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	DATE: 03/22/04	SHEET 1 OF 29	

TEST PROCEDURE
FOR
DEADMAN BATTERY PACK LONGEVITY TEST

CAMERON P/N 2021604-01

CHECKED BY: Ray Arbor Date: August 2, 2001

APPROVED BY: Spiridon Ionescu Date: August 2, 2001

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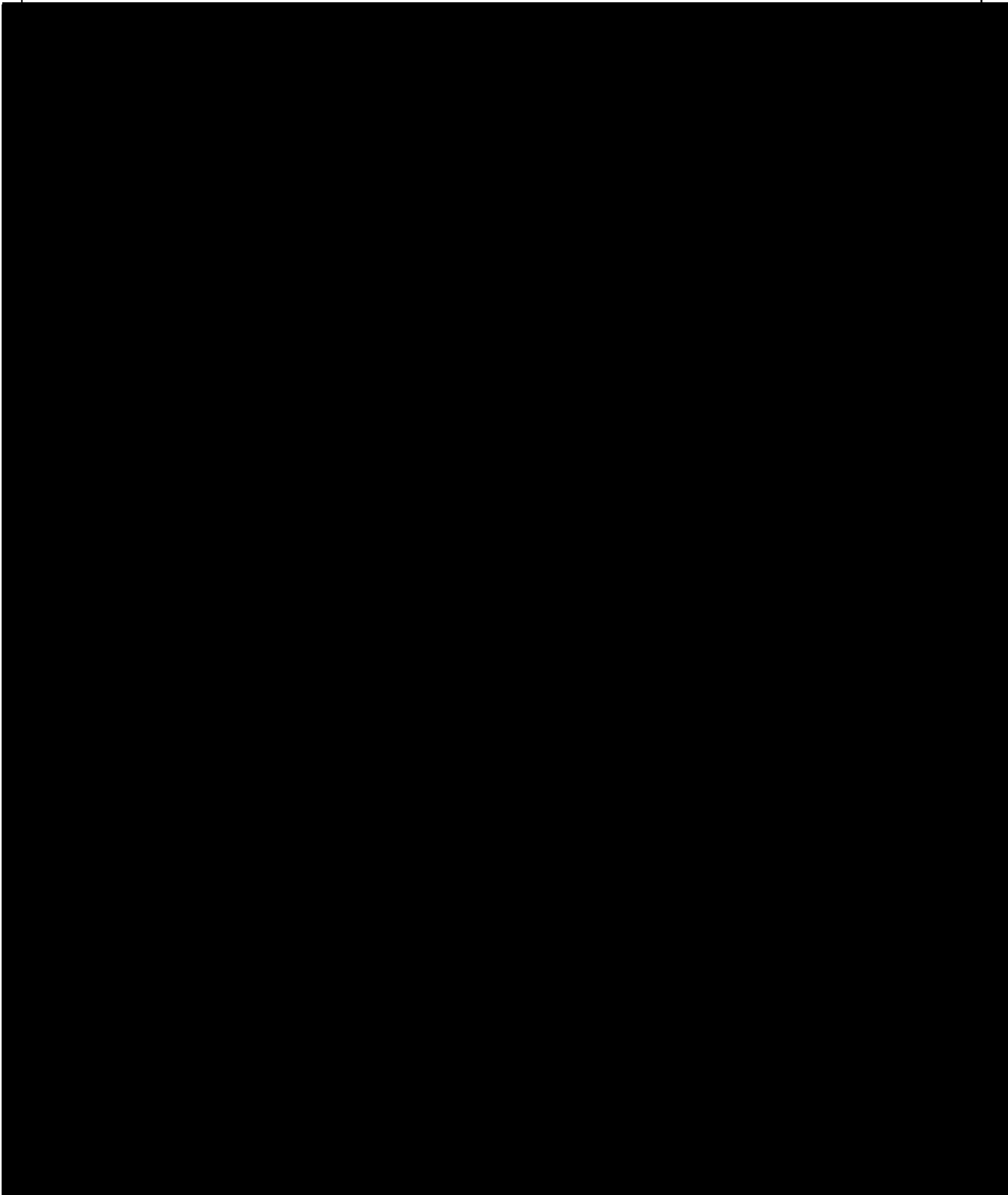
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DEADMAN BATTERY PACK LONGEVITY TESTS

1.0 Purpose

This report documents the results of experiments intended to determine the number of Shutdown Sequence actuations the DeadMan System can carry out and to compare these results with earlier calculations consigned in Document DF-055061-01.

The battery used for the tests is the 9-Volt Battery Pack (Cameron P/N 2021604-01), consisting of three FRIWO M 25 Lithium batteries 3-Volt cells.

A series of tests were conducted at temperatures of 24°C, 0°C and 7°C, using three separate Battery Packs.

2.0 Drain on the Battery Pack

There are two sources of drain on the 9 V Battery Pack:

A long term, low current drain (1.75 ma) while the DeadMan Controller is in the Monitoring Mode. This is the main cause of discharge of the Battery Pack. After one year of operation in the Monitoring Mode roughly 60 % of the battery capacity is drained out.

A short term, high current (up to 5.5 A) drain during Emergency Shutdown Sequences. These sequences can be repeated many times on the drilling platform to verify that the DeadMan System is in working order.

To better emulate field conditions, both types of load are applied in the course of the Battery Pack tests.


2.1 Monitoring Mode drain test

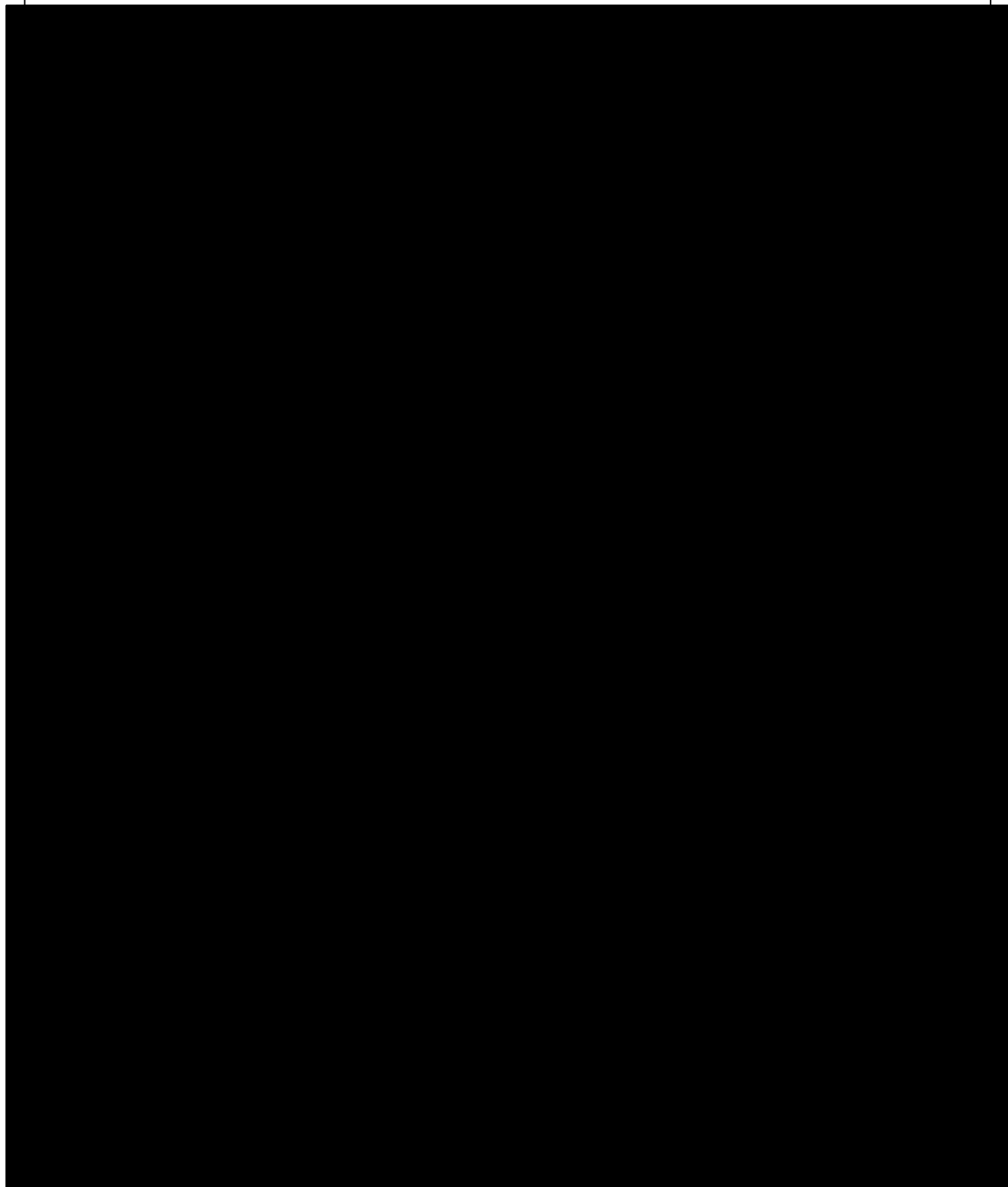
Using a new Battery Pack, a drain test in the Monitoring Mode is carried out at a current level 100 times larger than the normal 1.75 ma drain current of the DeadMan Controller board. This increases the current drain from 1.75 ma to 175 mA and shortens the duration of the test from one year to 3.65 days.


