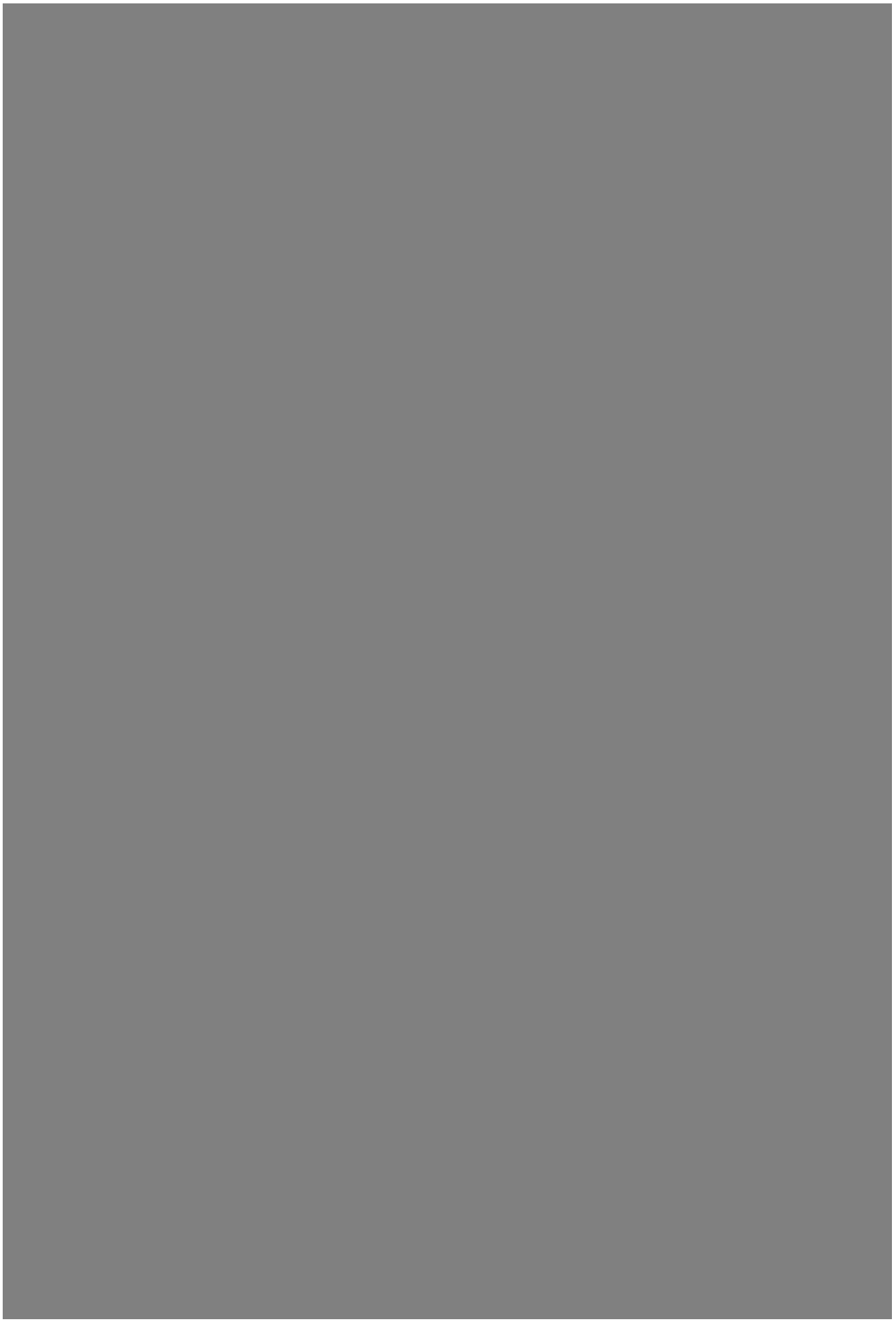


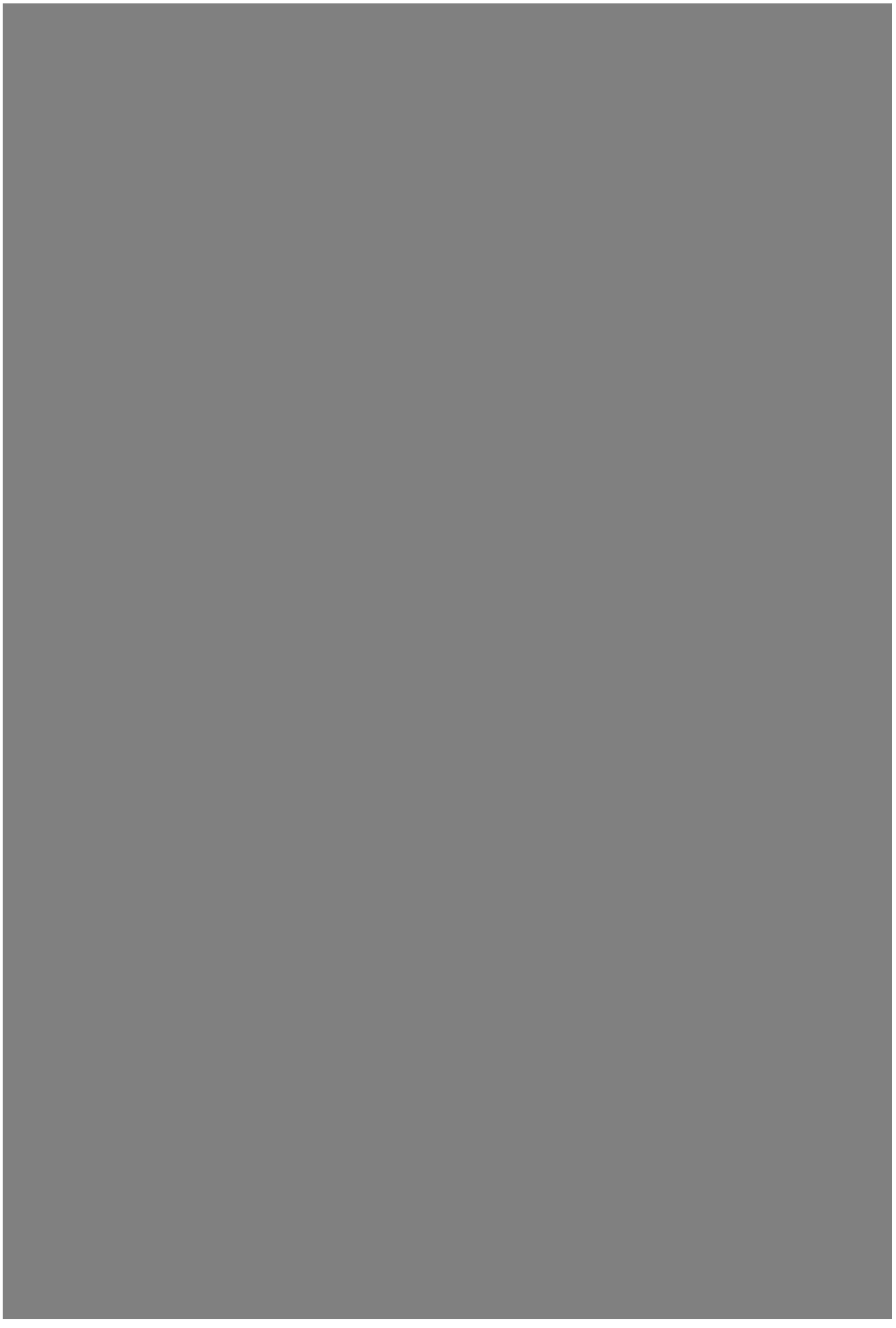


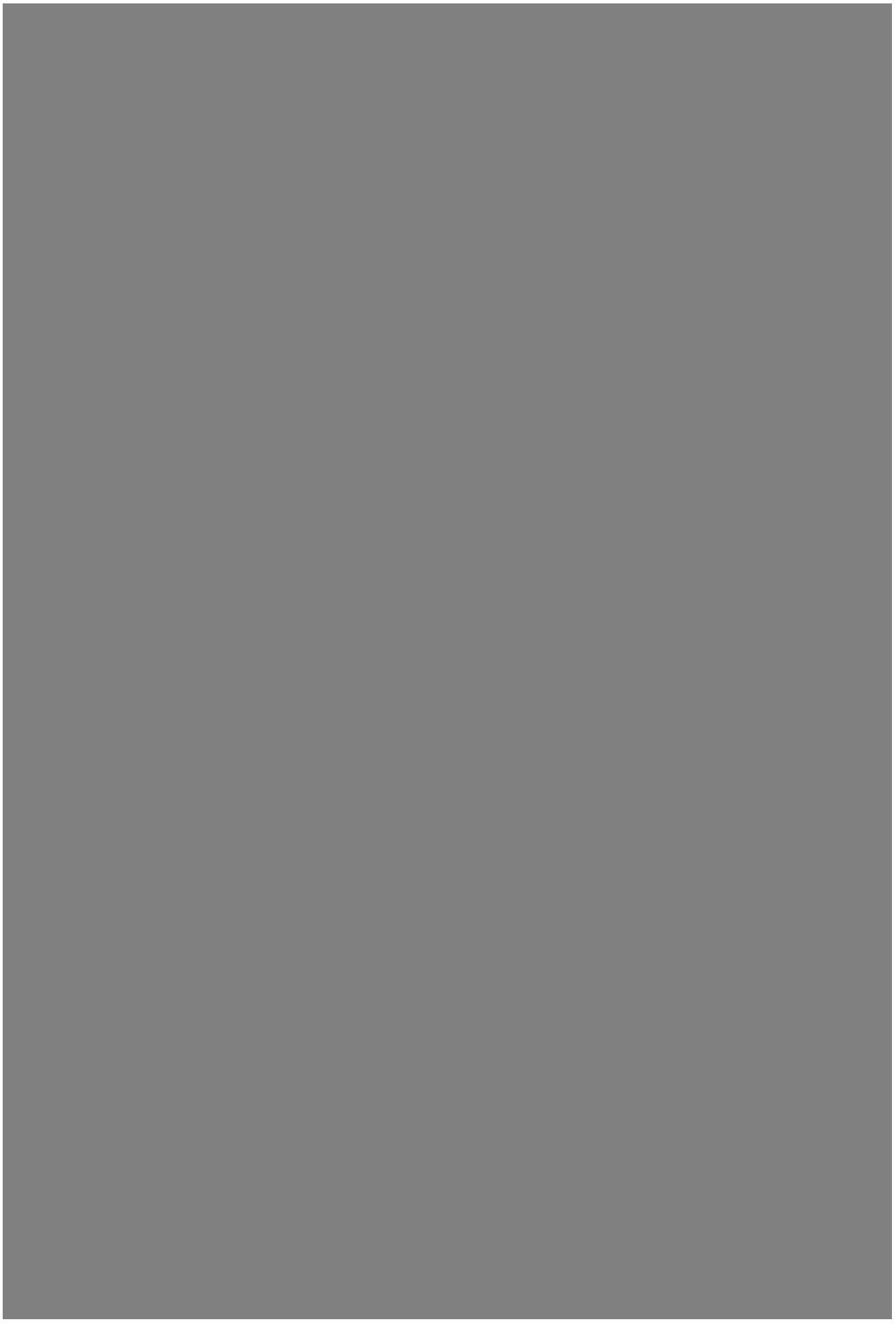


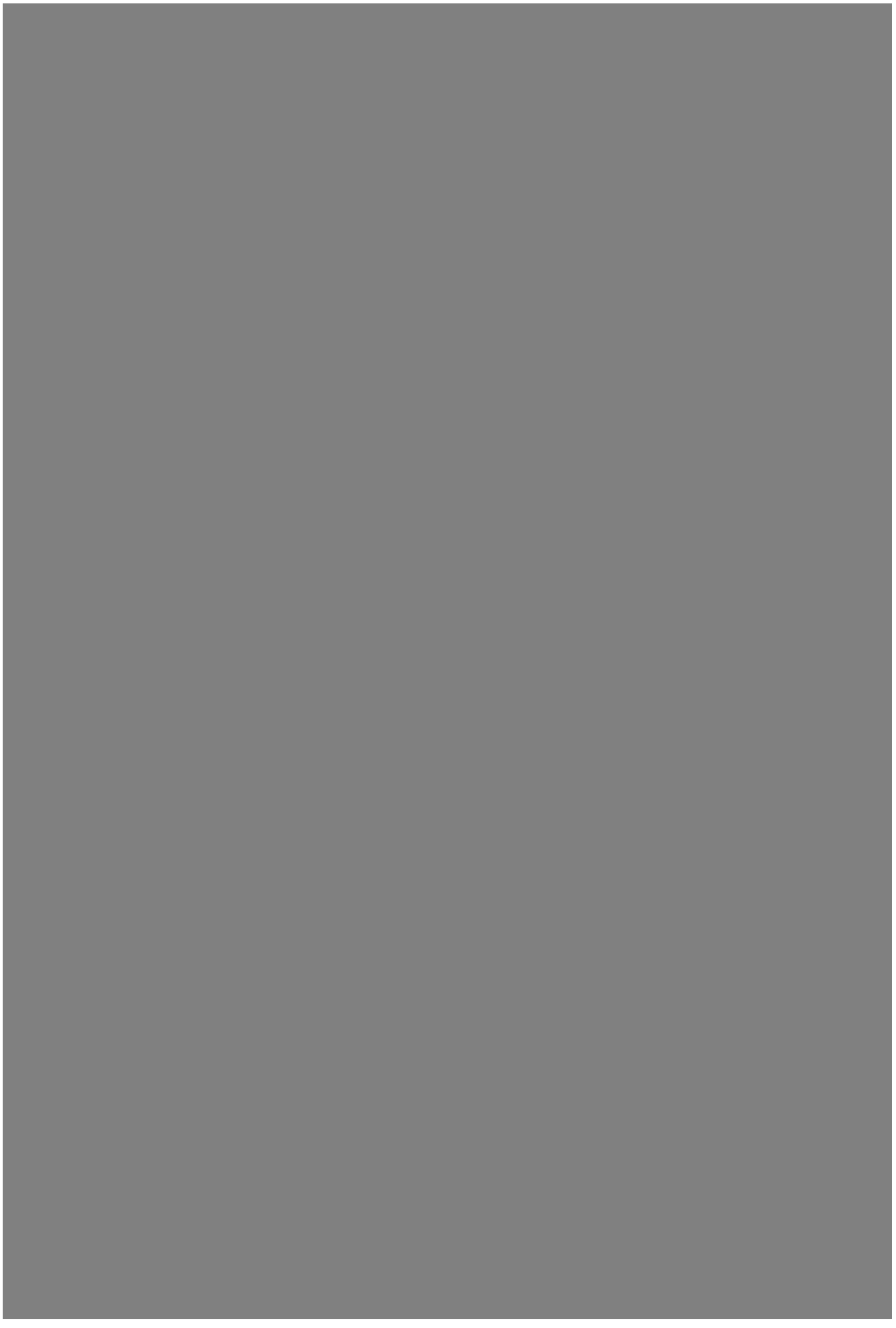


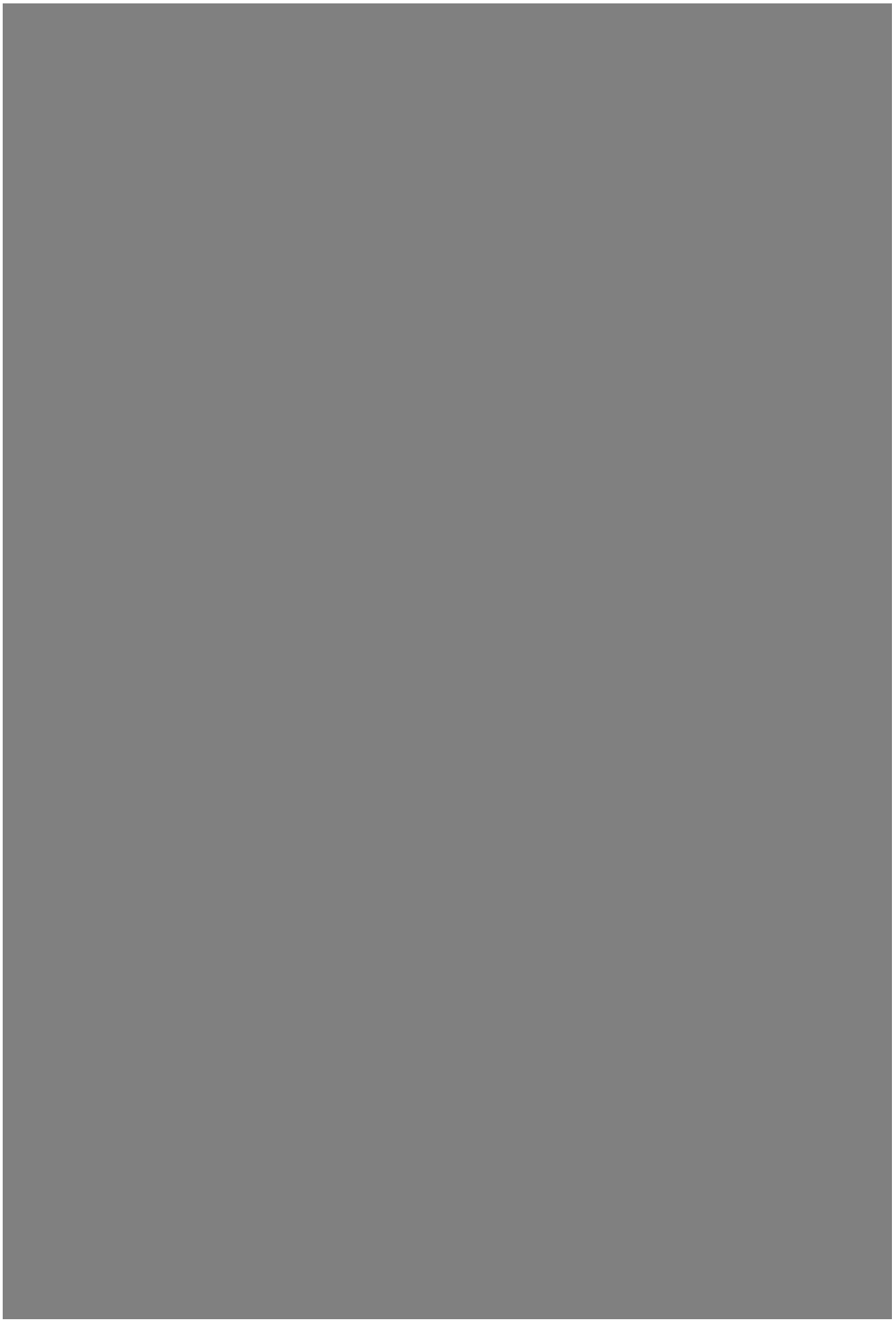


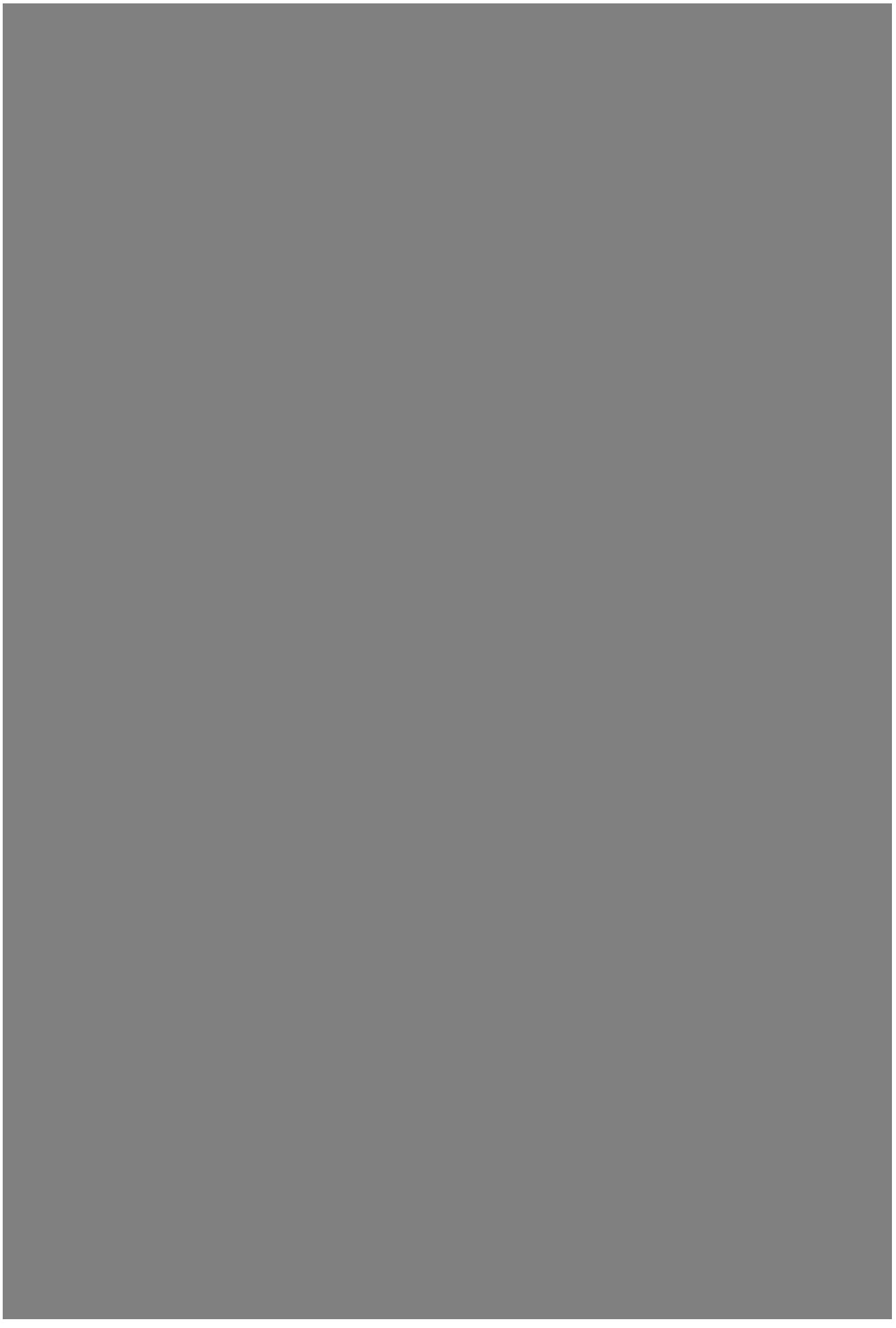


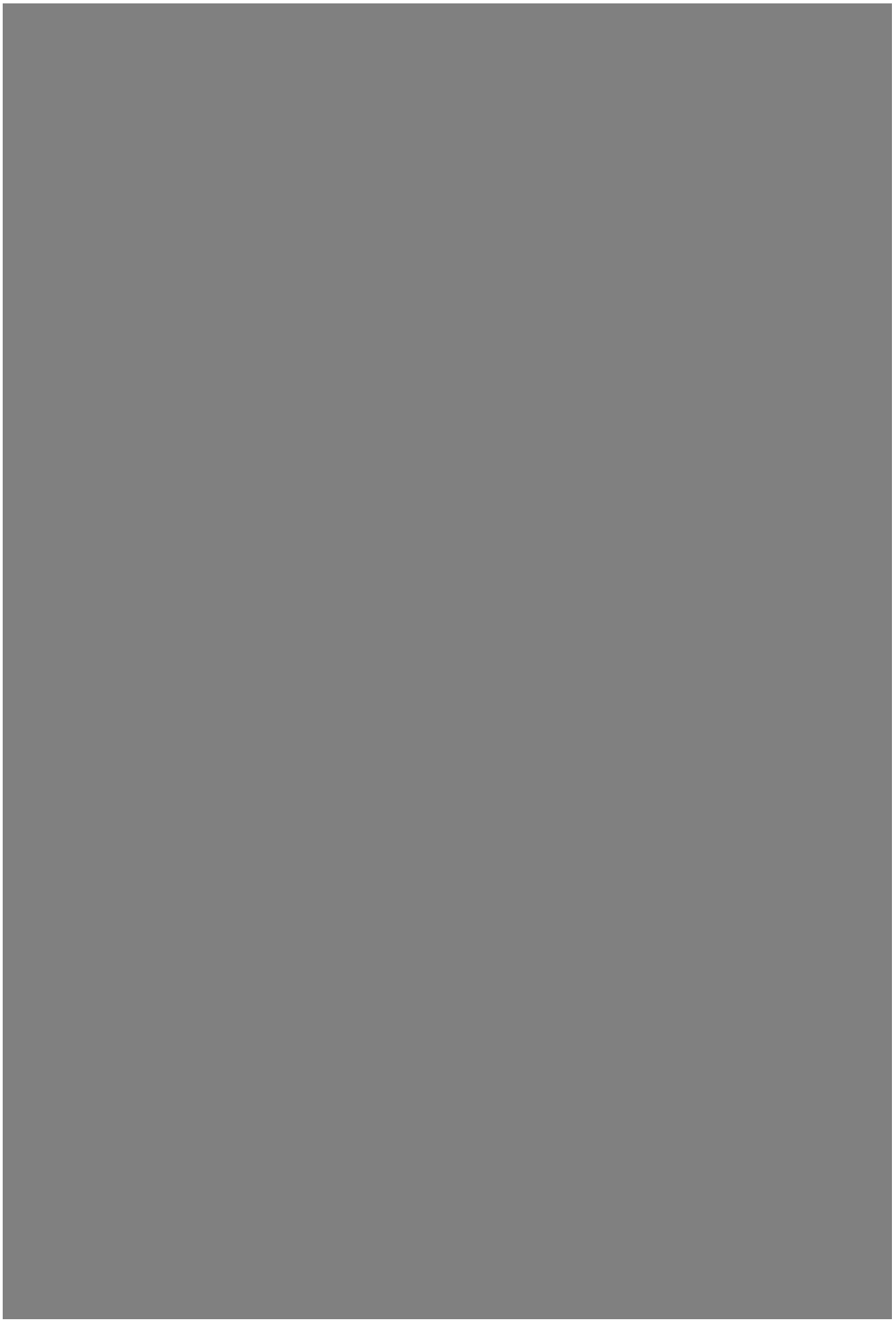


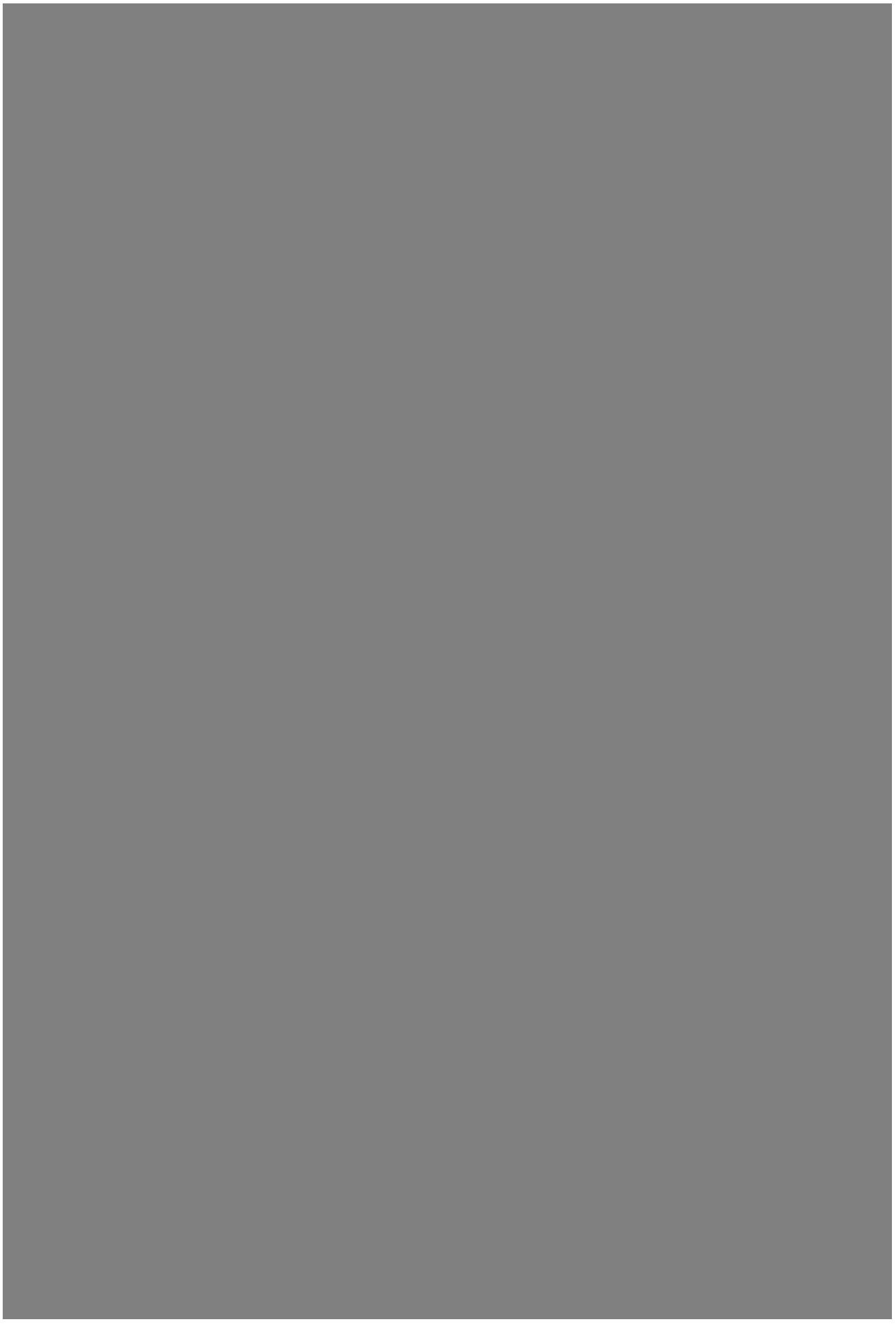


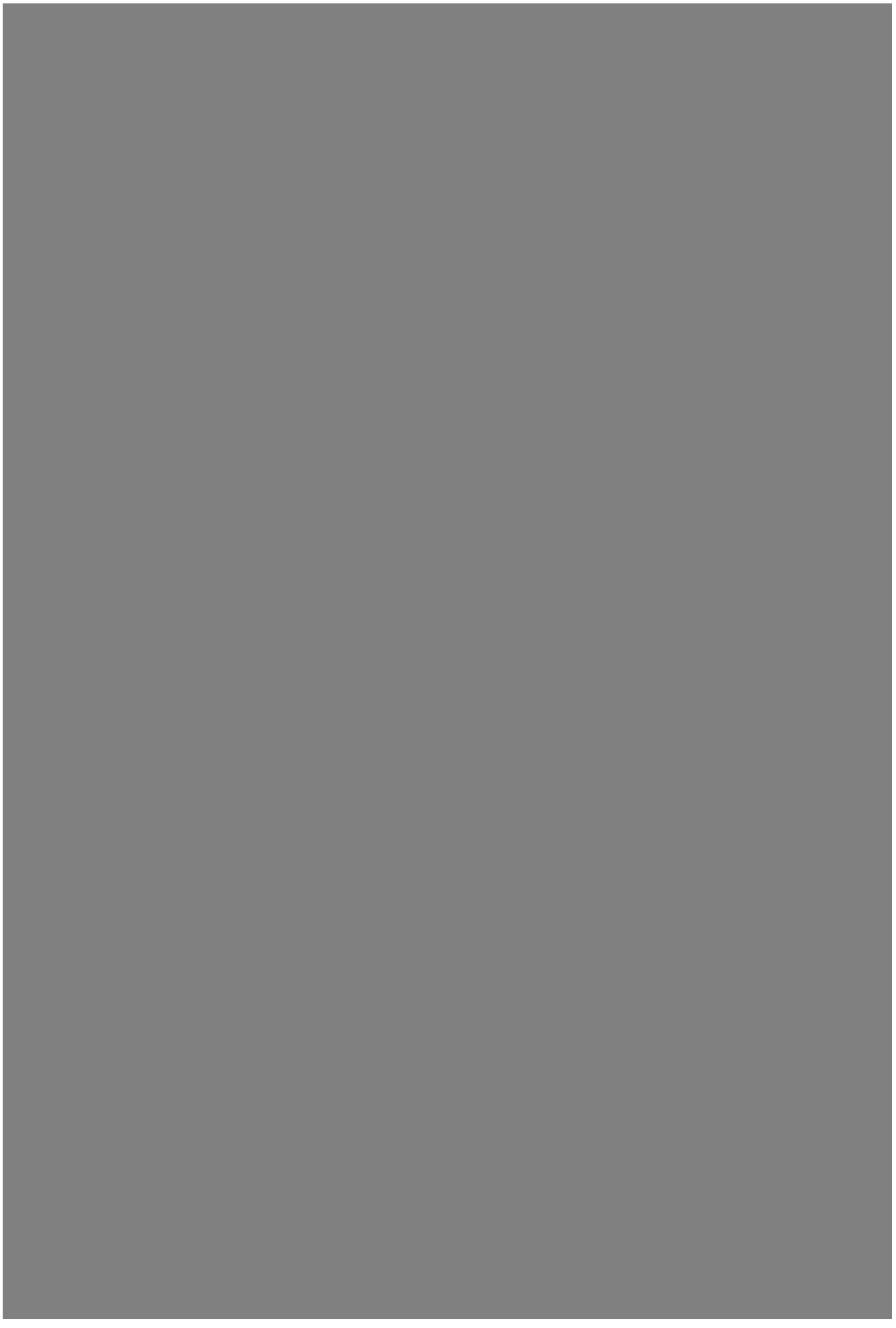


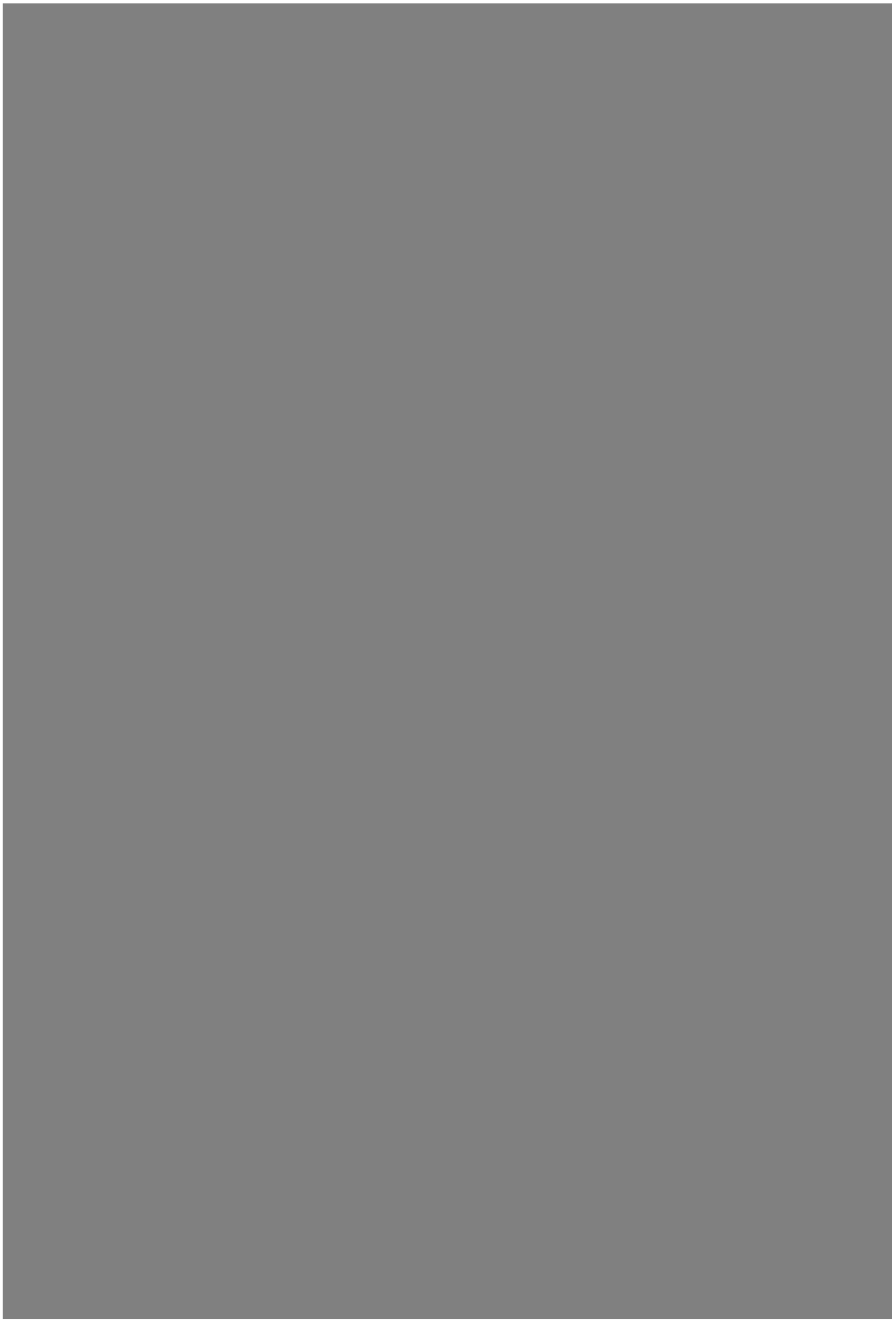




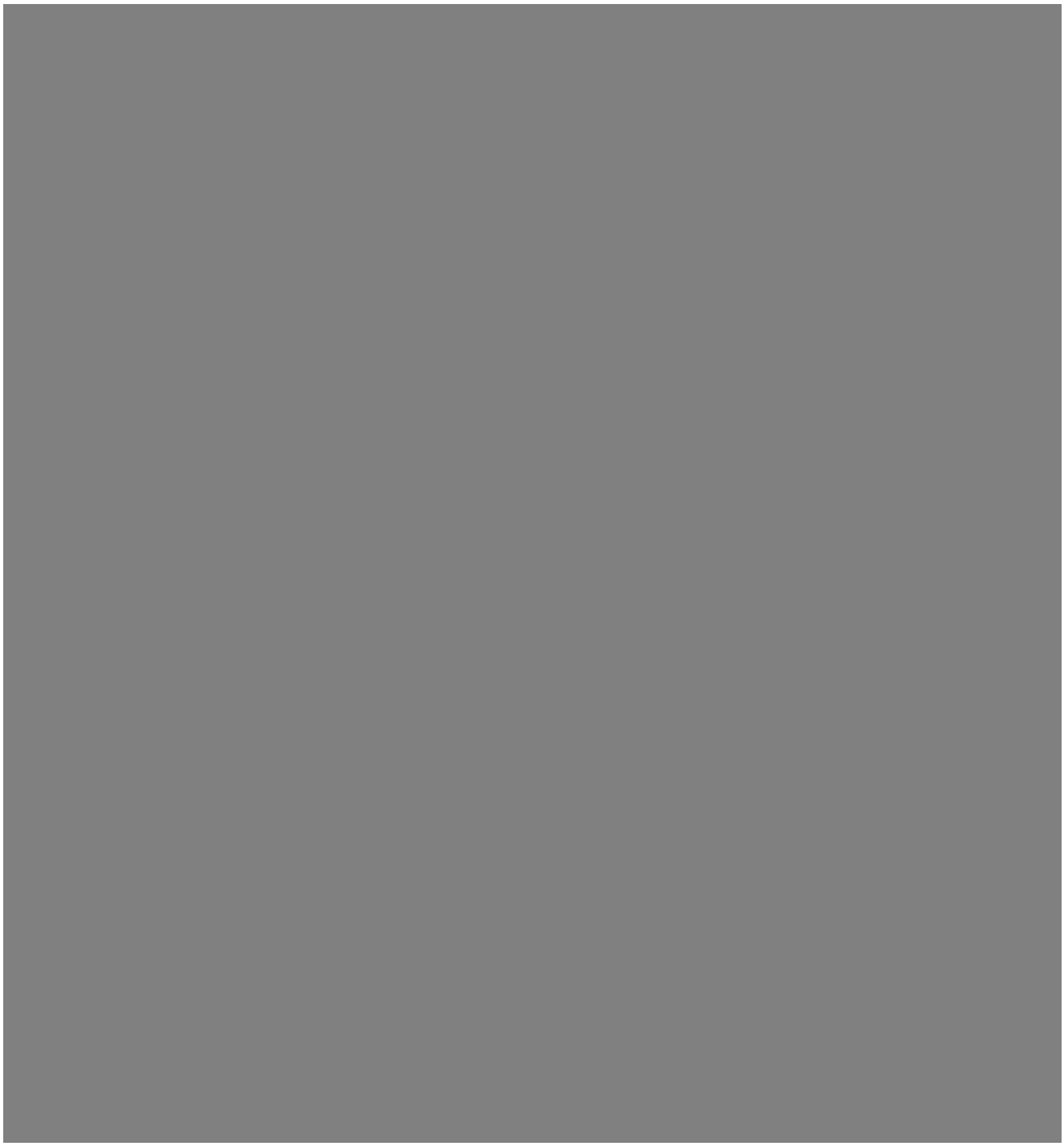


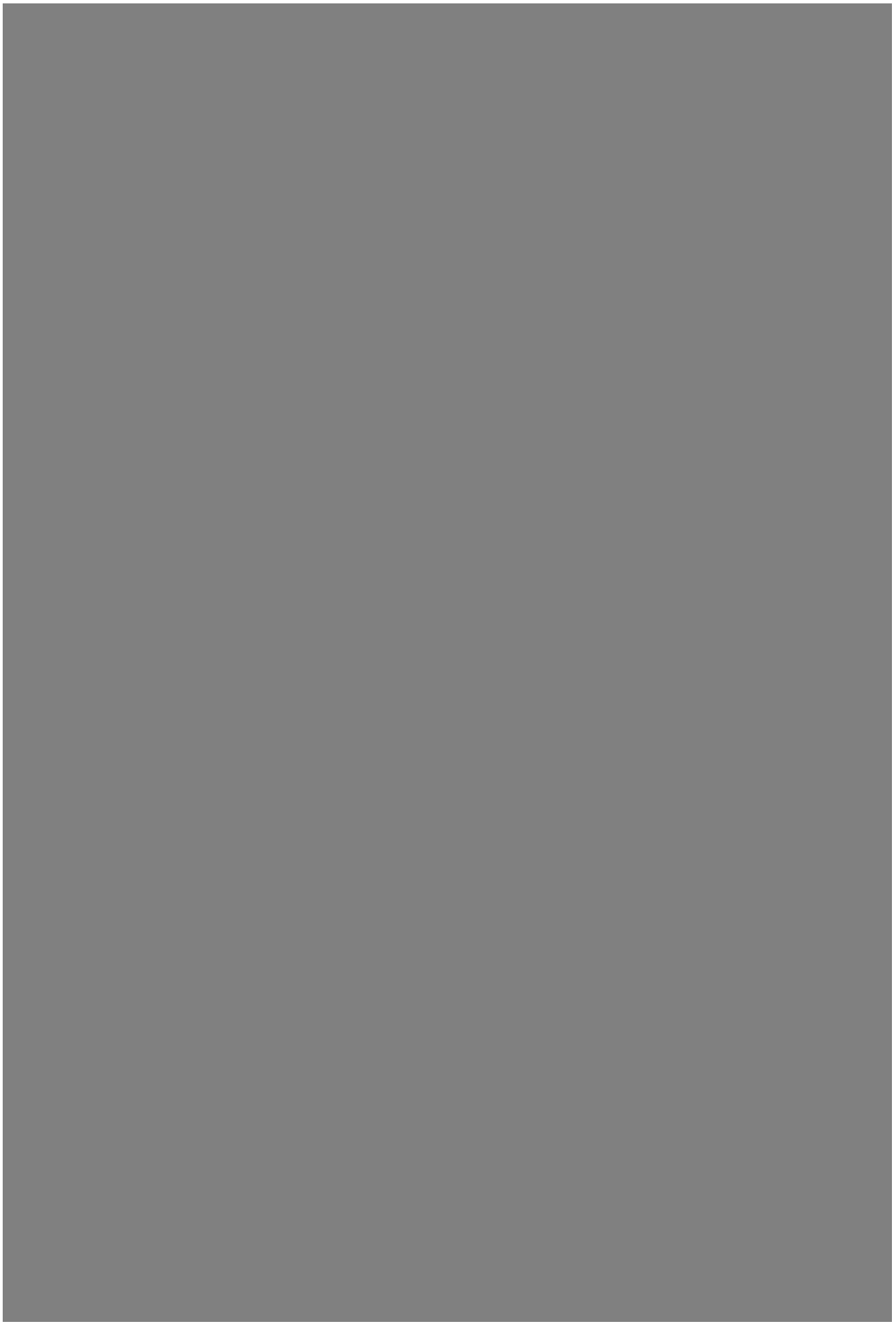


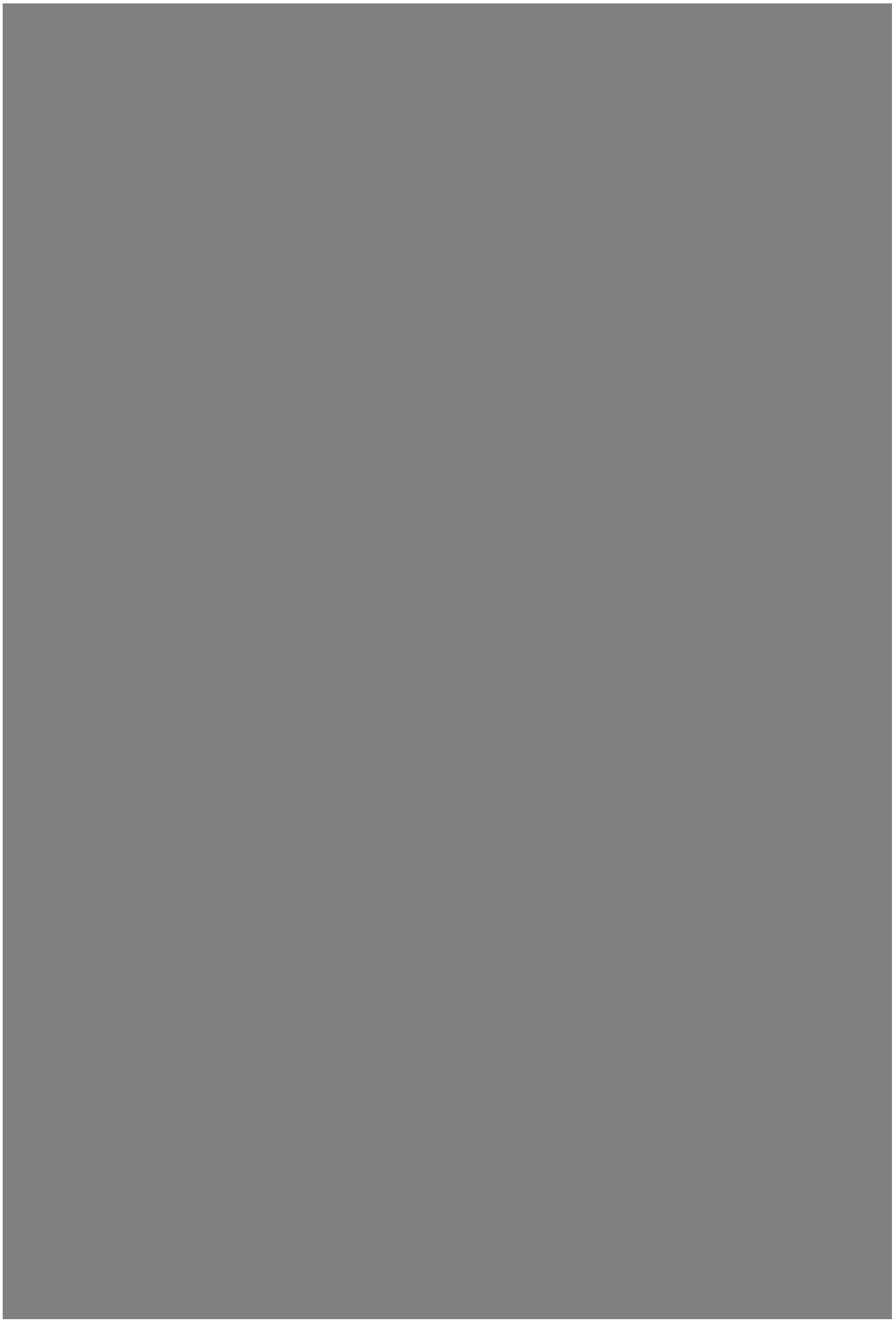


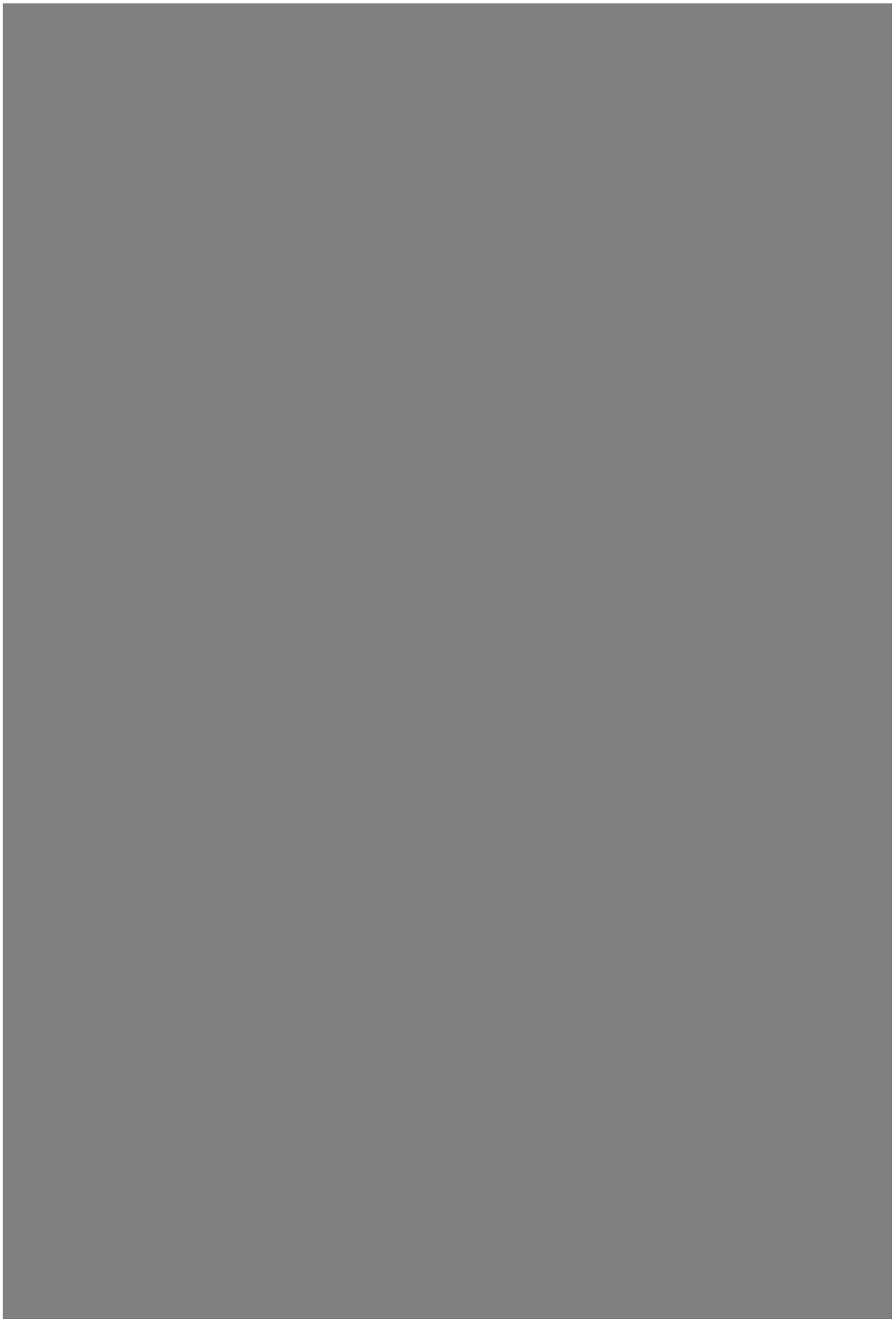


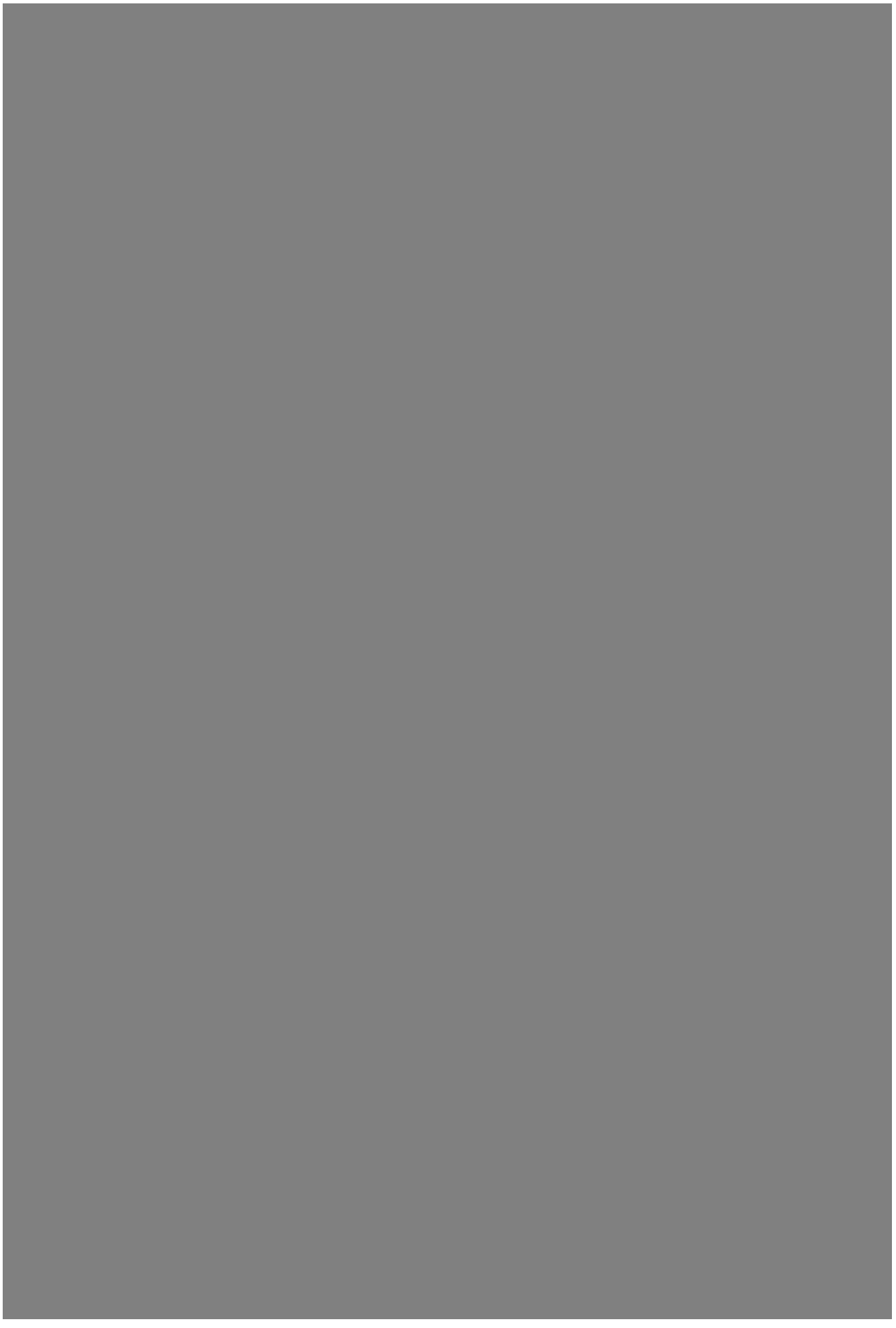


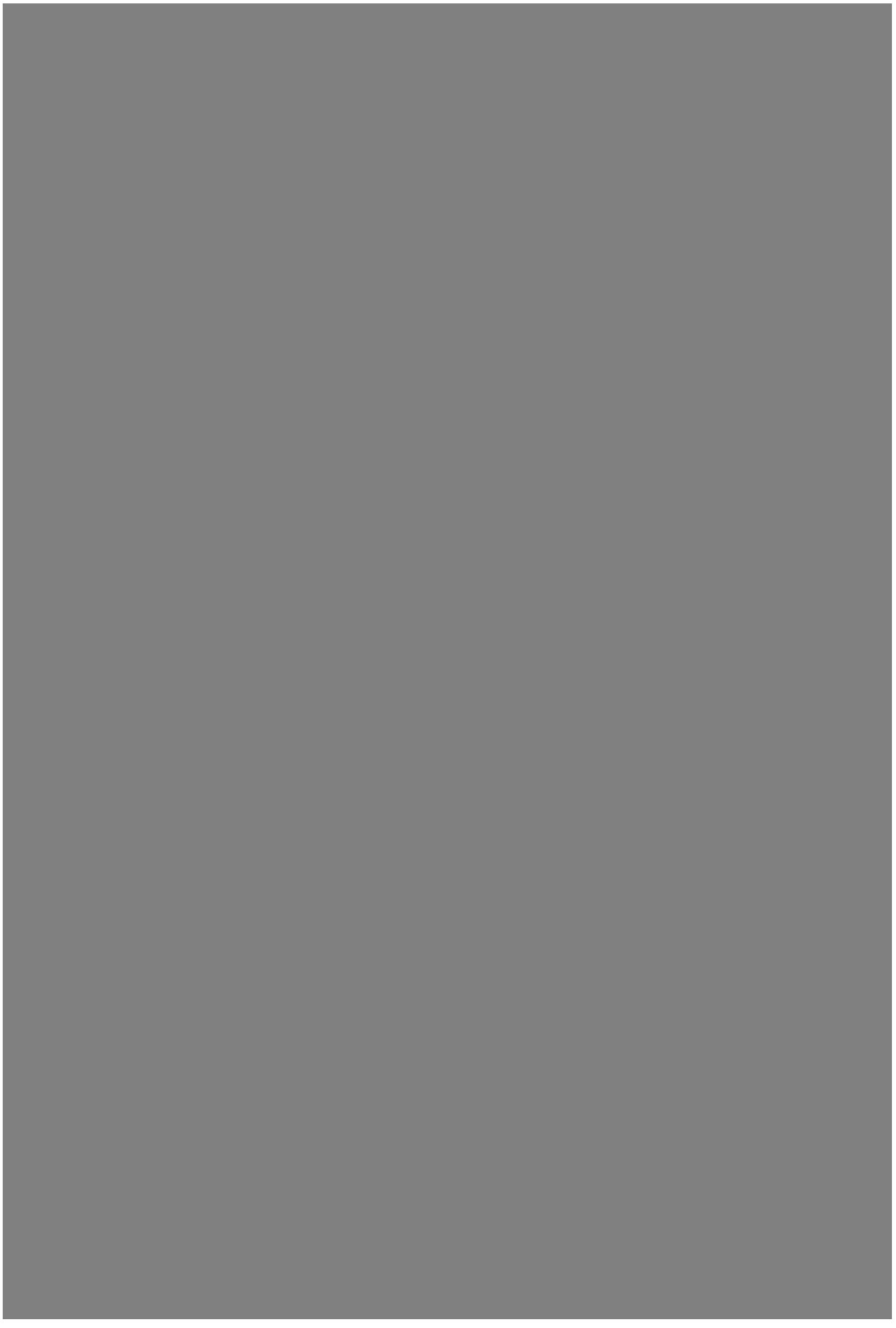


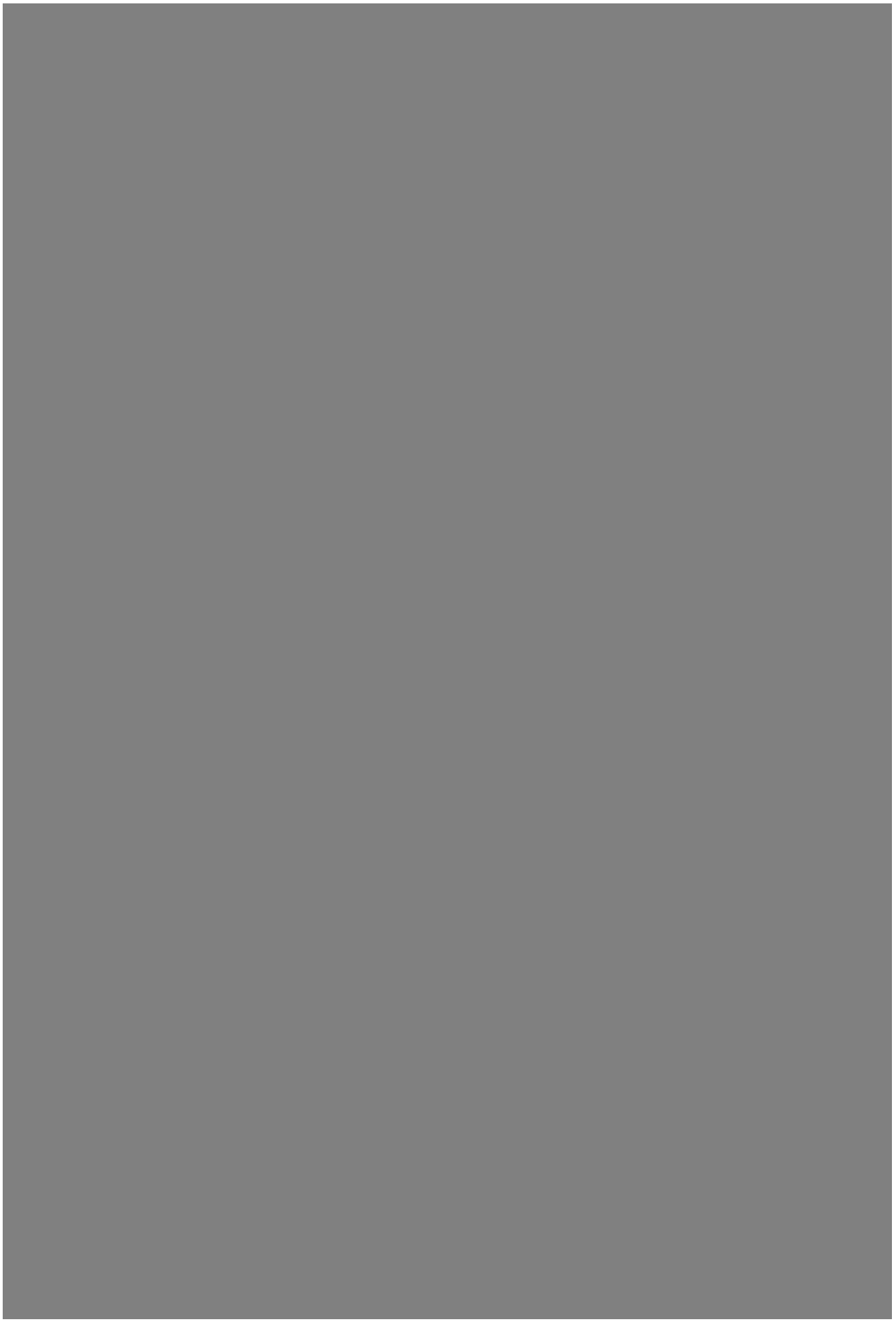


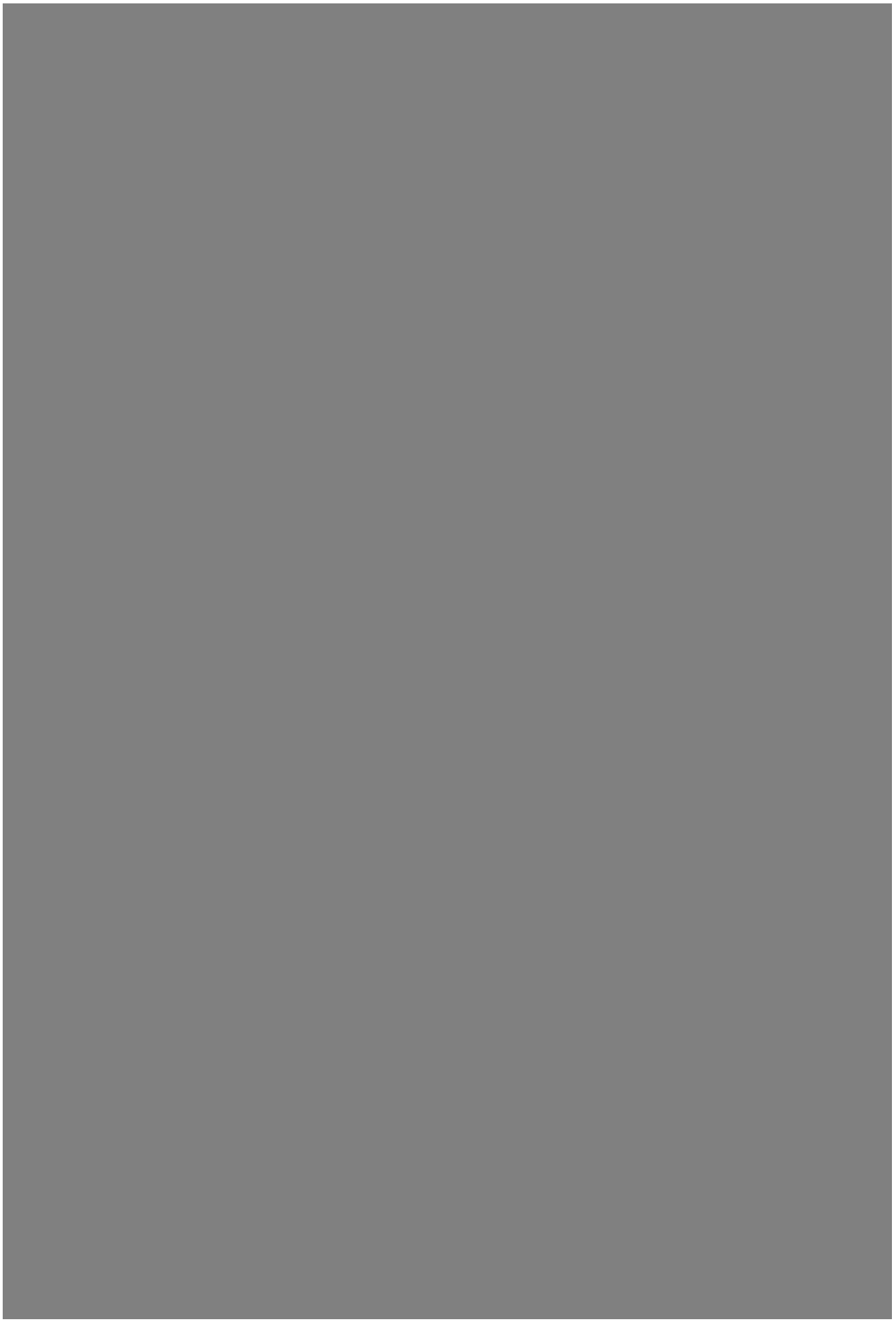


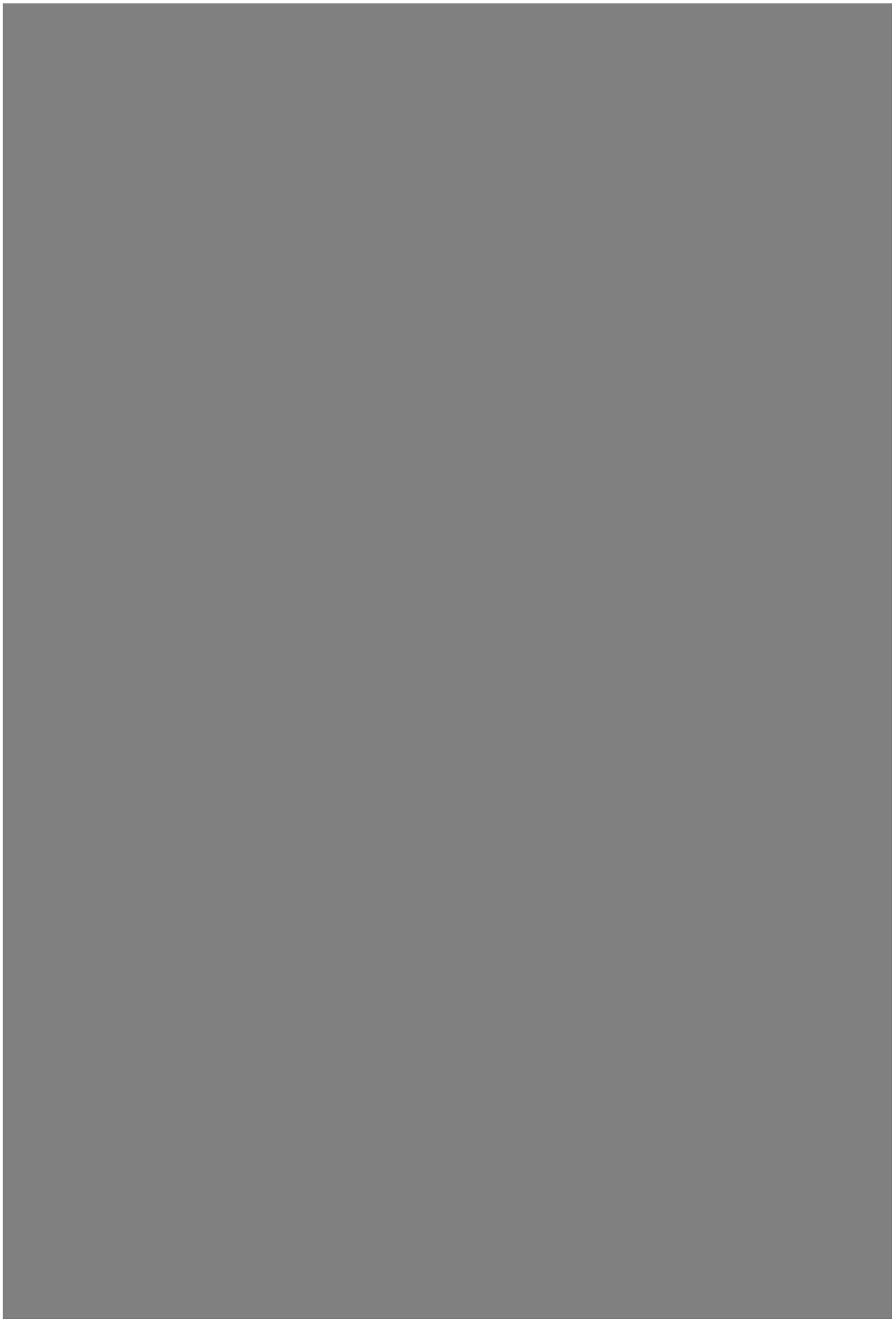


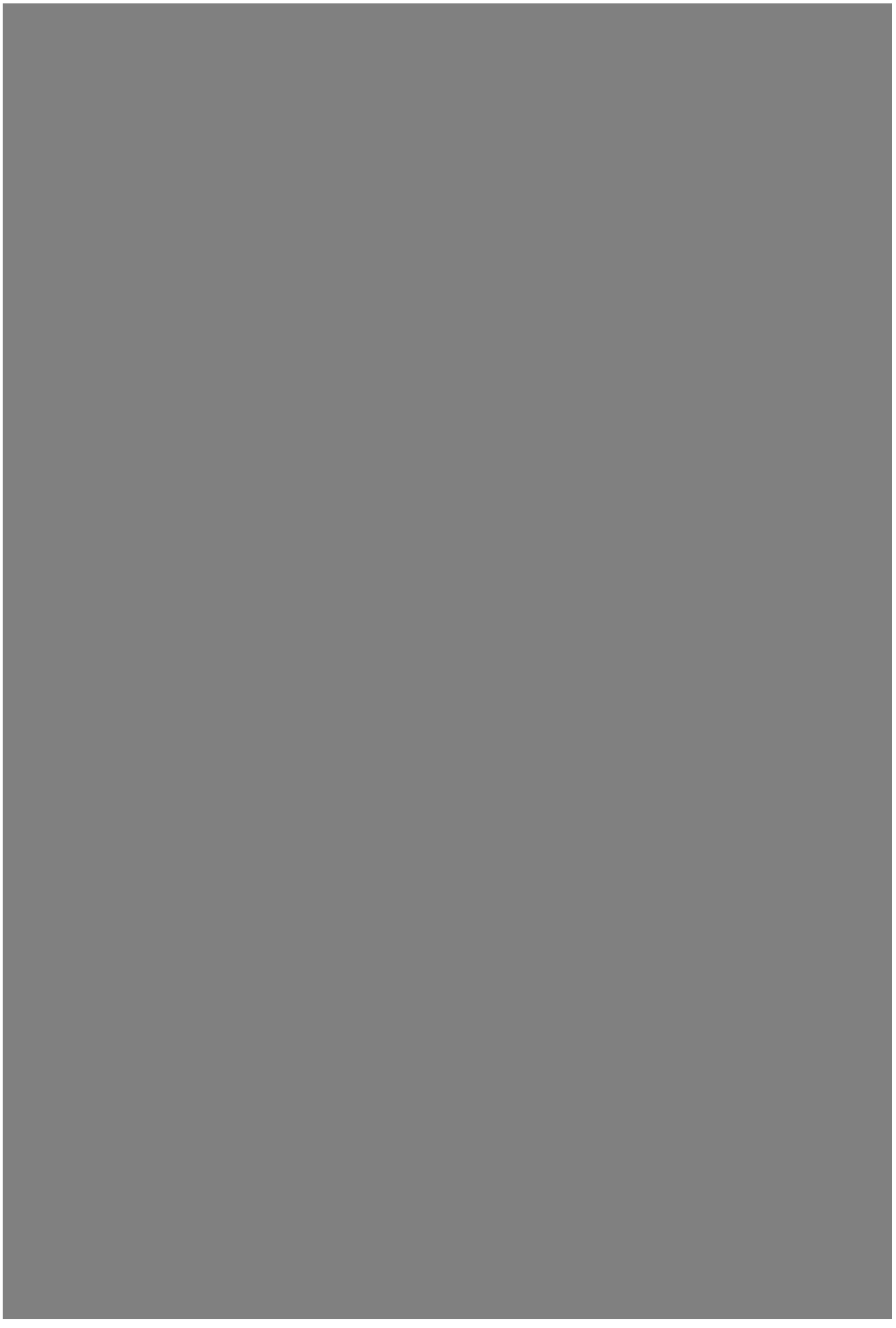


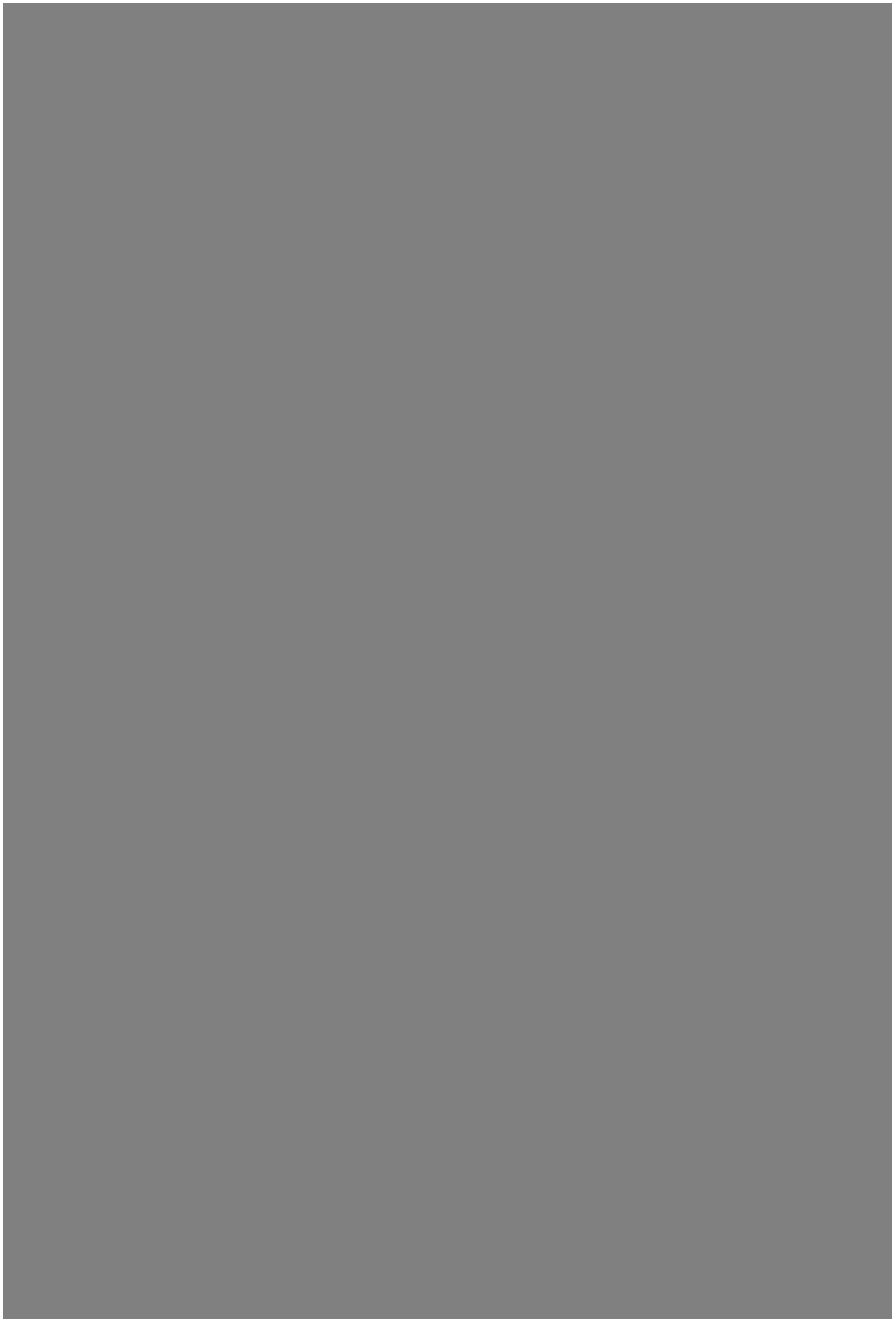


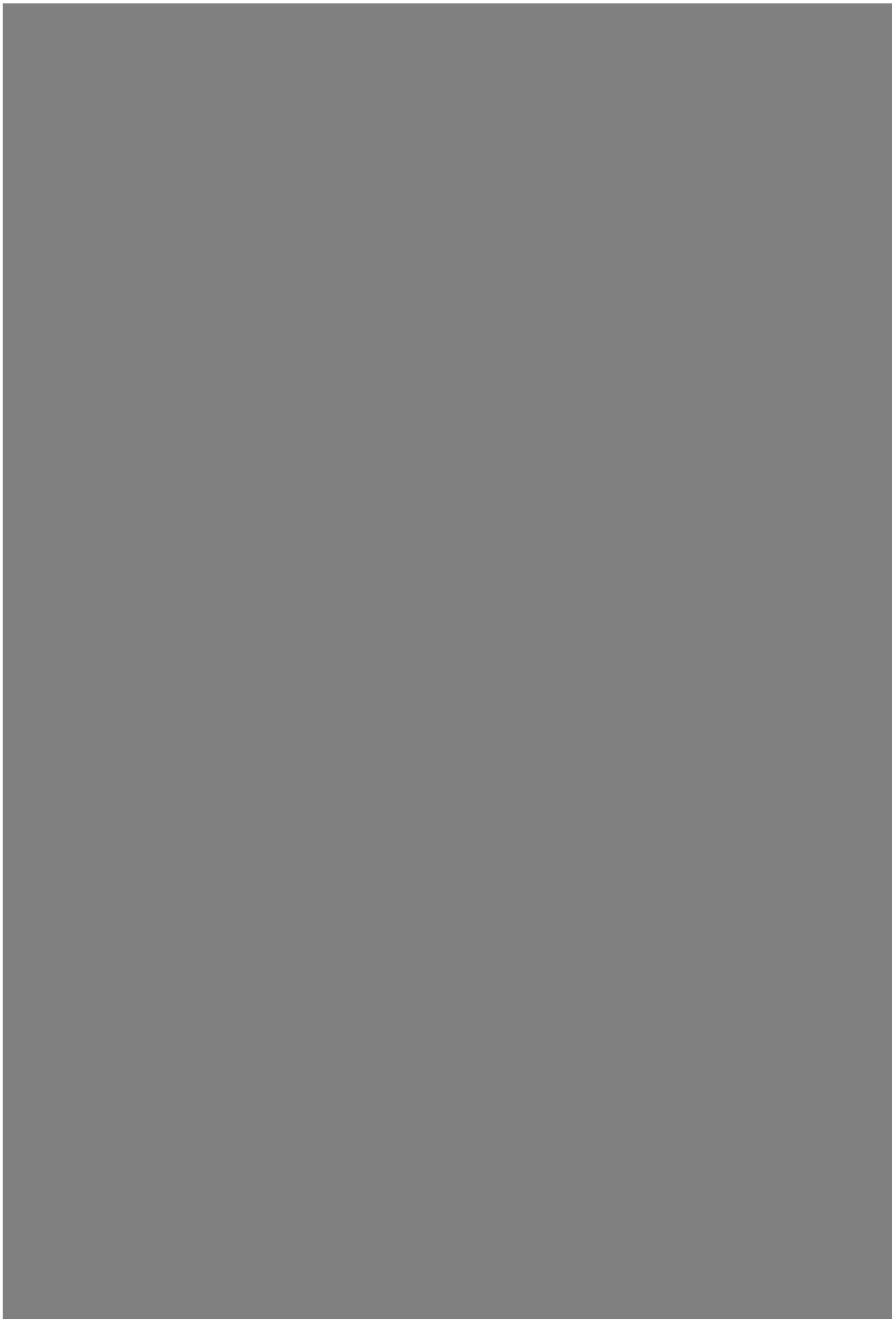


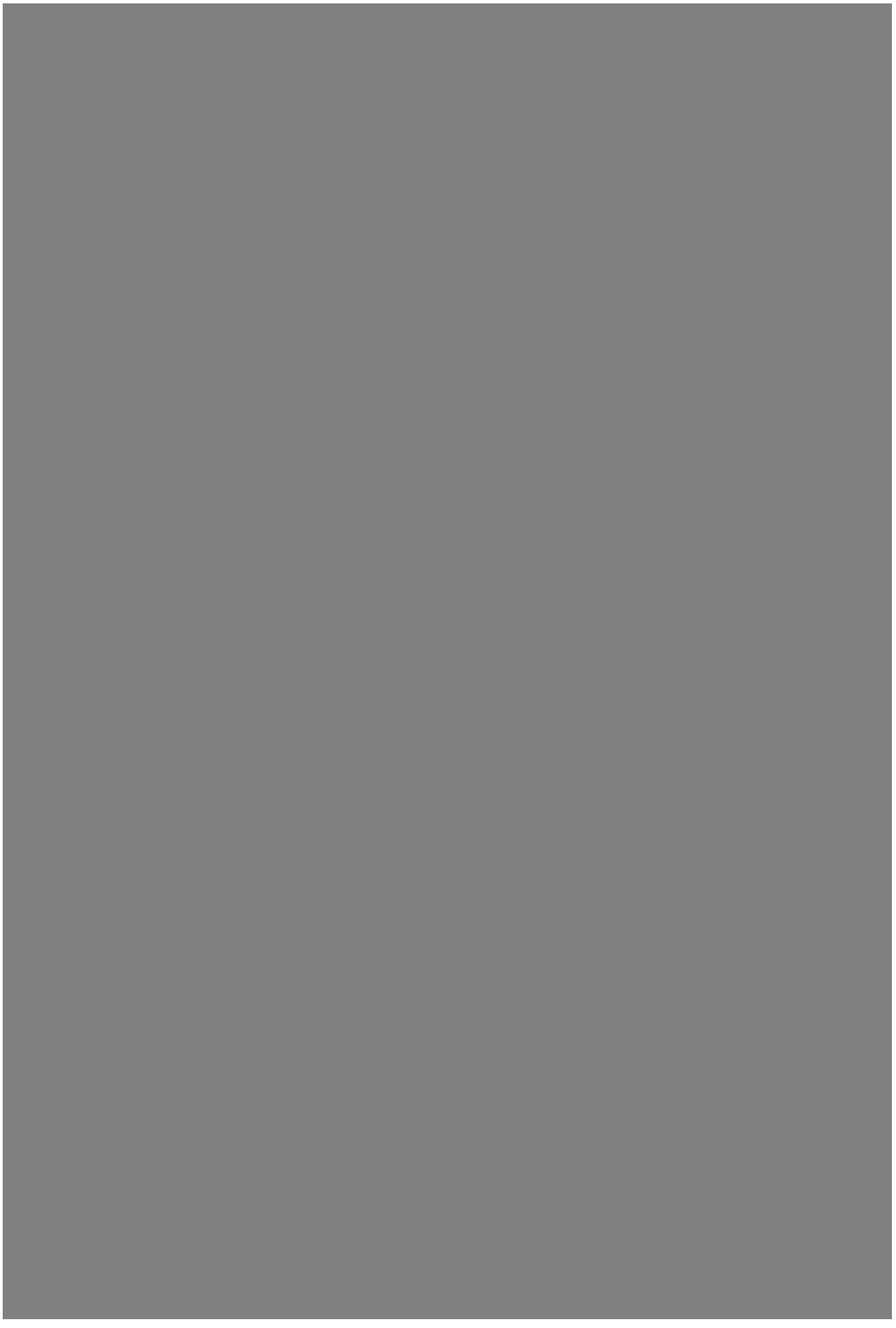


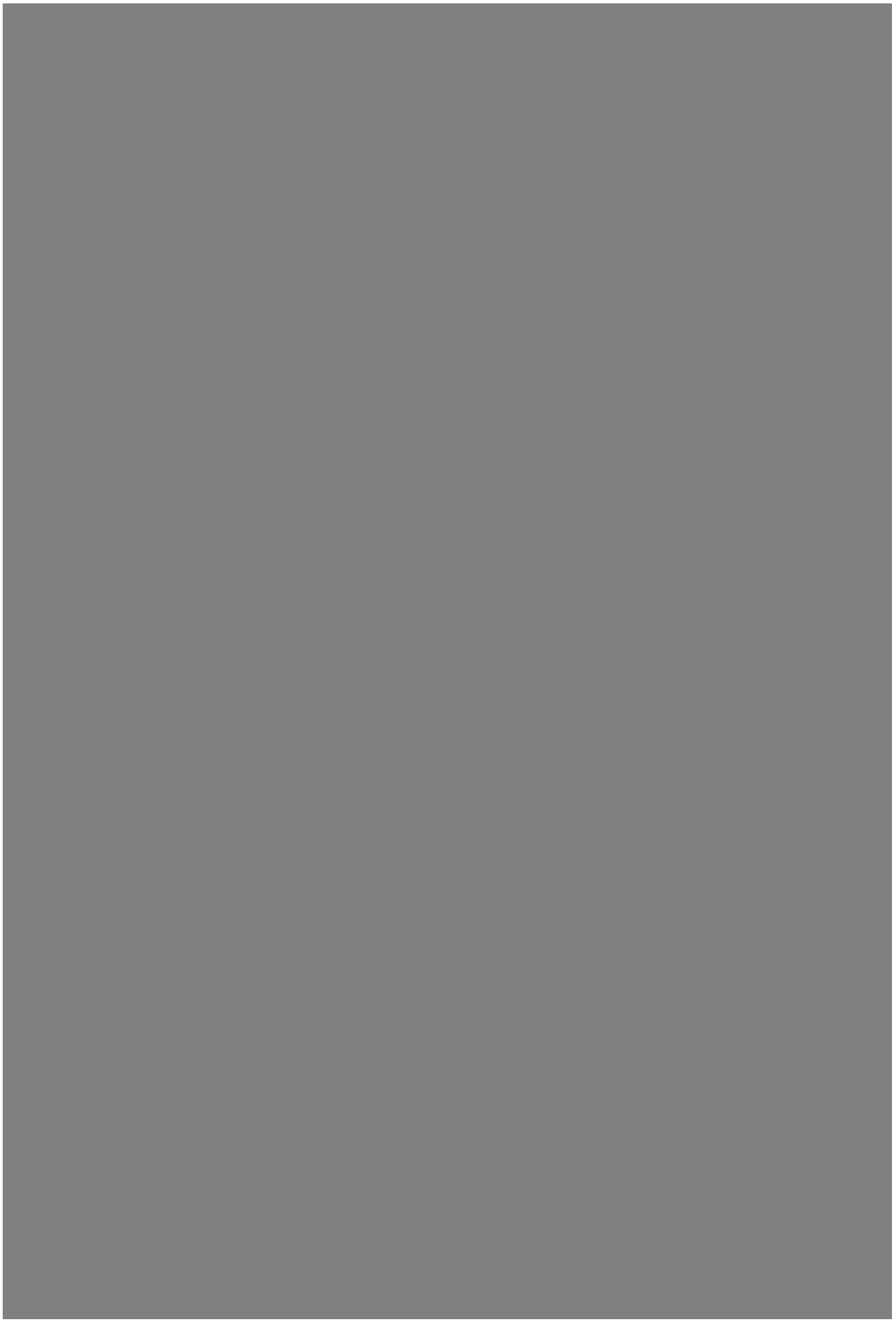


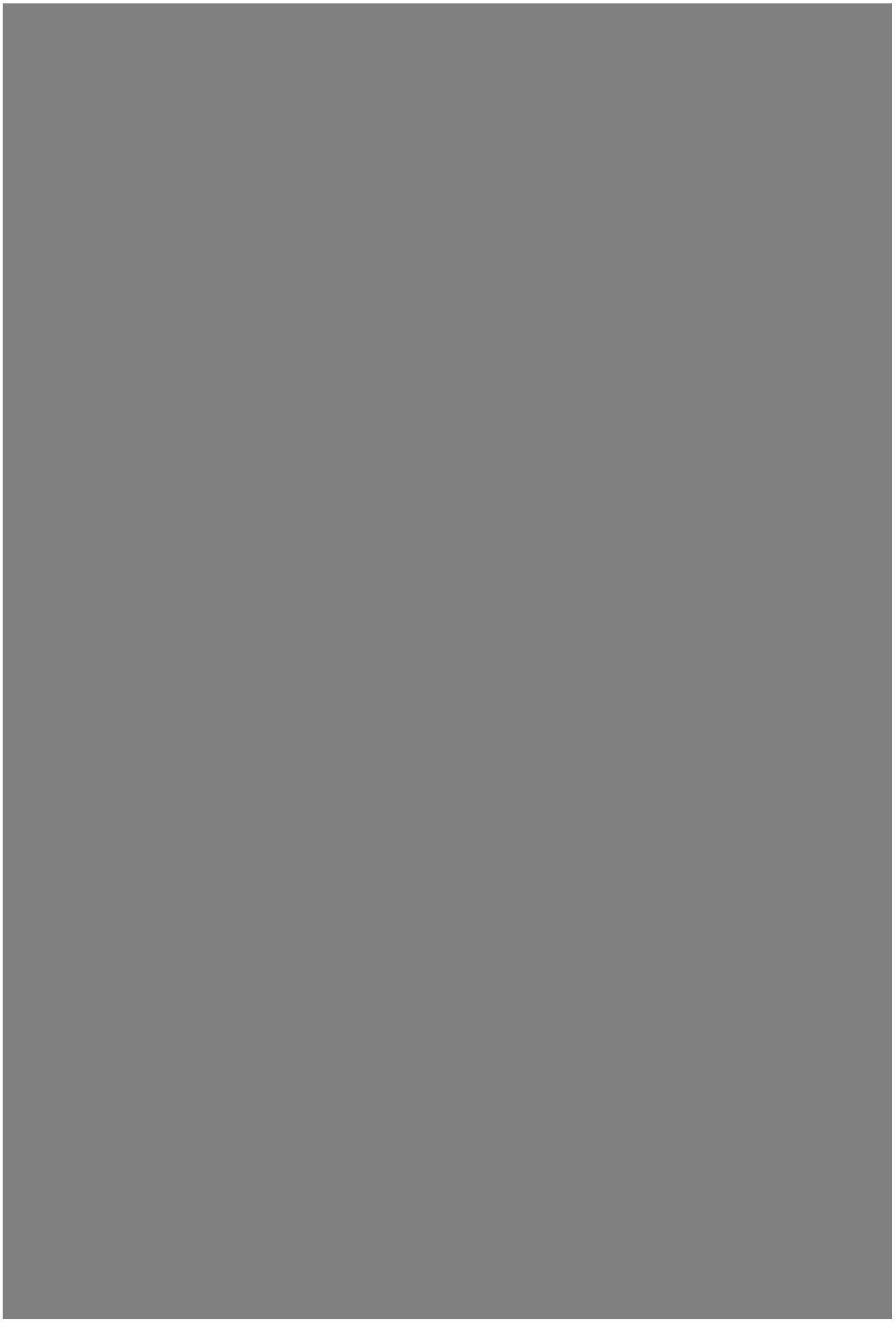


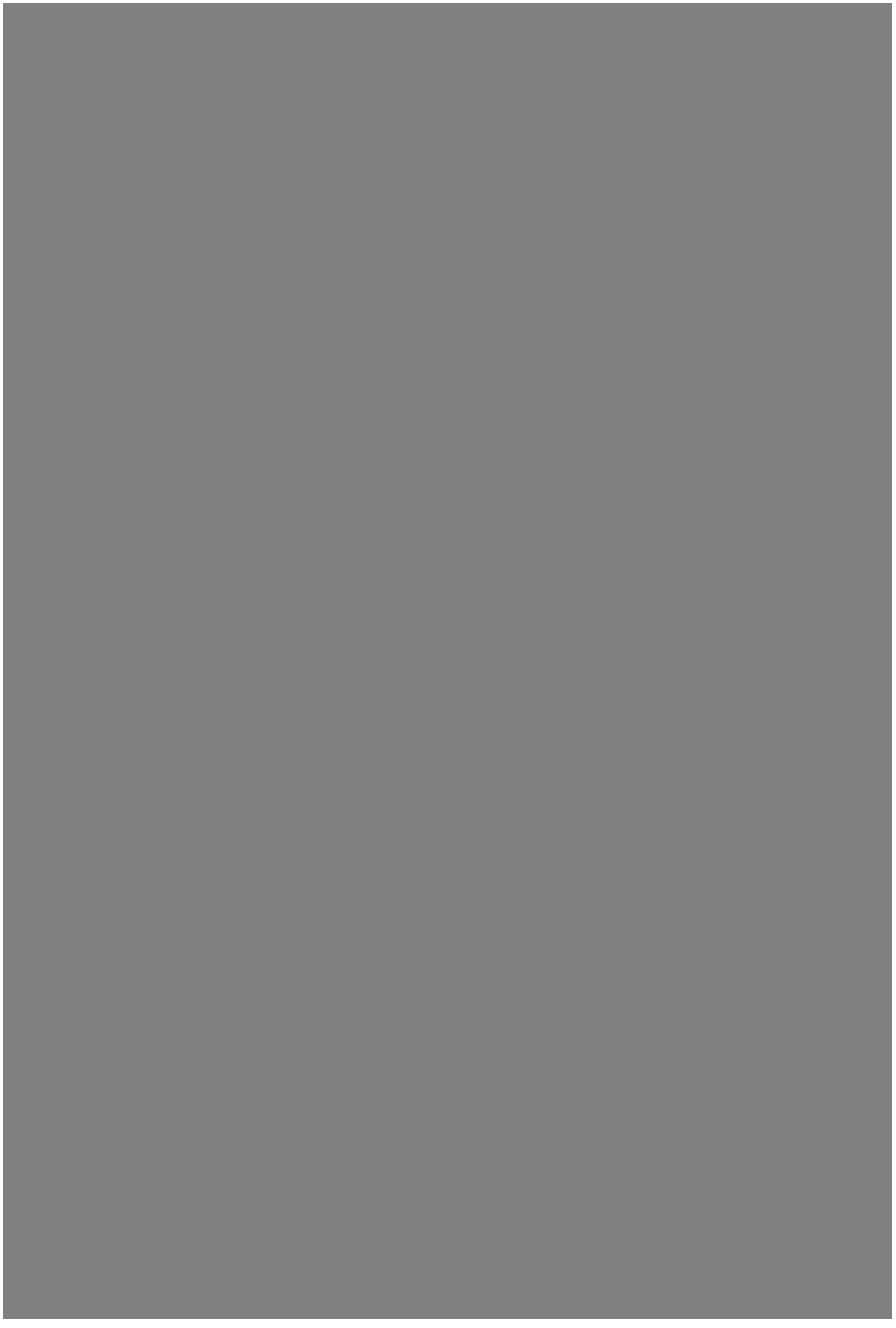


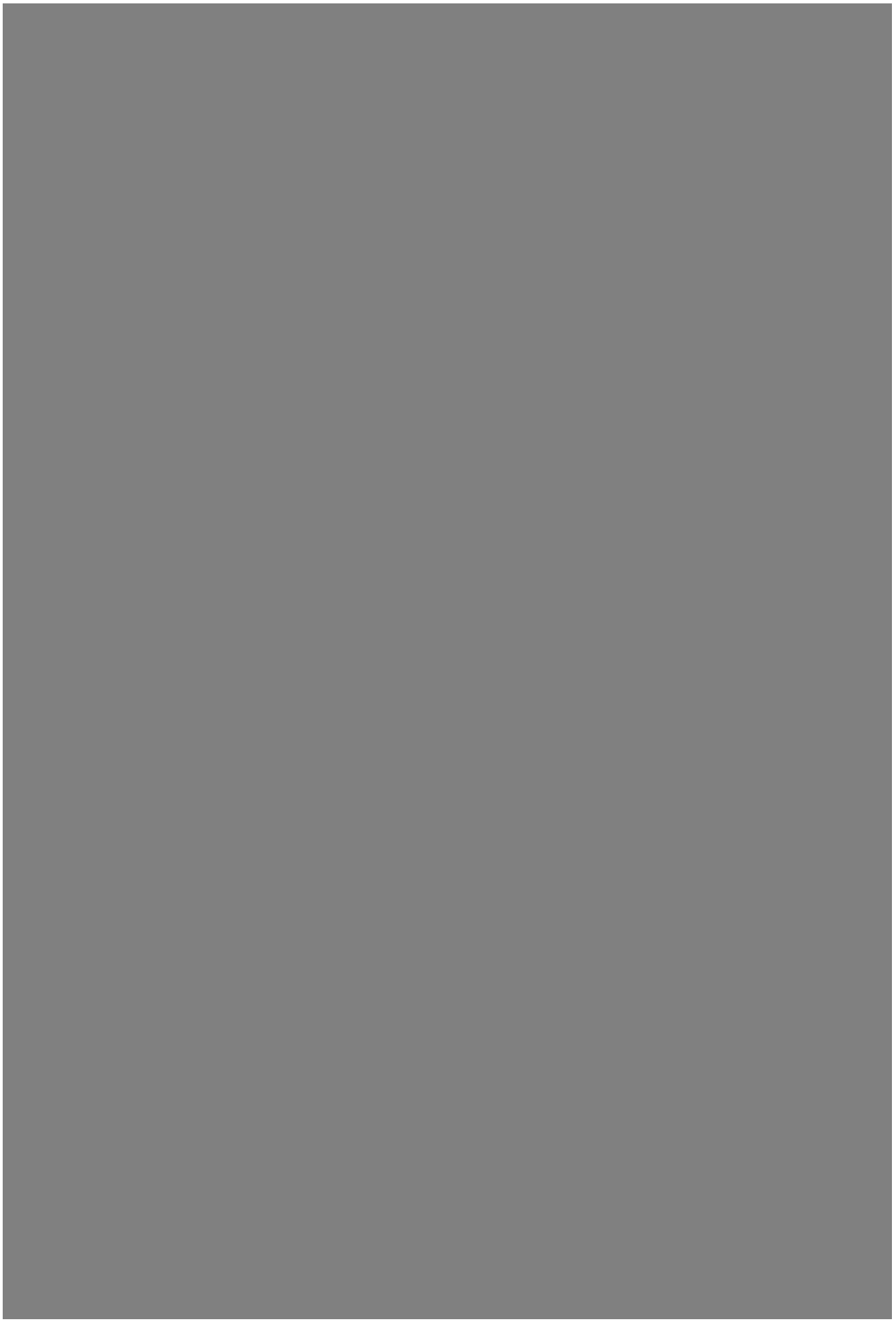


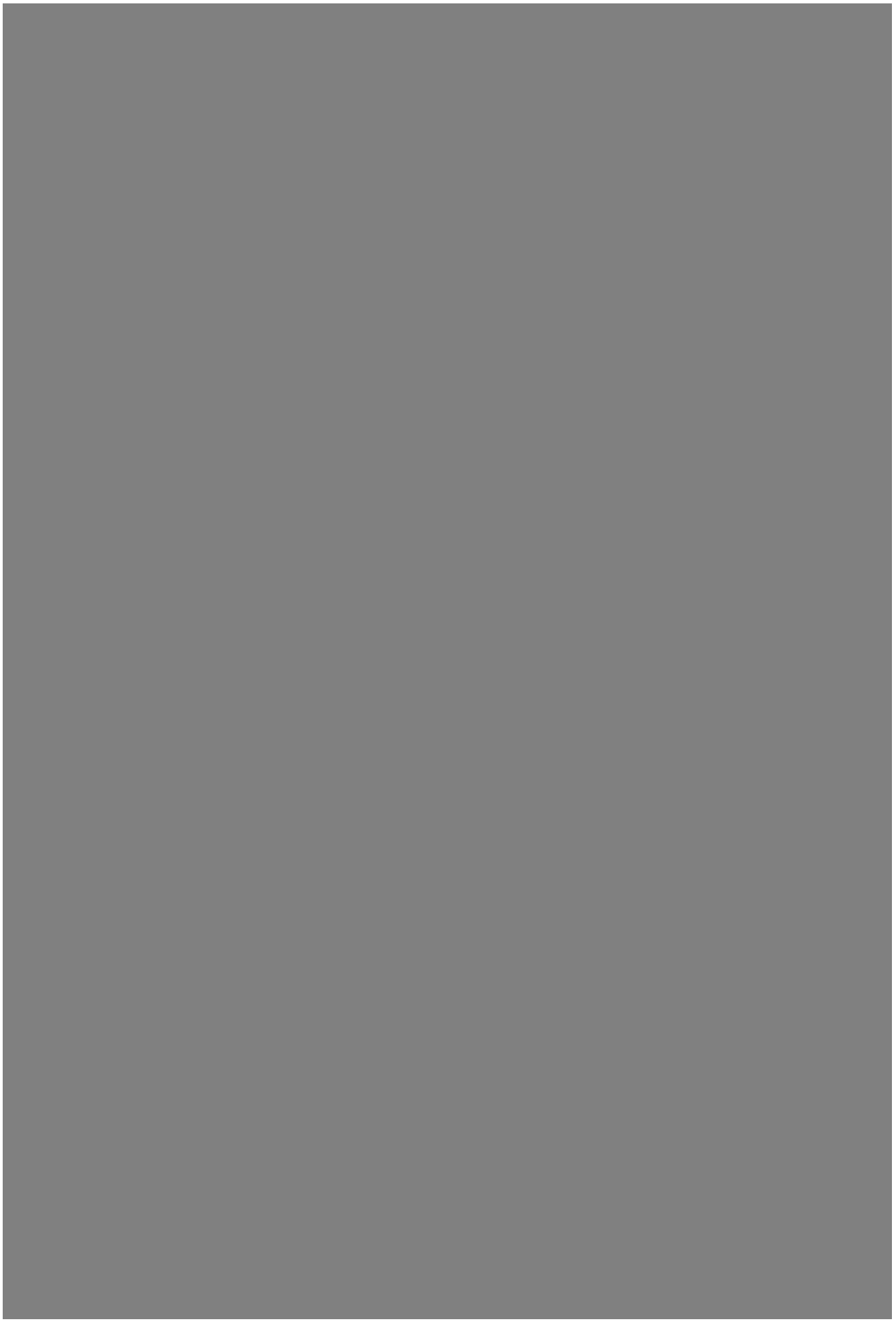




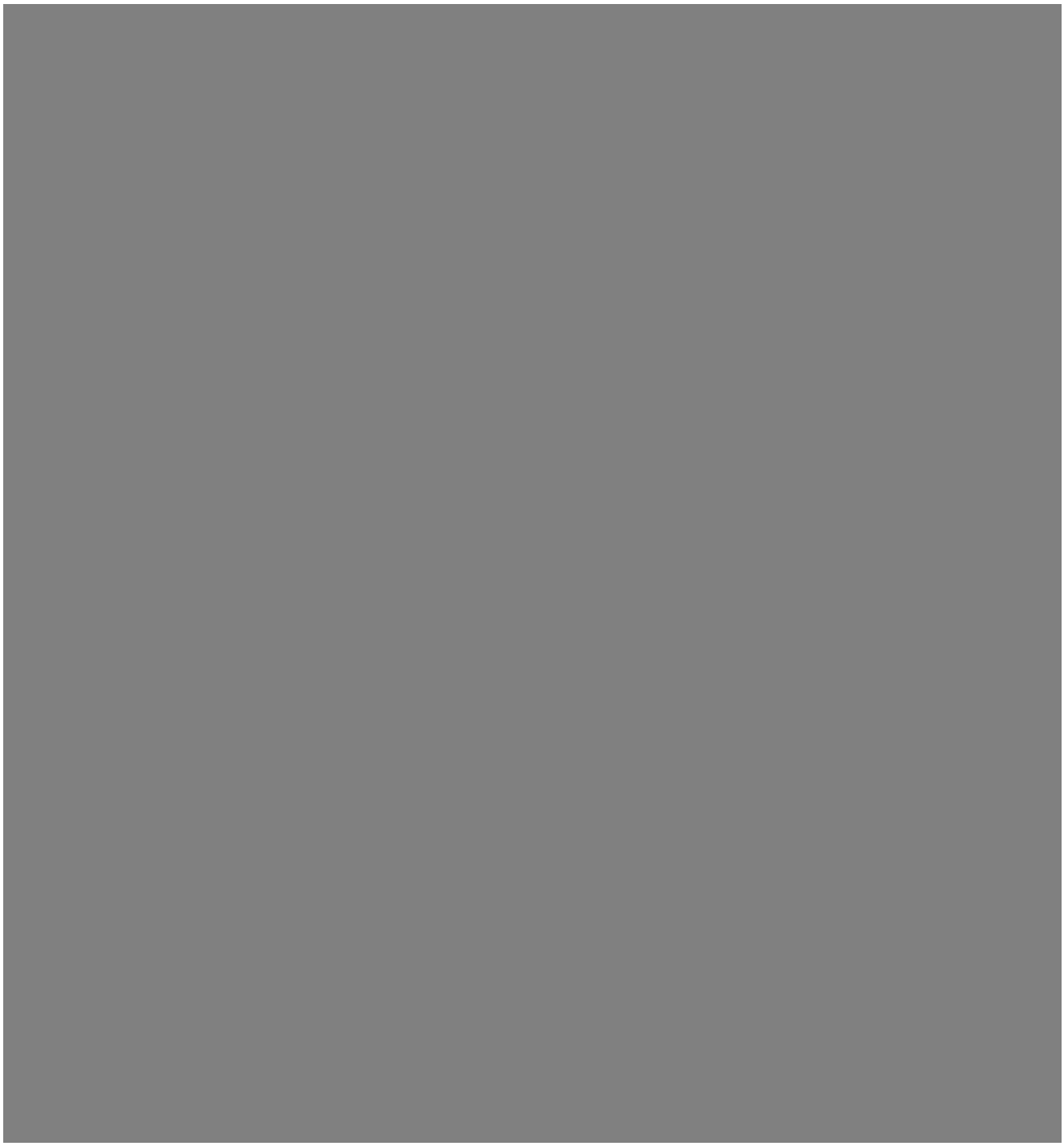


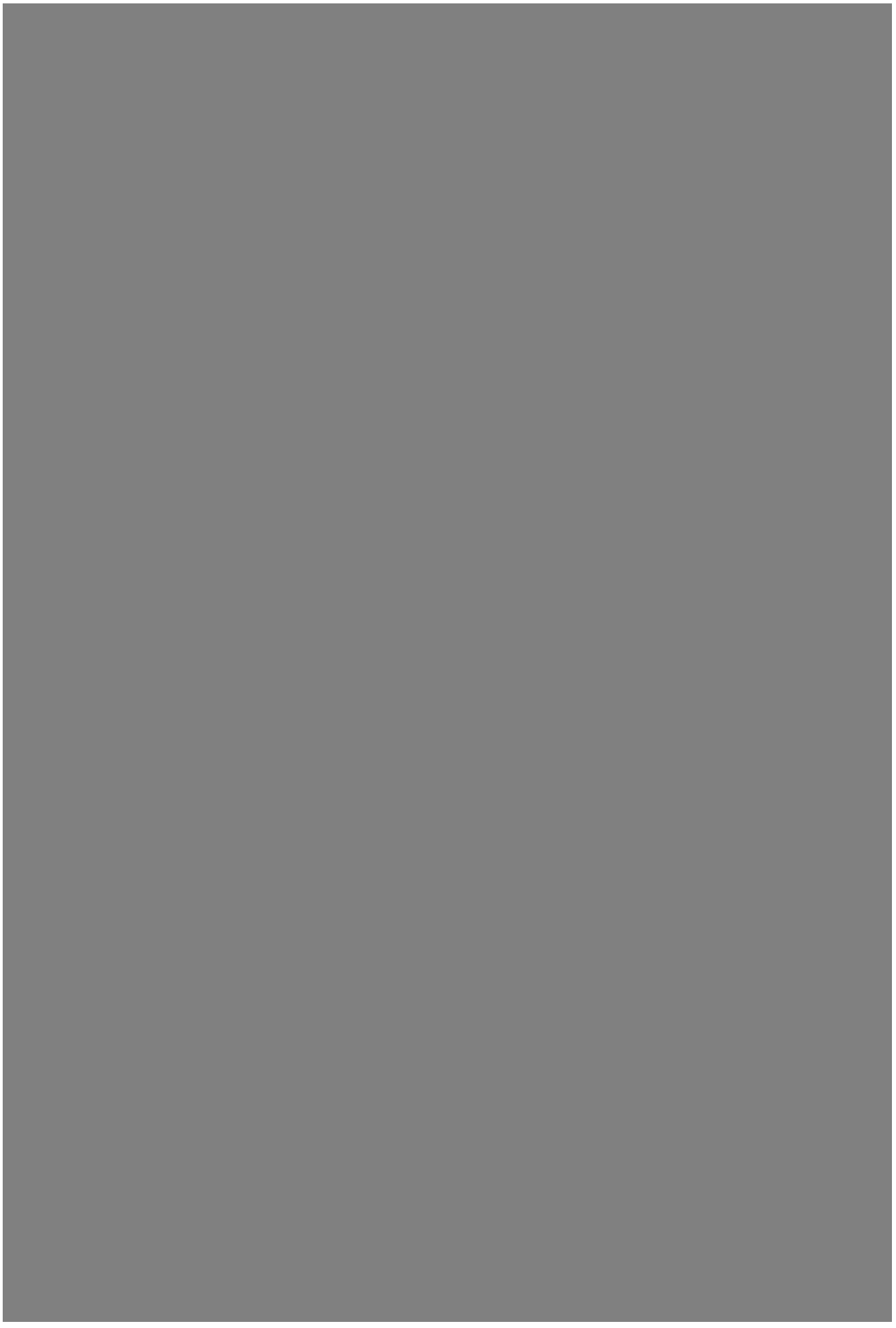


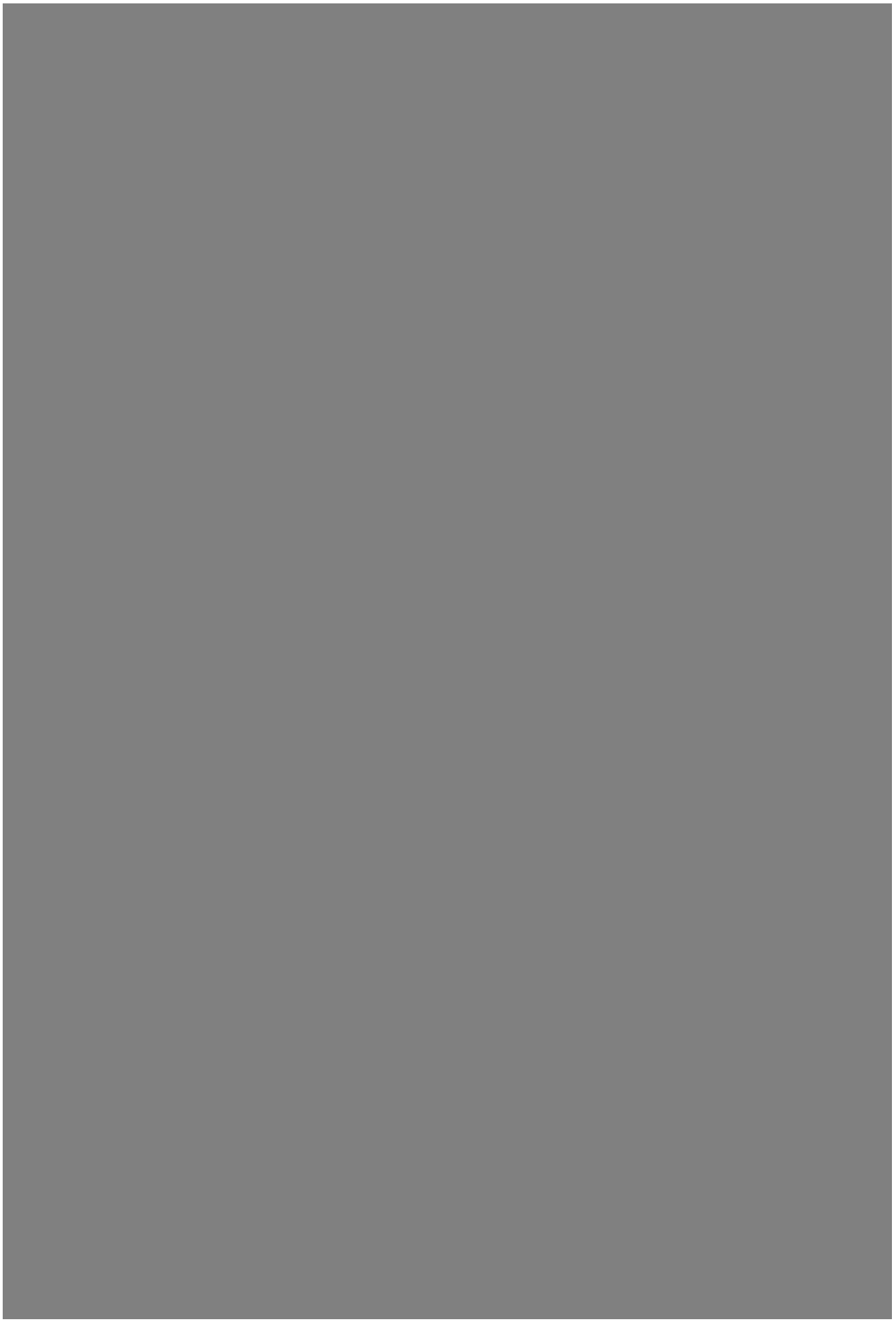


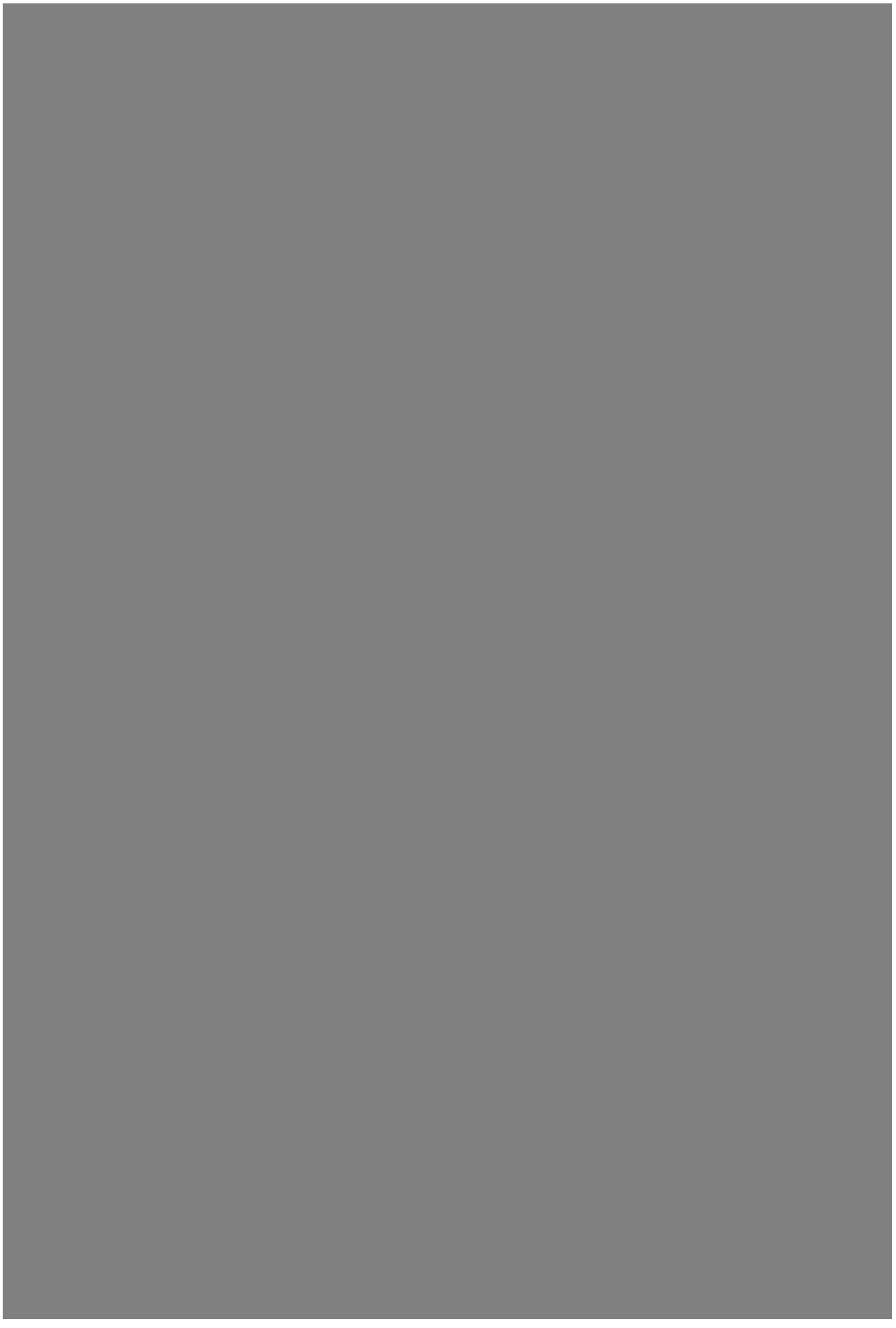


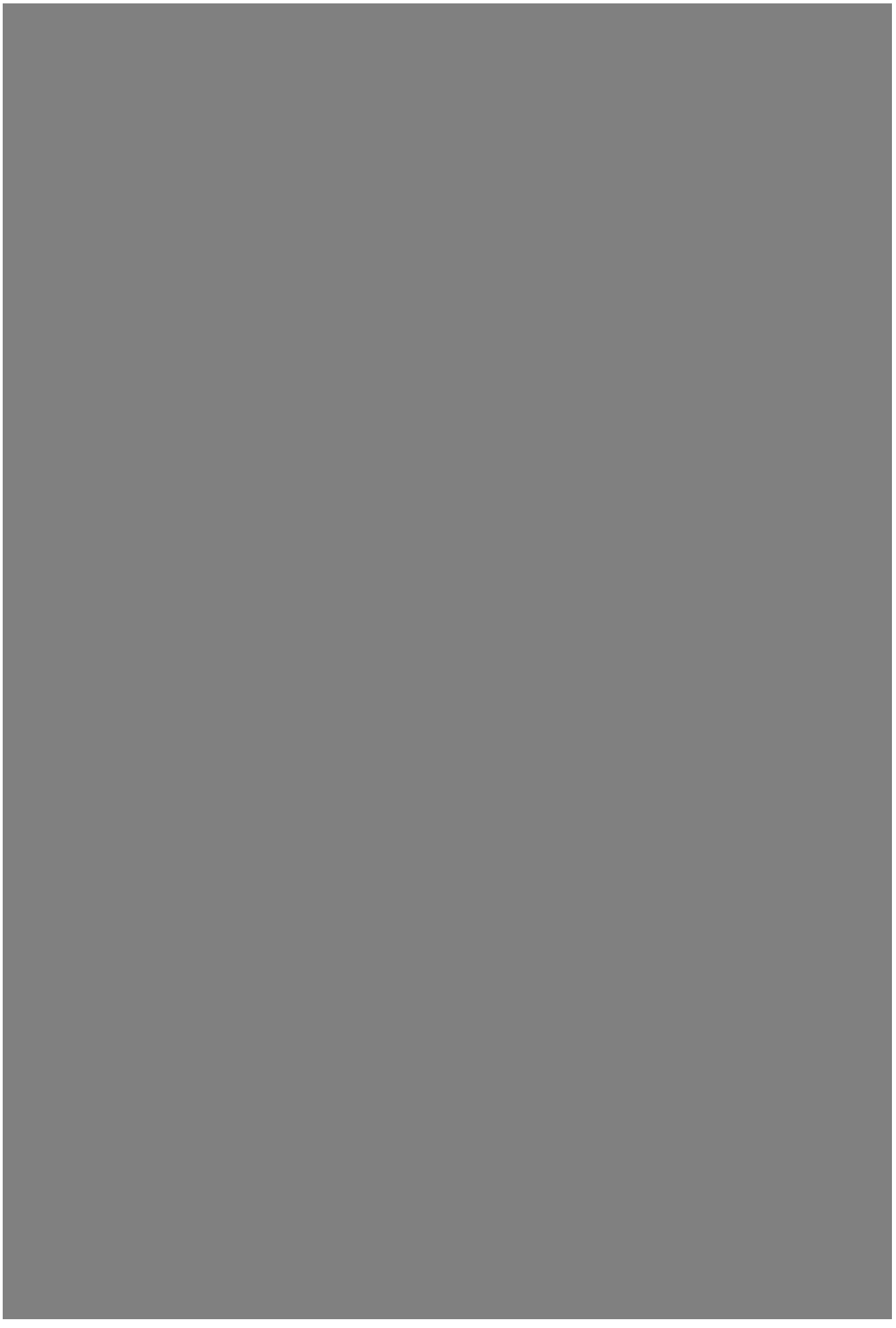


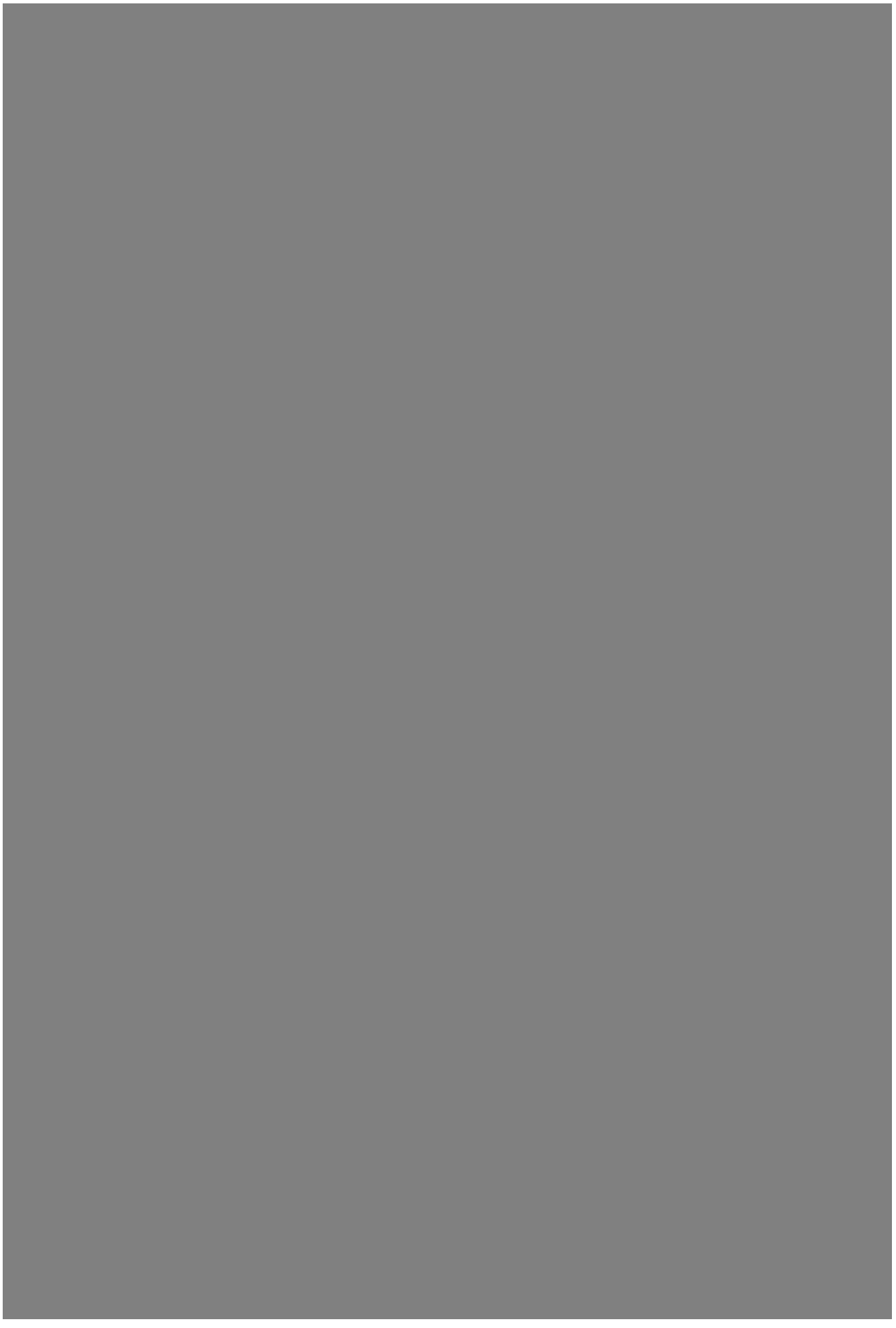


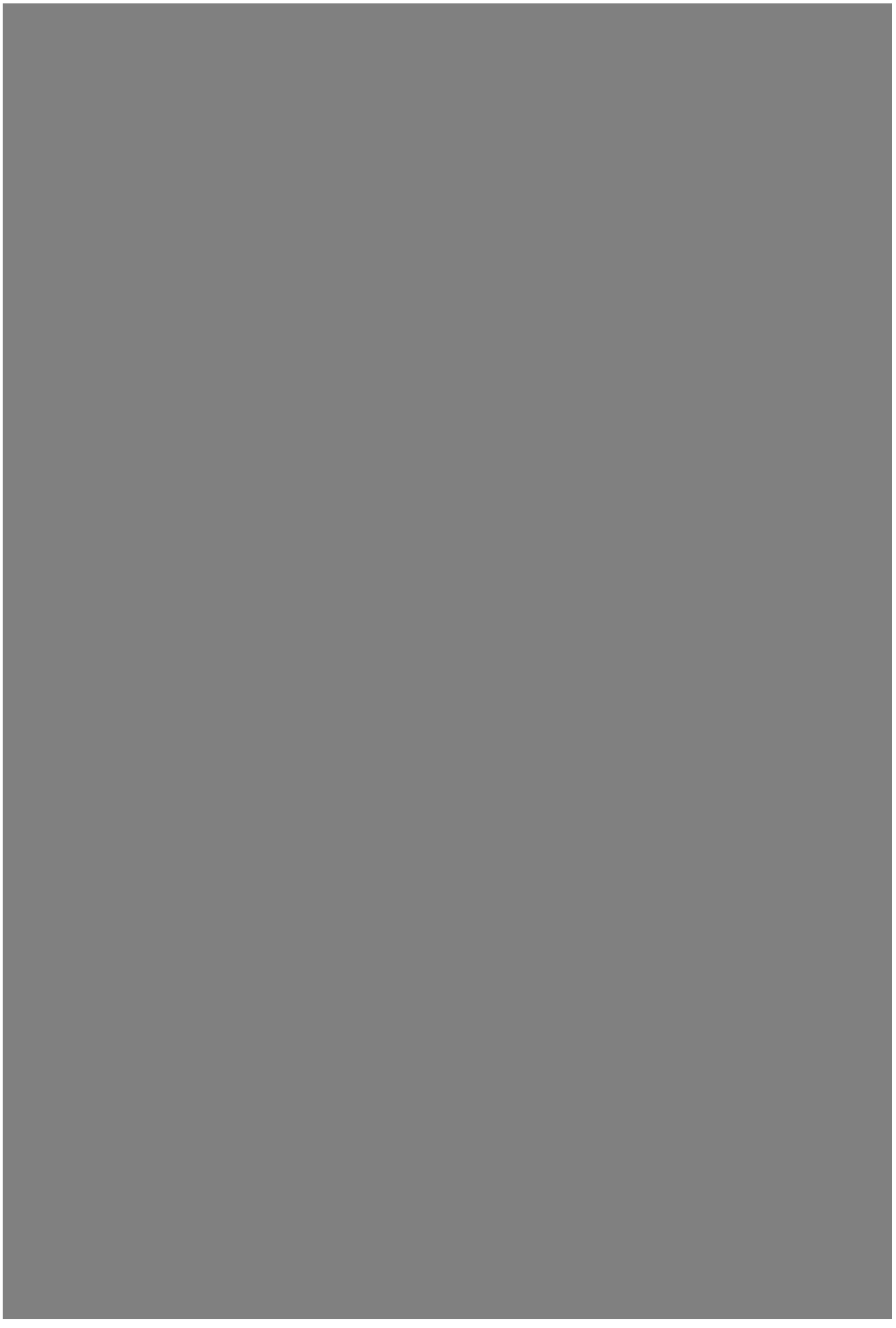


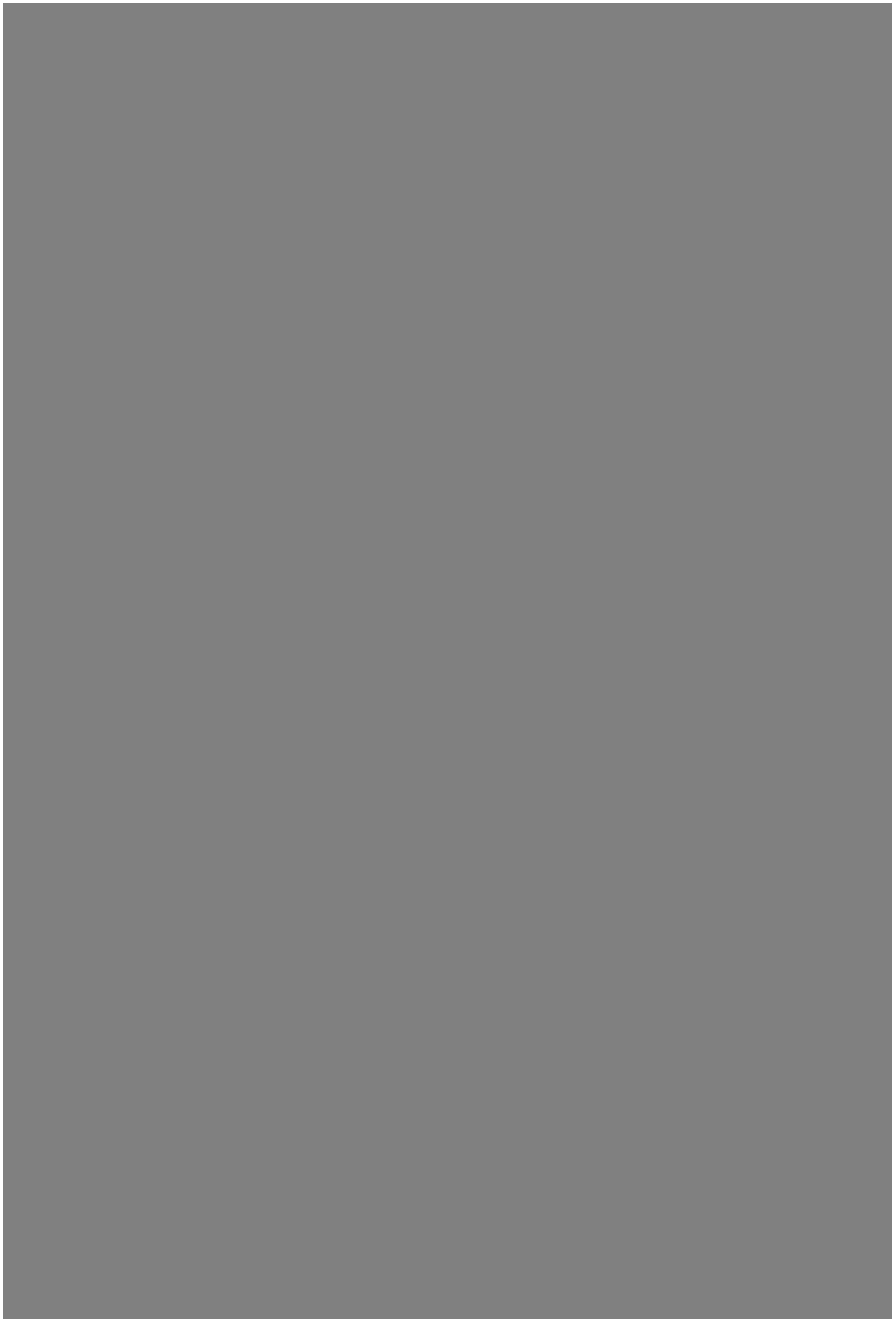


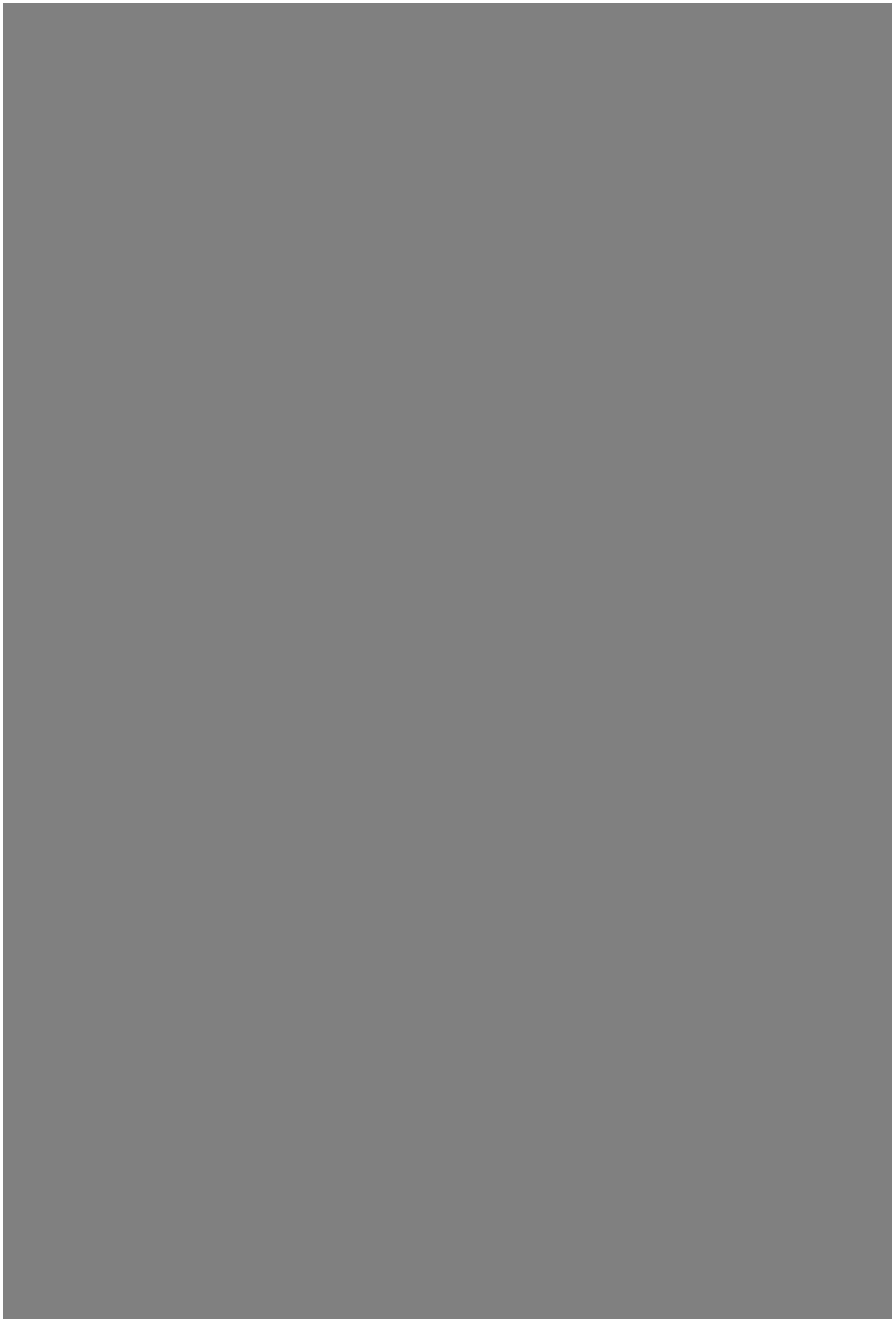


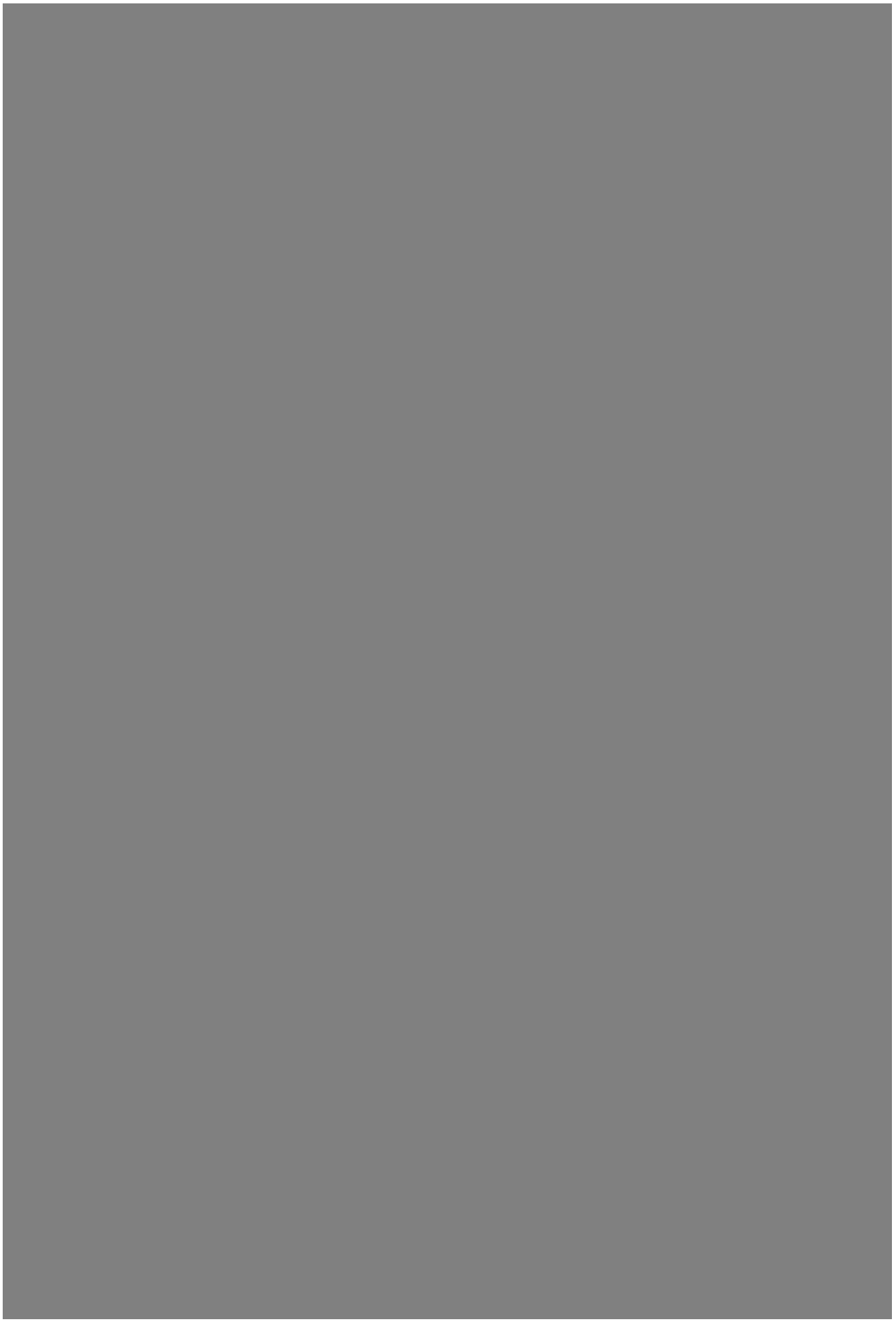


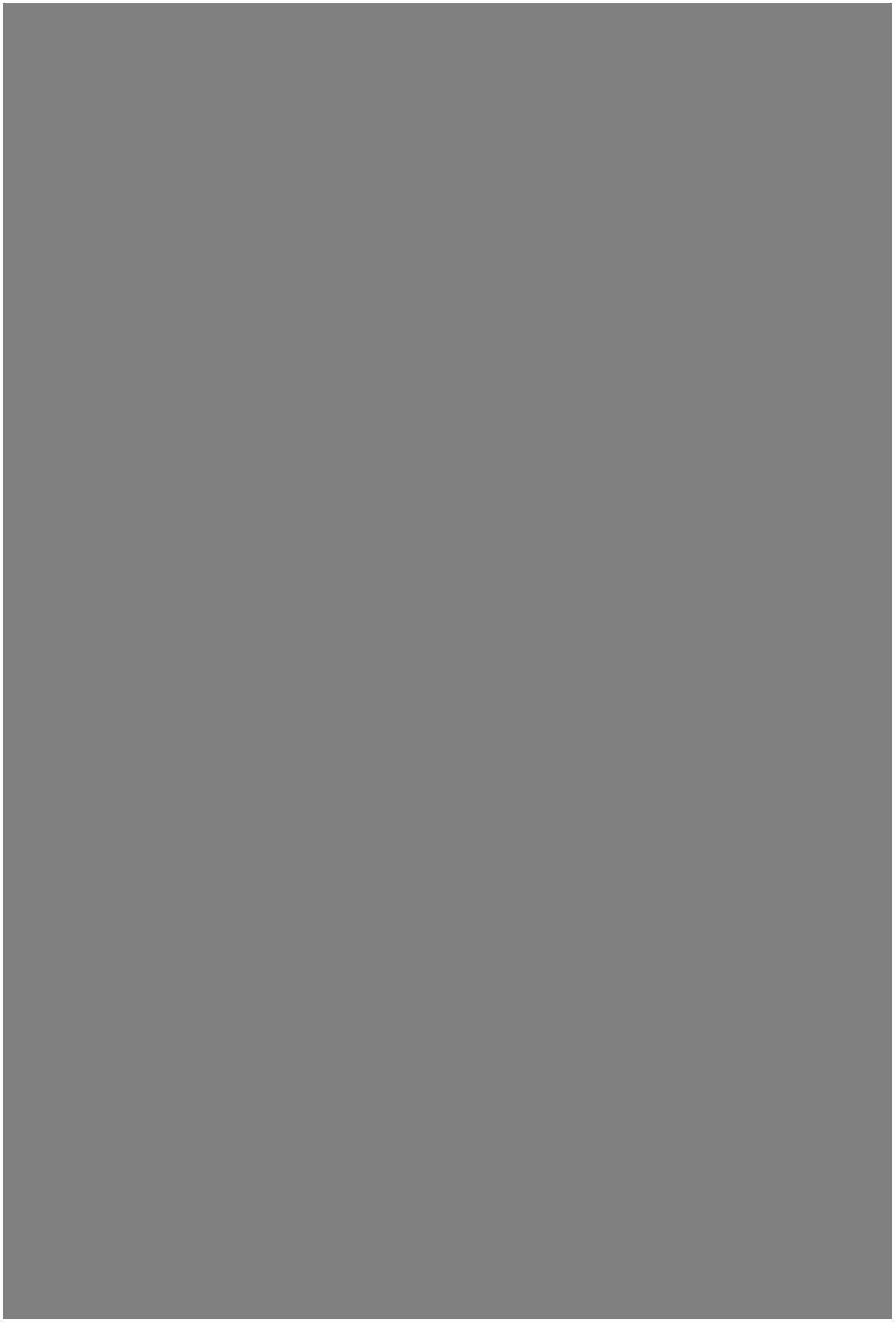


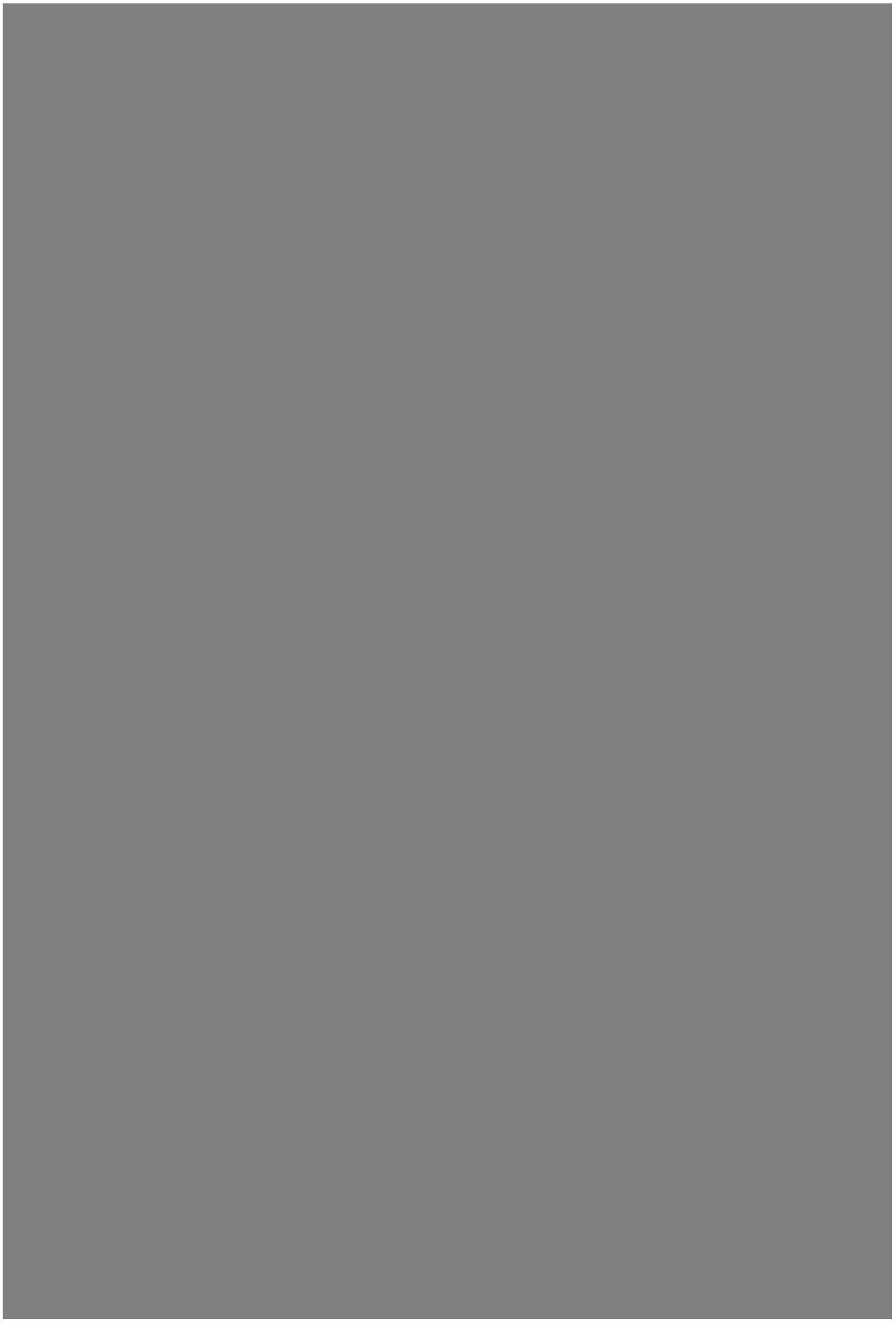