The test load consists of 3 x 10 ohms power resistors in series. The current consumption of the Controller board in the Monitoring Mode and the external load resistors provide the required 175 ma of drain current.

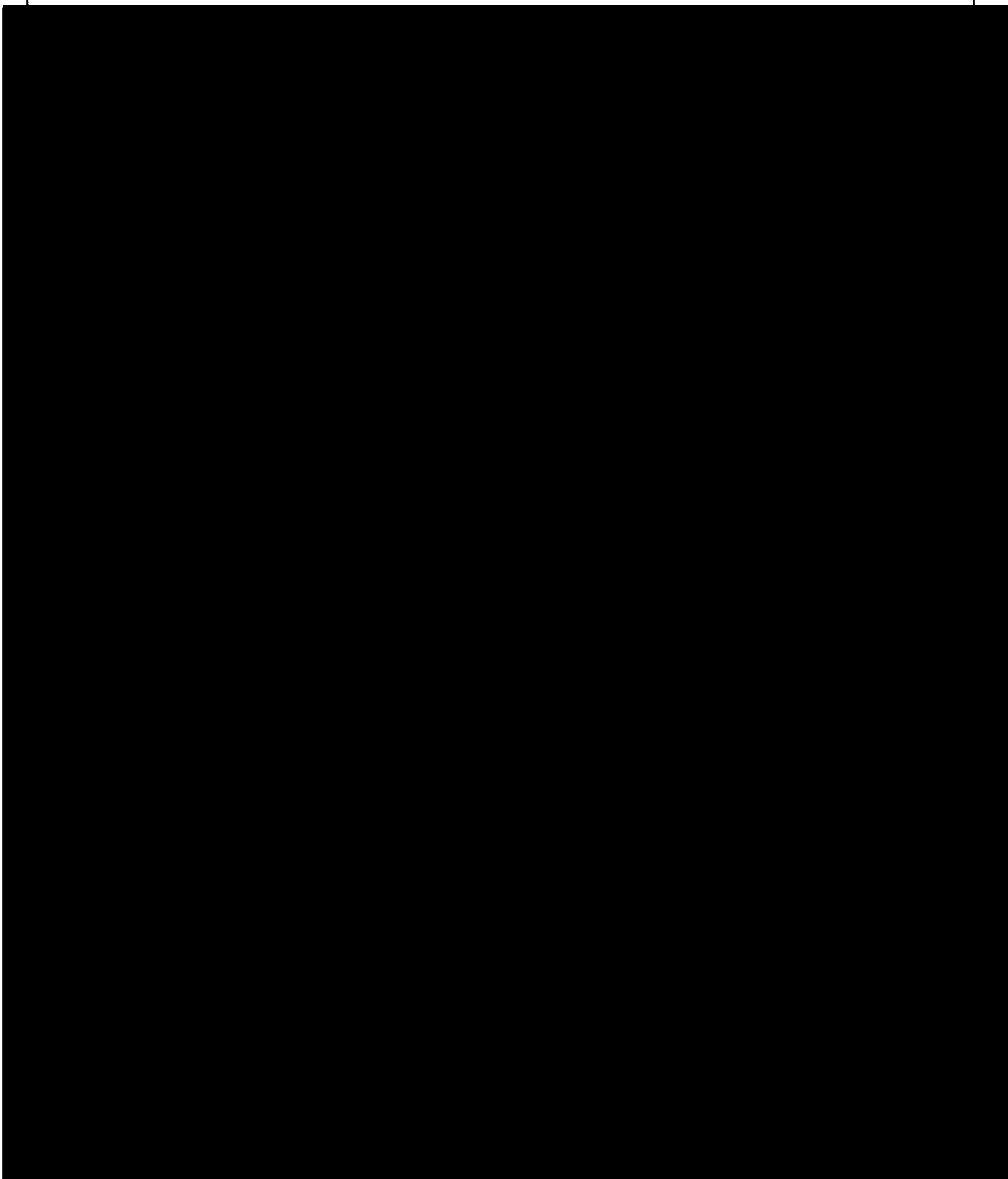
The Battery Pack drain test in the Monitoring Mode can be carried out at any time as long as it isn't carried out last.

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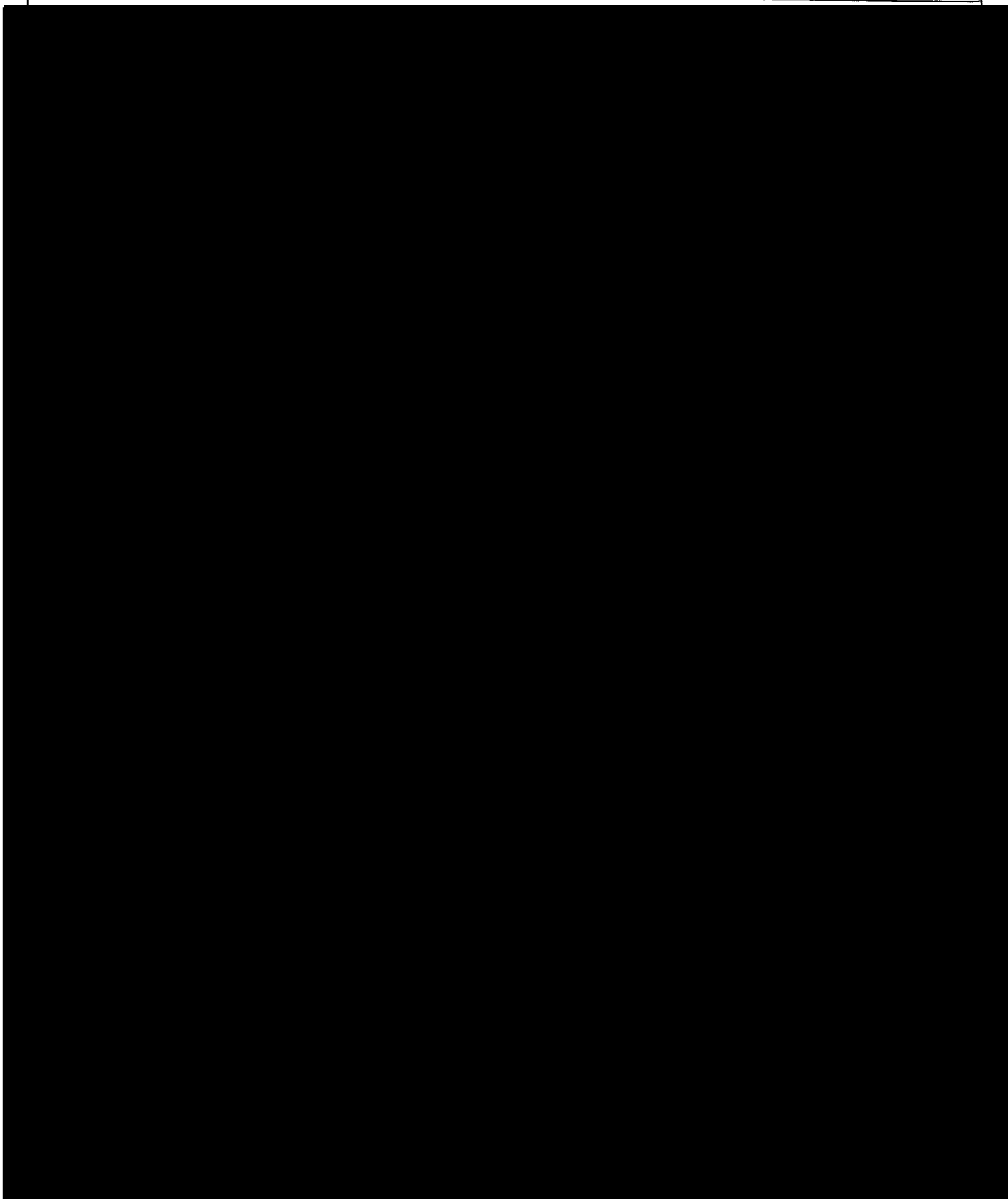
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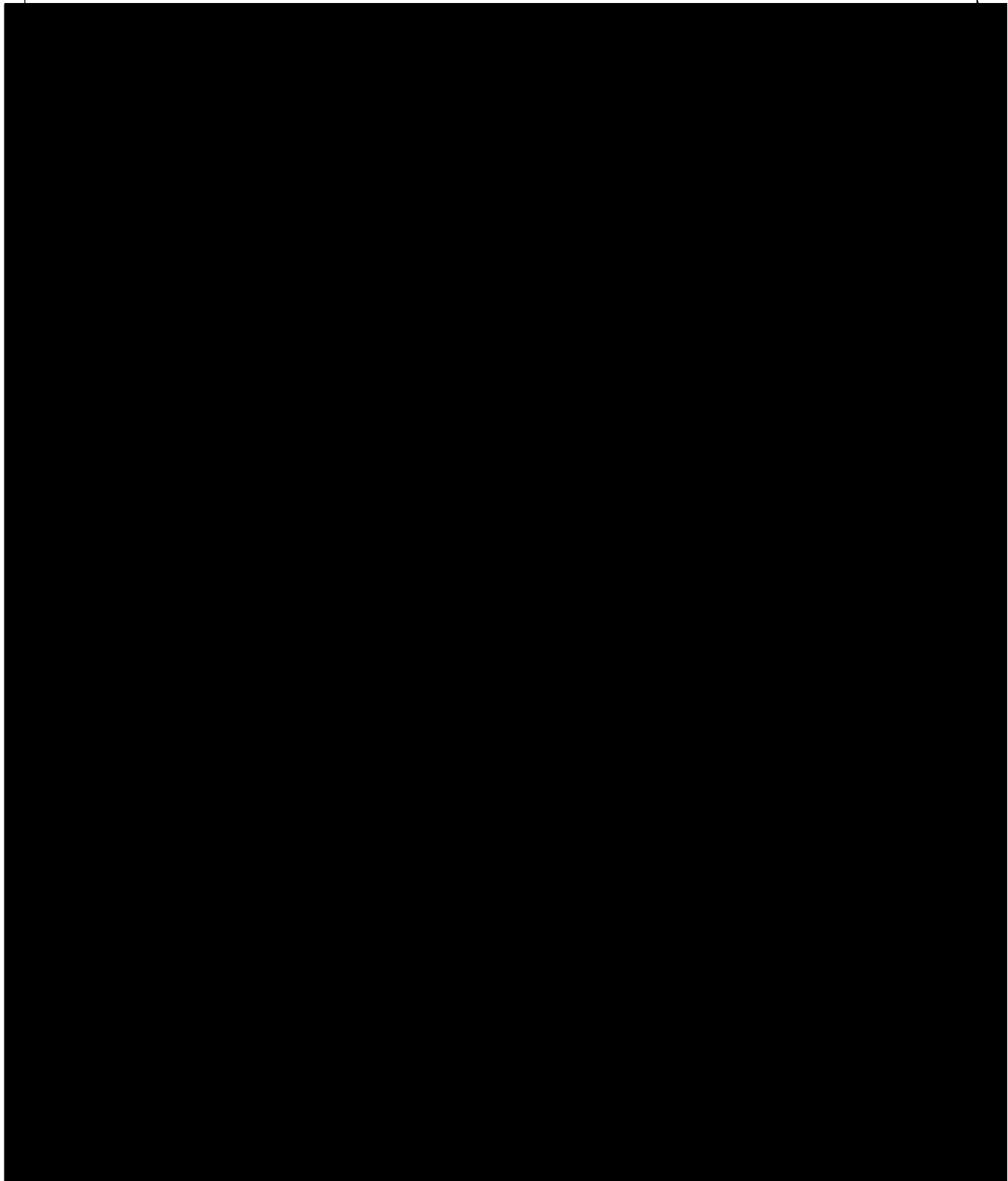