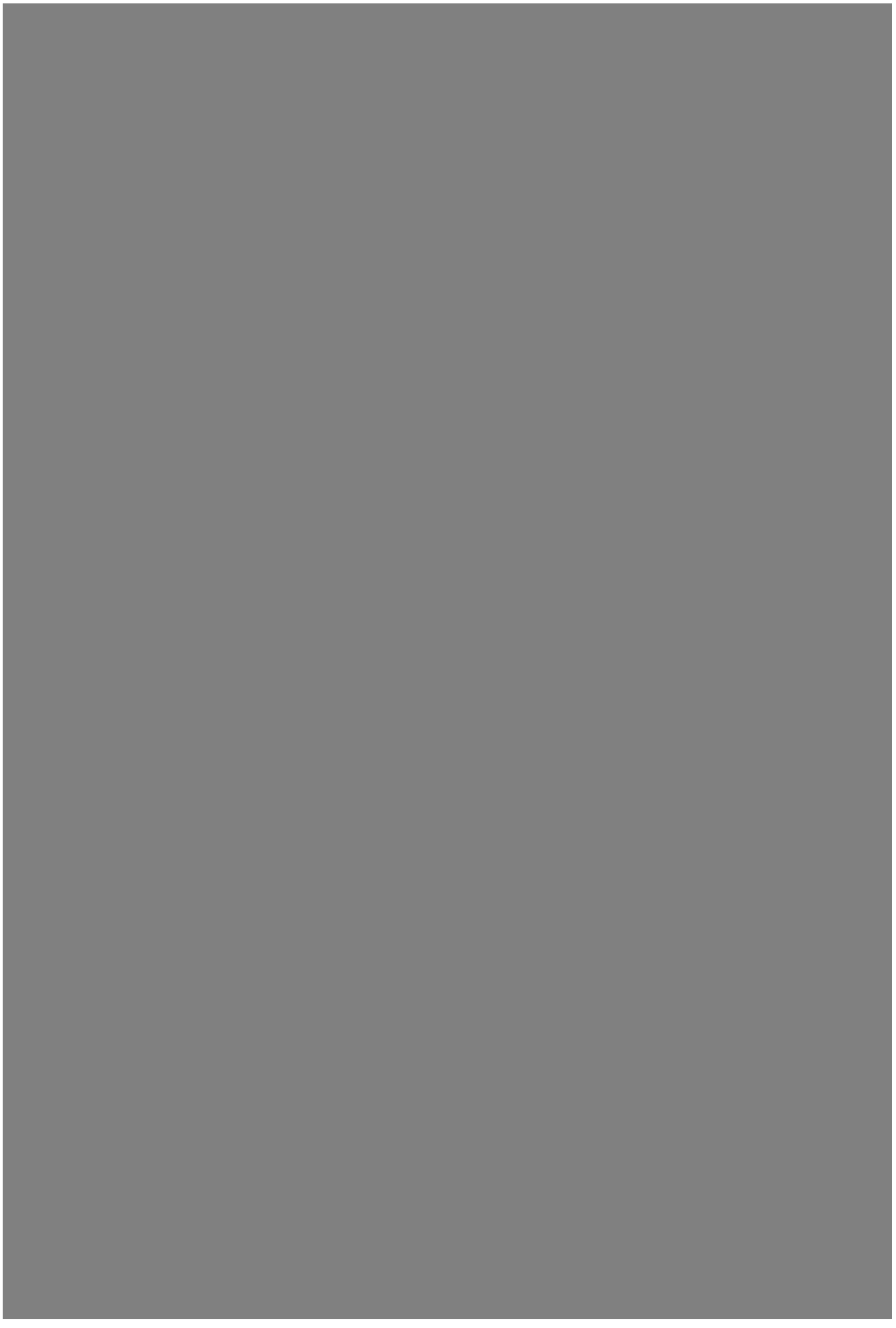


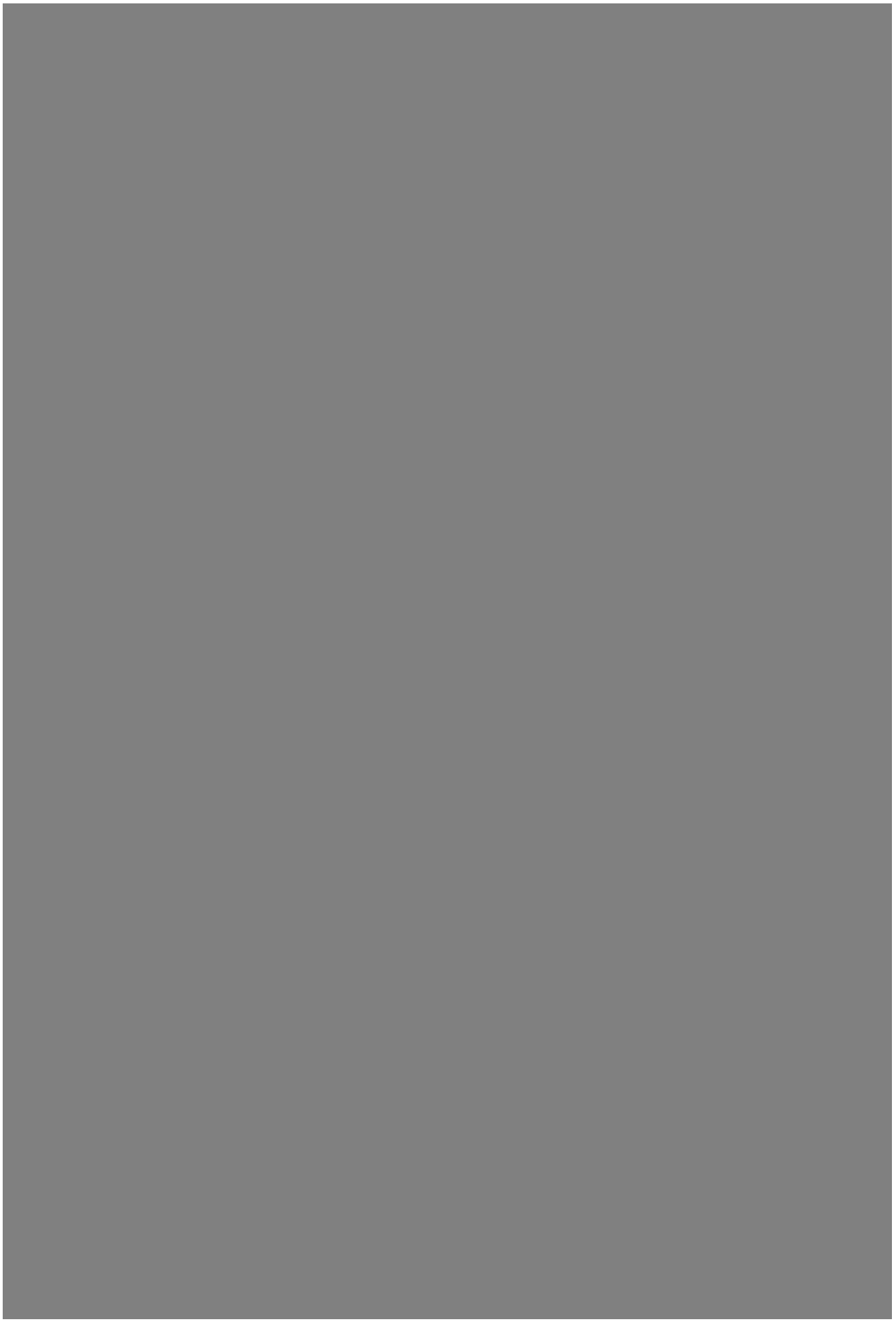


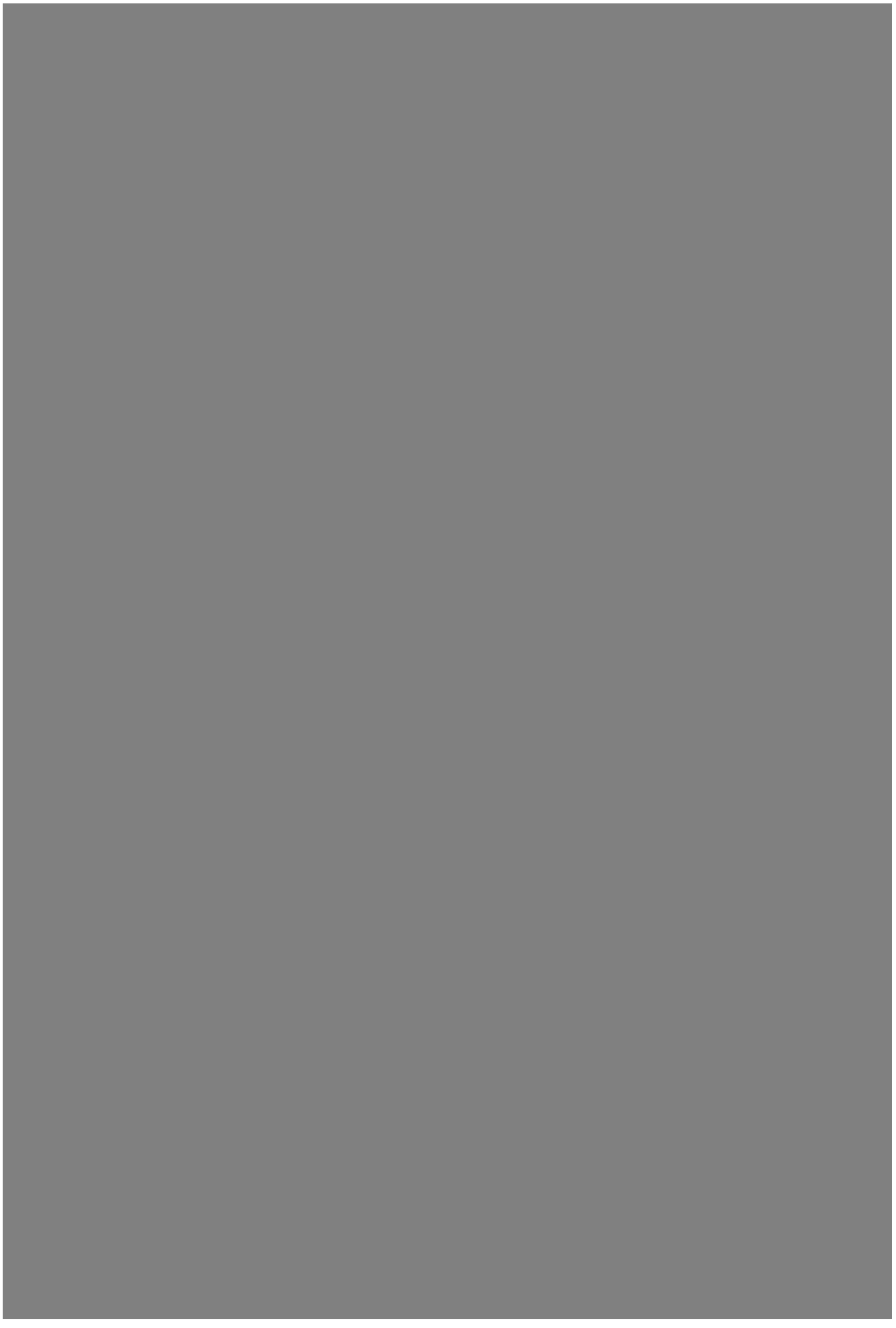


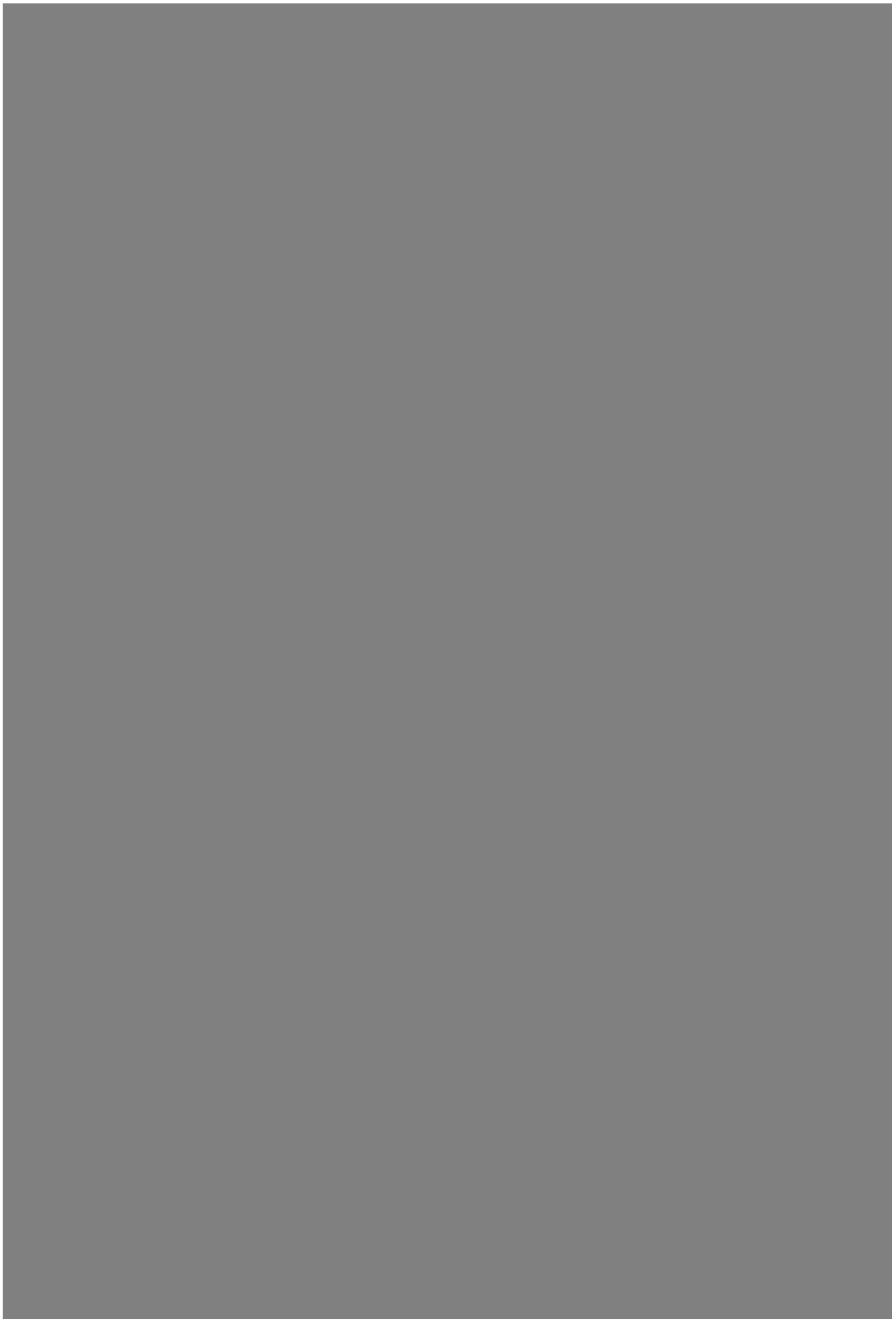


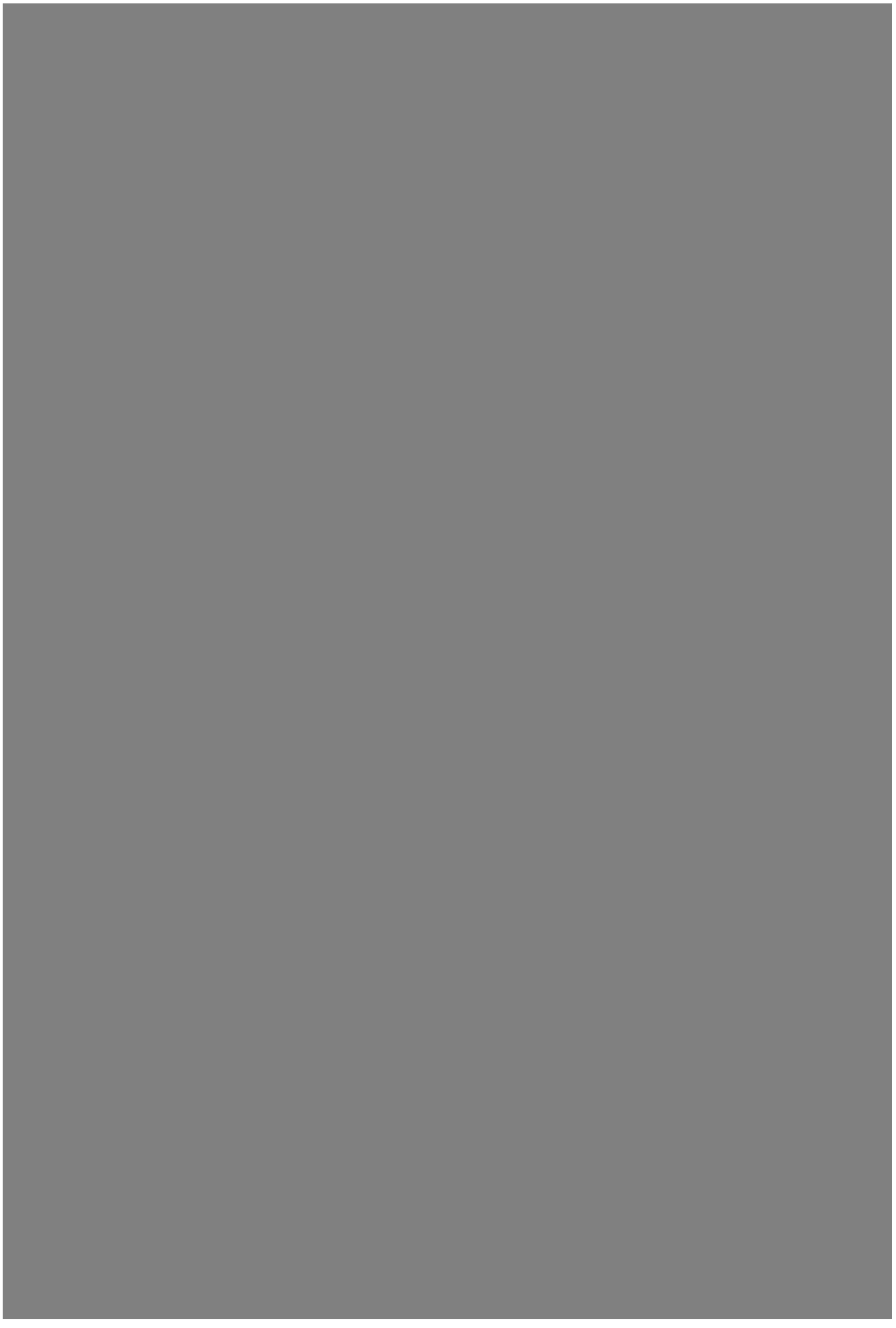


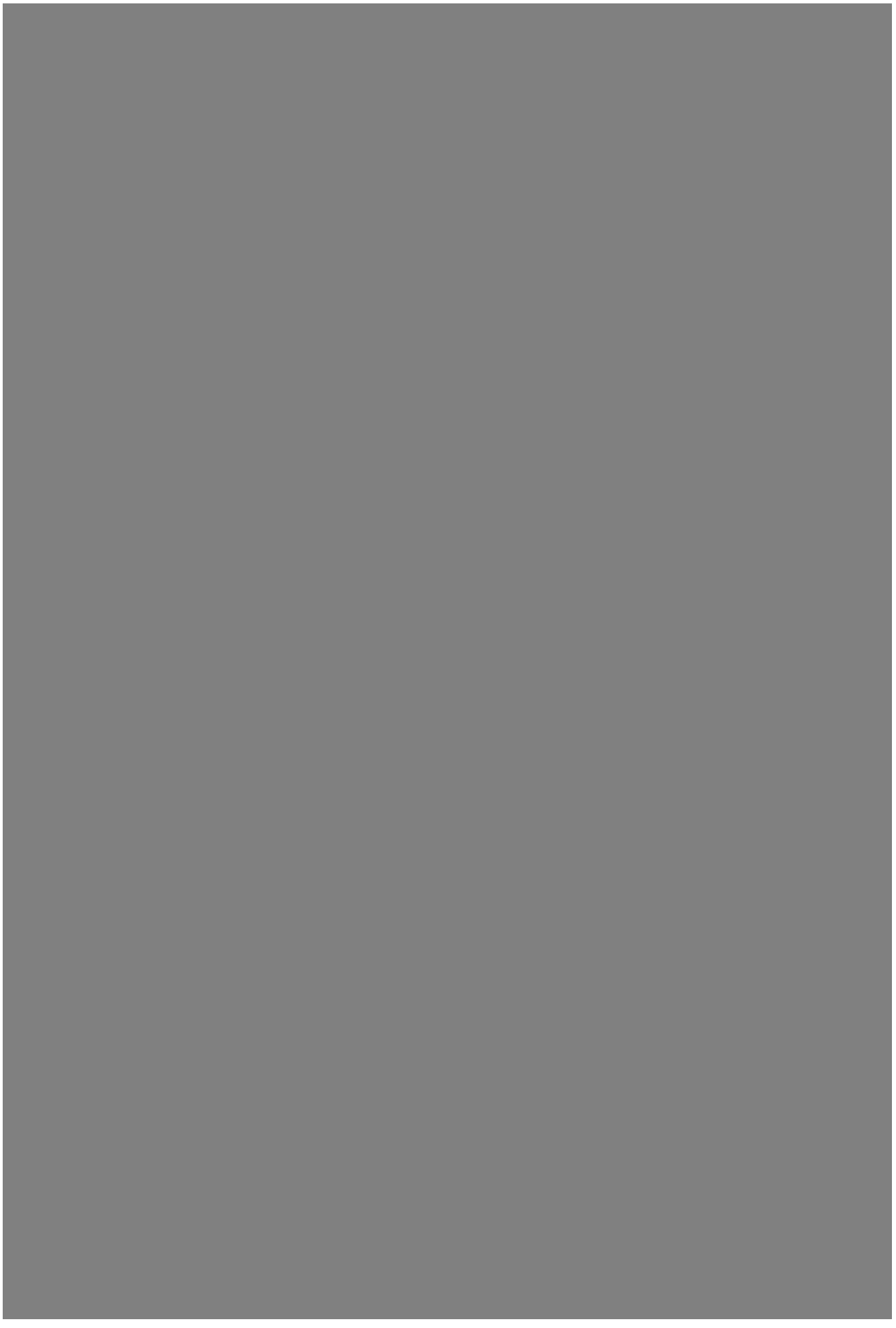




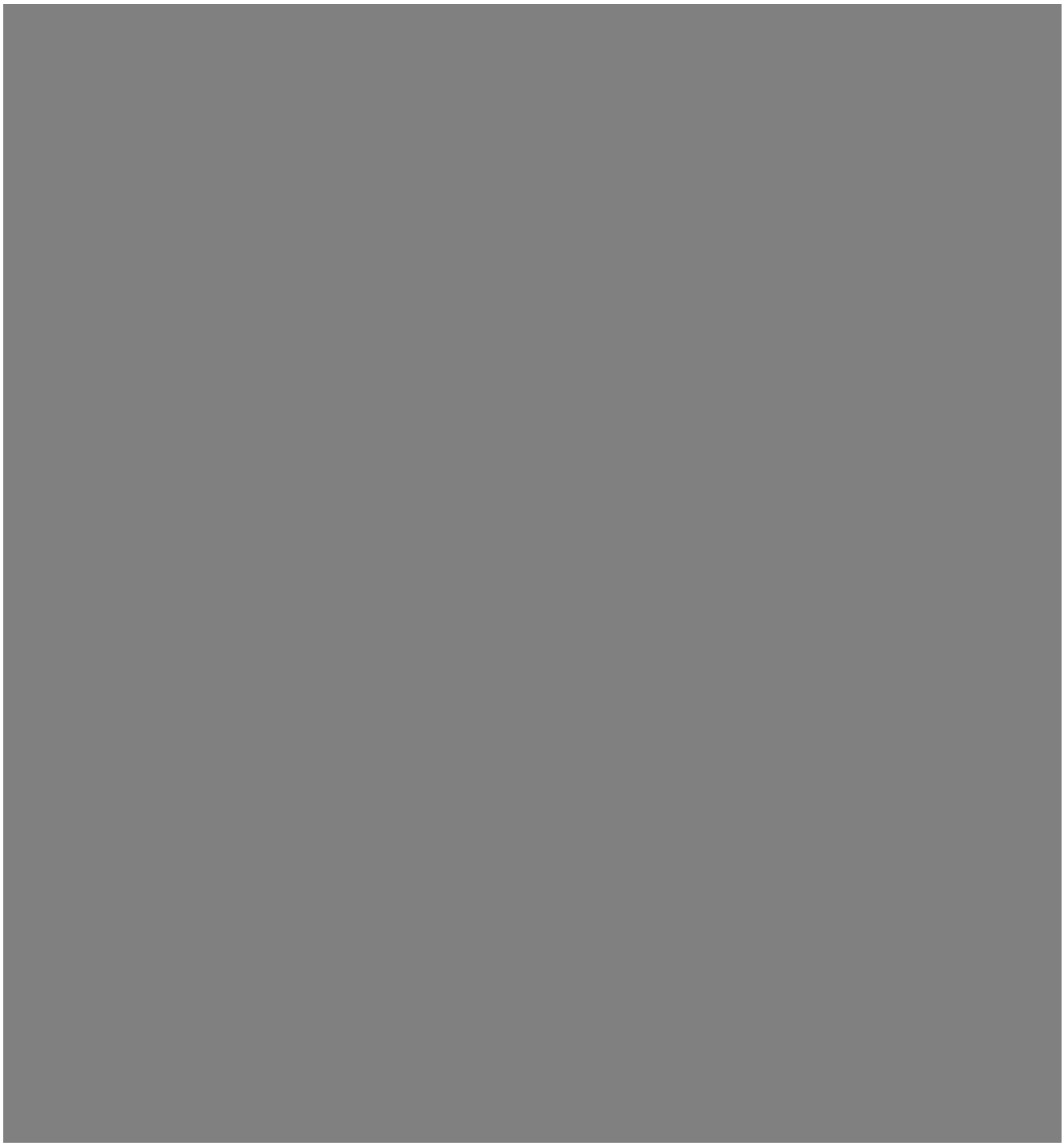


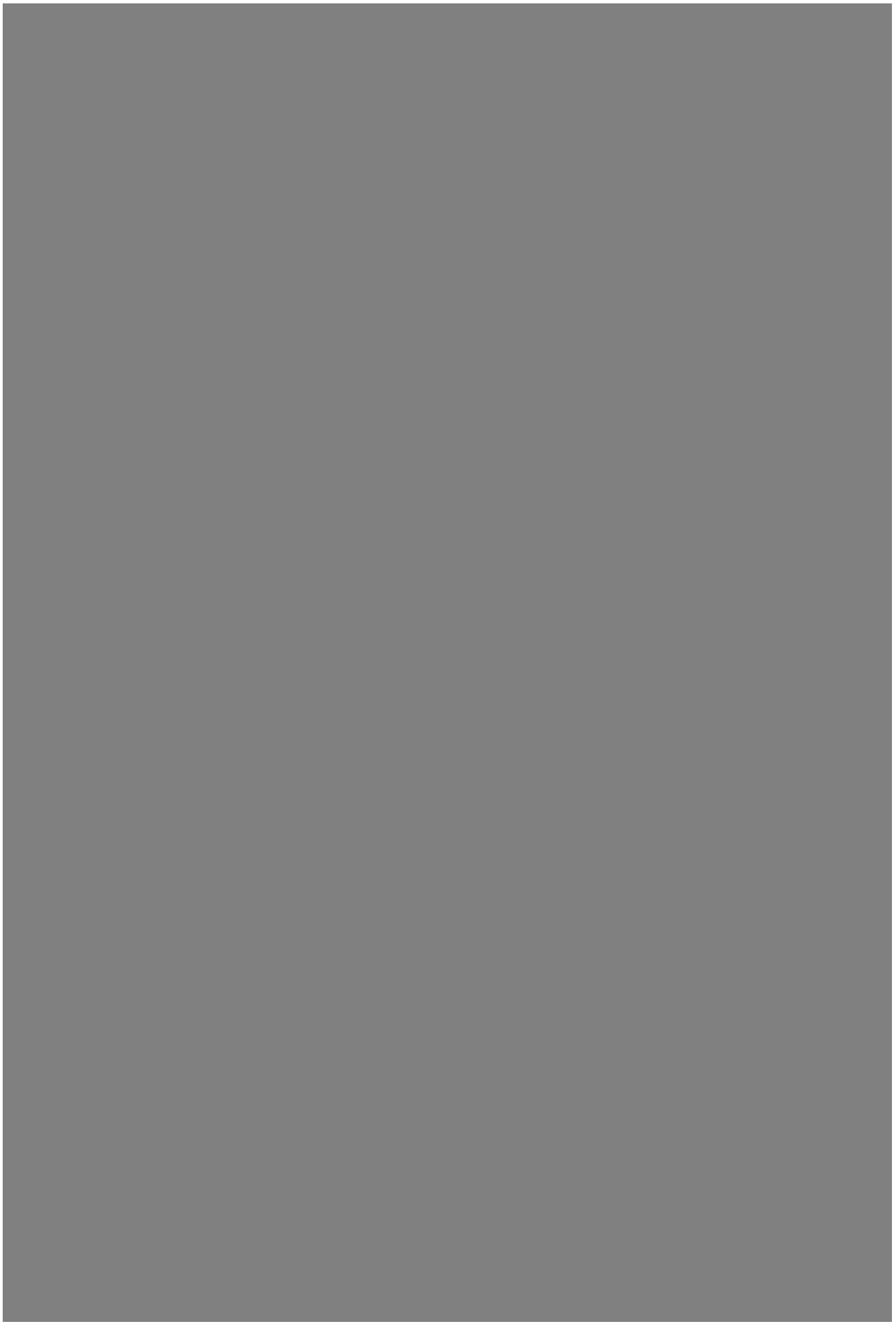


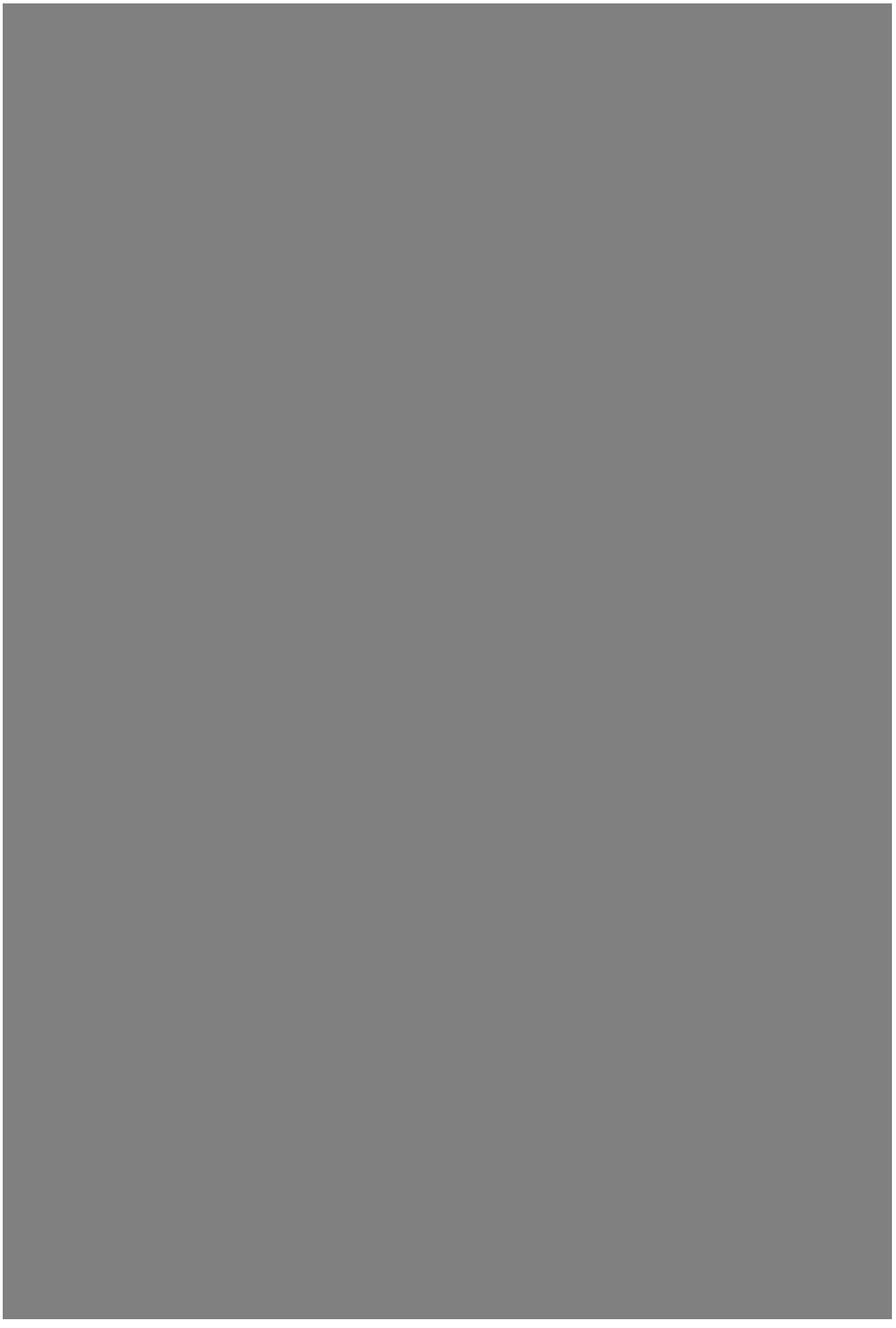


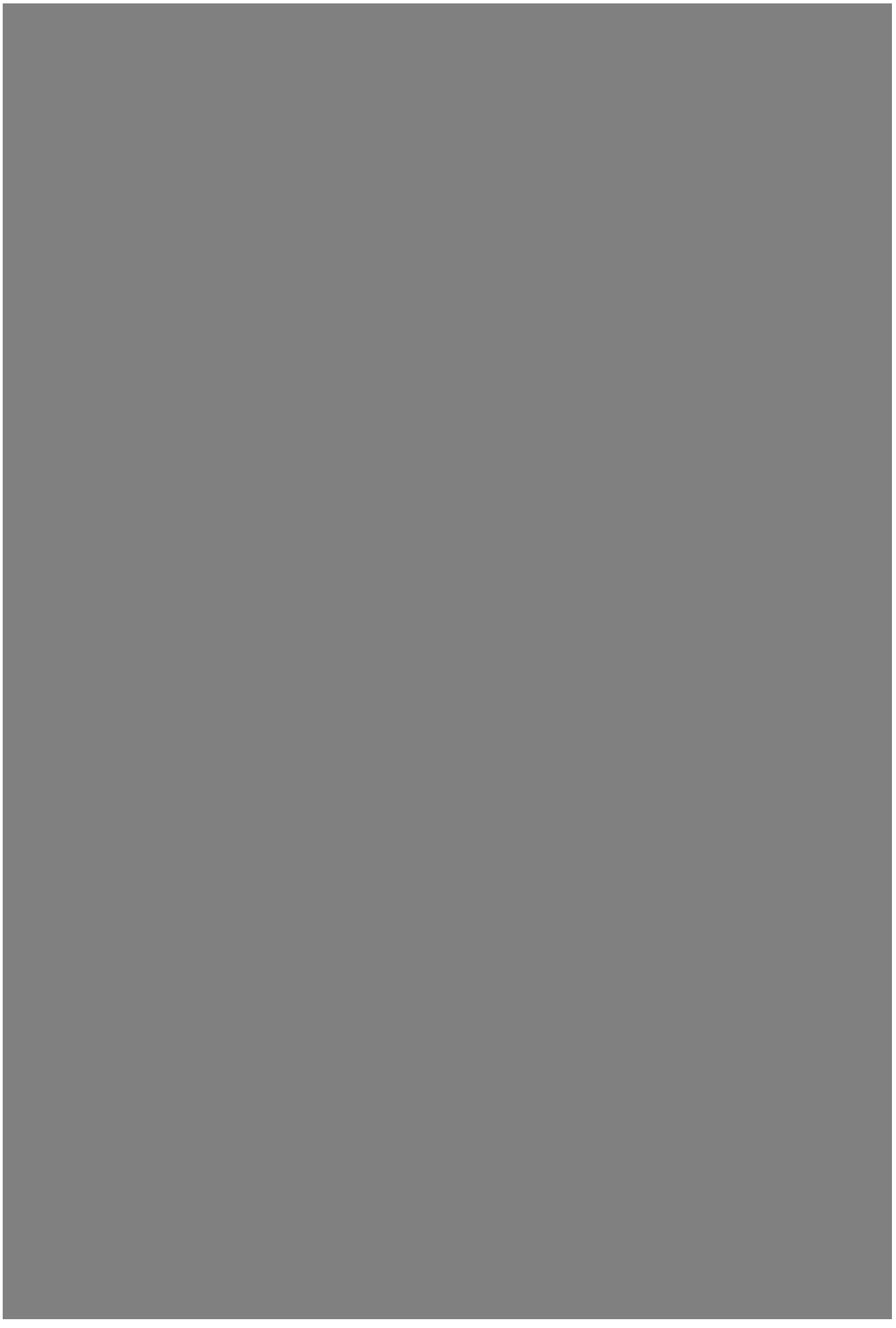


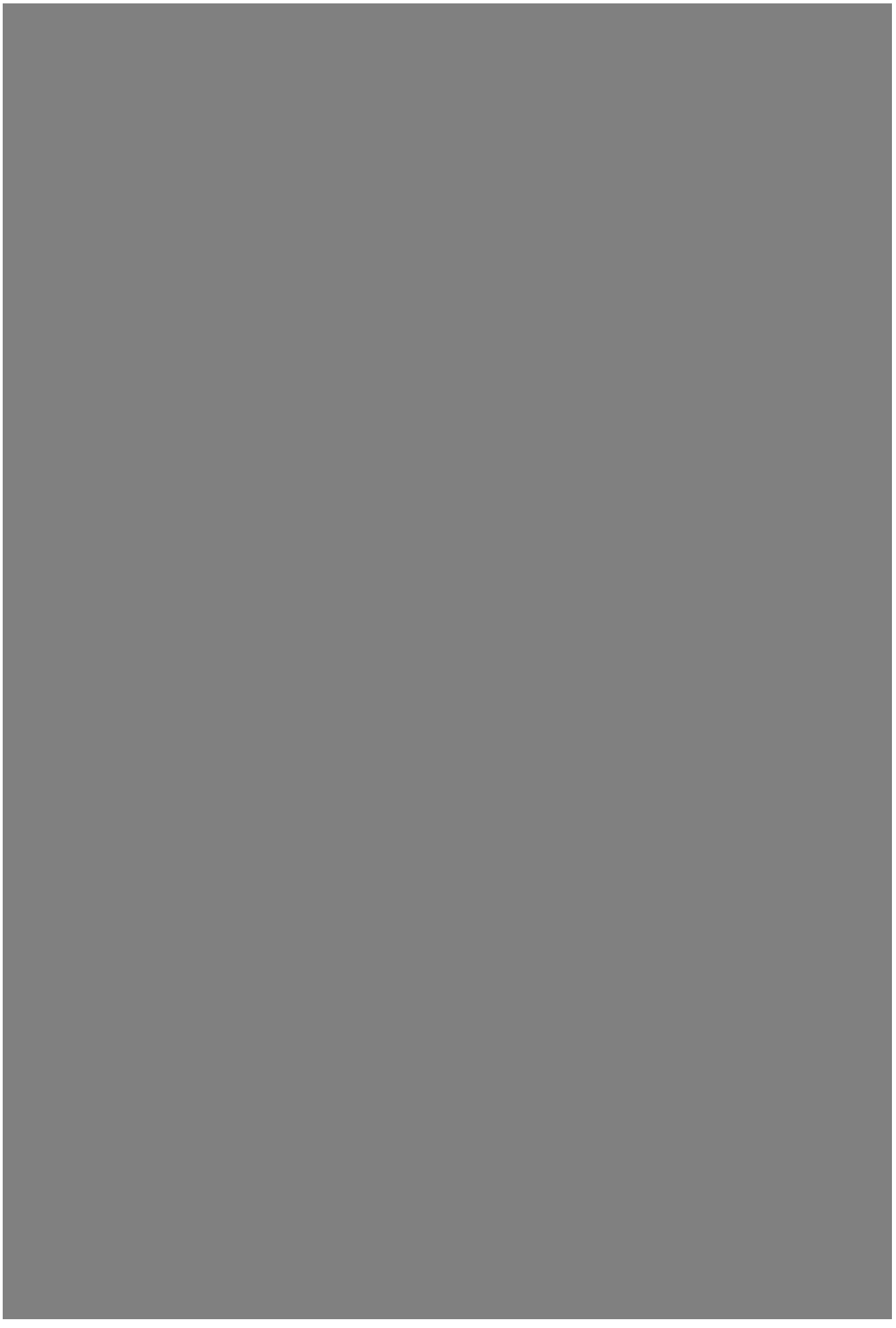


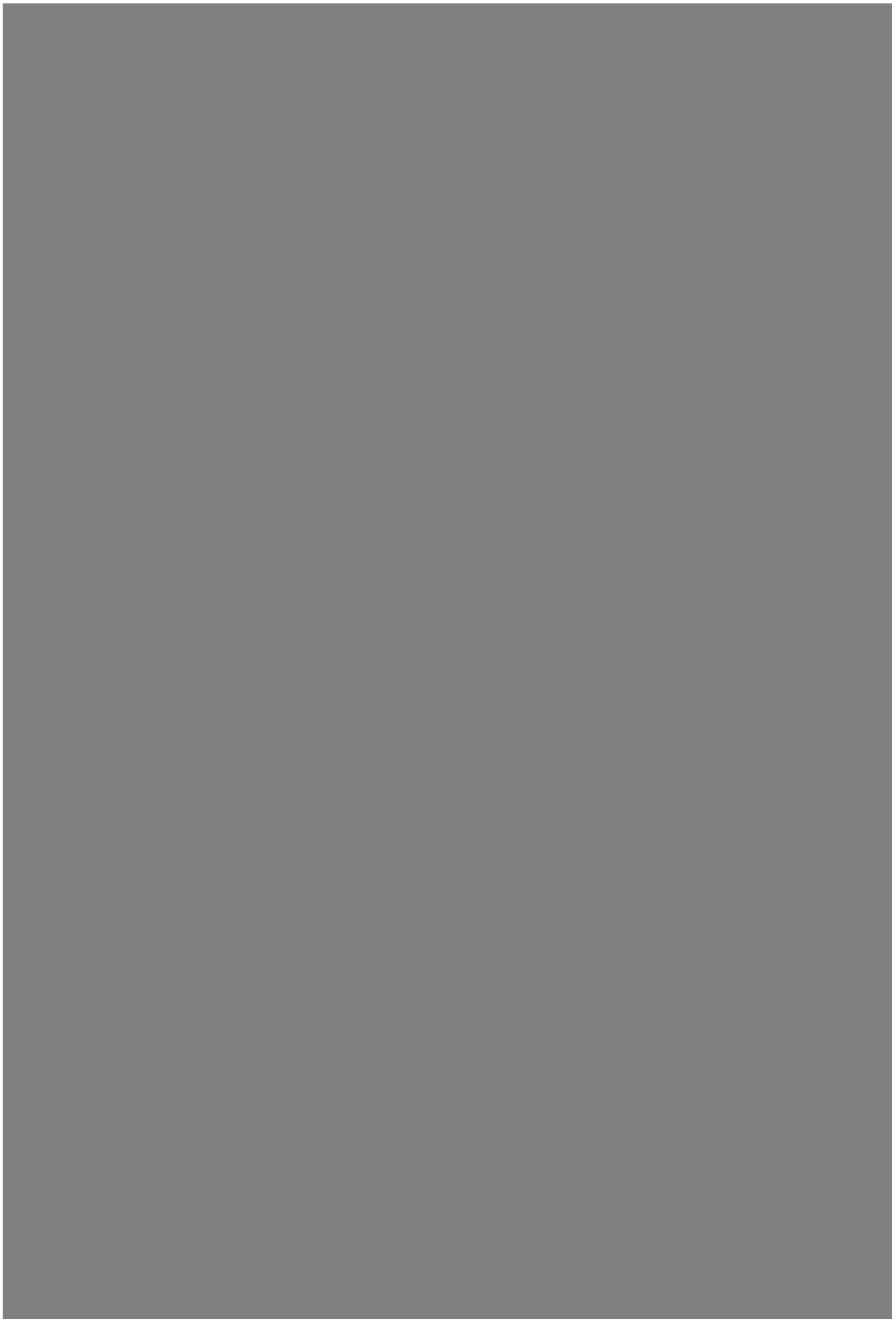


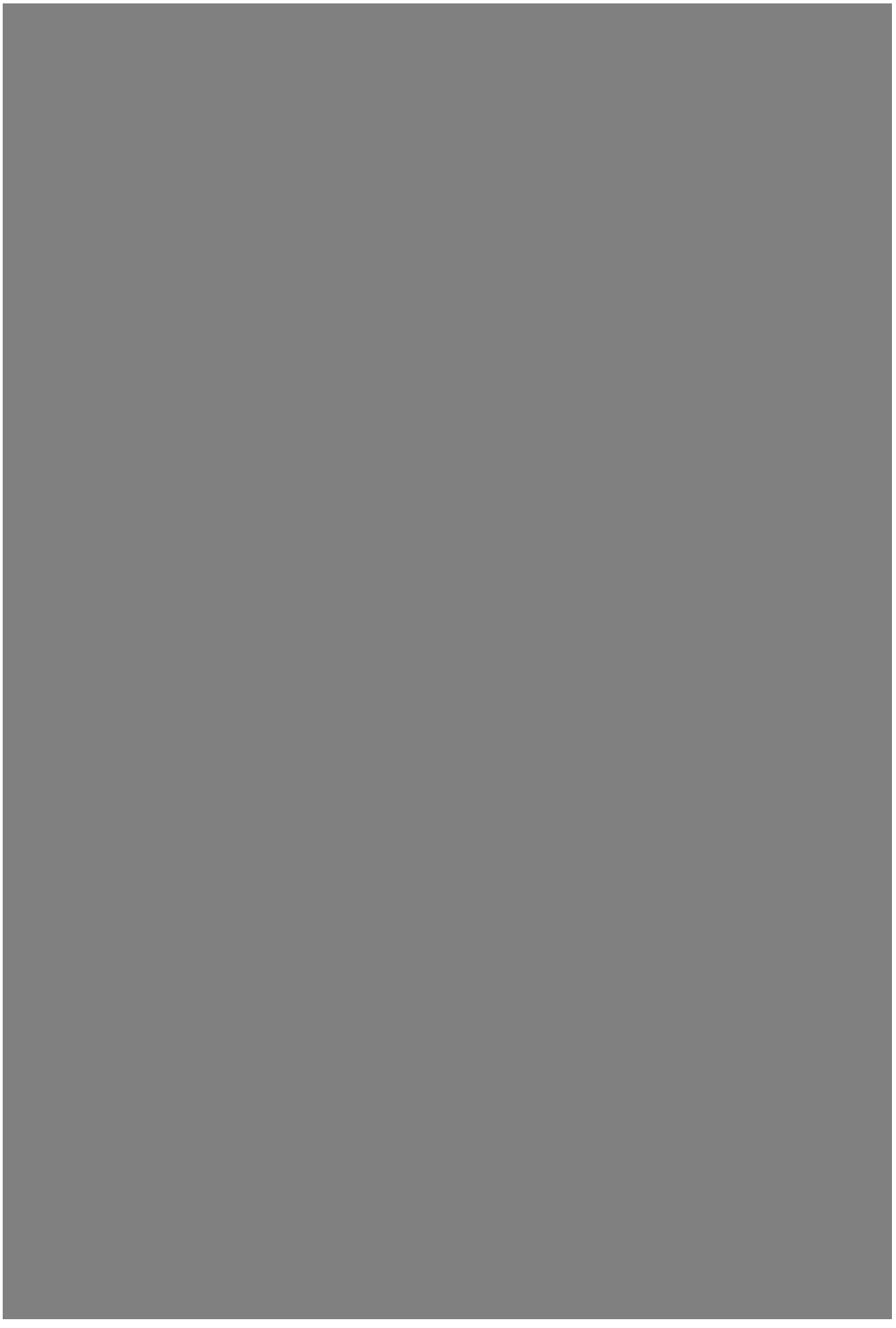


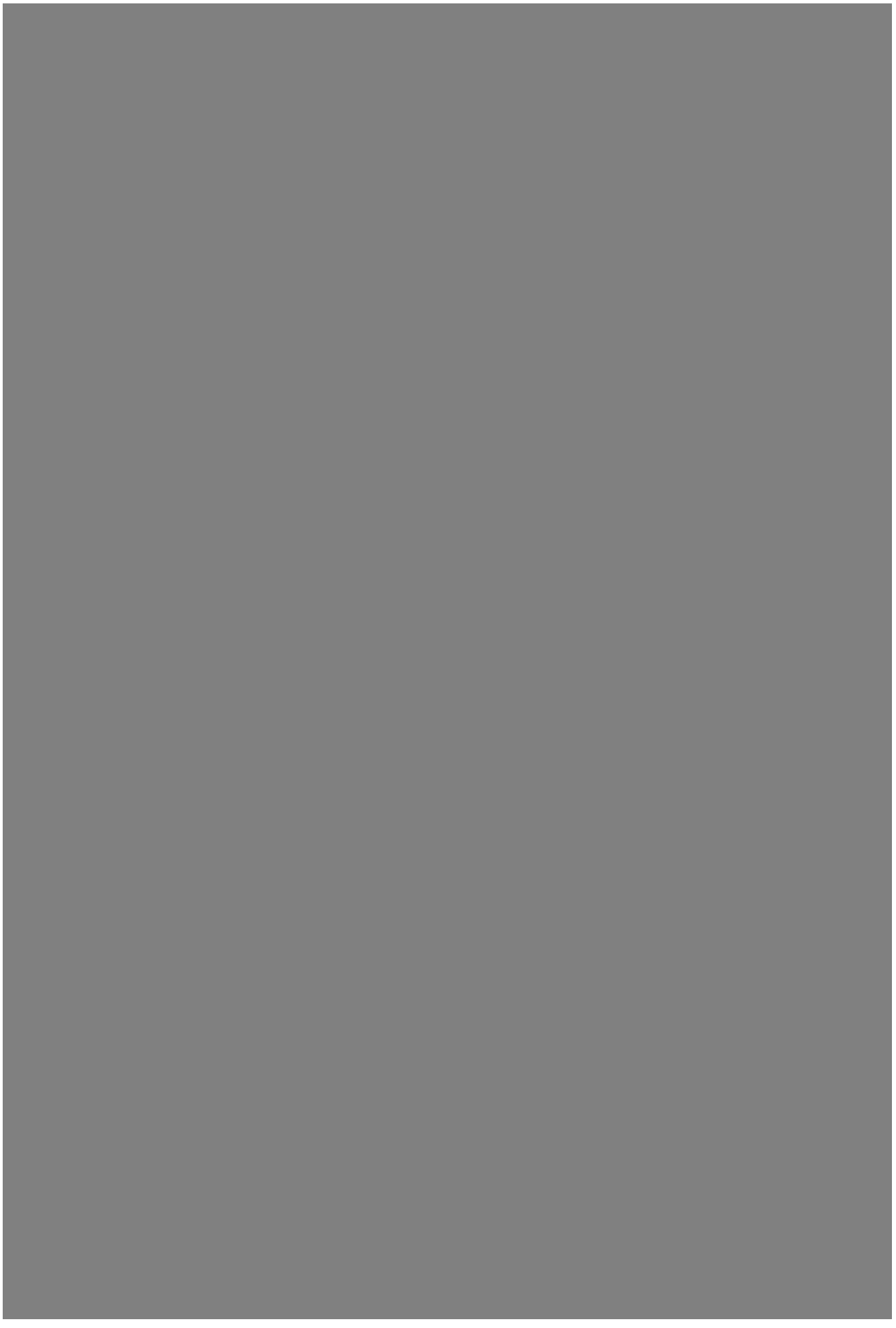


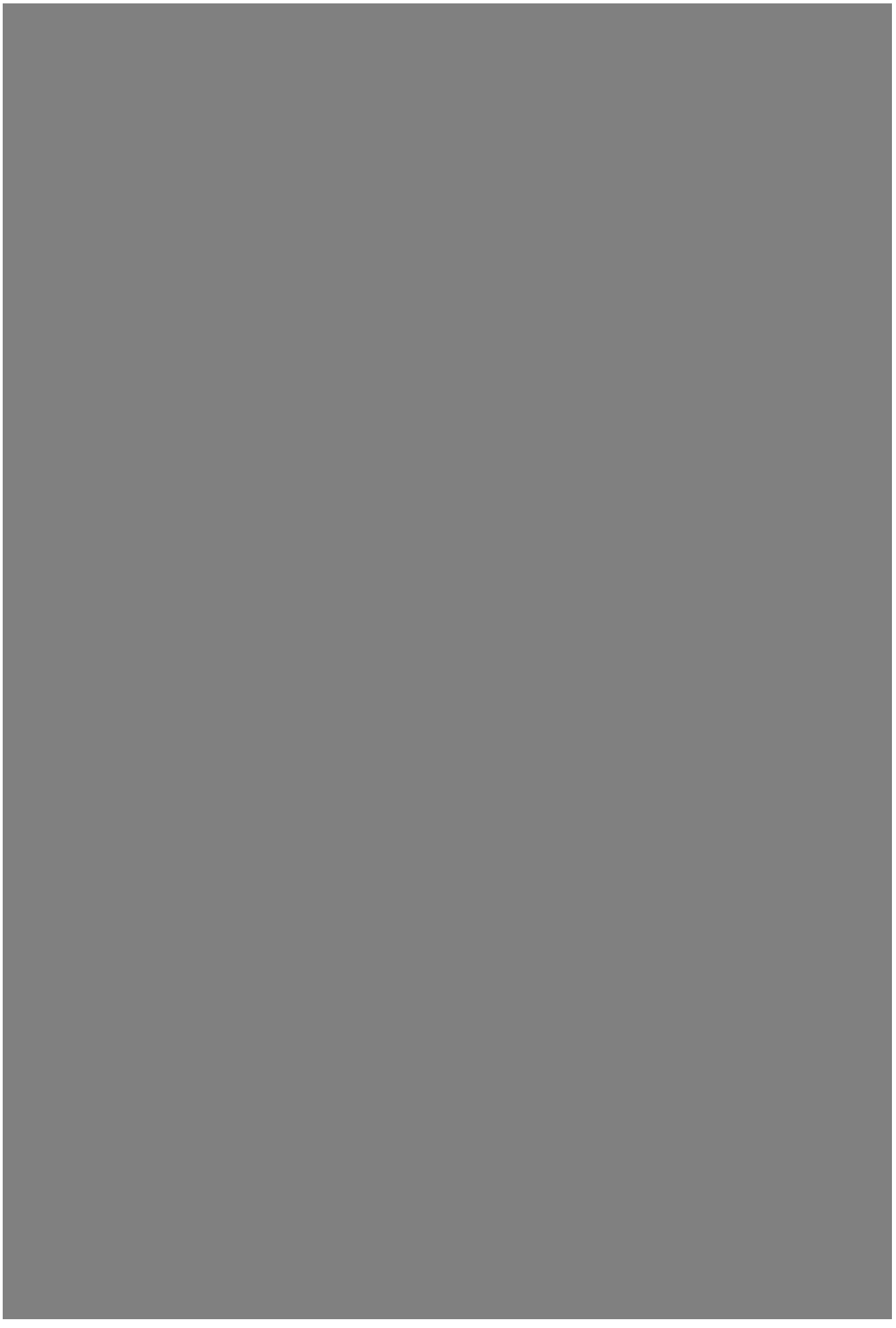


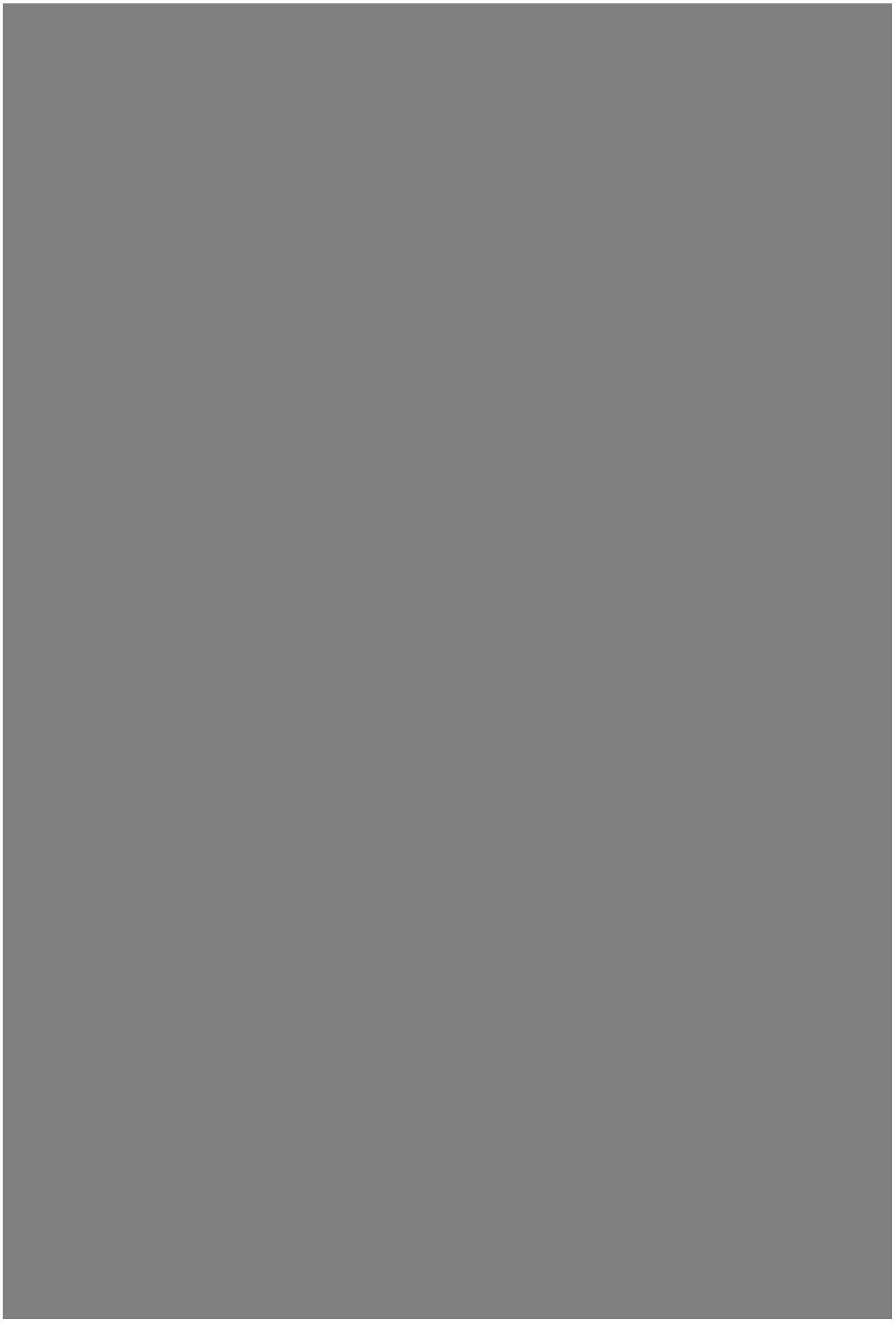


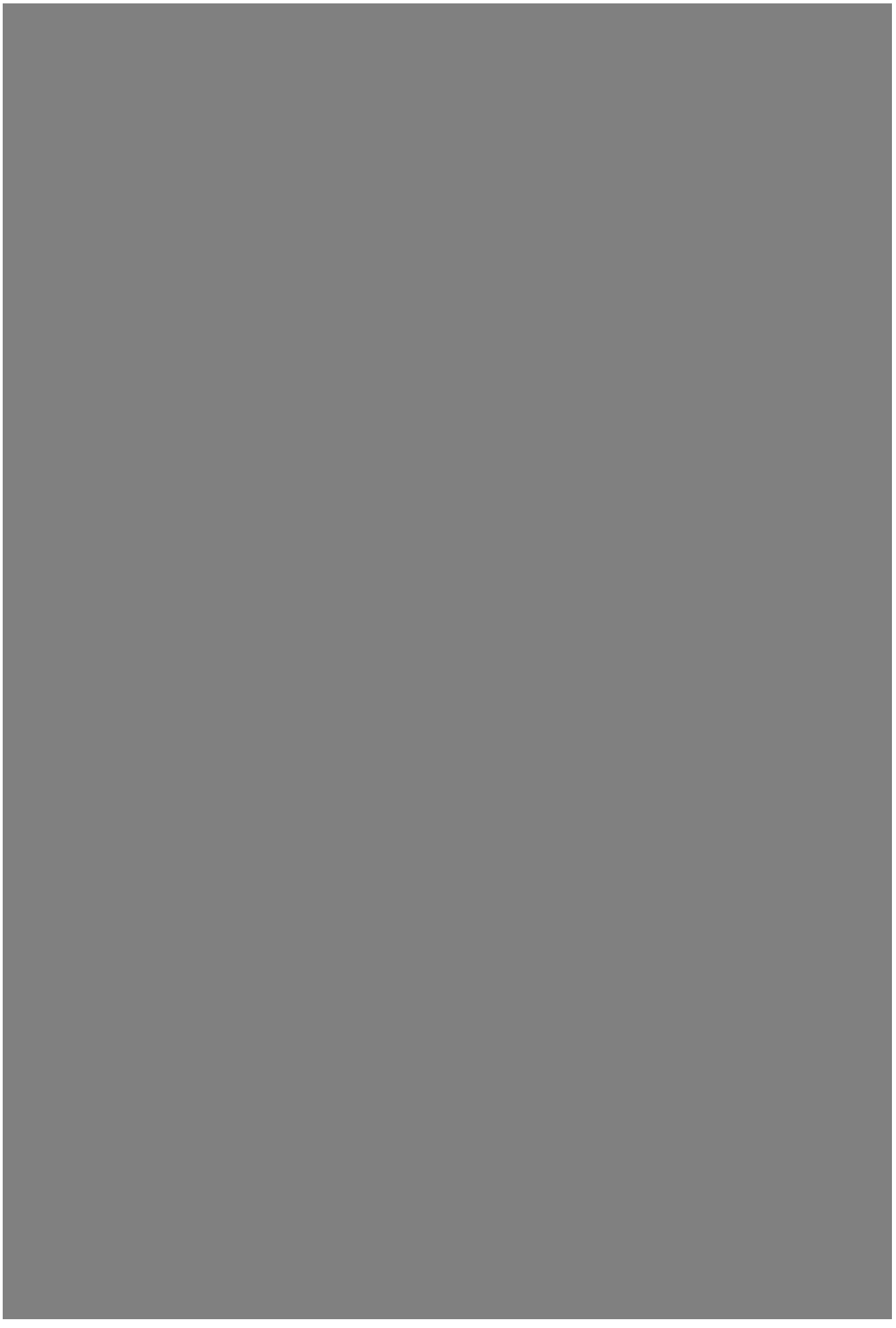


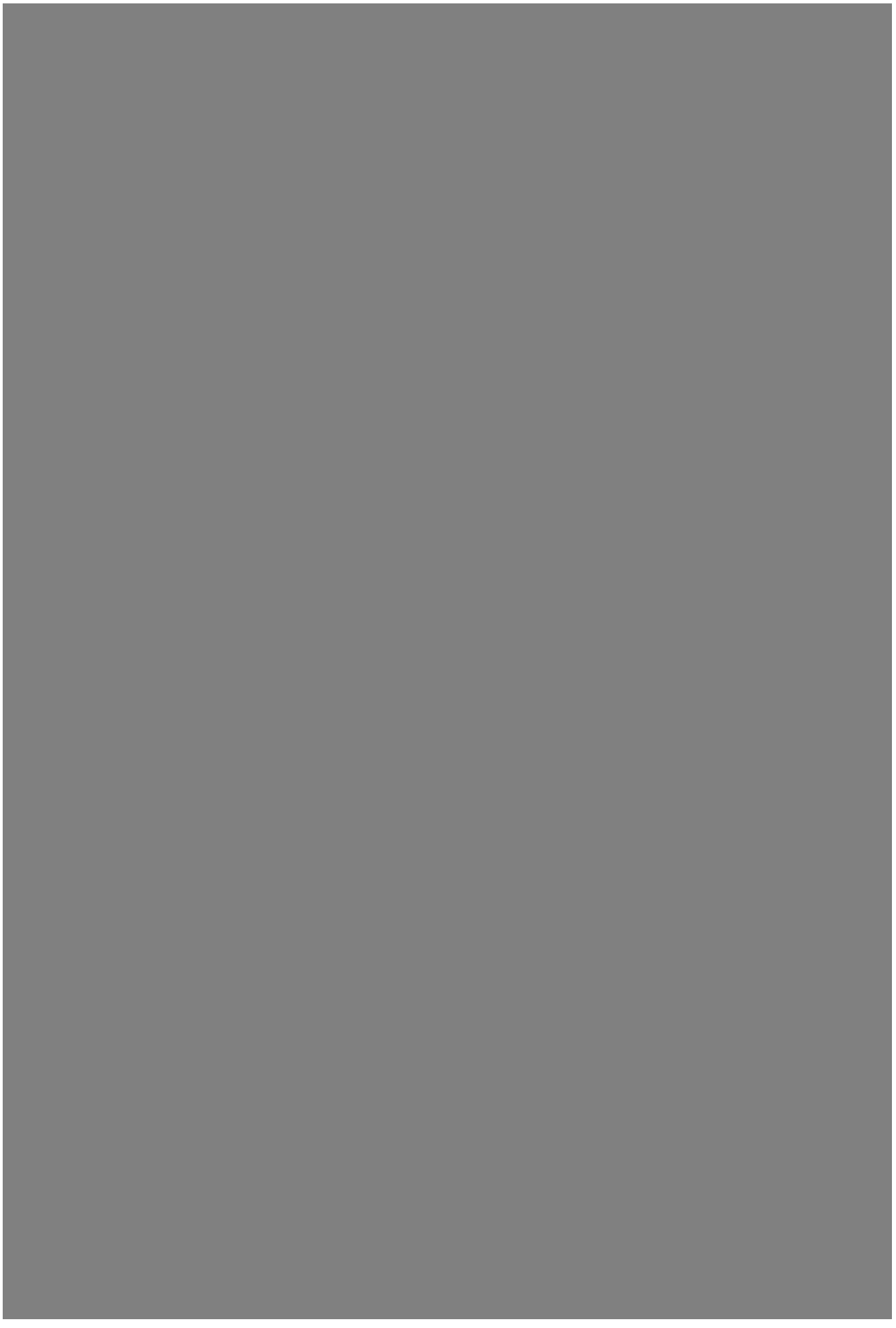


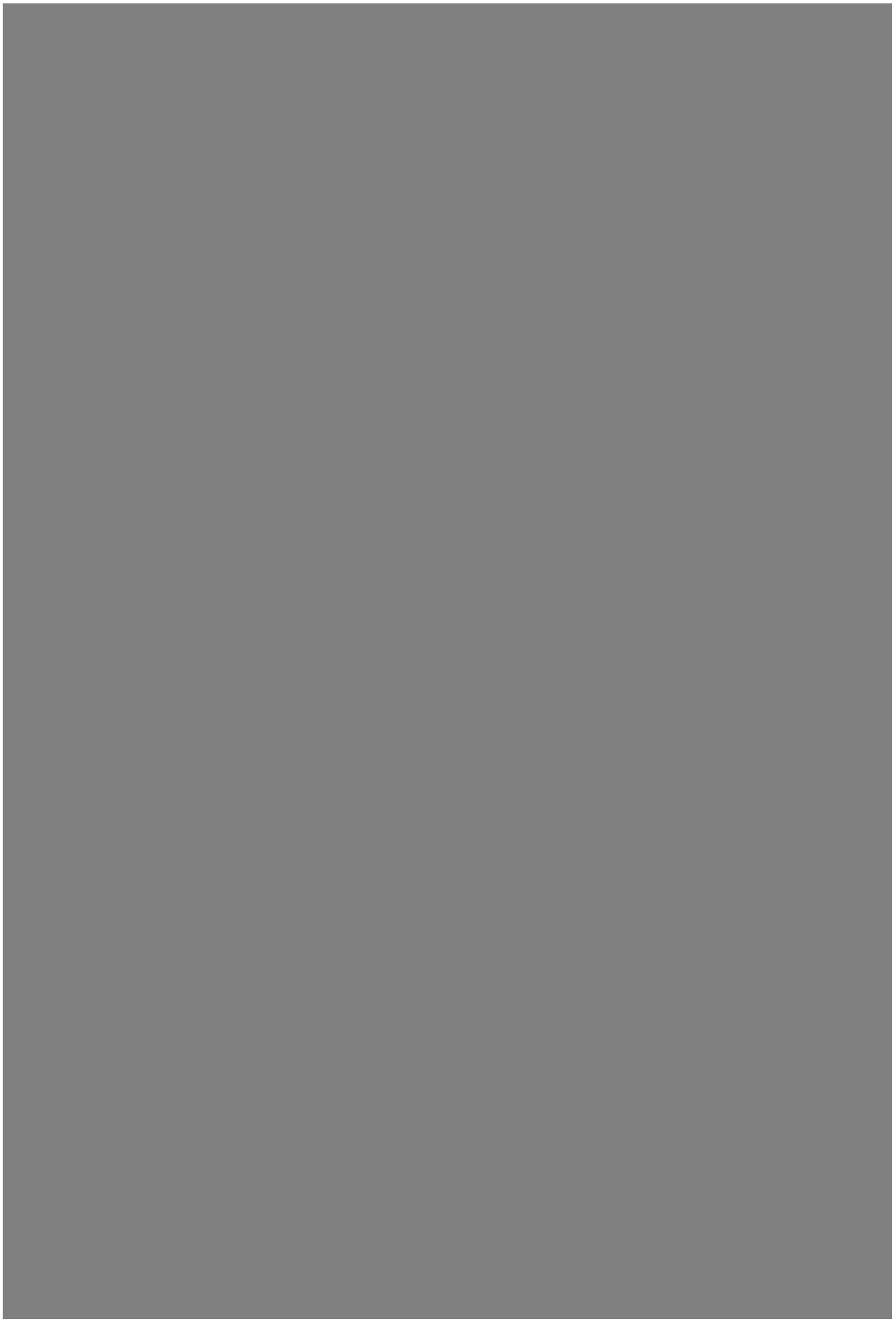


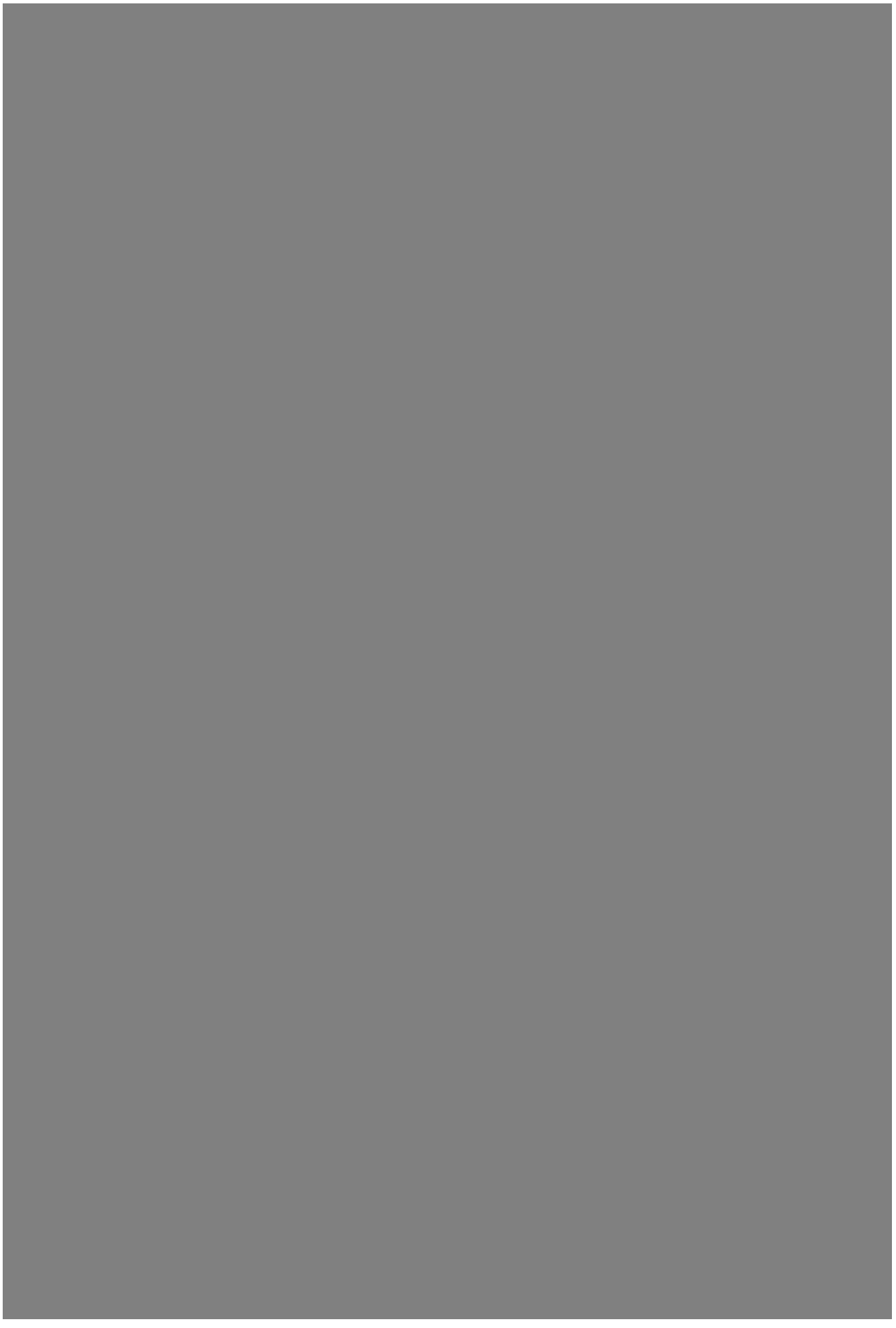


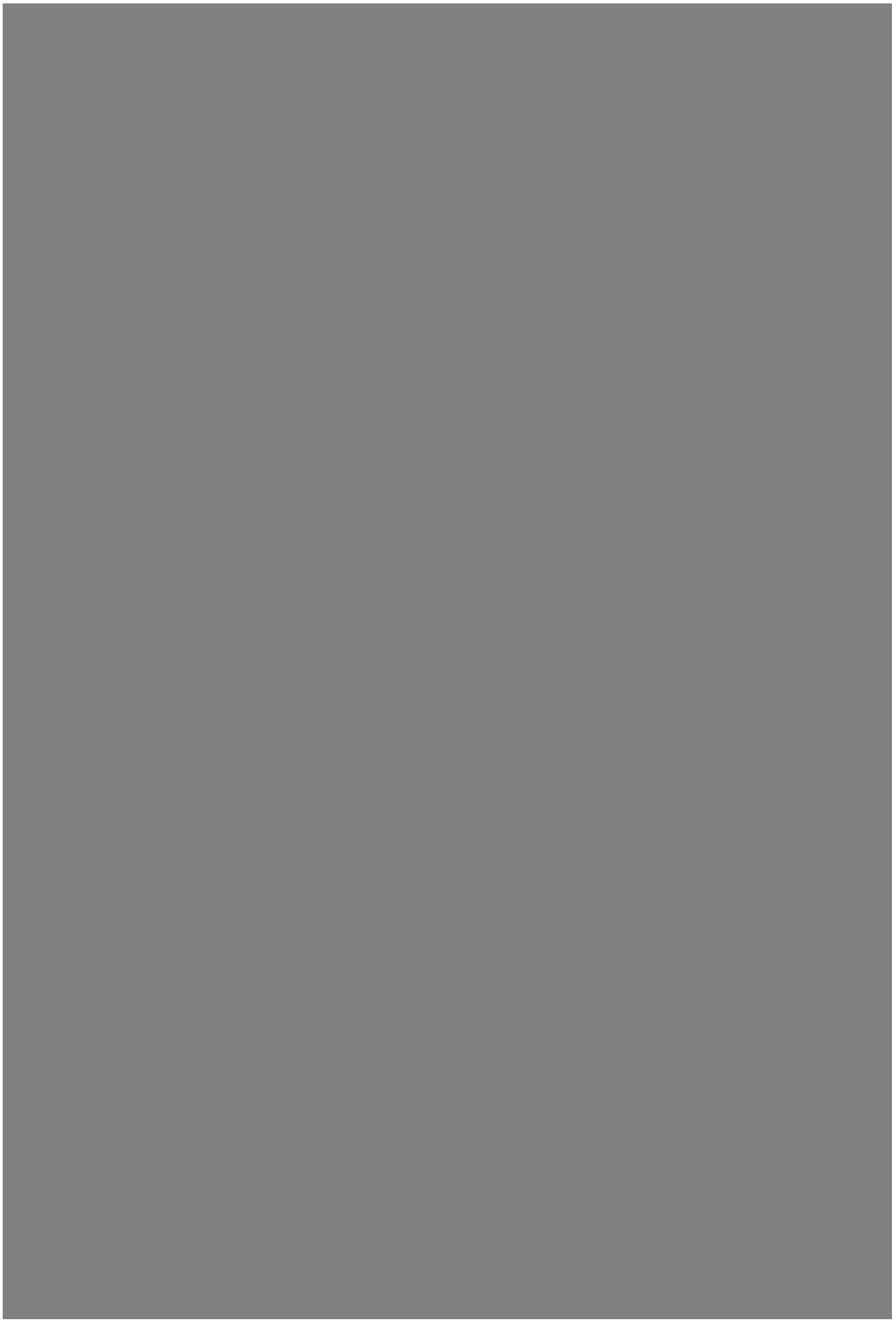


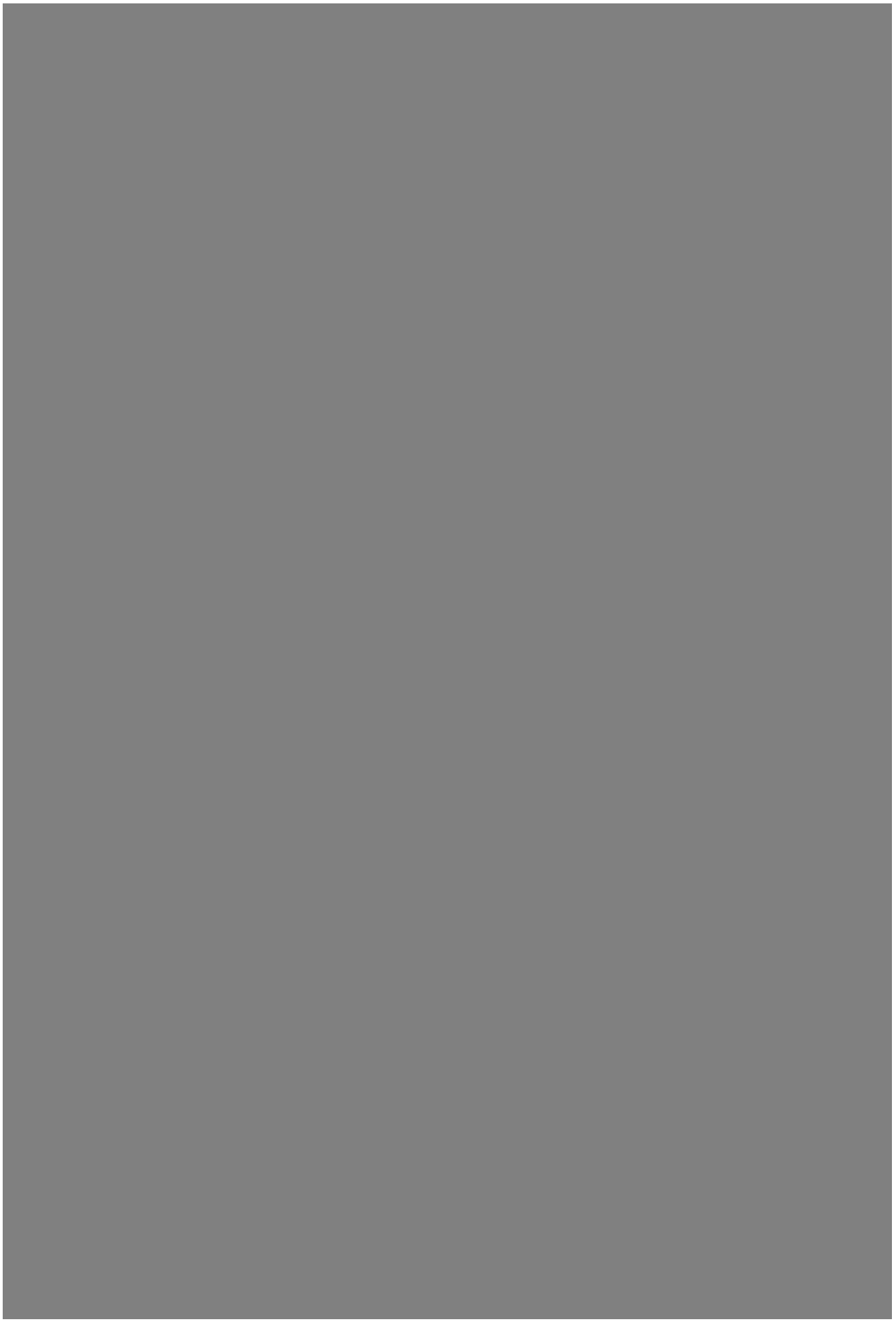


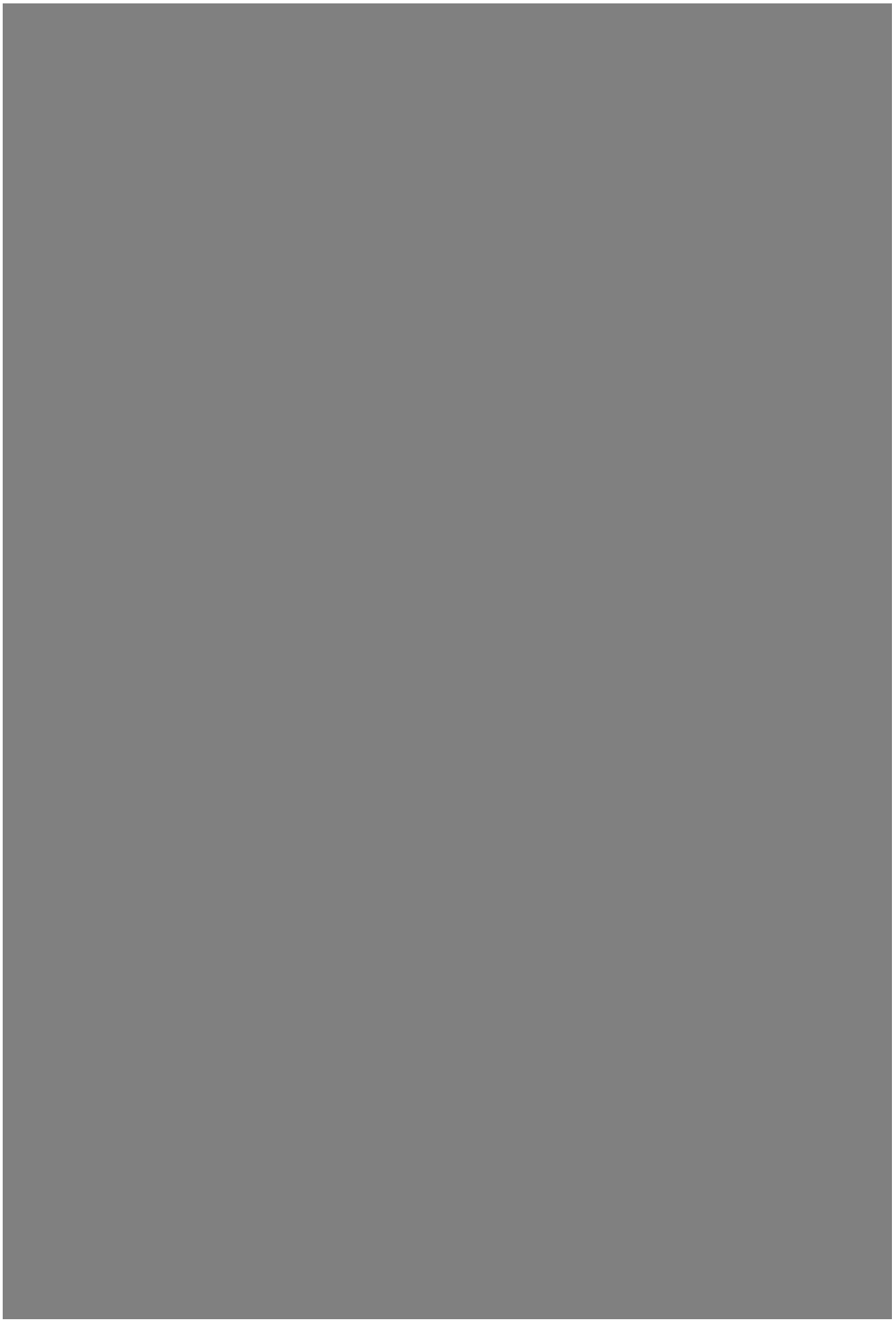


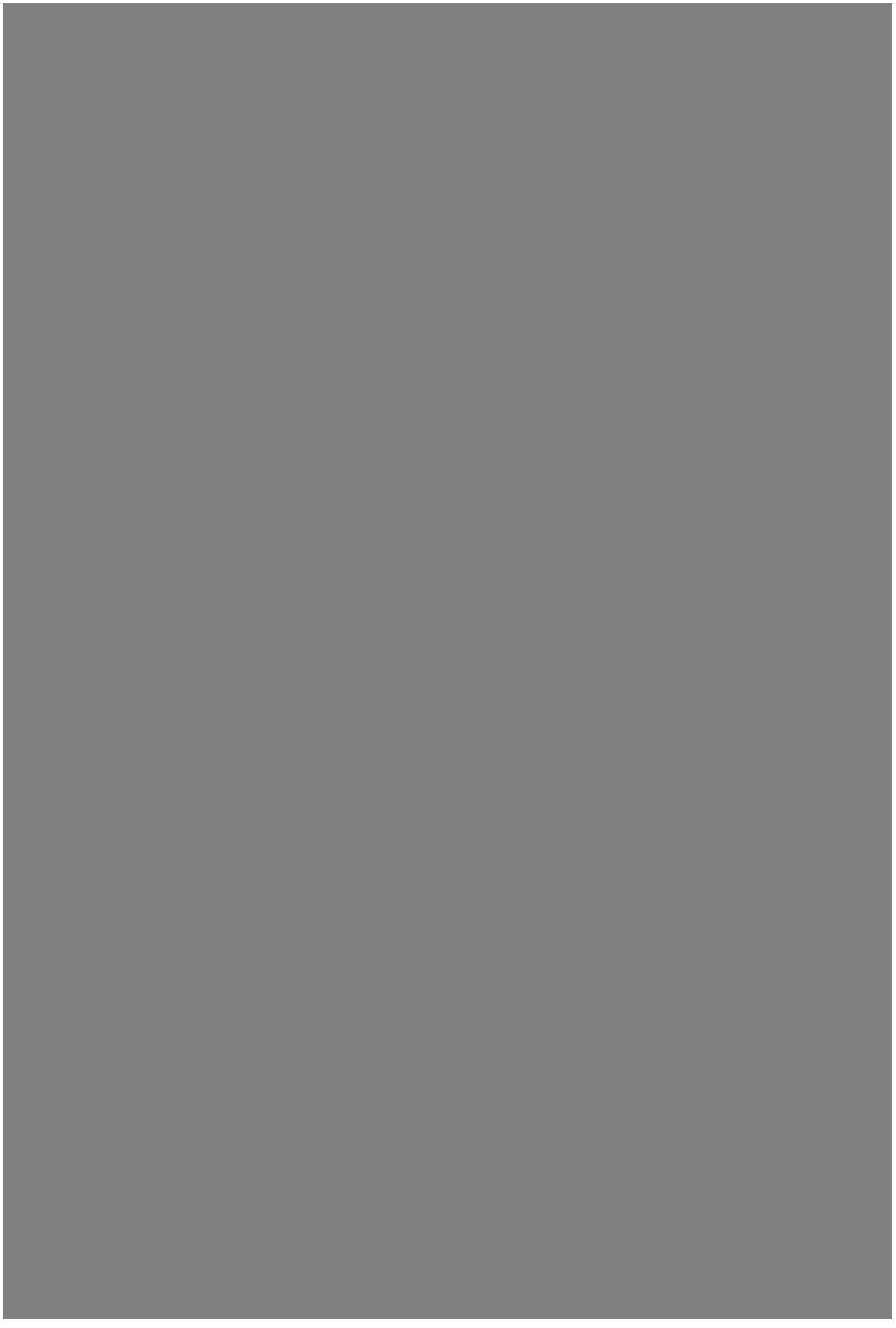




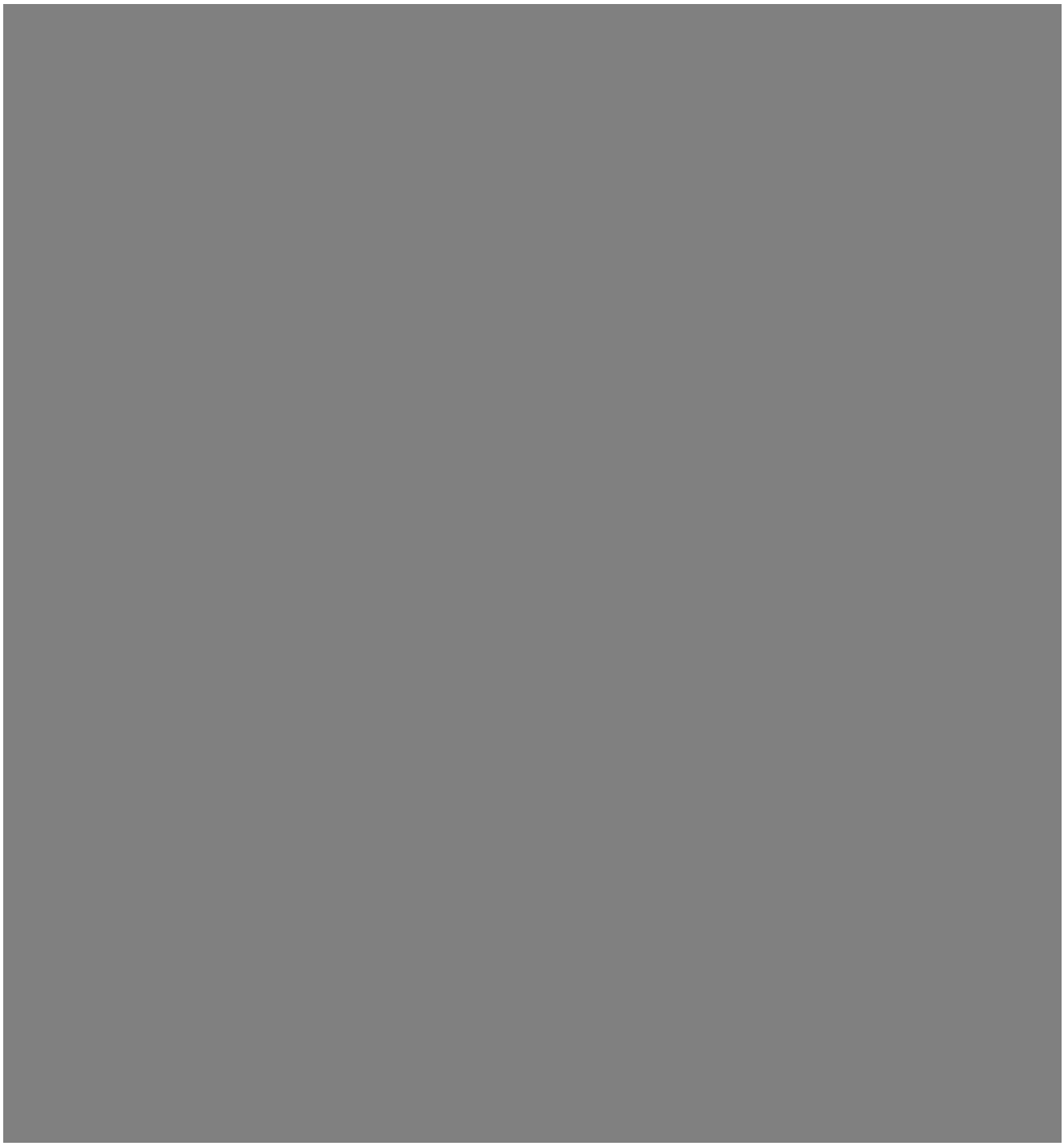


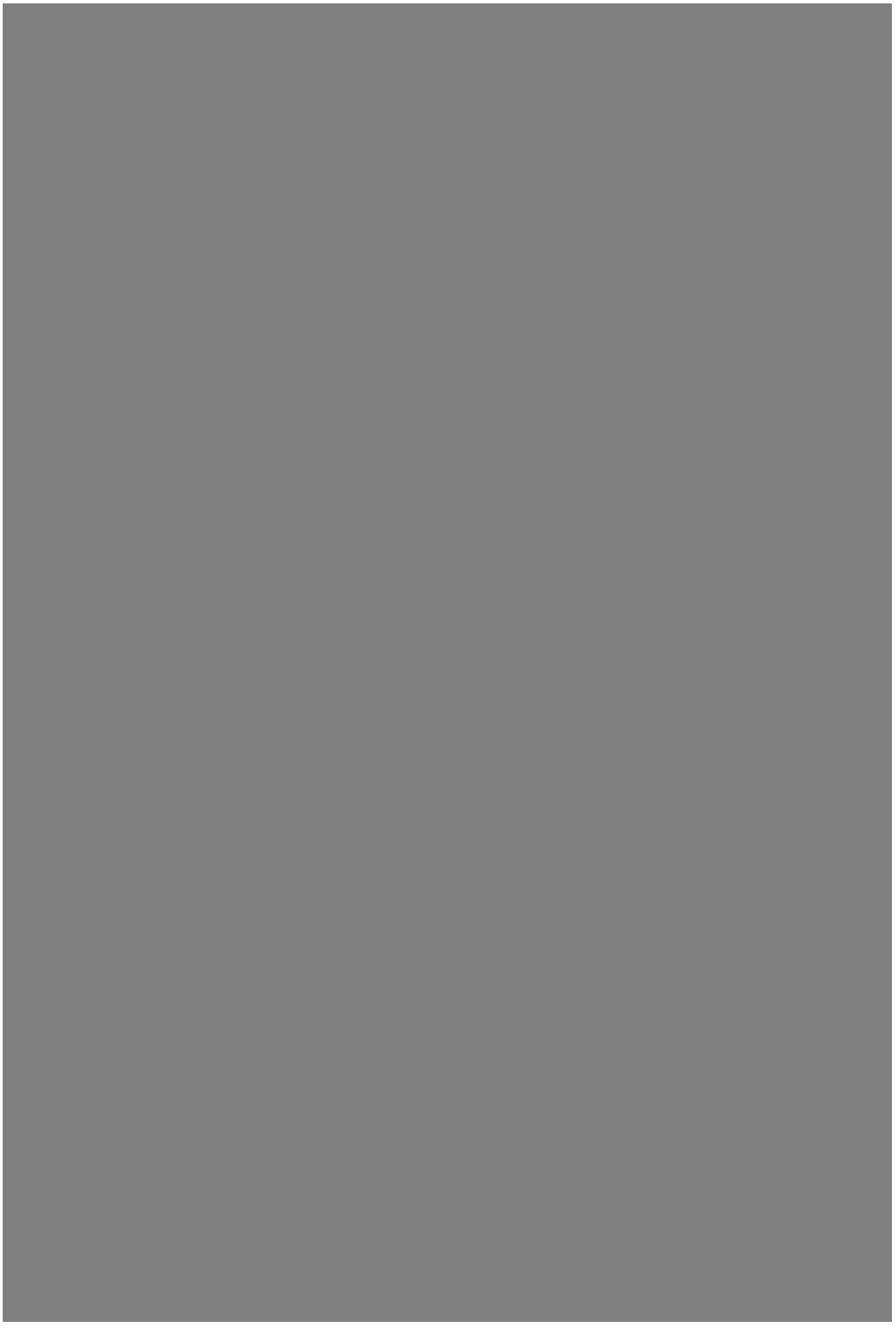


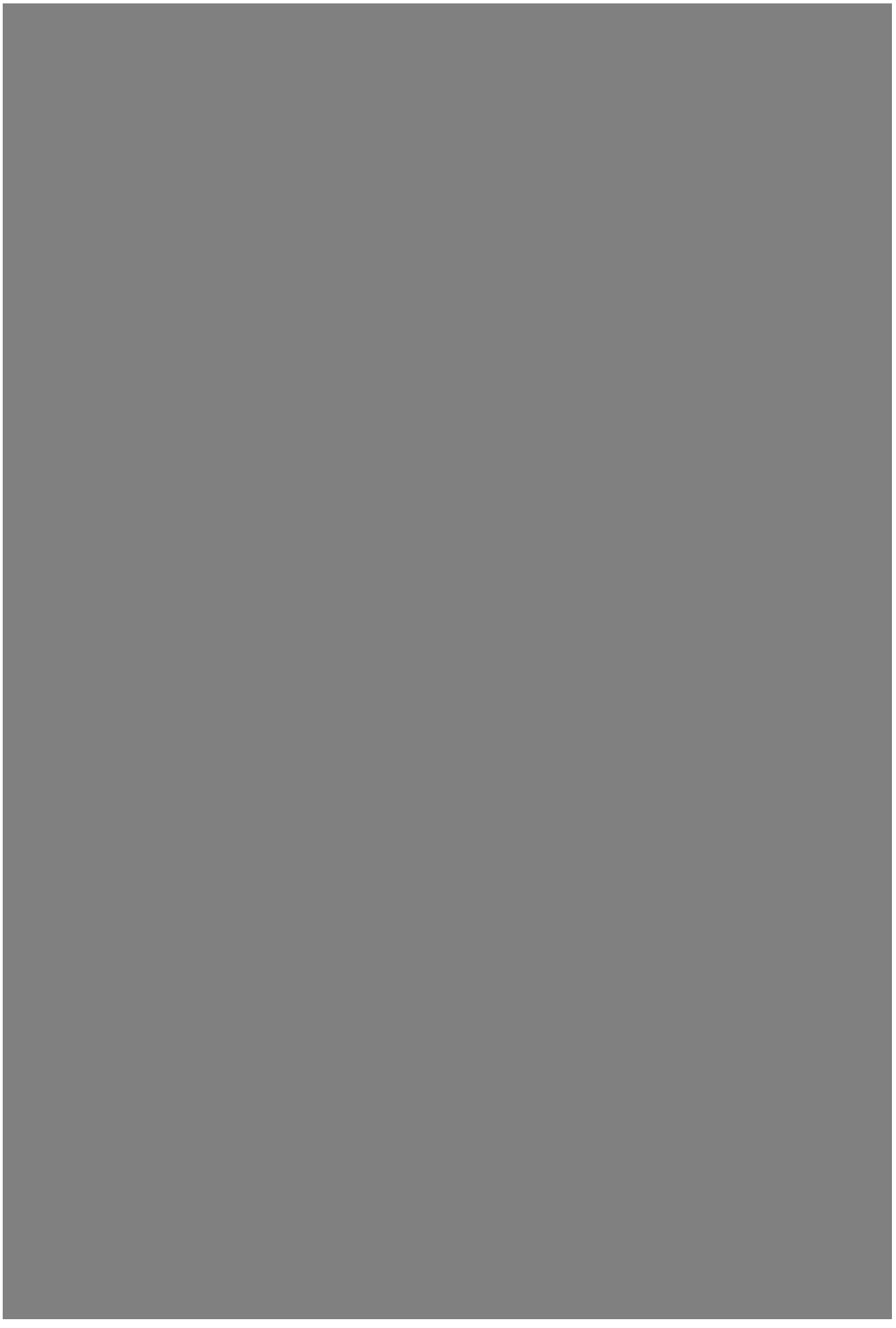


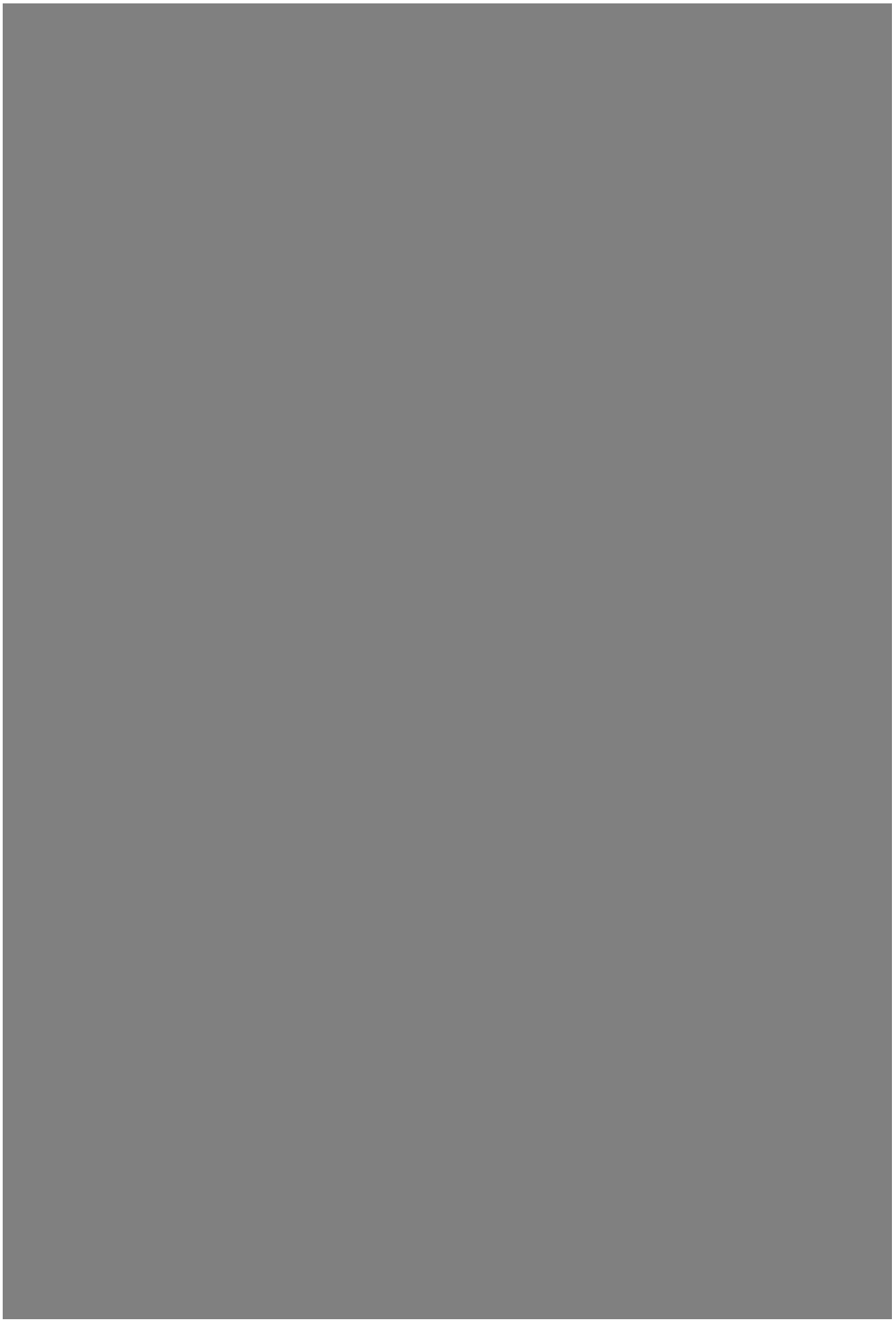


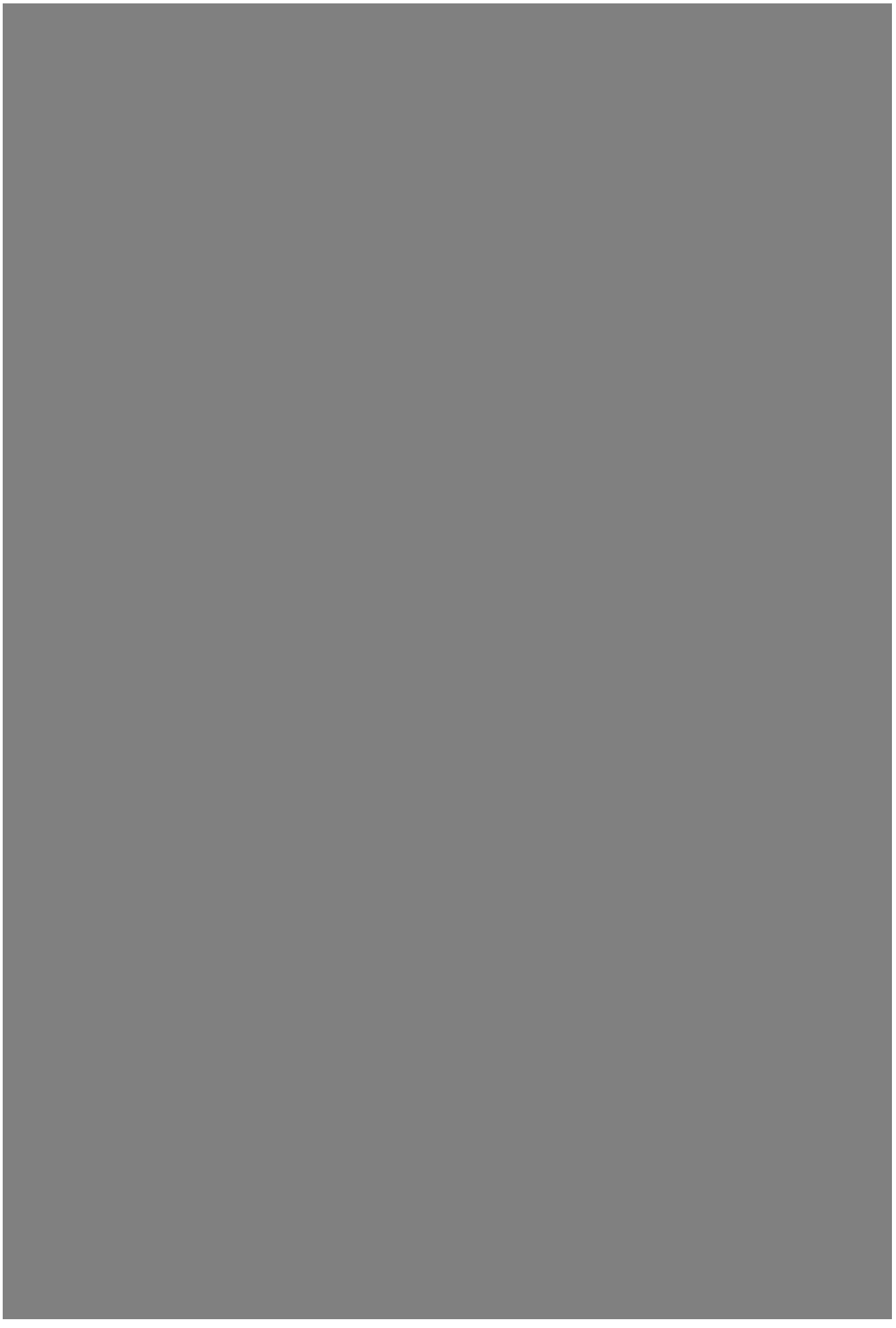


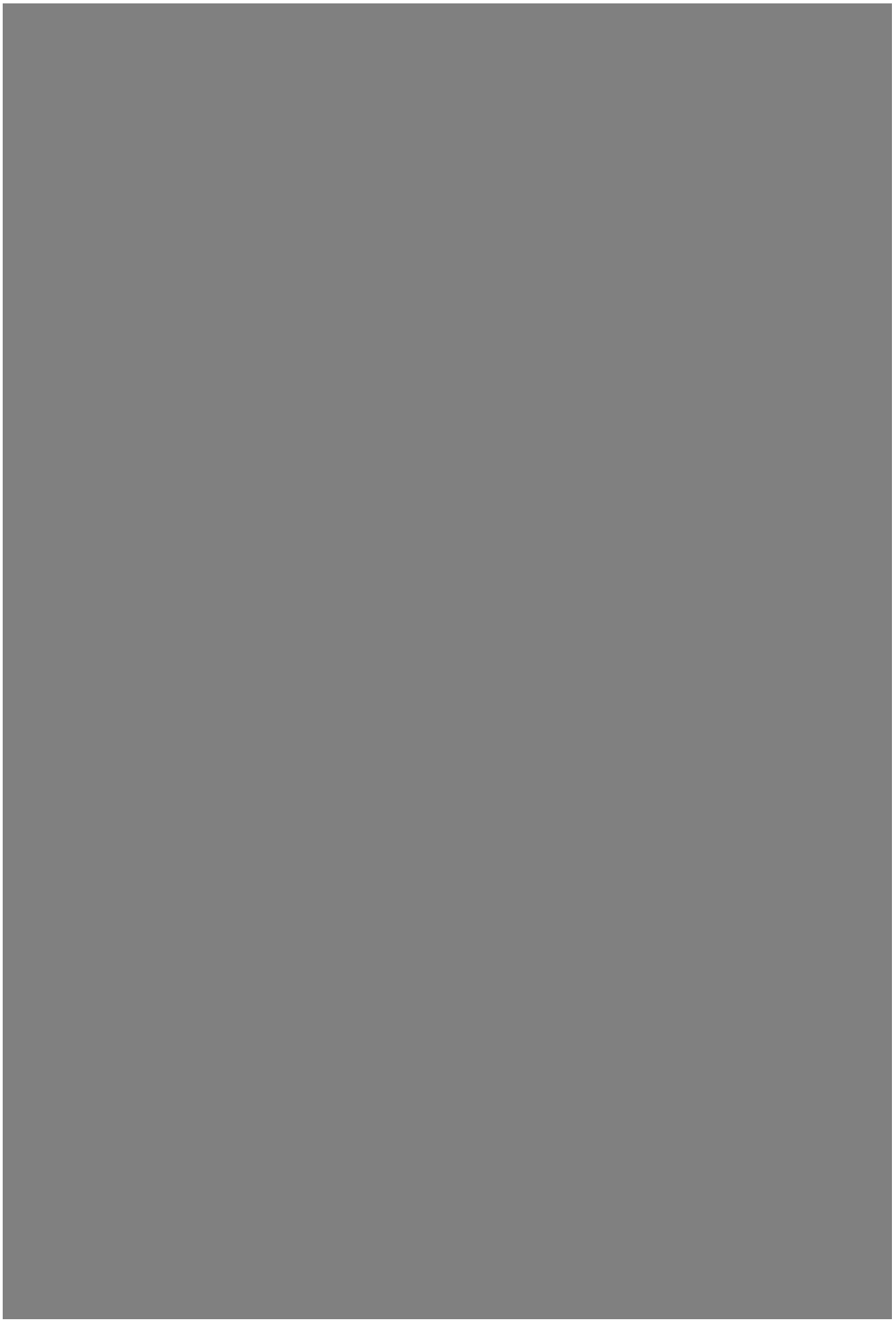


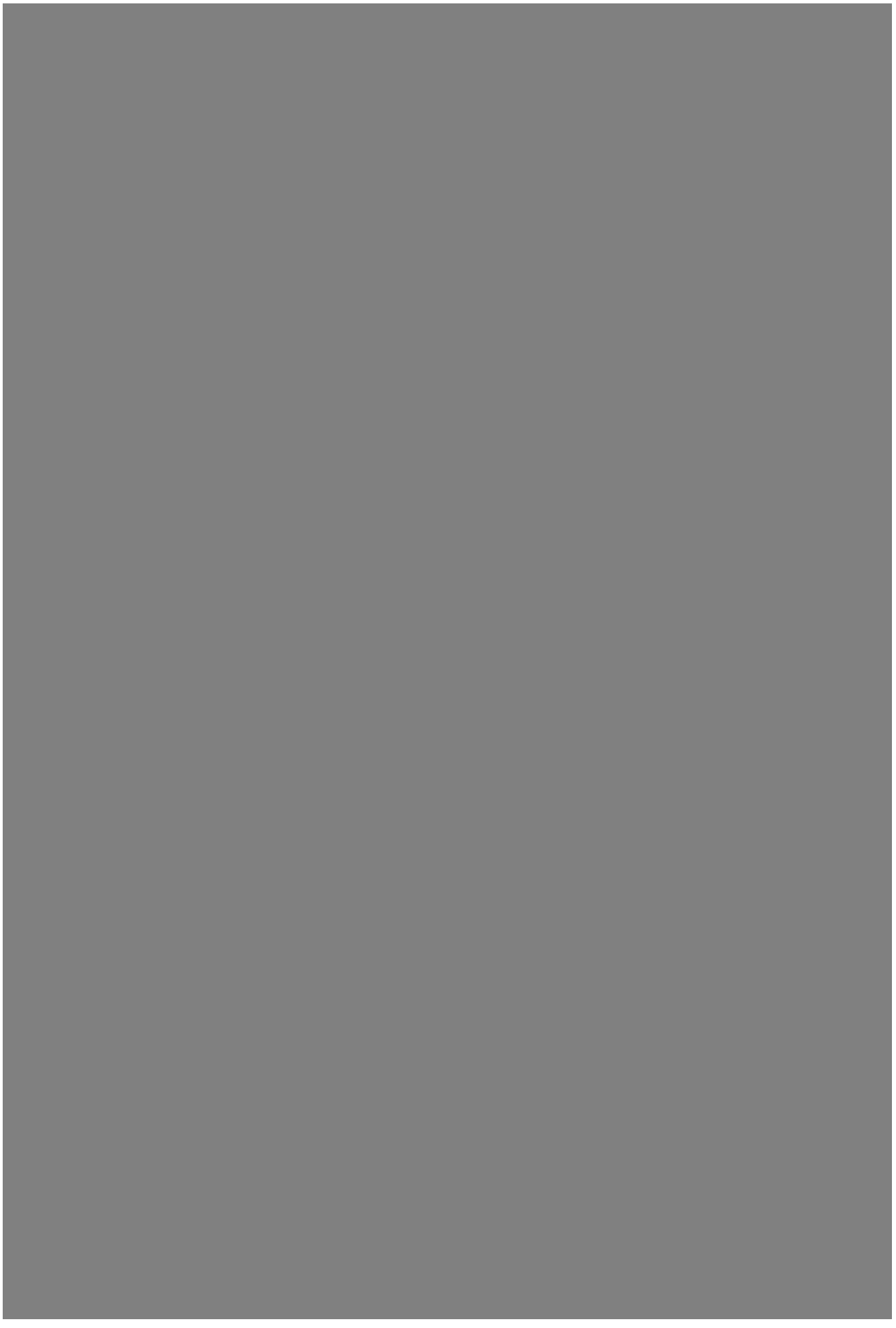


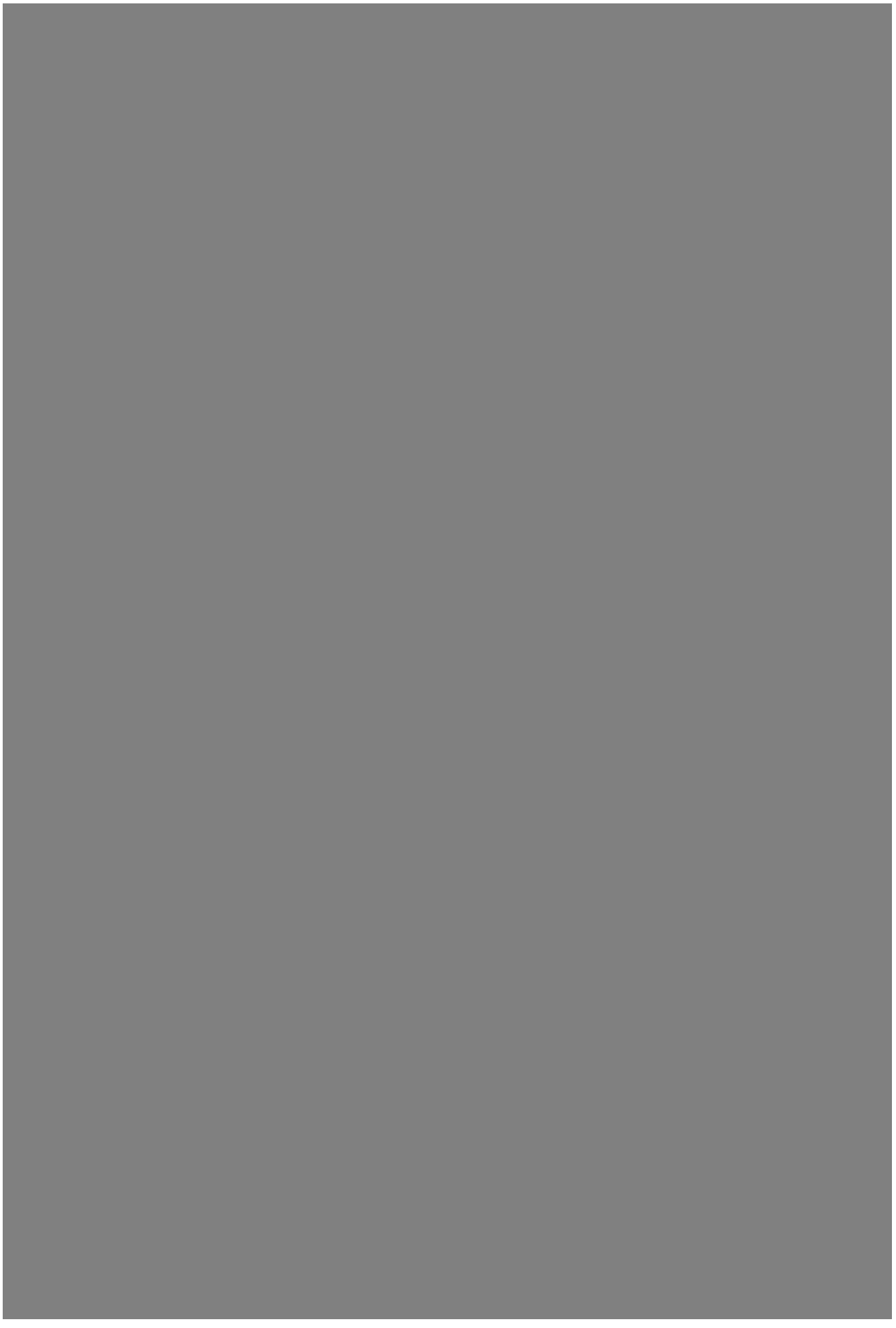


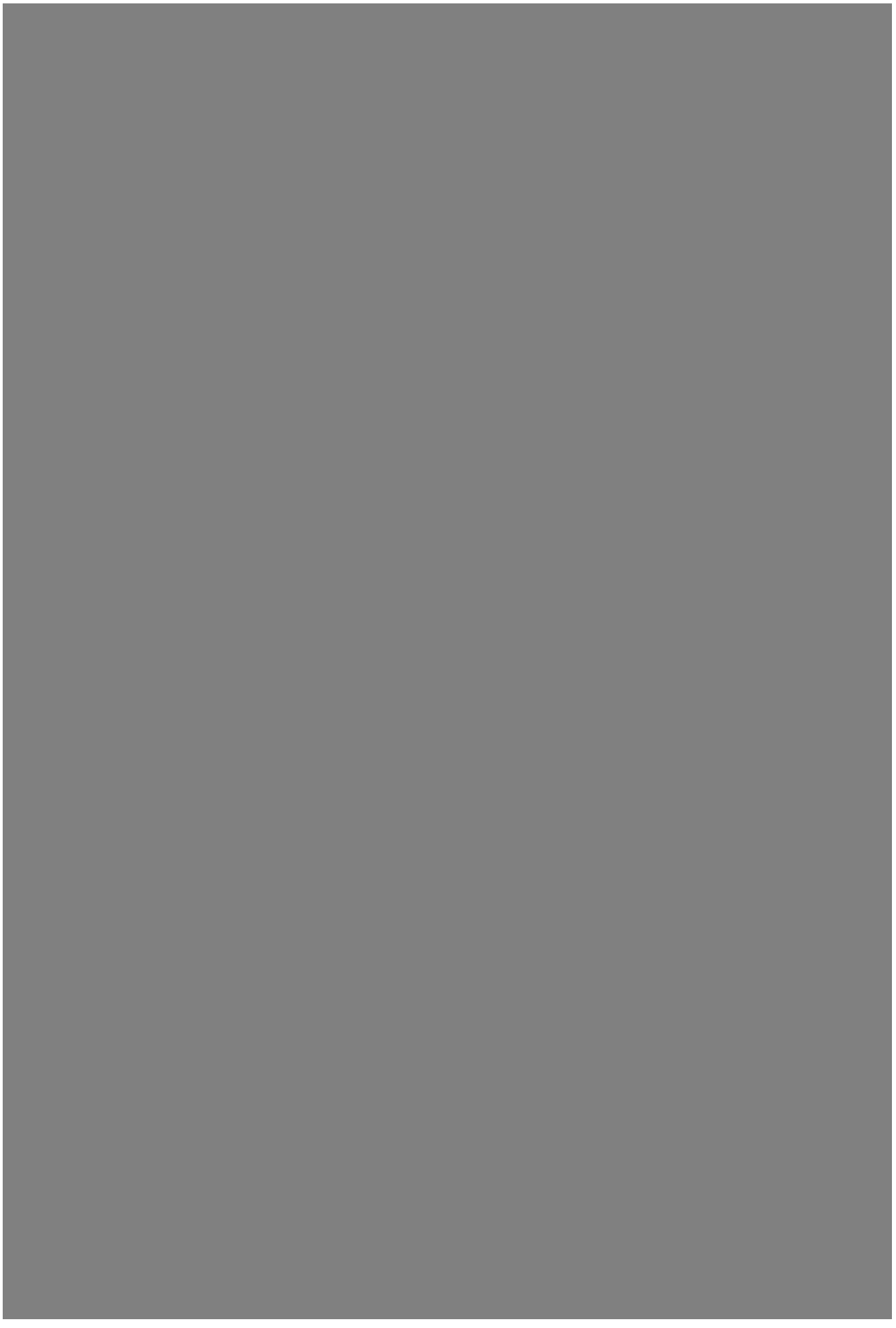


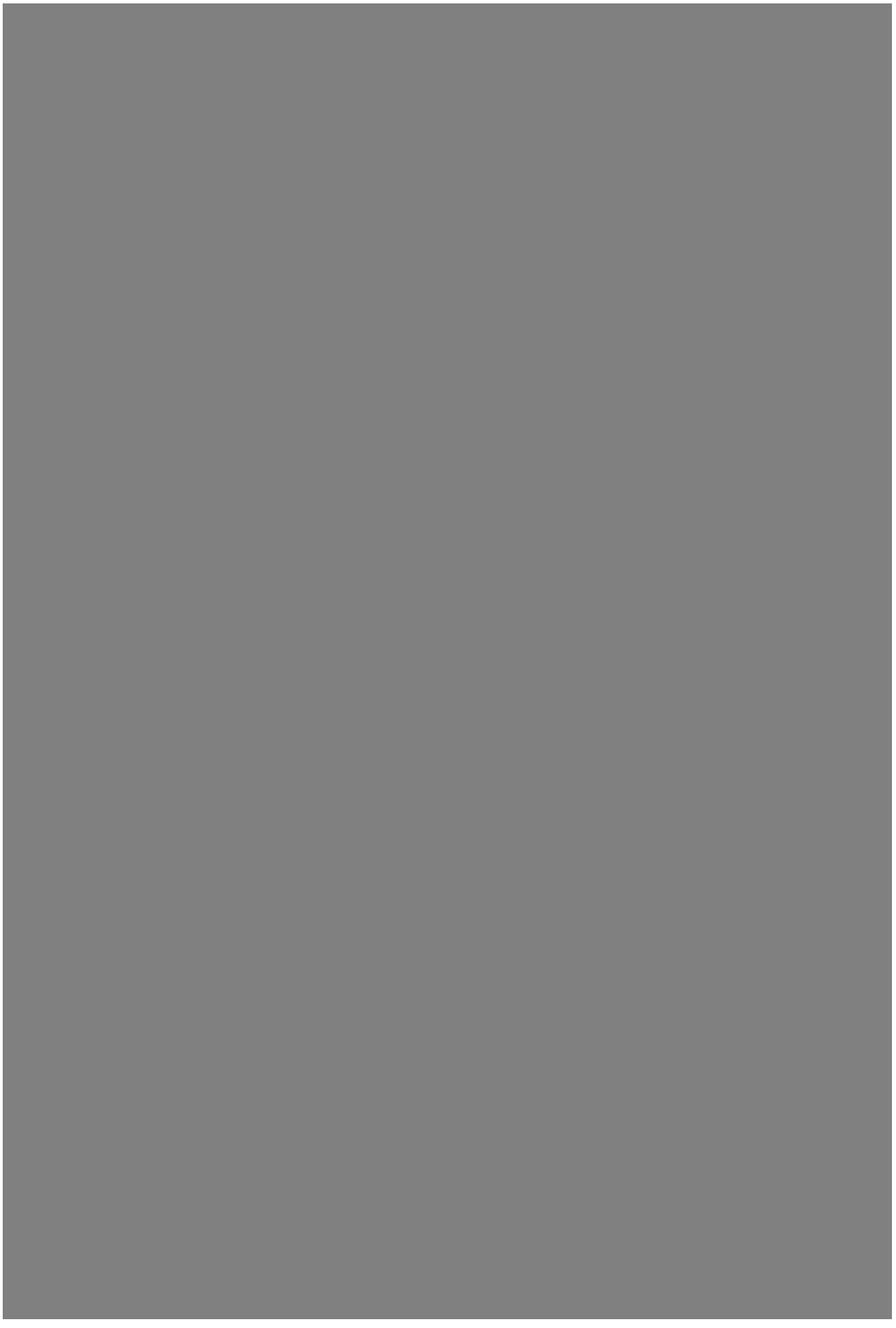


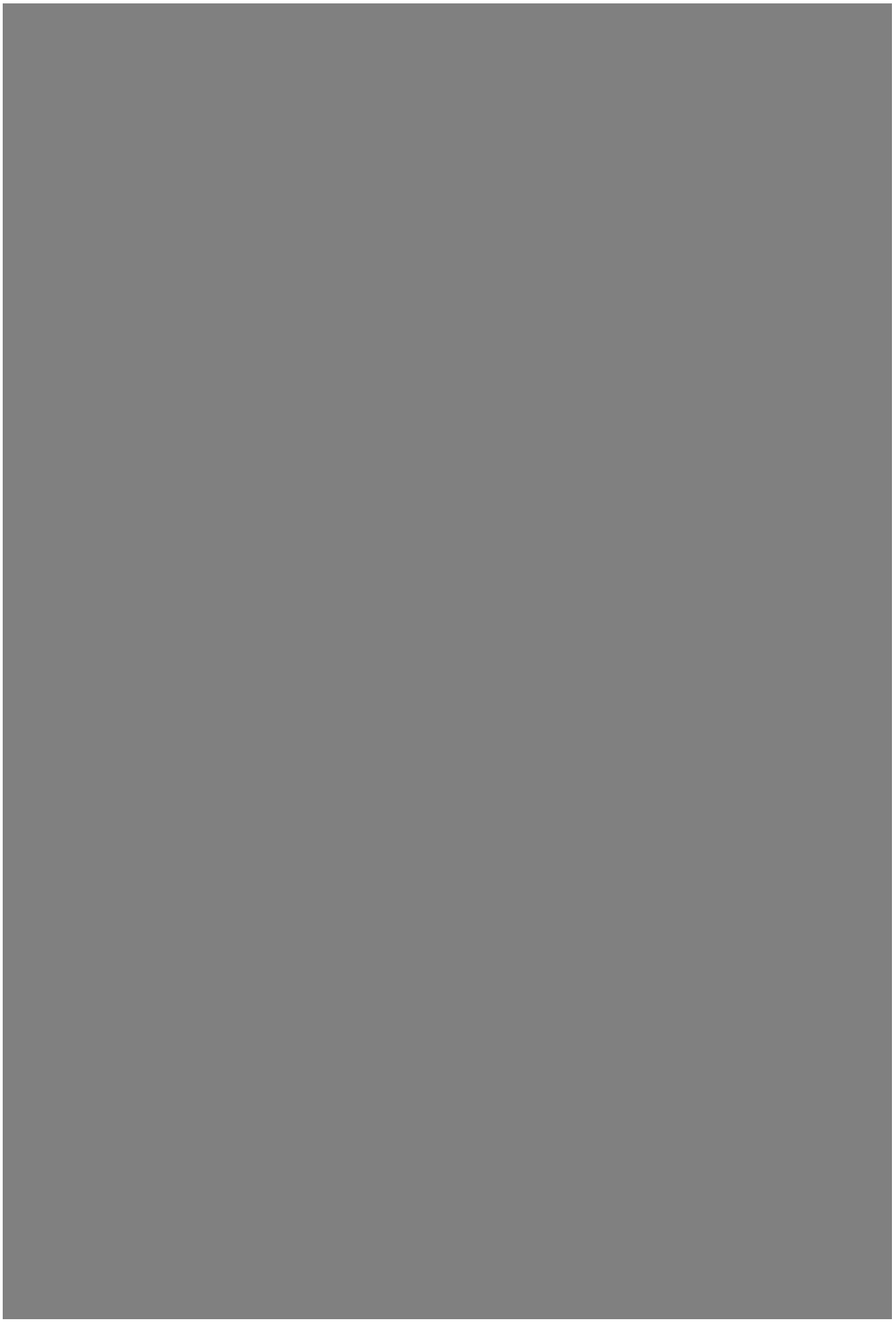


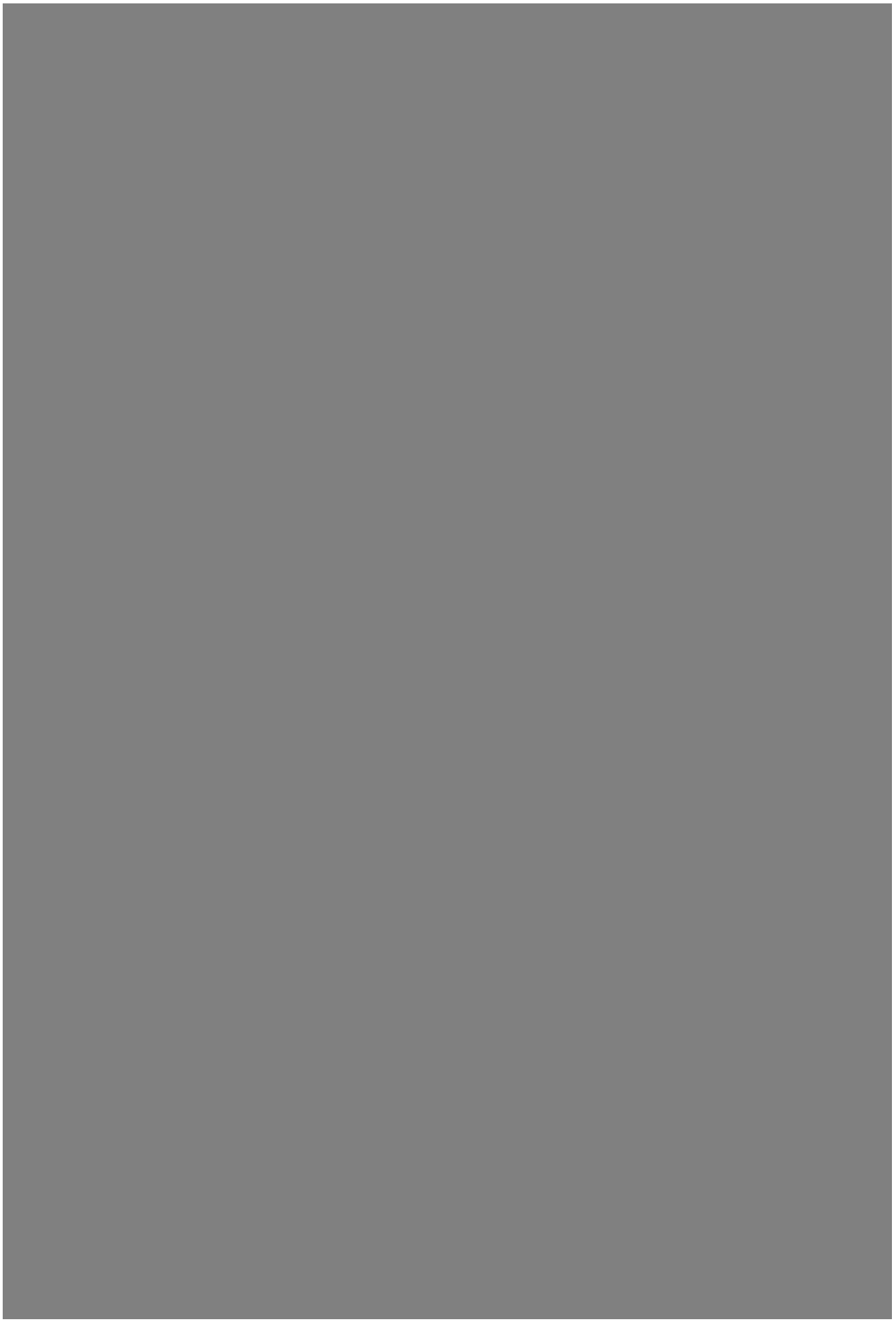


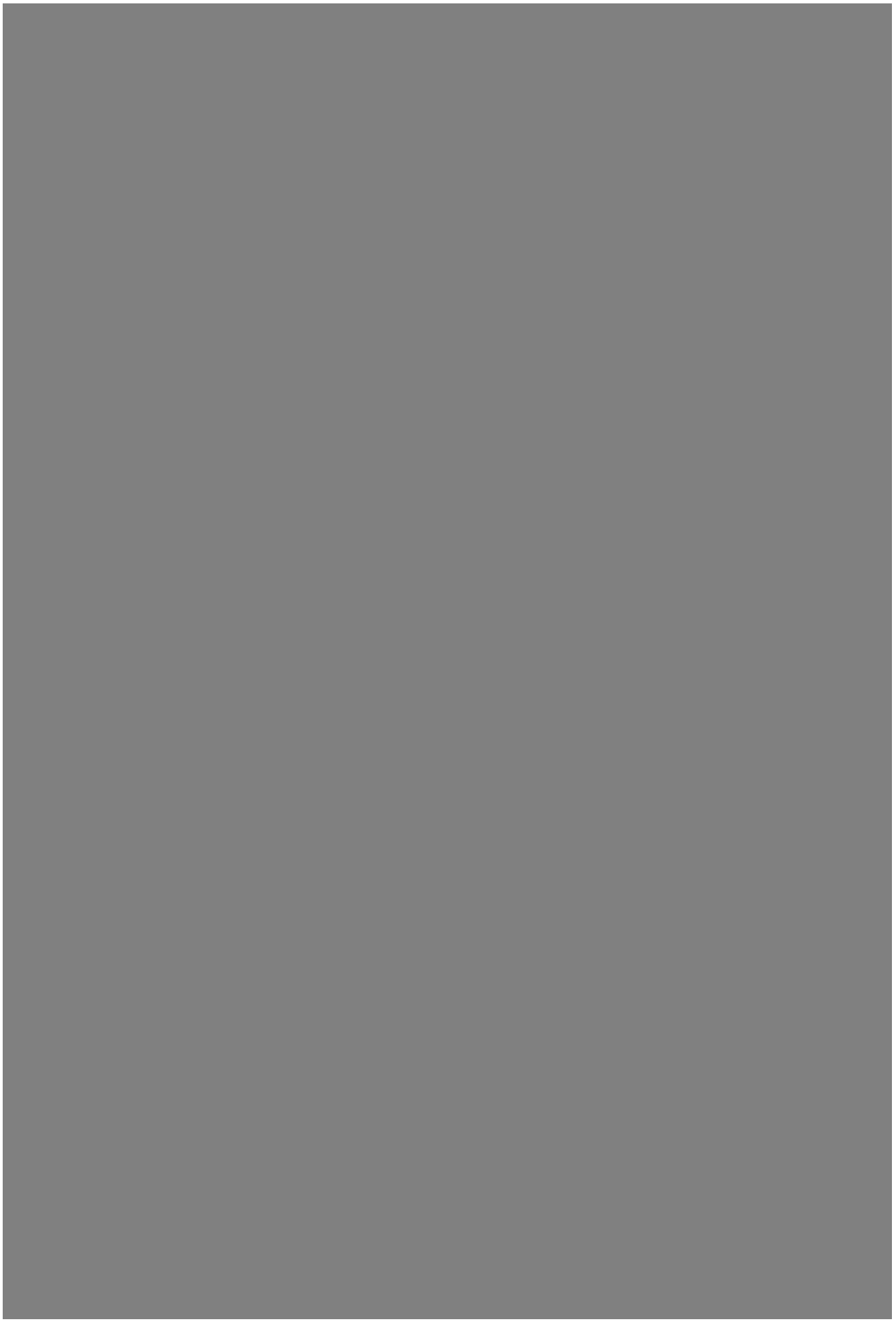


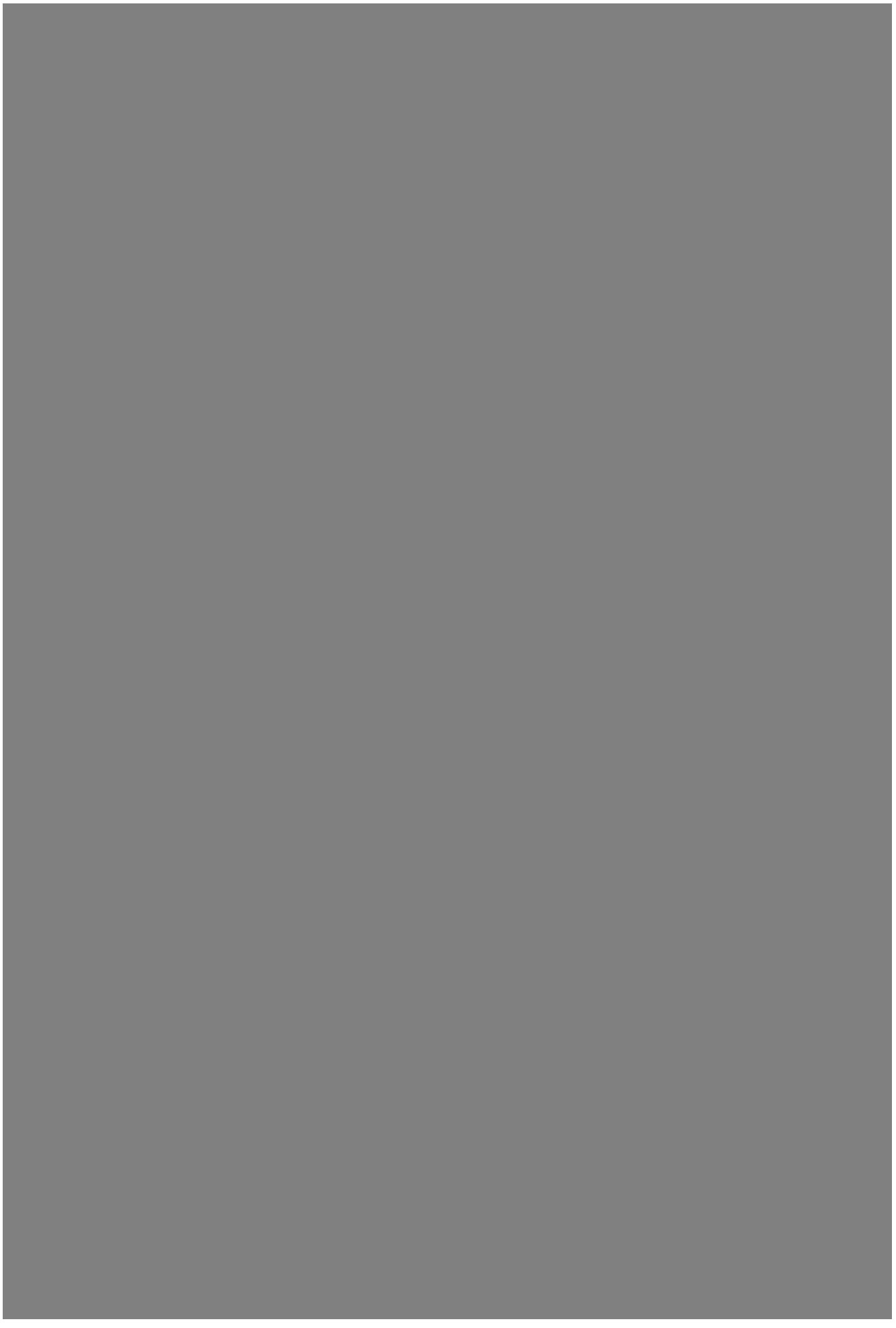


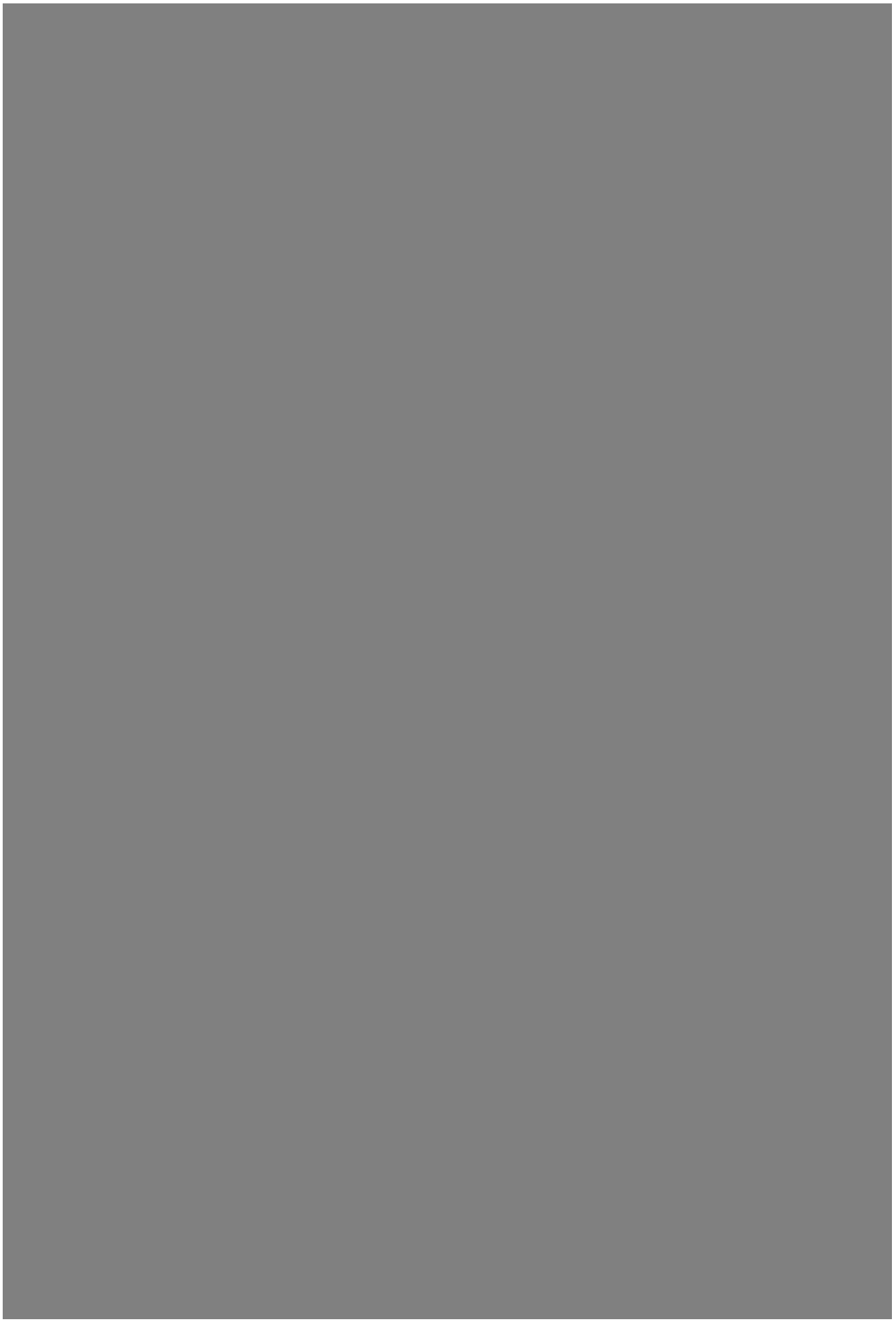


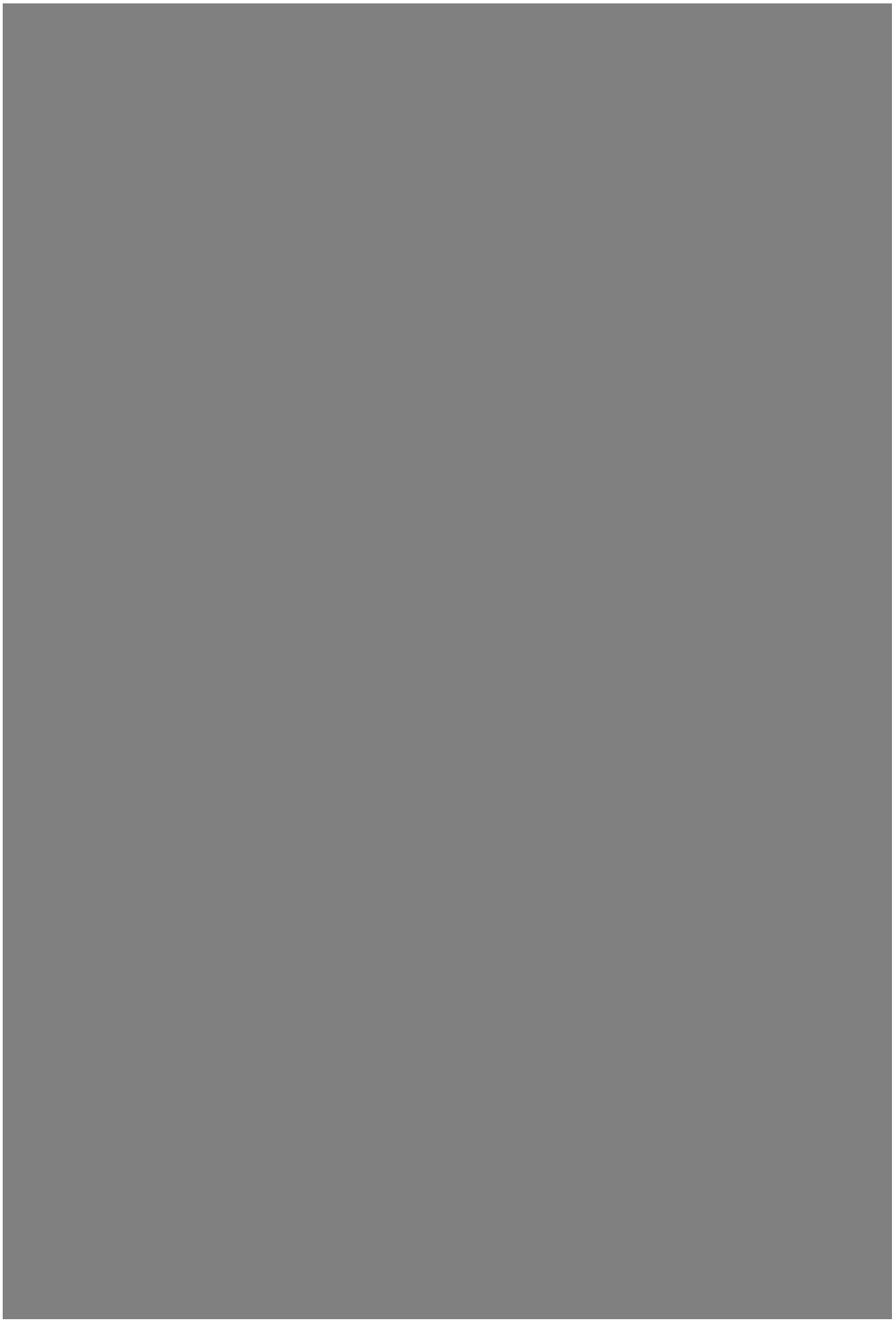