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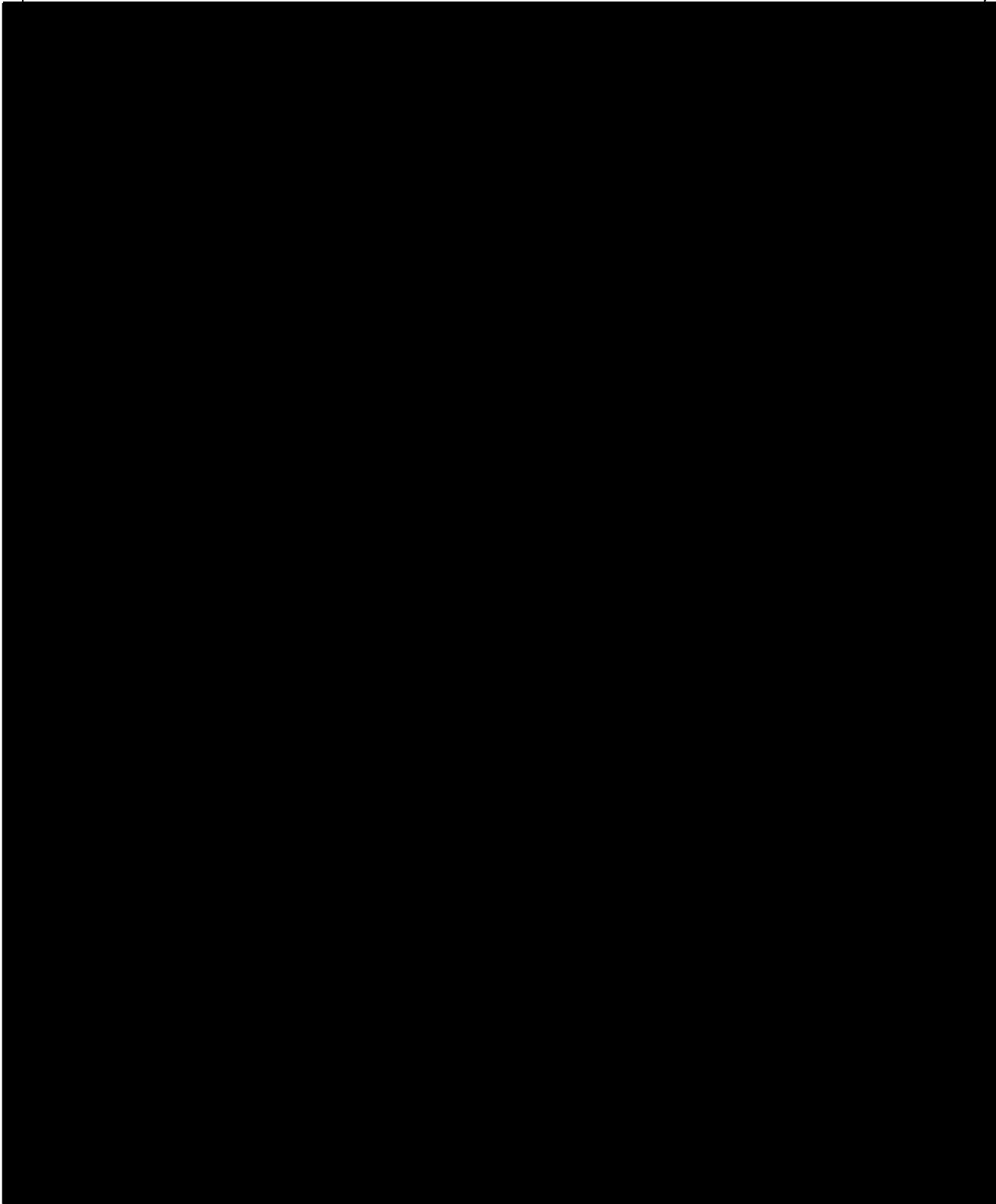
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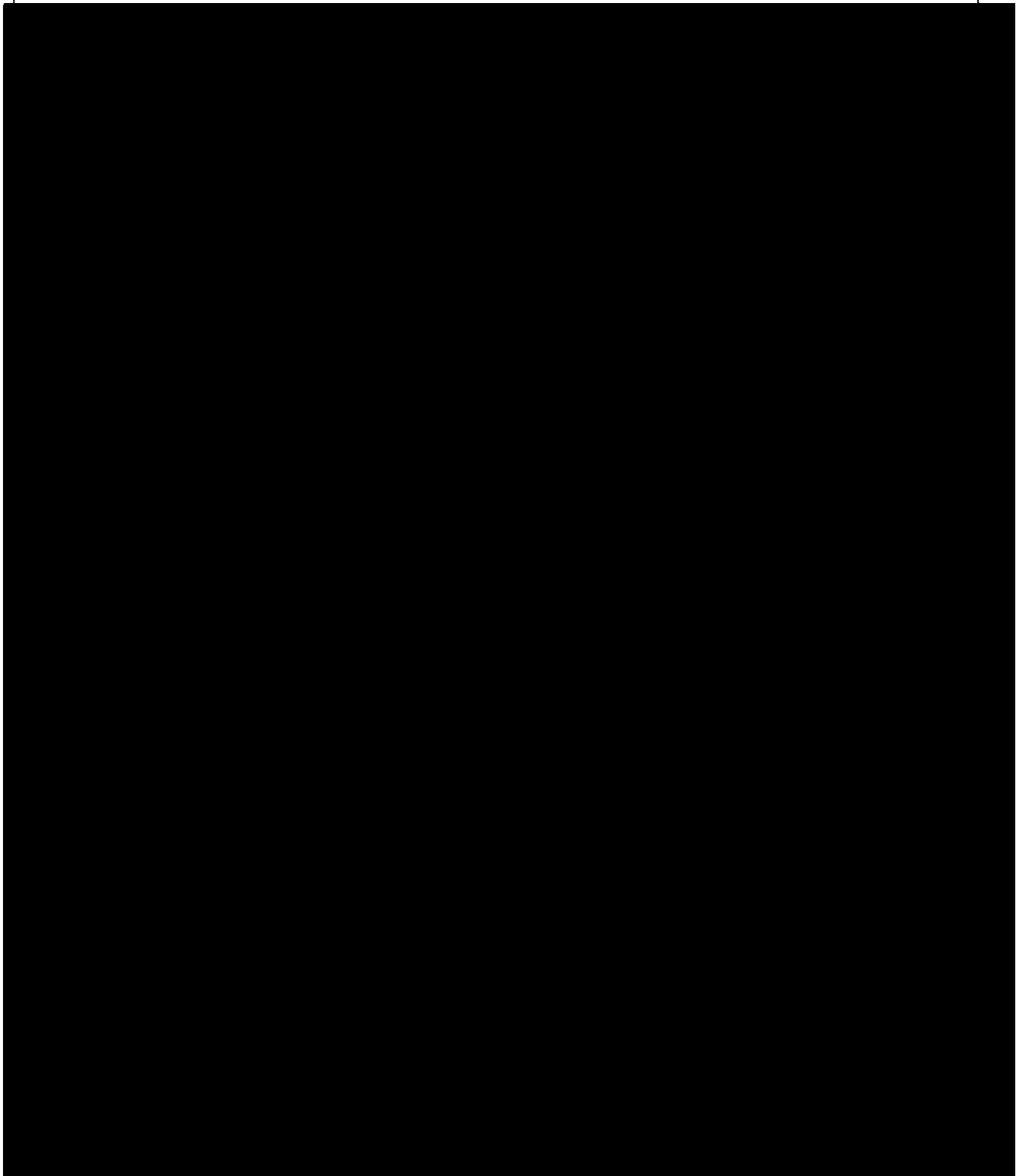