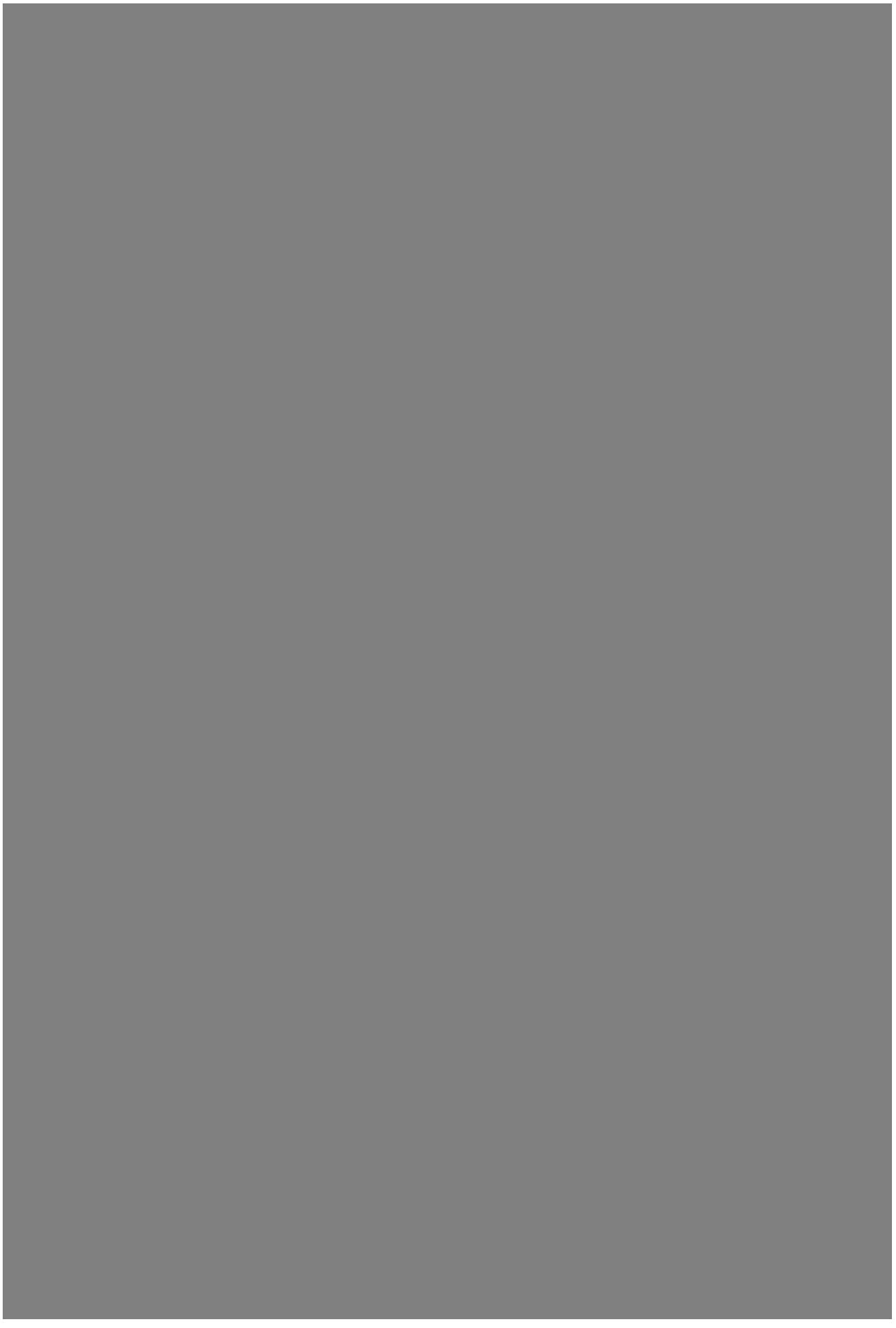


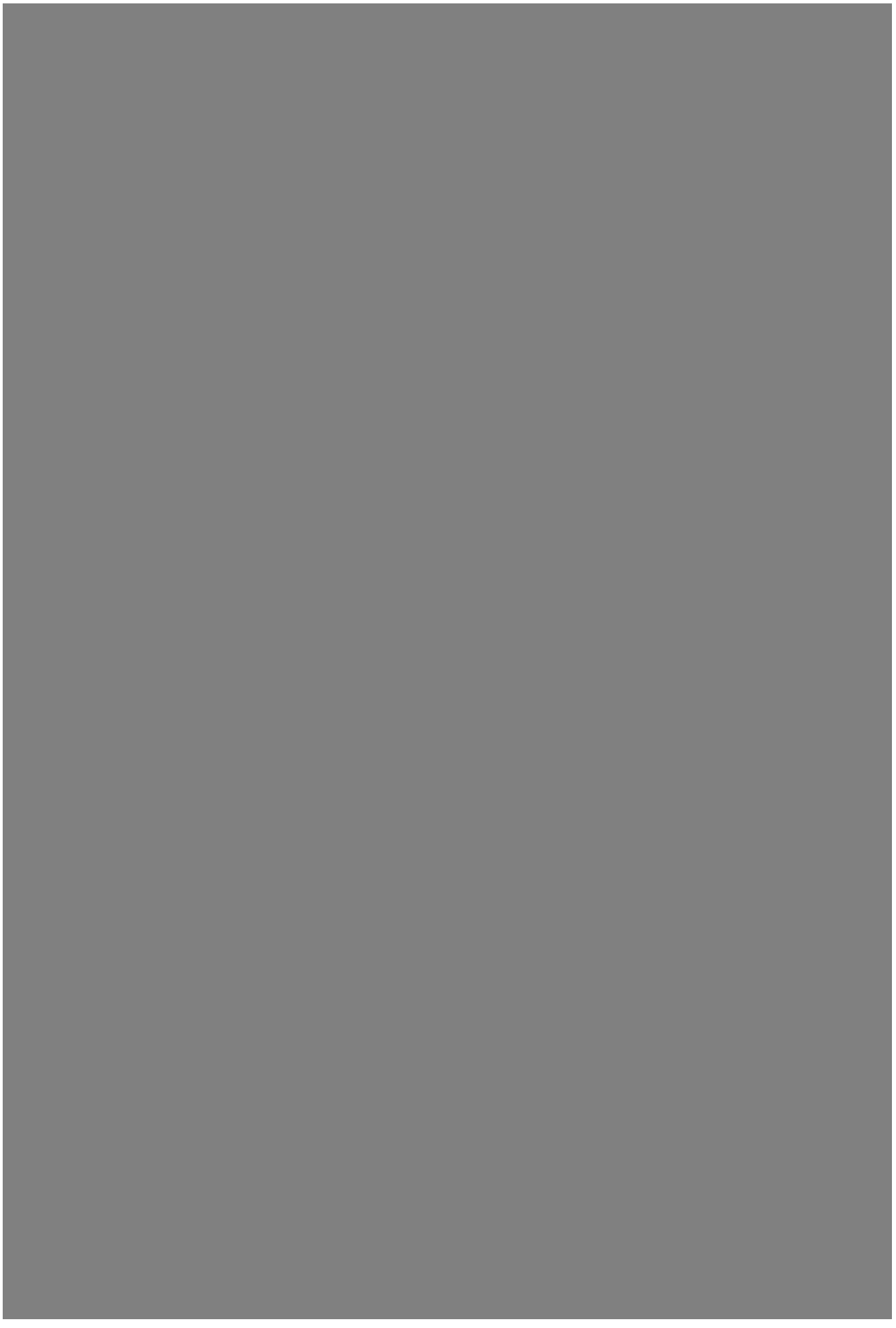




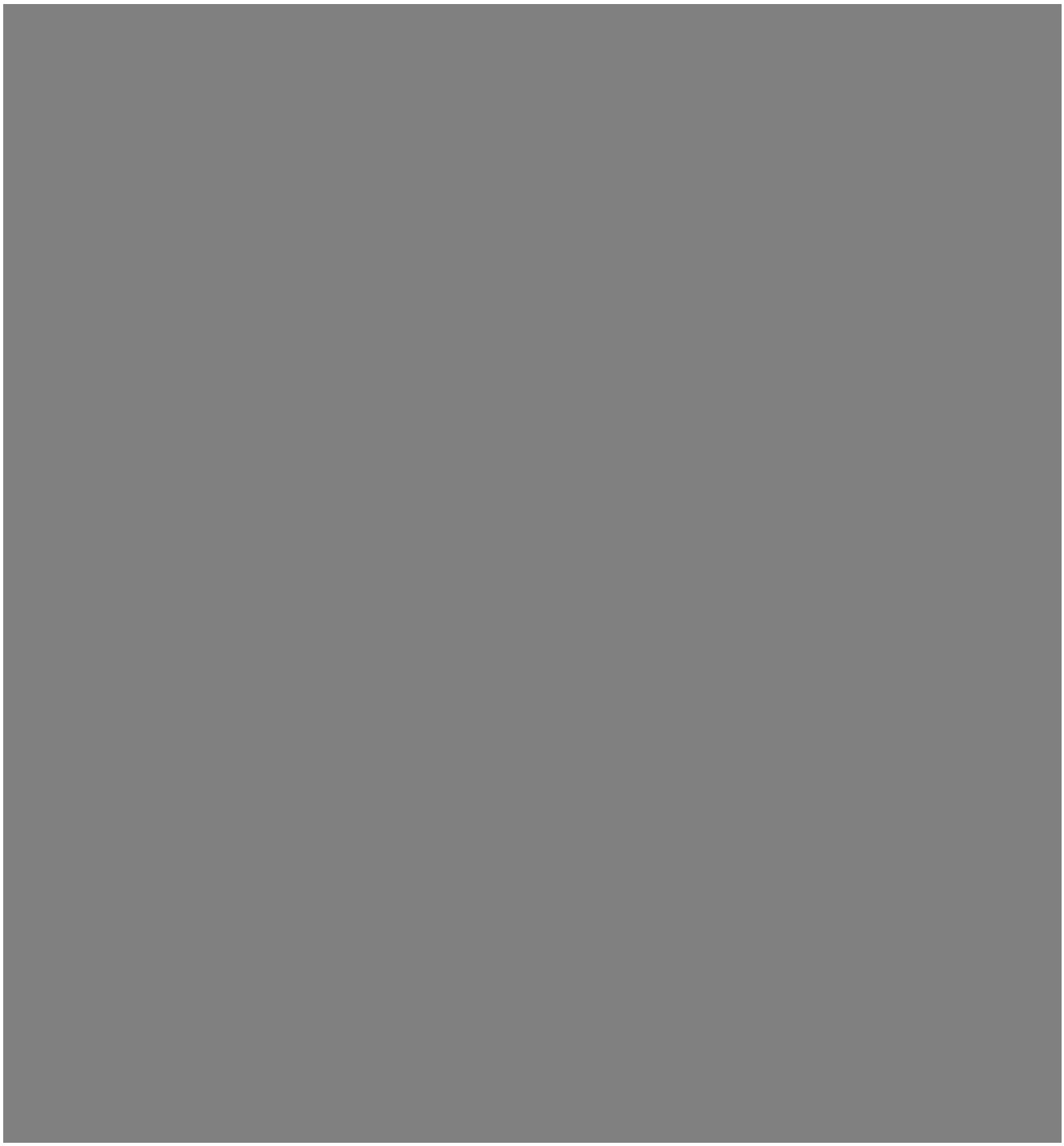


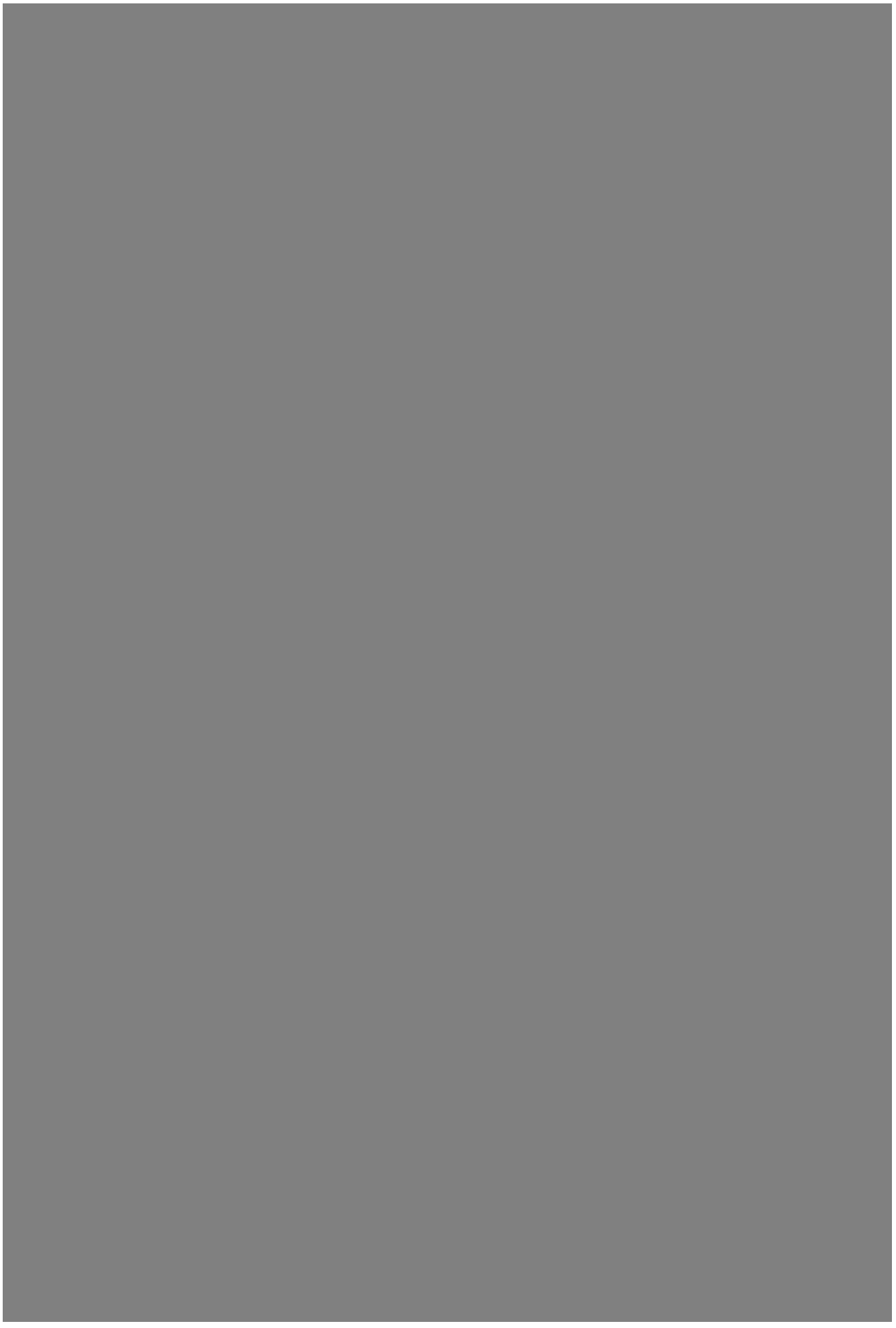


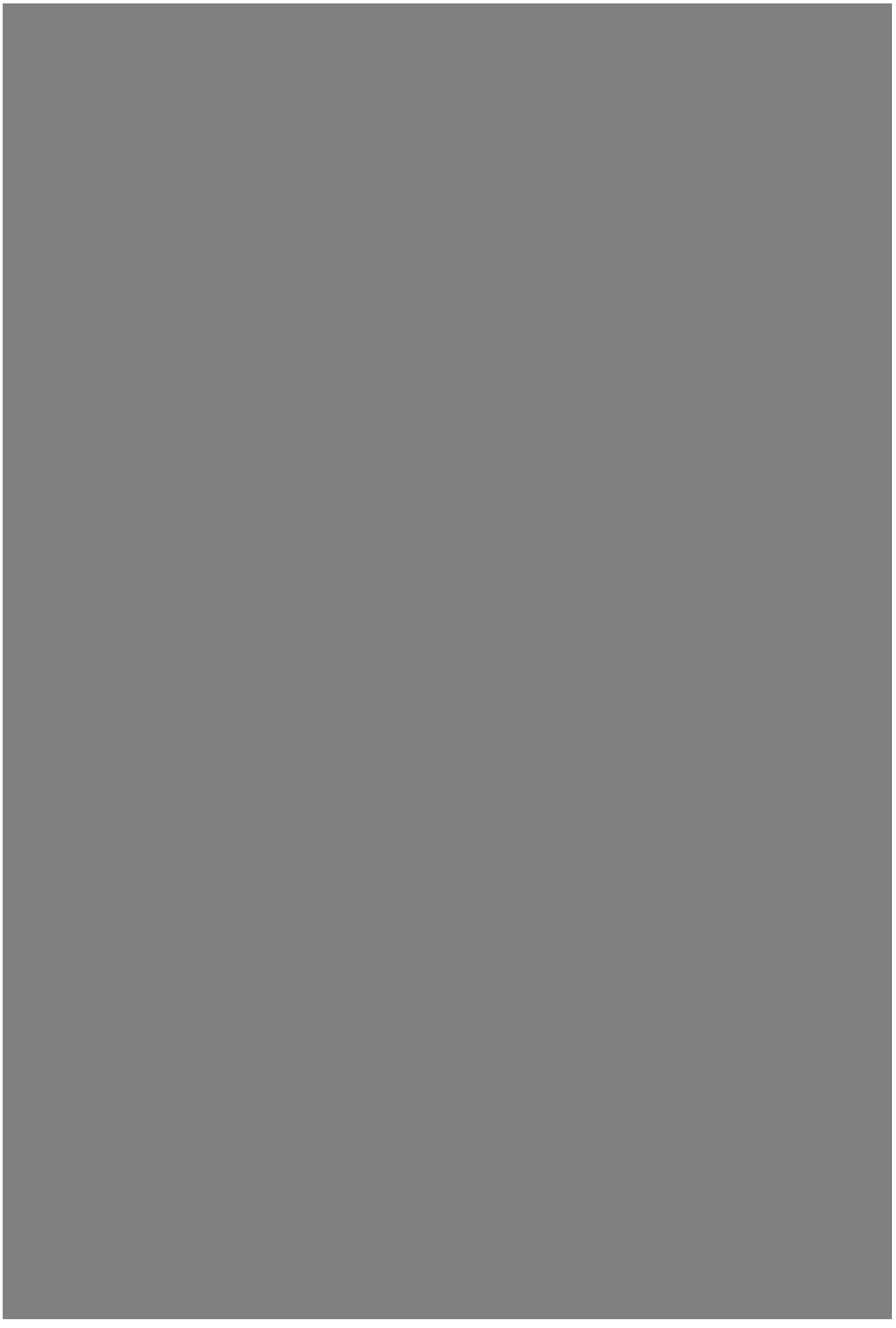


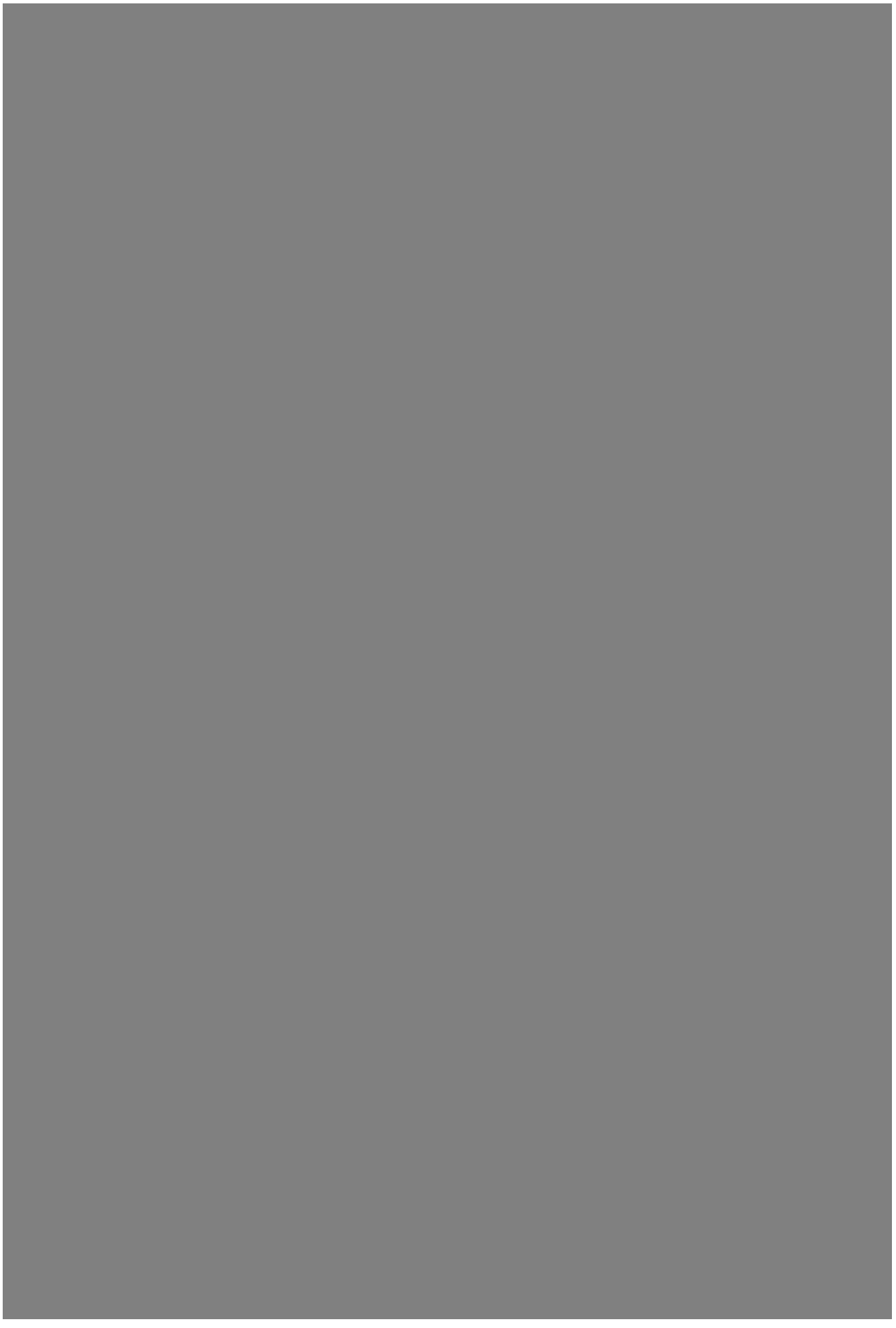


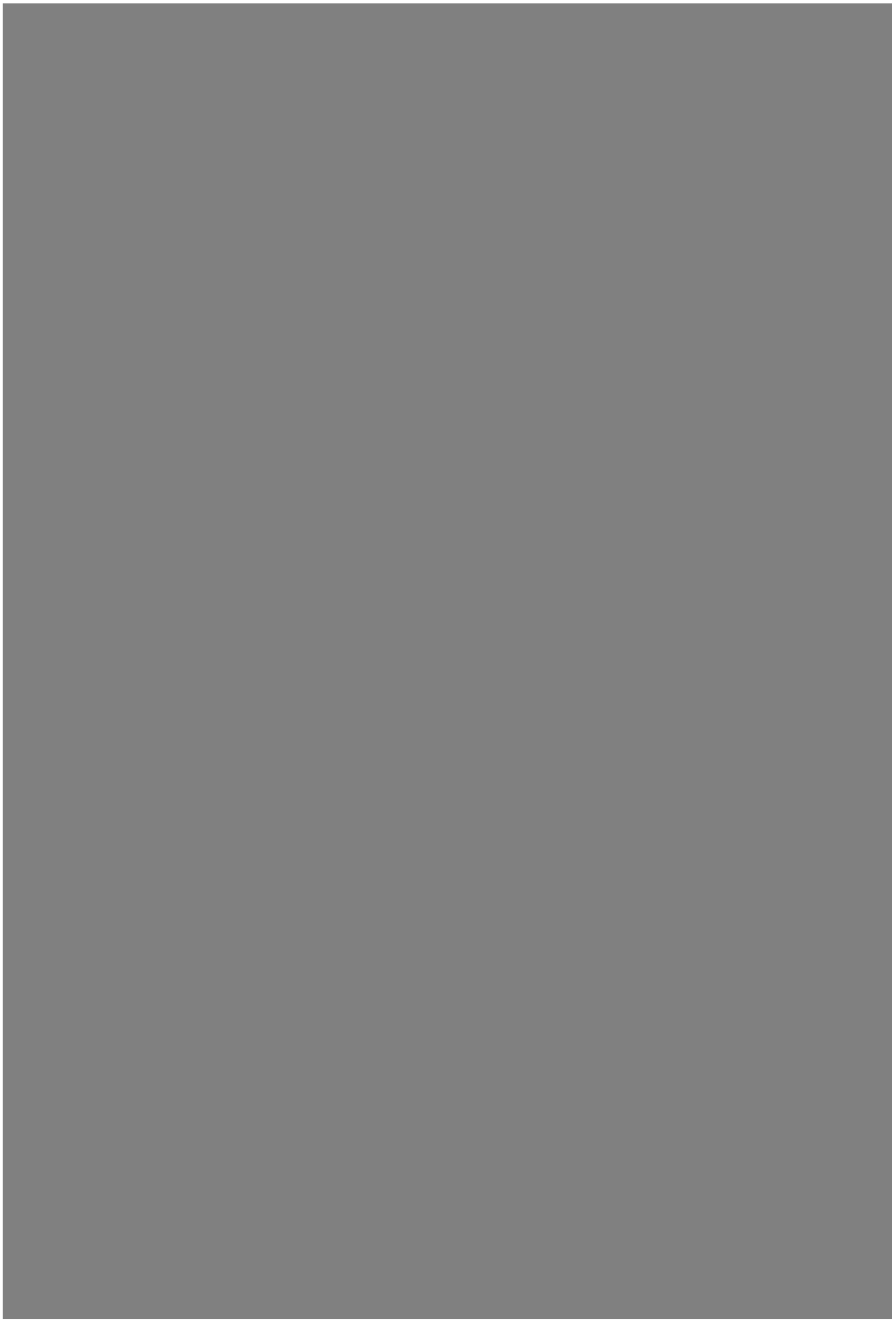


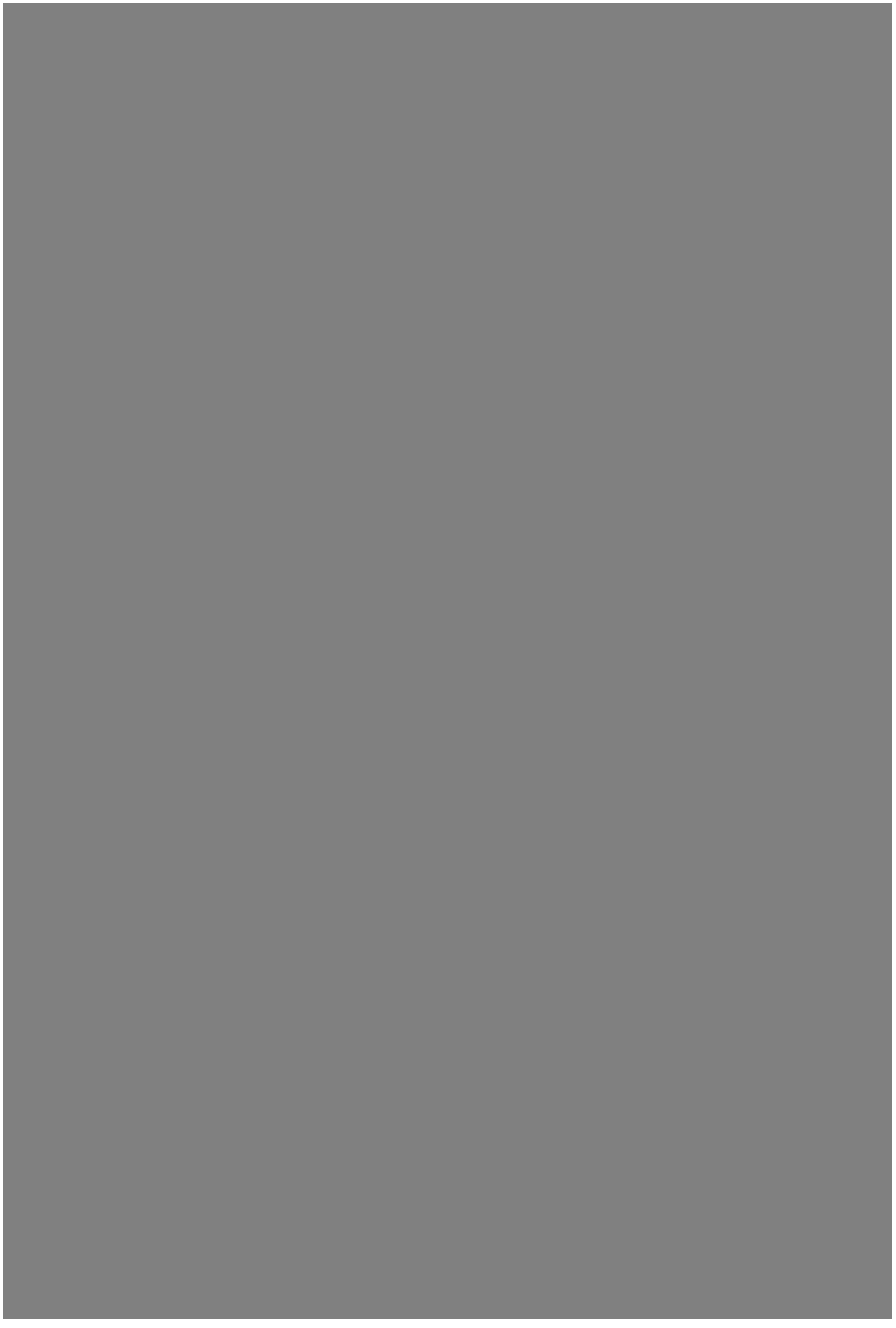


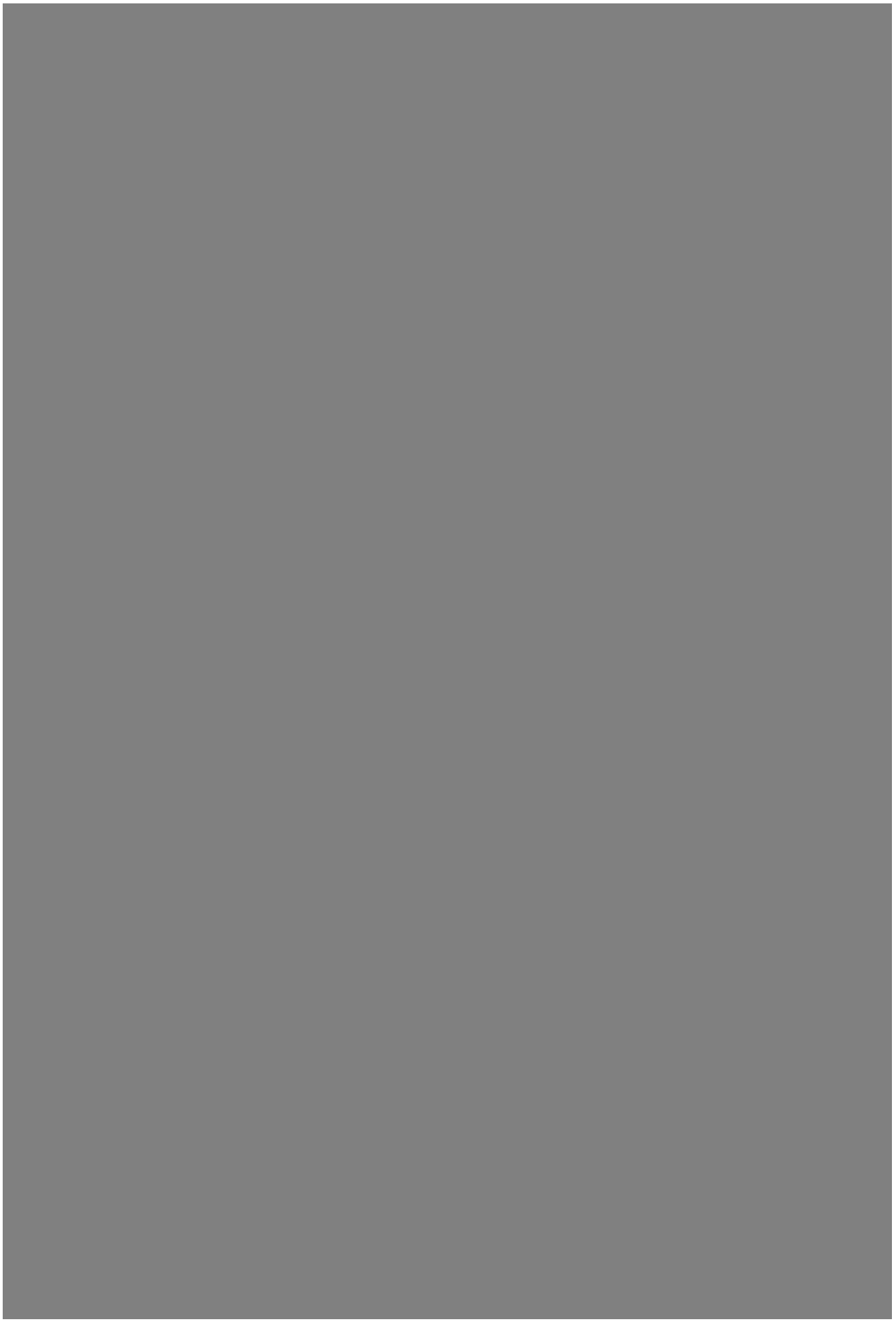


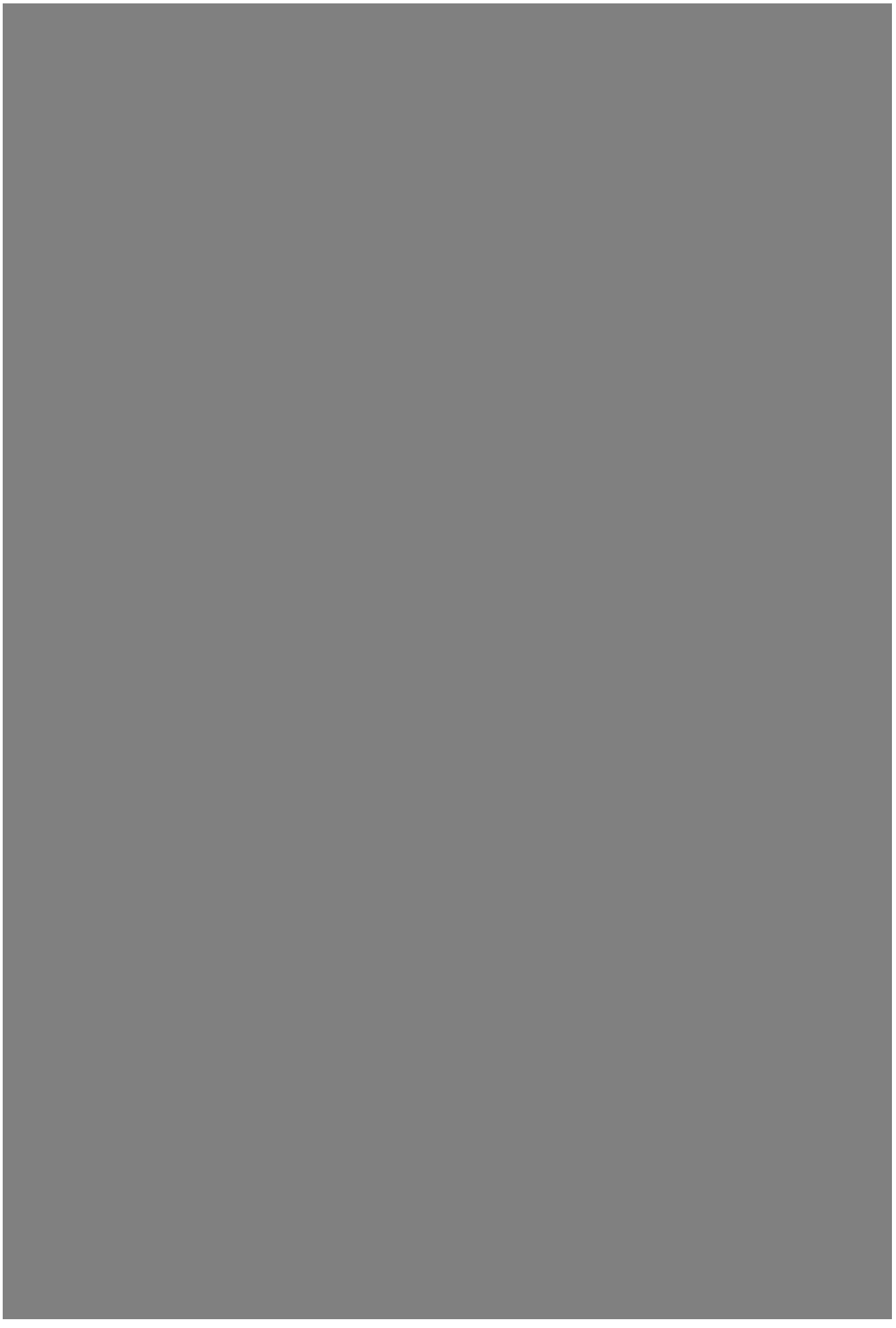


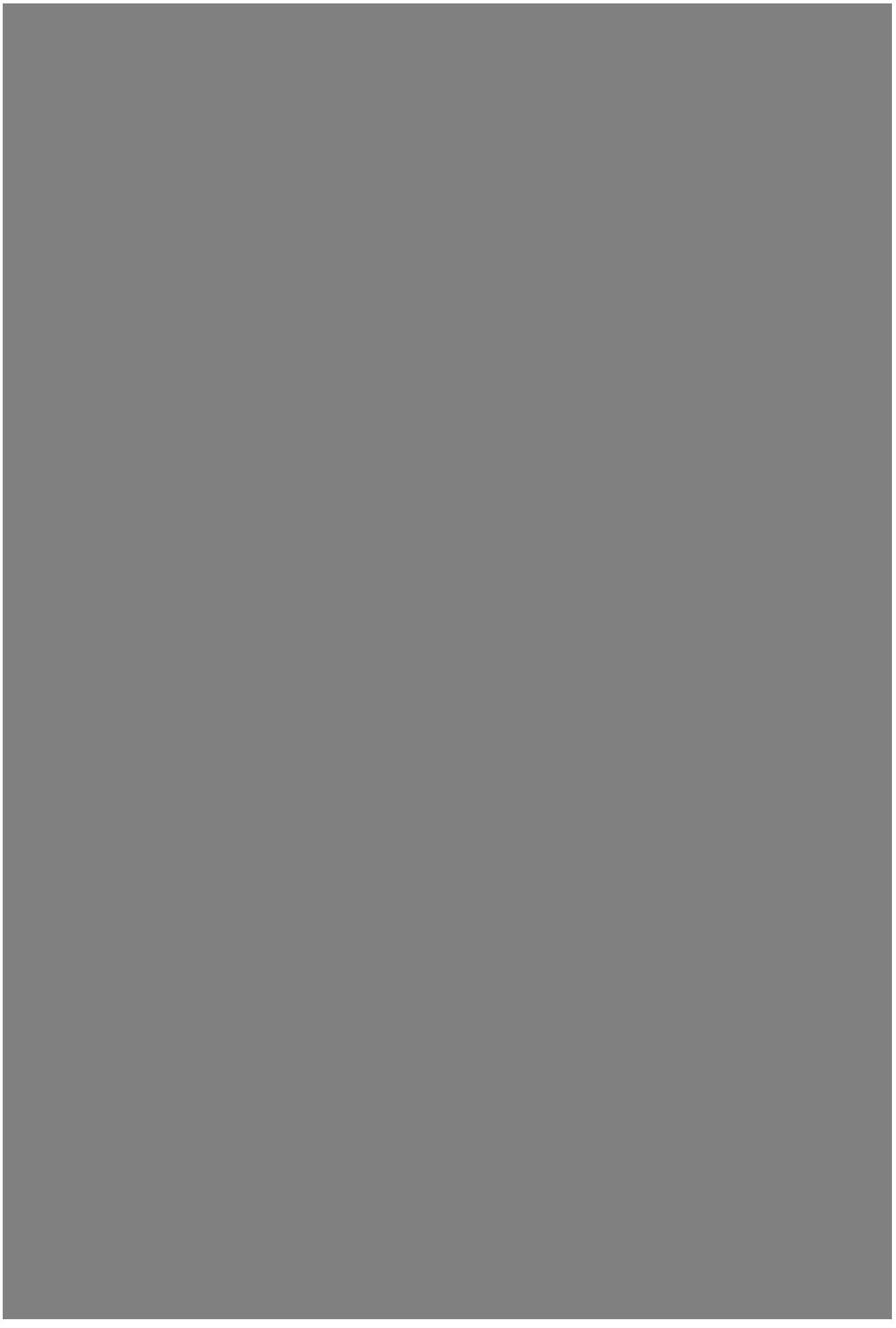


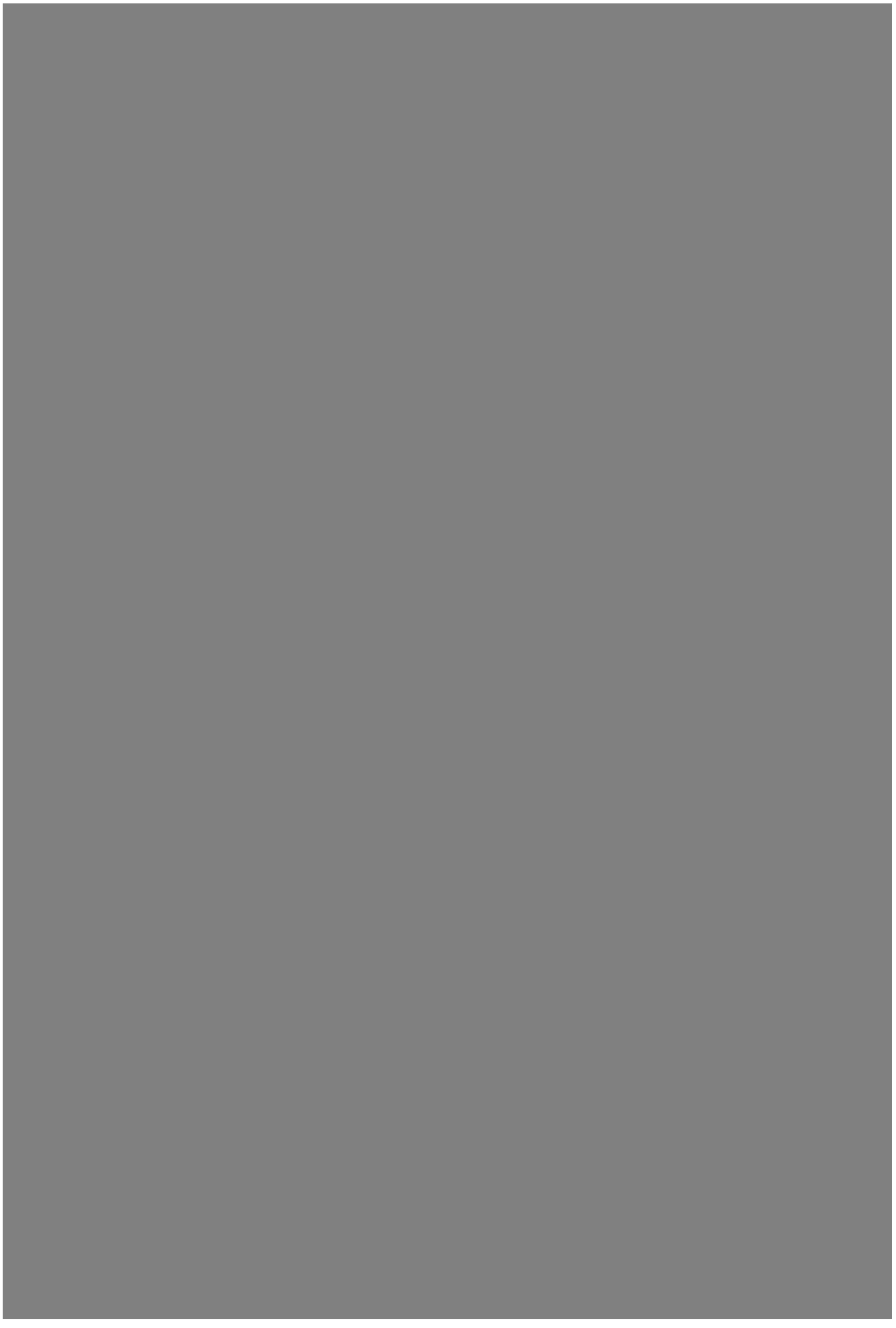


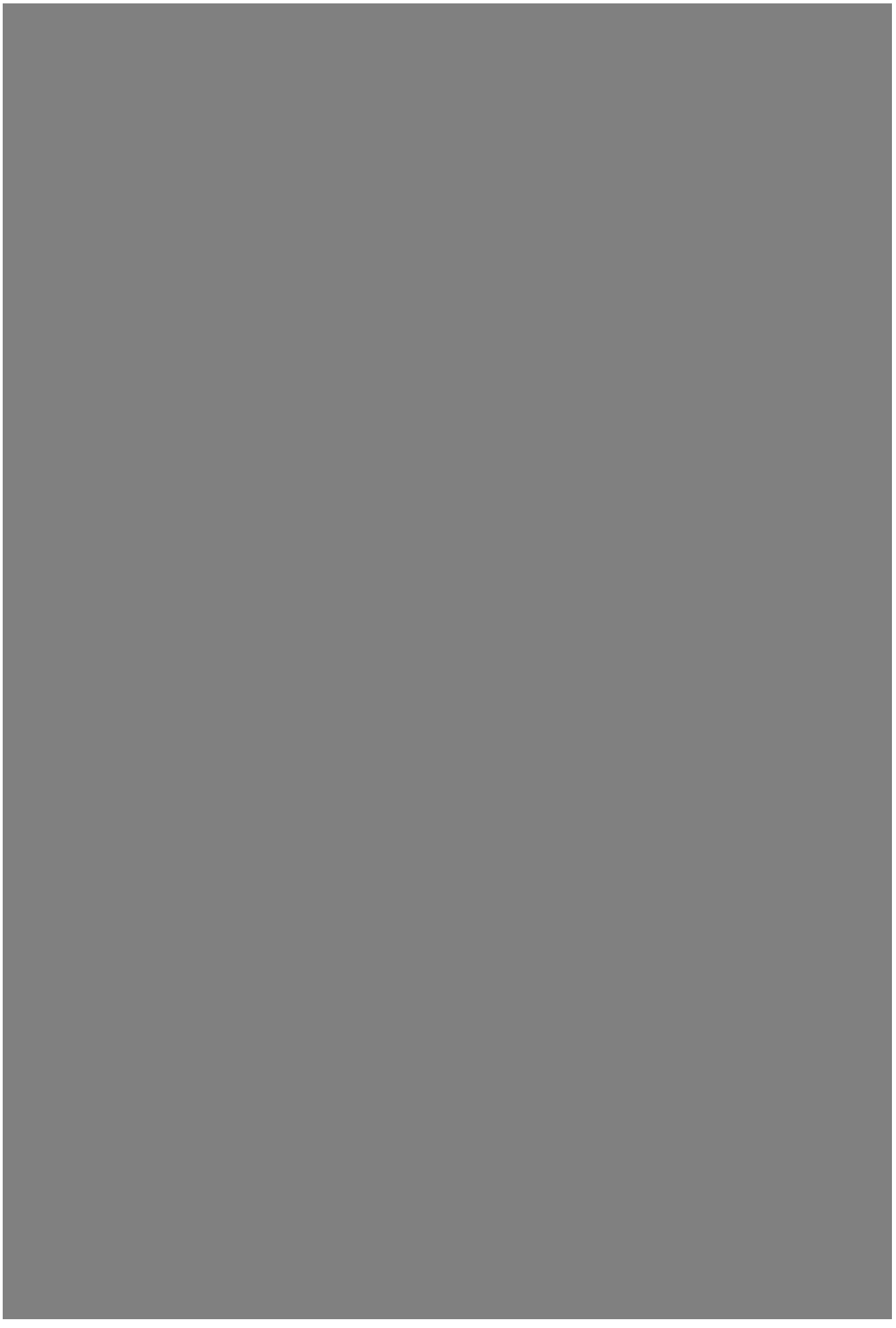


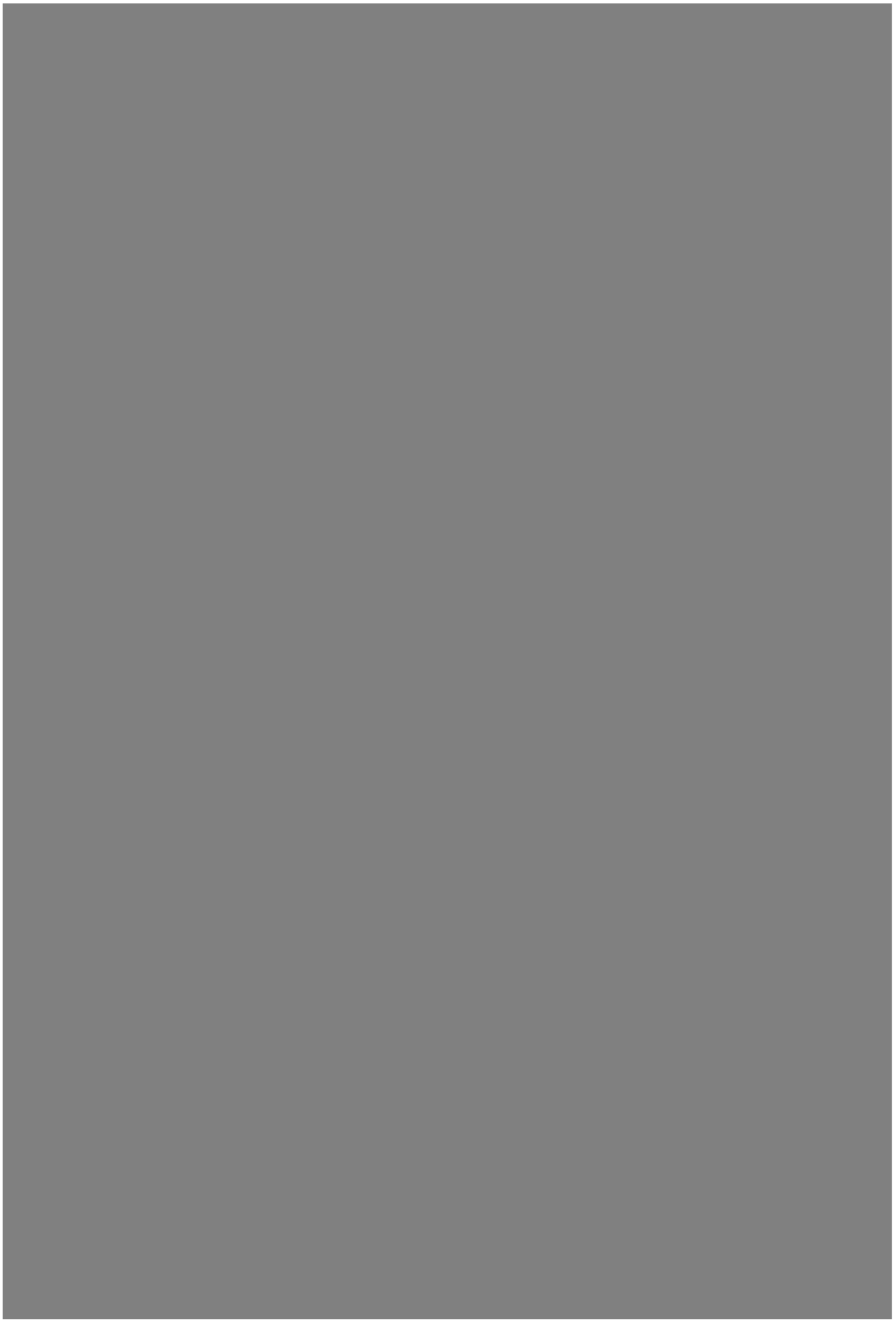


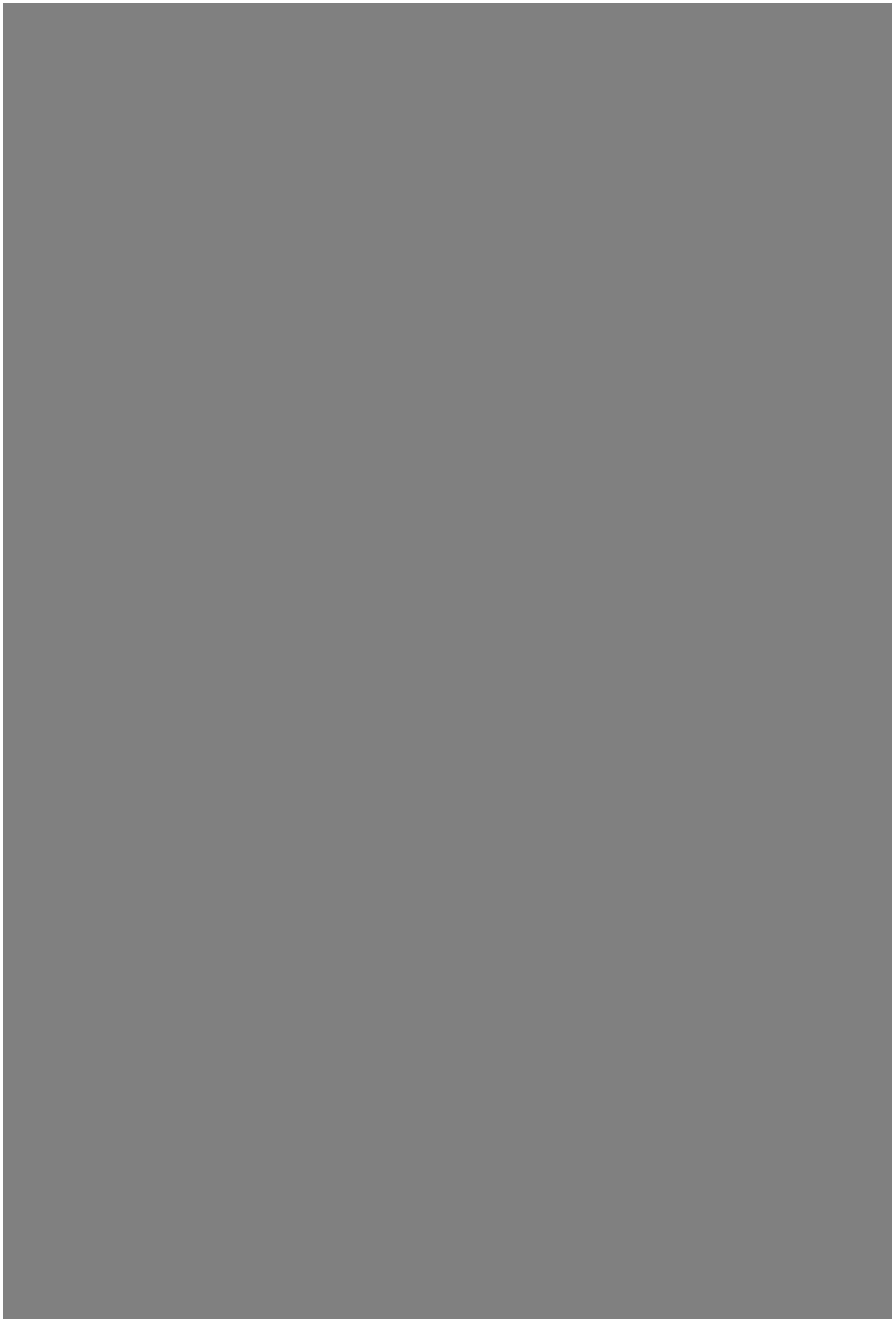


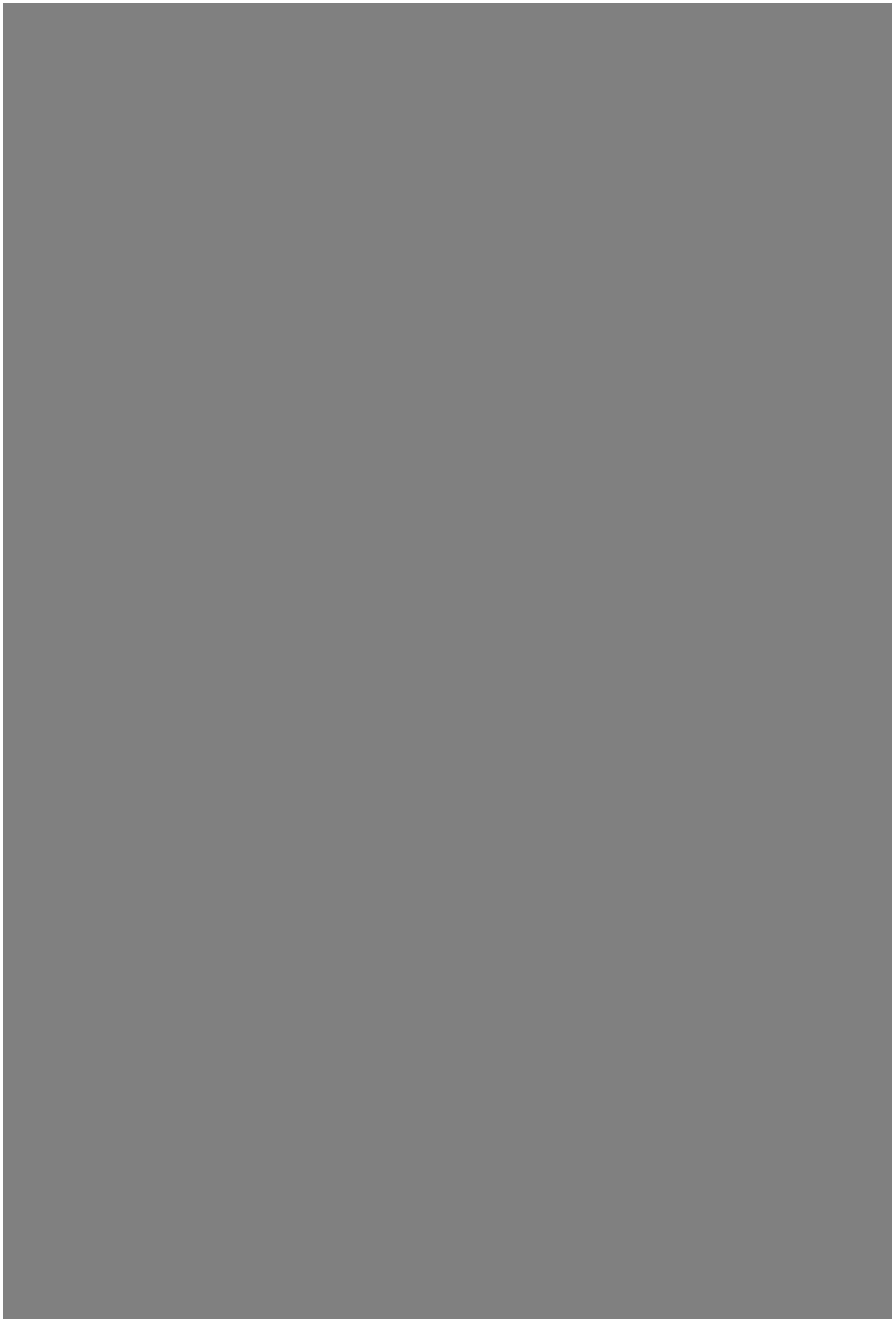


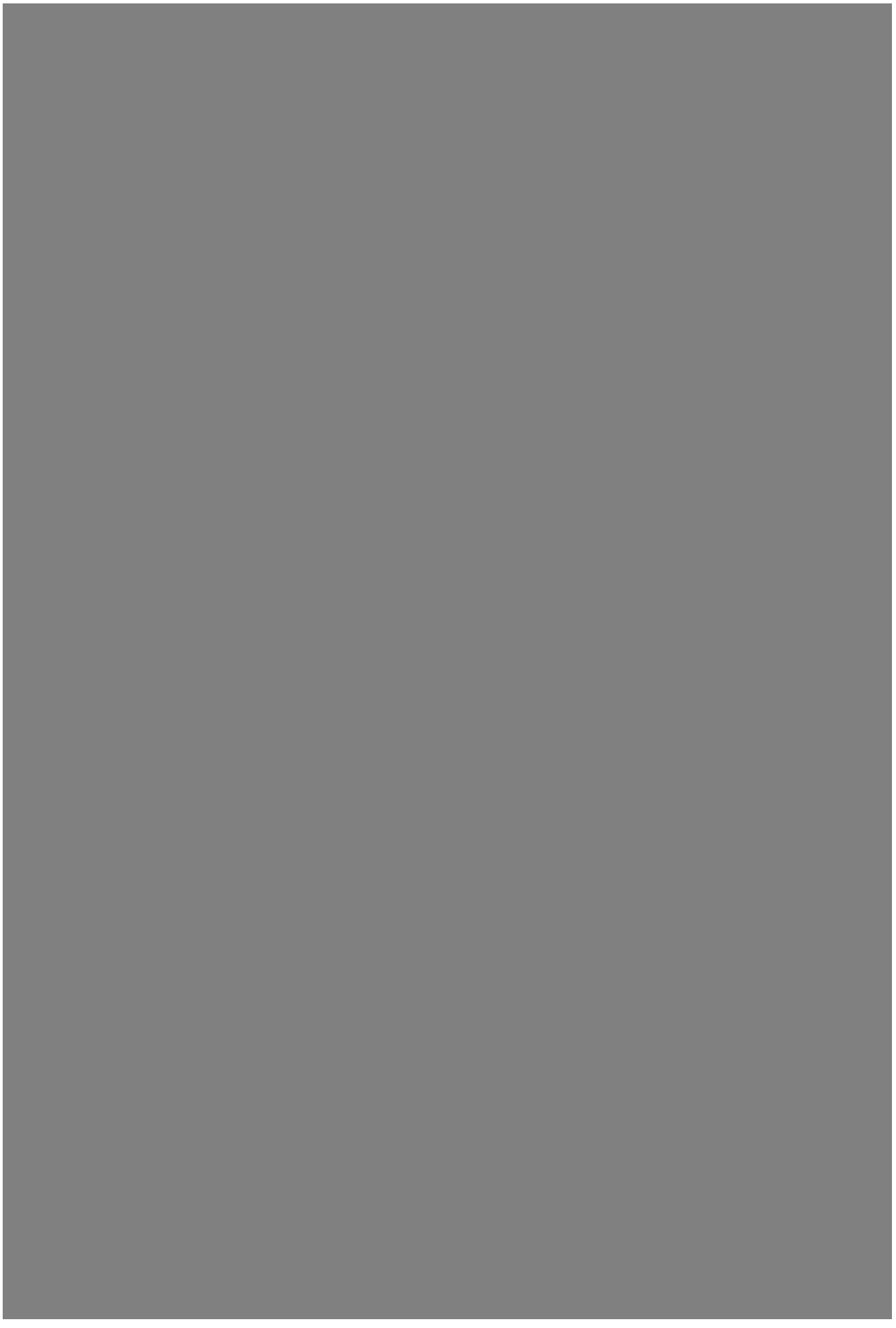


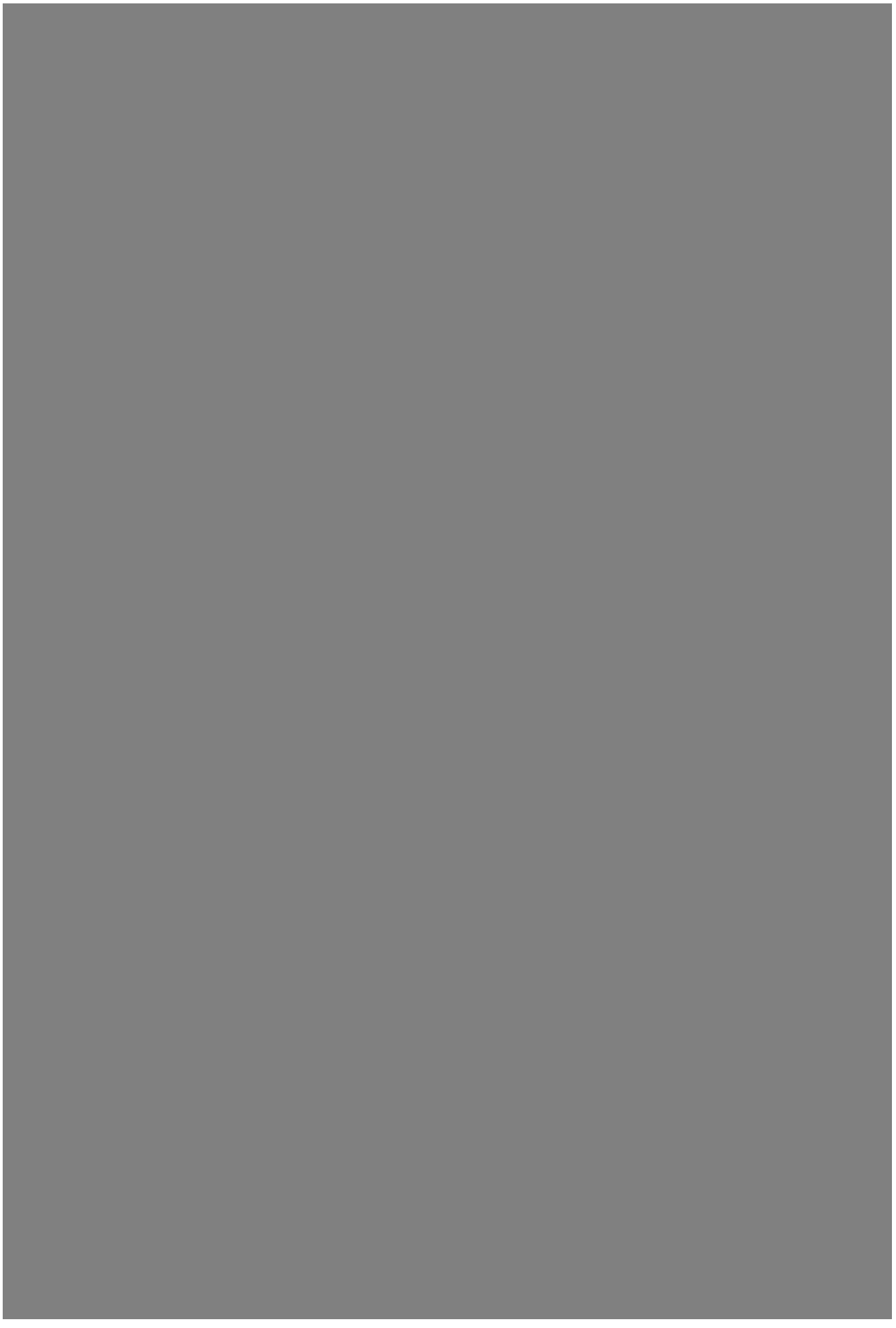


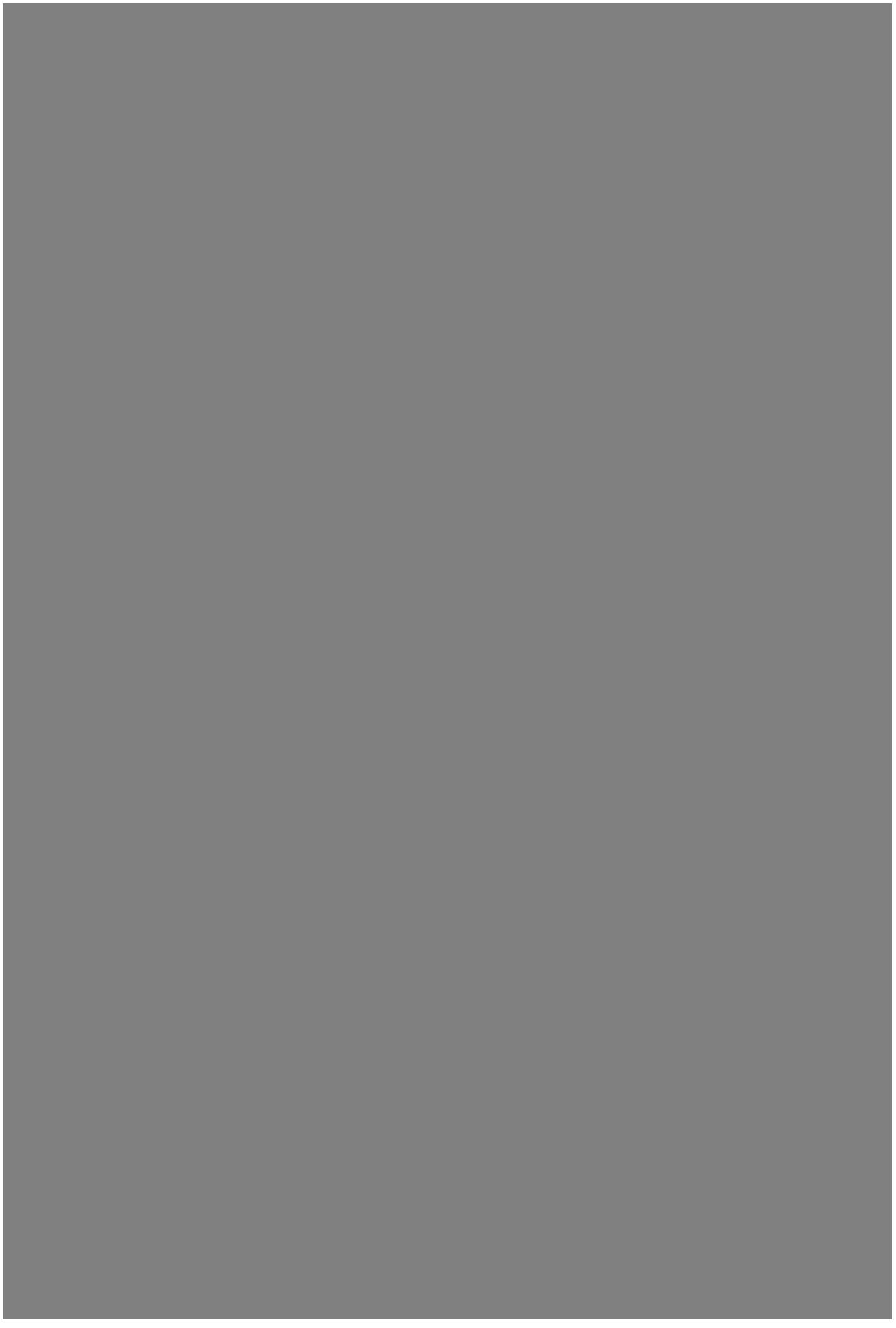


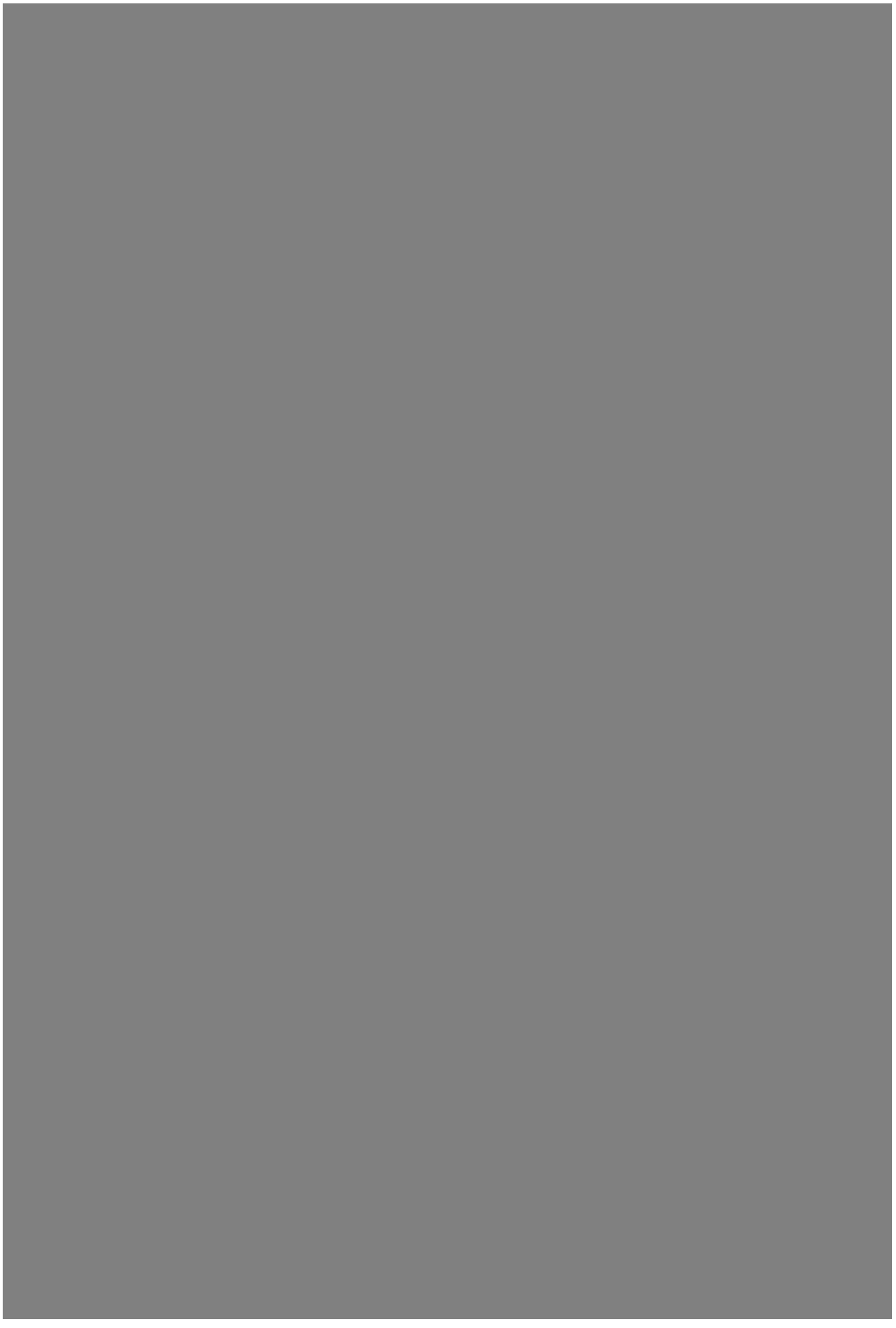




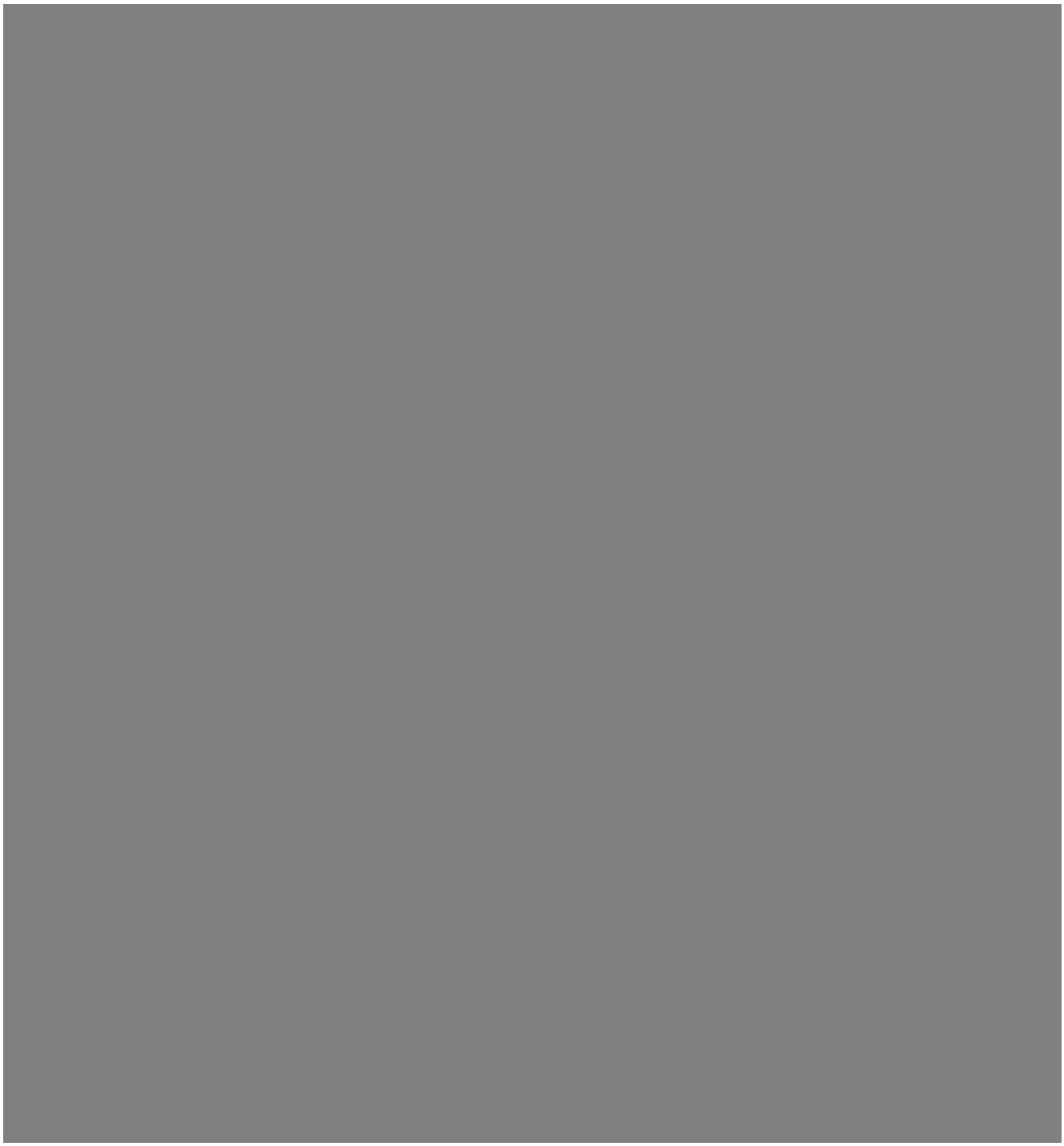


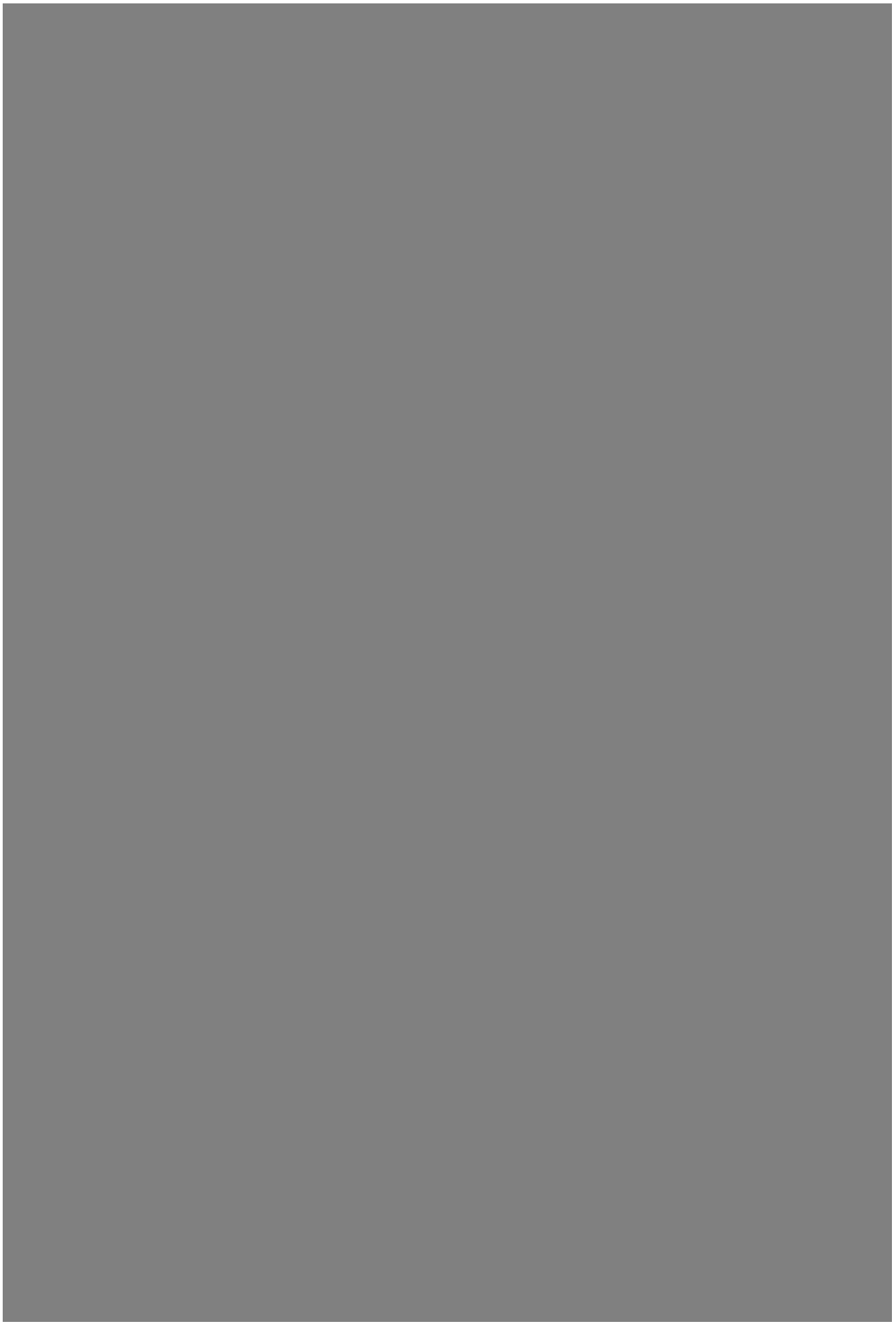


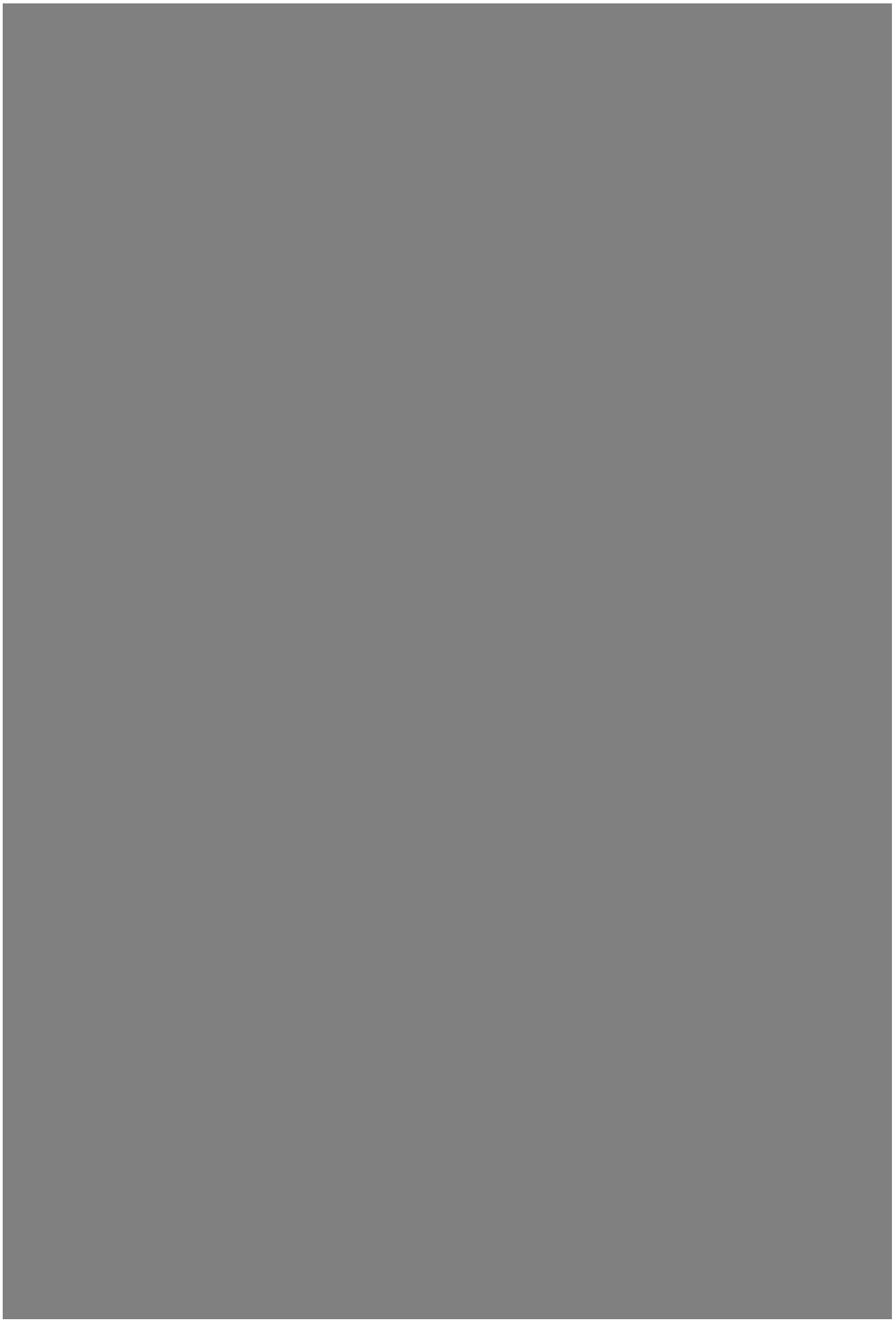


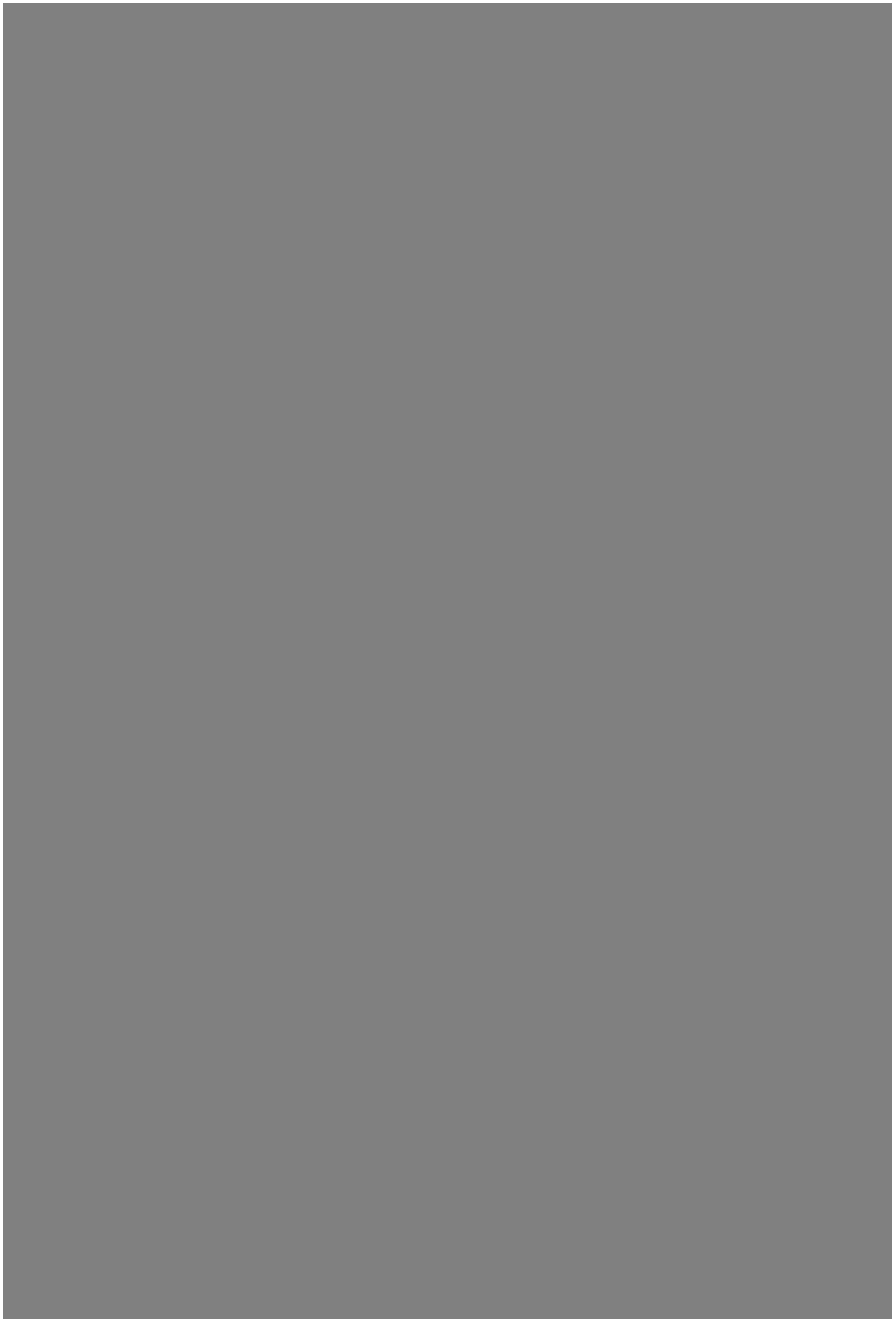


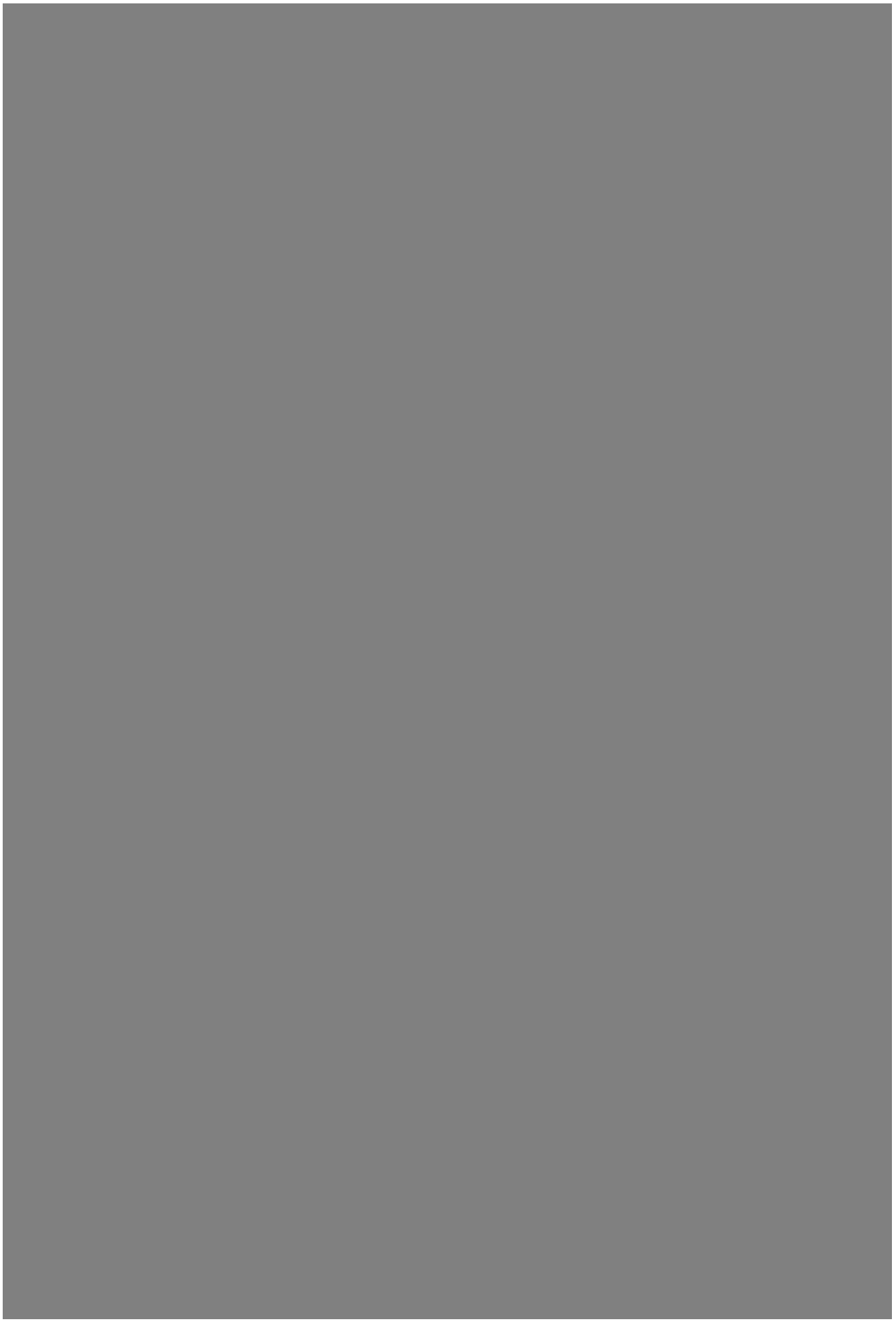


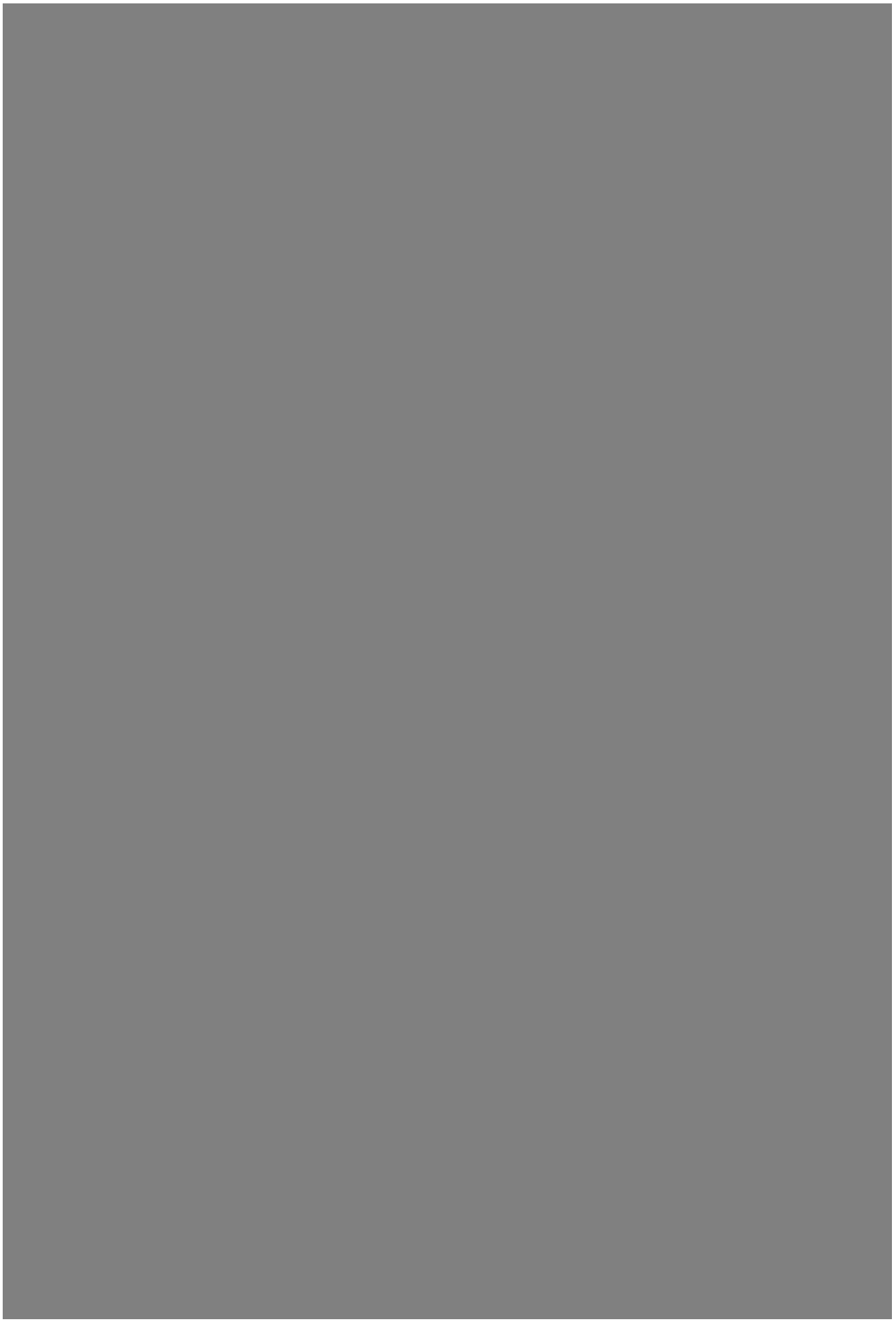


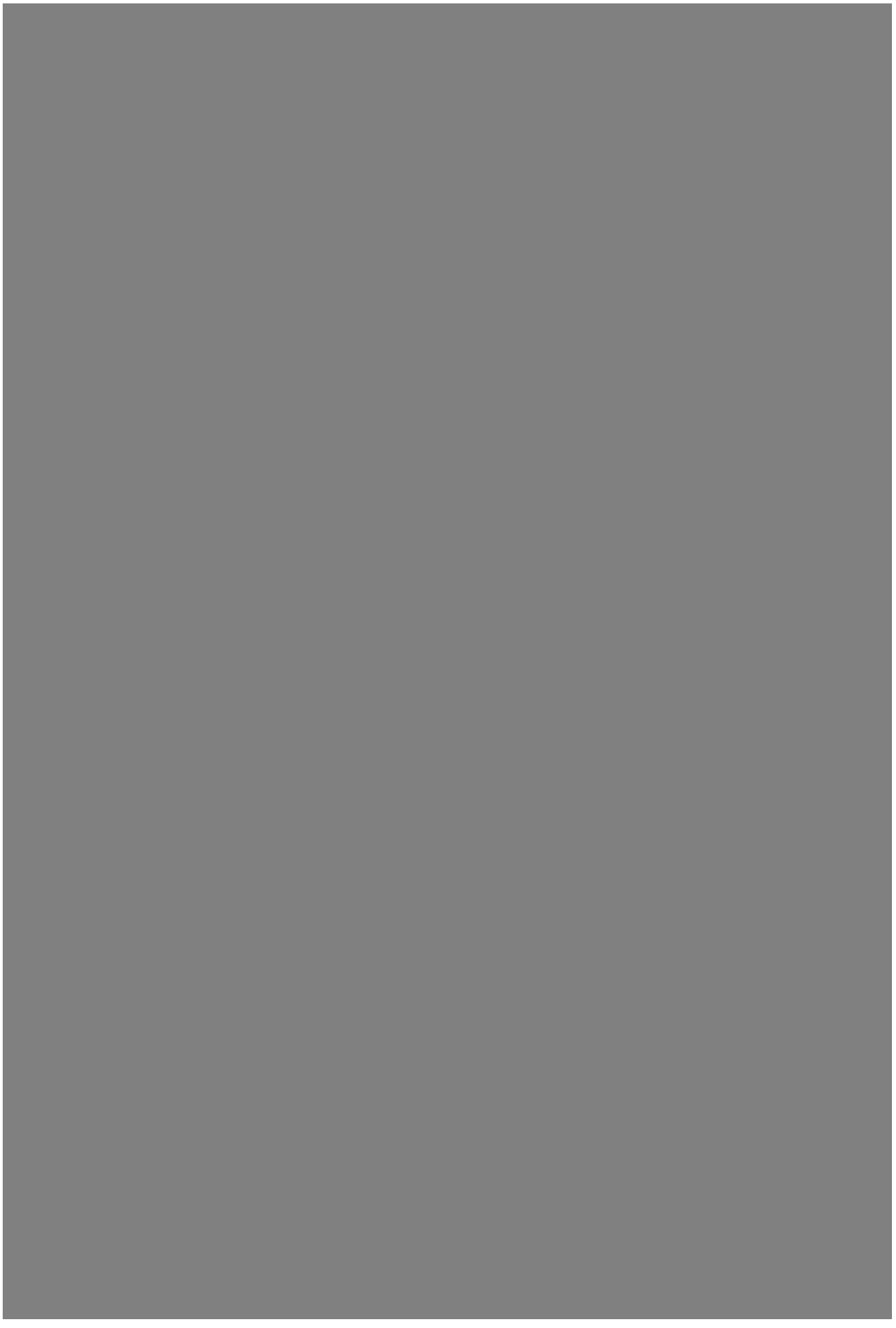


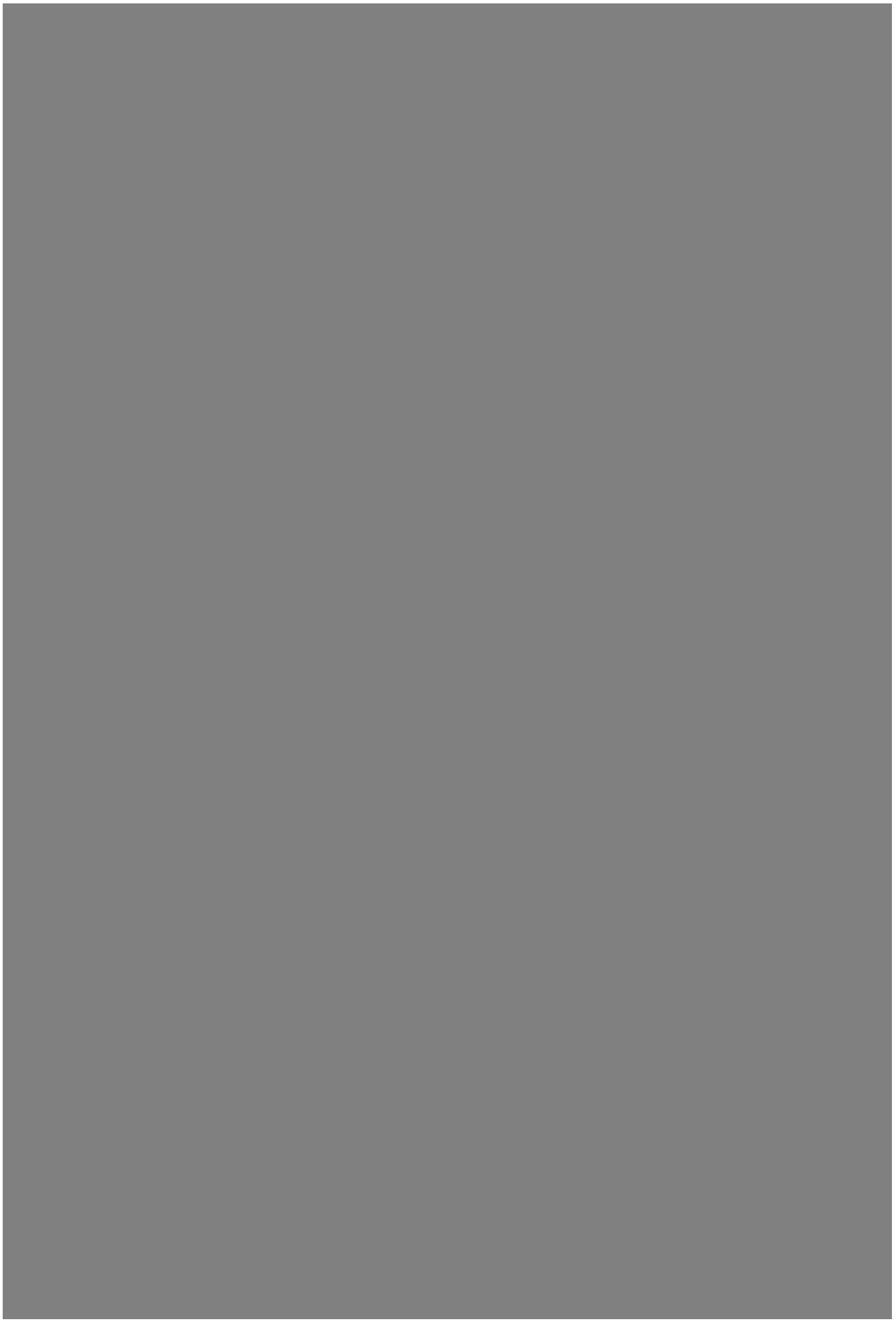


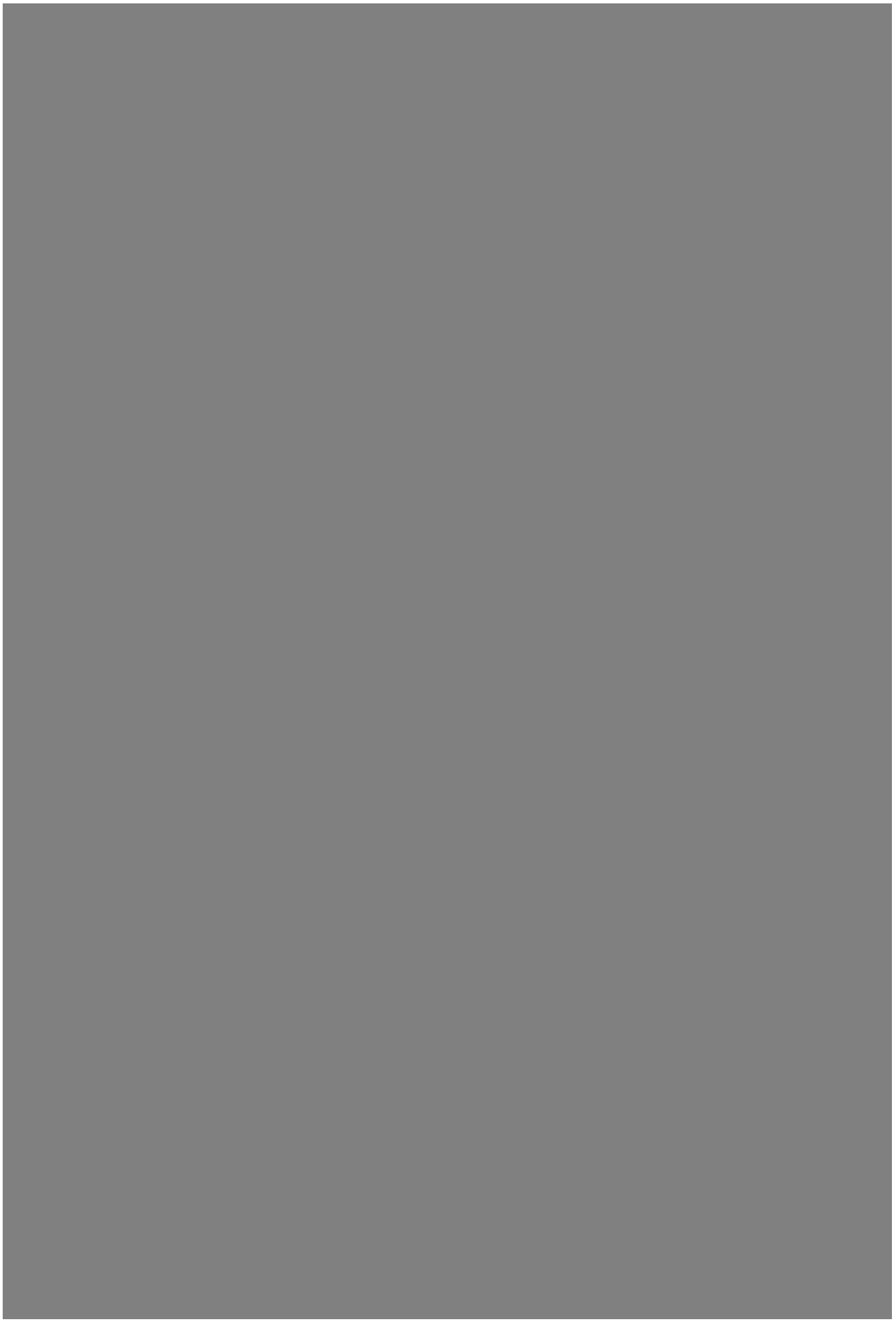


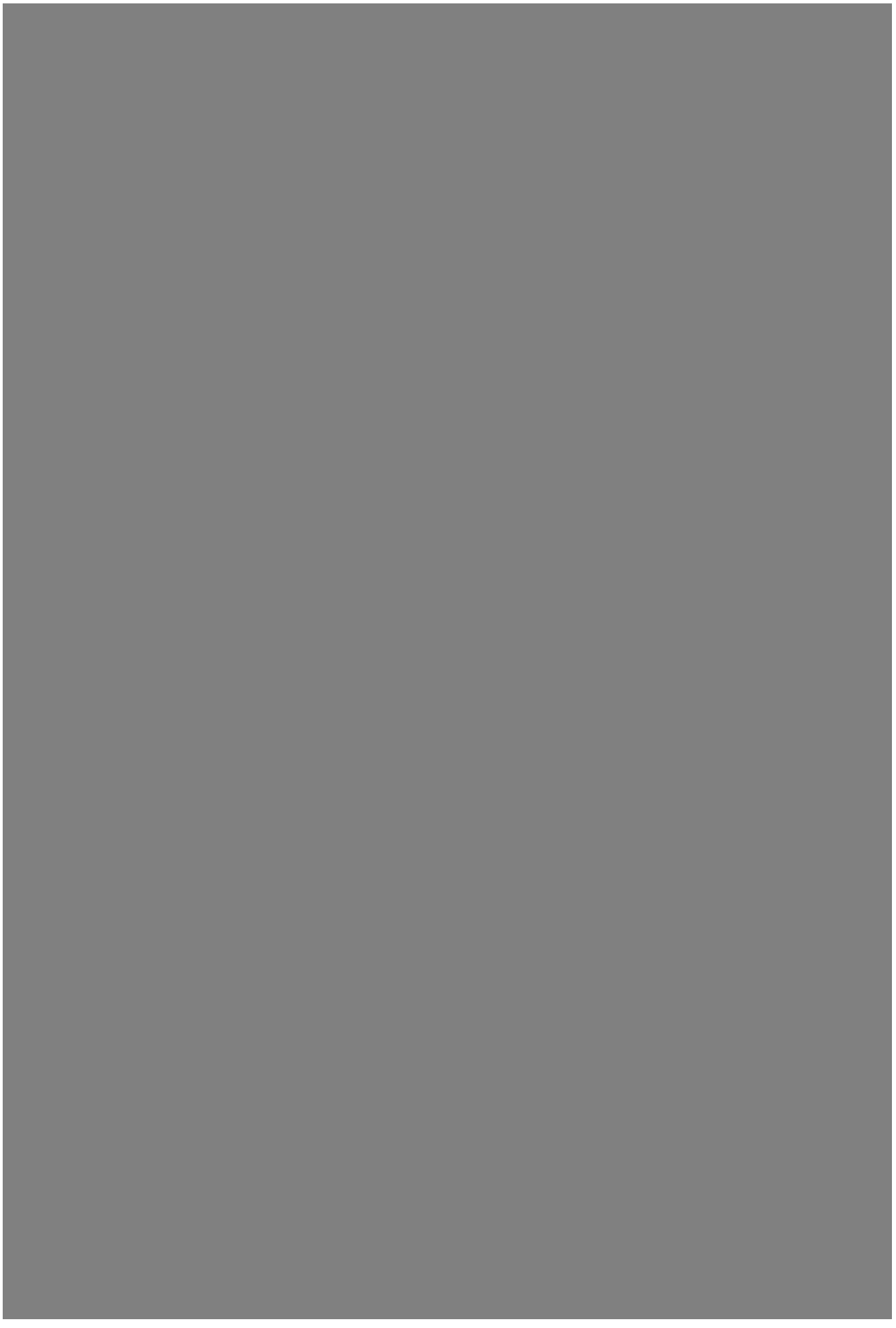


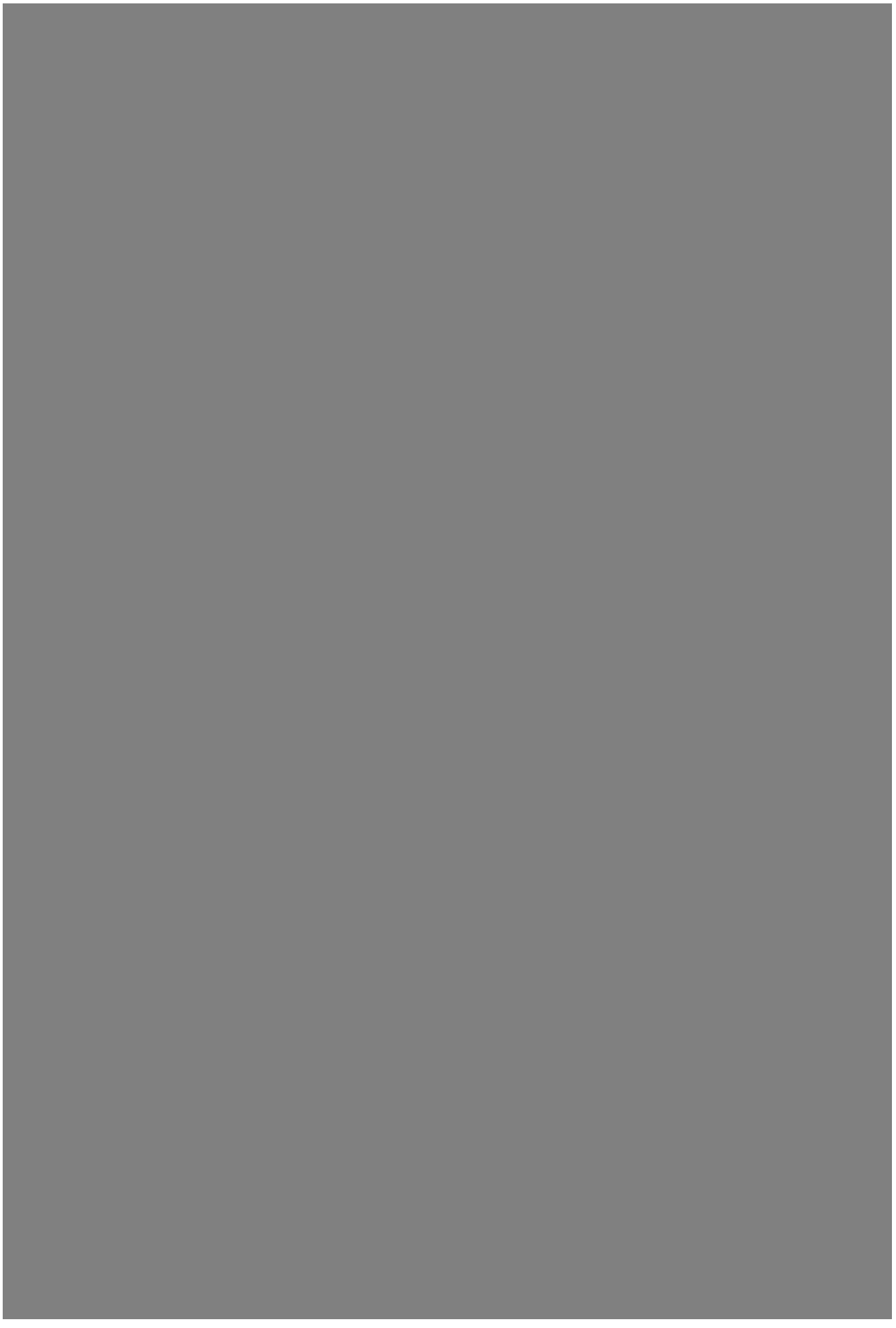


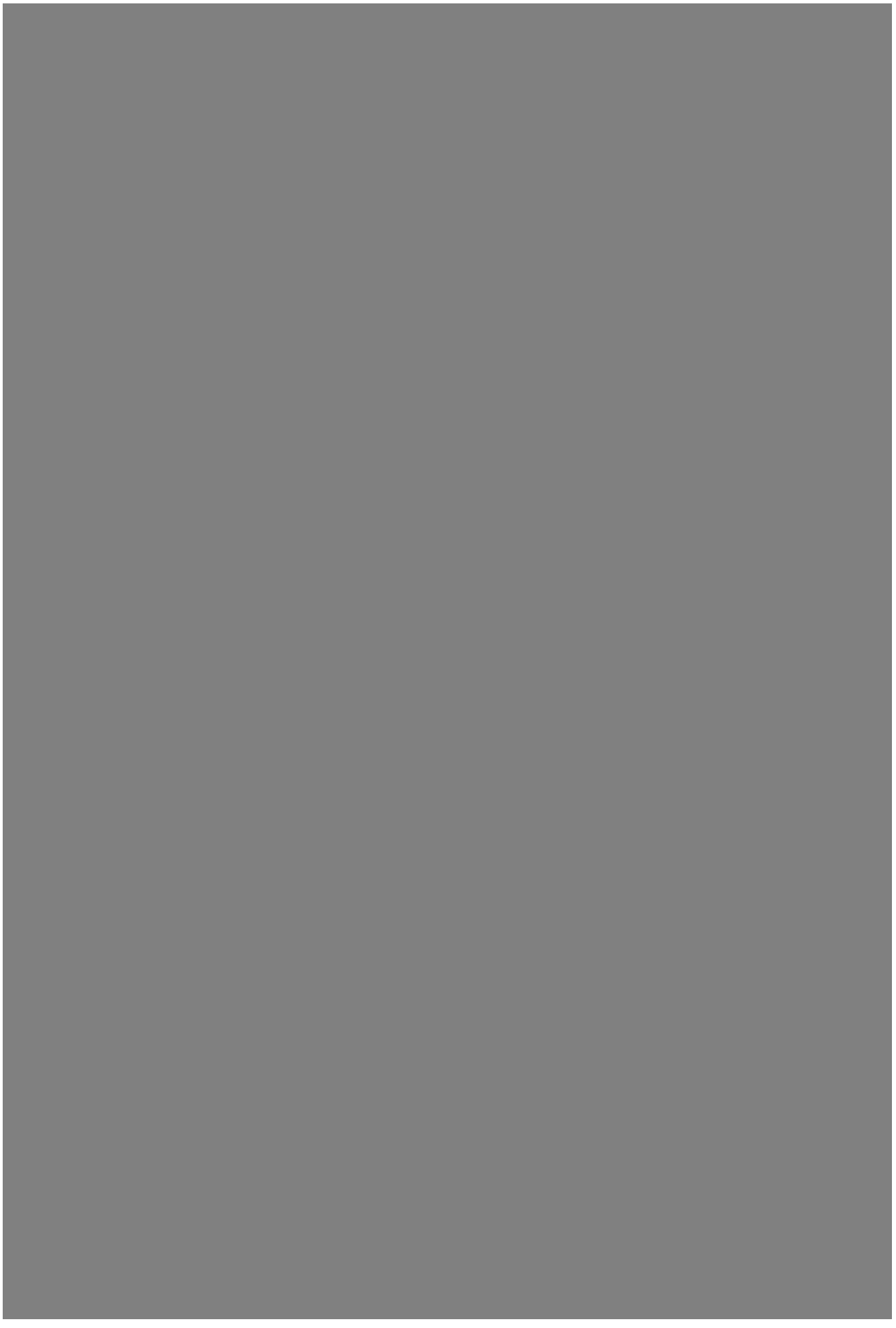


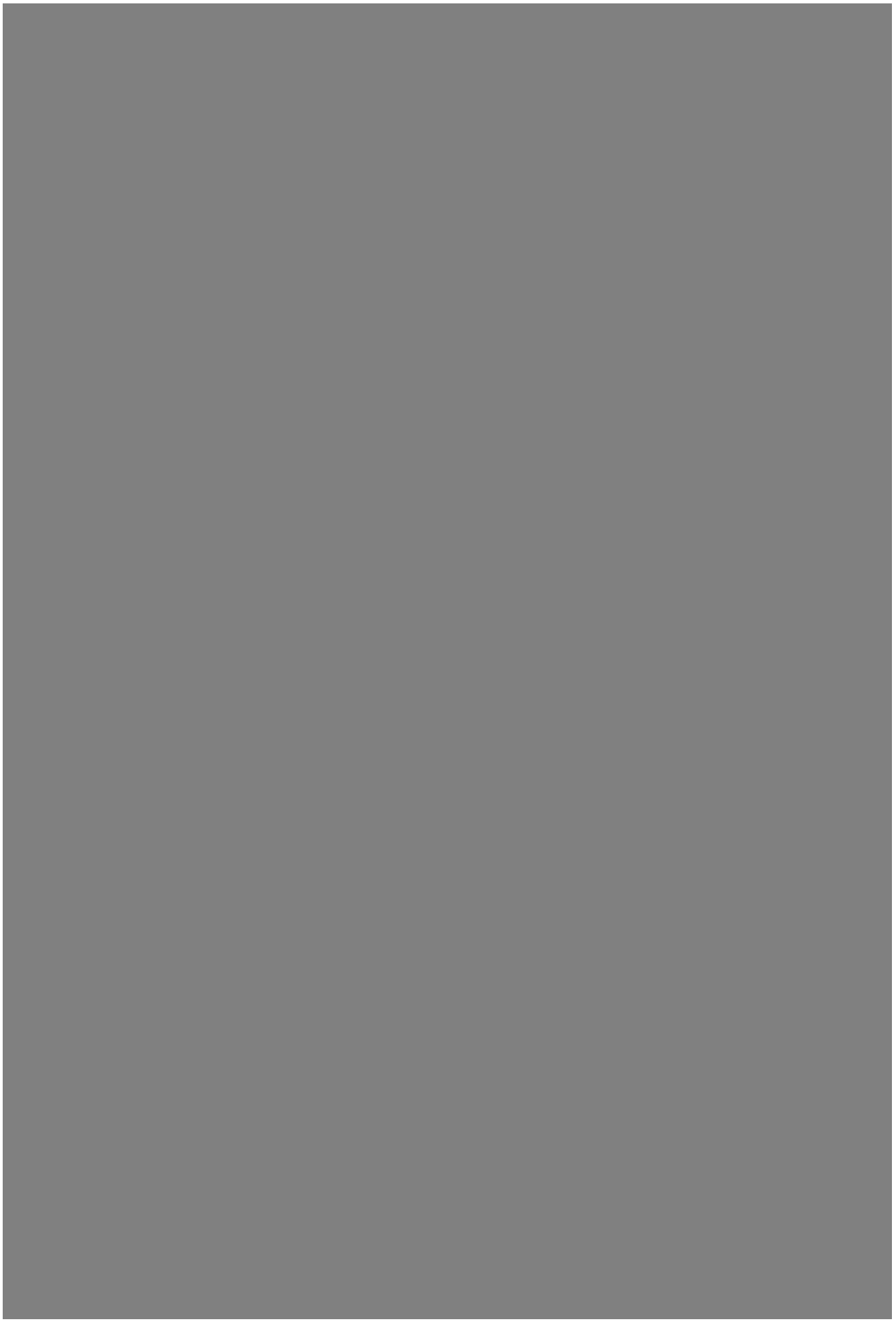


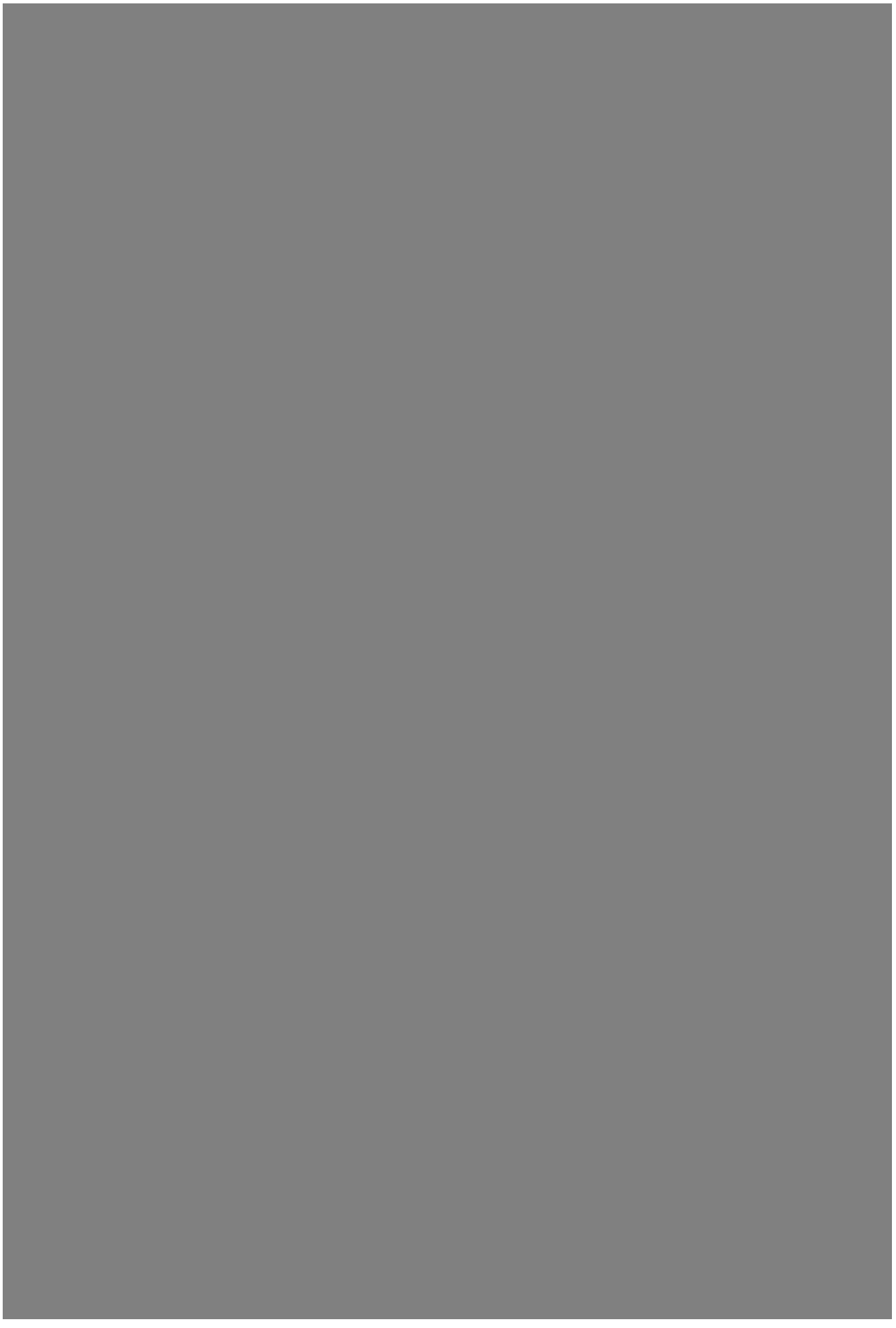


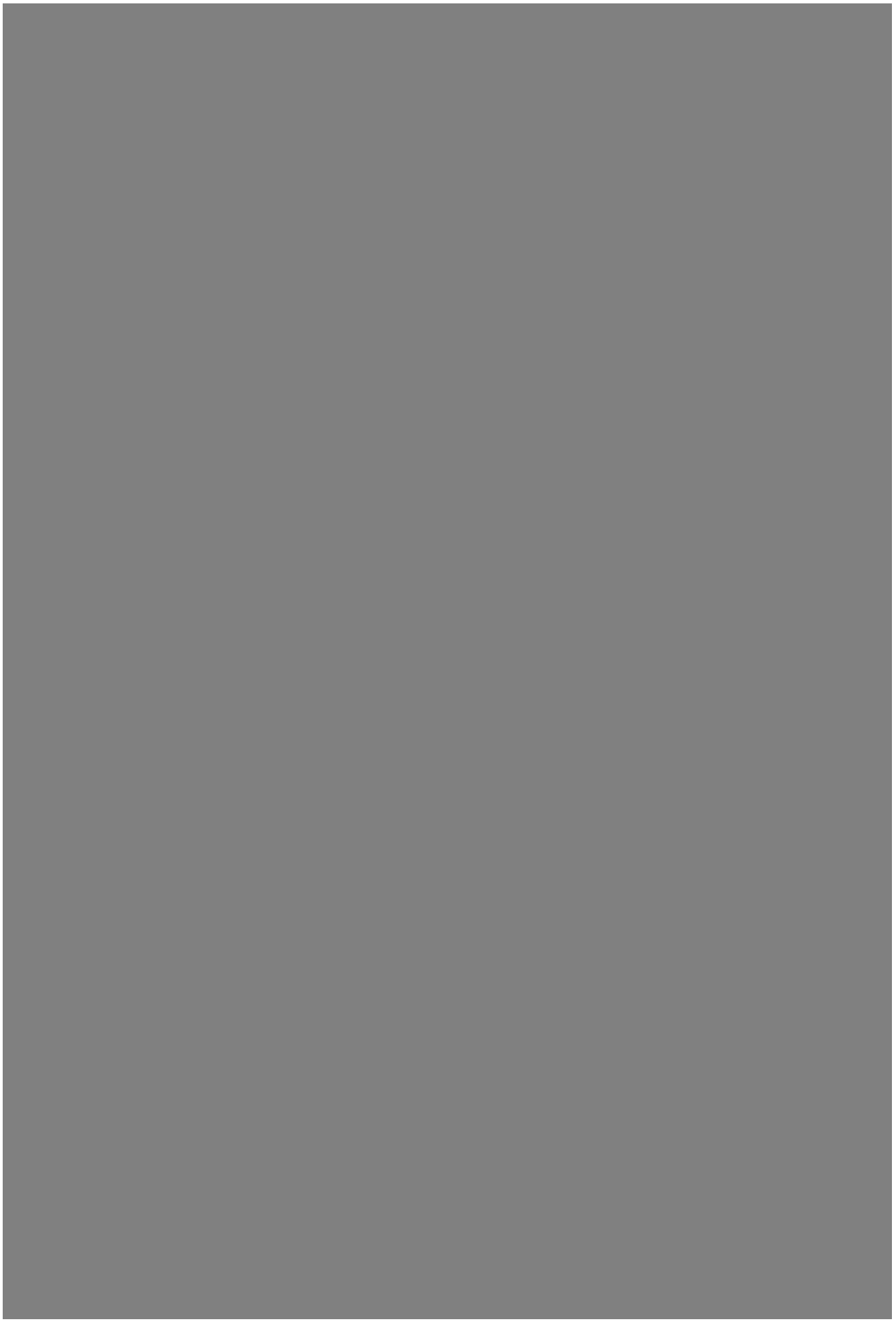


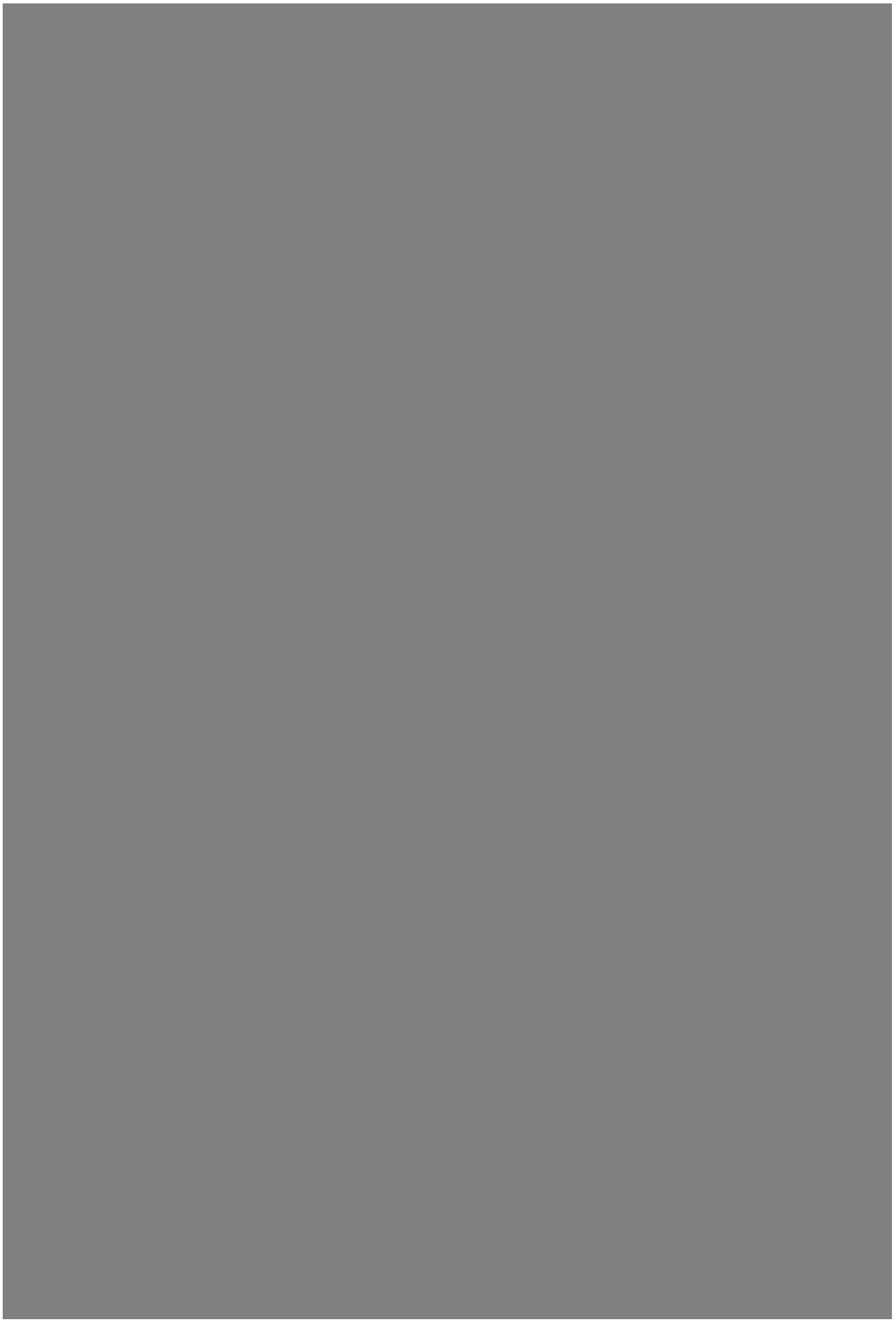


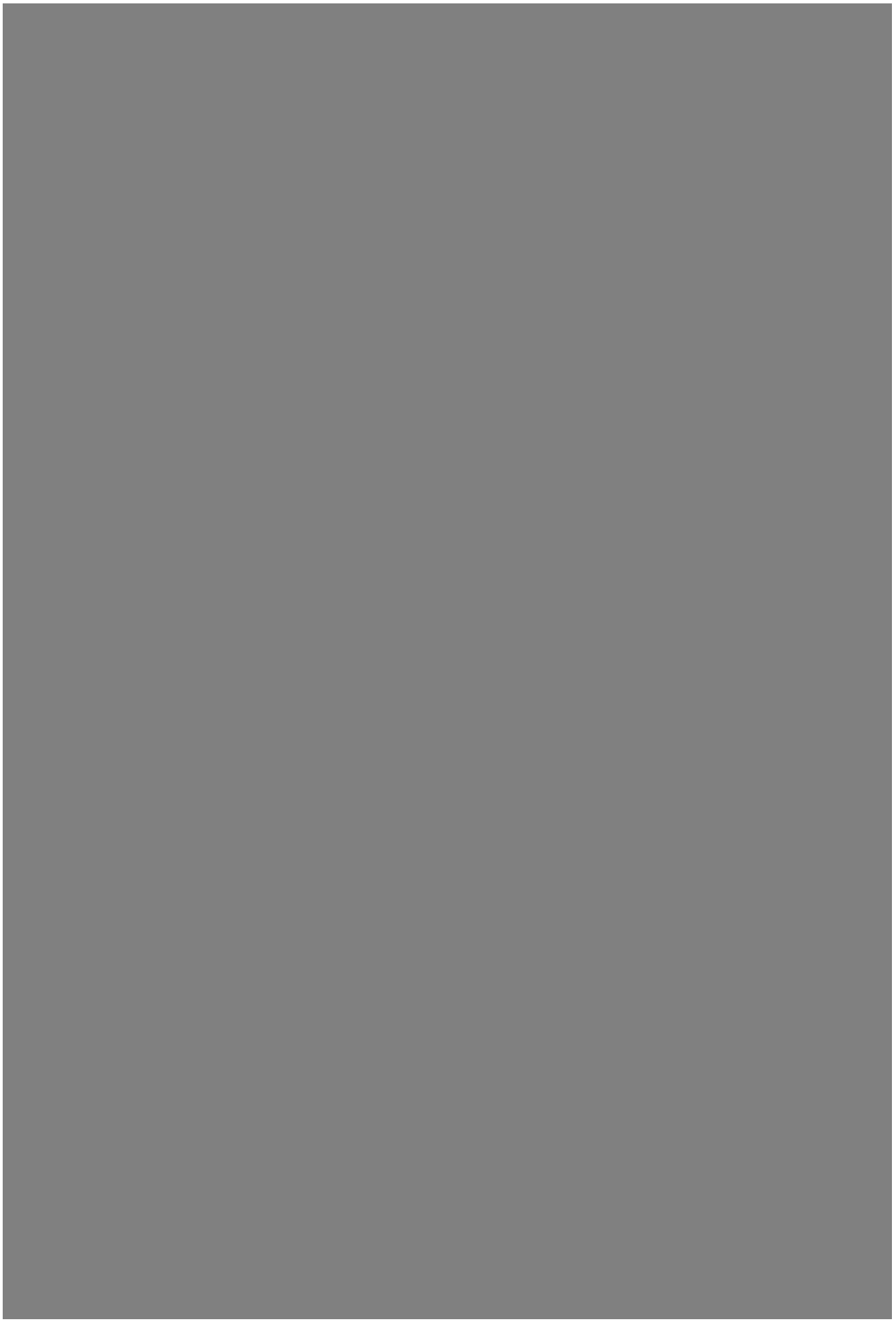


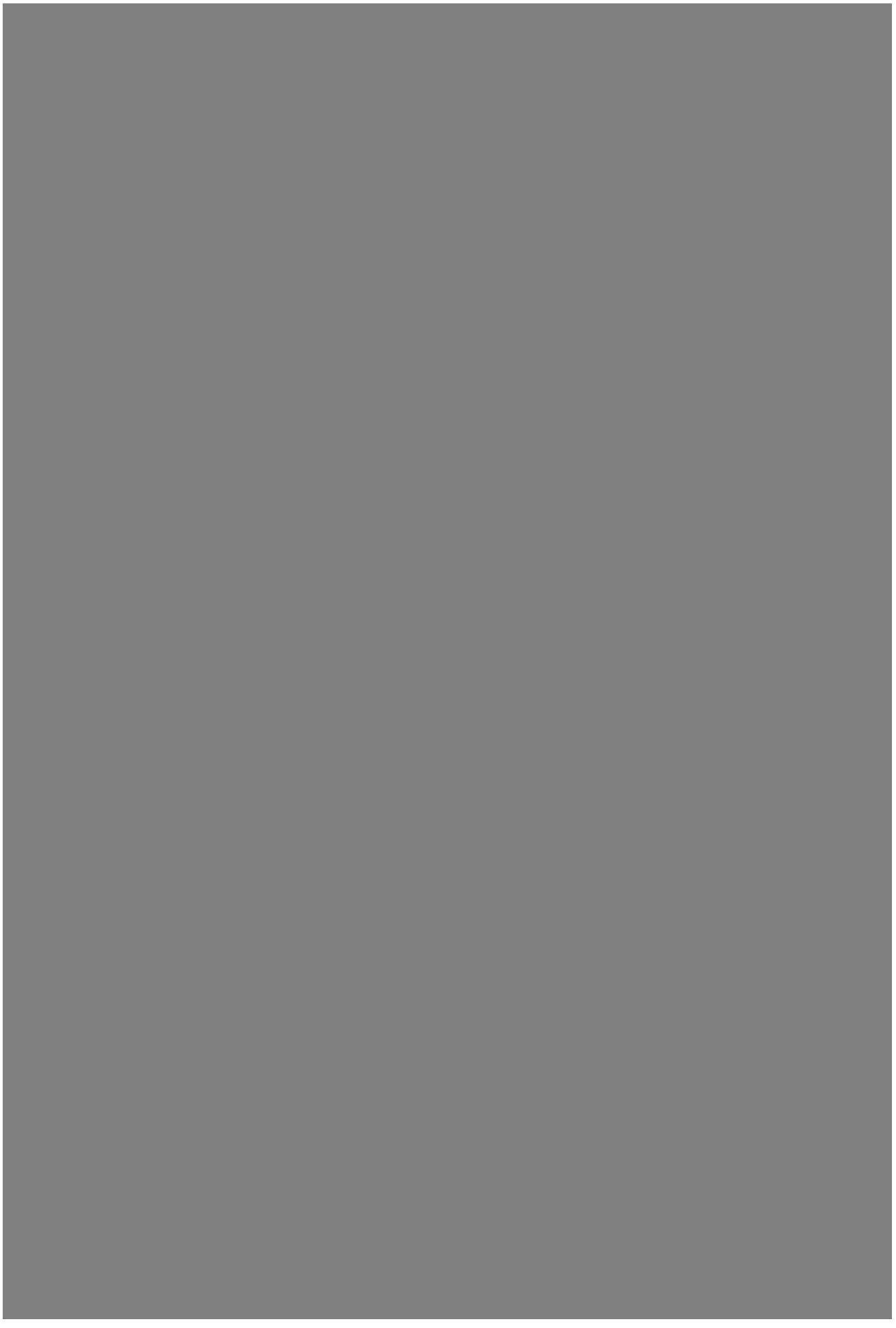




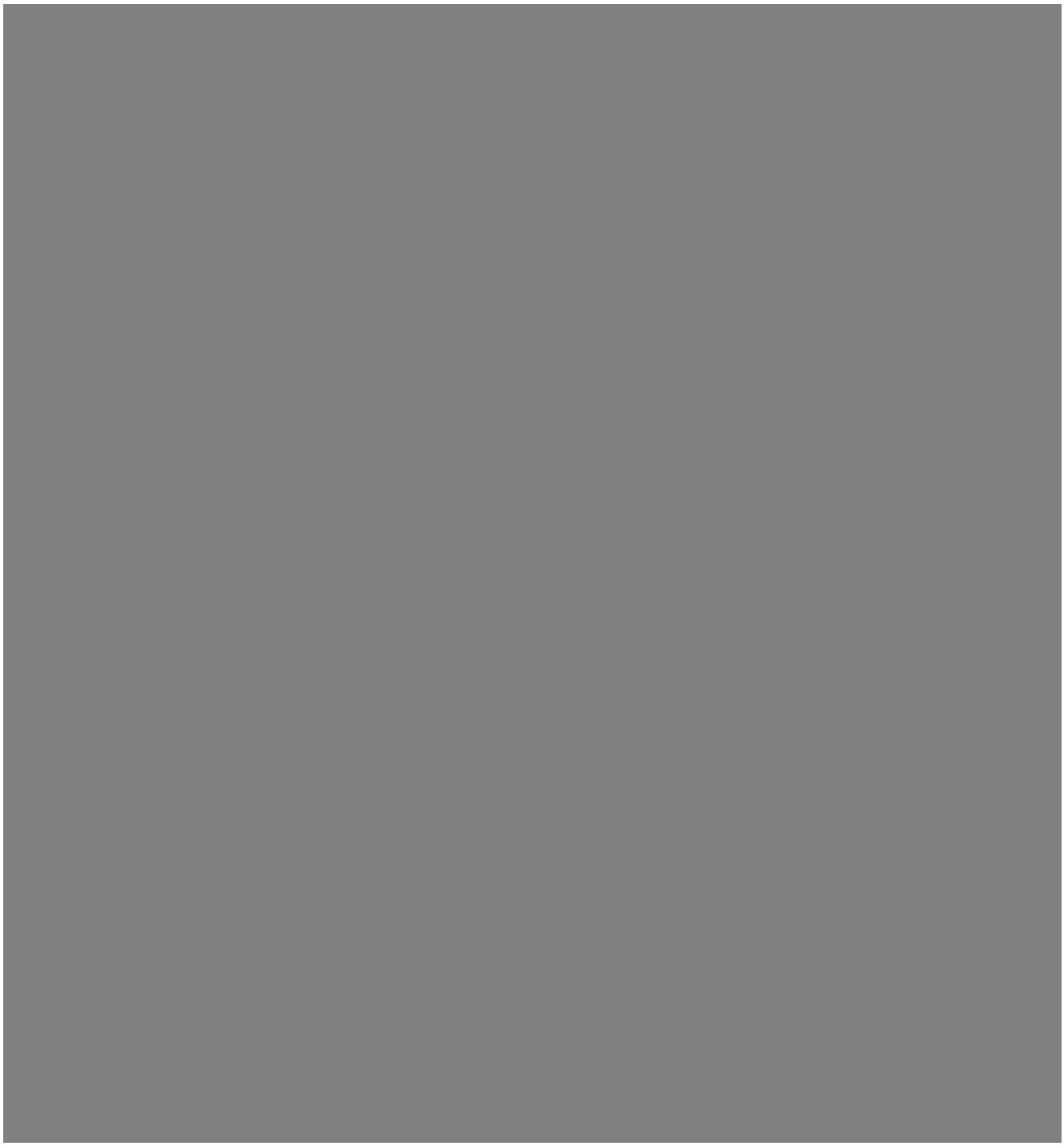


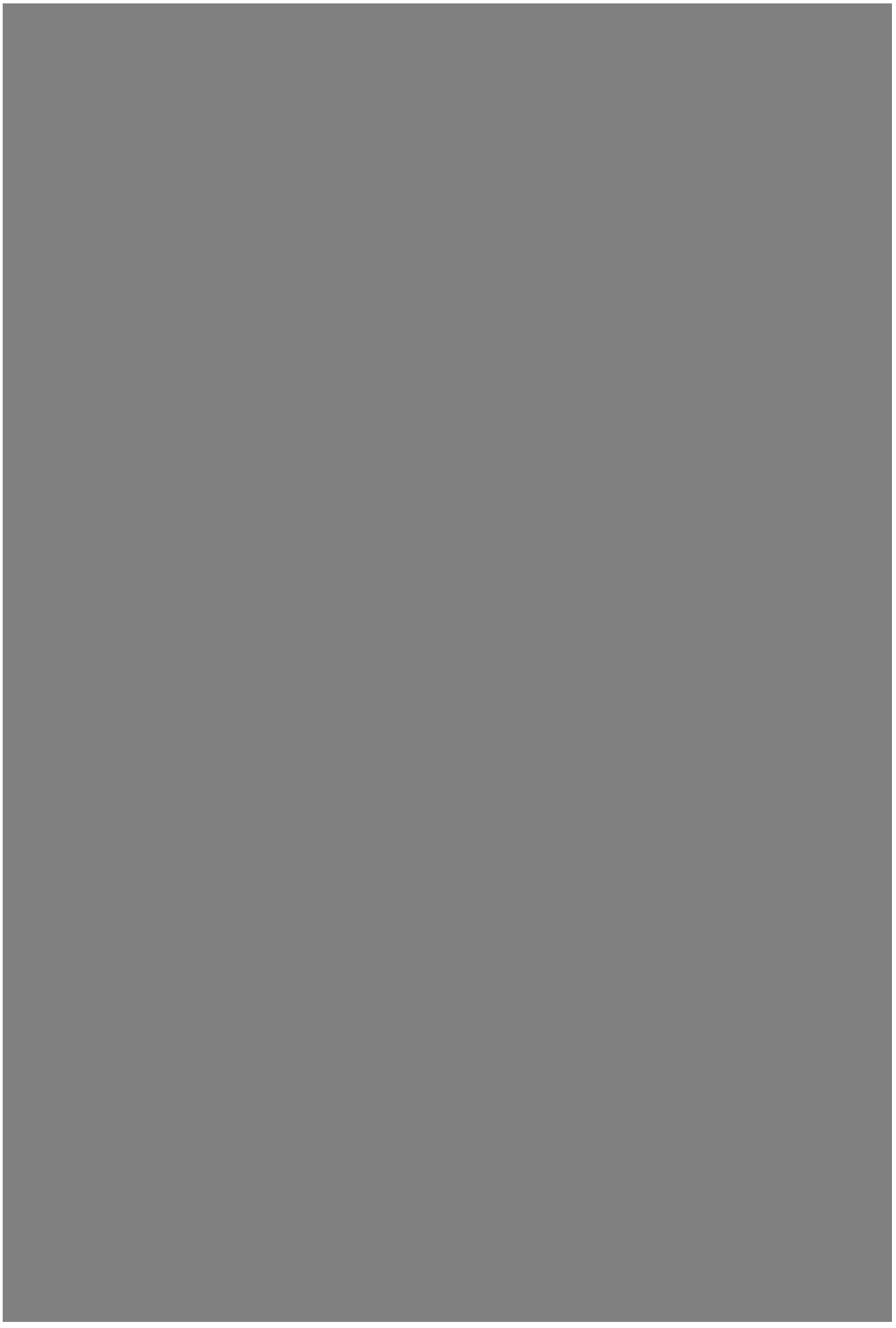


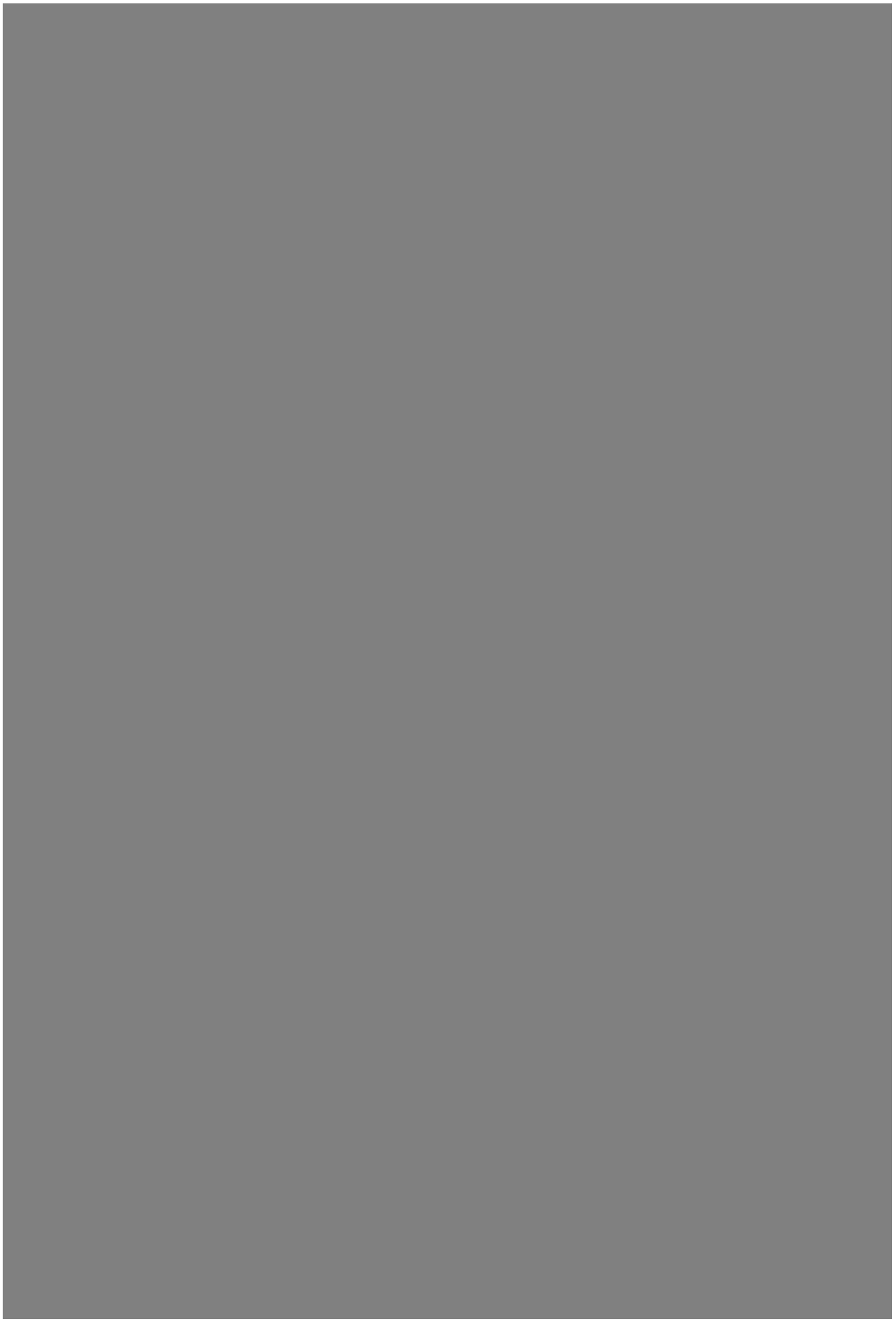


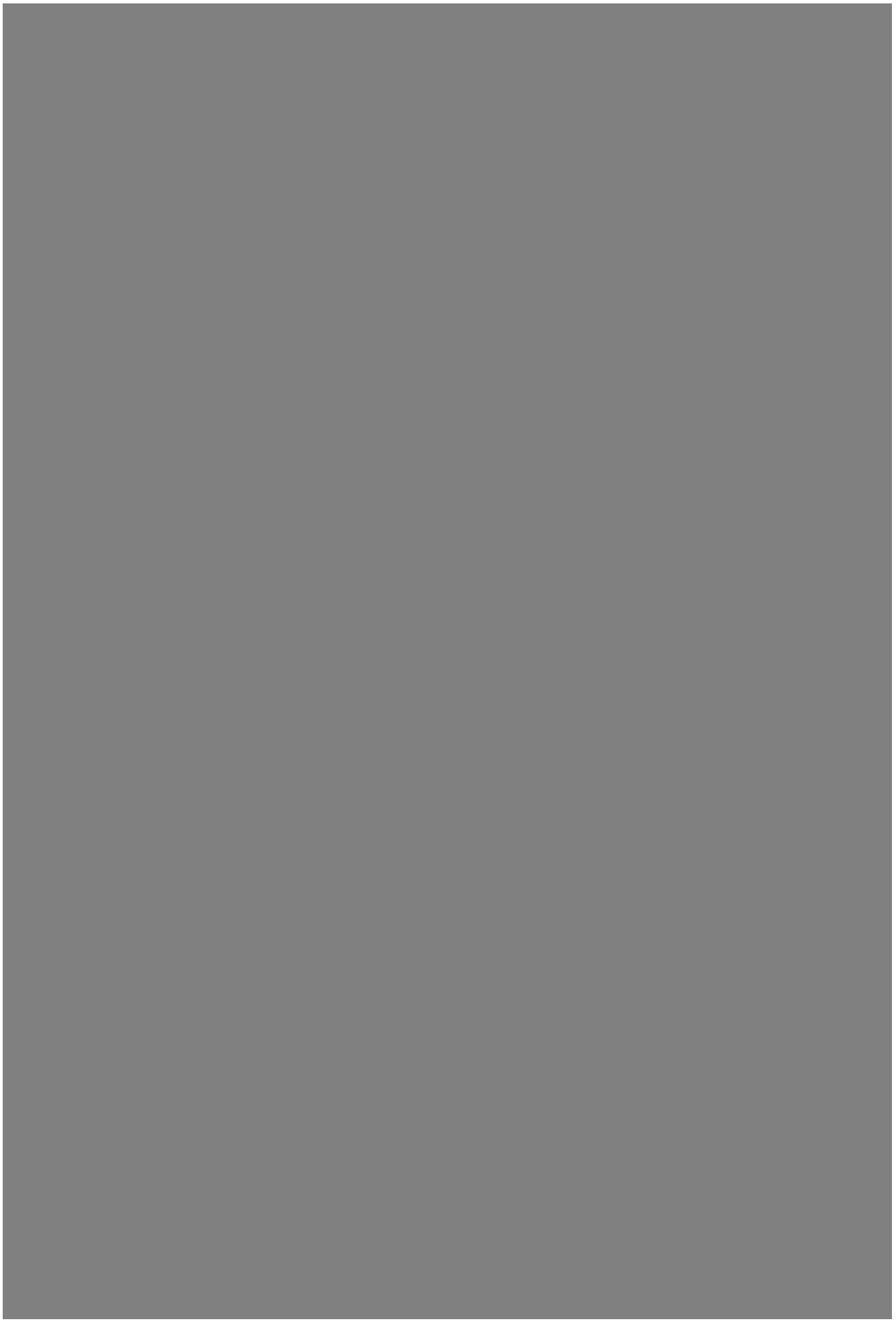


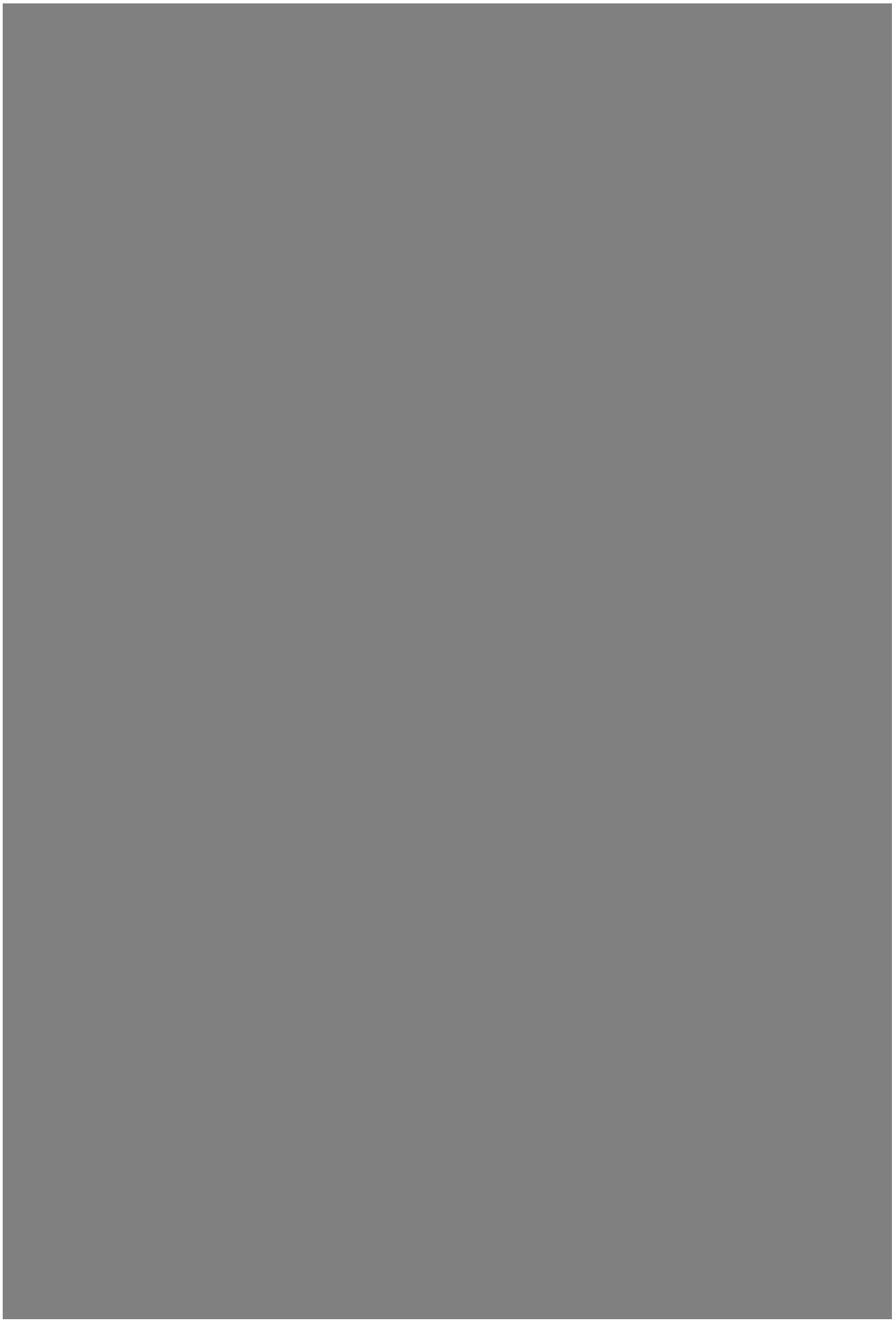


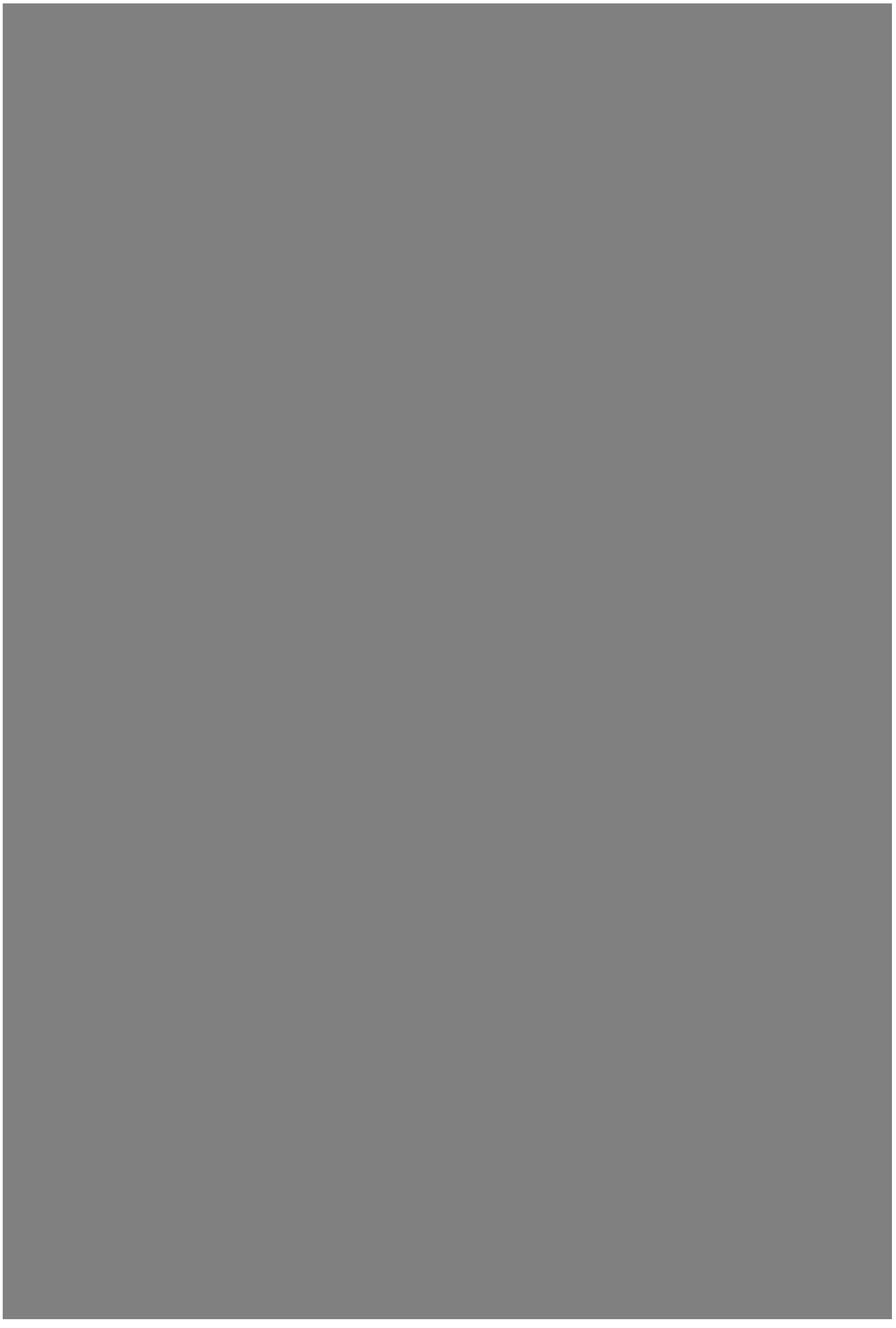


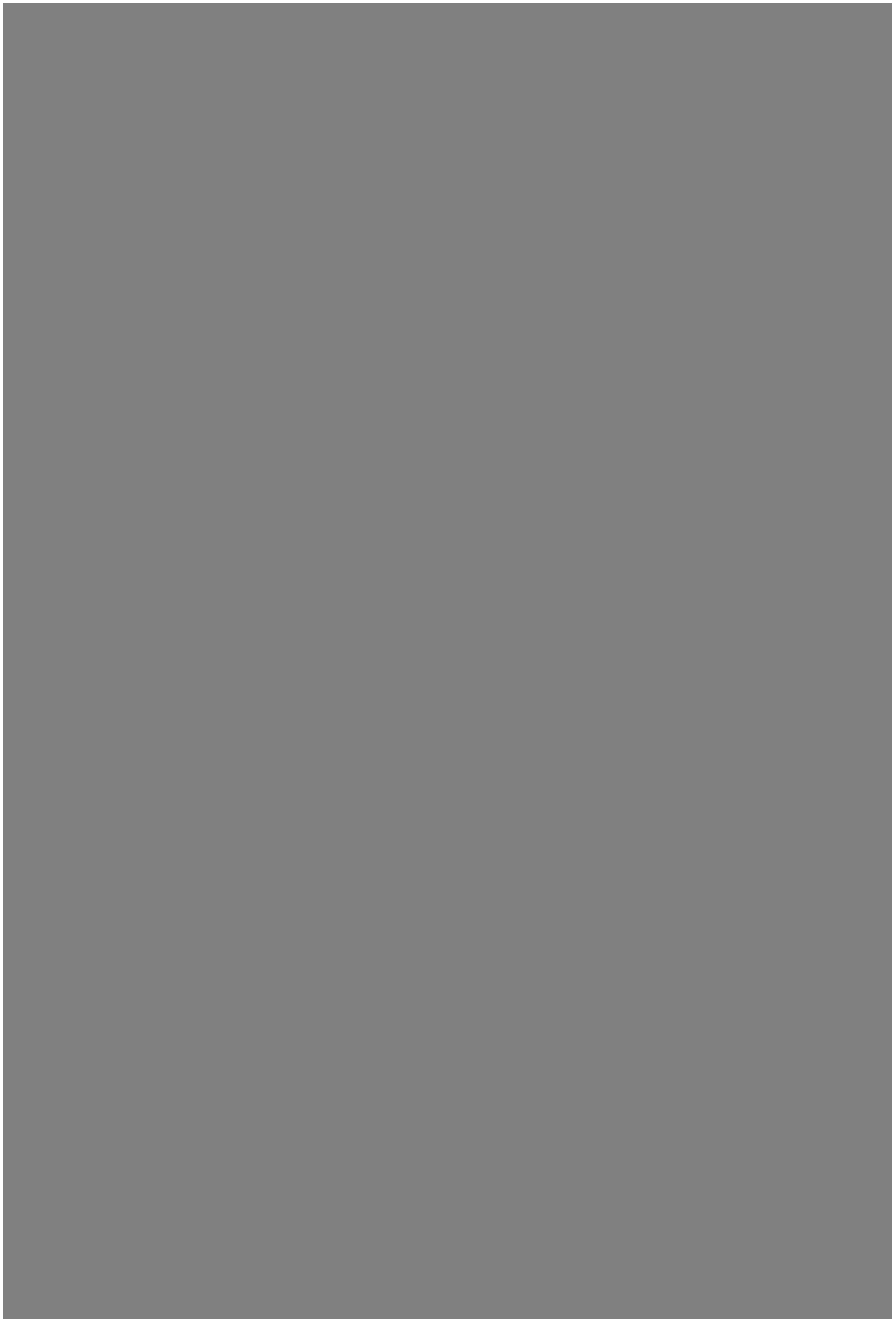


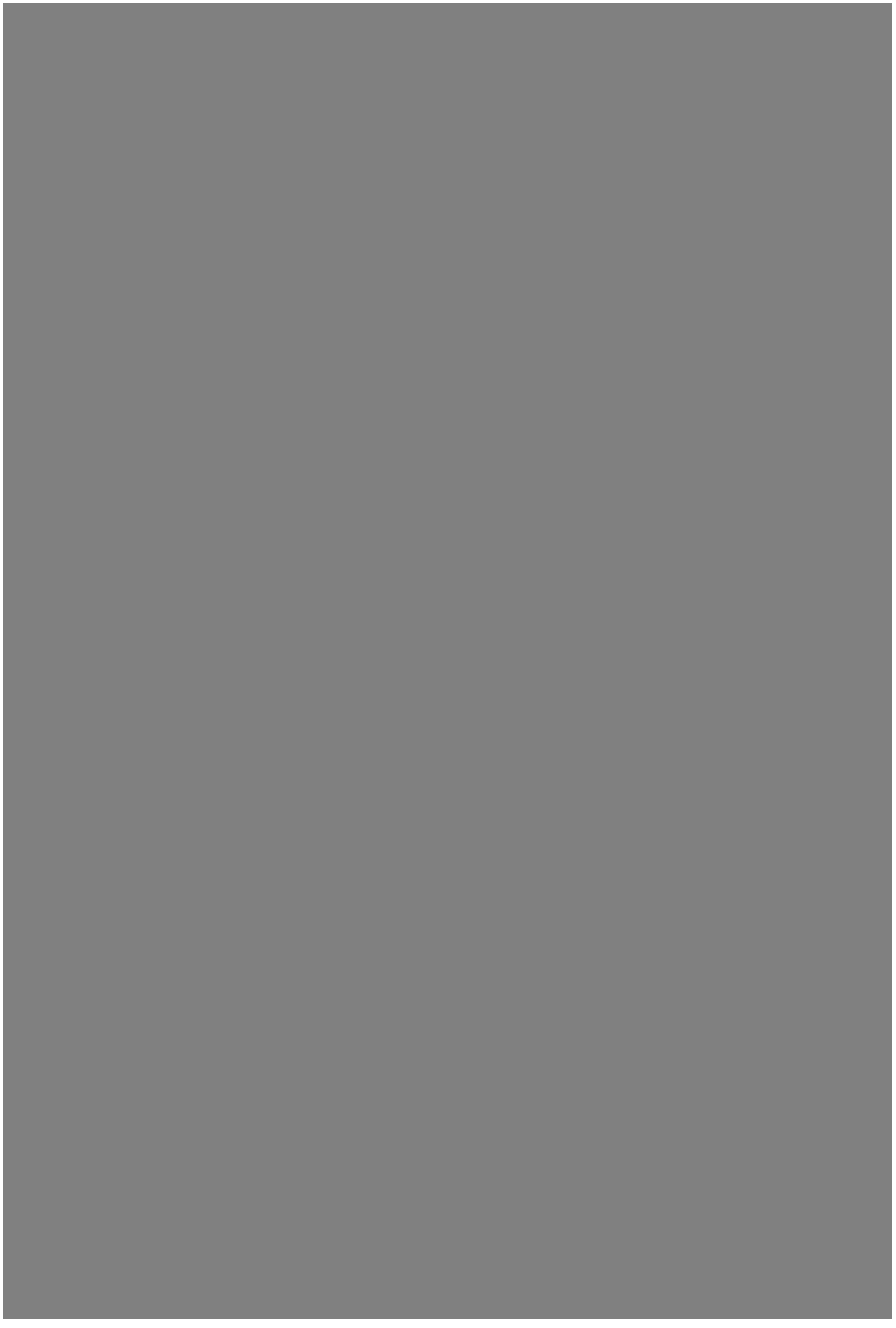


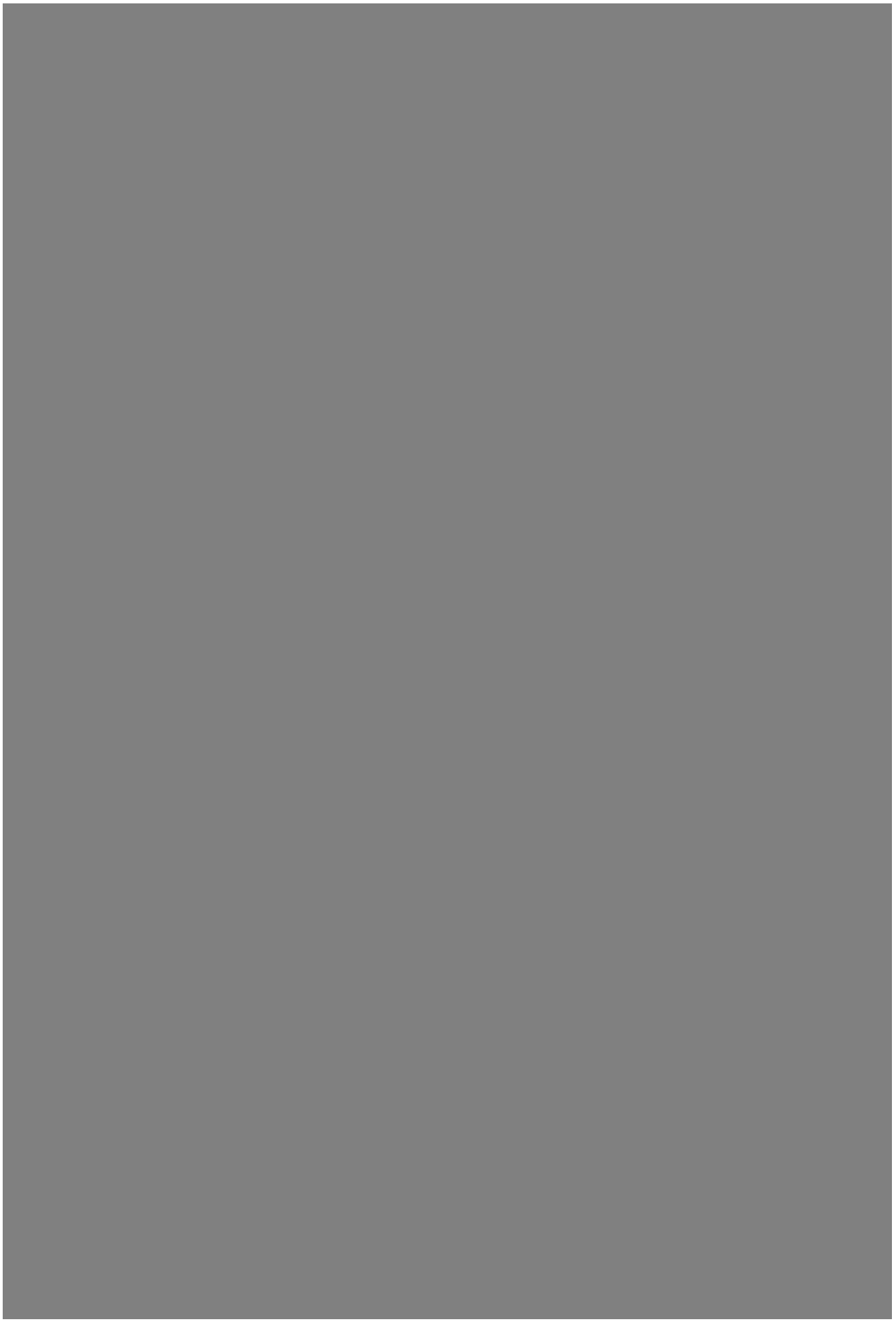


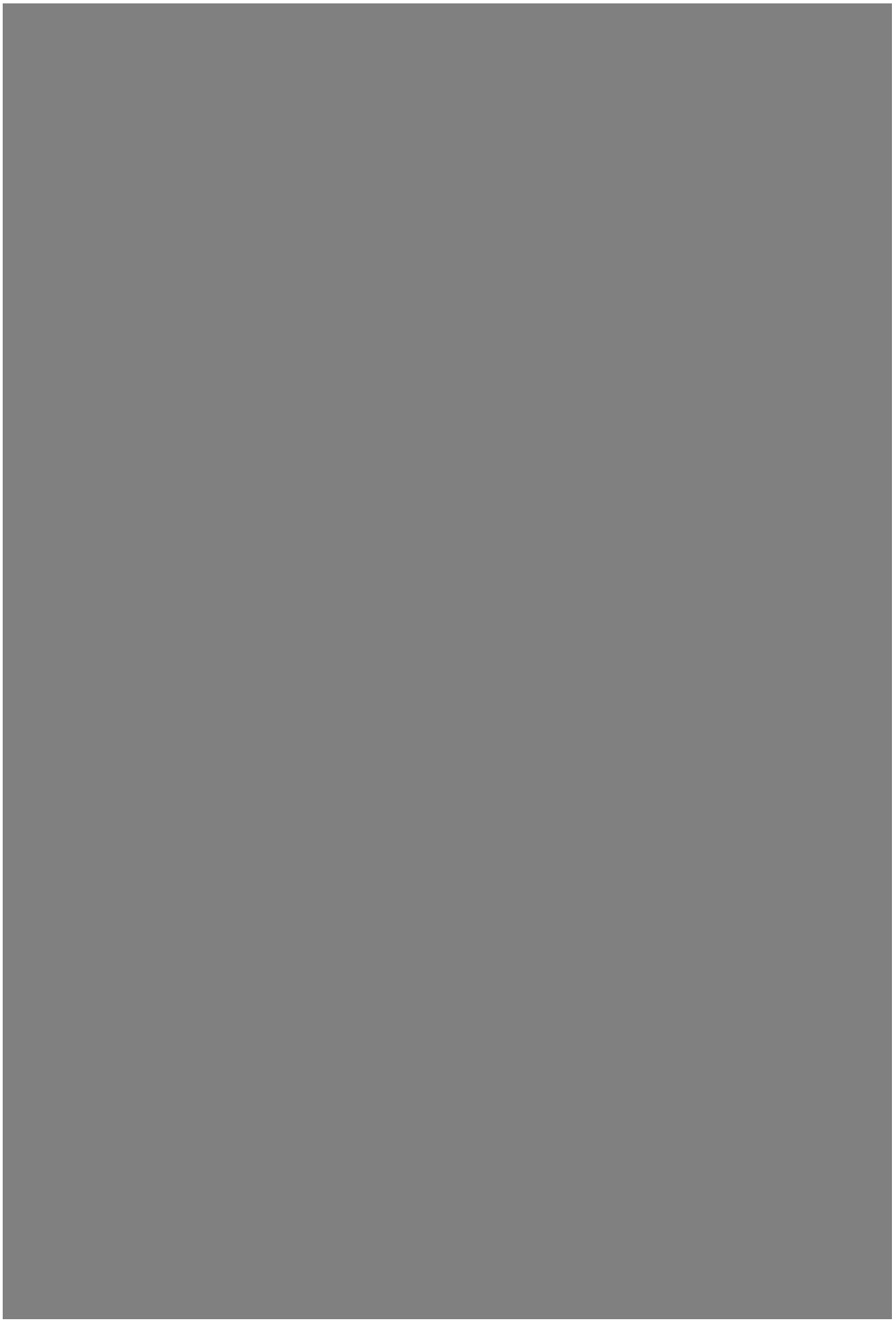


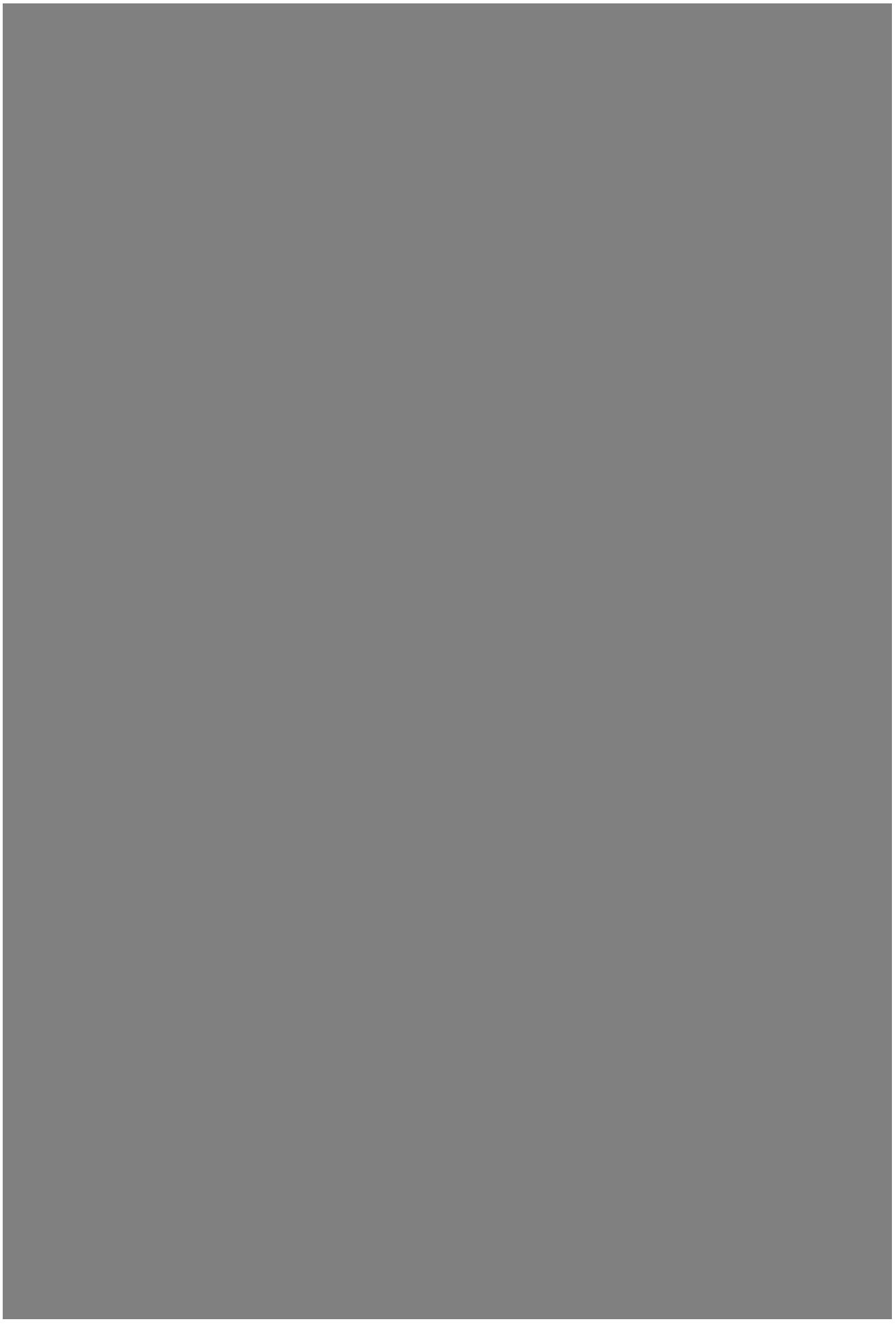


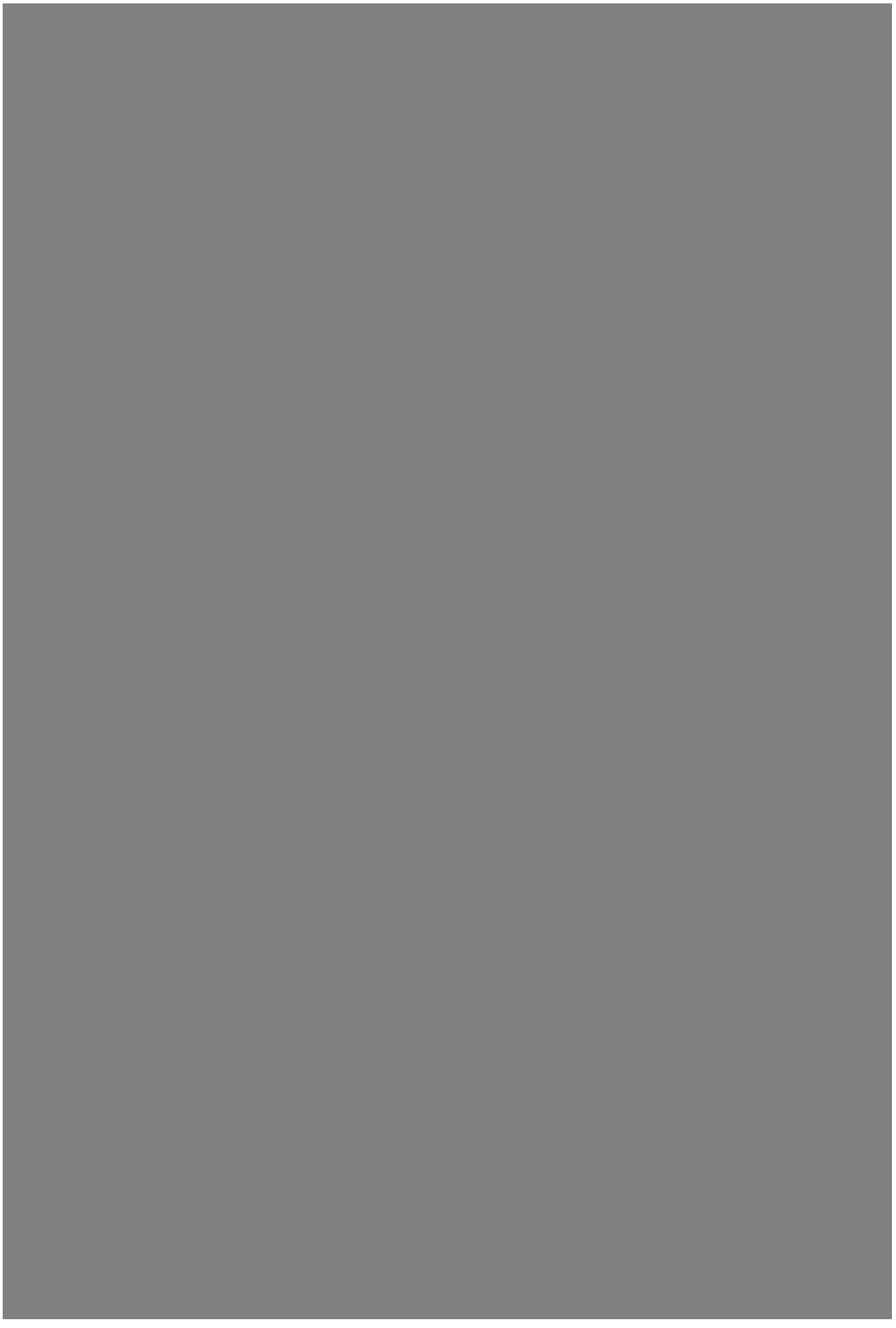


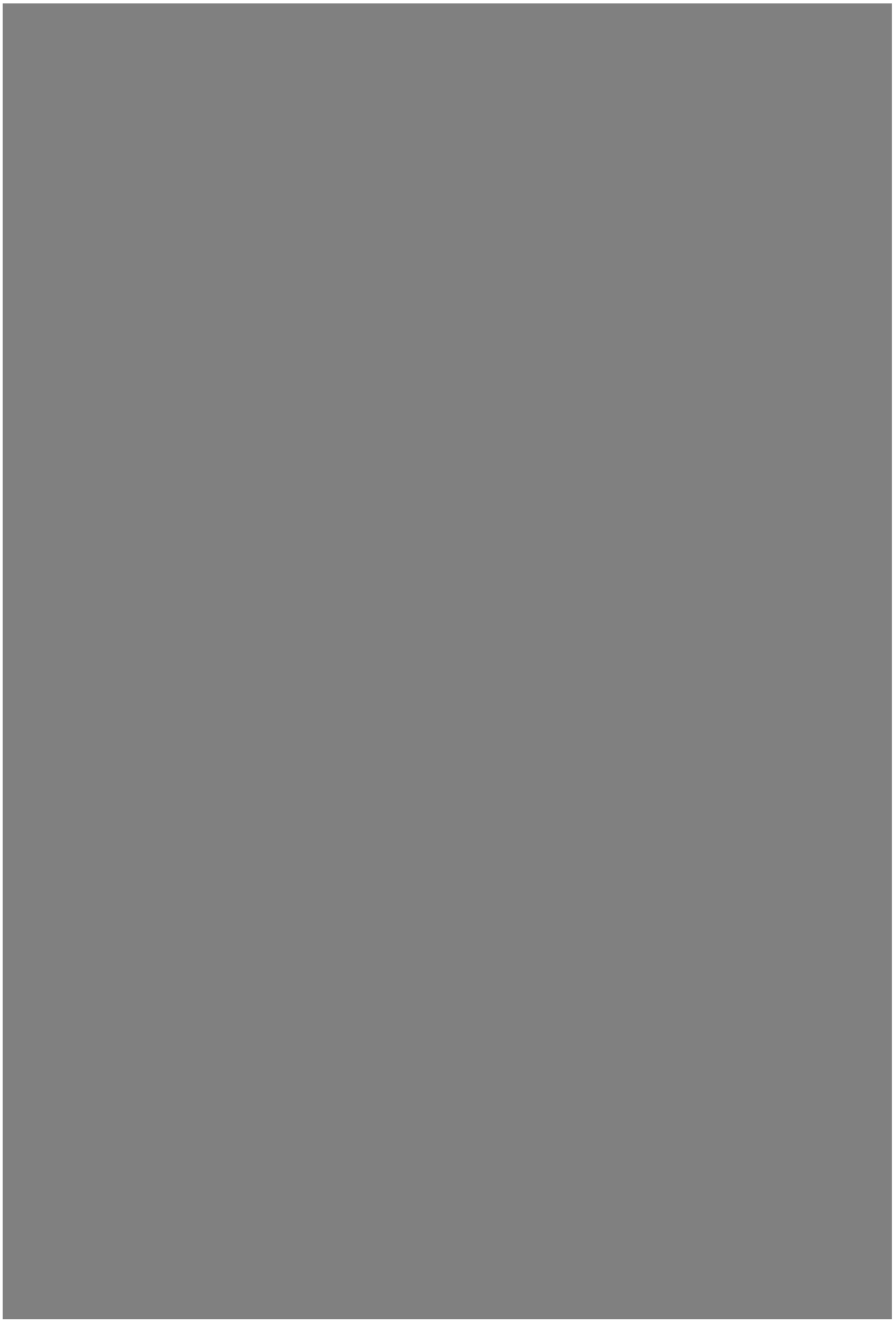


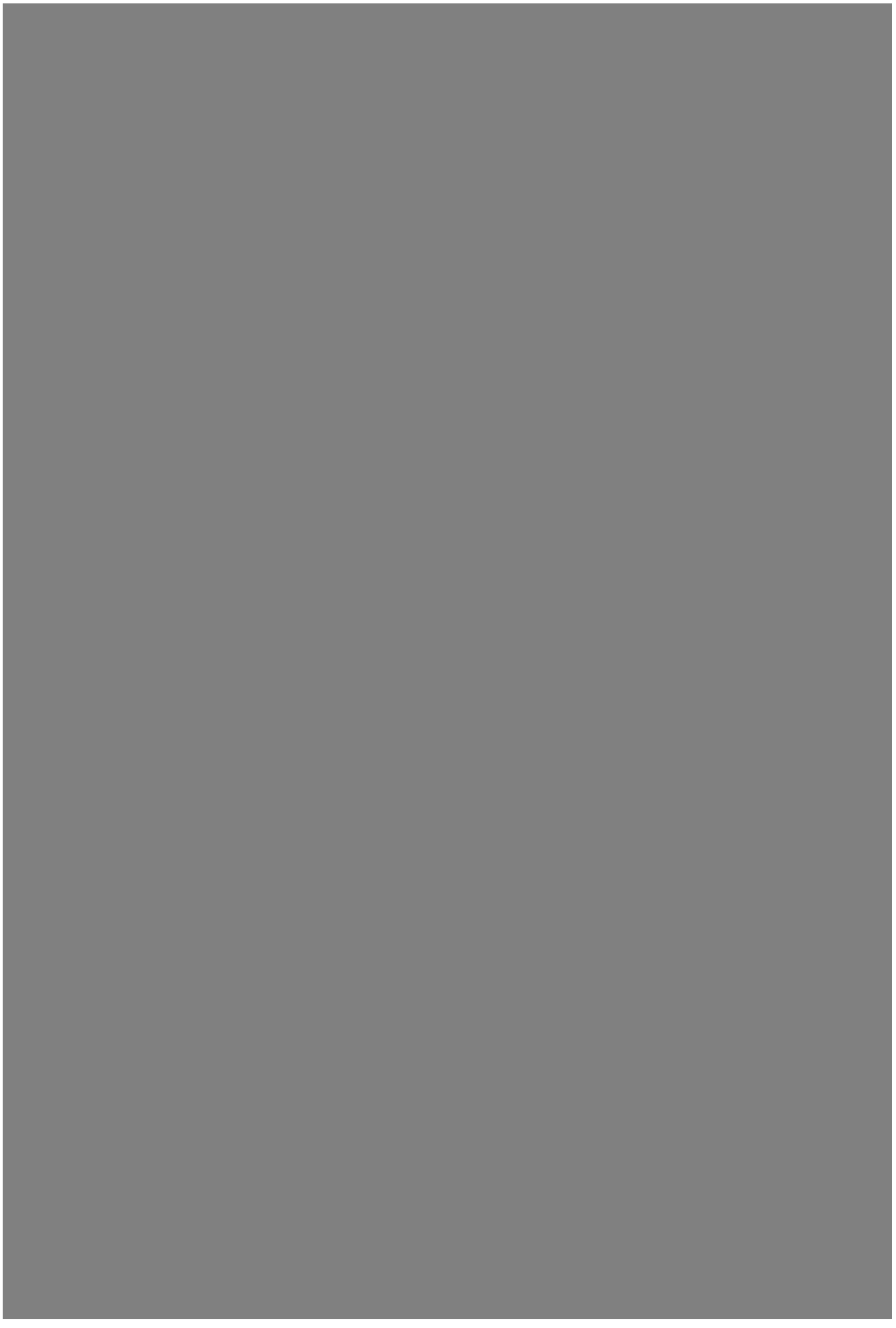


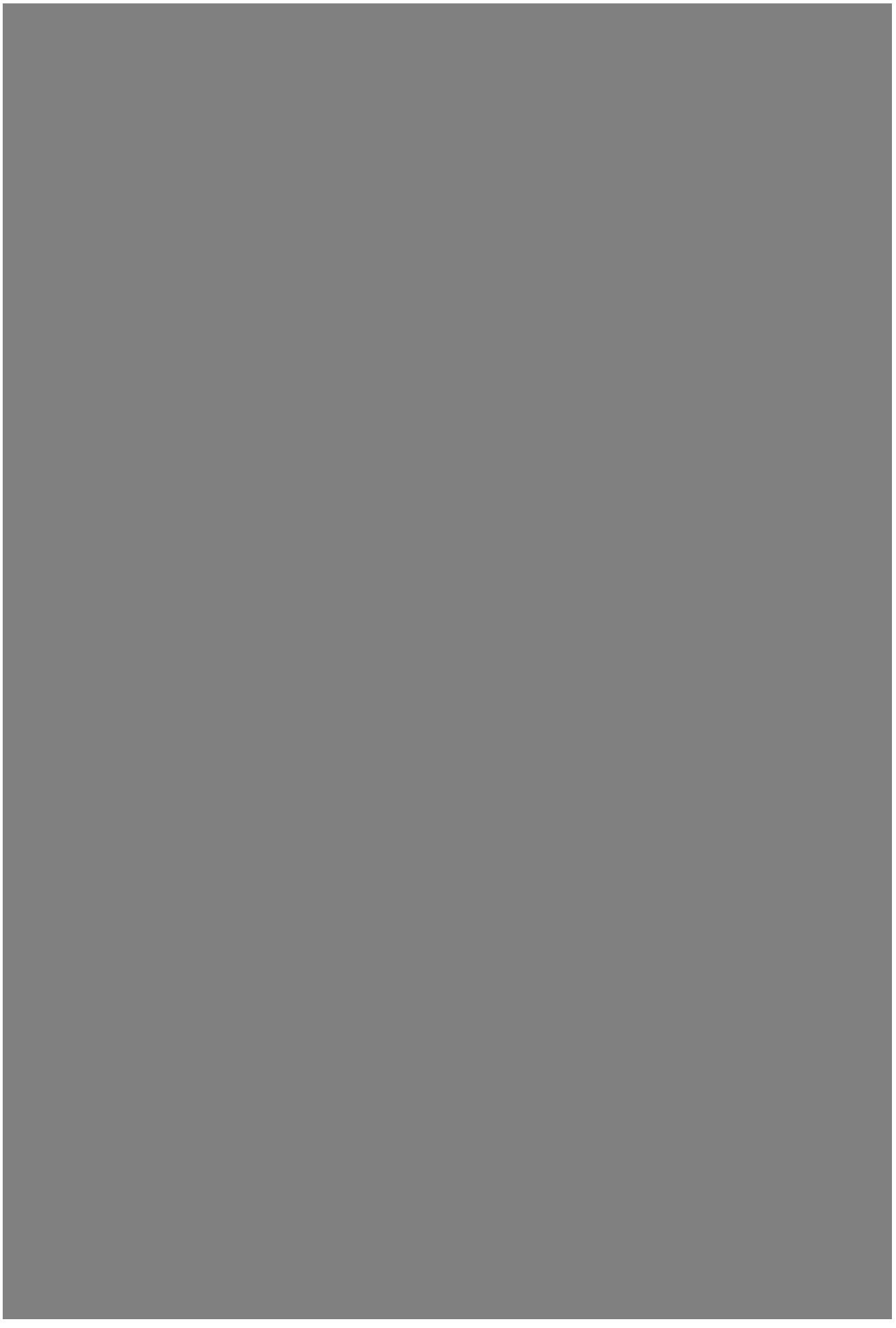


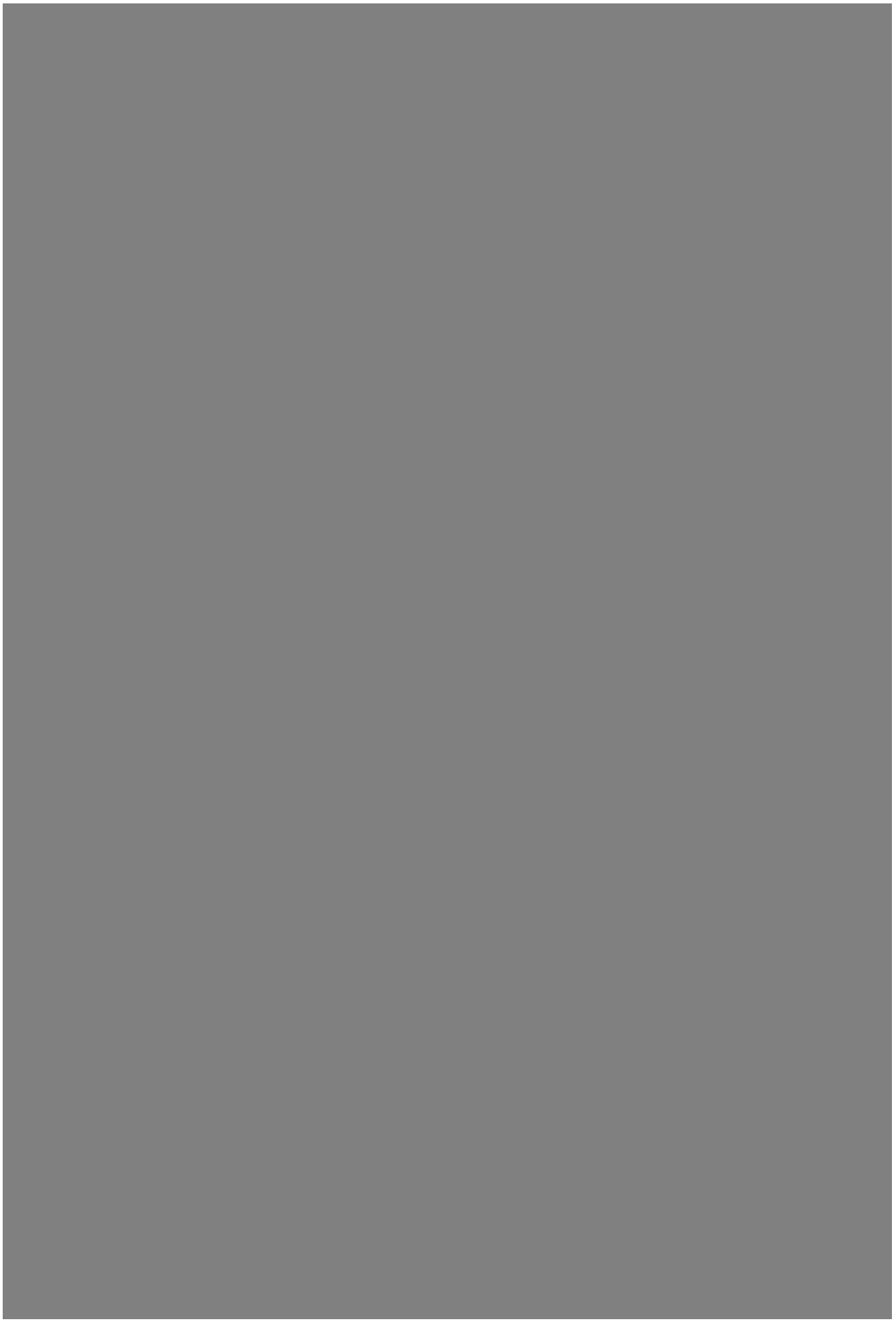


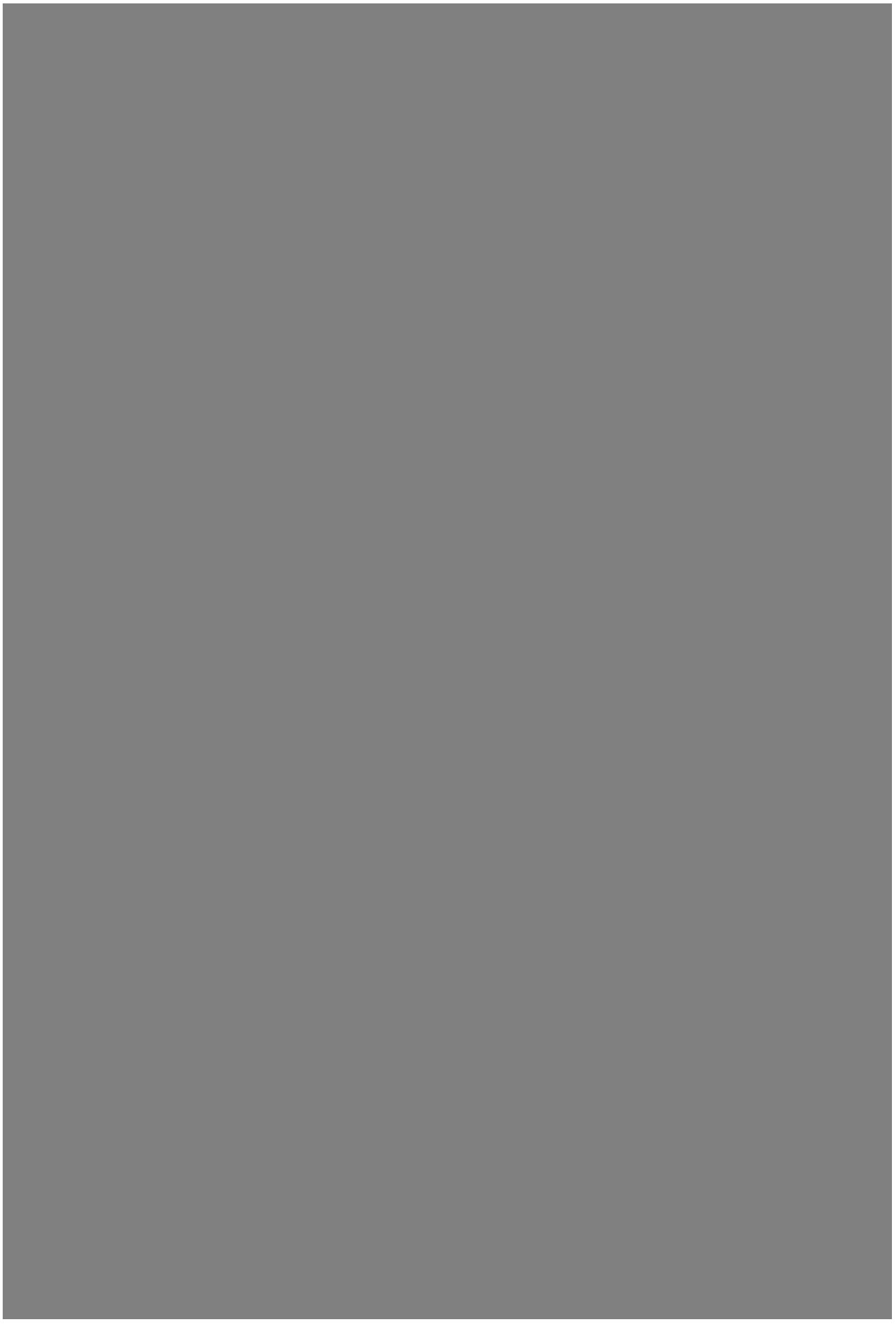


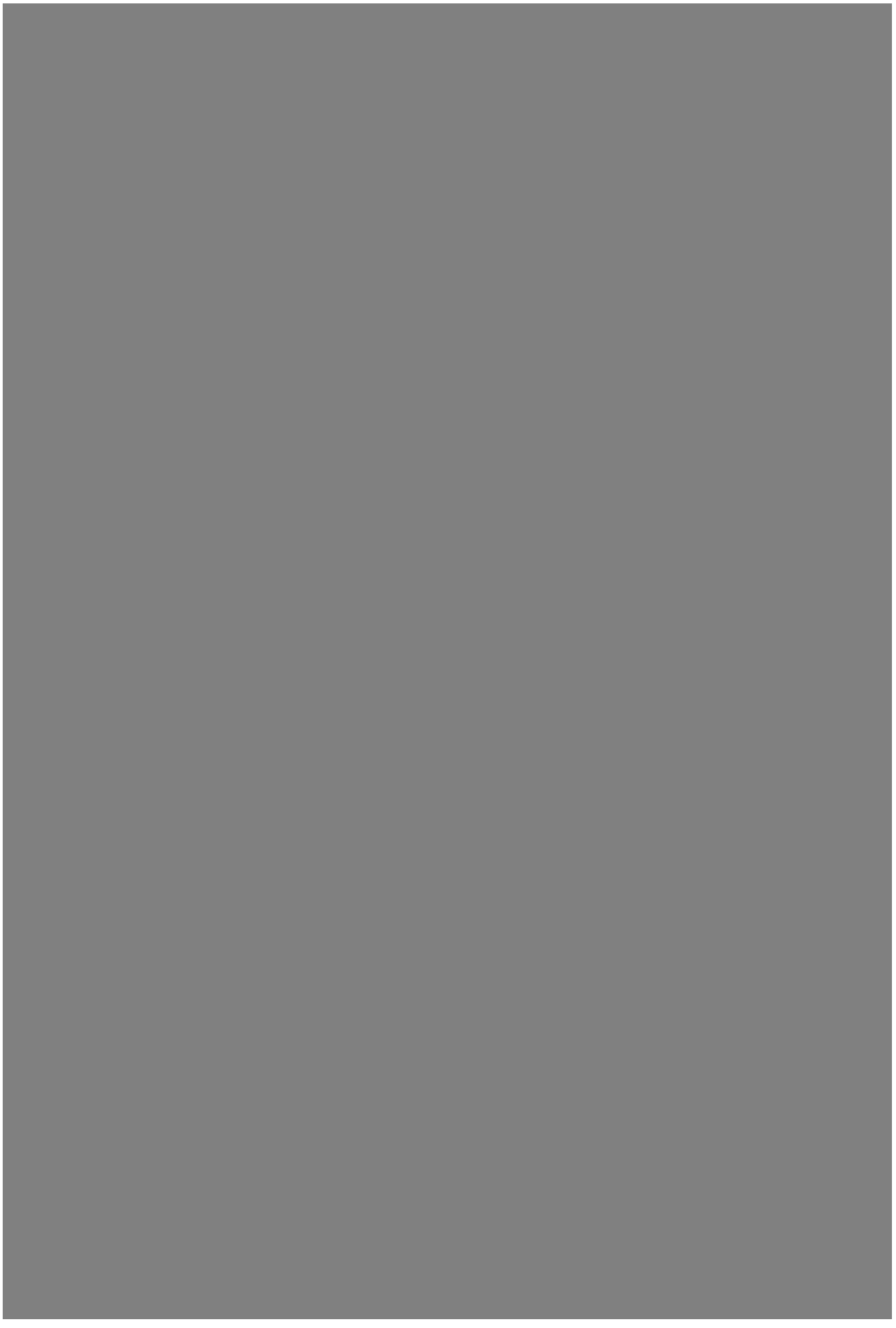




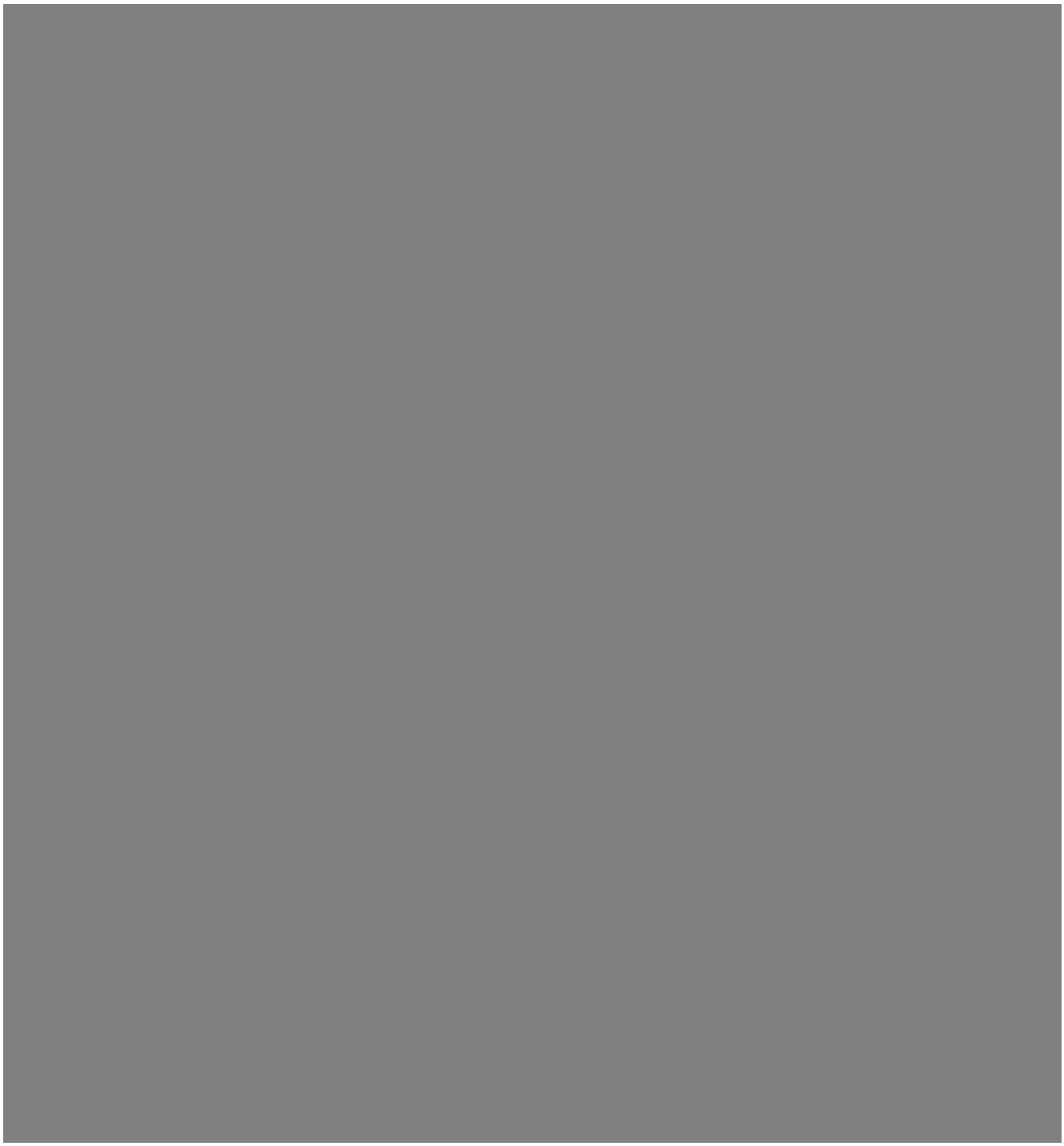


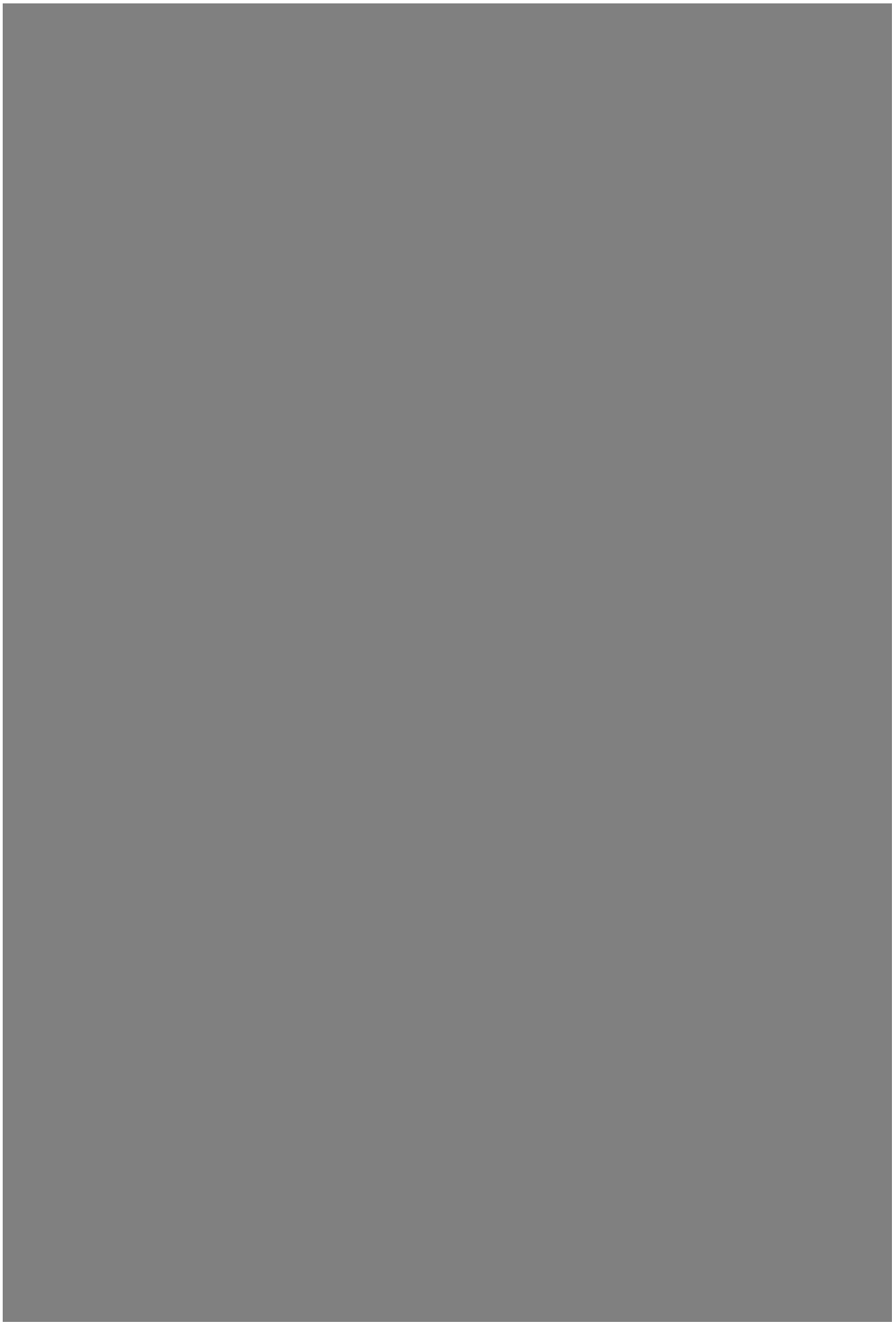


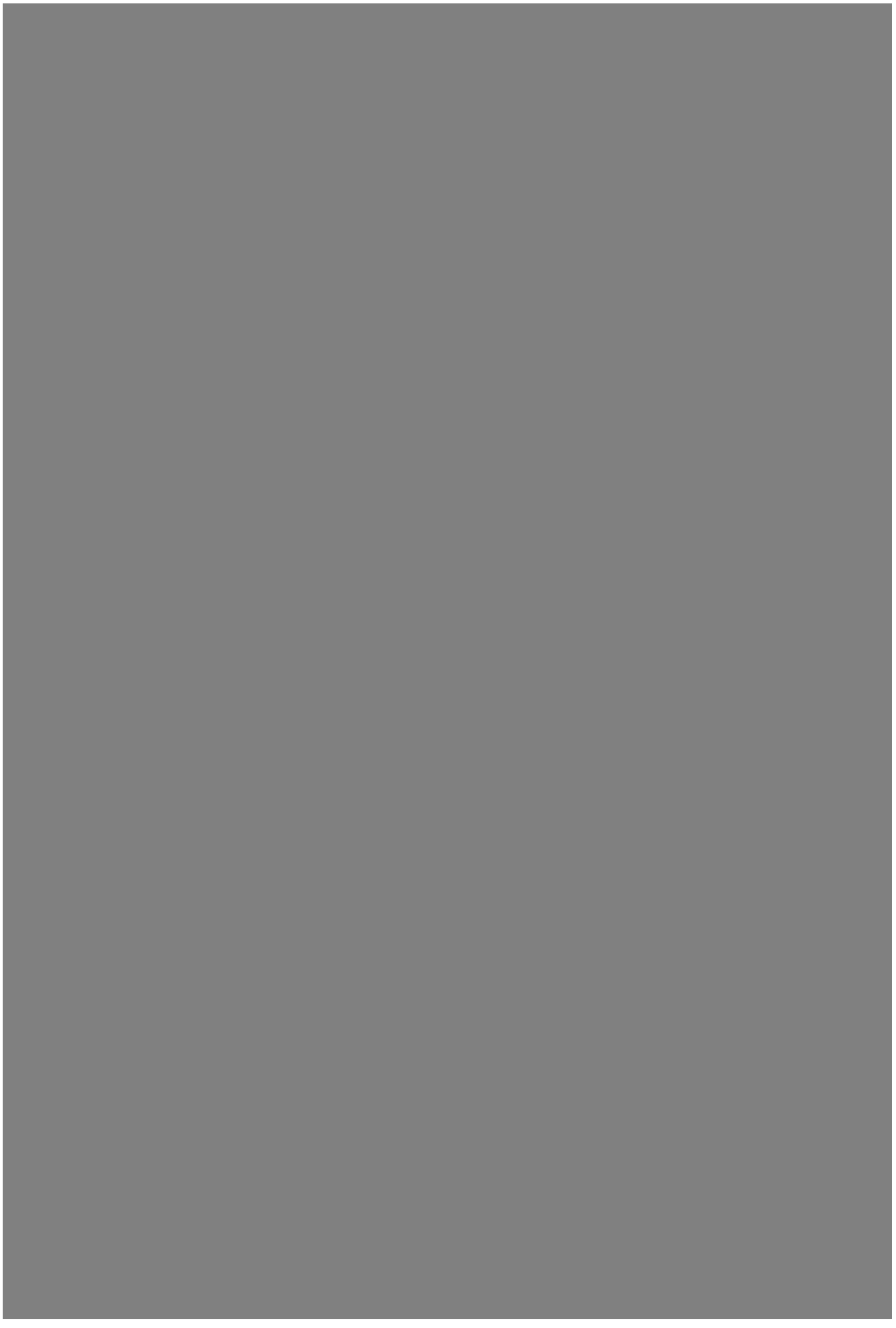


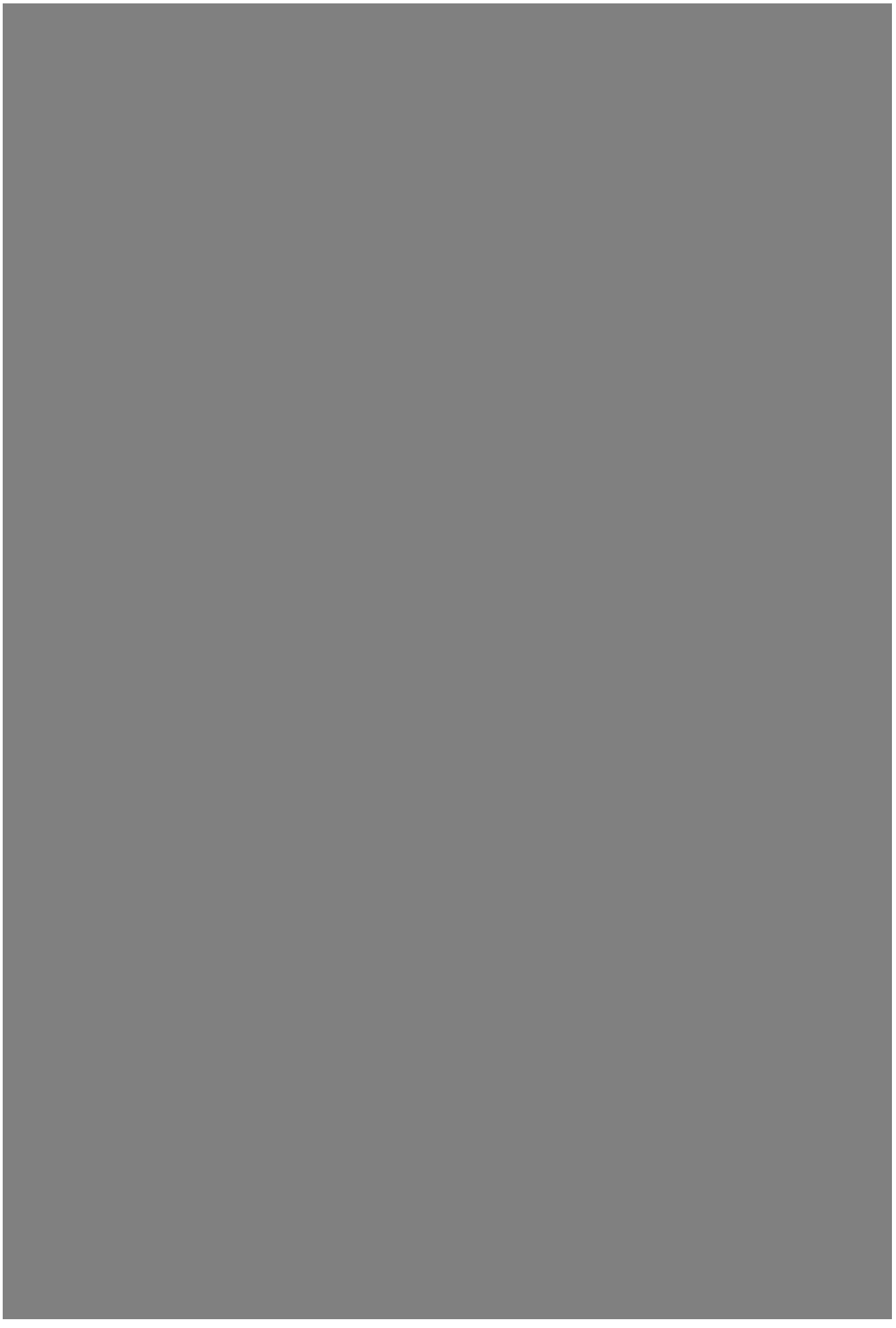


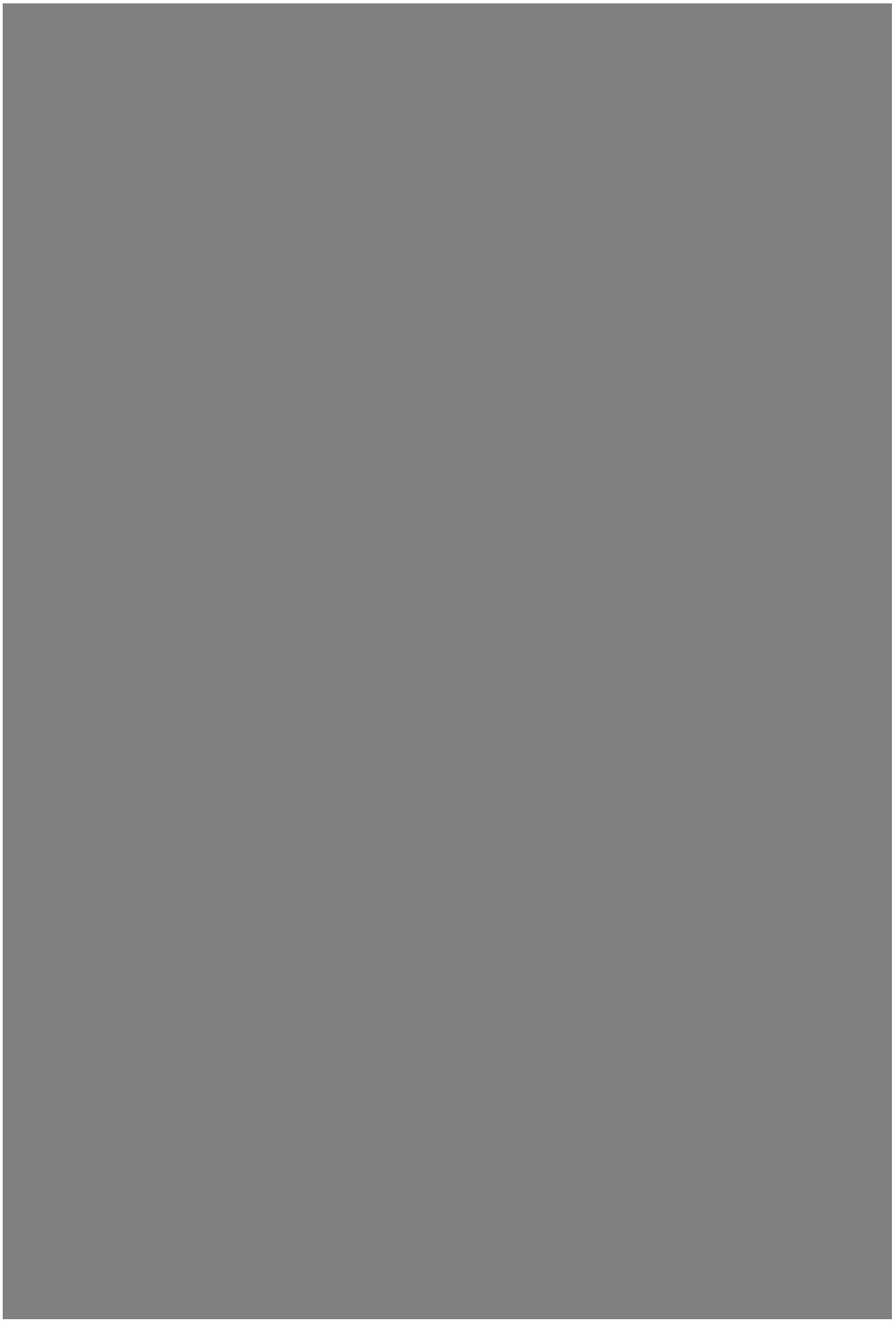


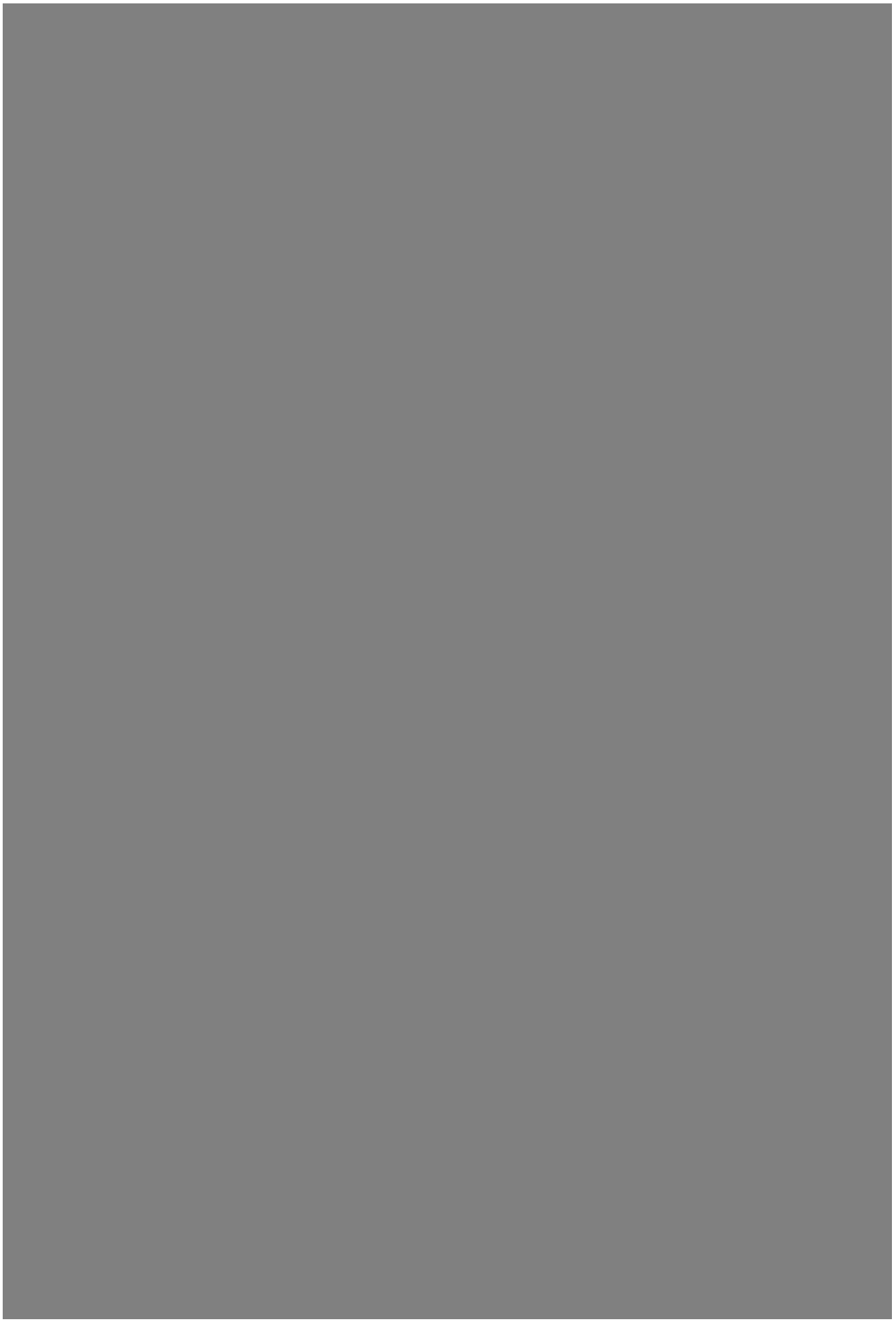


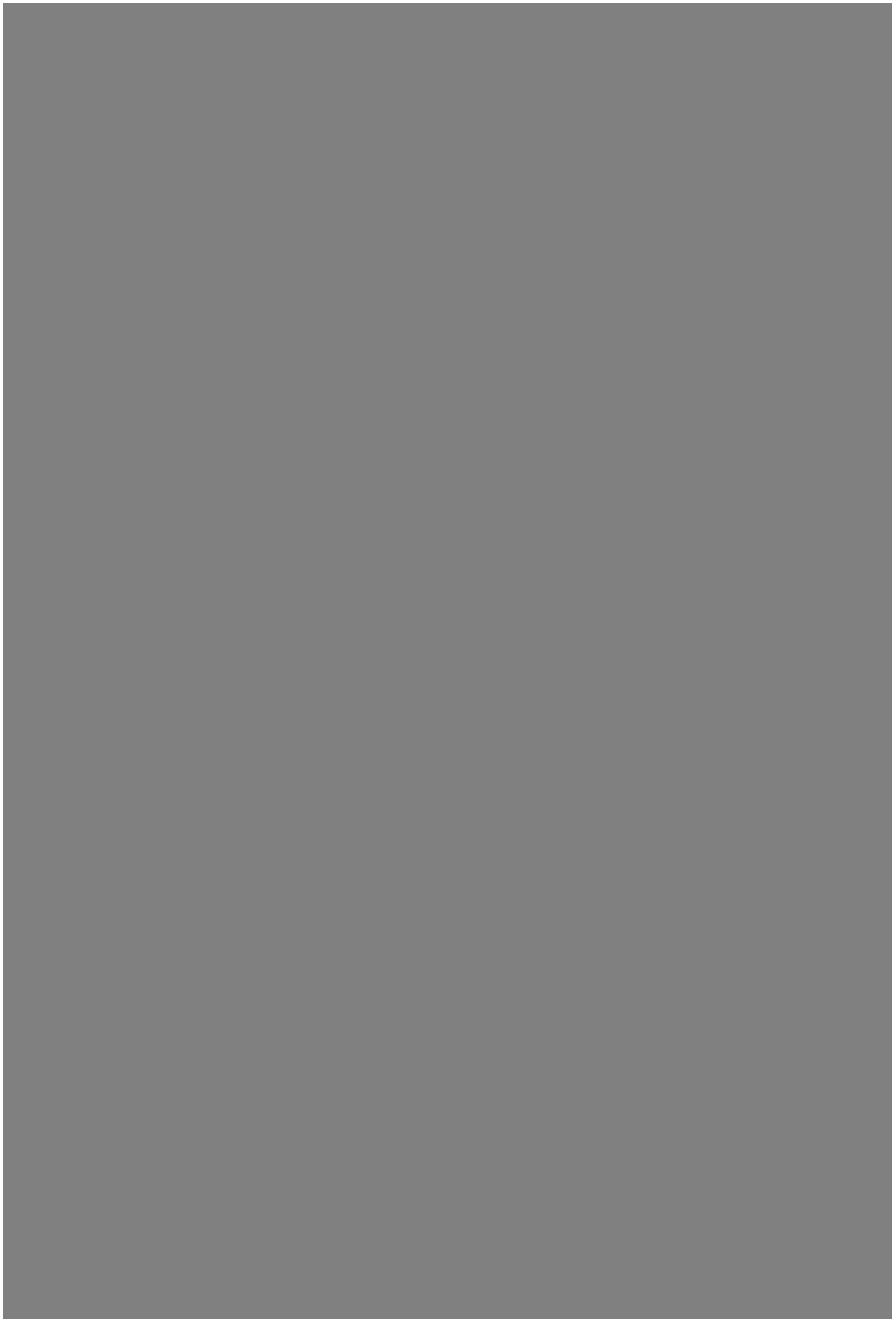


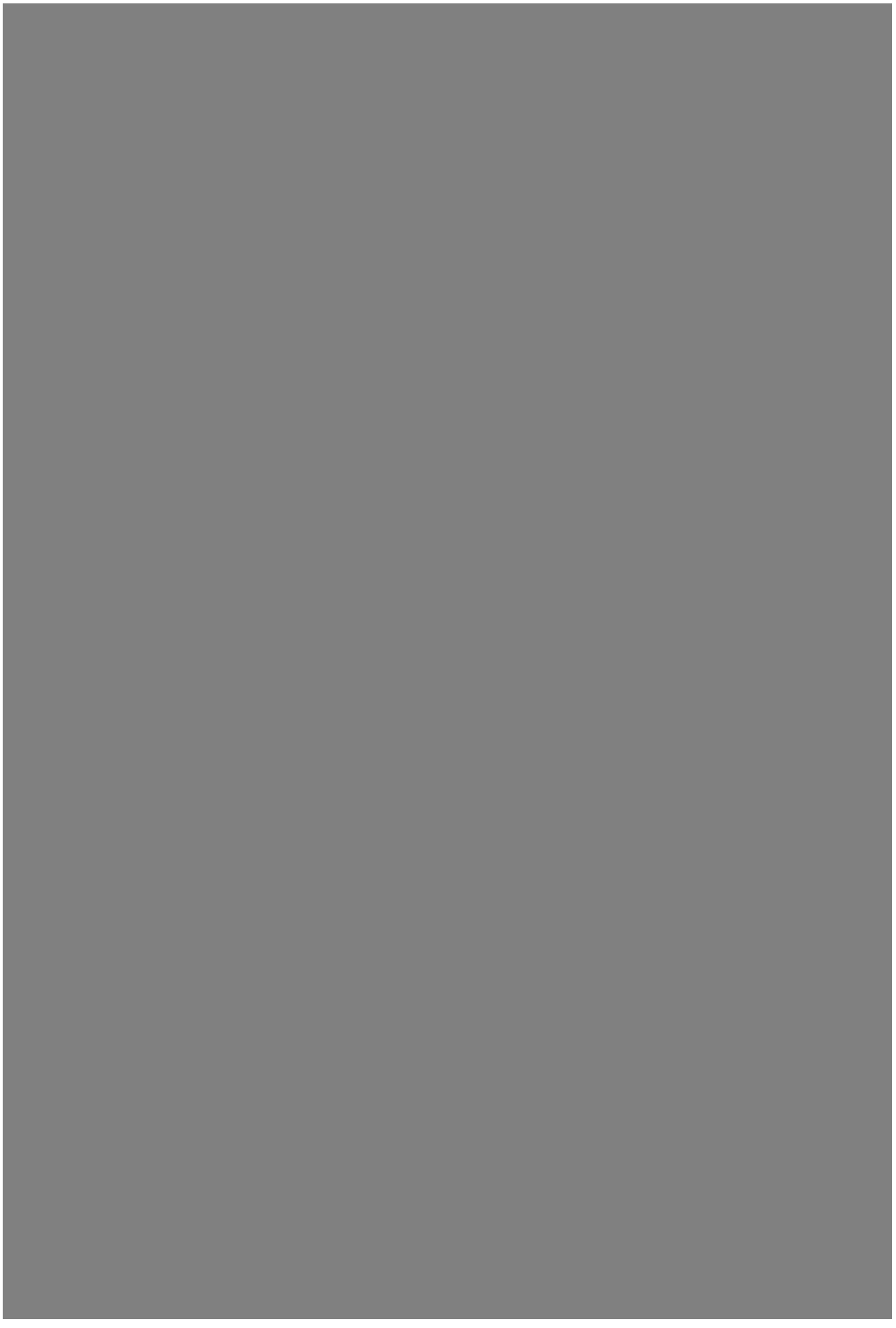


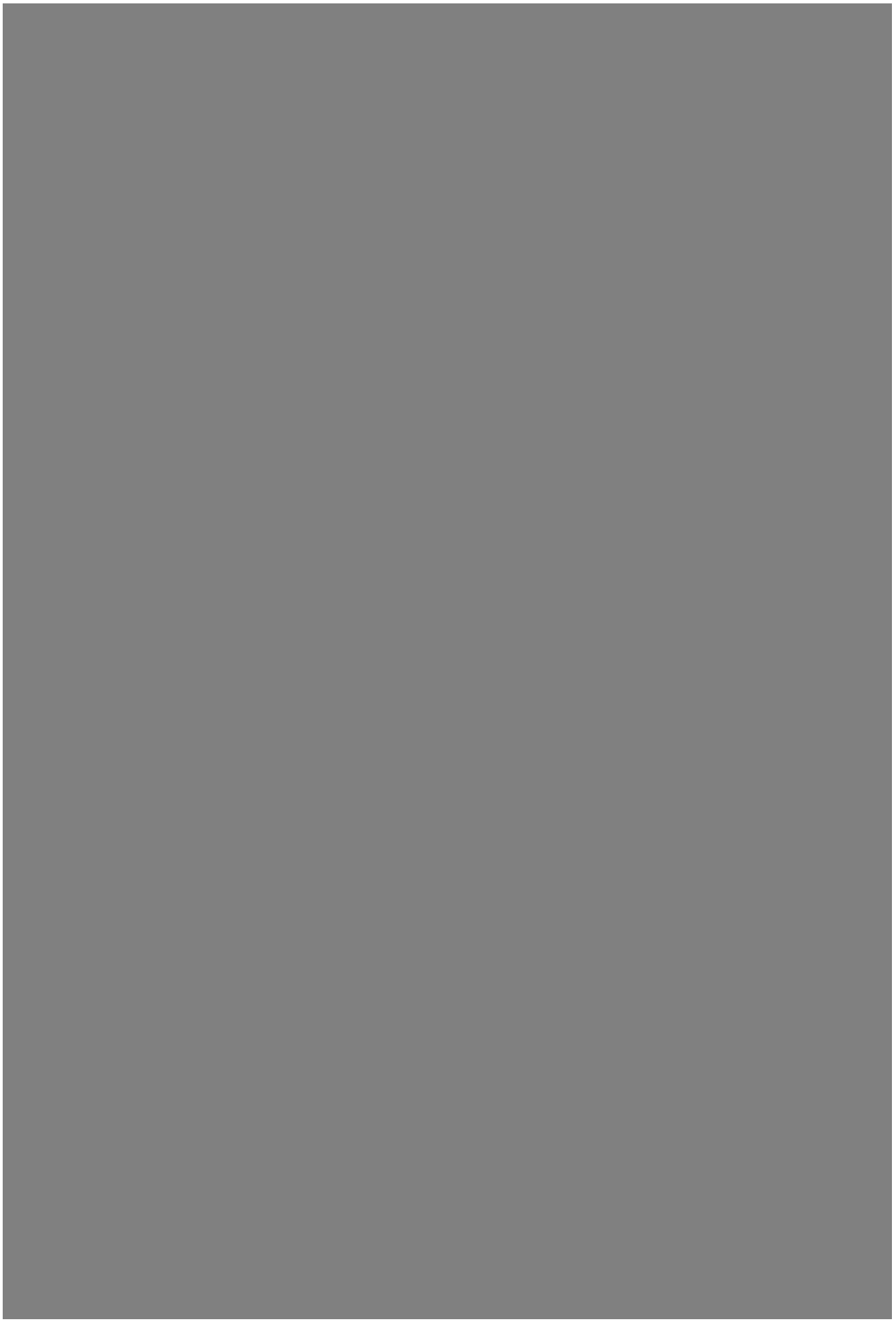


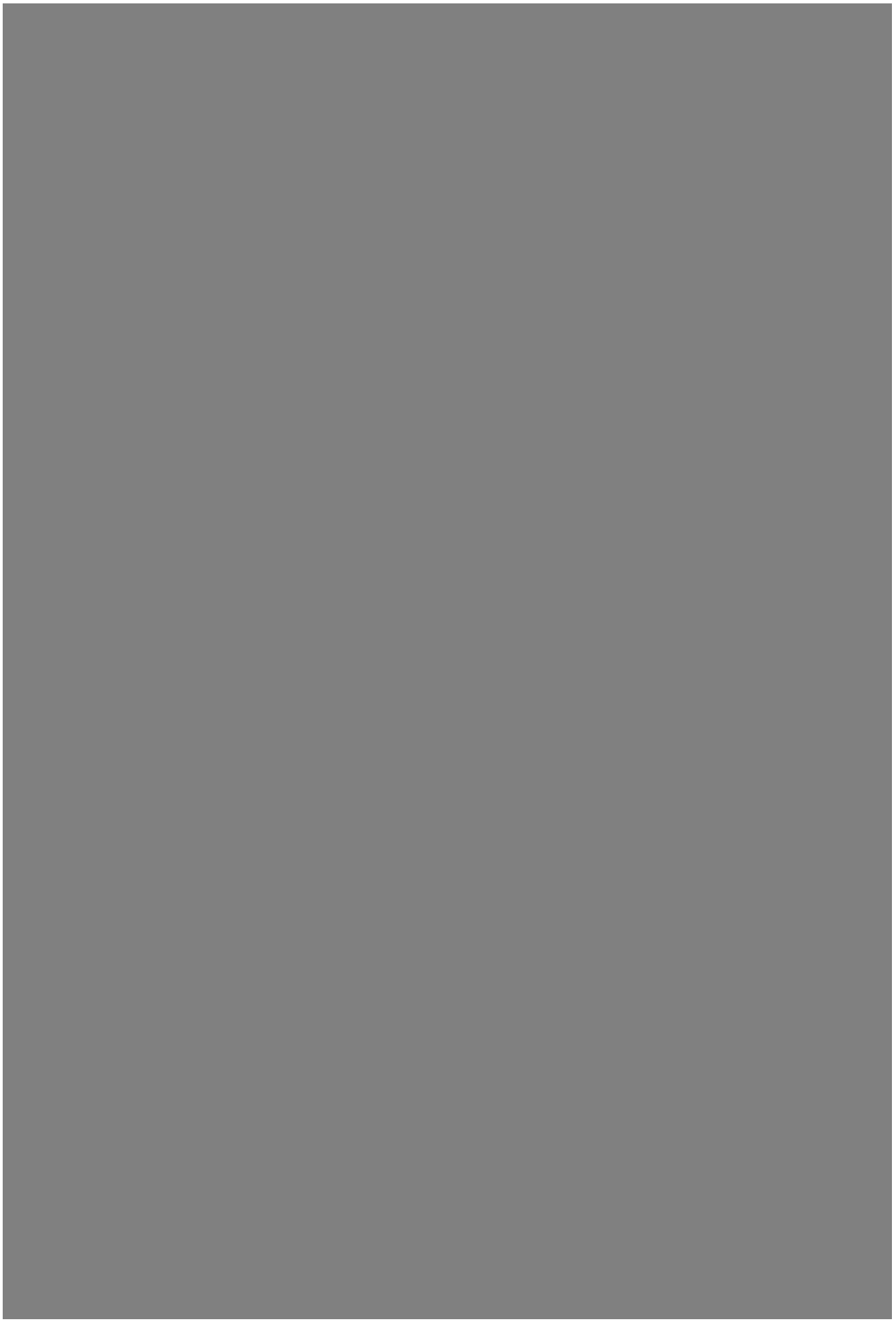


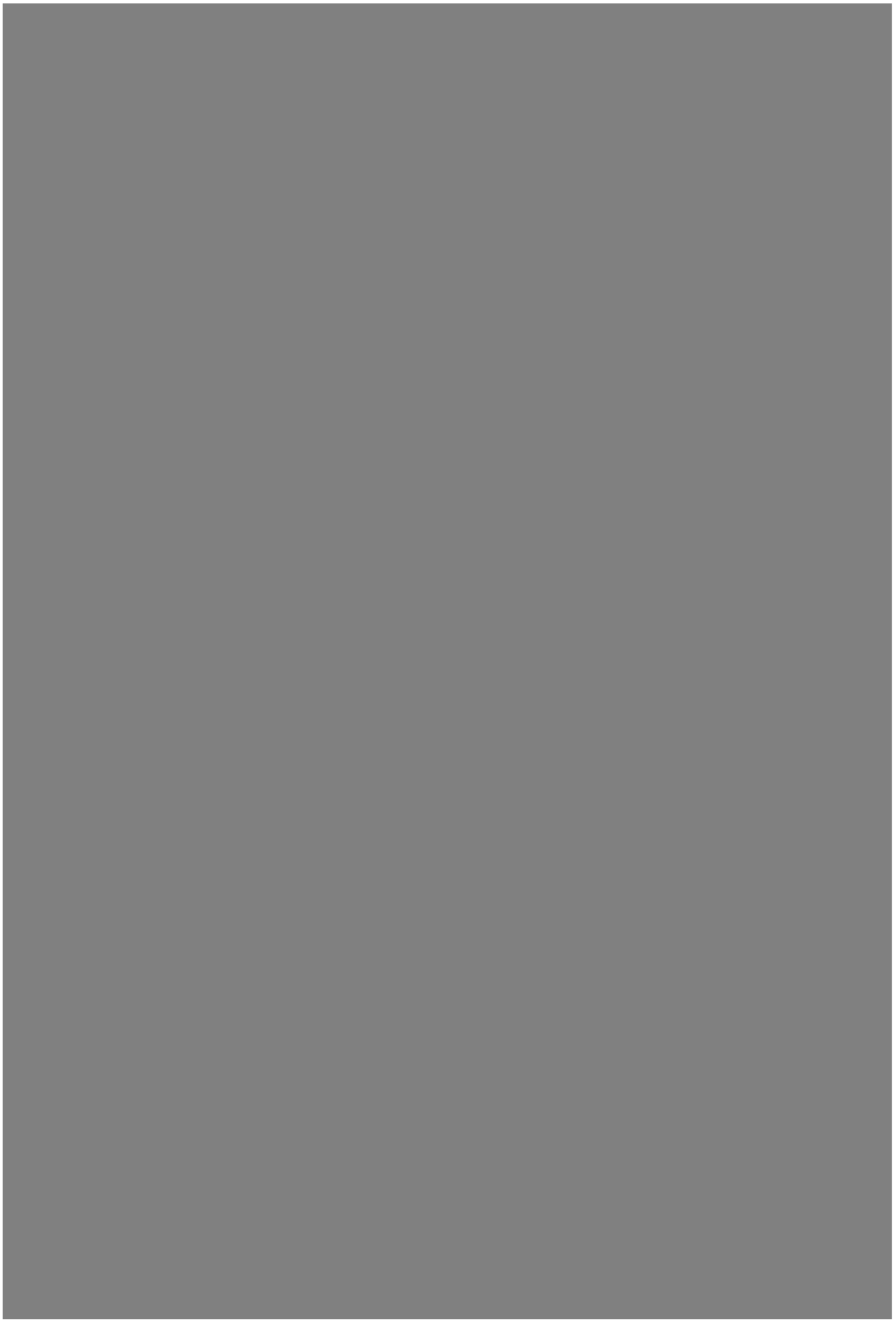


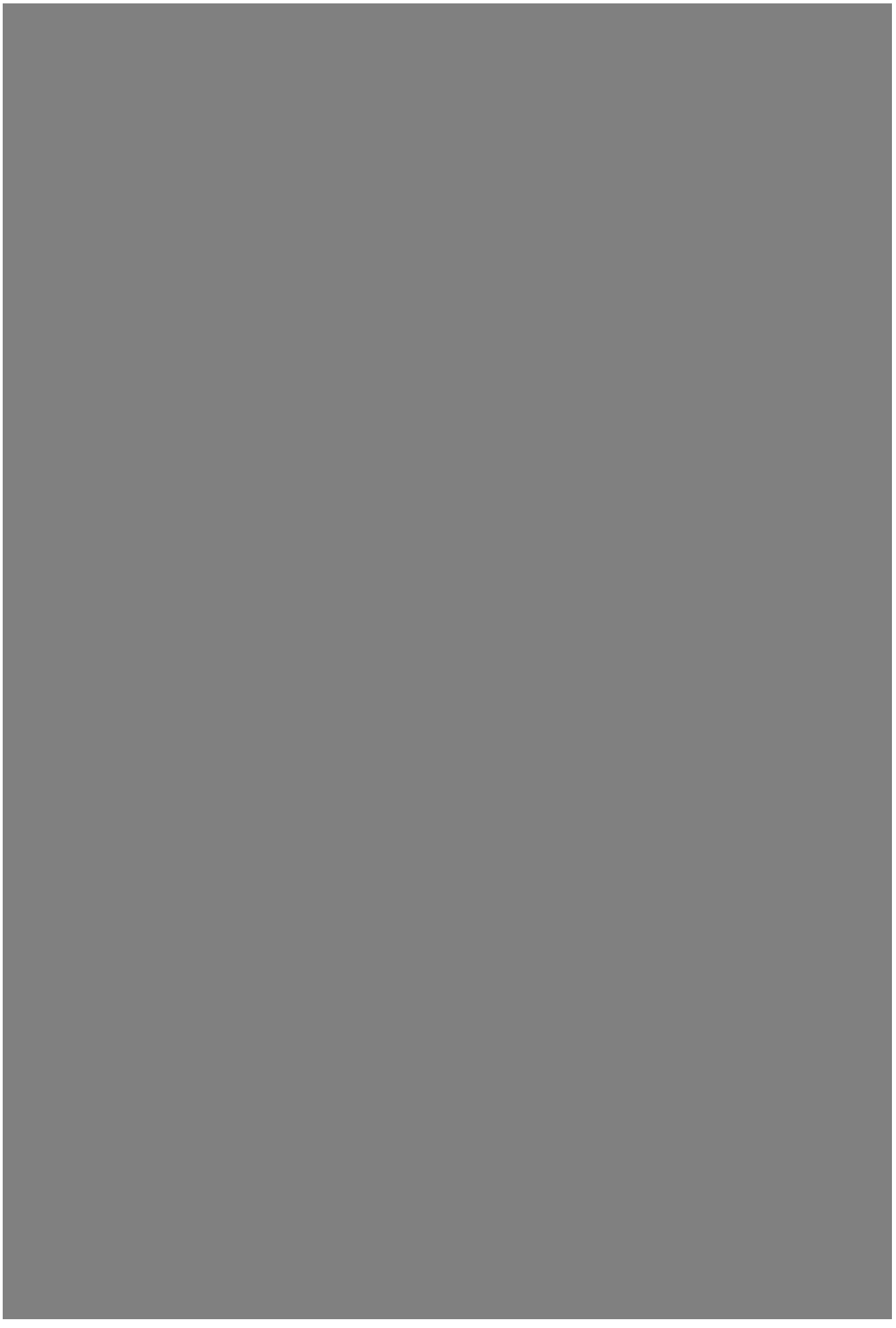


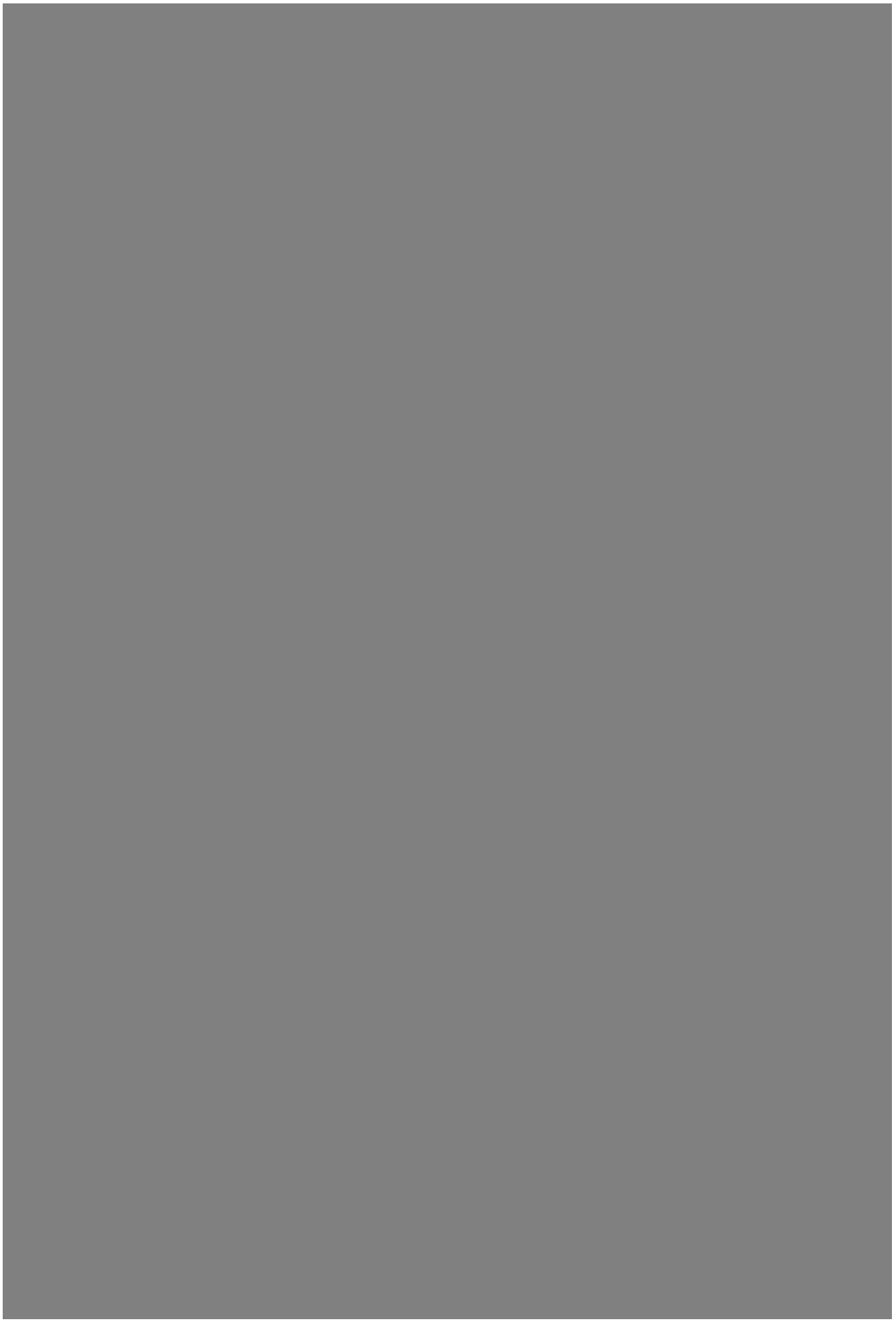


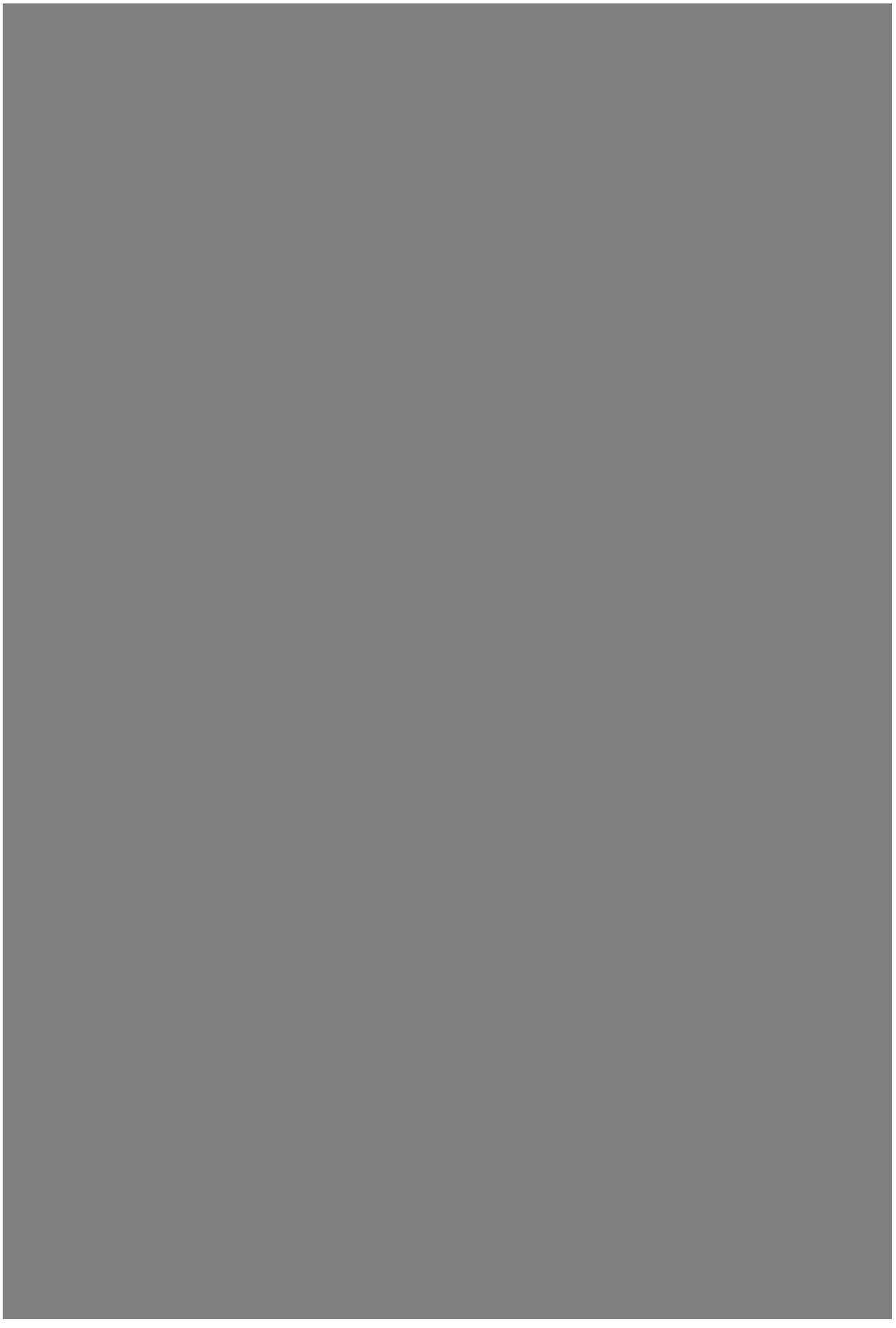


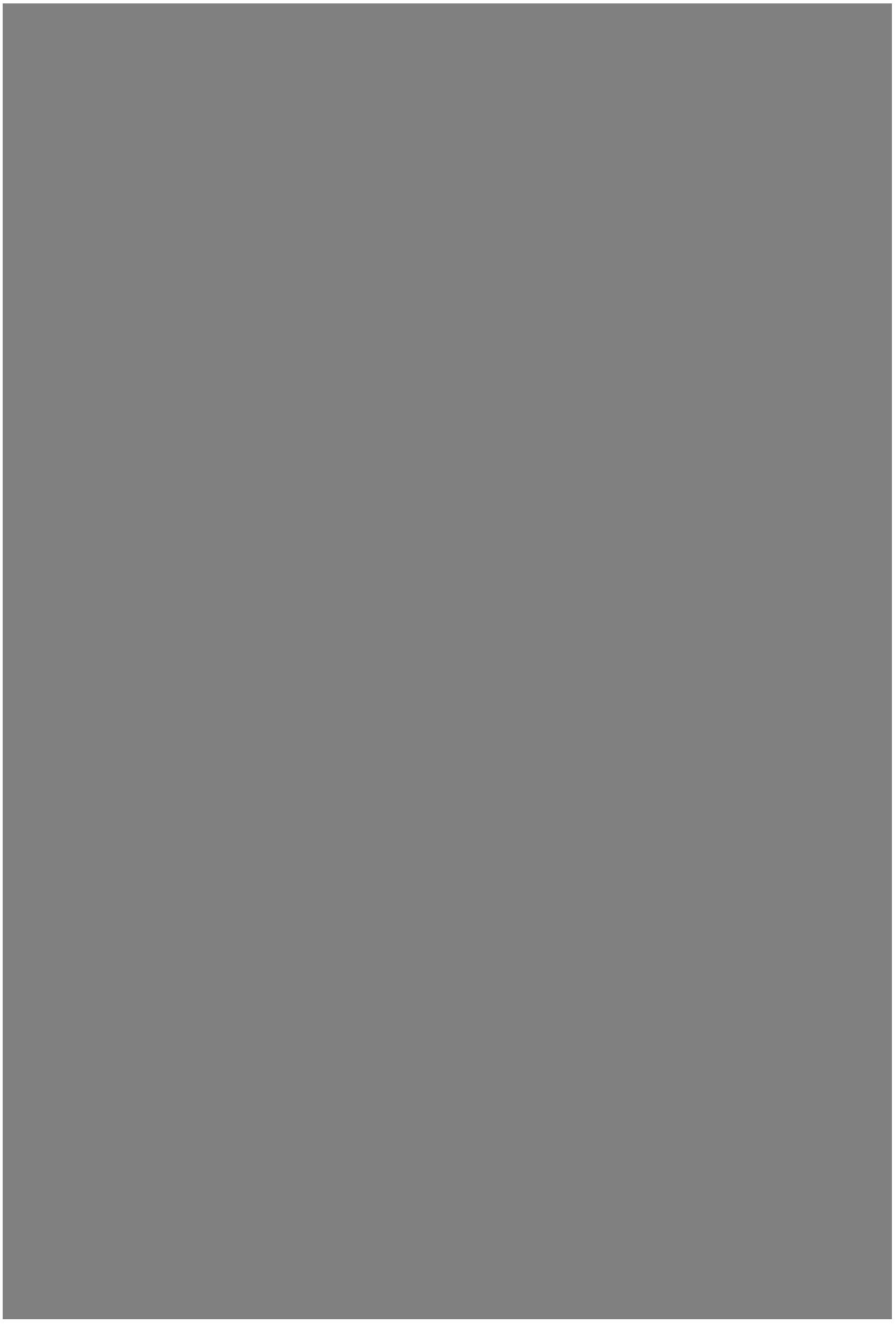


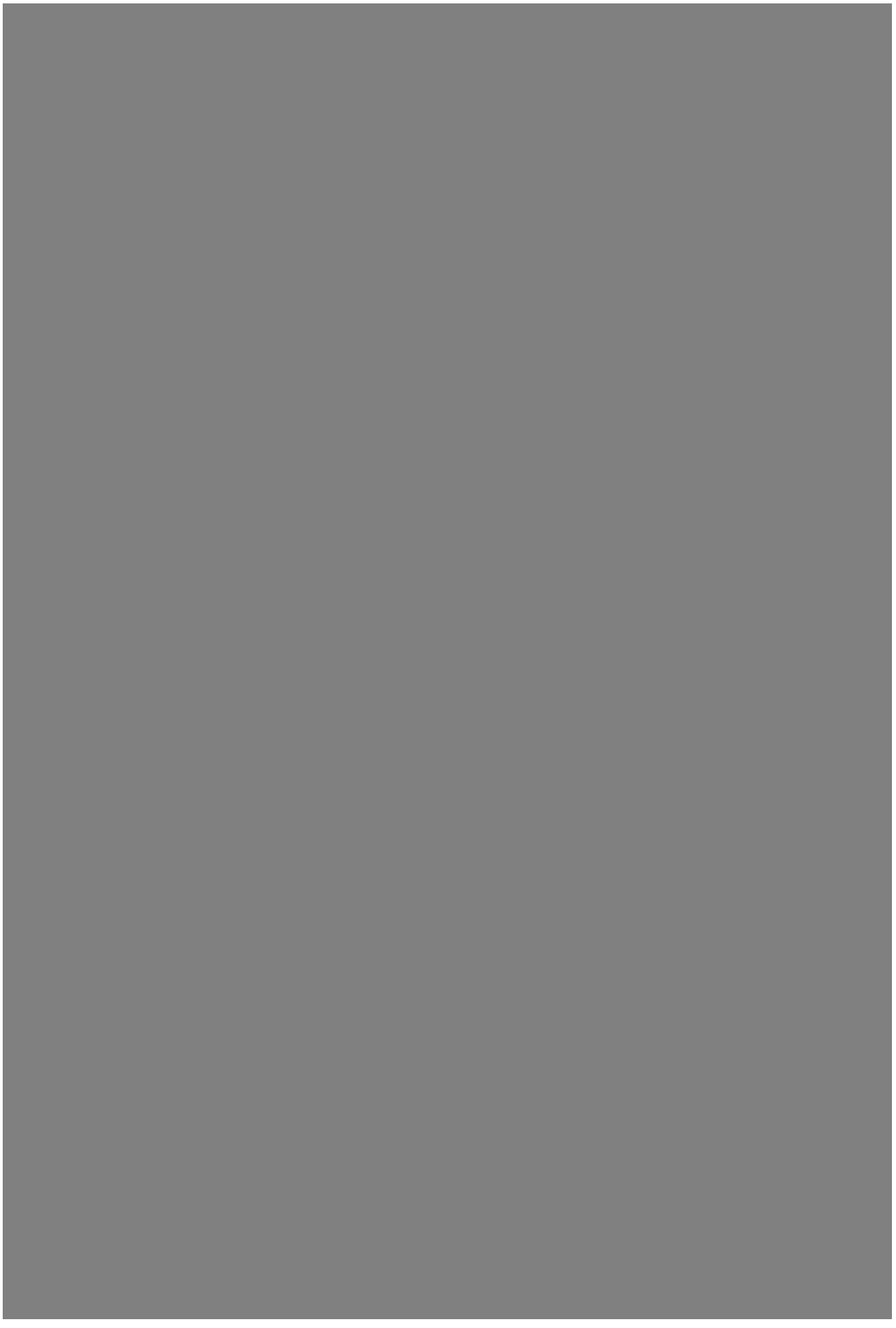


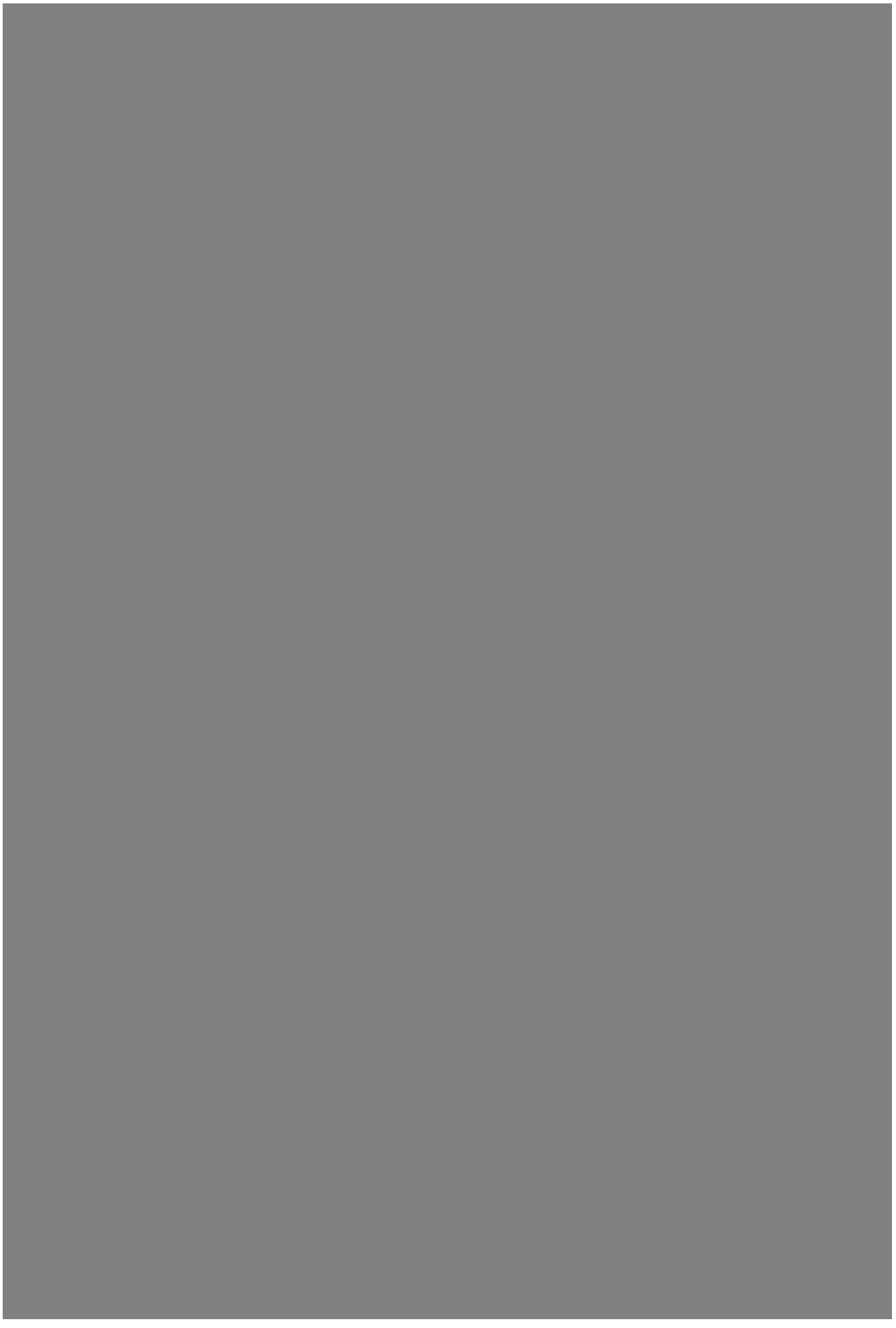


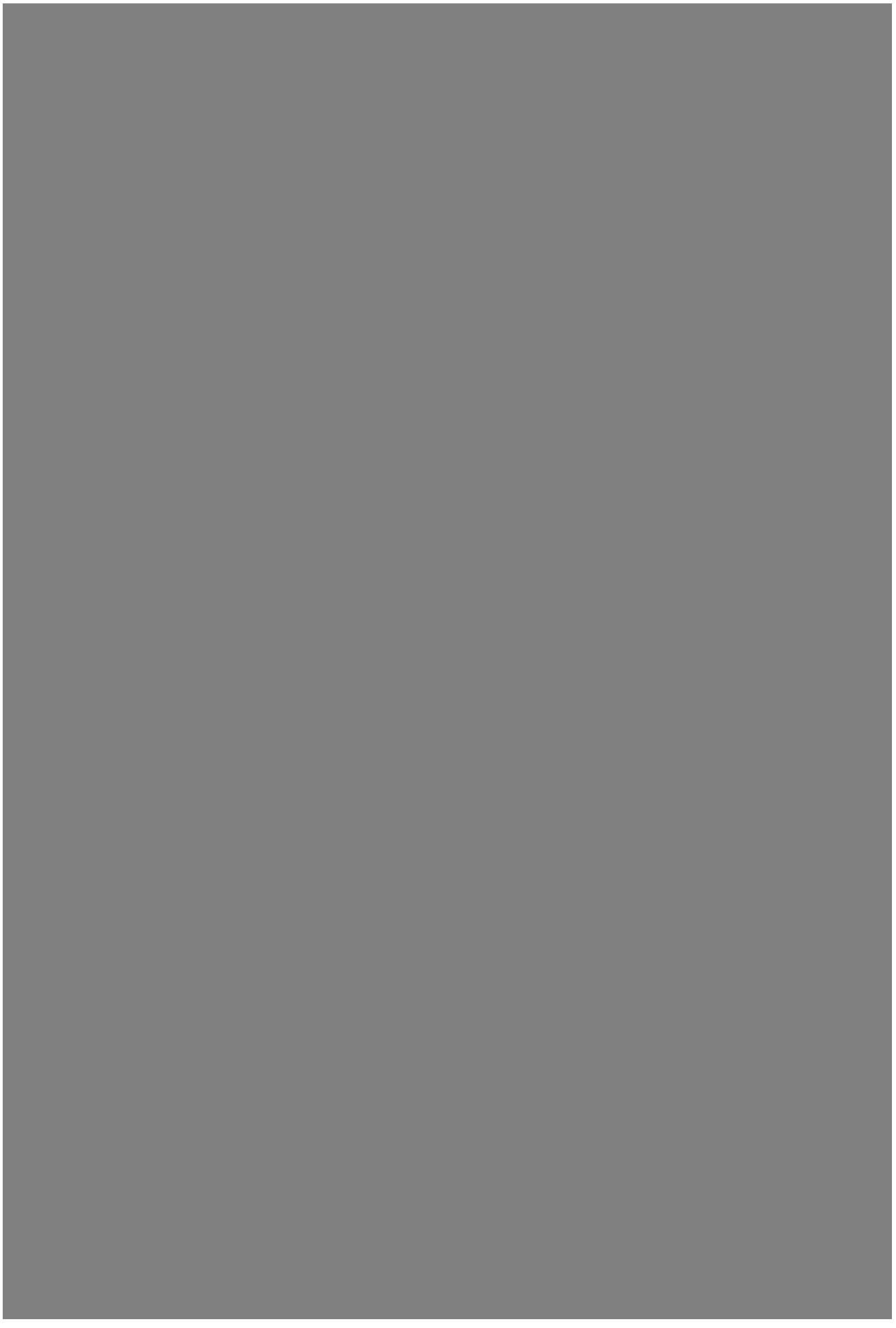




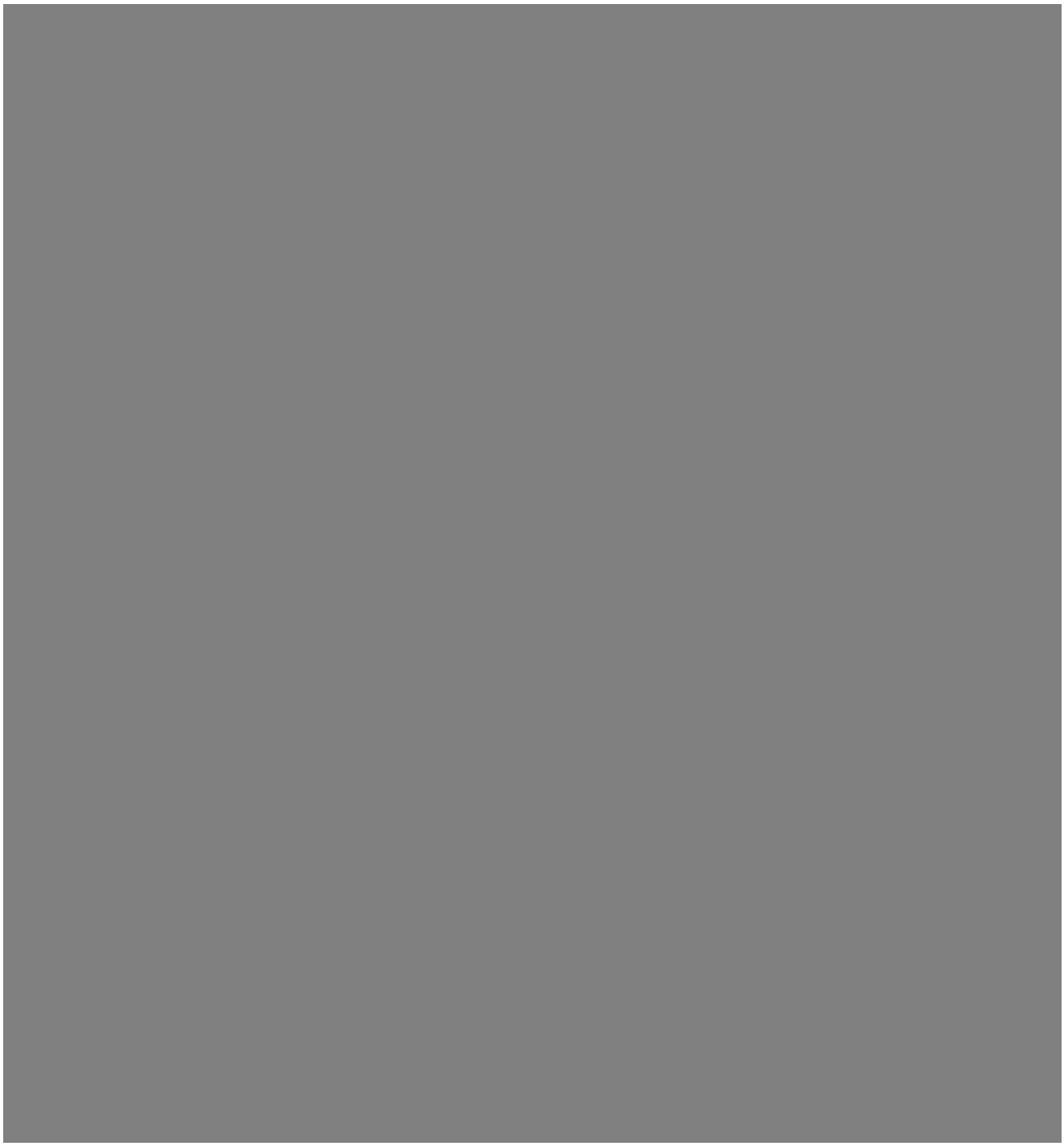


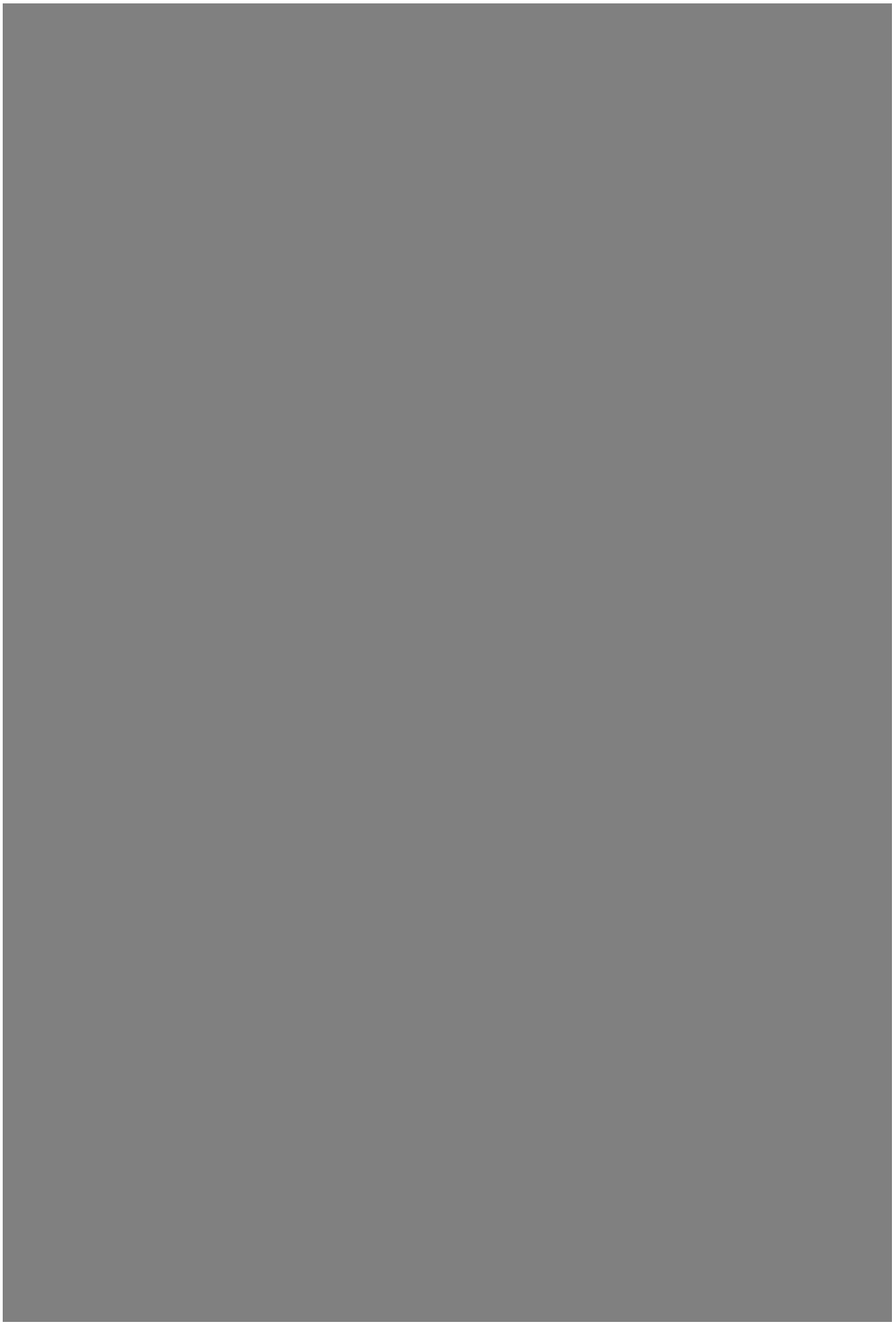


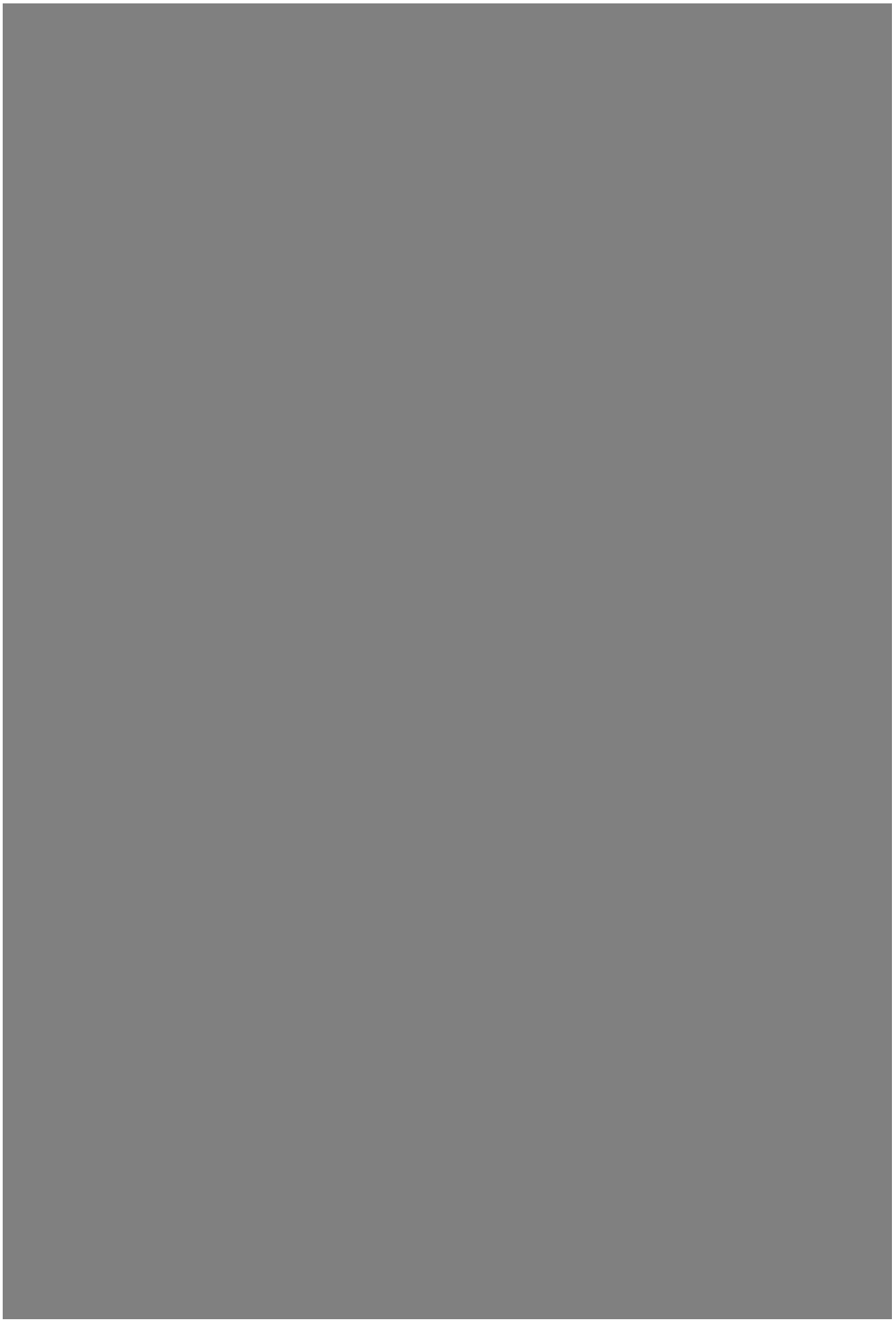


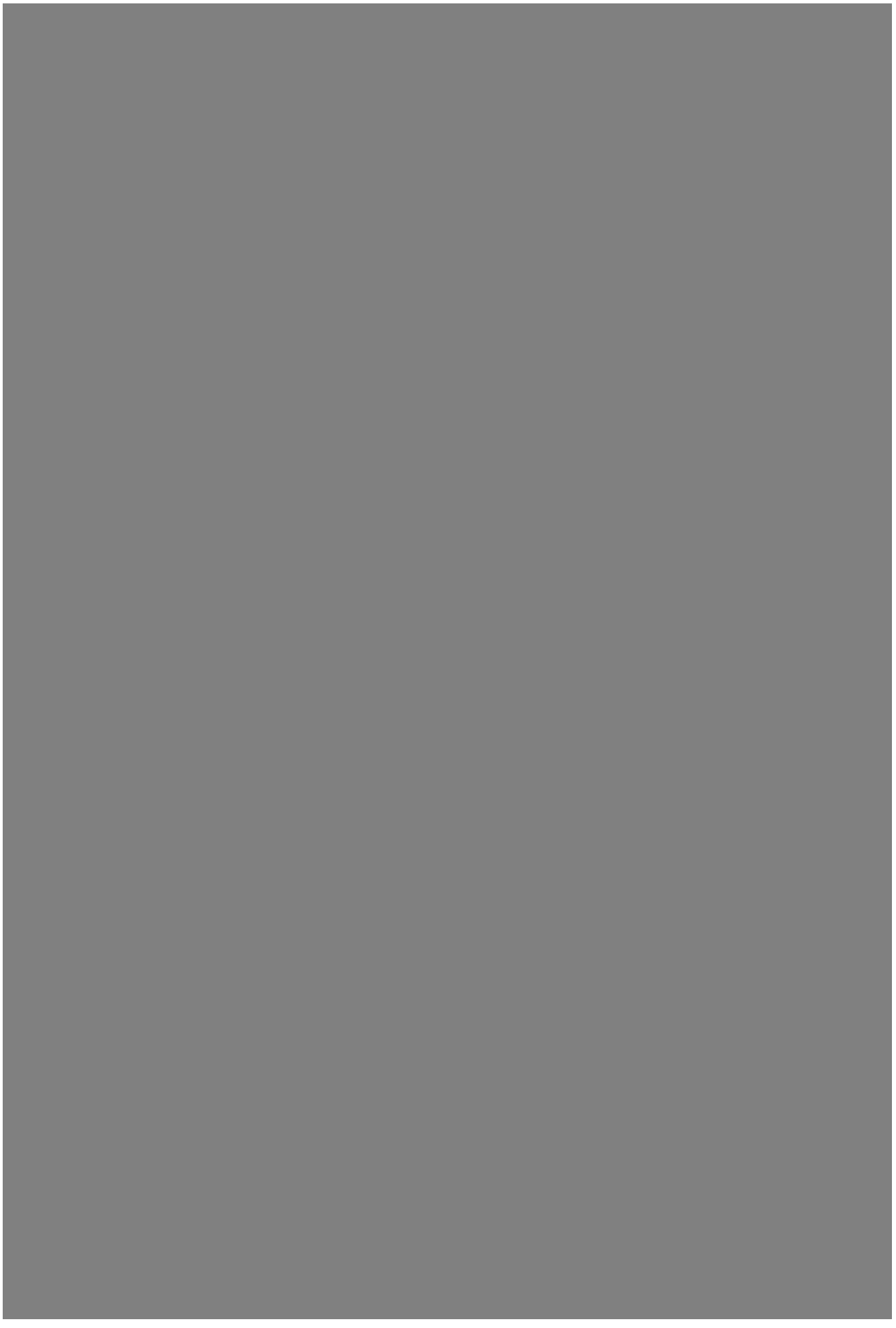


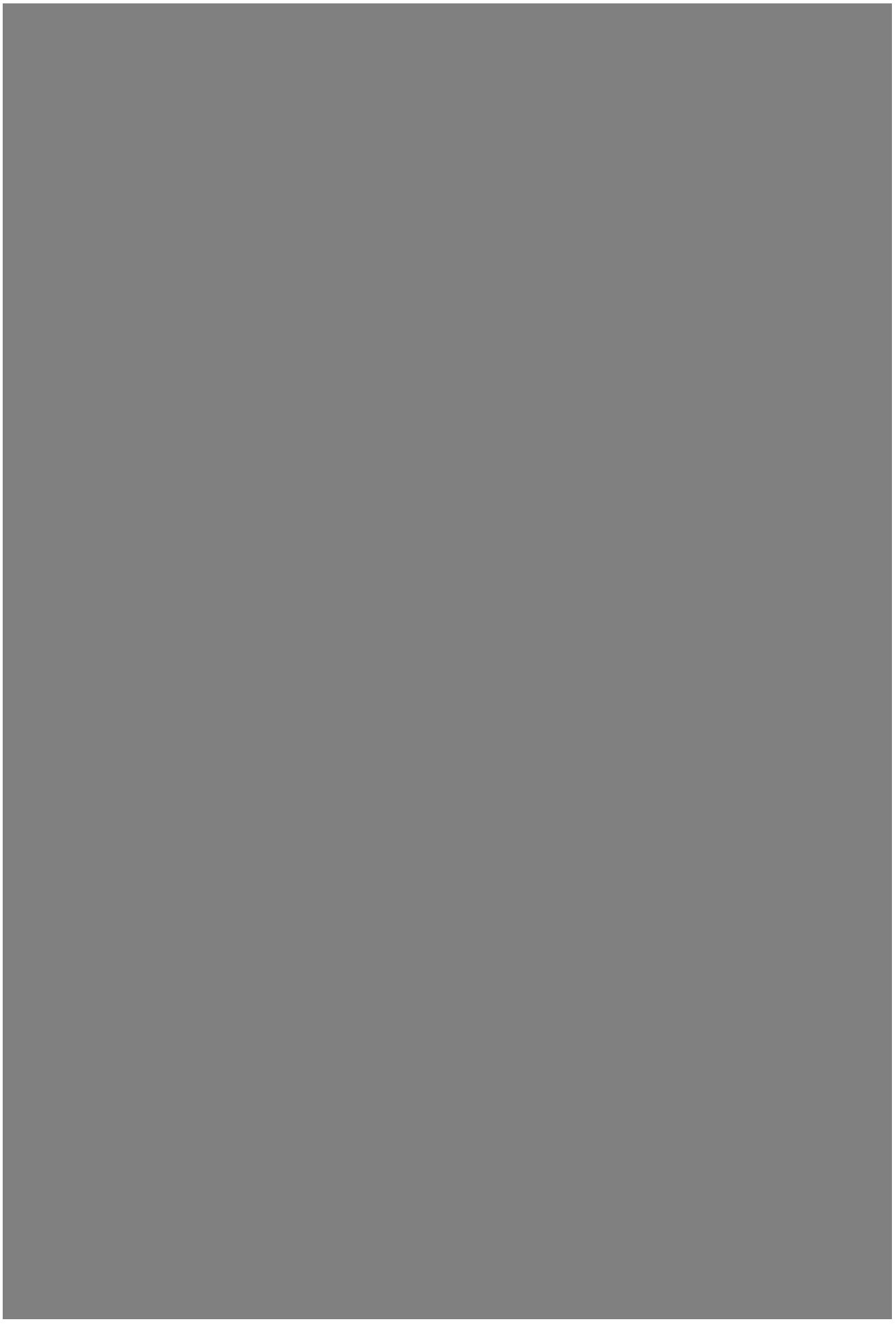


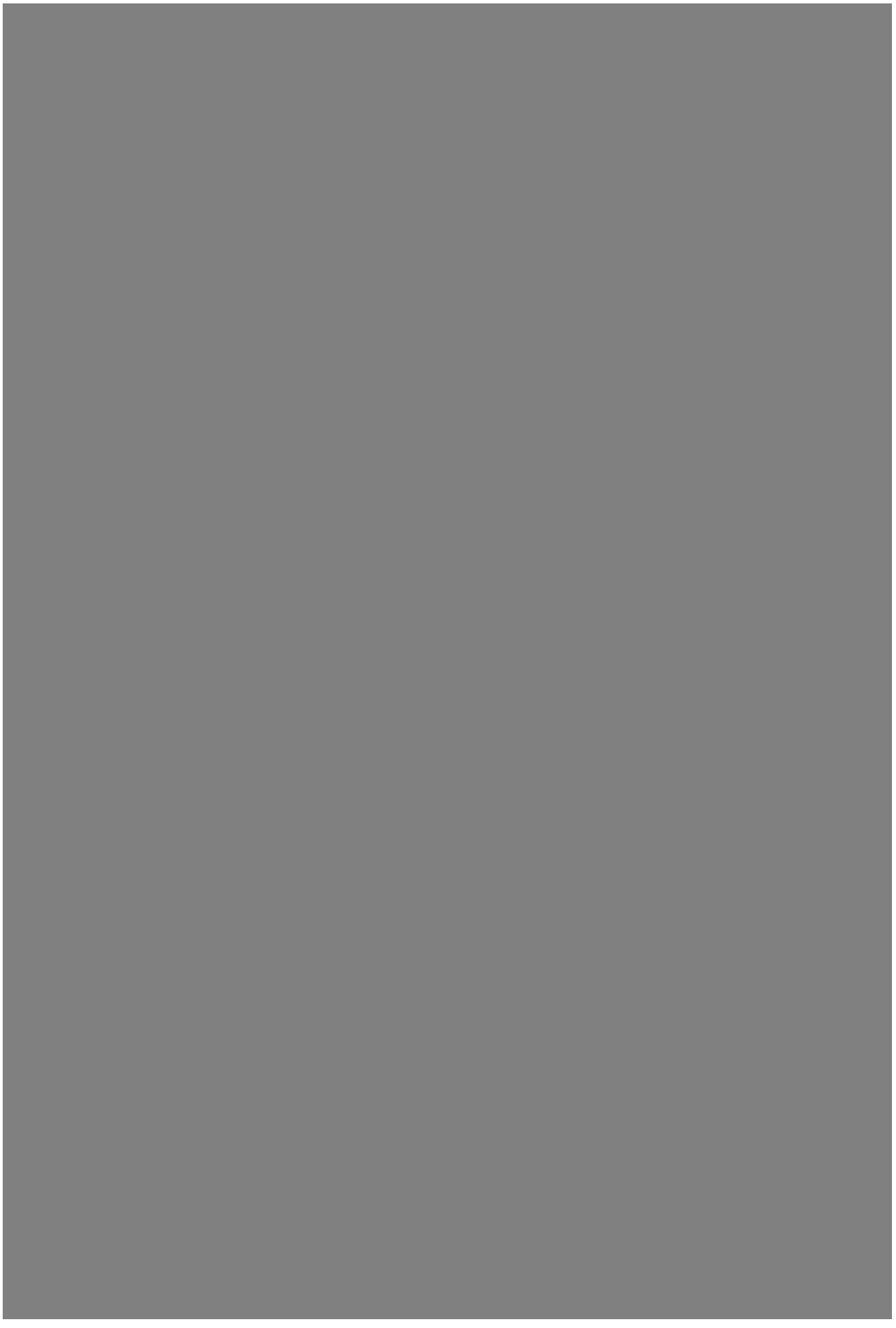


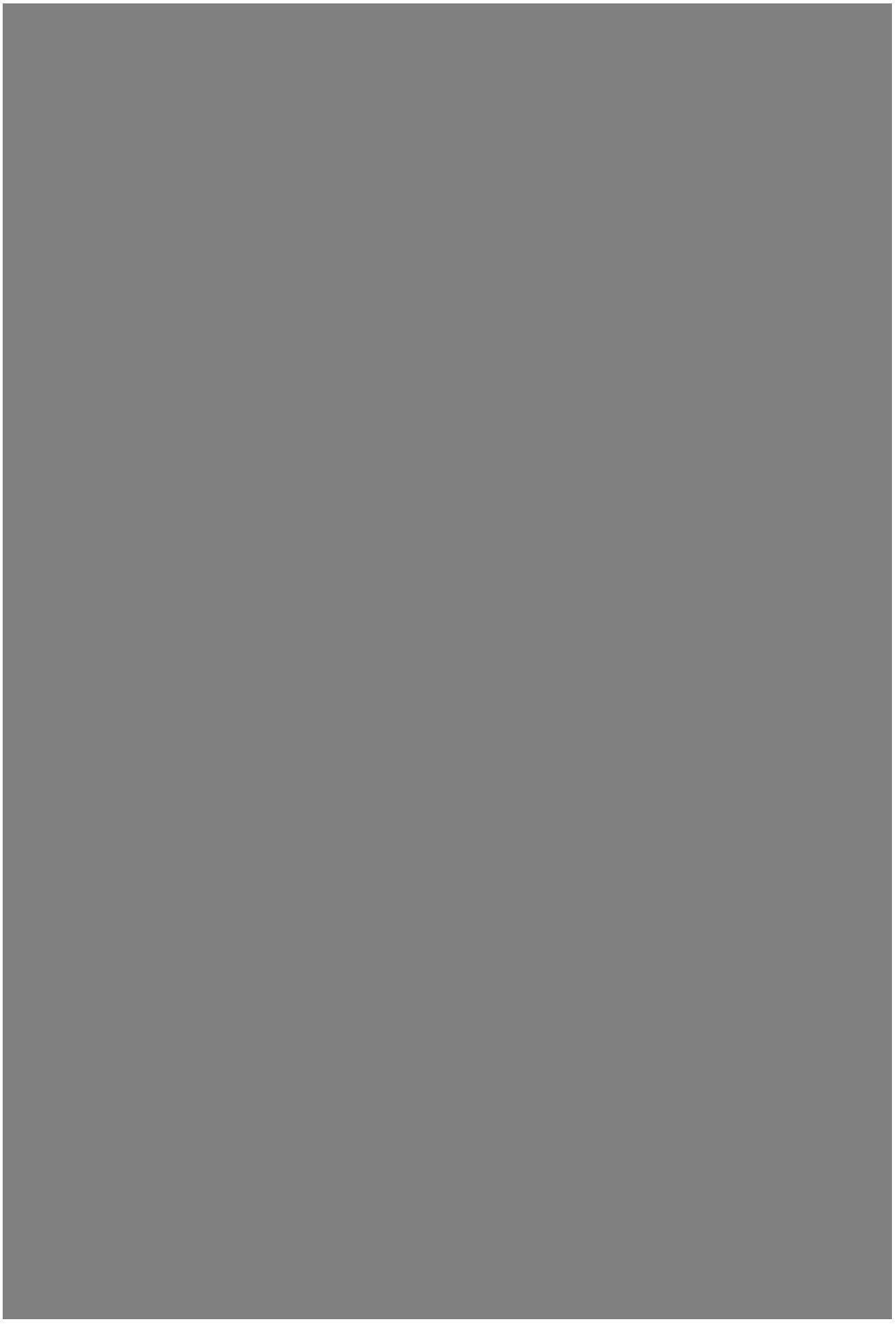