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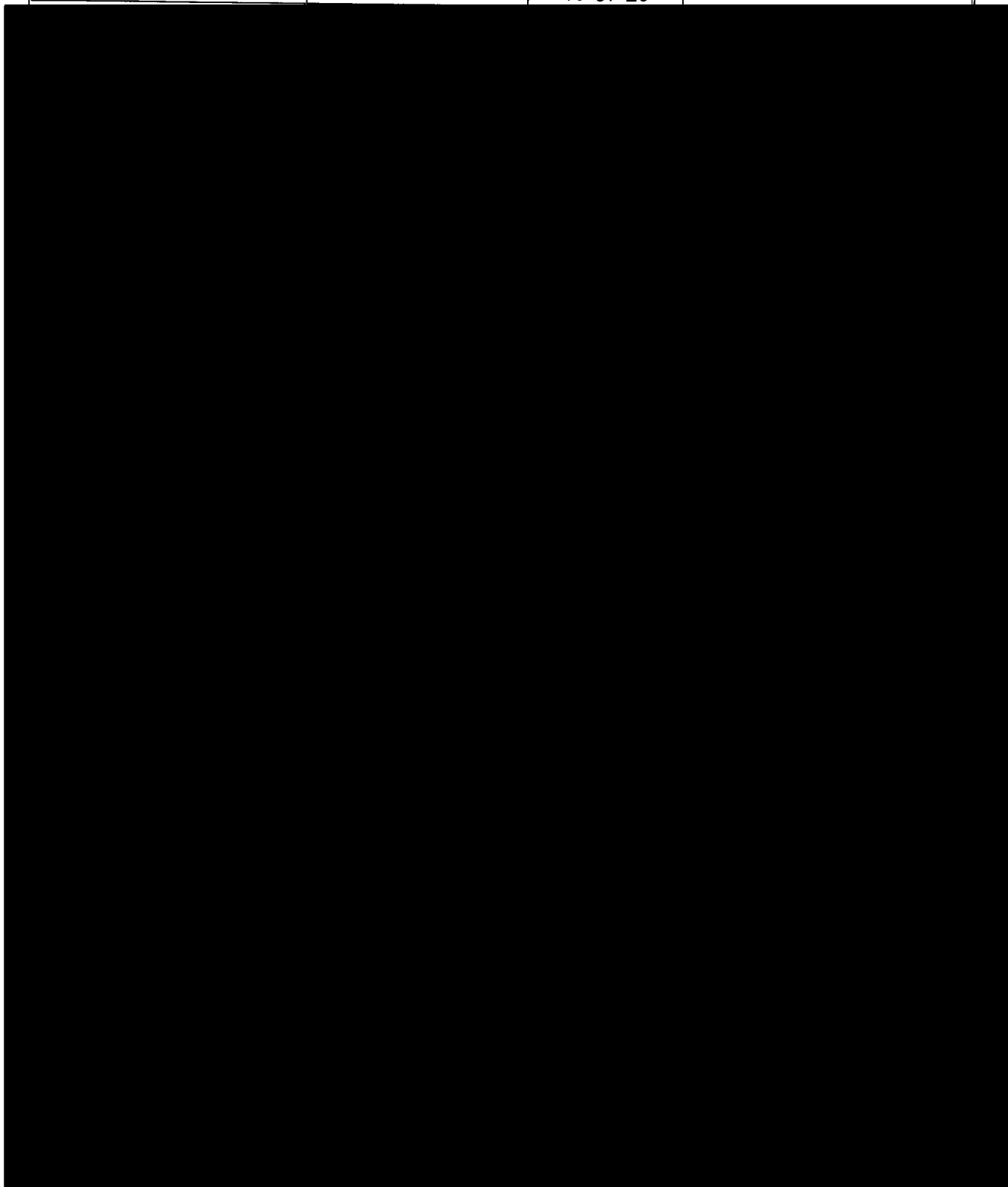
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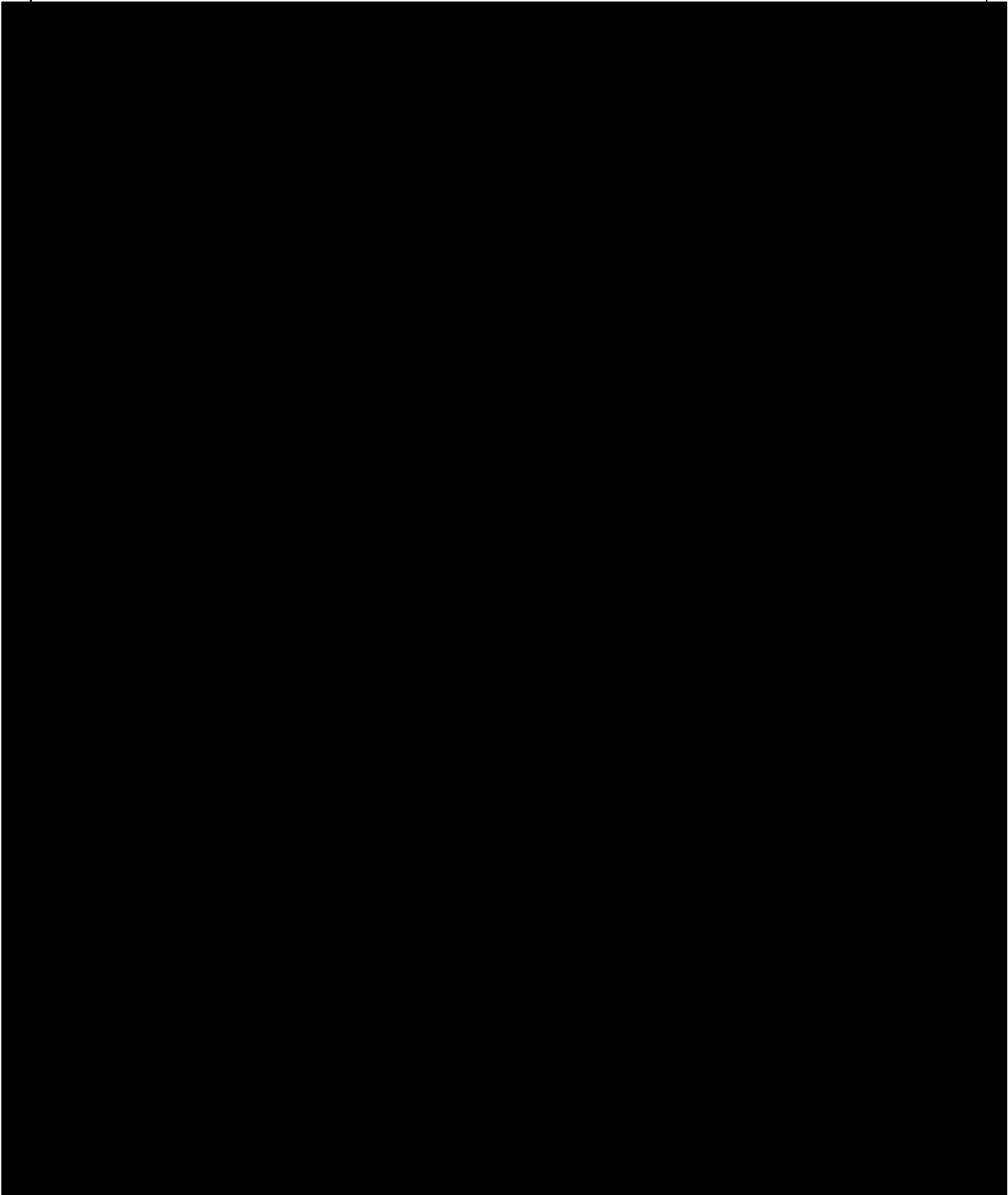