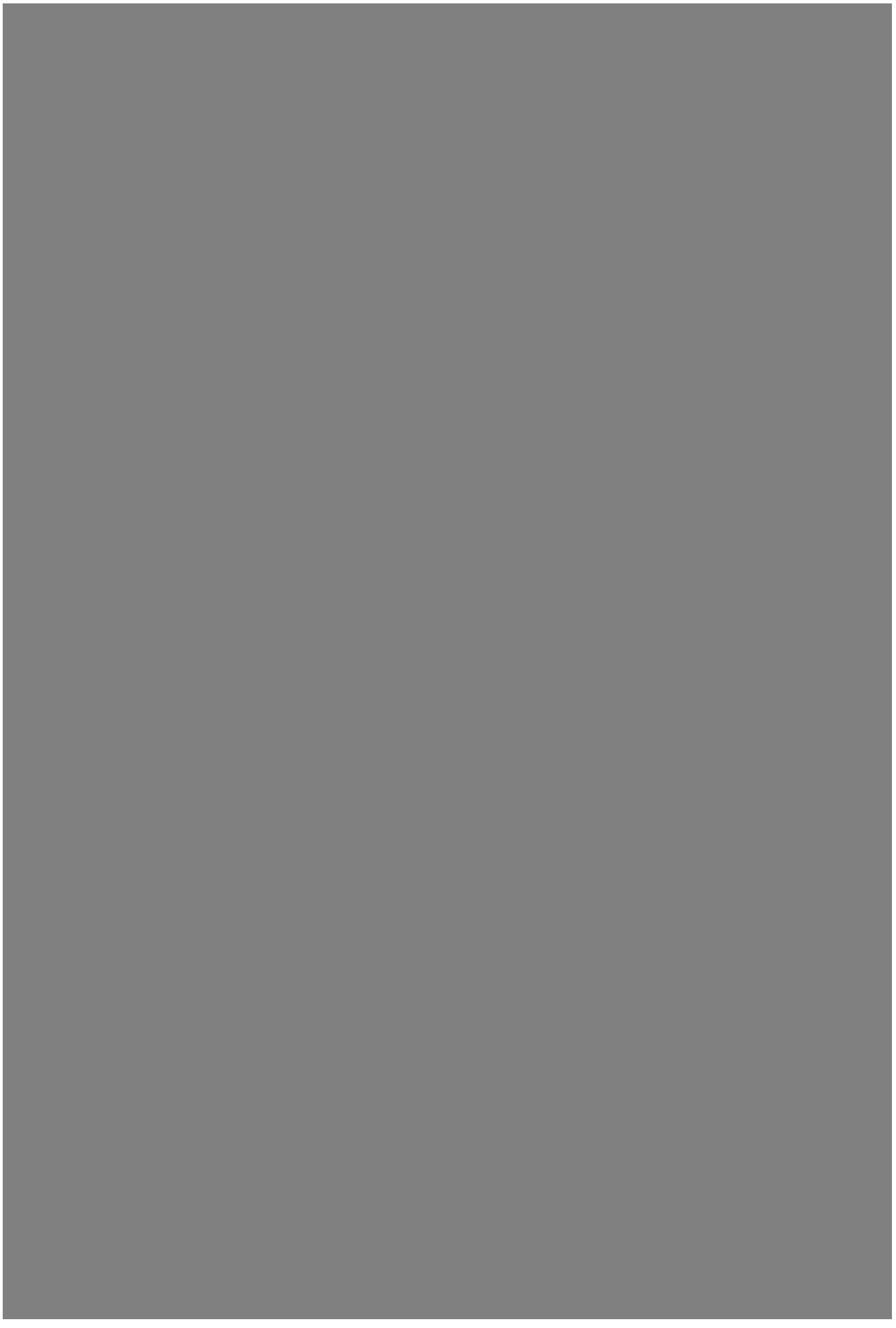


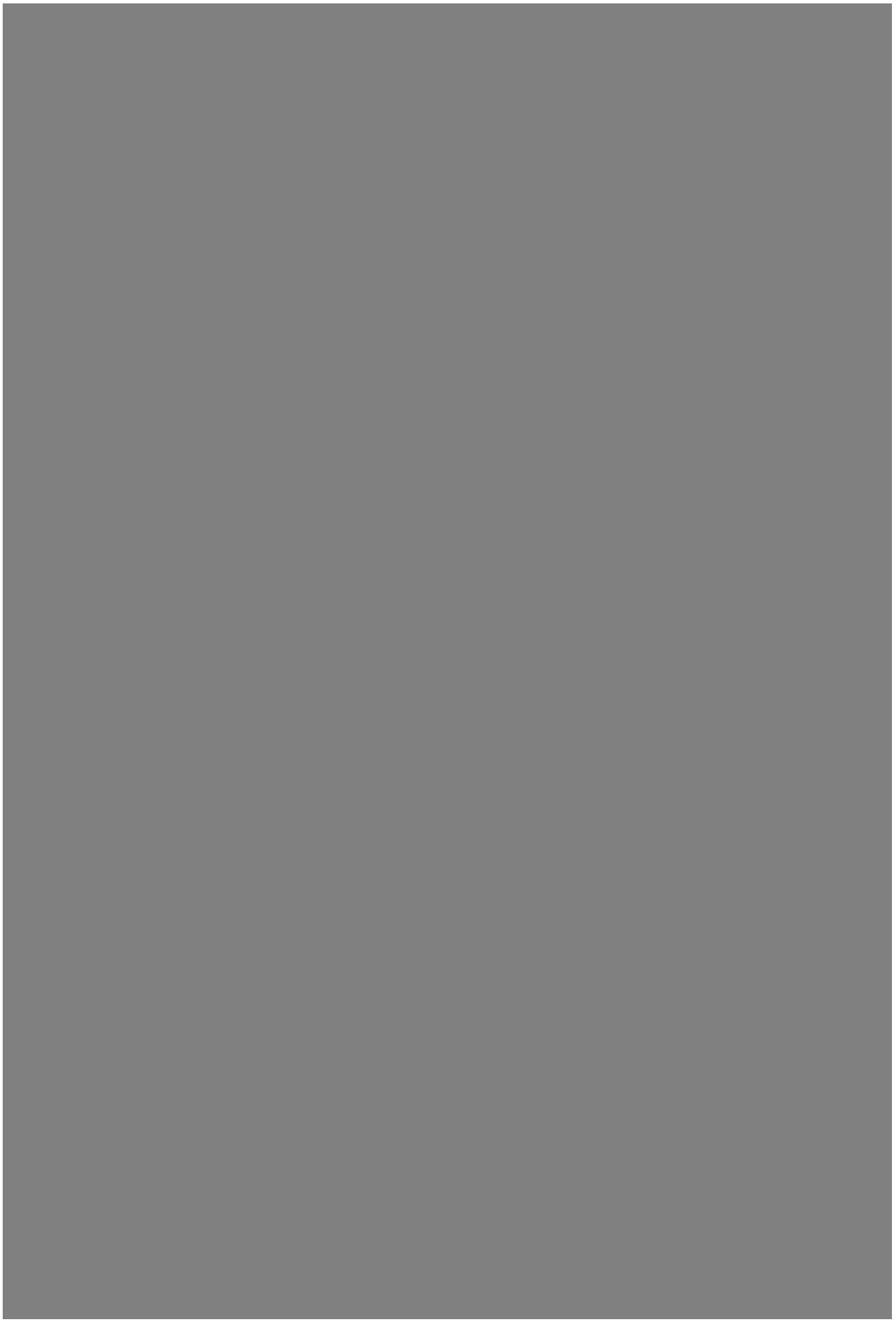


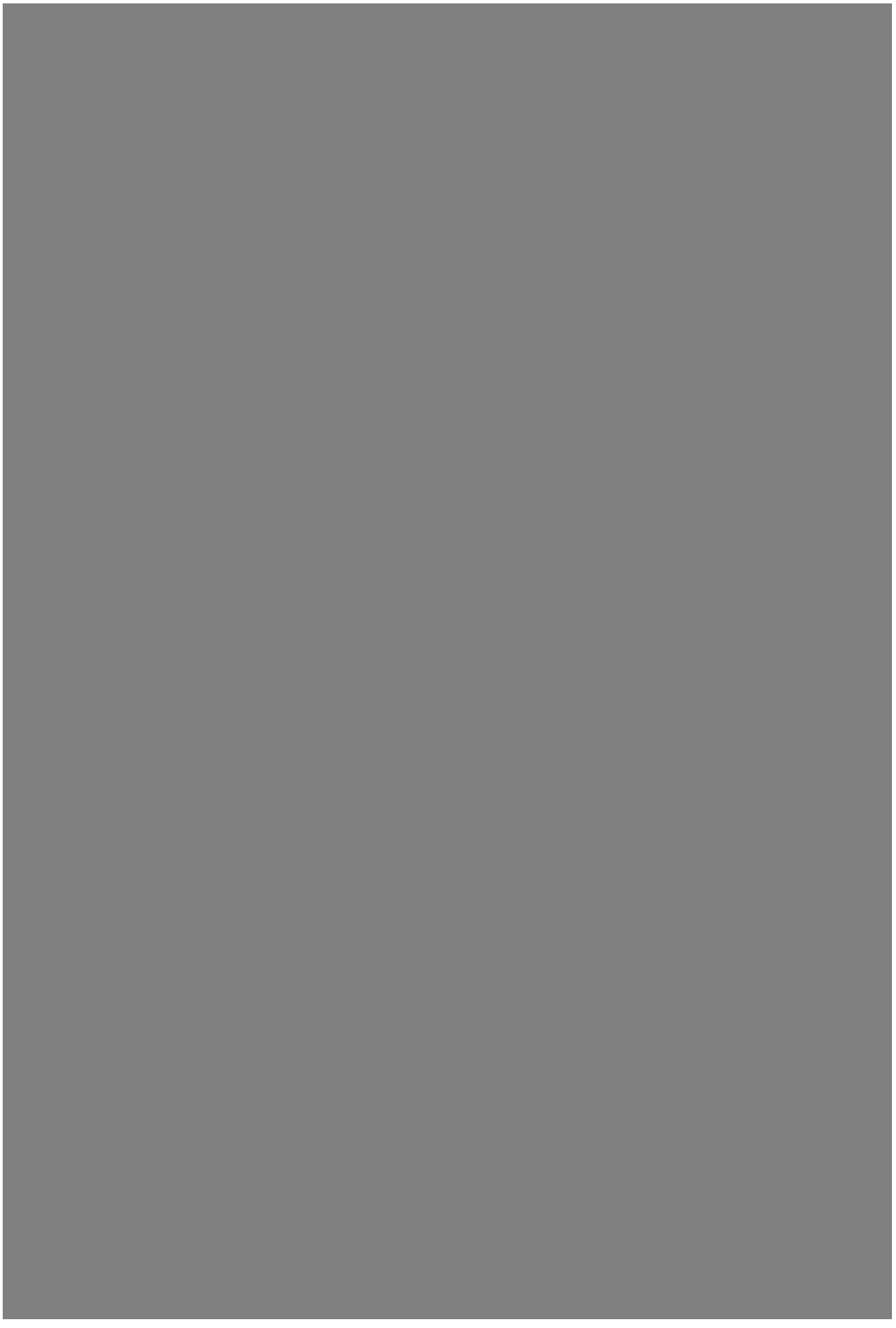


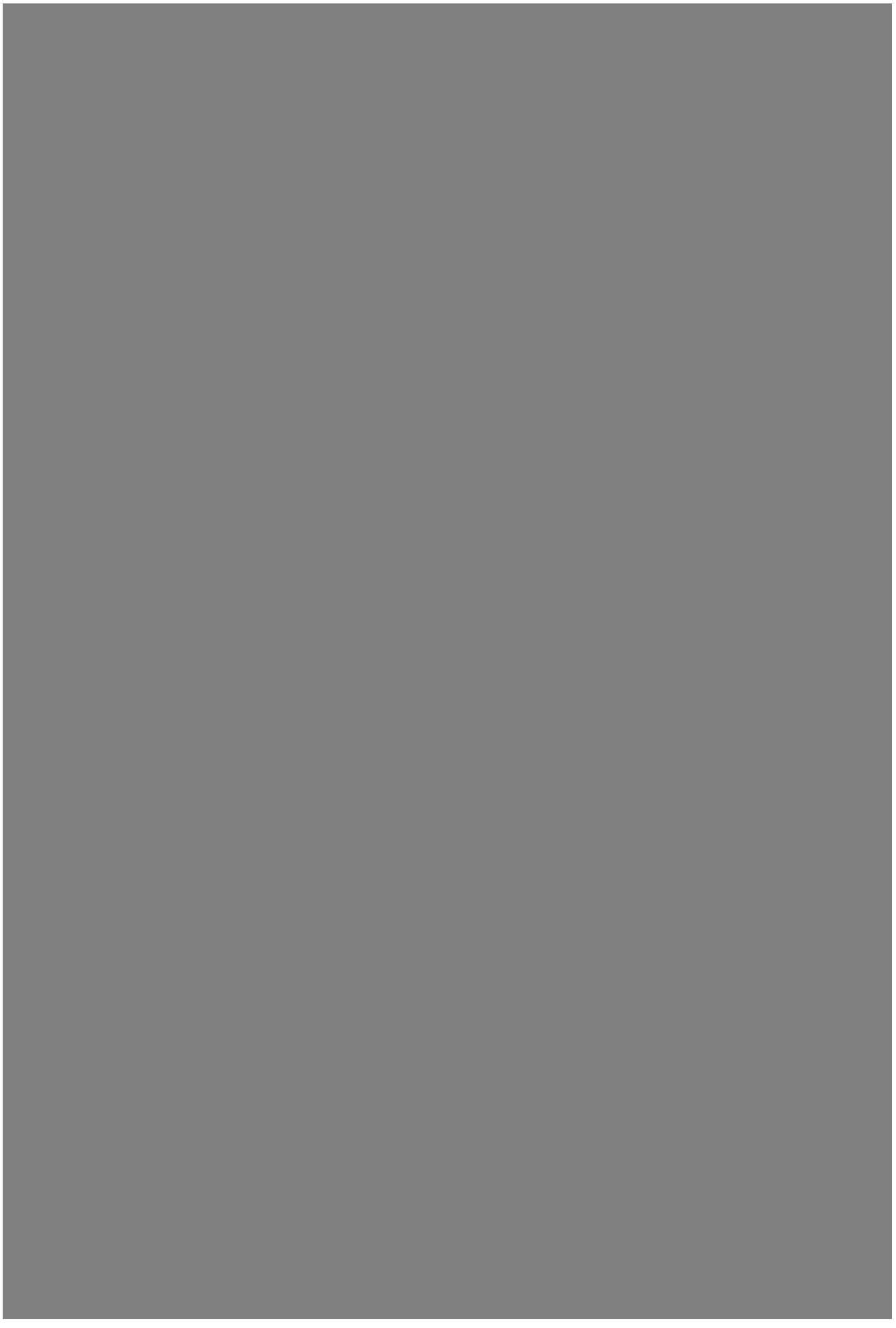


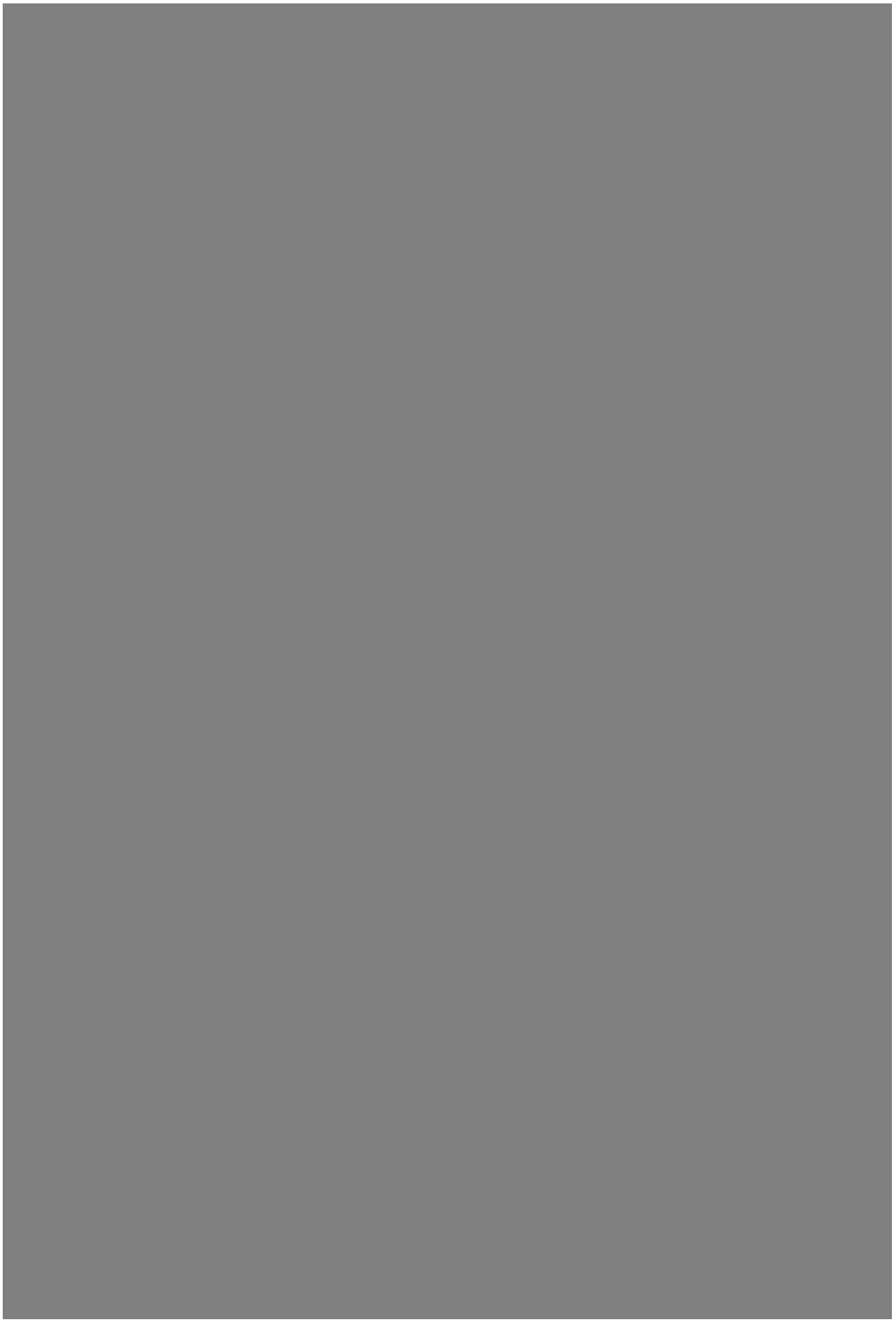


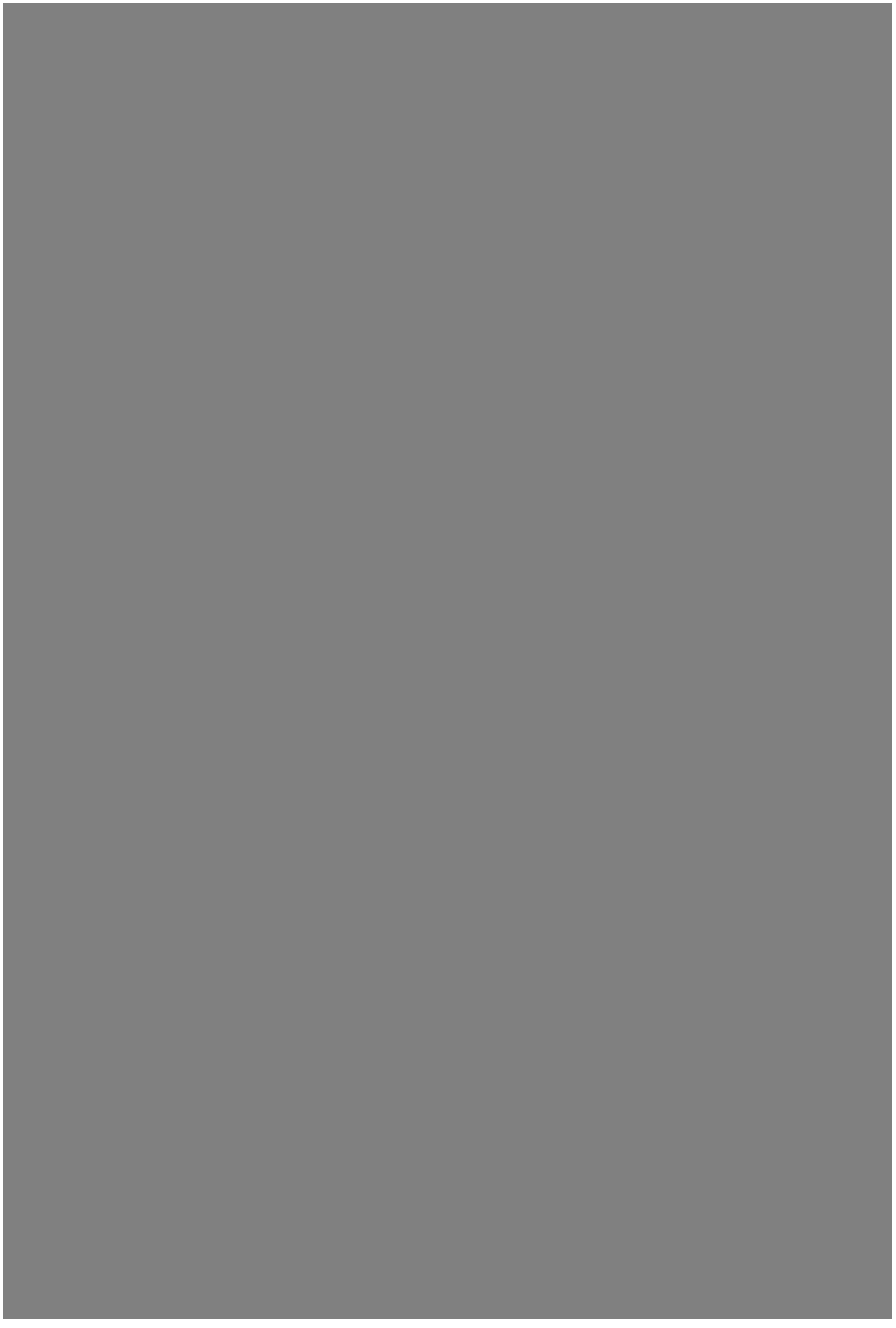


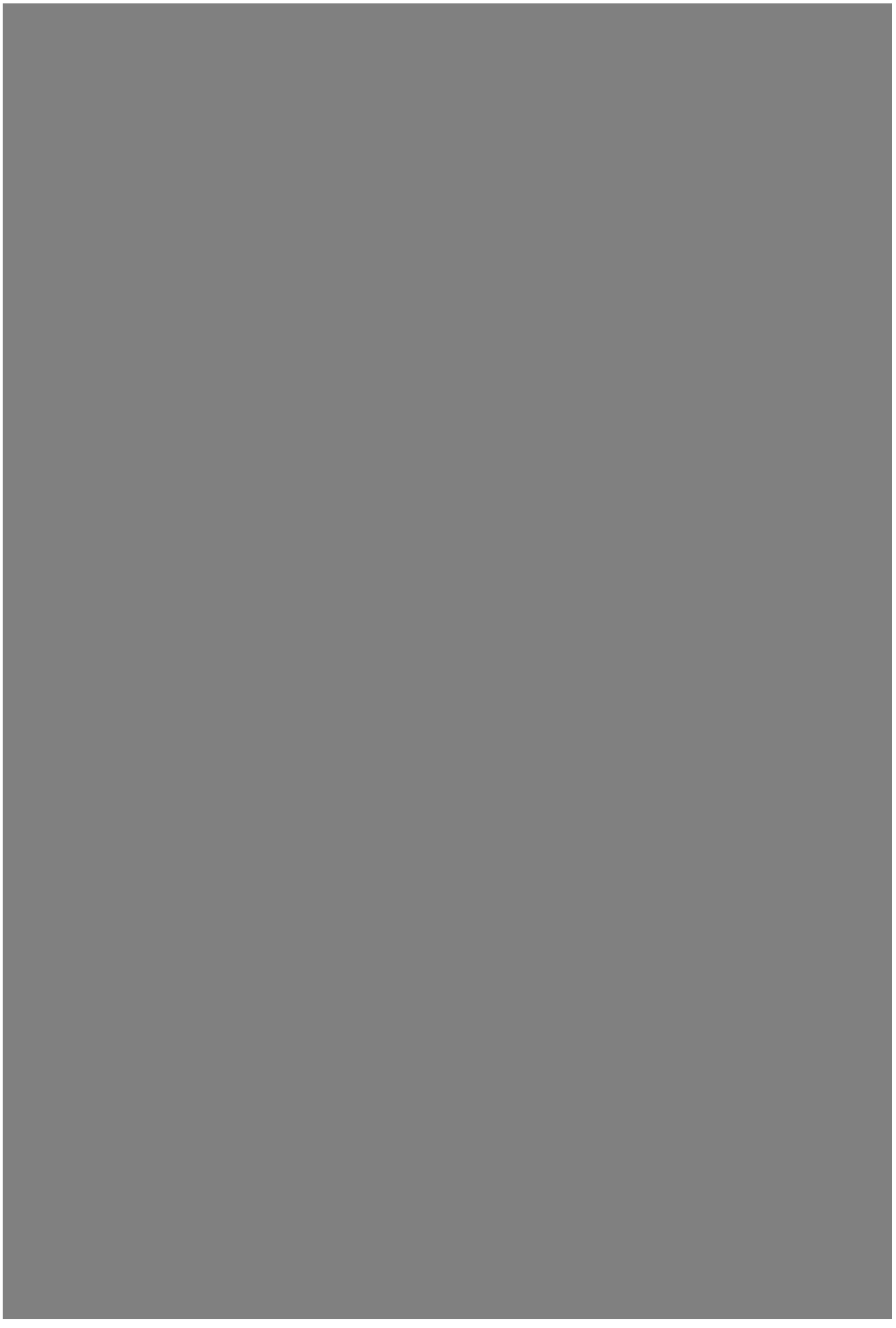


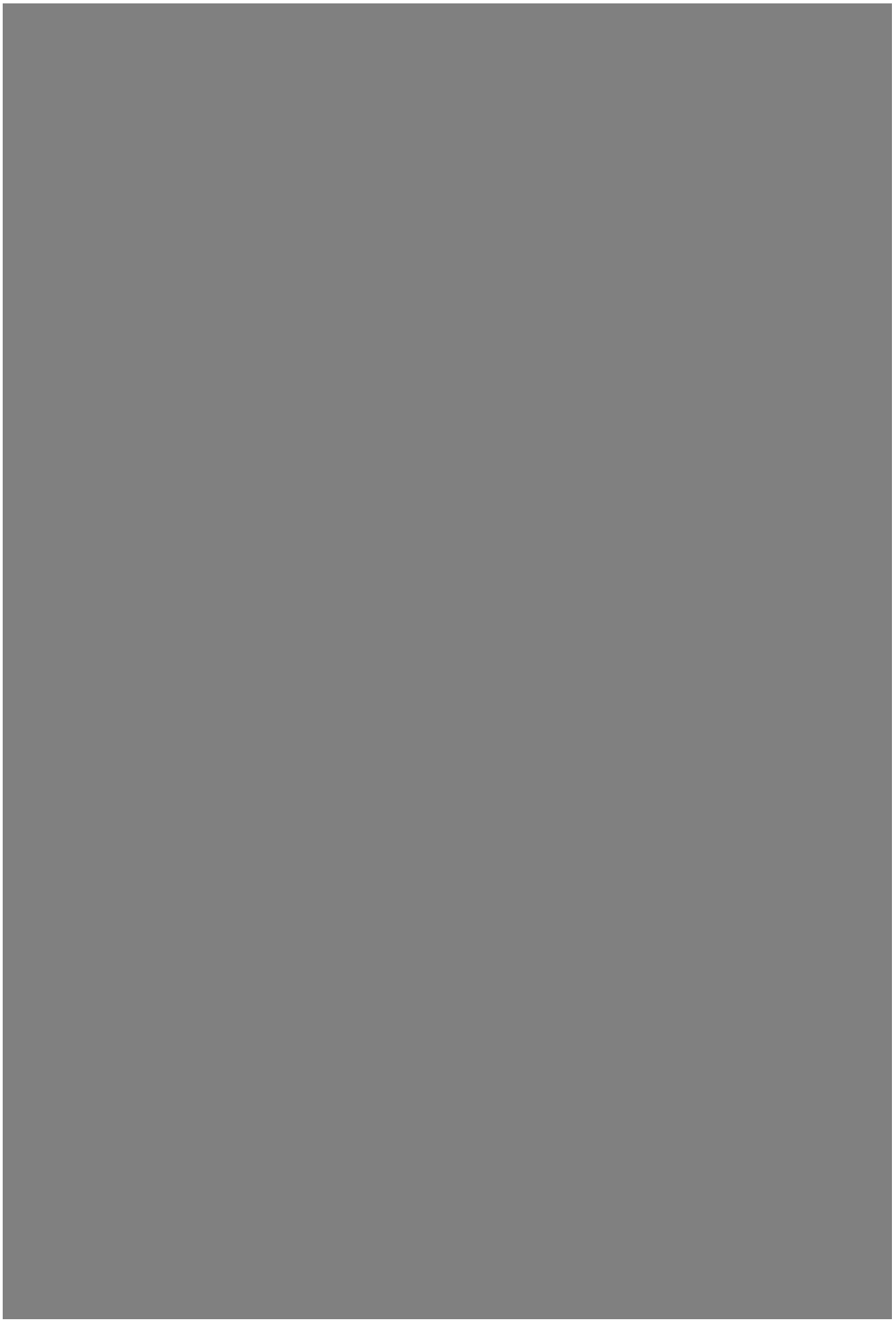


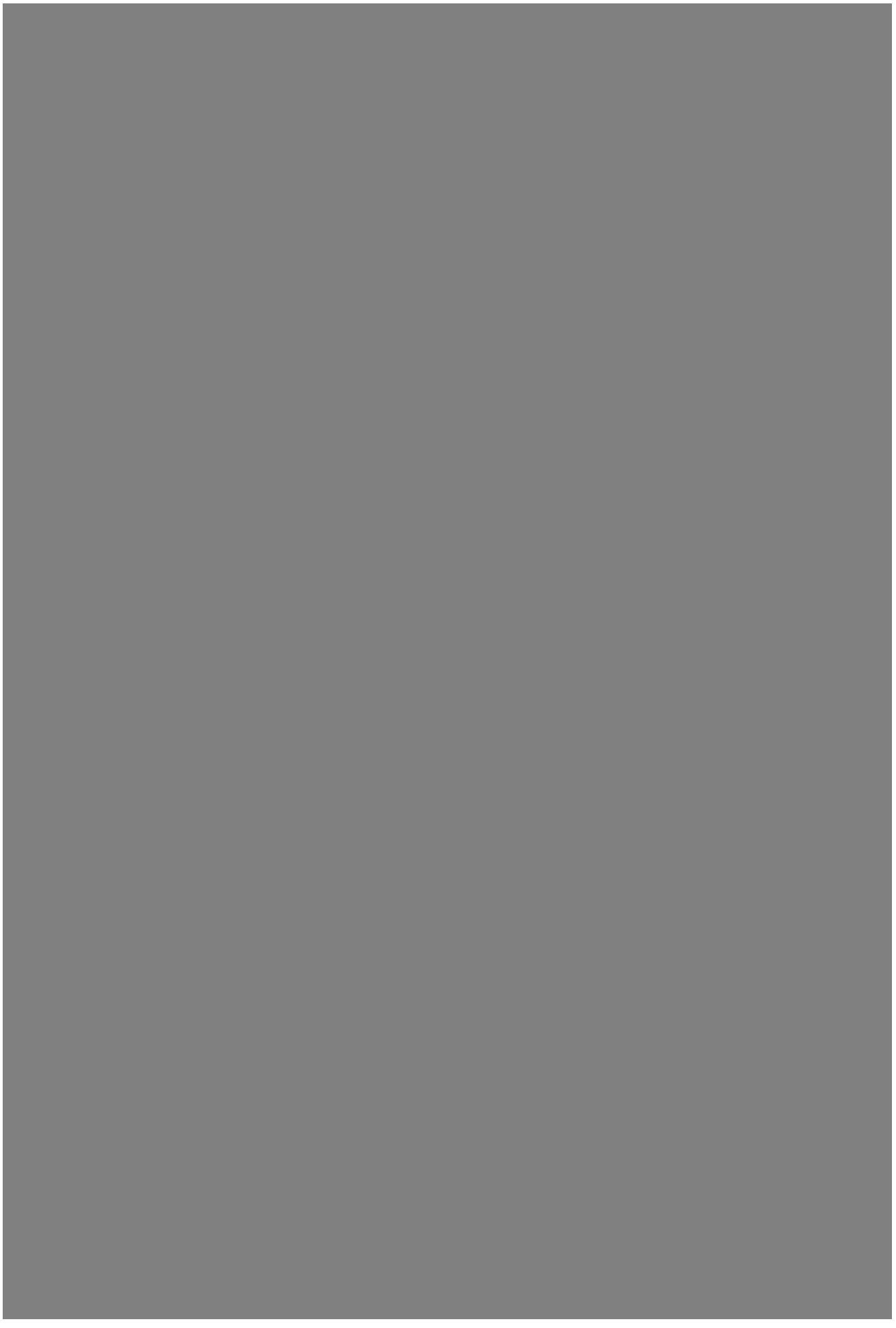


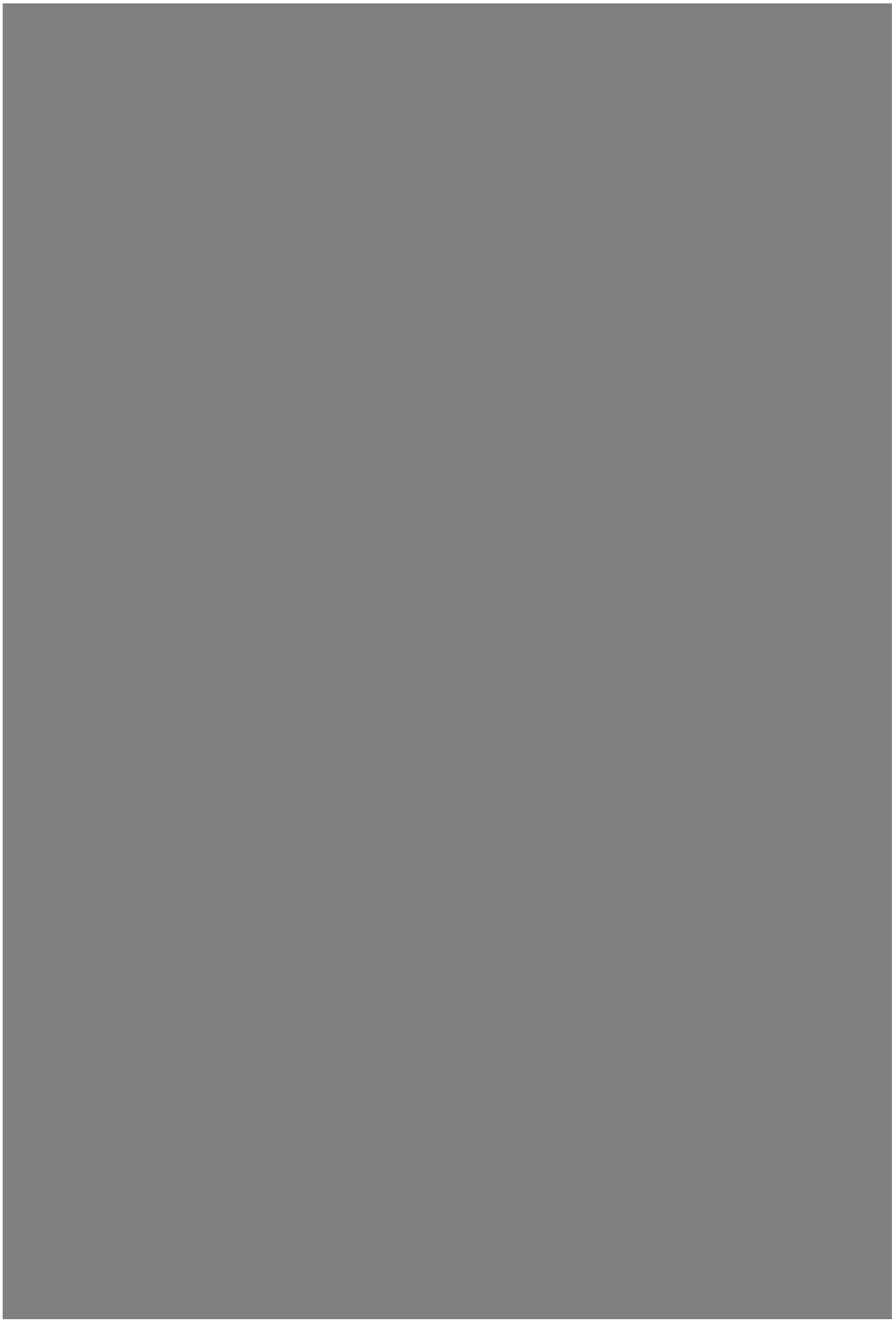


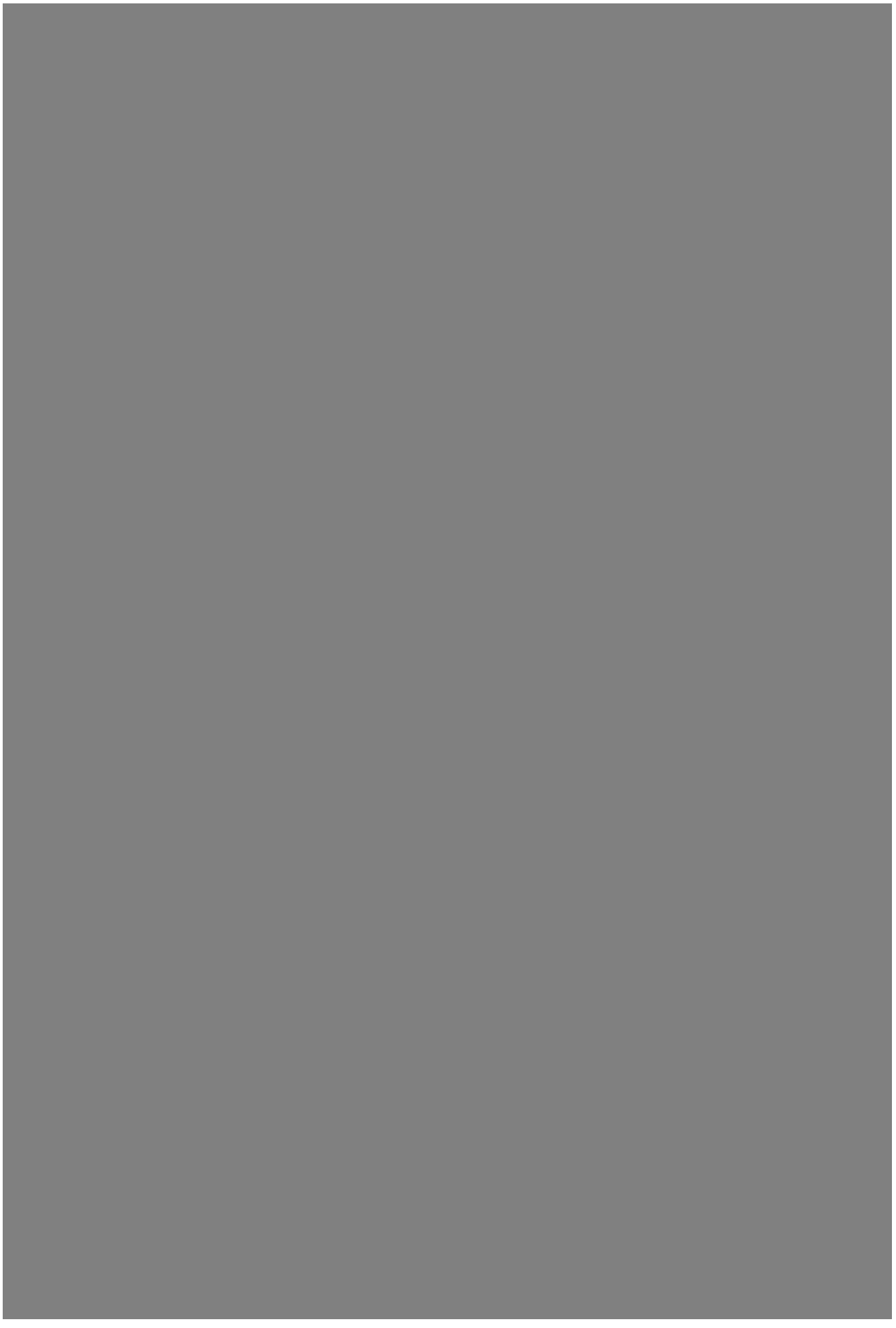




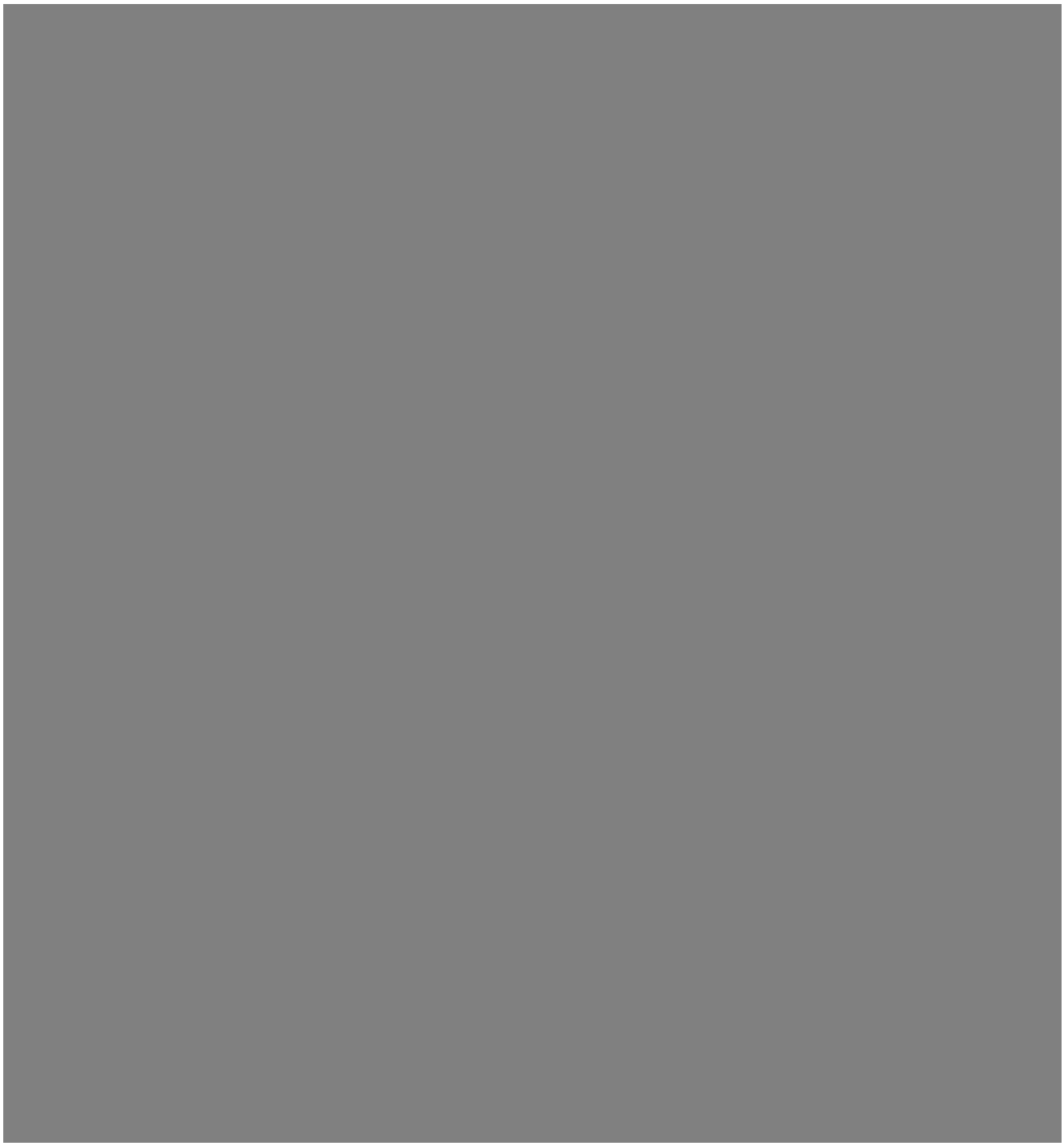


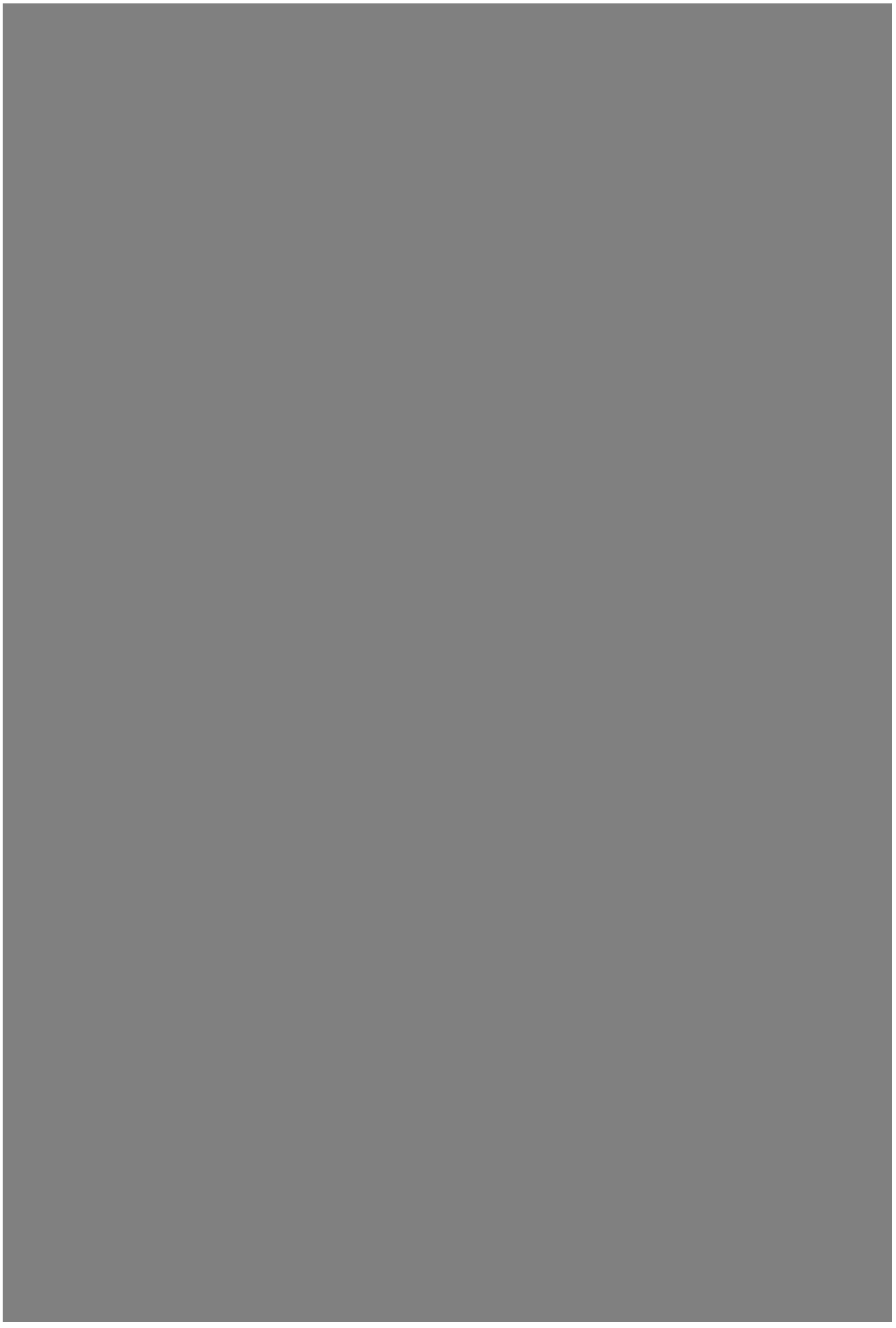


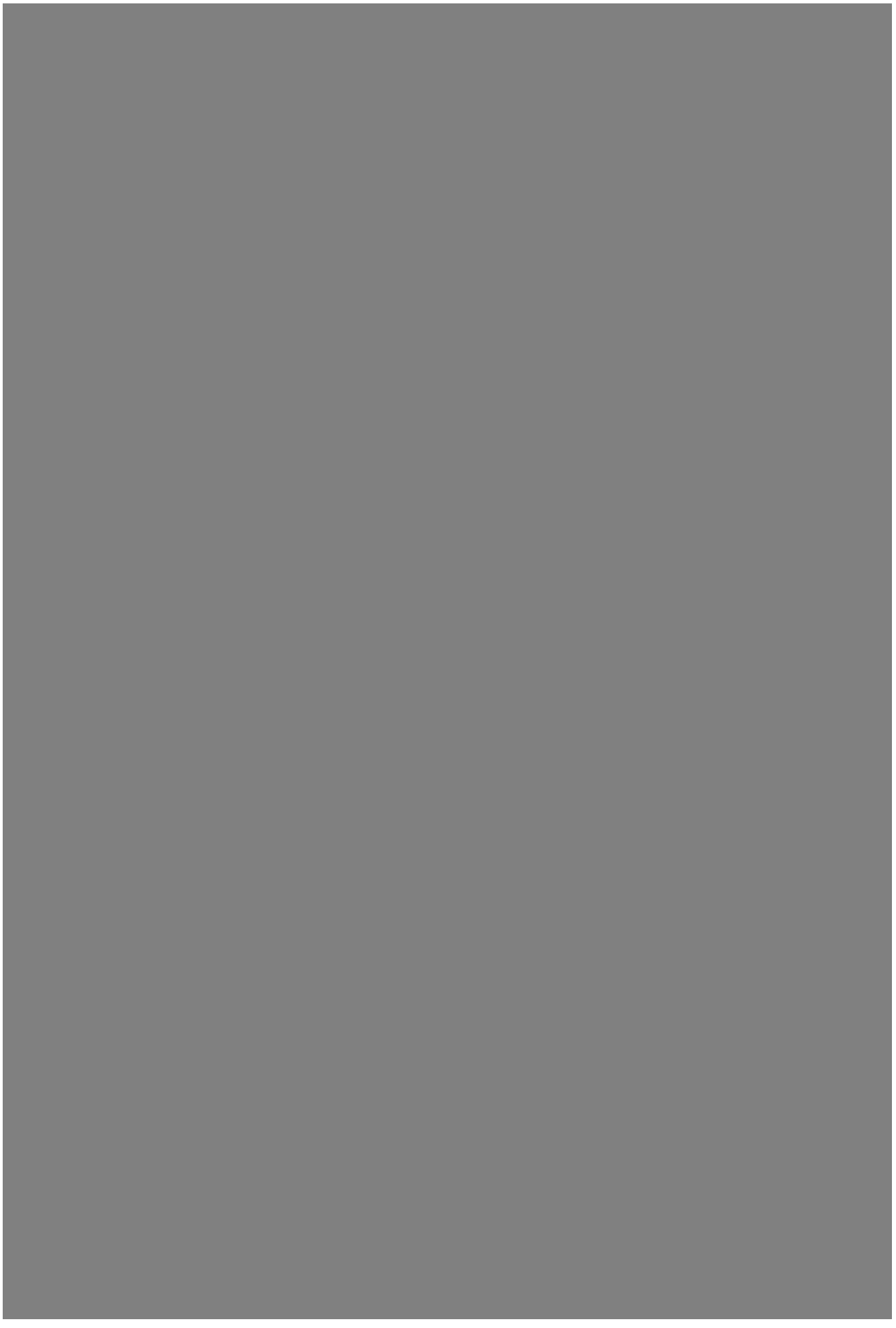


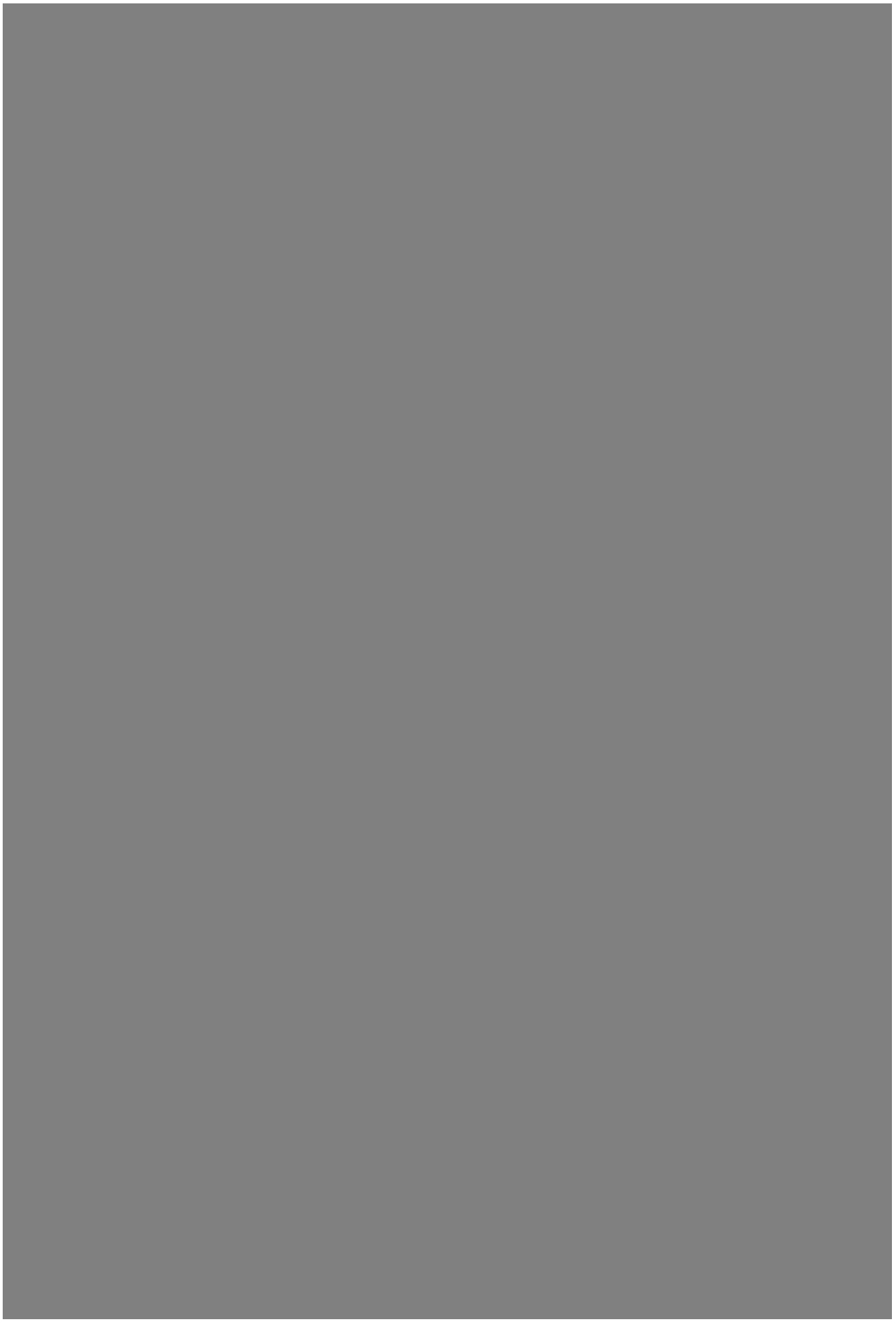


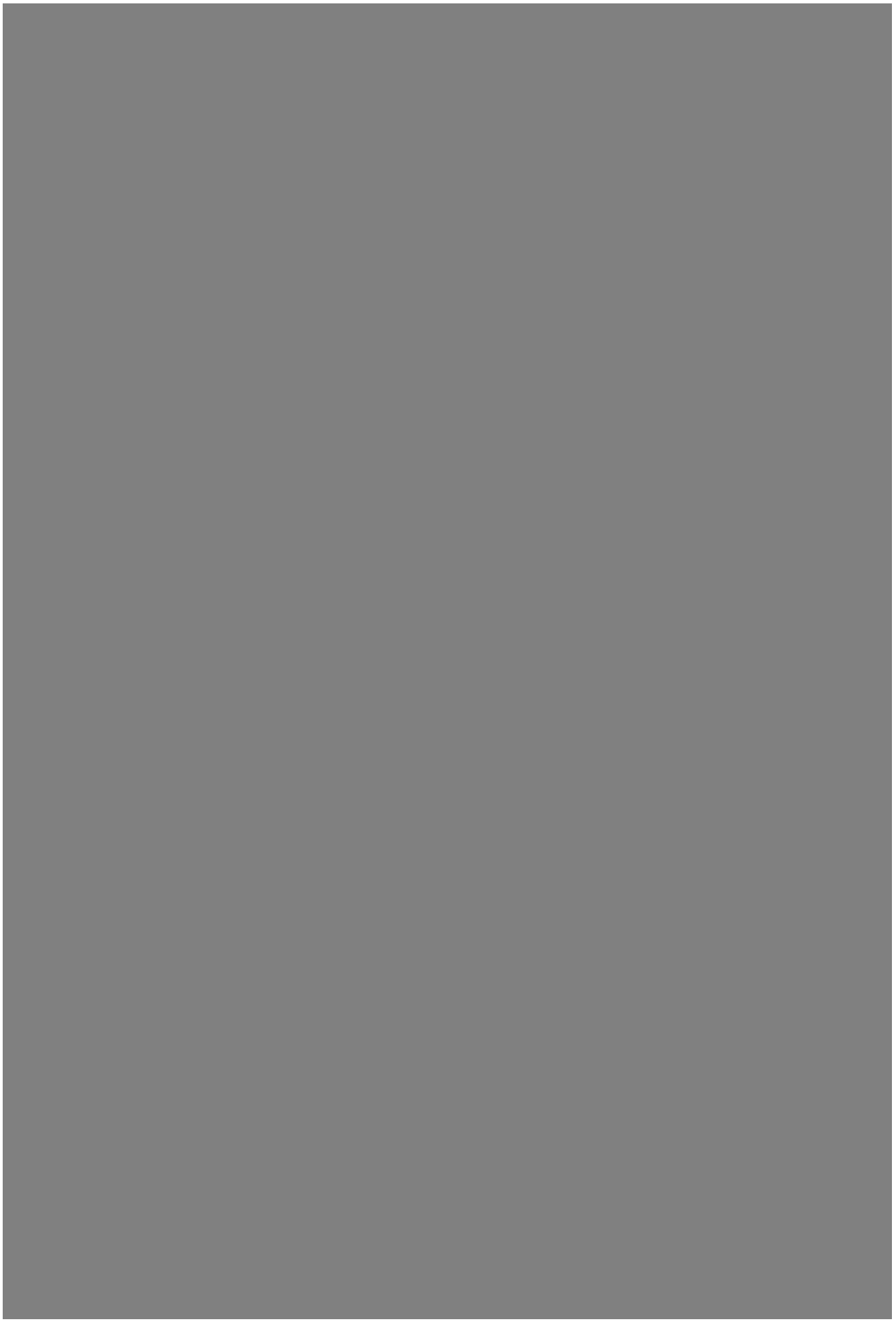


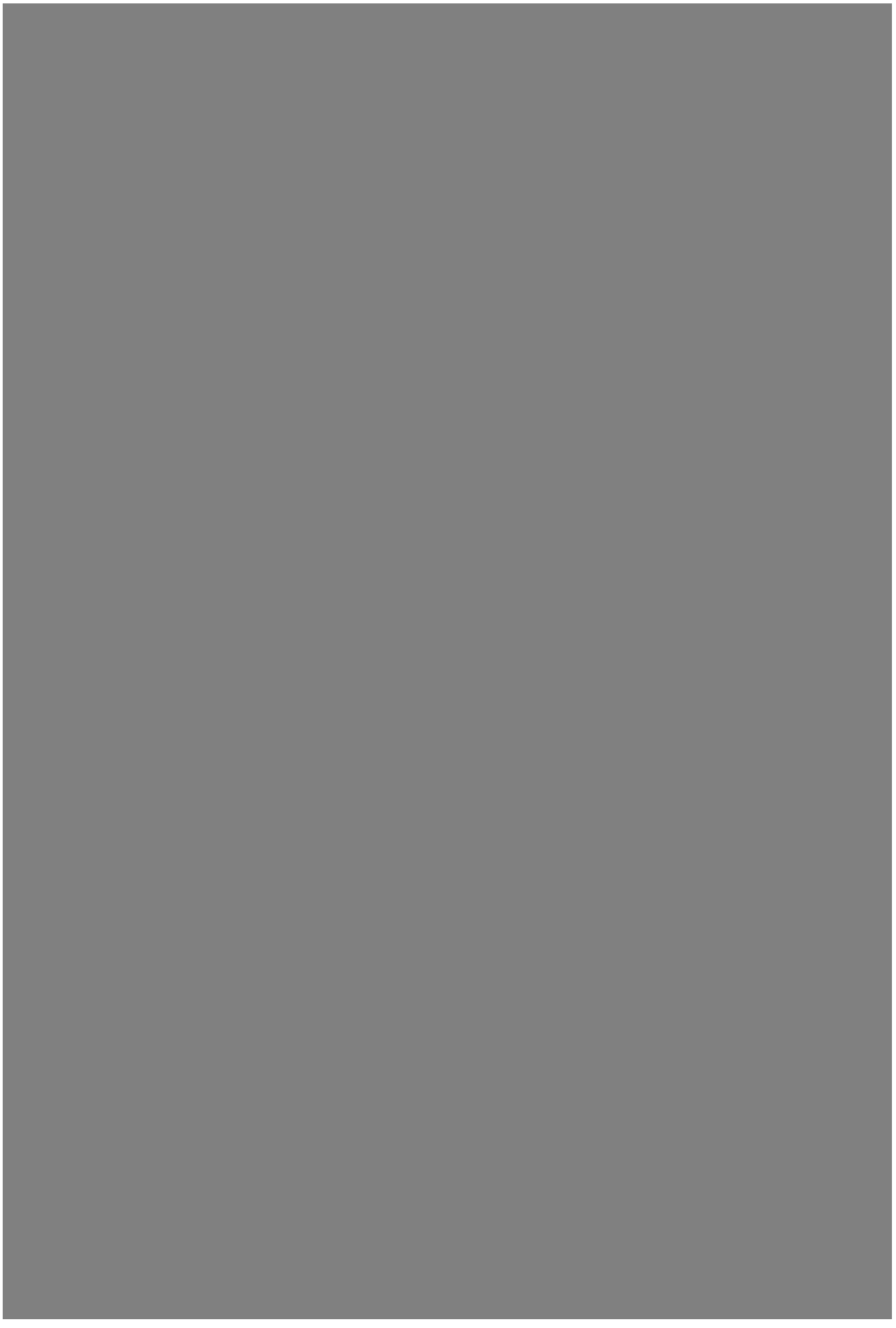


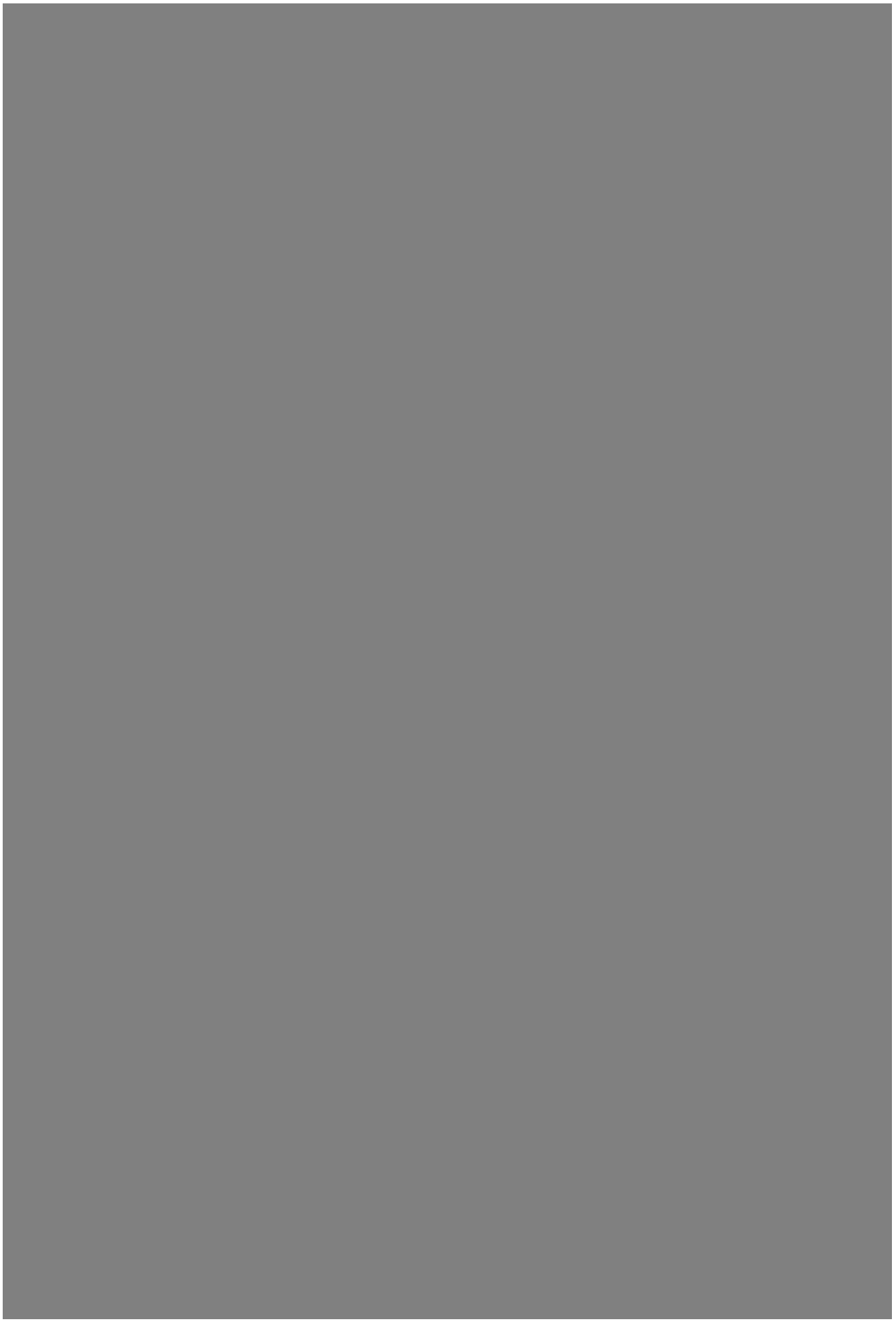


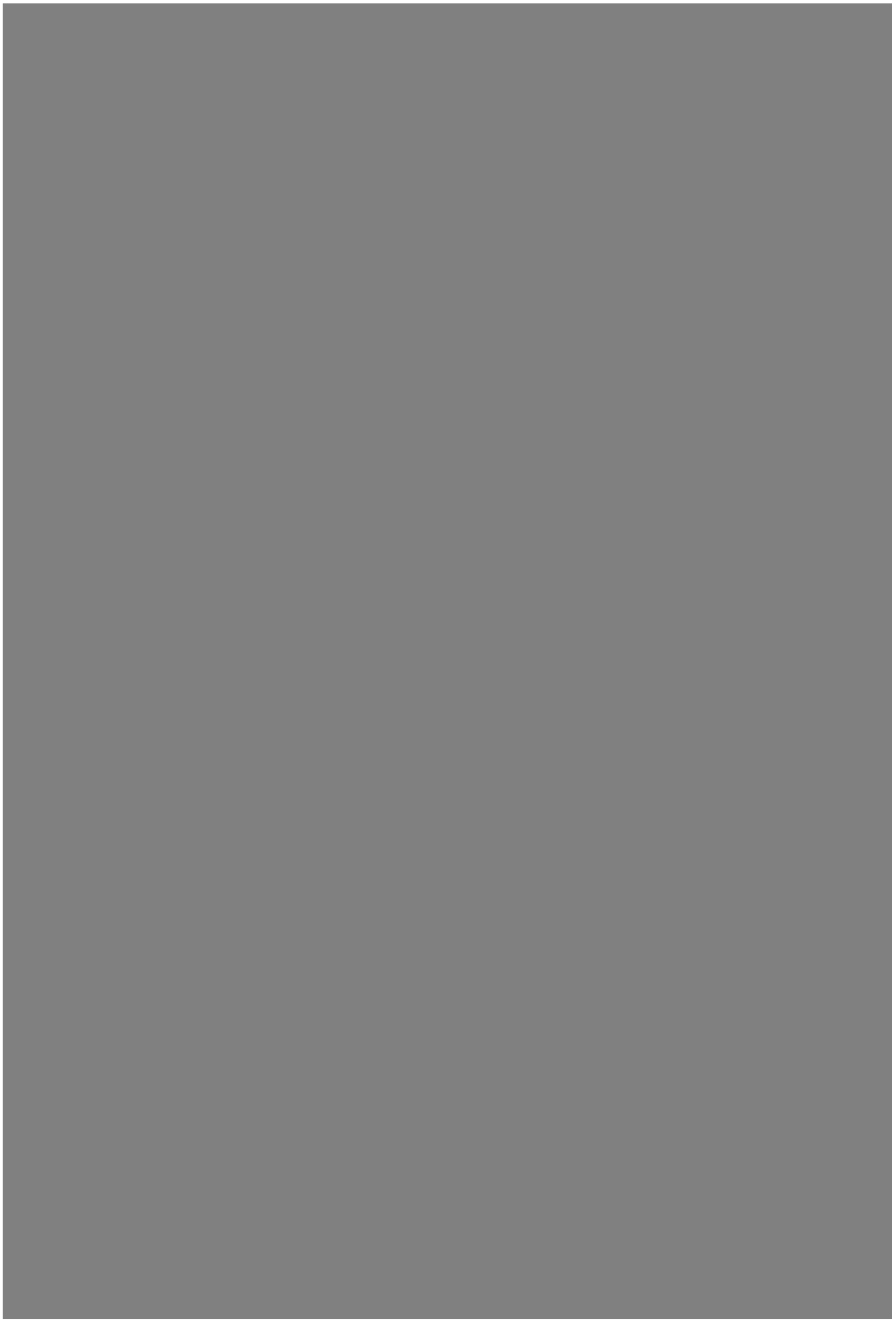


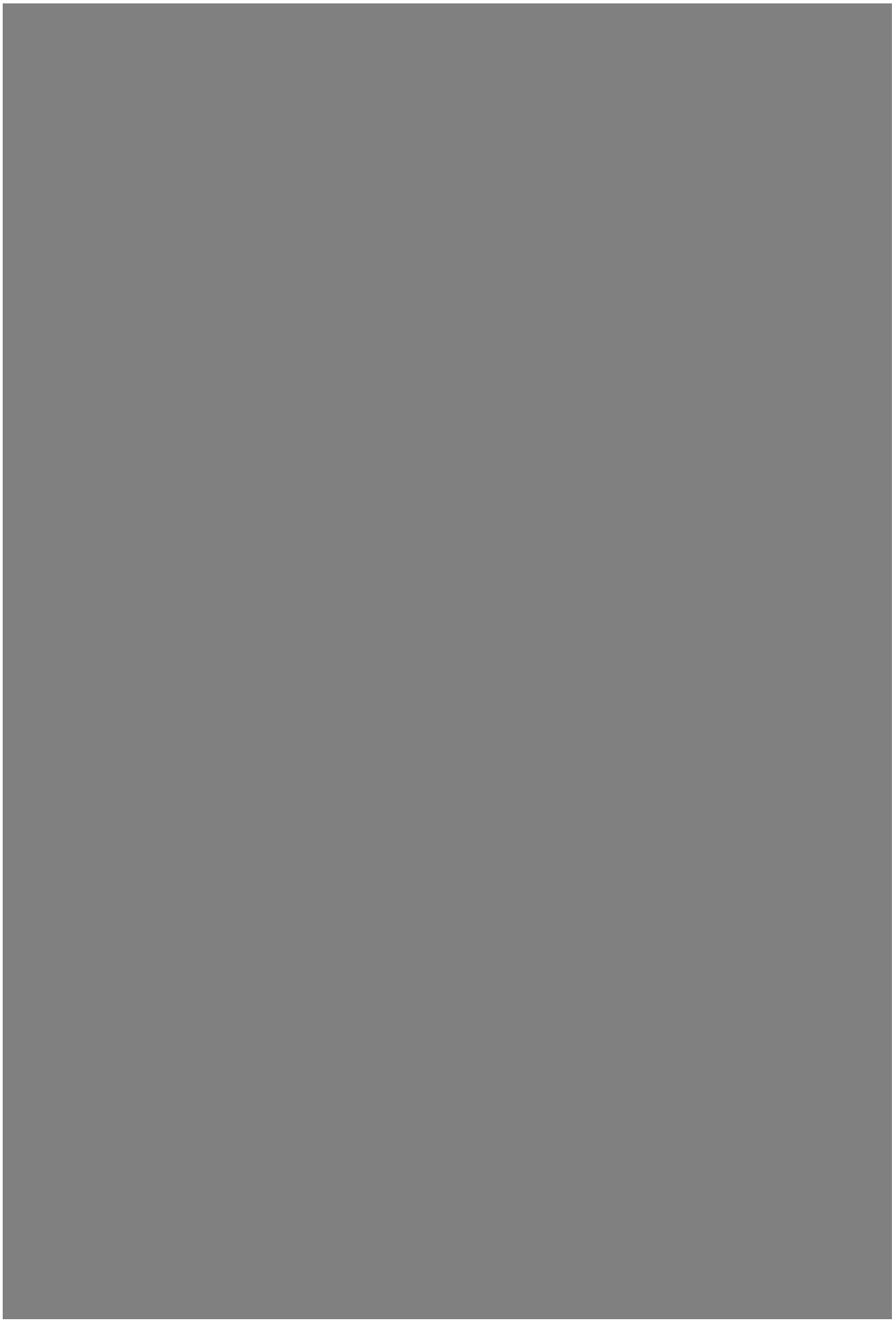


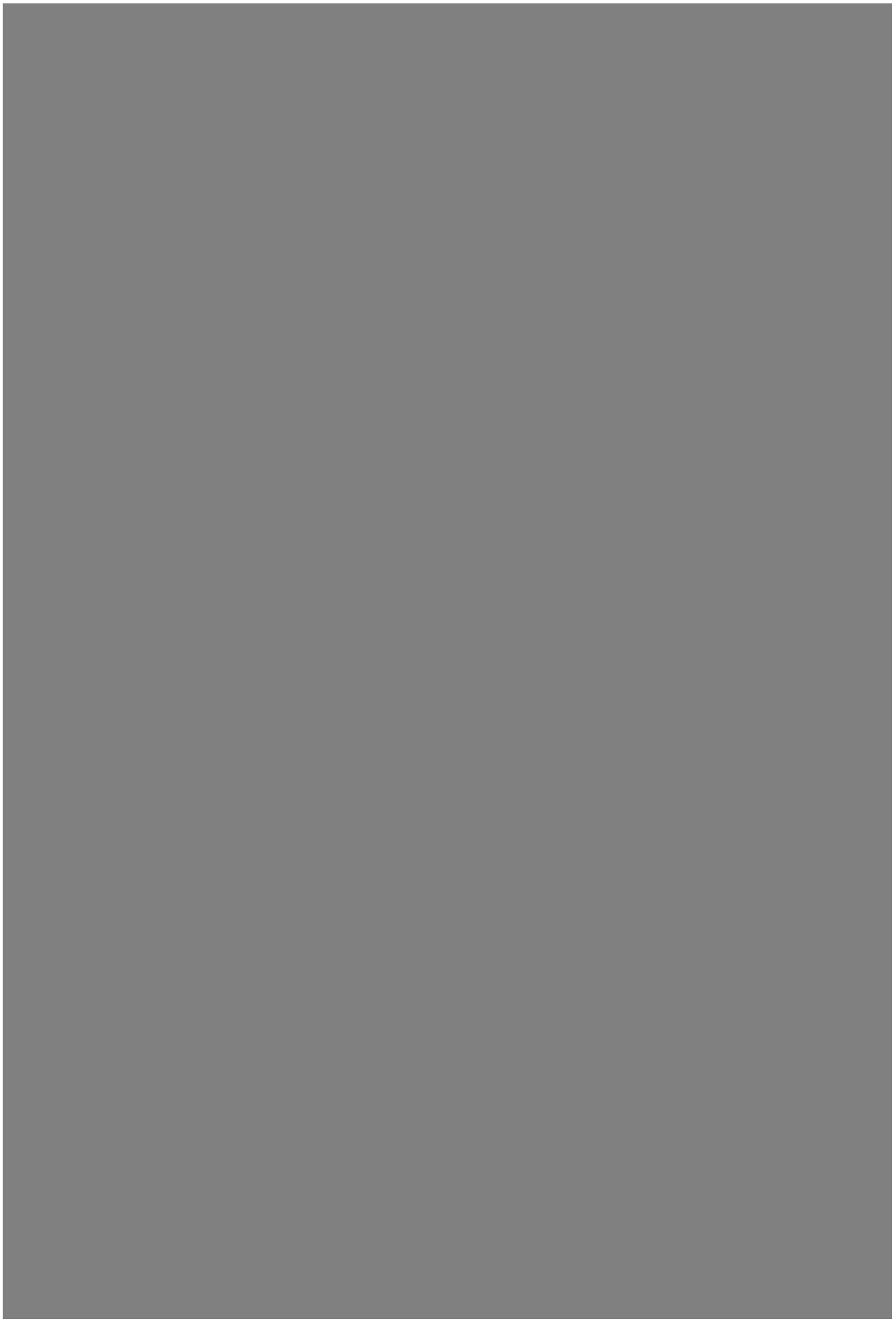


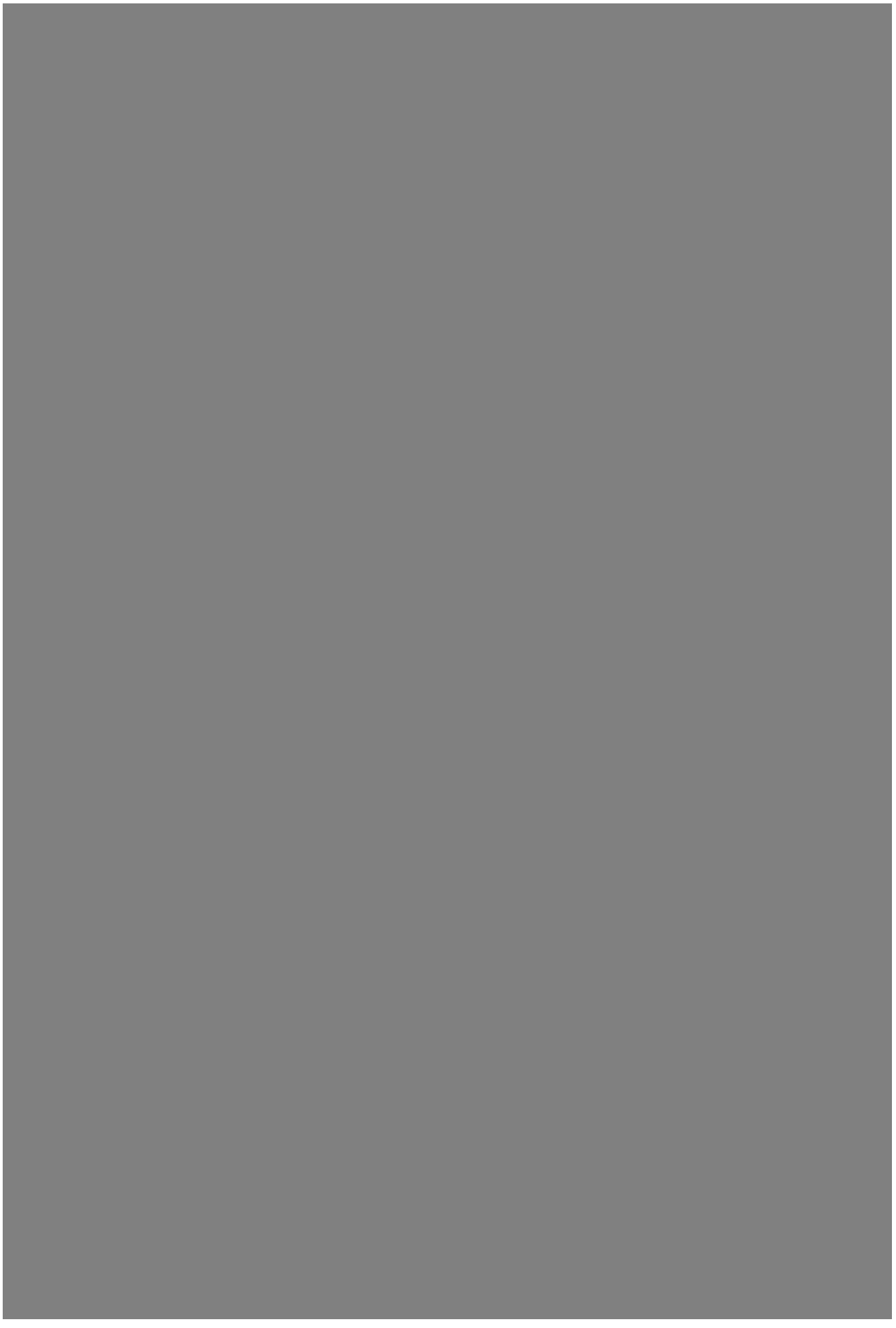


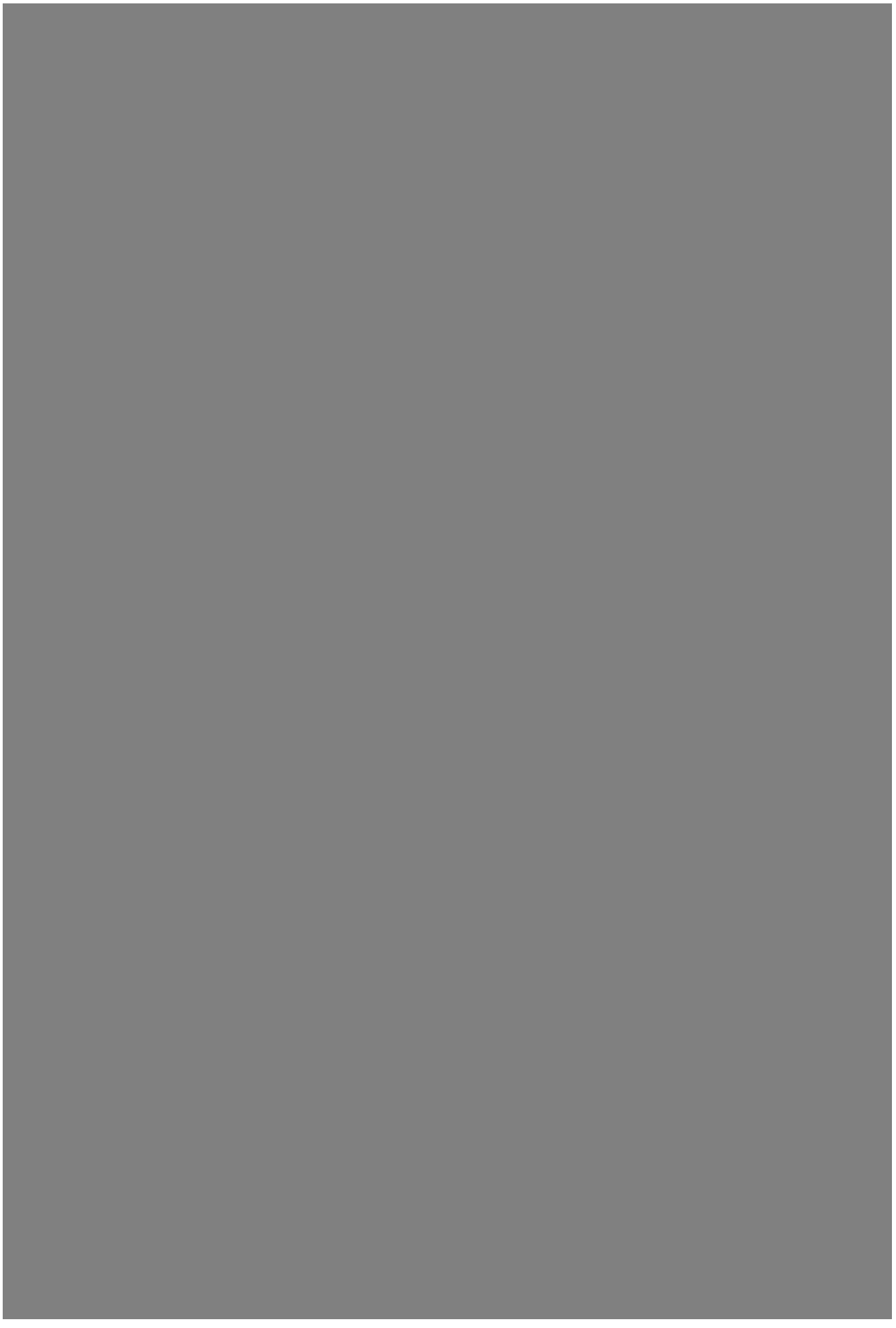


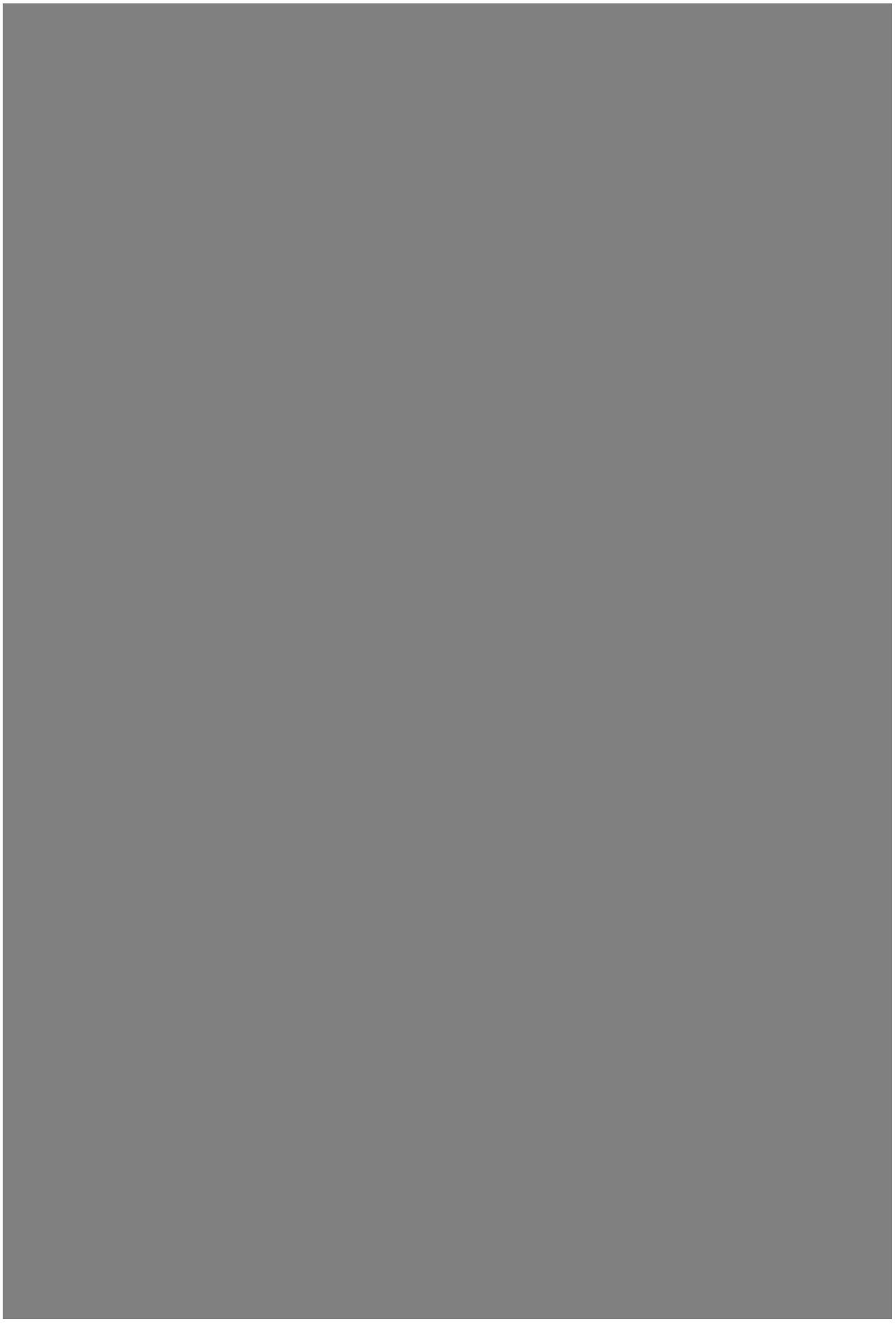


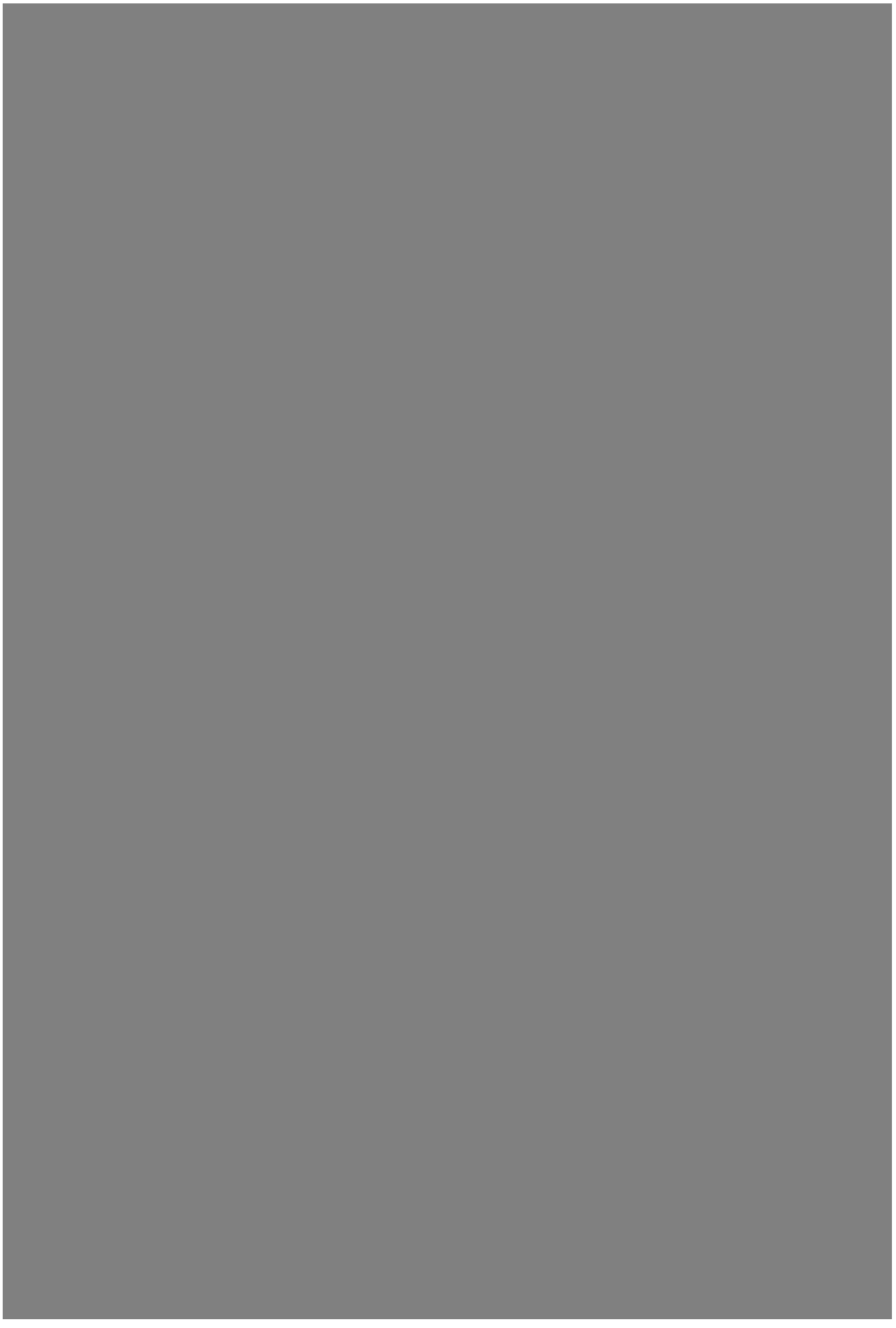


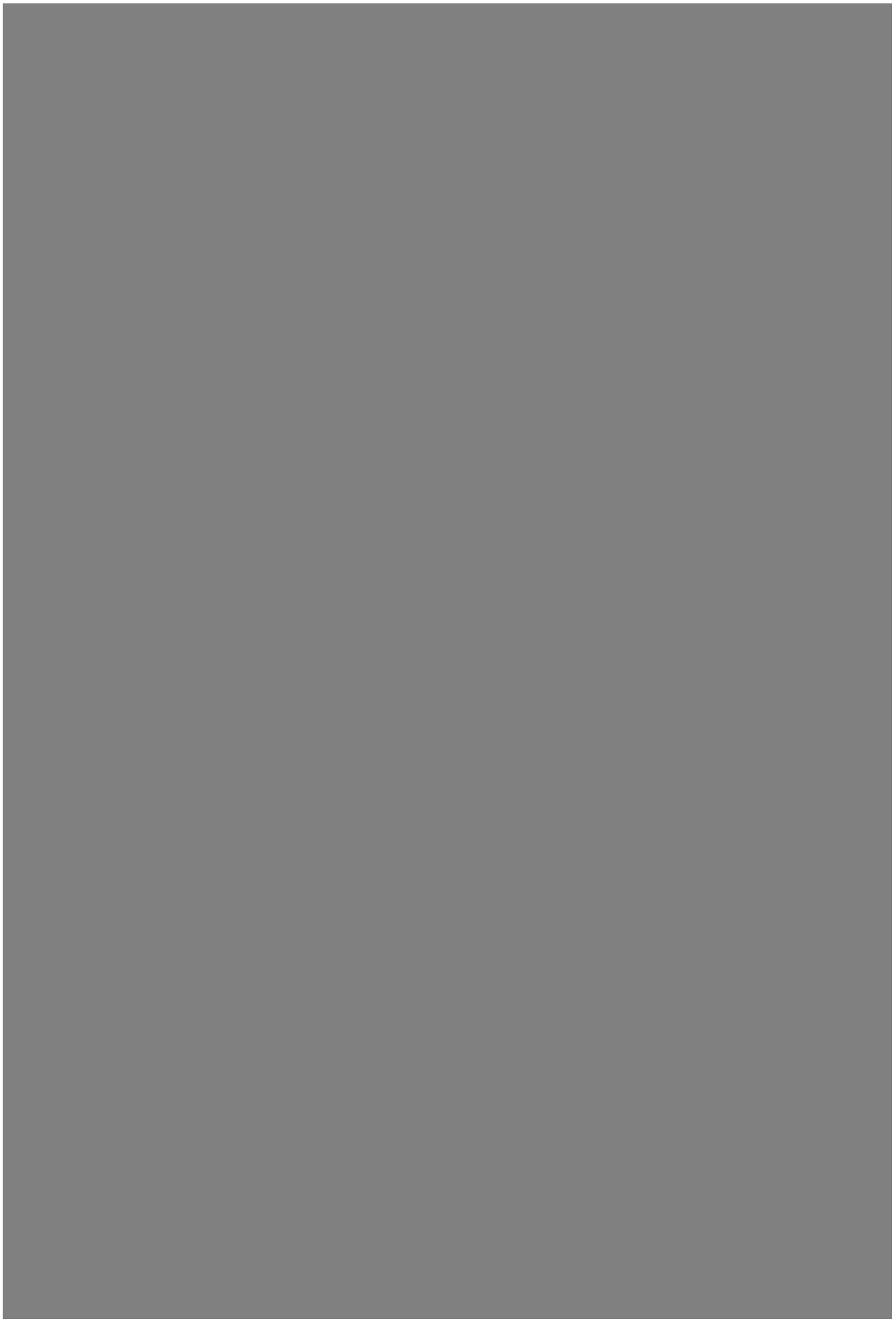


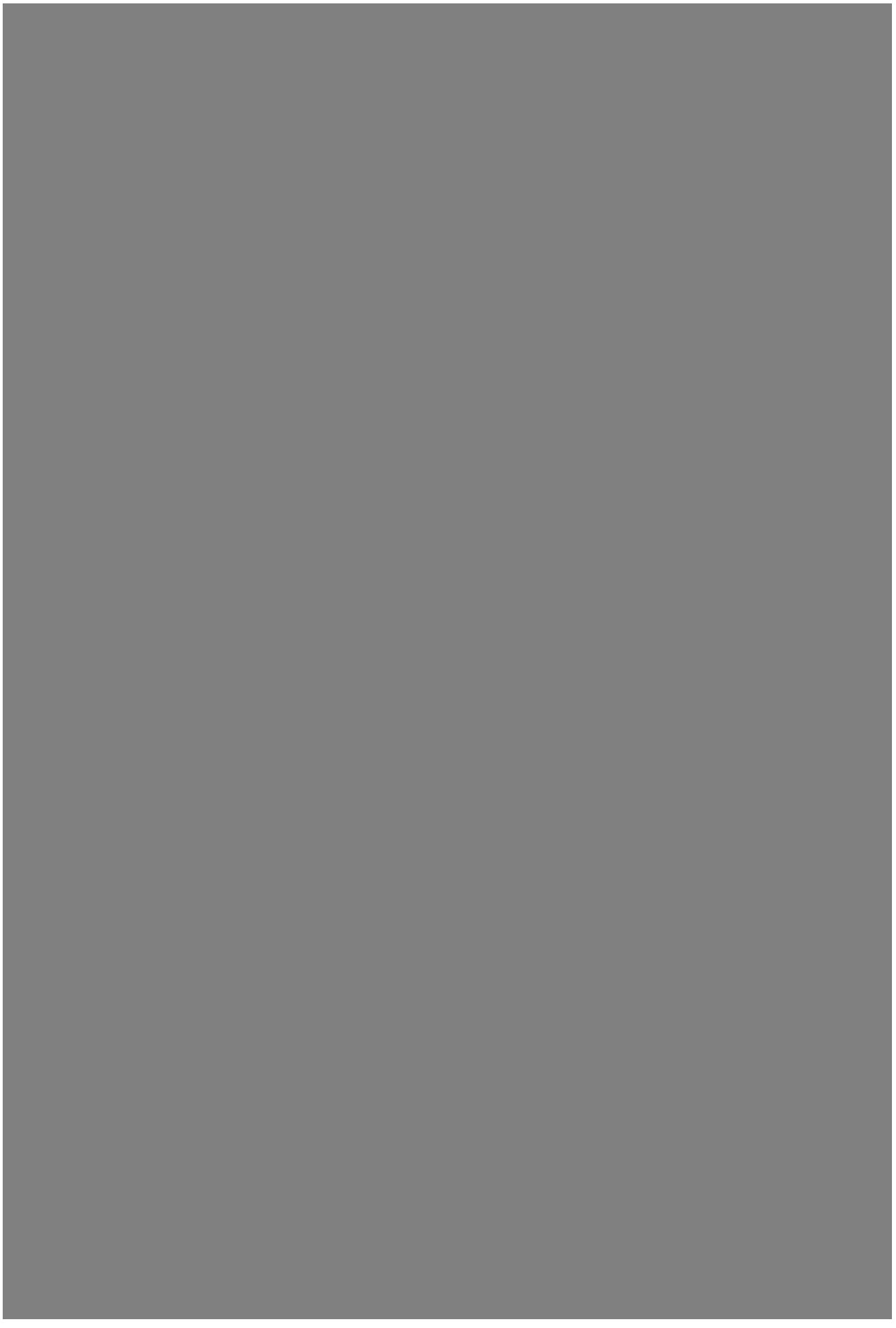


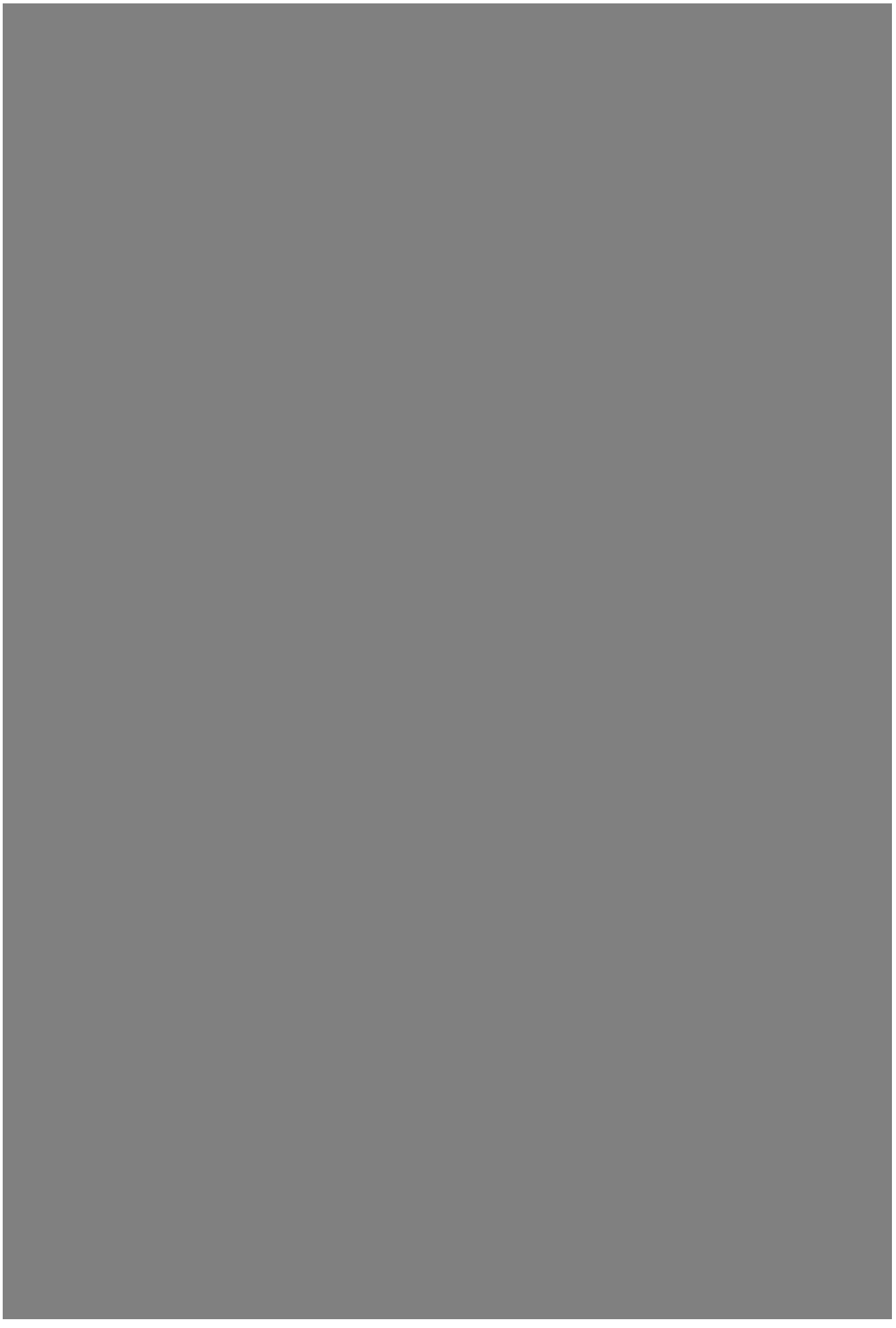


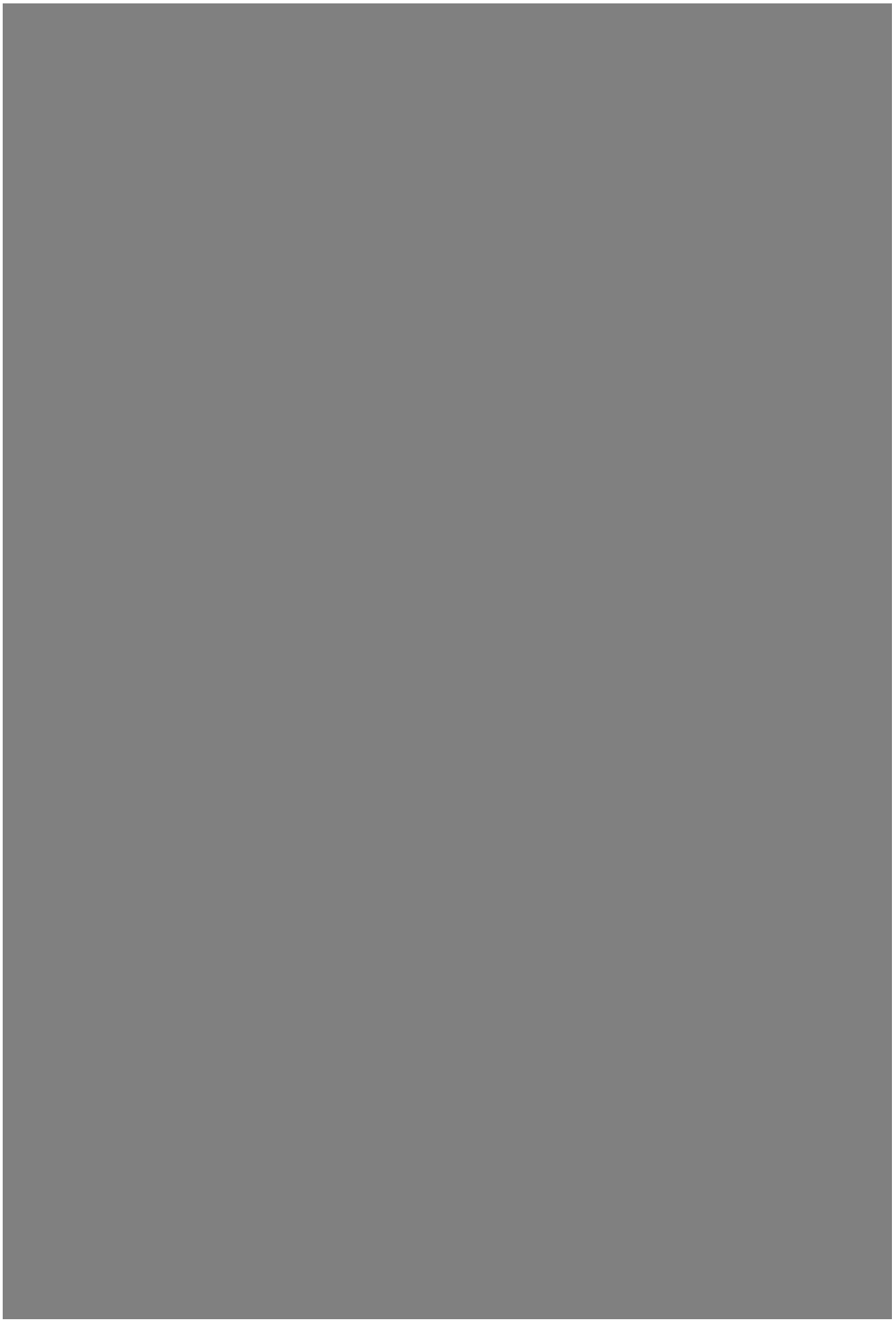




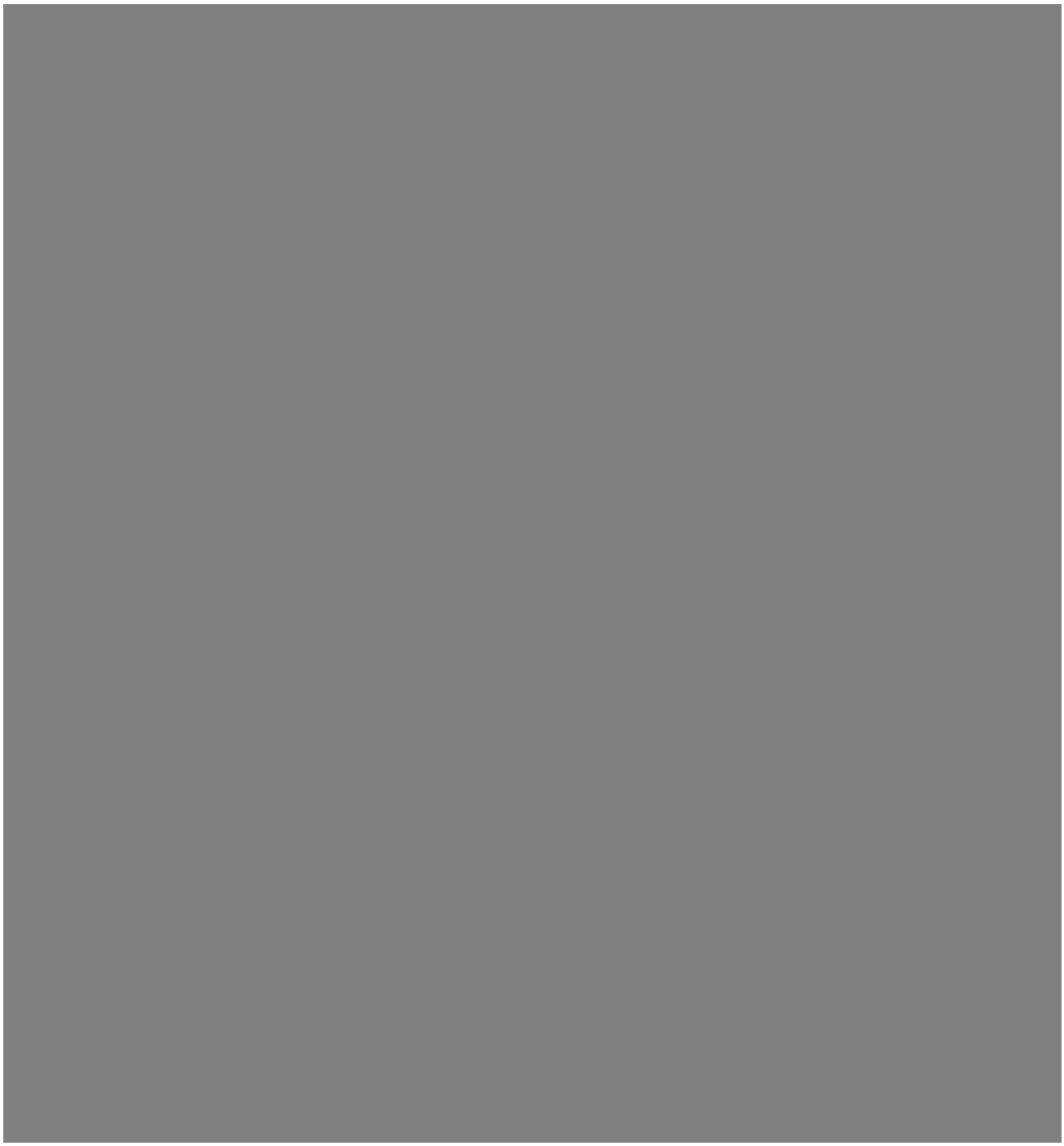


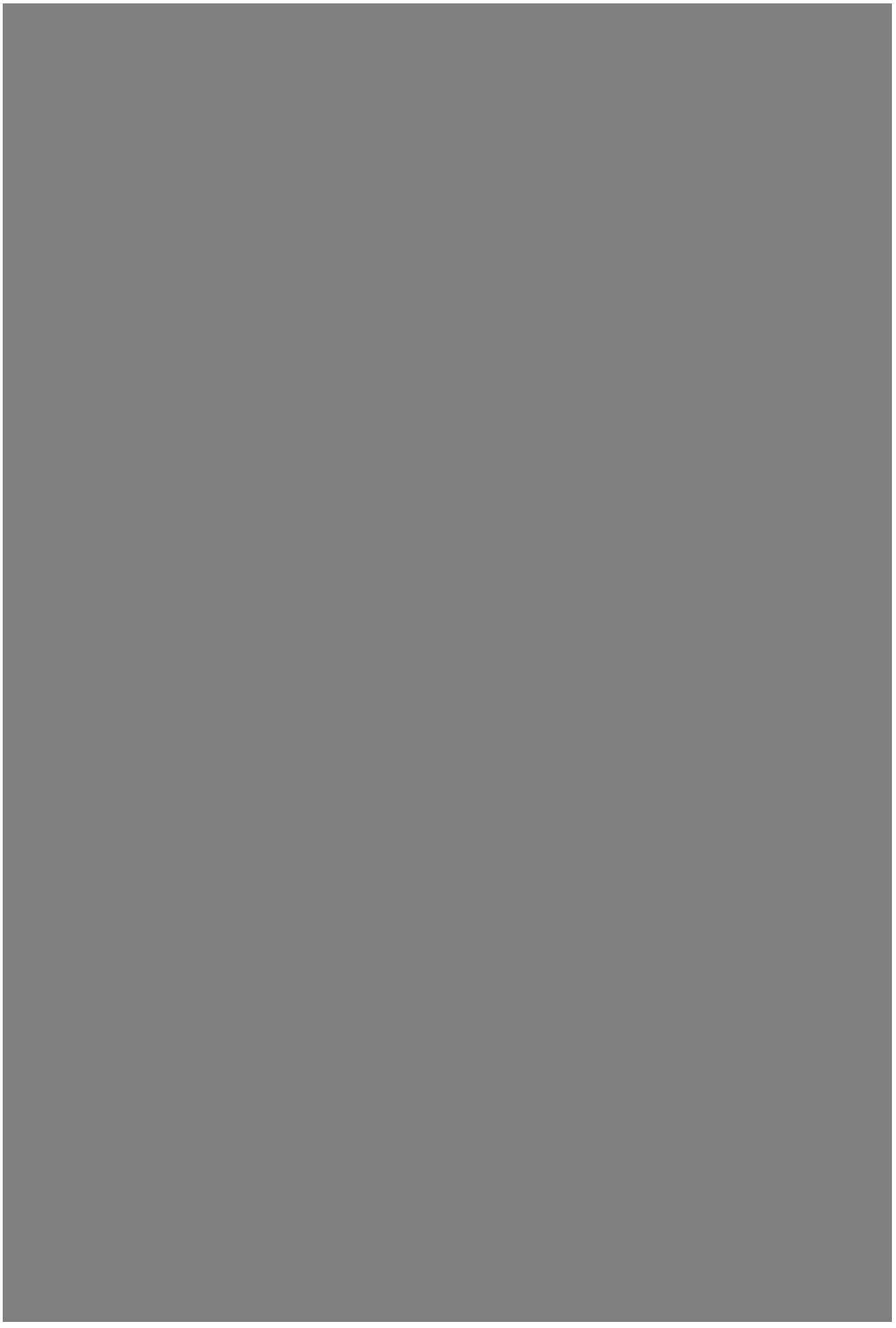


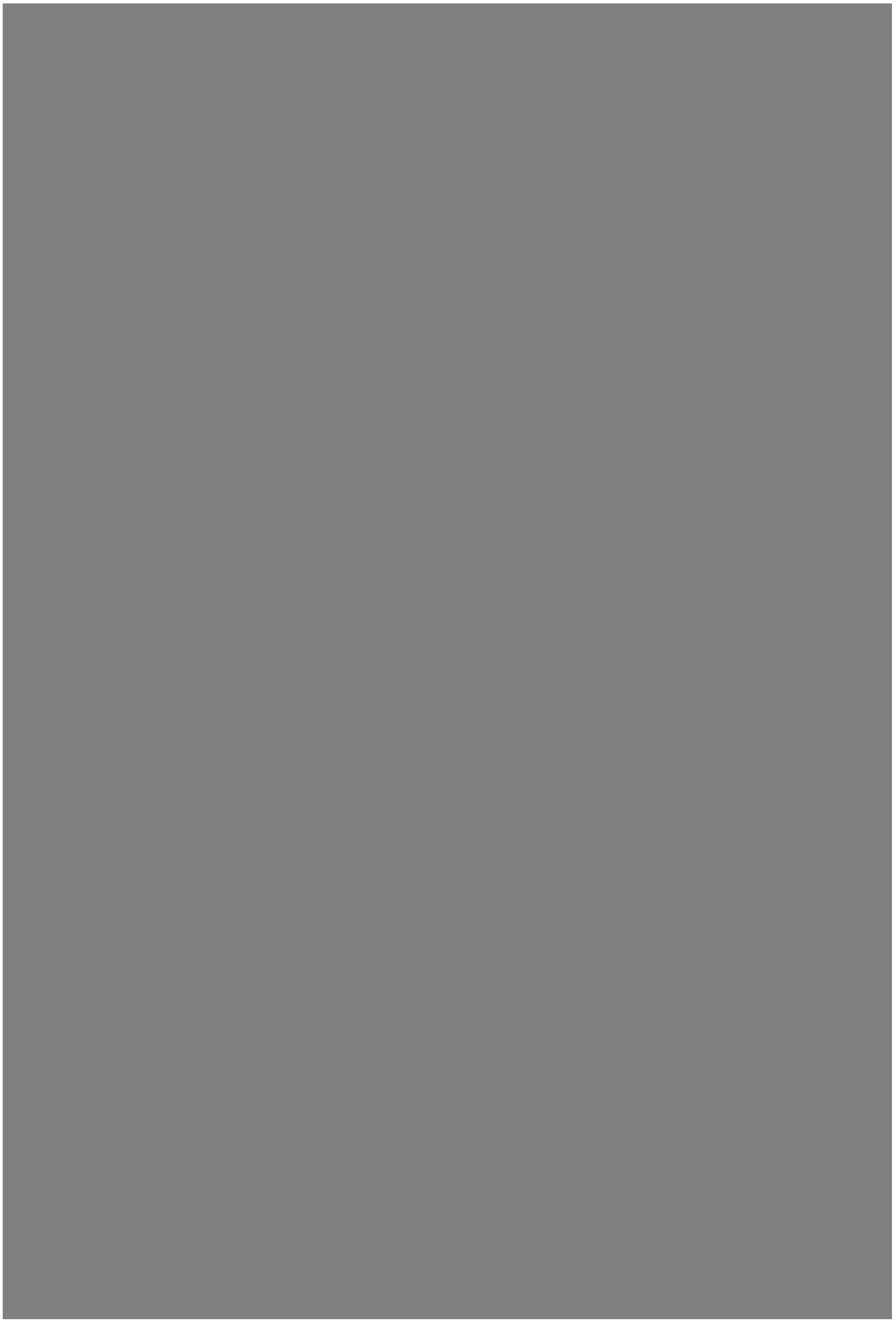


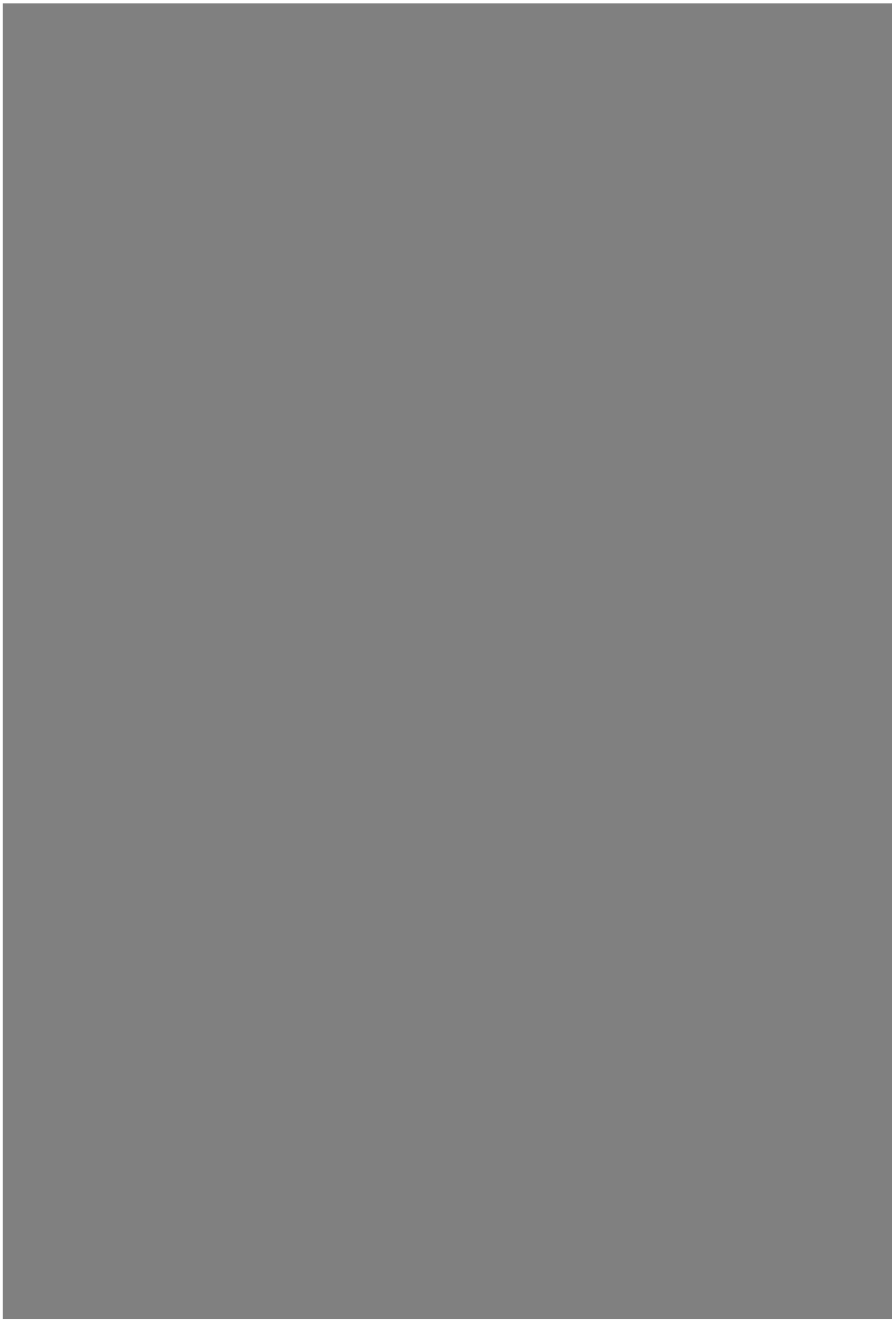


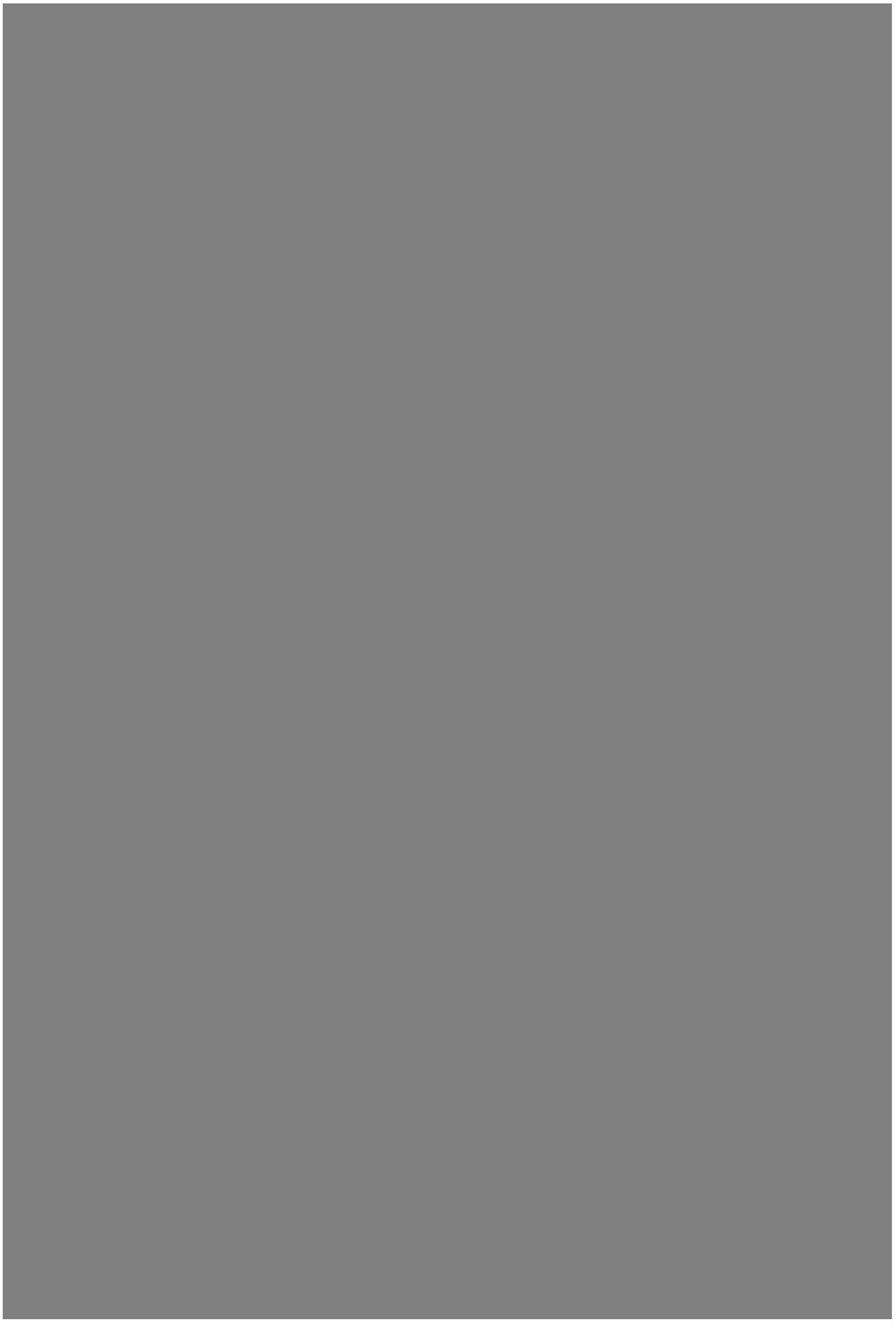


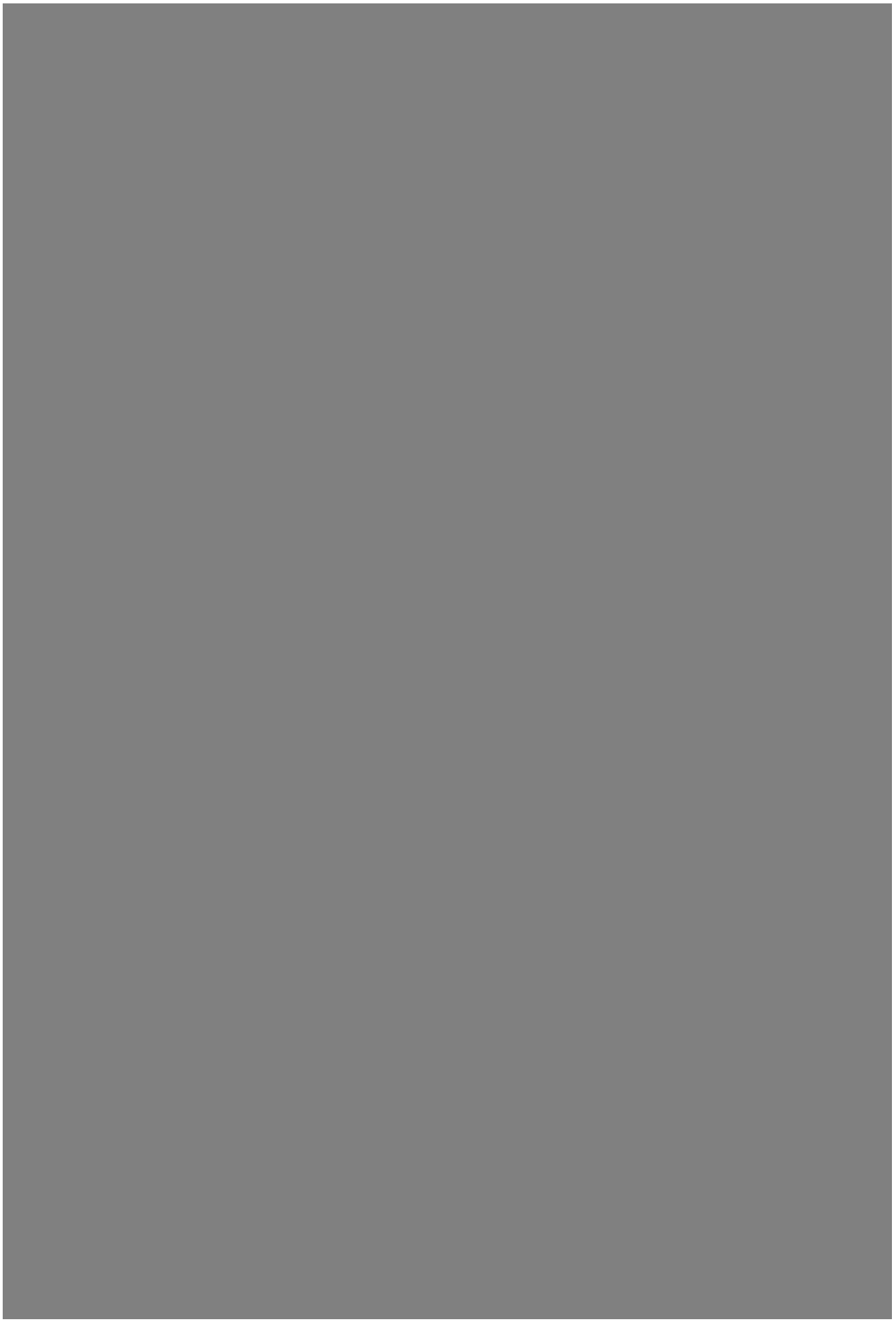


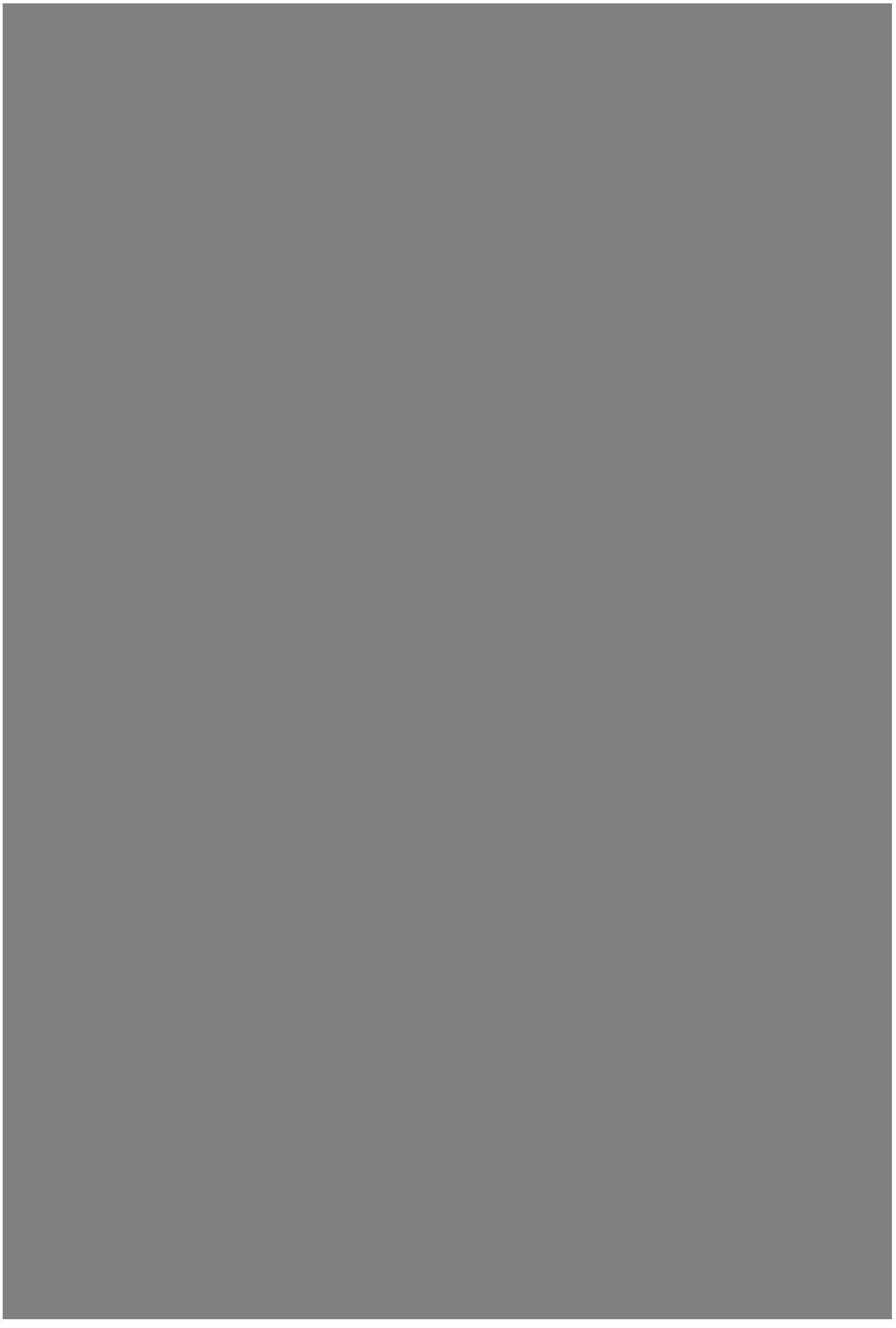


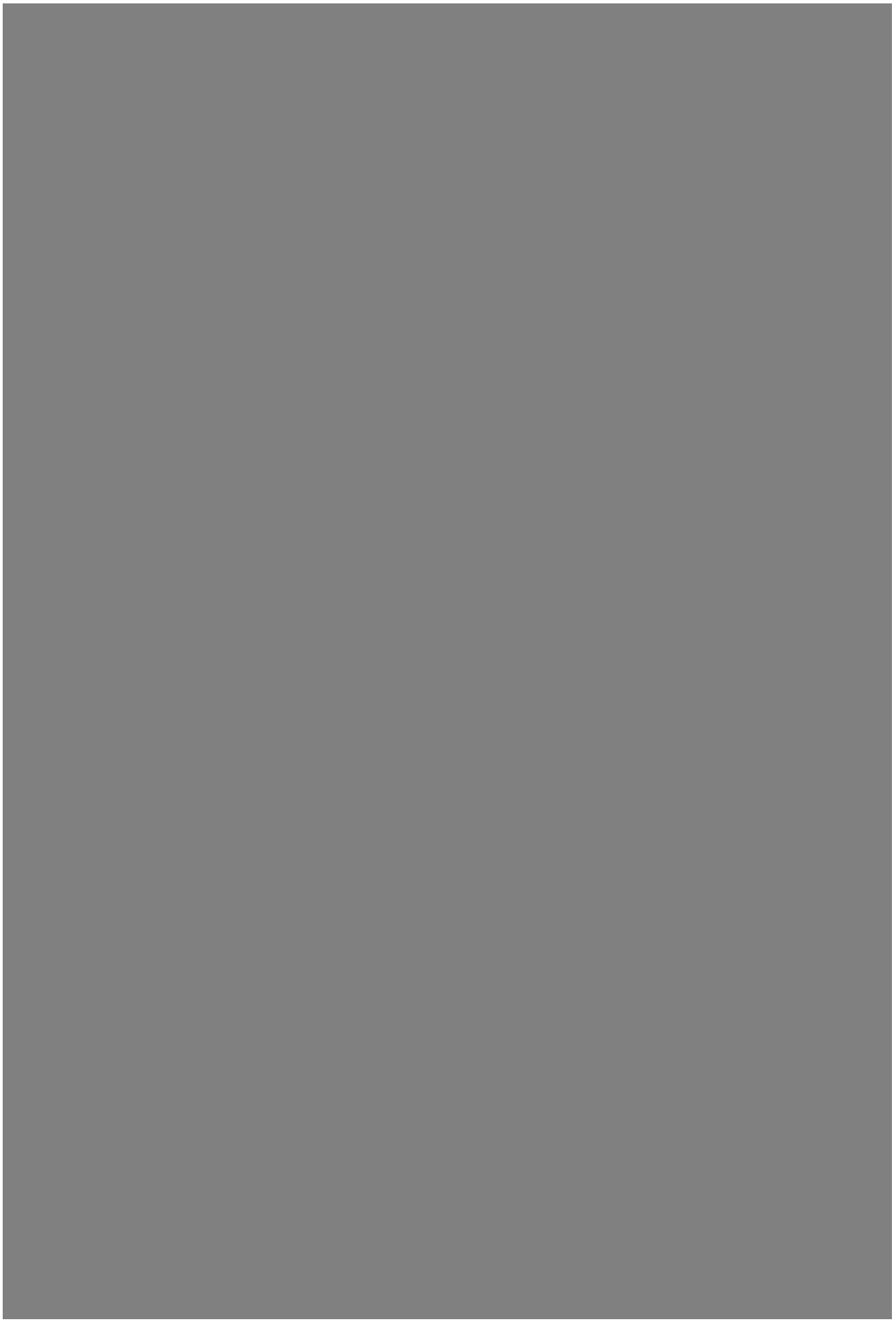


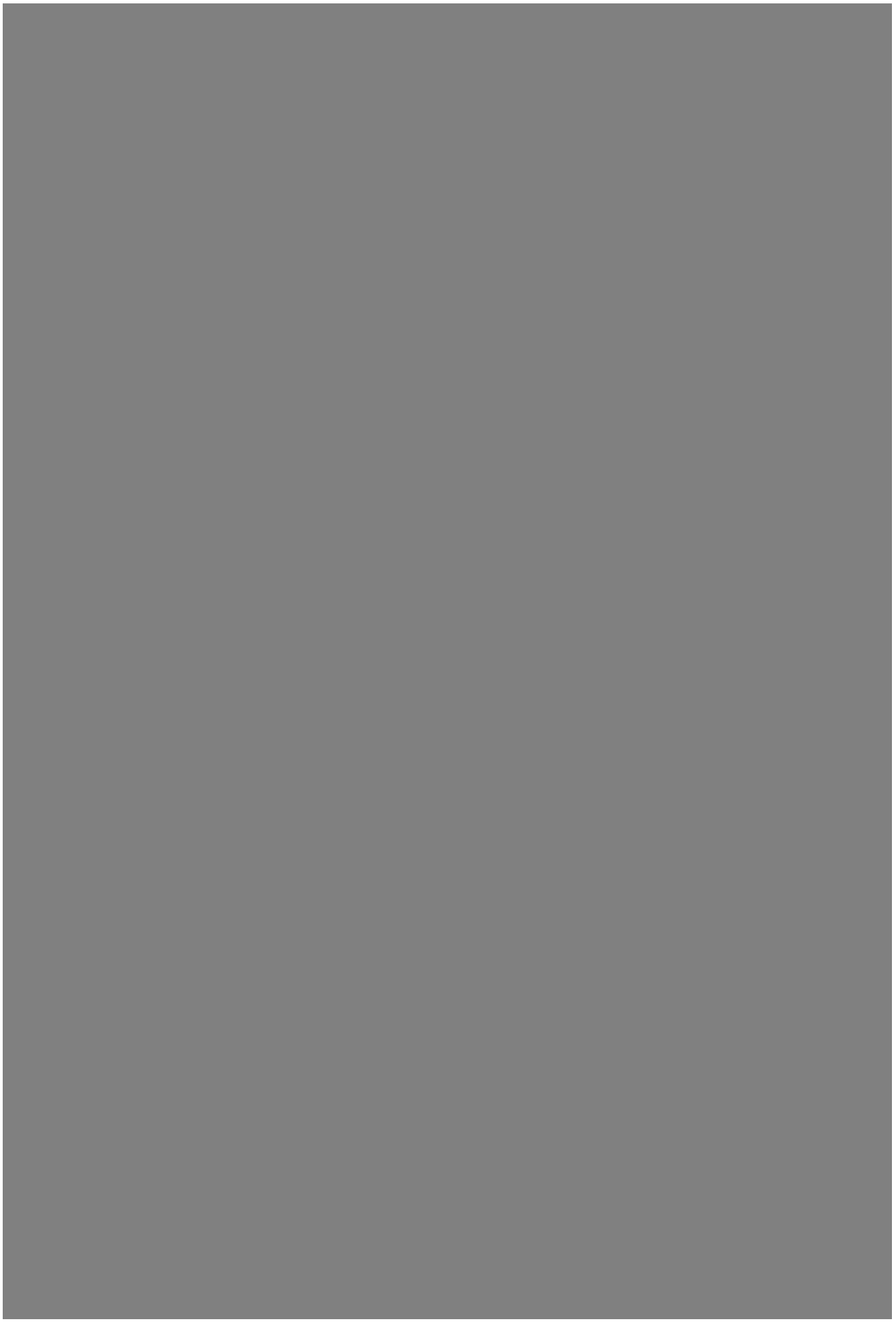


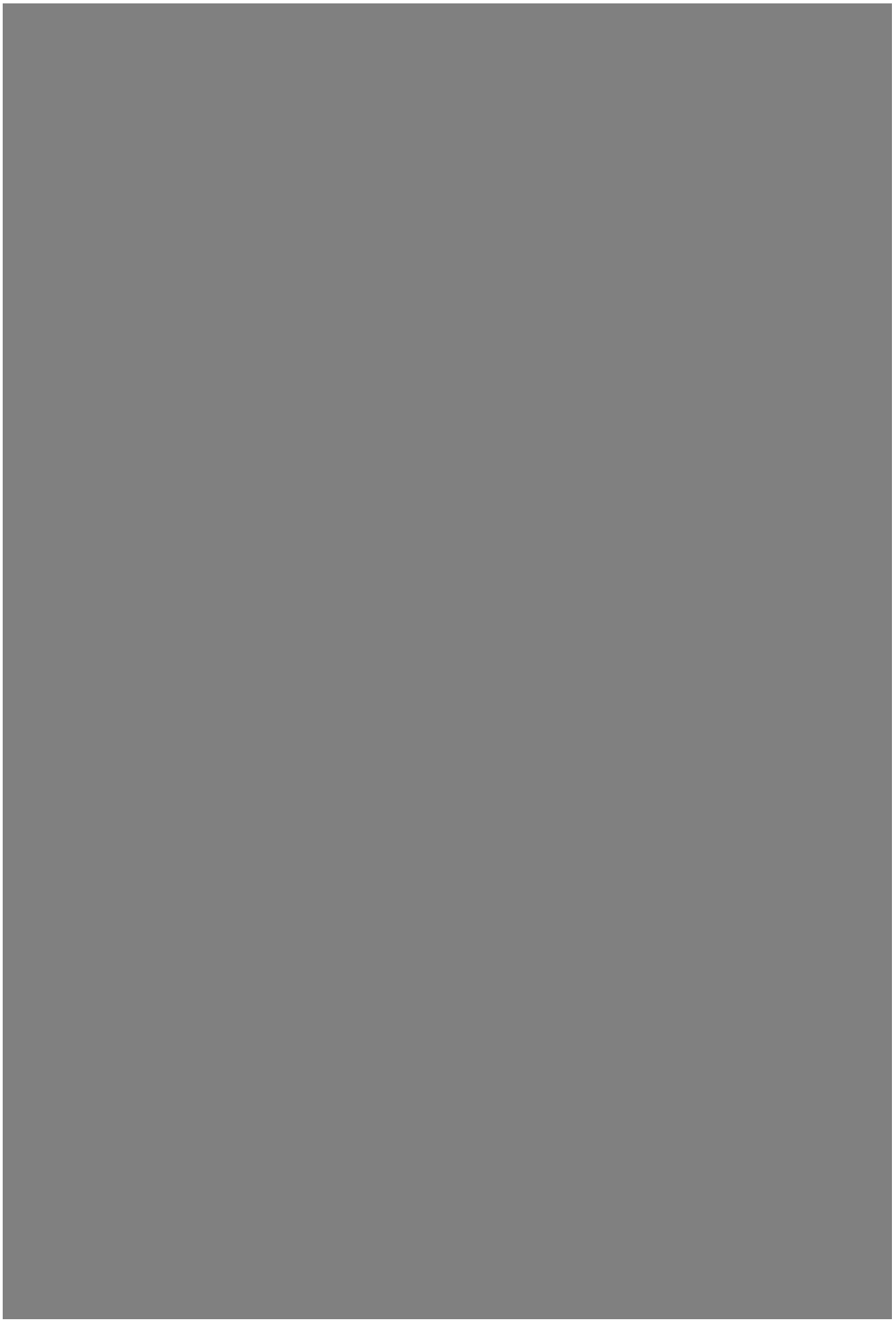


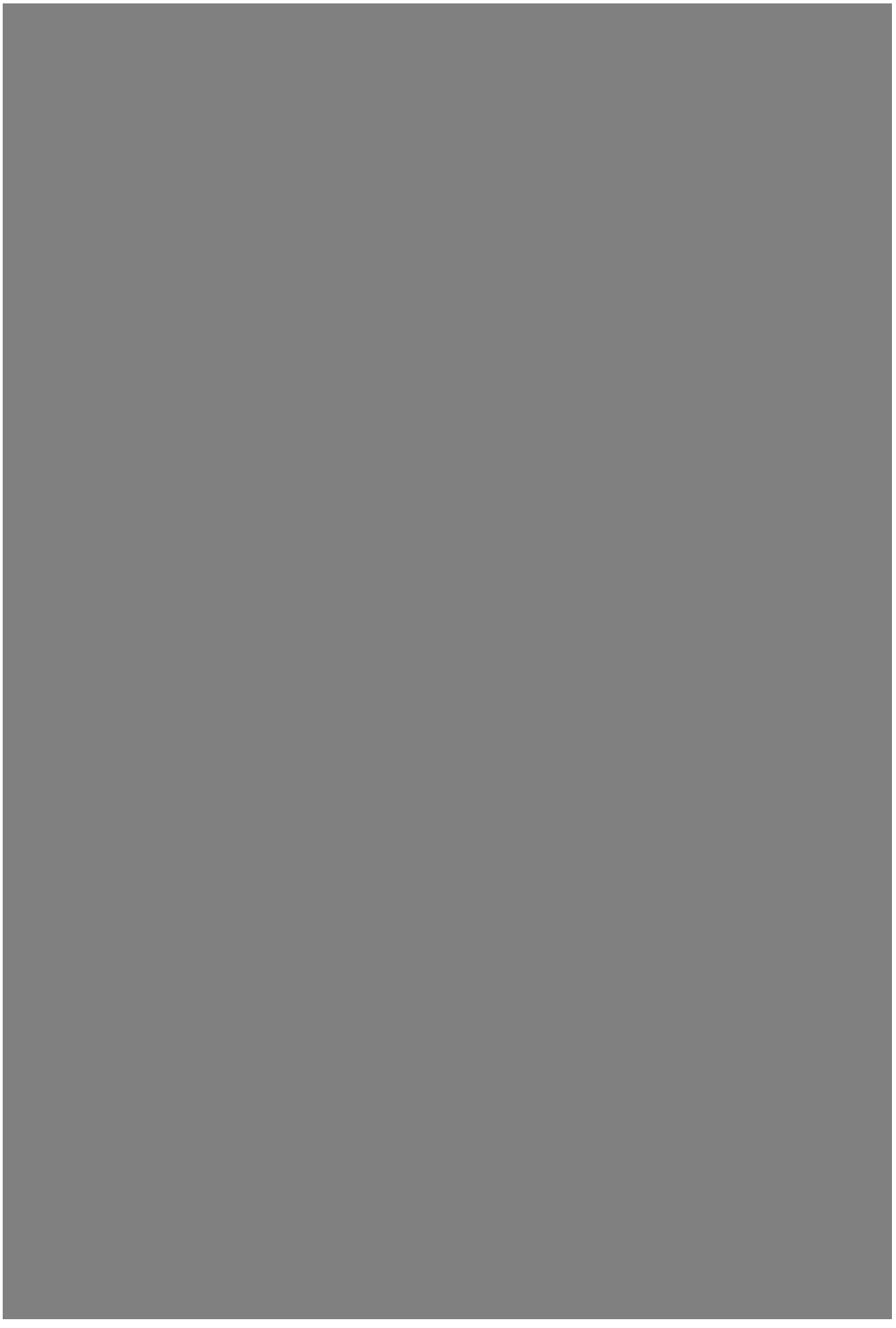