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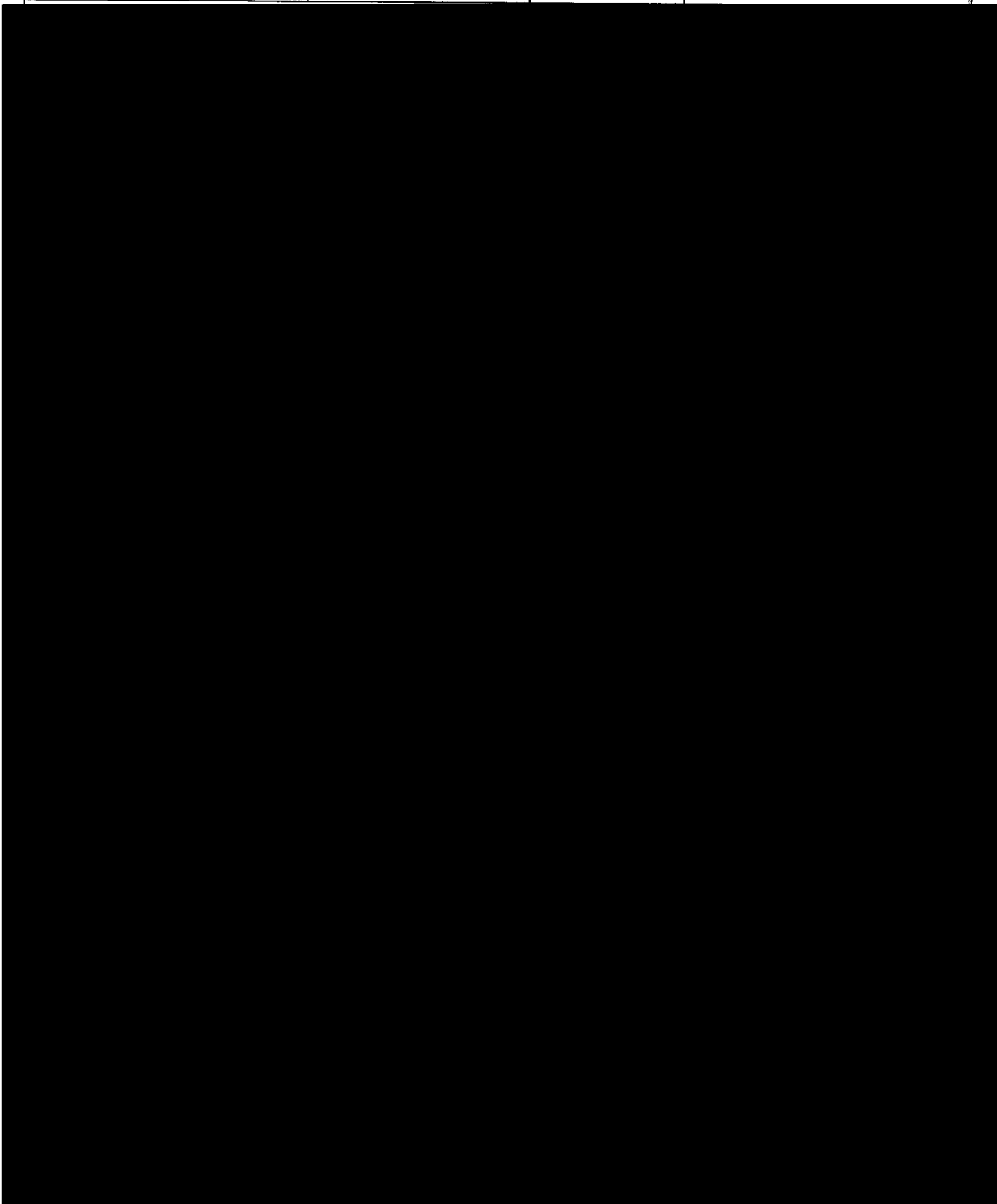
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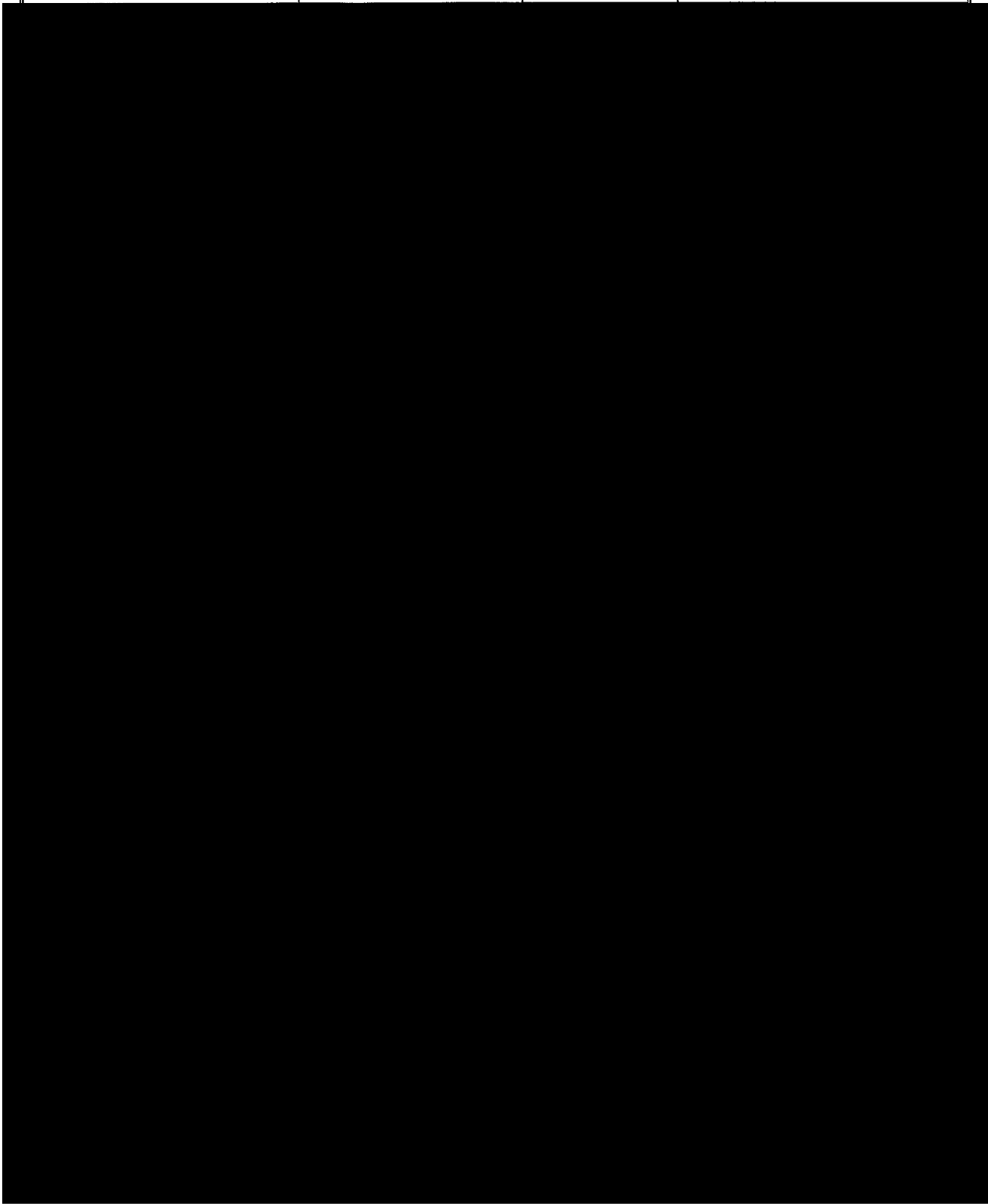
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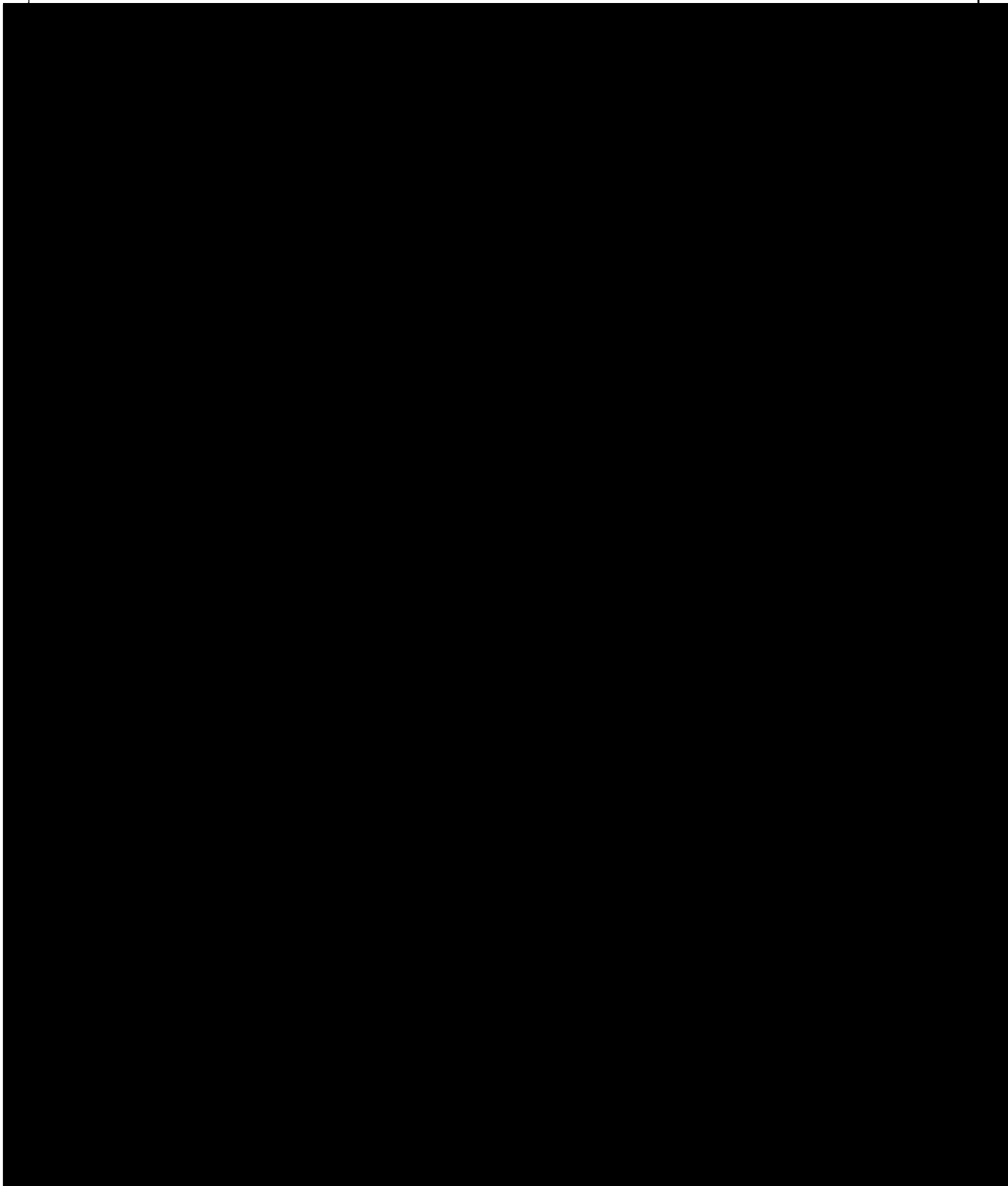
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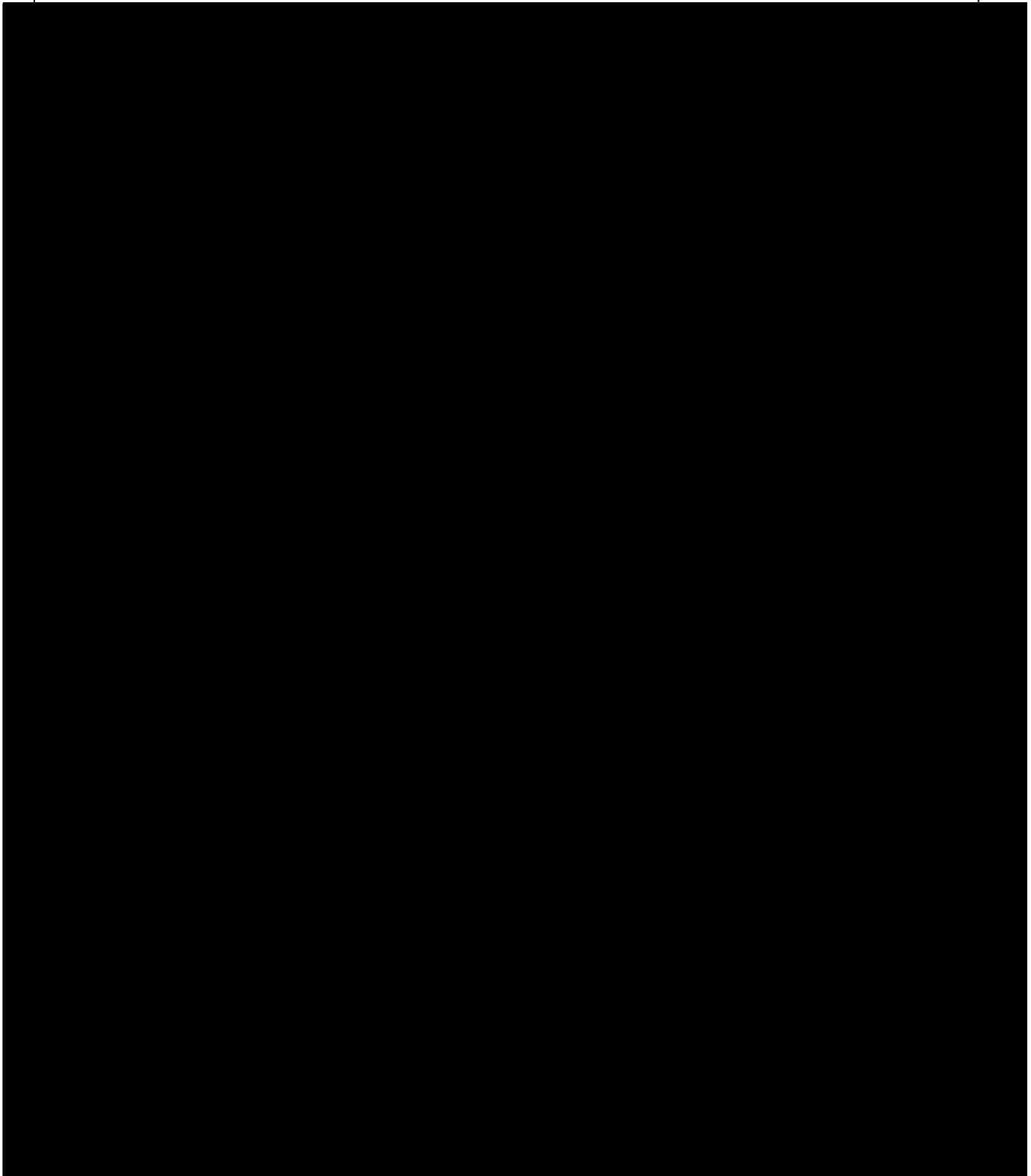
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