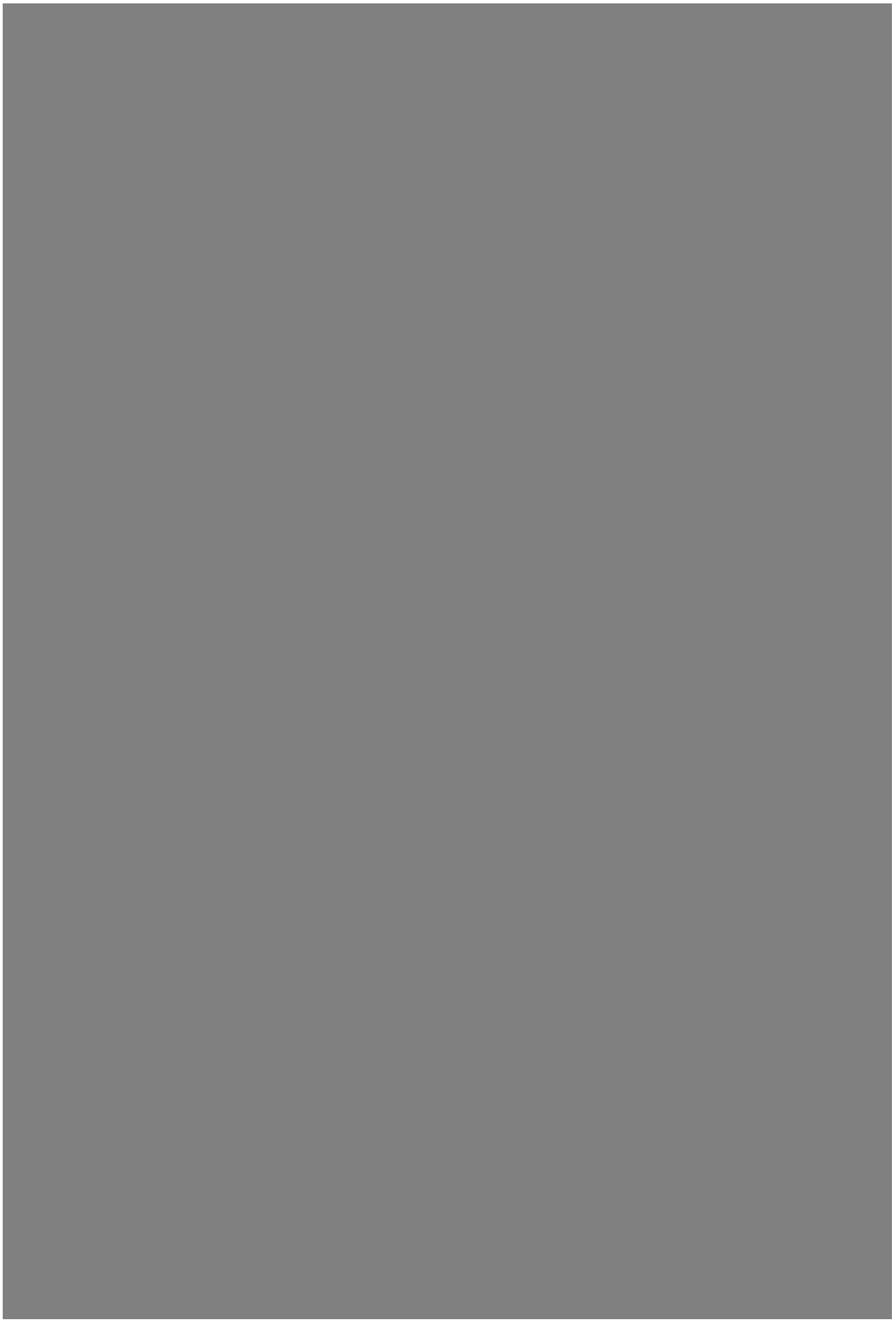


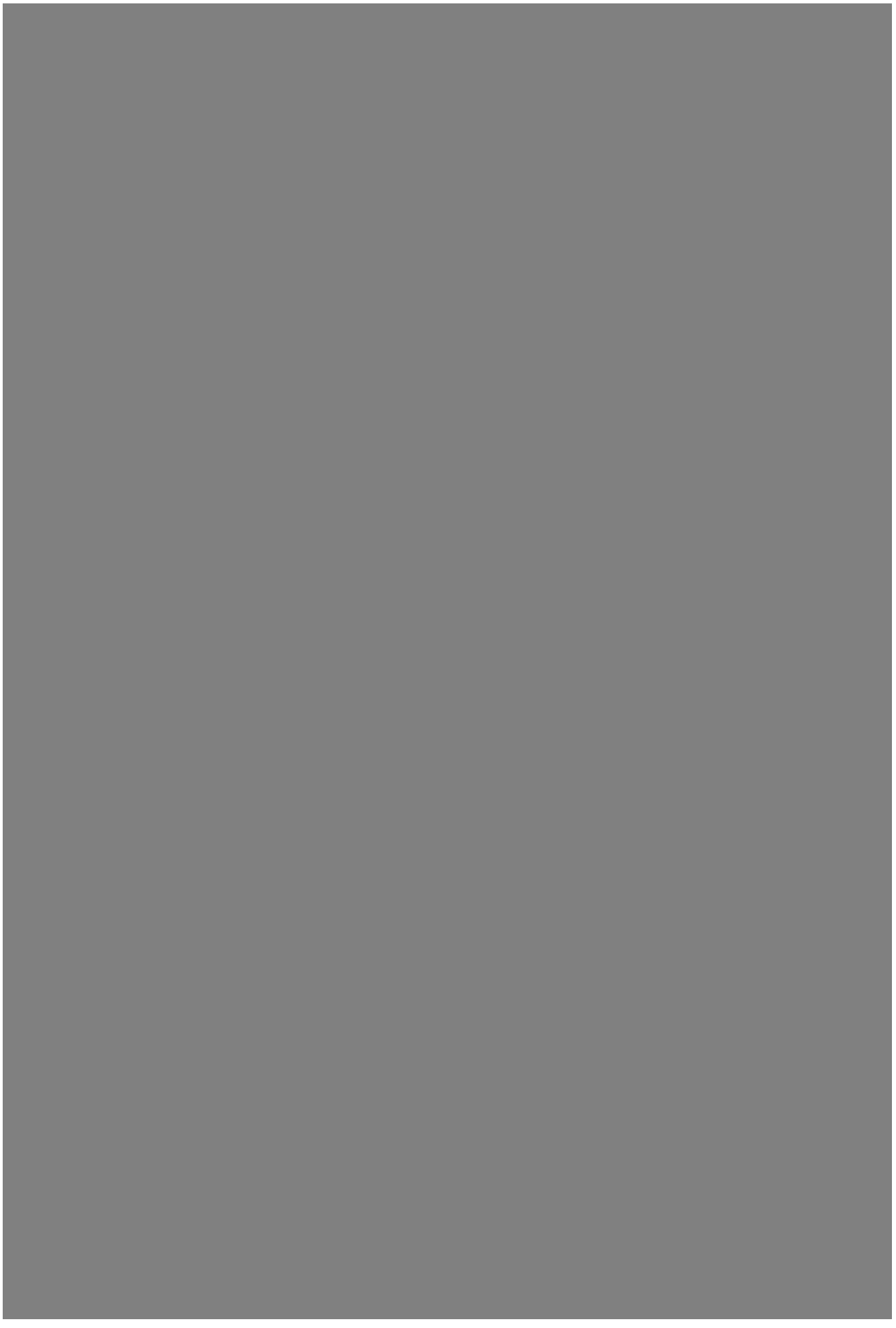


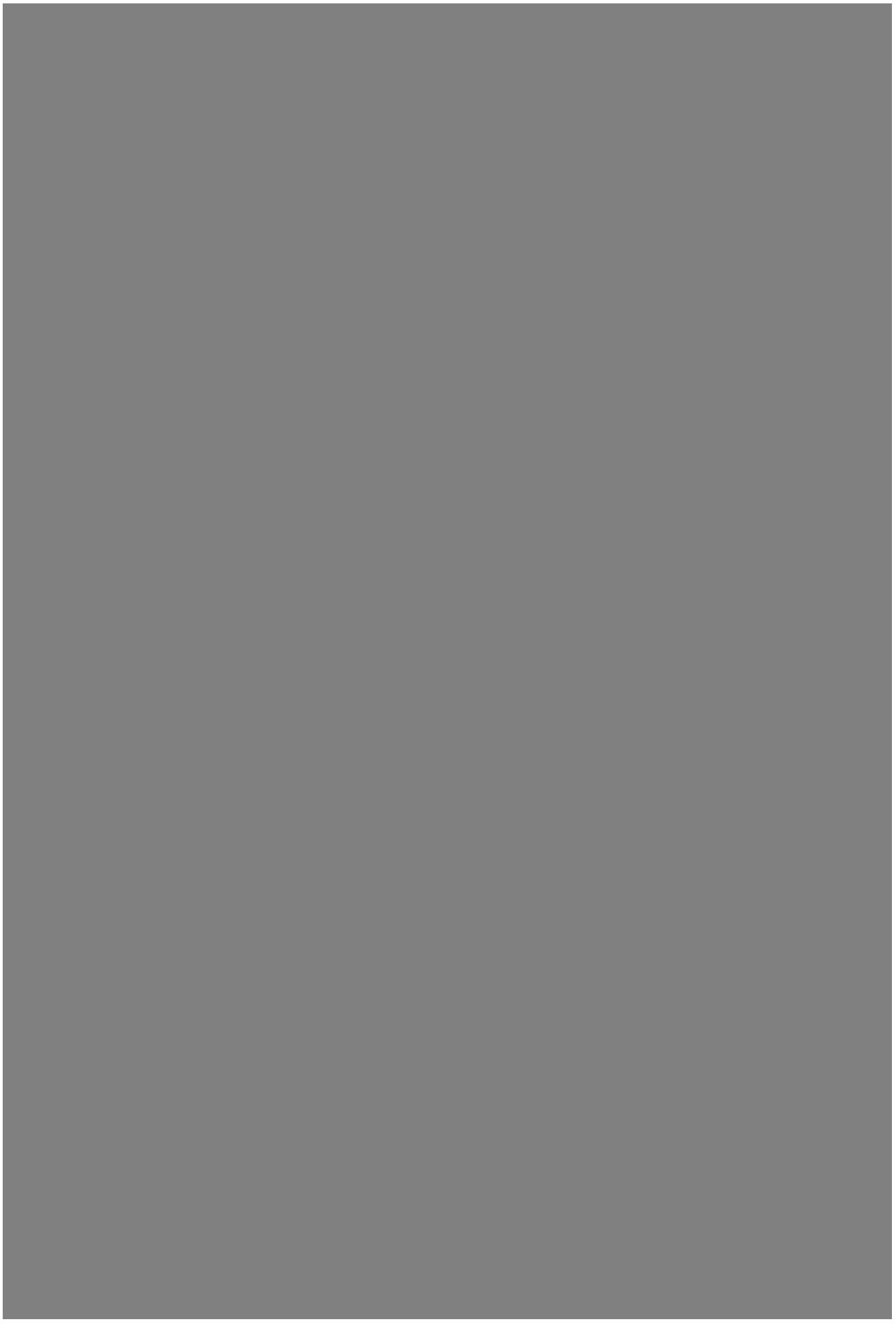


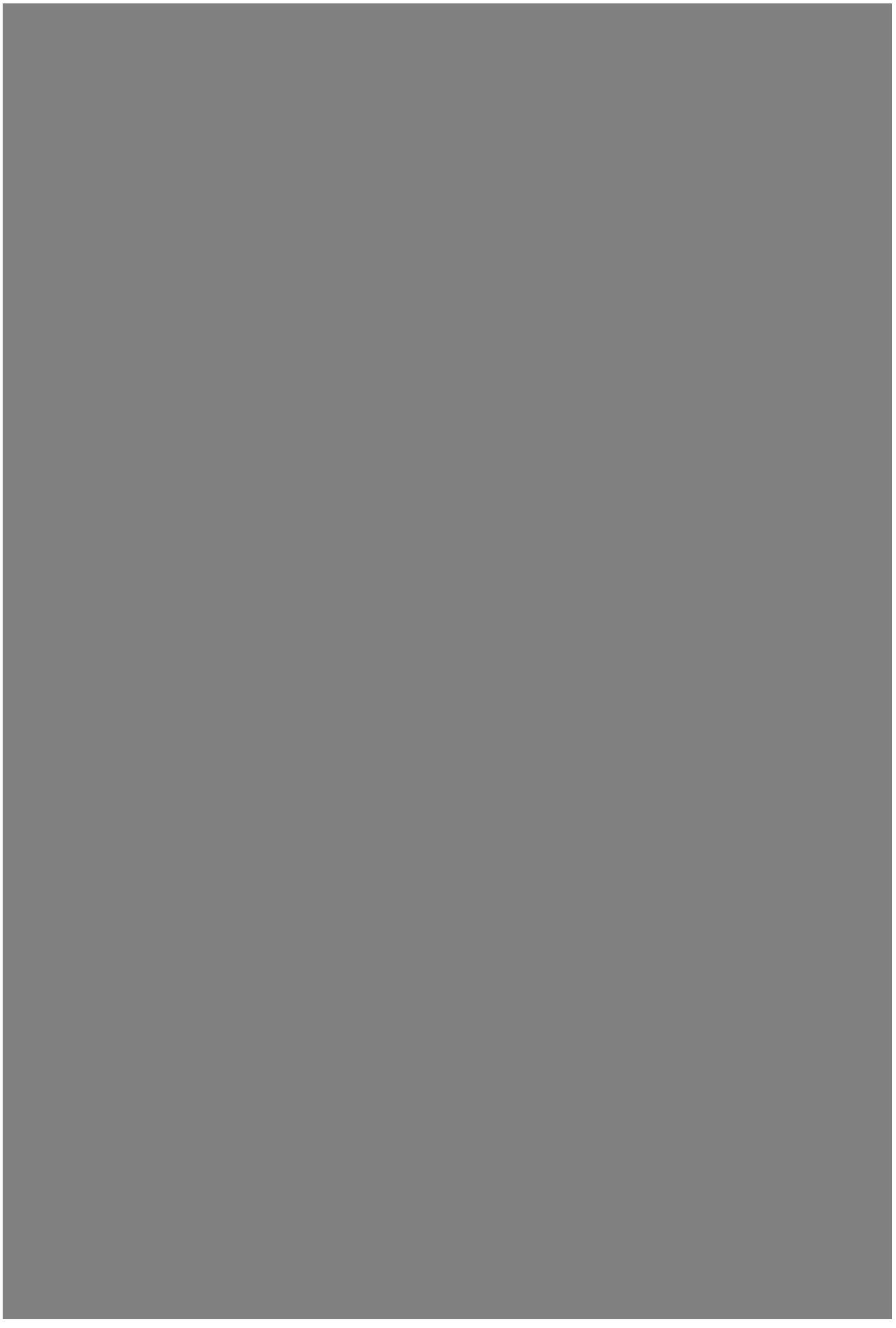


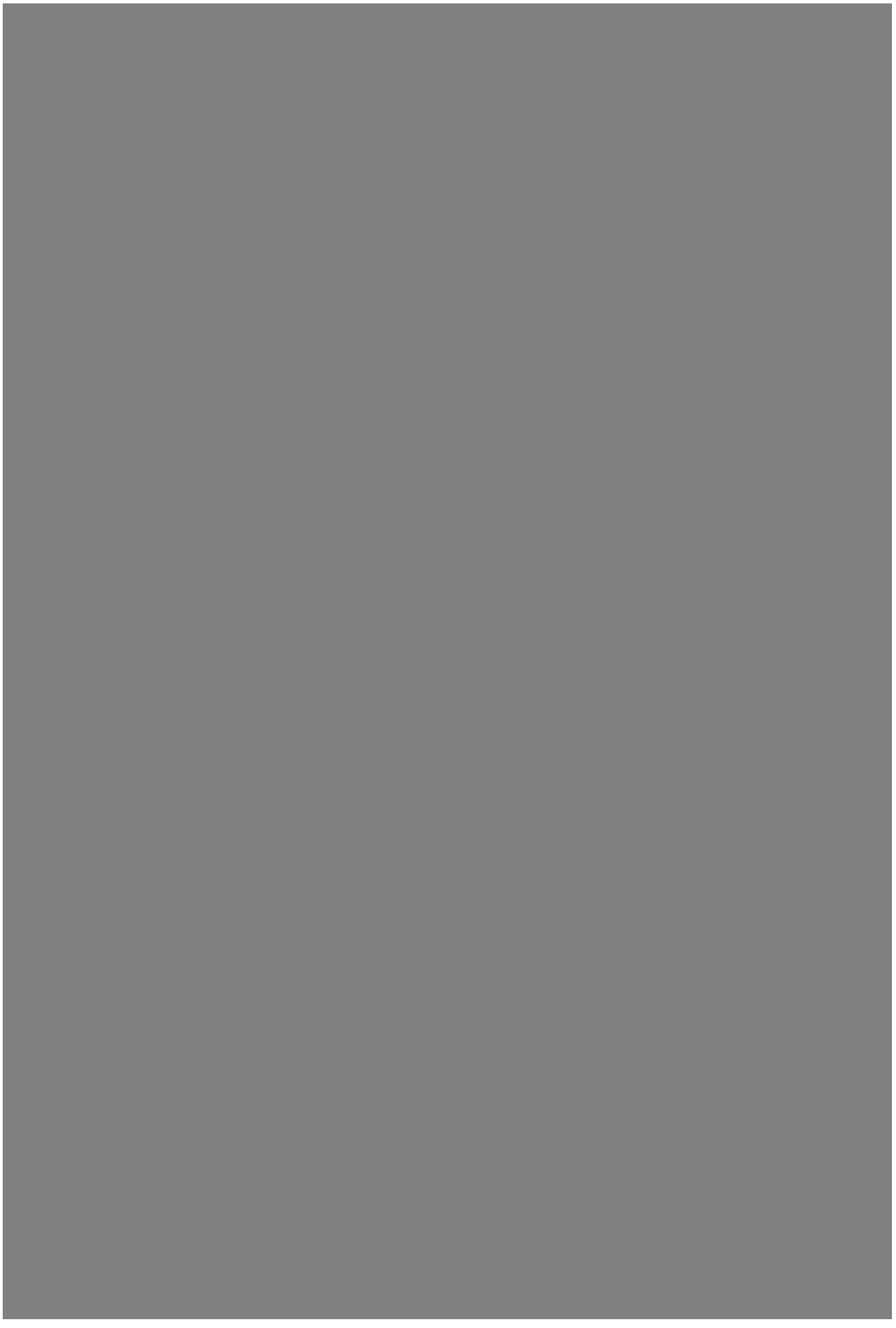


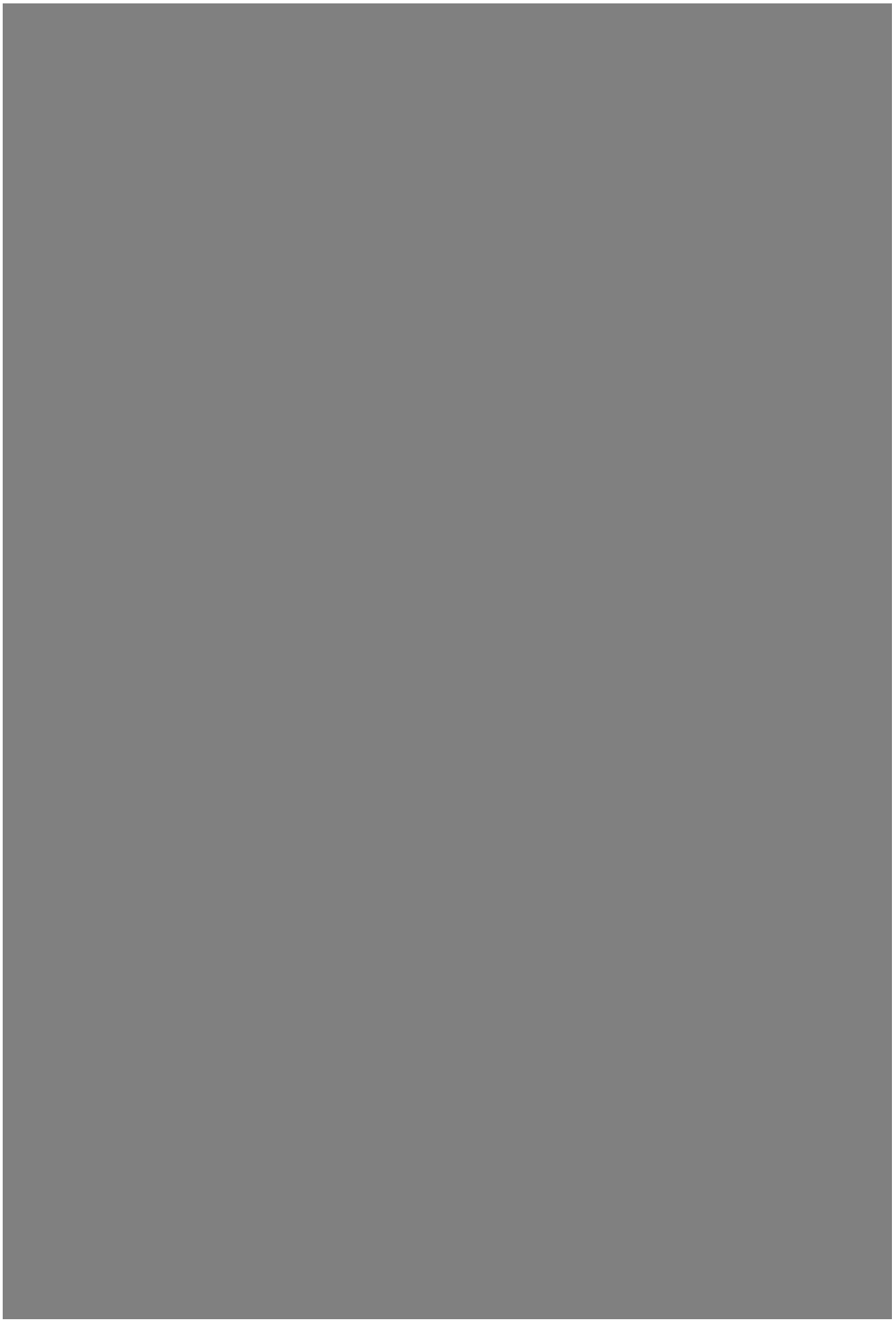


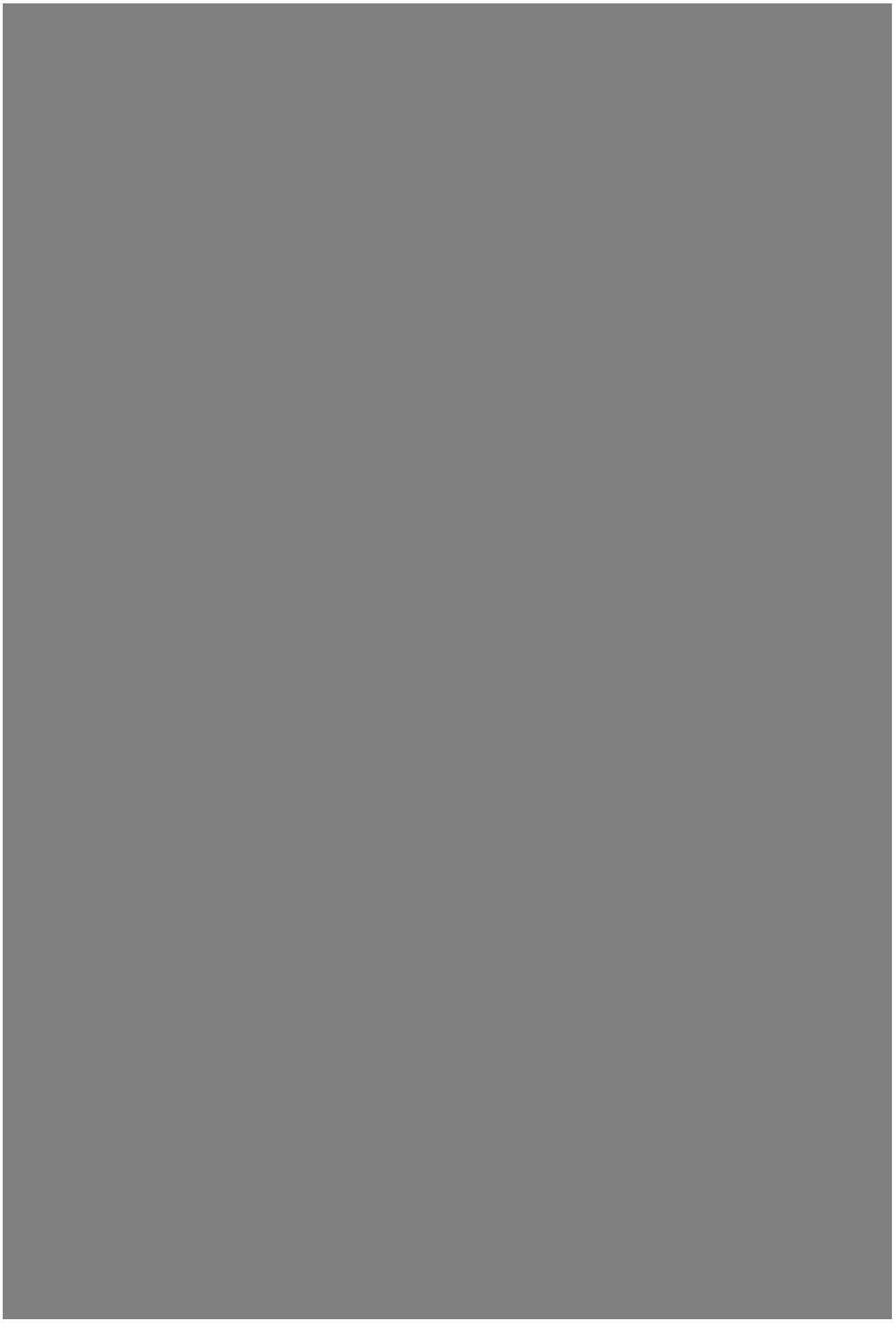




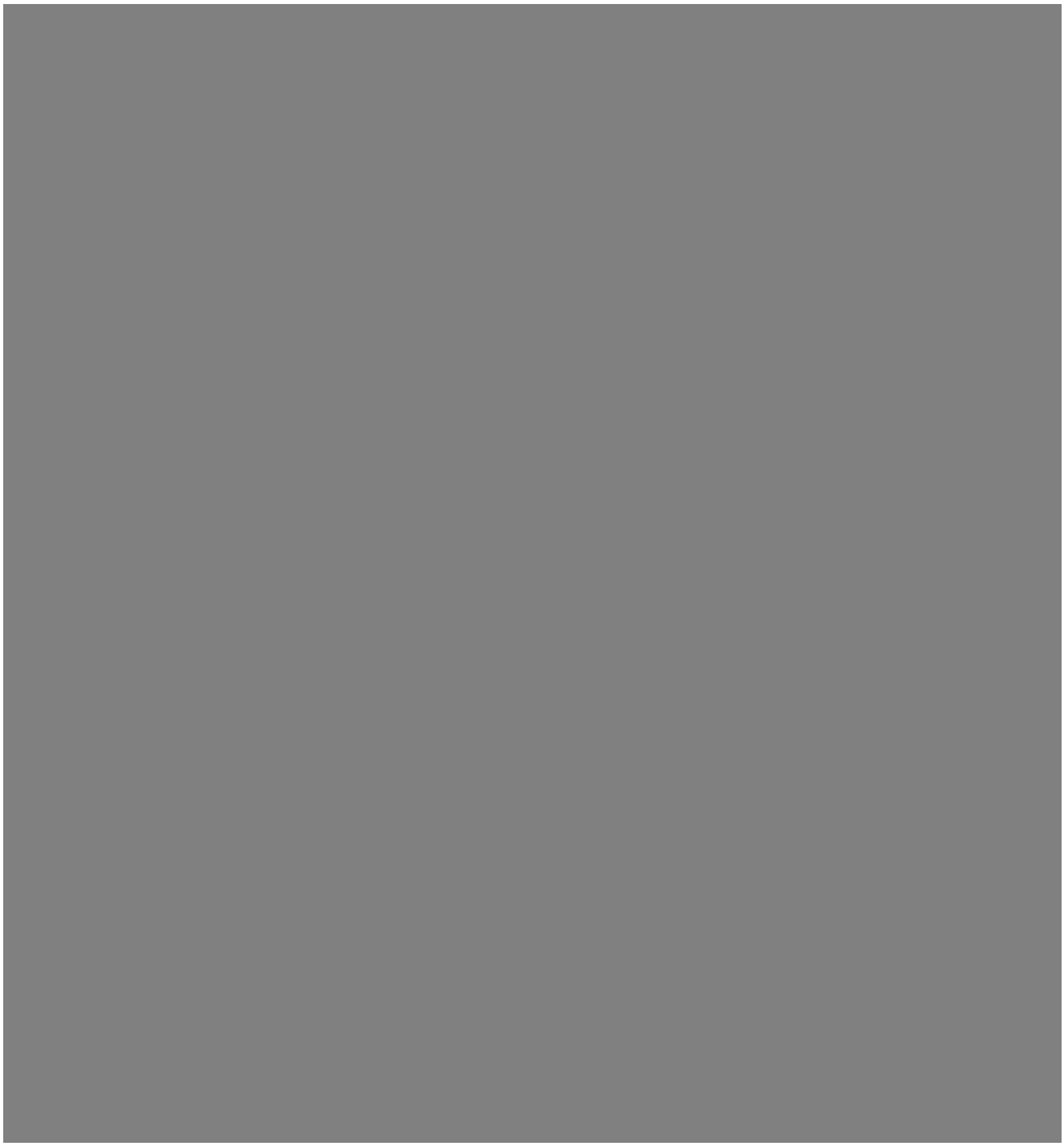


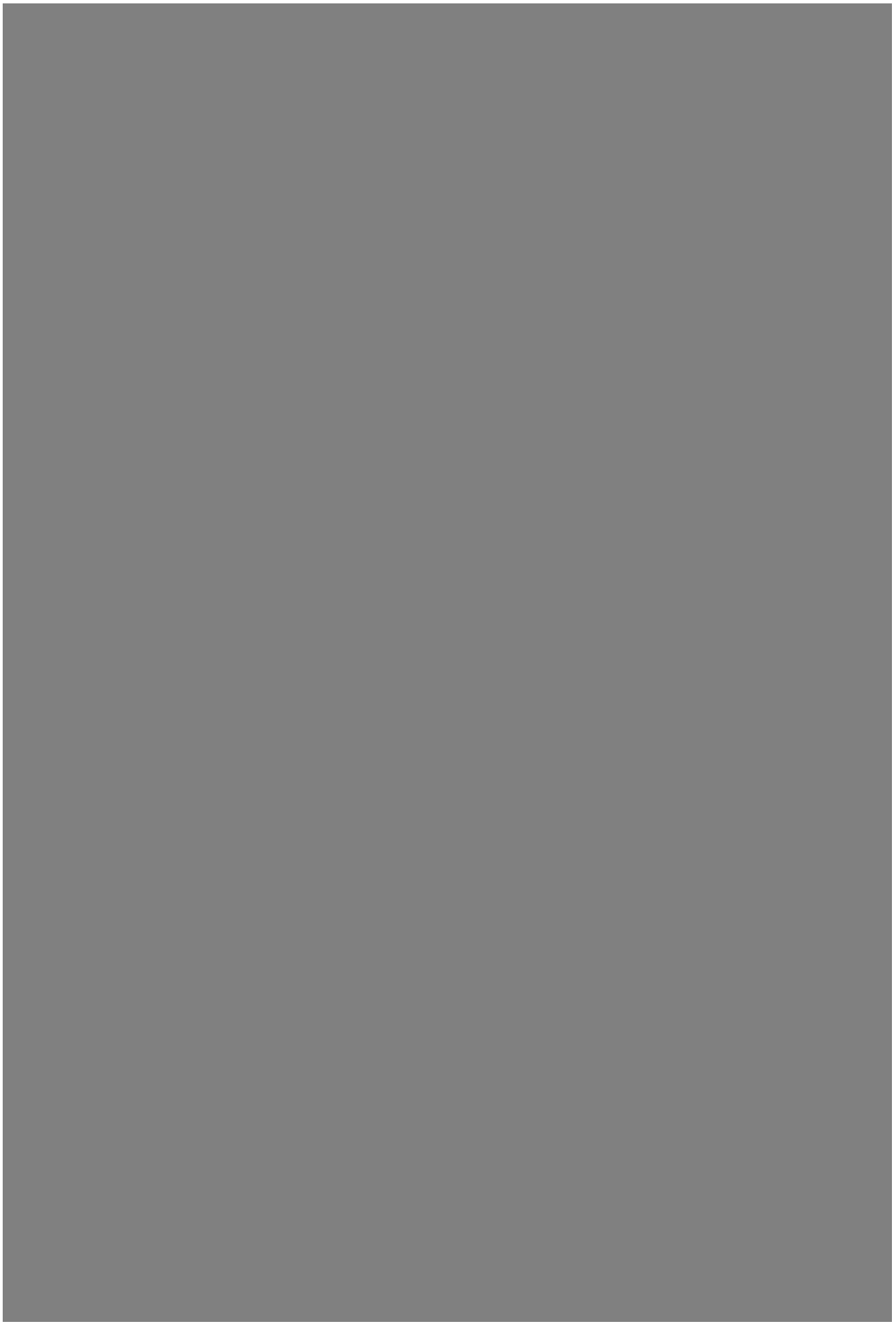


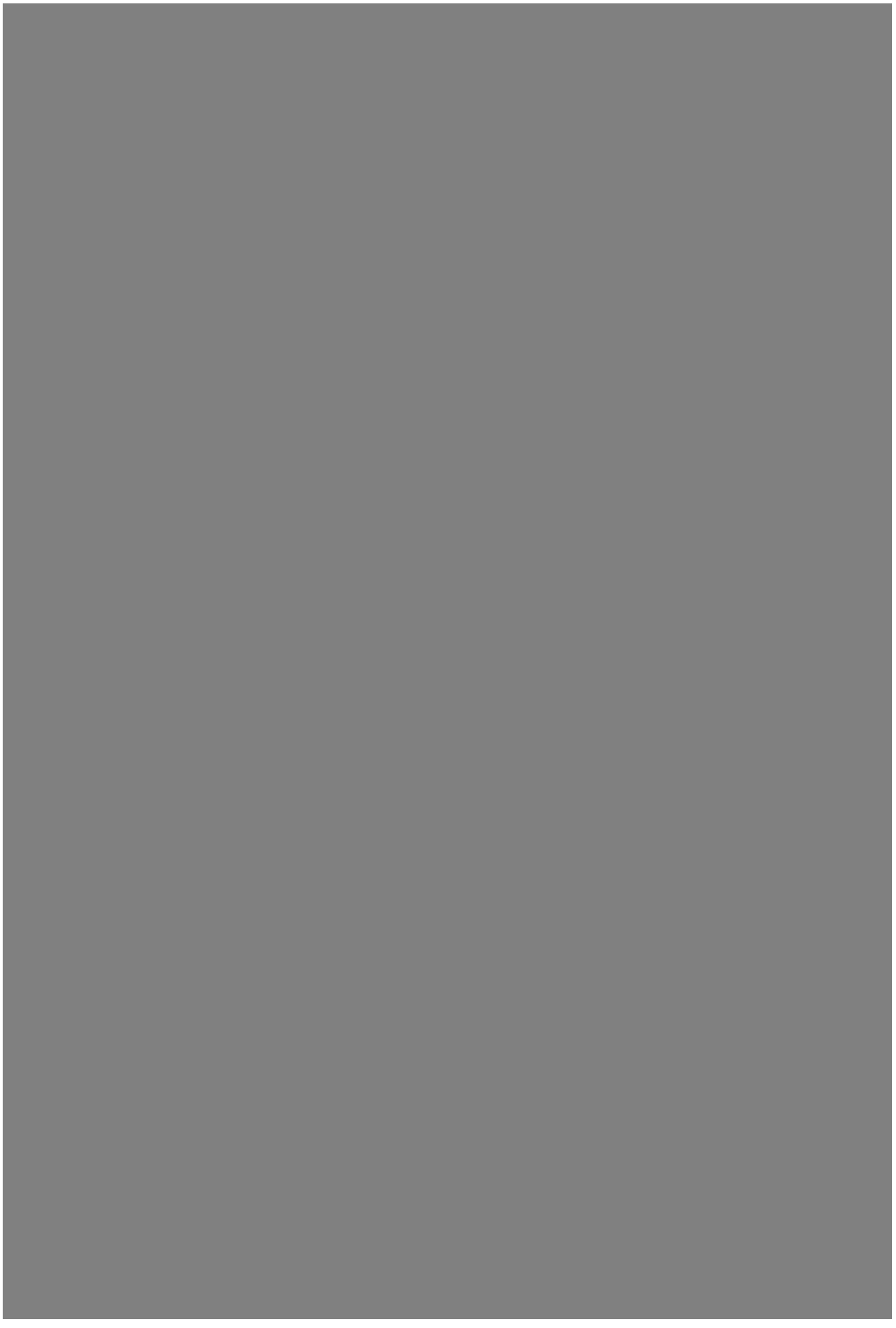


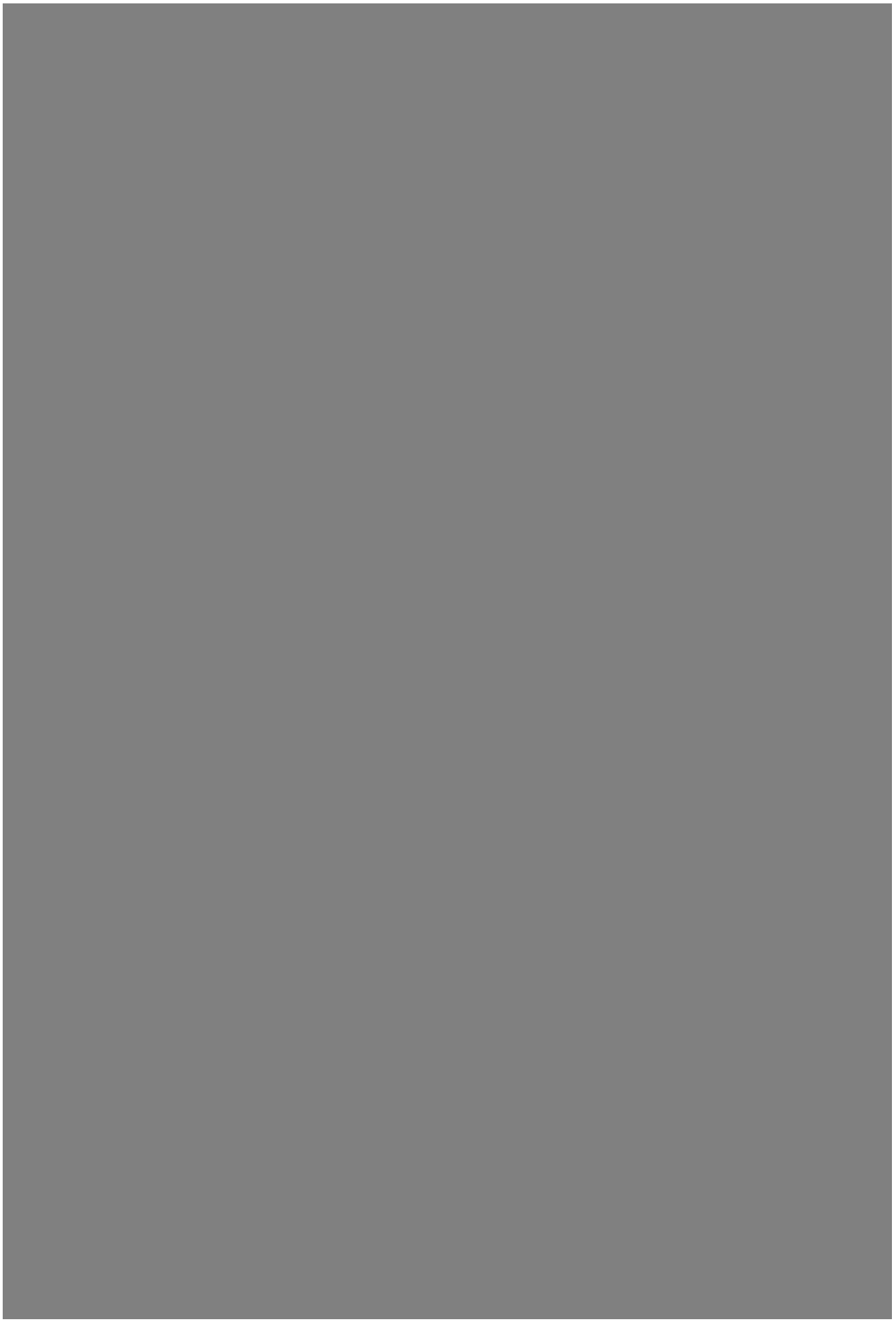


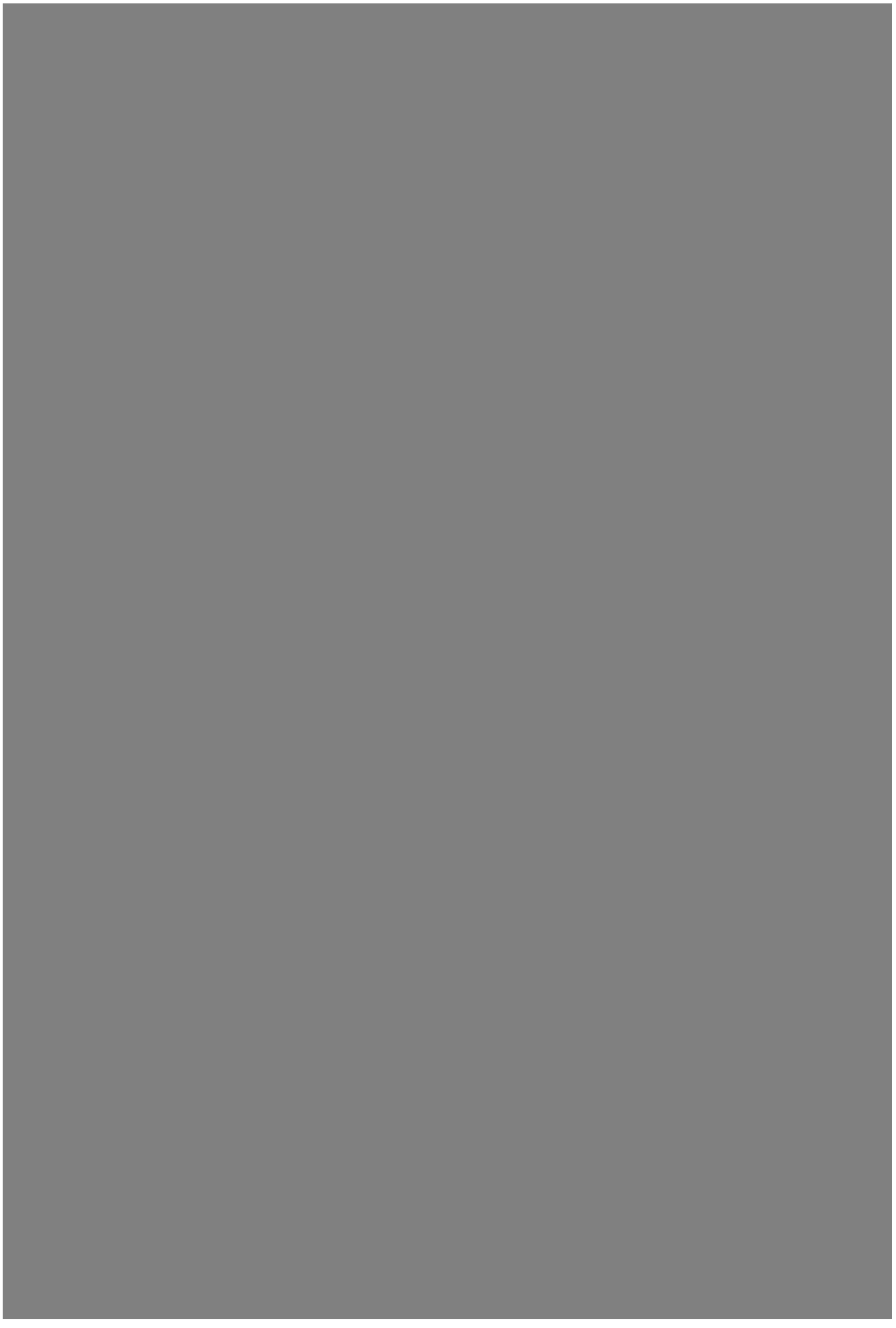


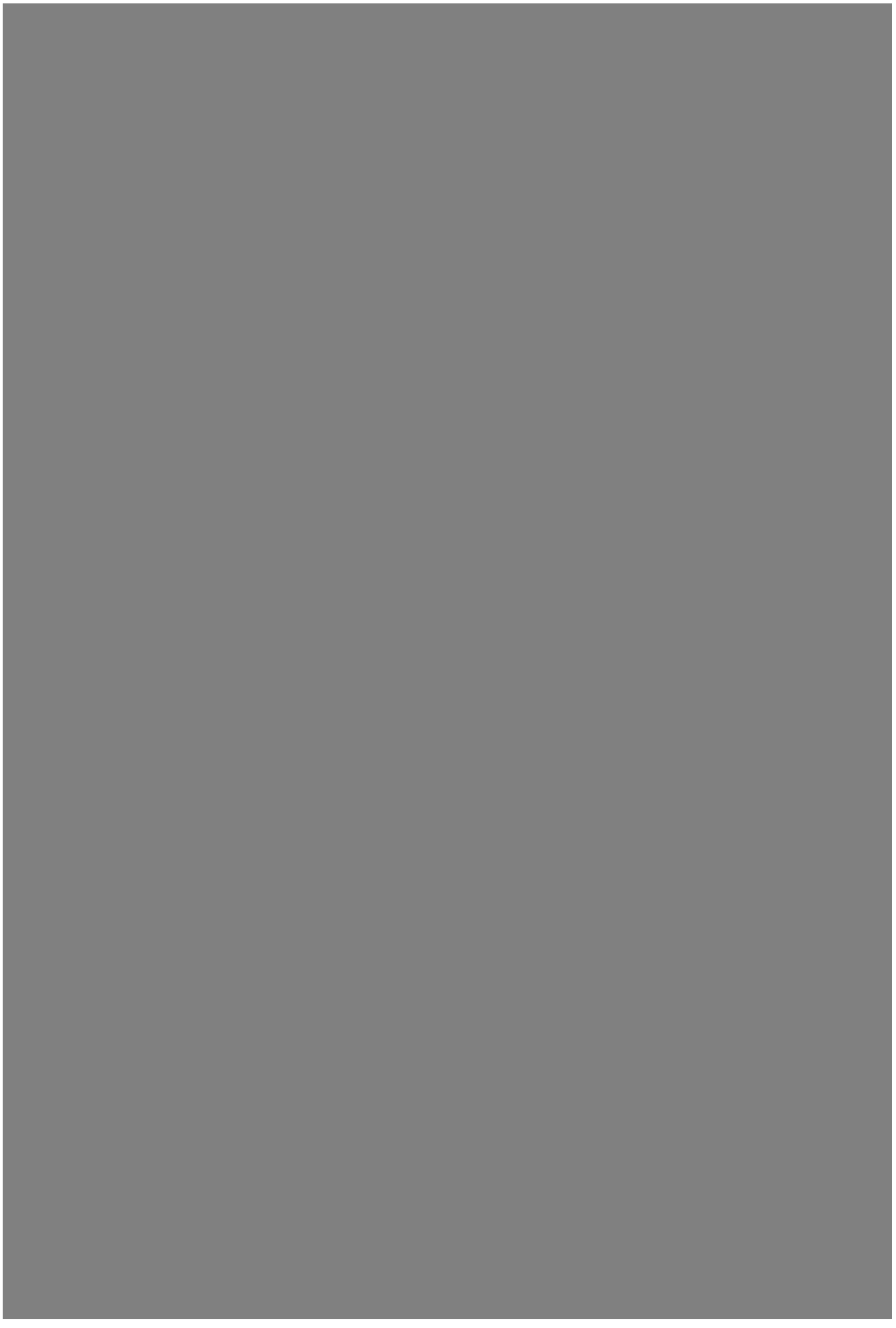


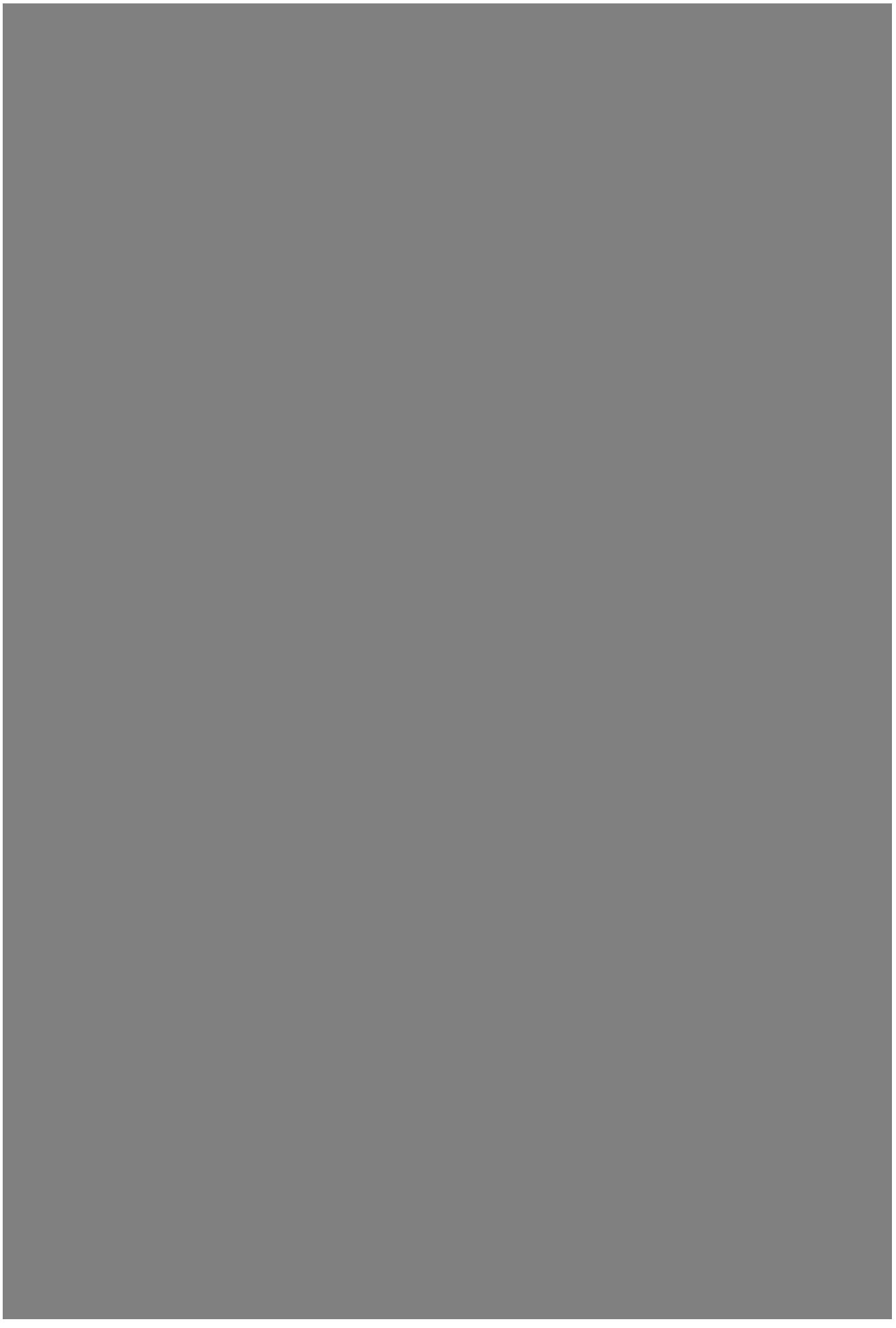


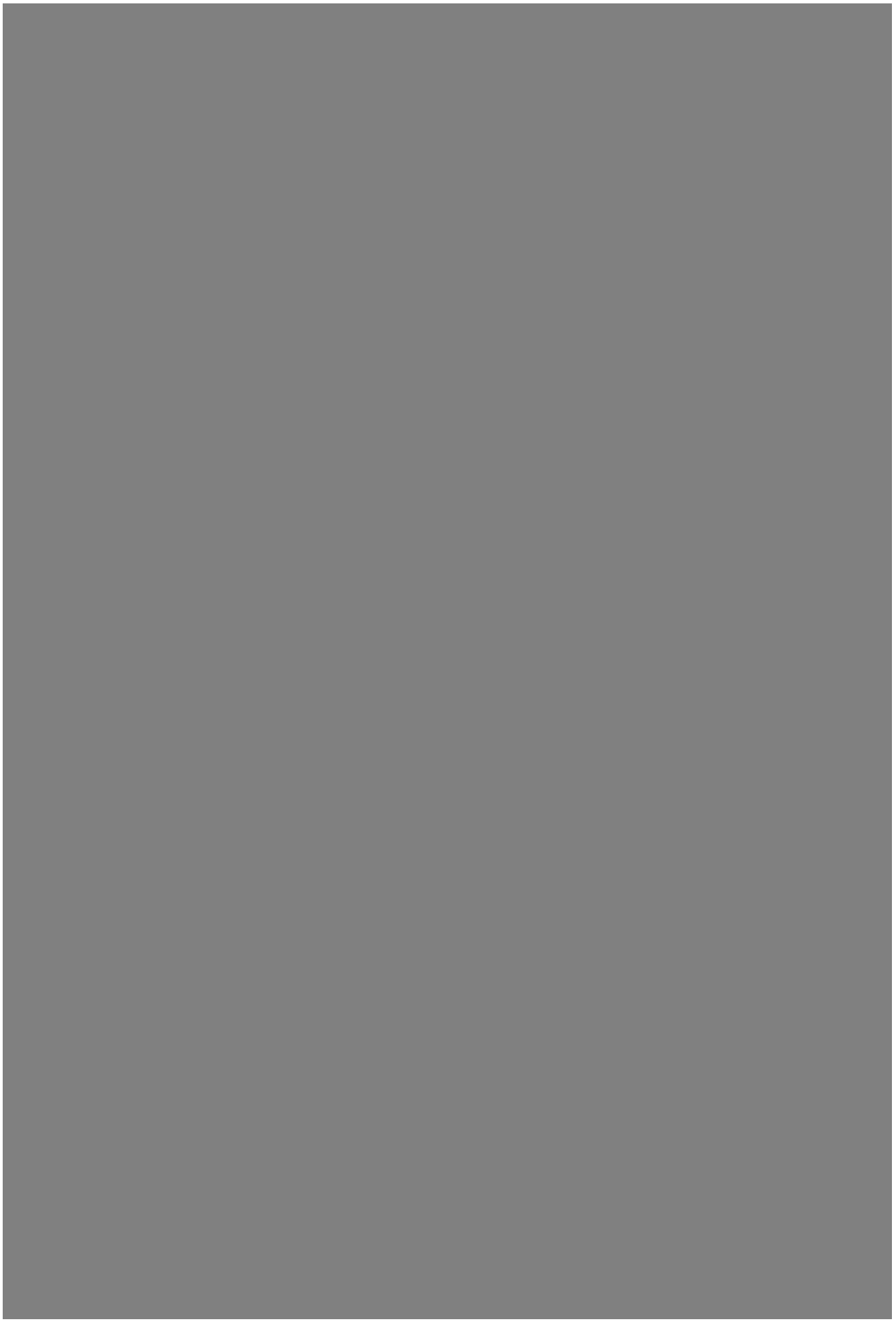


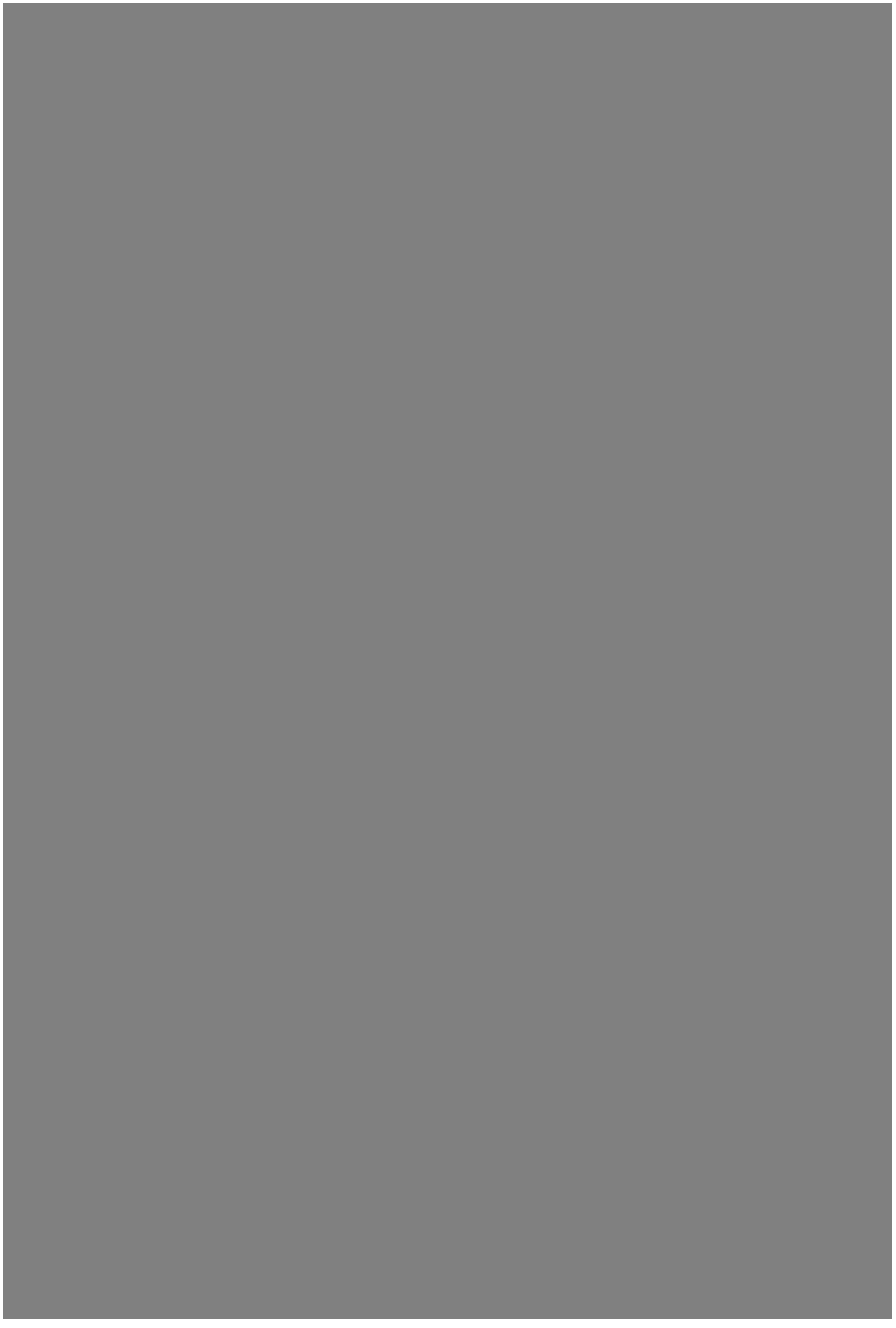


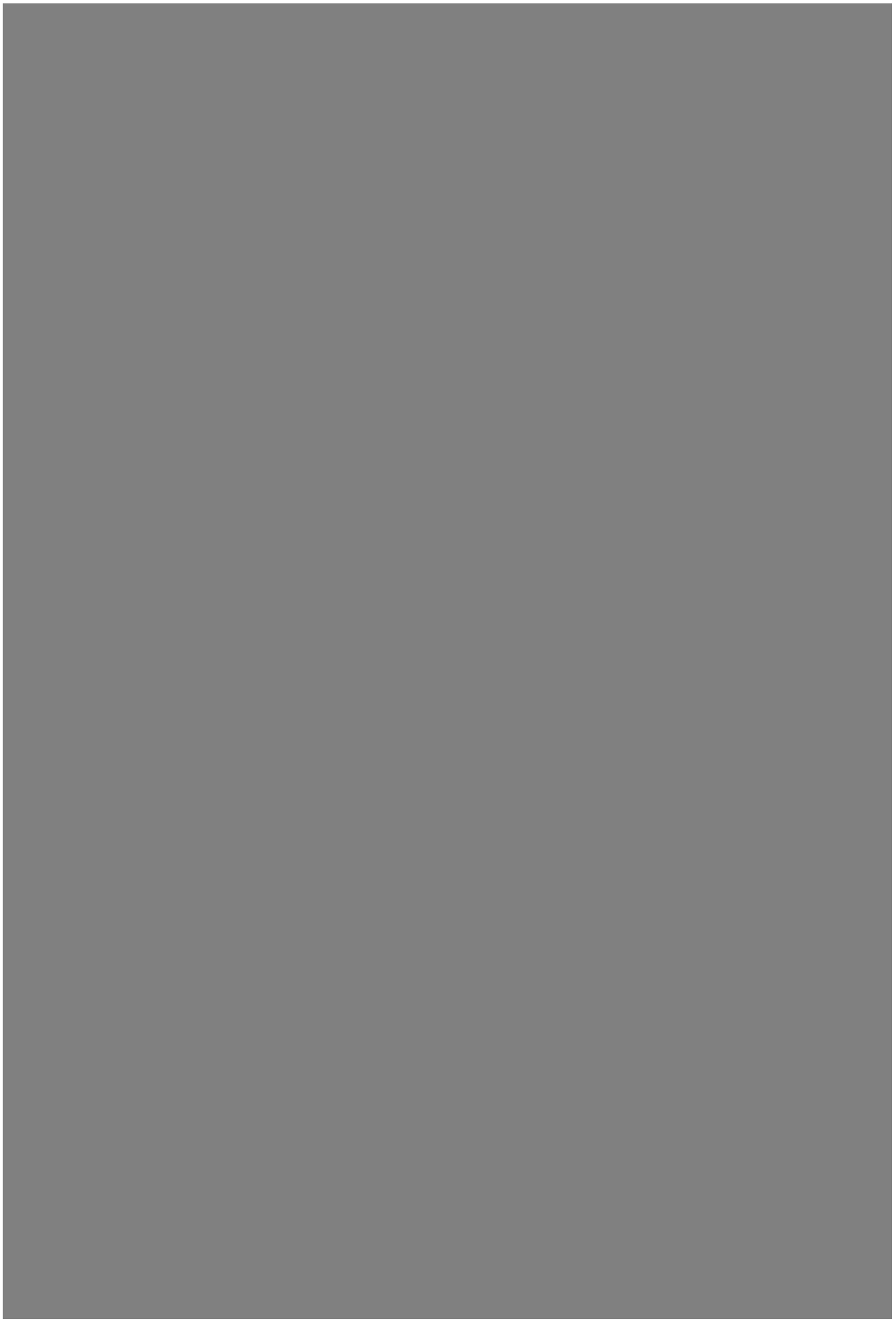


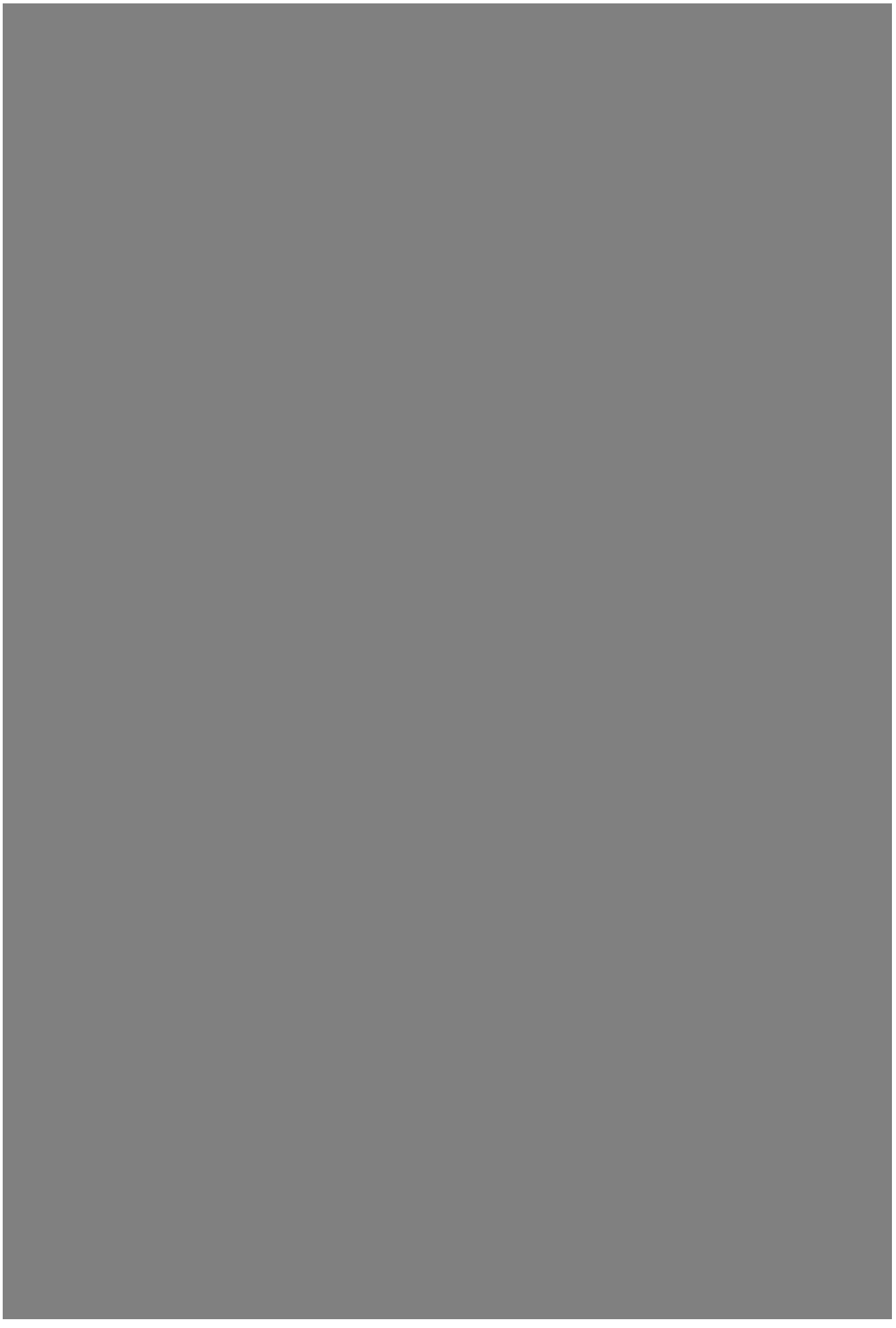


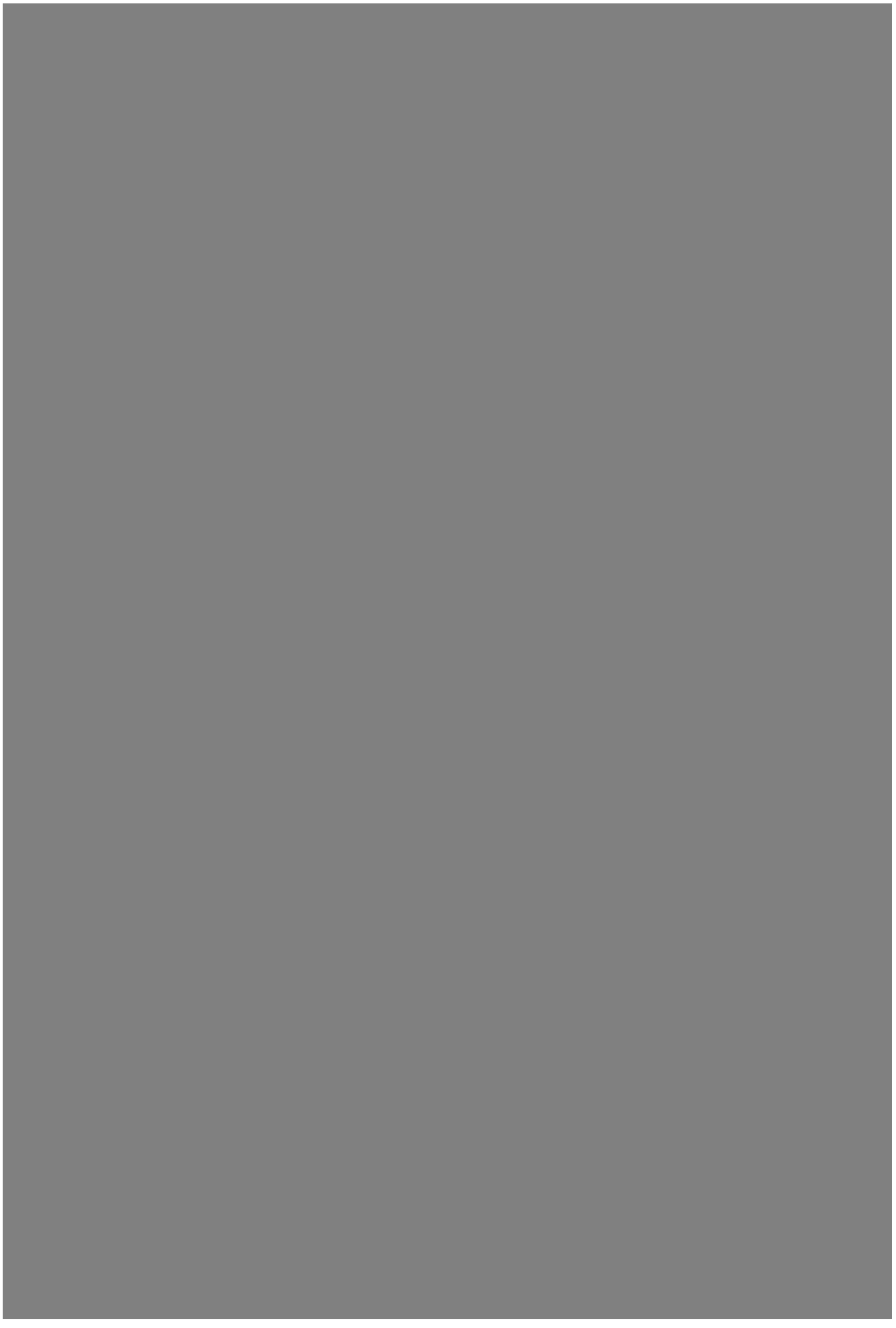


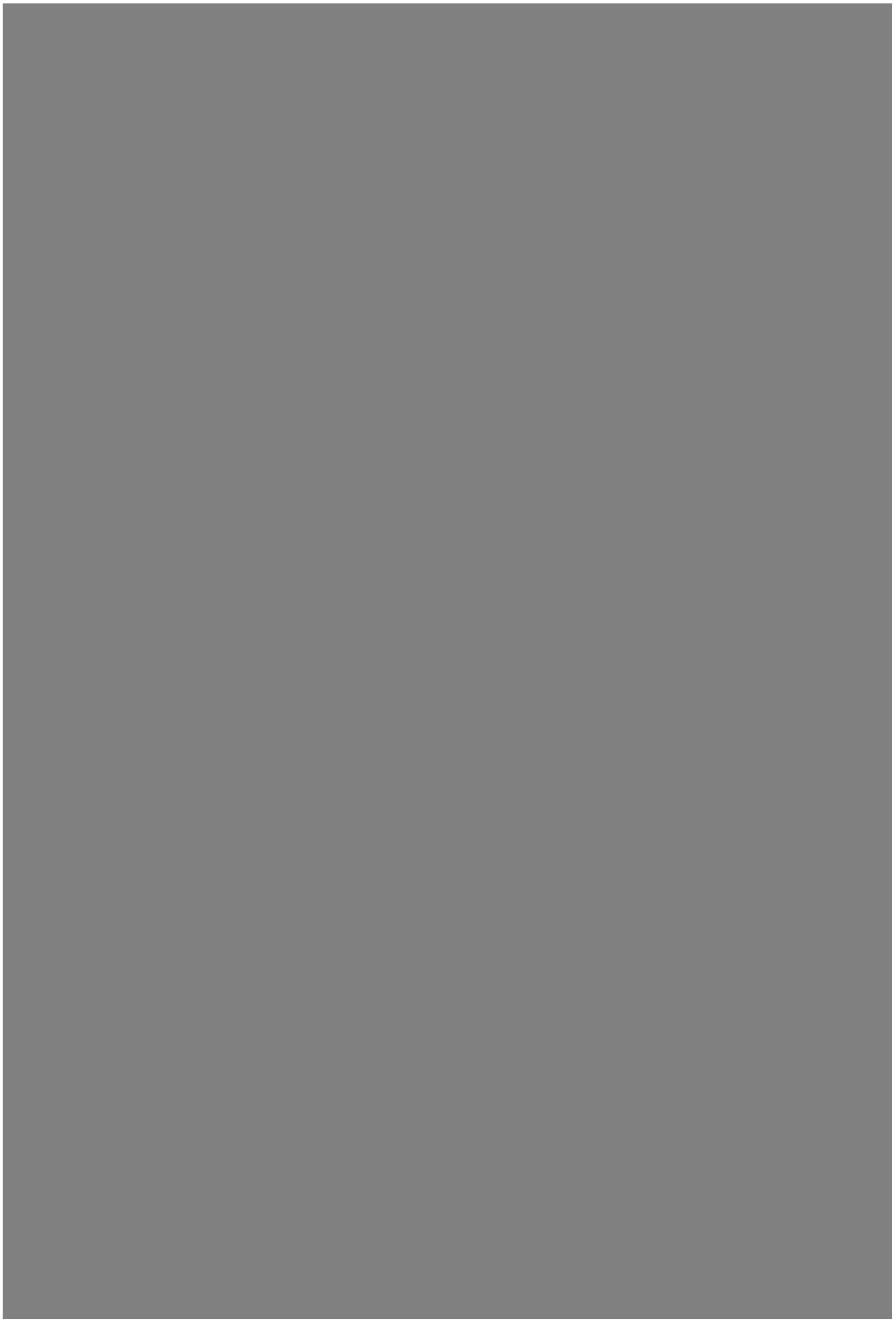


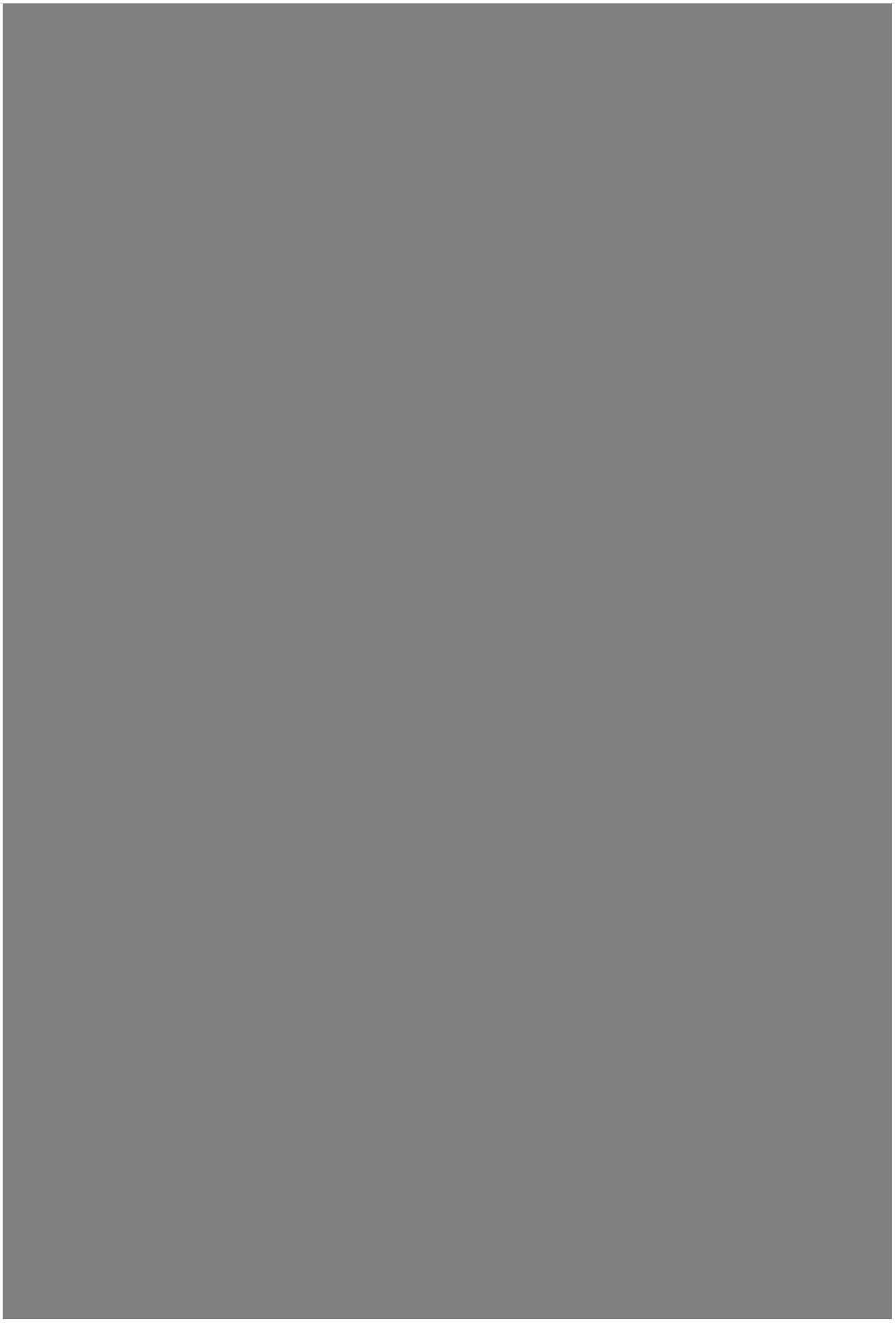


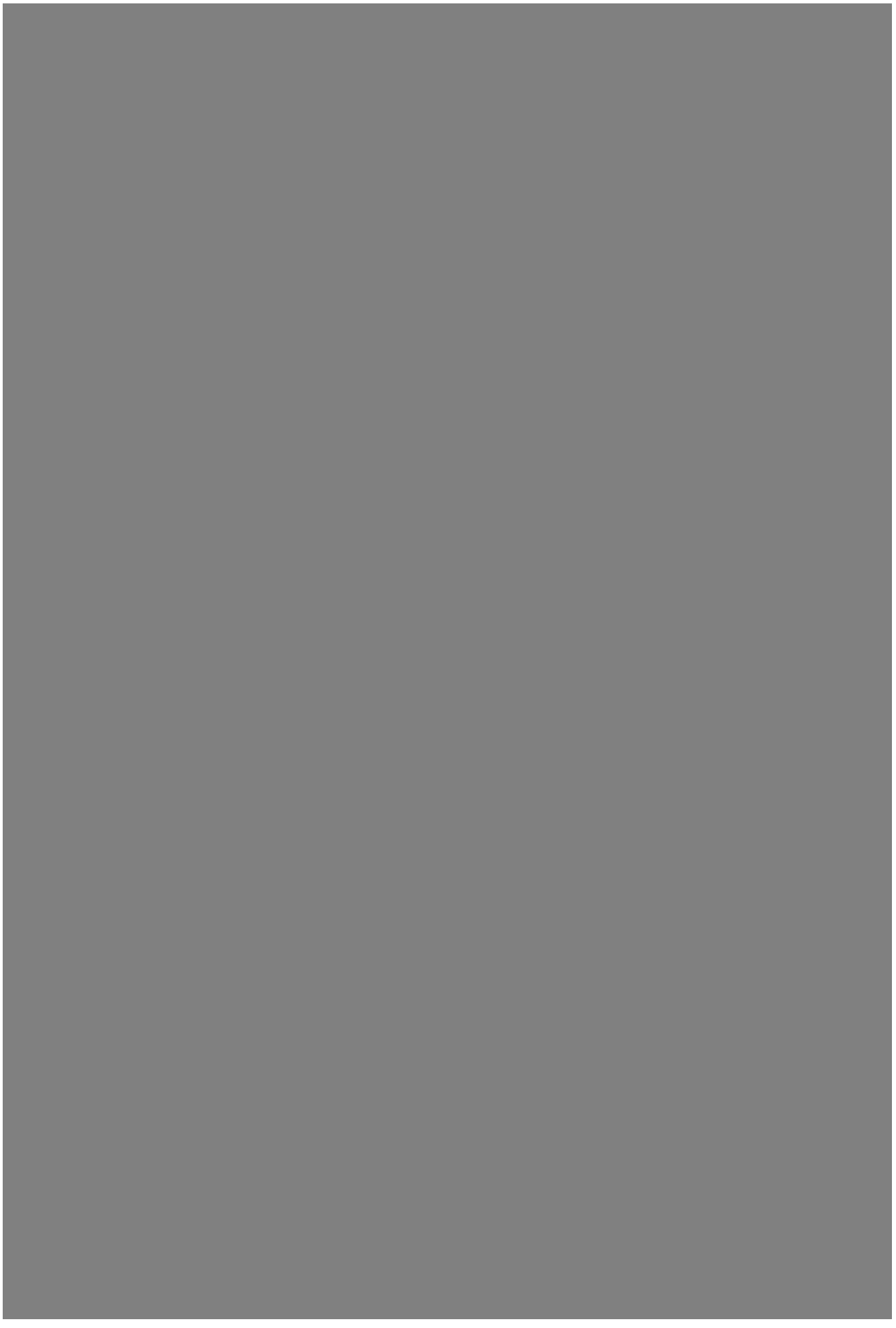


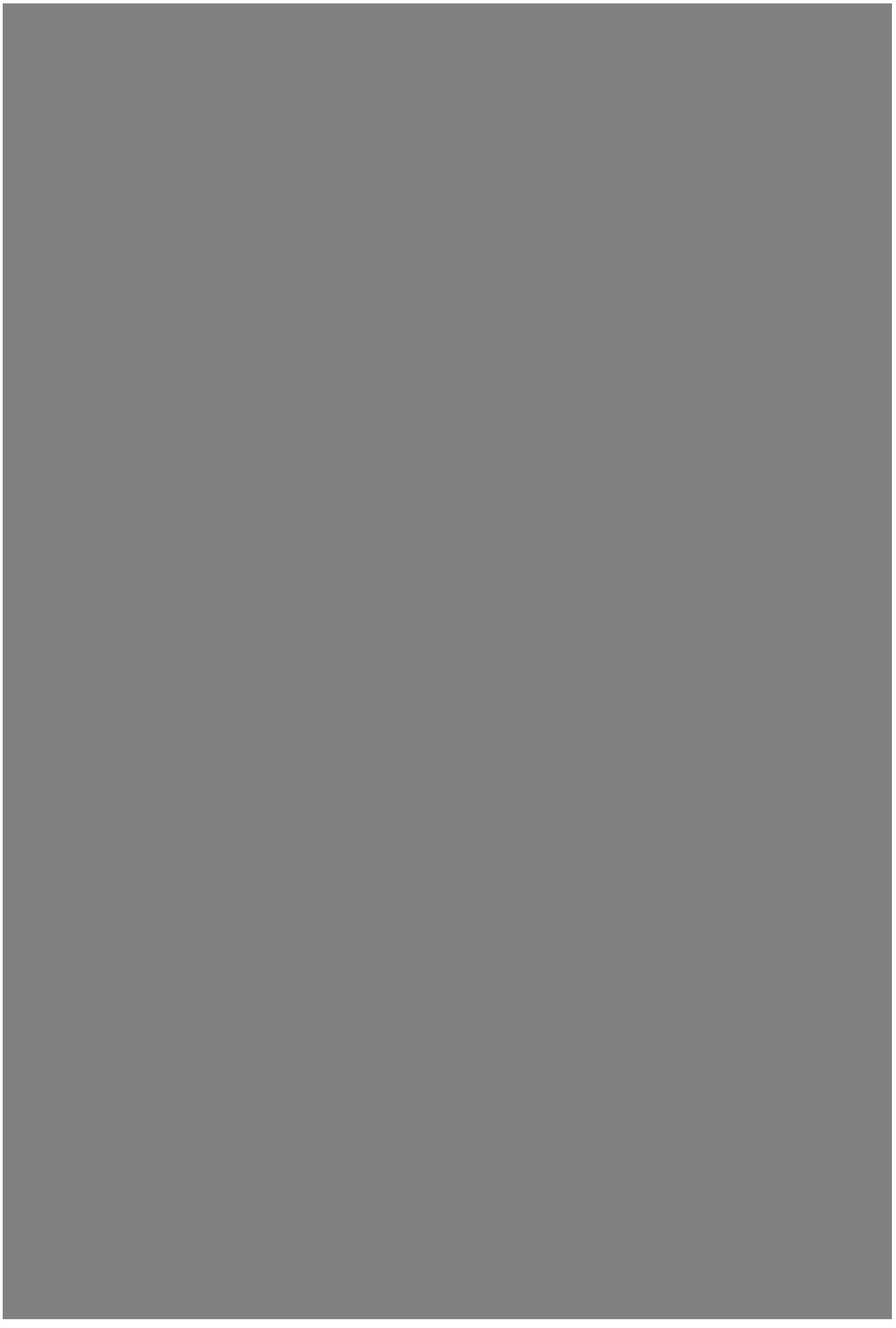


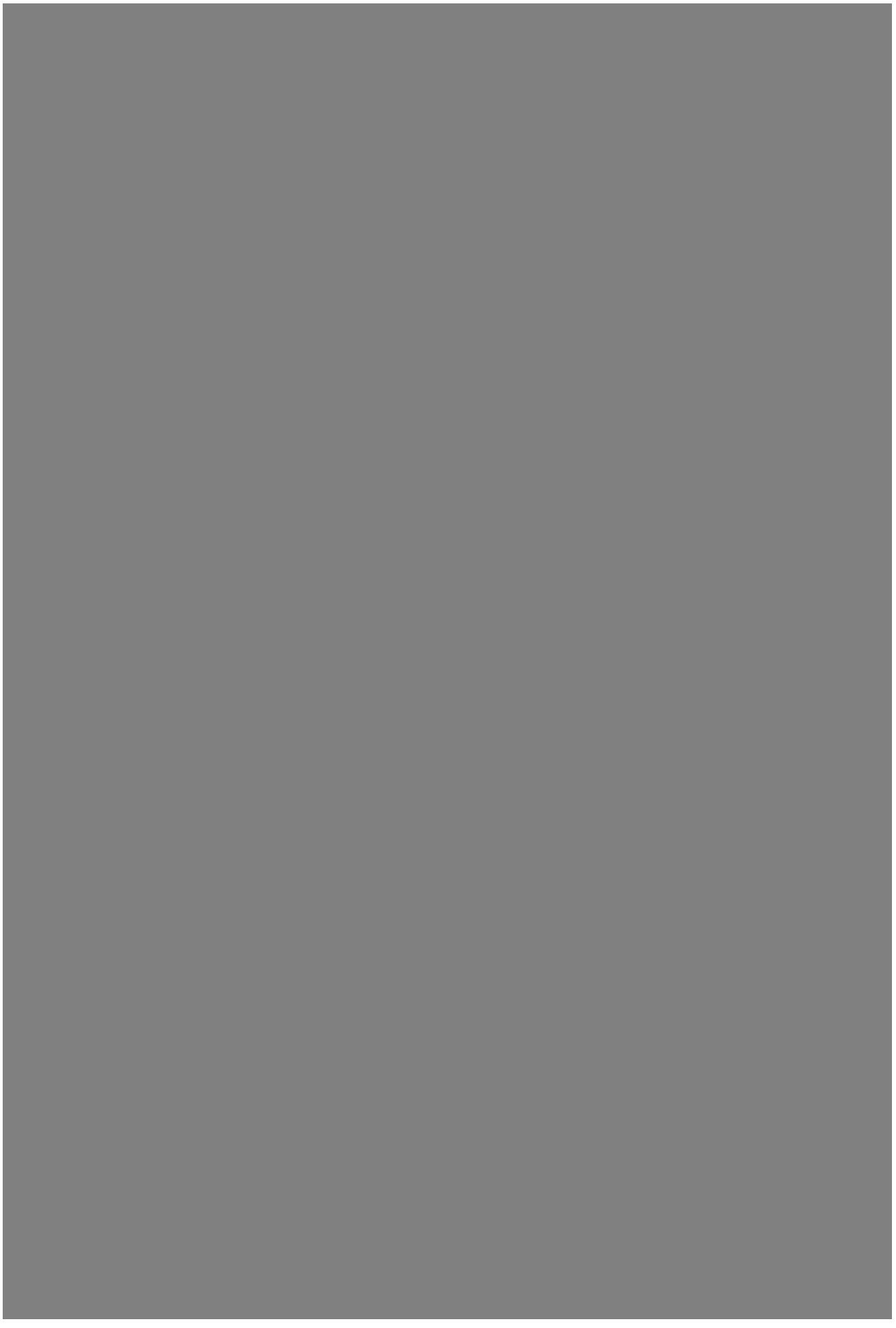


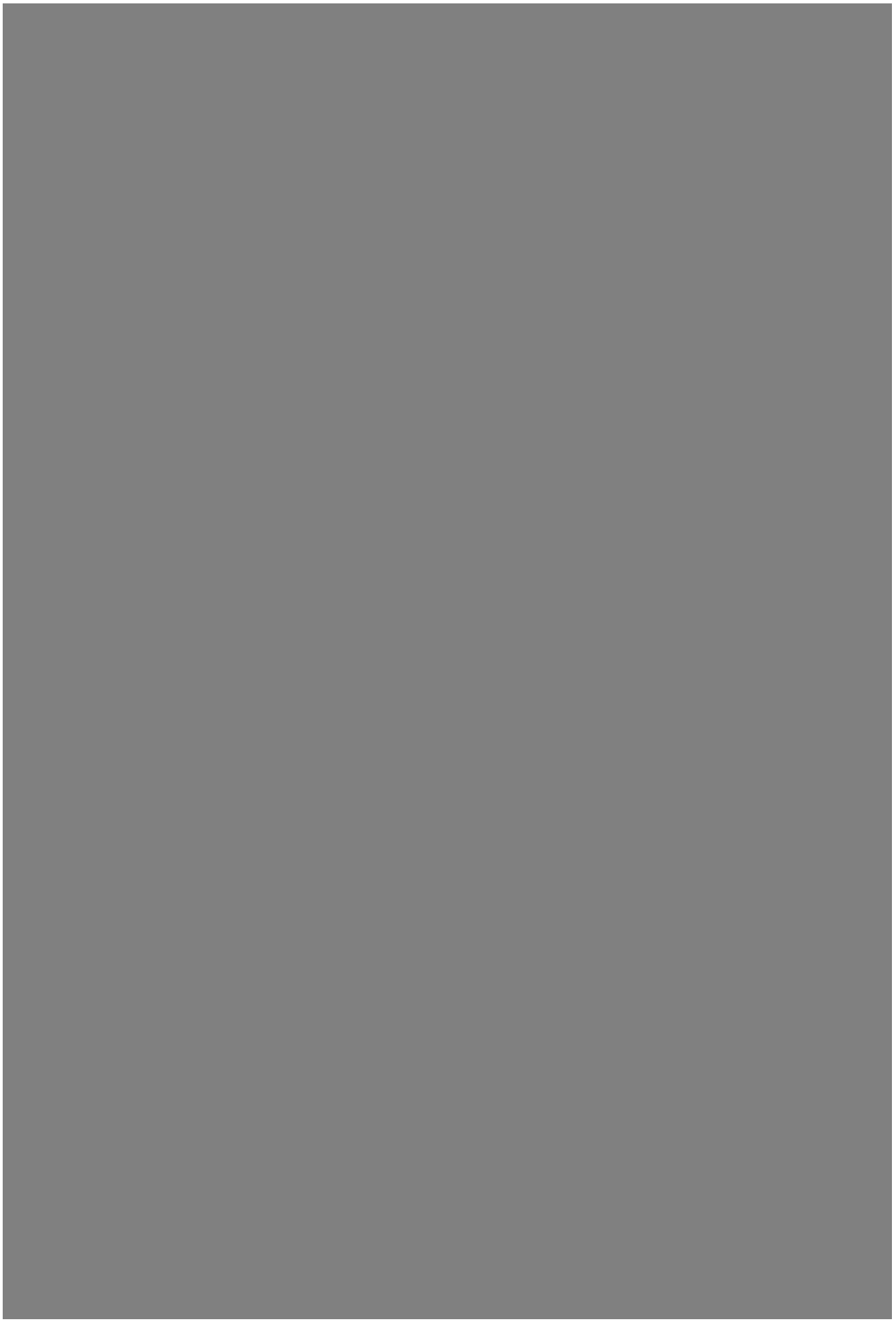




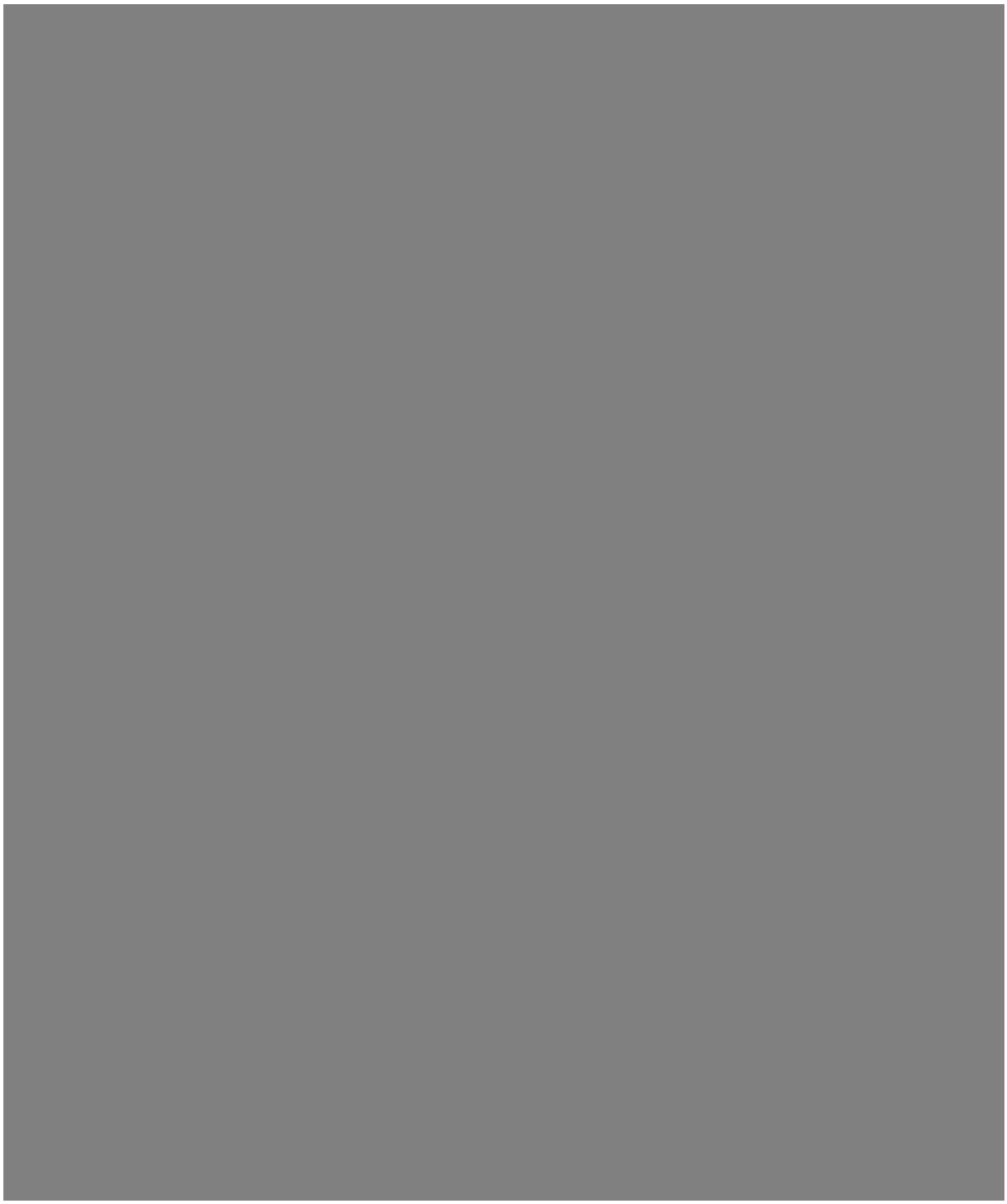


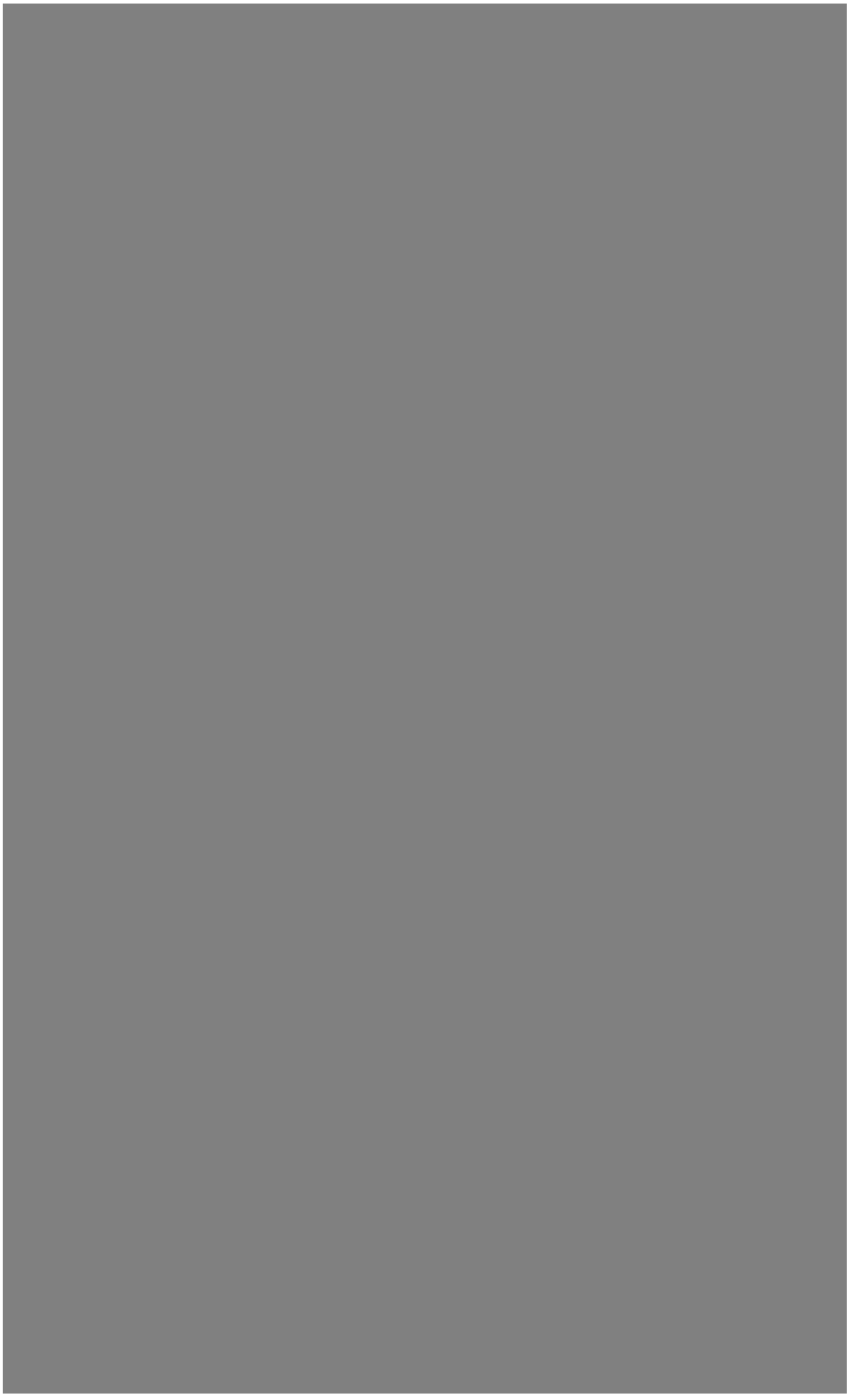


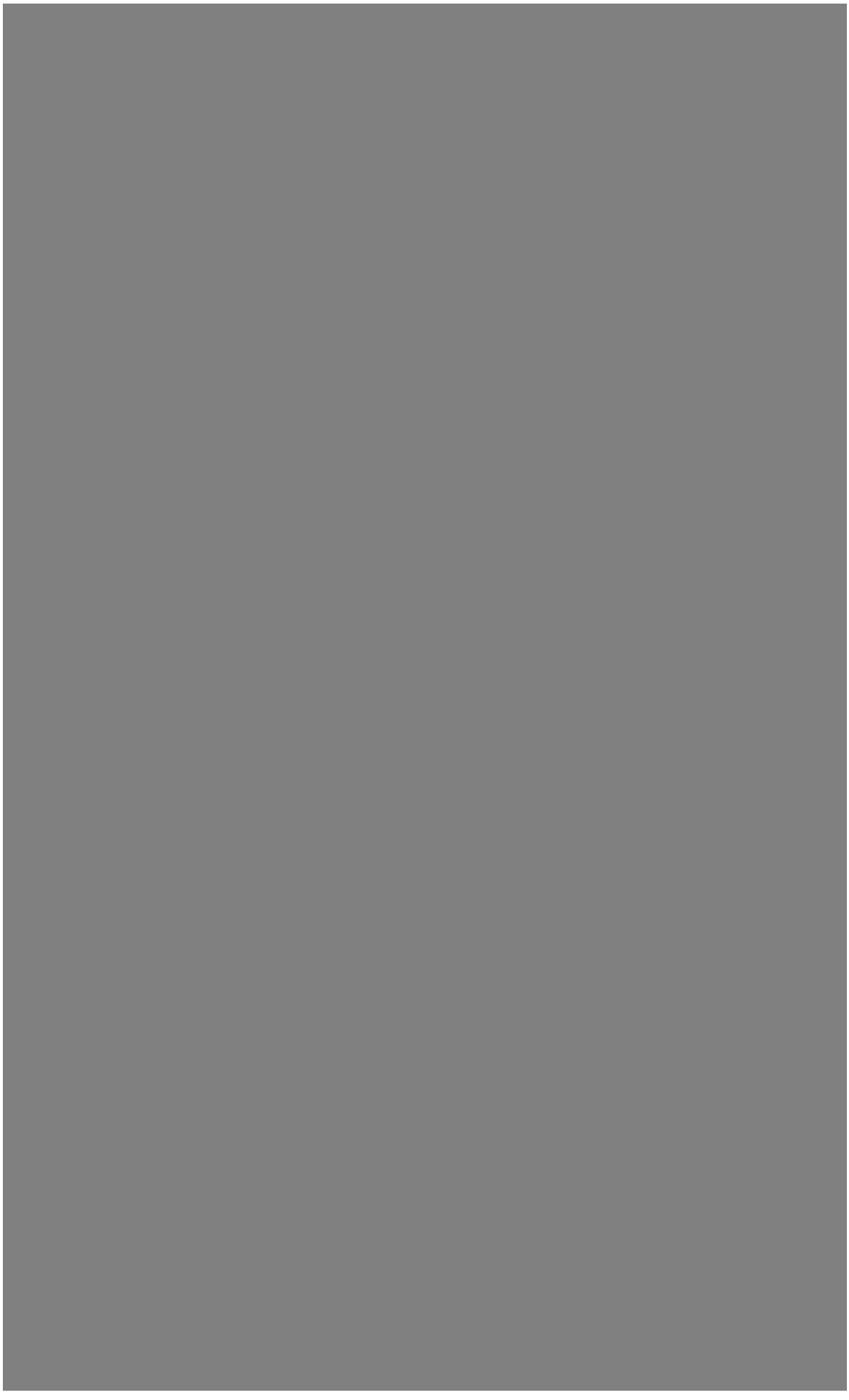












| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

| **e of Ground Floor** |
|---|
| n/a |
| **sed floor (external)** |
| |

| **ing Room Temp (°C)** |
|---|
| |
| |
| |

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

| Room Information | | | Ventilation Heat Loss | |
|---|---|---|---|---|
| Room | - | | Air Changes a hour | 0.00 |
| Level | | | Air Change Factor (W/m³K) | 0.33 |
| Design Room Temp (°C) | | 0.00 | Total Volume (m³) | 0.00 |
| Outside Design Temp (°C) | | -2.50 | Heat loss (W) | 0.00 |
| Temp Difference (°C) | | 2.50 | Estimated Energy usage (kWh) | 0.00 |
| Degree Days | | 2228 | | |

**Room Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |
| Length (m) | | Width (m) | | Height (m) | |

**Floor**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |

**External Wall**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Roof**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| Length (m) | | Width (m) | | Area (m²) | 0.00 |
| | | | Total | Area (m²) | 0.00 |

**Windows**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Doors**

| | | | | | |
|---|---|---|---|---|---|
| Width (m) | | Height (m) | | Area (m²) | 0.00 |
| Width (m) | | Height (m) | | Area (m²) | 0.00 |

**Internal Walls**

| | | | | | |
|---|---|---|---|---|---|
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |
| Length (m) | | Height (m) | | Area (m²) | 0.00 |

| **Fabric** | *Heat Loss (W)* | *Usage (kWh)* | *Additional heat loss* | *Addition* |
|---|---|---|---|---|
| Floor | 0.00 | 0.00 | Thermal Bridging (New Build >2006) | 0.00% |
| Ext Wall | 0.00 | 0.00 | Exposed location | 0.00% |
| Roof | 0.00 | 0.00 | High ceiling | 0.00% |
| Glazing | 0.00 | 0.00 | Intermittent heating | 0.00% |
| Int./Party Wall | 0.00 | 0.00 | | **Total Room H** |
| | | | | **Total Room Energy** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| Volume ($m^3$) | 0.00 | | | | | |
| | | **Temp Difference** | **Heat Loss (W)** | **Usage (kWh)** | | **Typ** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | **Expos** |
| U Value ($W/m^2K$) | 0.00 | 0.00 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| U Value ($W/m^2K$) | 0.00 | 2.50 | 0.00 | 0.00 | | |
| | | | | | | **Adjoin** |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |
| U Value ($W/m^2K$) | 0.00 | 0 | 0.00 | | | |

| *Watts* | *kWh* |
|---|---|
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| 0.00 | 0.00 |
| **Heat Loss (W)** | 0 |
| **Usage (kWh)** | 0 |

**e of Ground Floor**

**sed floor (external)**

**ing Room Temp (°C)**

**AMENDMENTS SINCE PUBLICATION**

| Date | Version |
|---|---|
| 03/11/2015 | 1.0 |
| 15/12/2015 | 1.1 |
| 28/01/2016 | 1.2 |
| 01/02/2016 | 1.3 |
| 10/05/2016 | 1.4 |
| 10/05/2016 | 1.4 |
| 10/05/2016 | 1.4 |
| 27/05/2016 | 1.4 |
| 28/03/2017 | 1.5 |
| 12/05/2017 | 1.6 |
| 15/06/2017 | 1.6 |
| 19/09/2017 | 1.7 |
| 18/04/2018 | 1.8 |
| 29/07/2019 | 1.9 |
| | |
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| Notes |
| --- |
| First issue. |
| Updates to functionality and corrected reported errors. |
| Updates to functionality and corrected reported errors. |
| Updates to functionality and corrected reported errors. |
| Post 2006 building room design temp changed to 21°C throughout ,<br>except for bathroom (22) and store (16) |
| Added kWh to additional heat on room tabs |
| Added W/m2 to overview on design details tab |
| Updated postcode degree data |
| Updates to functionality and corrected reported errors including:<br>Radiator selection for room 3<br>Dimensions for roof windows |
| Minor update to unlock drop downs for Exposed floor (external) |
| Corrected cell value on sheet 11 cell F3 |
| Updated to include version 2.0 and guidance for the Compliance Certificate |
| Corrected cell entry issues on Compliance Certificate v1.2 tab (cell D22, D23, D24, and D25) |
| Rebranding of document, update of email and website addresses and cosmetic changes |
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