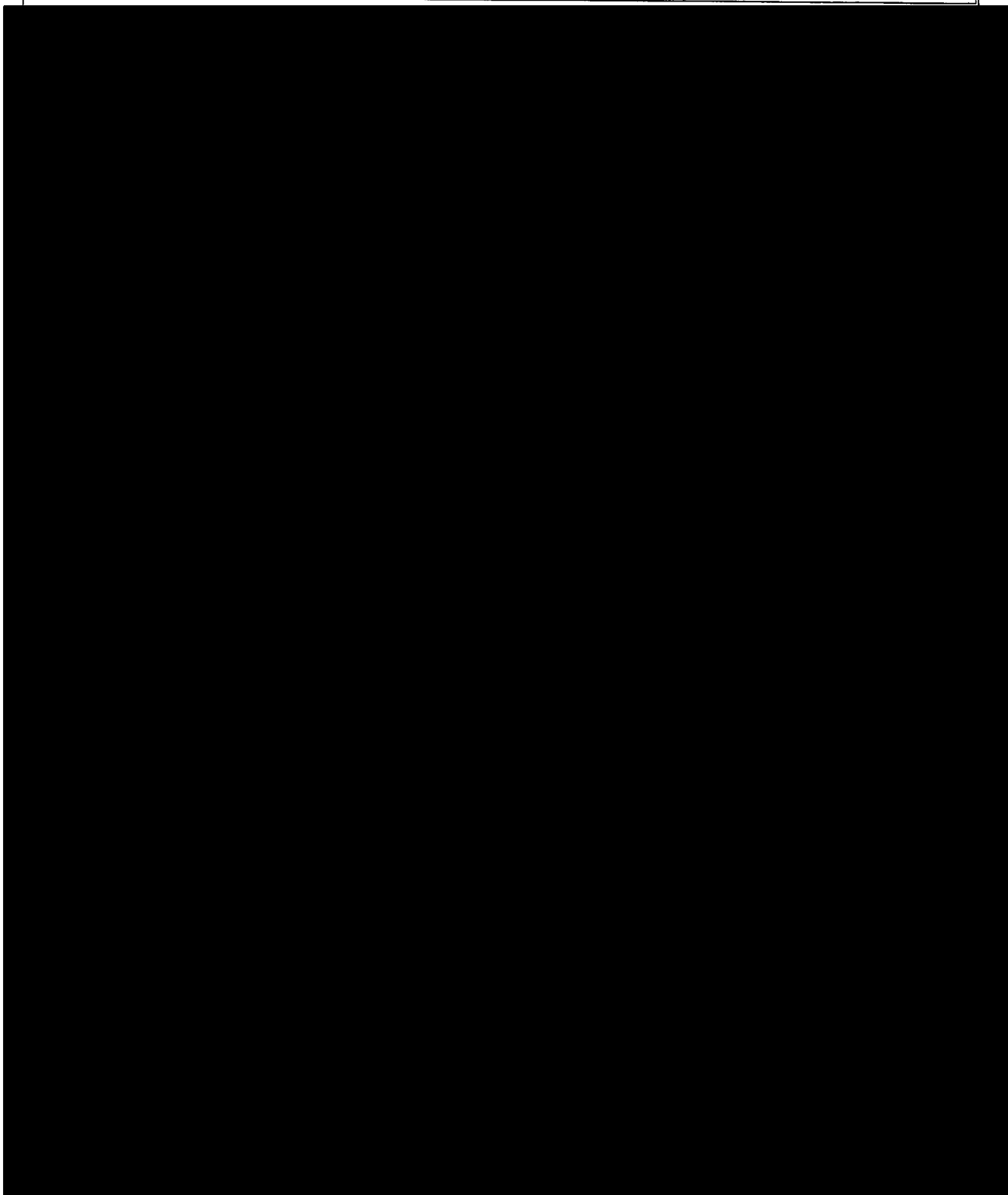
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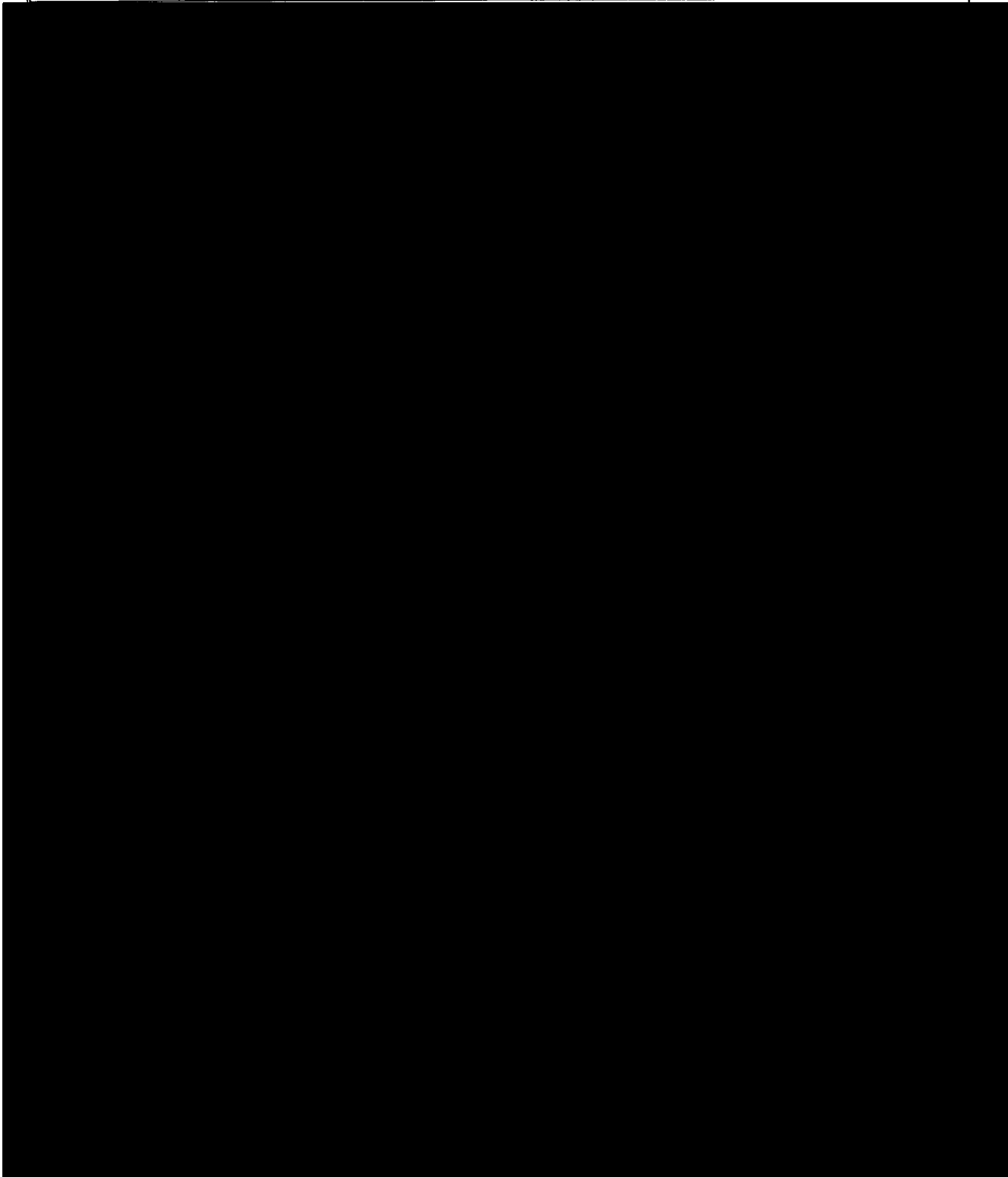



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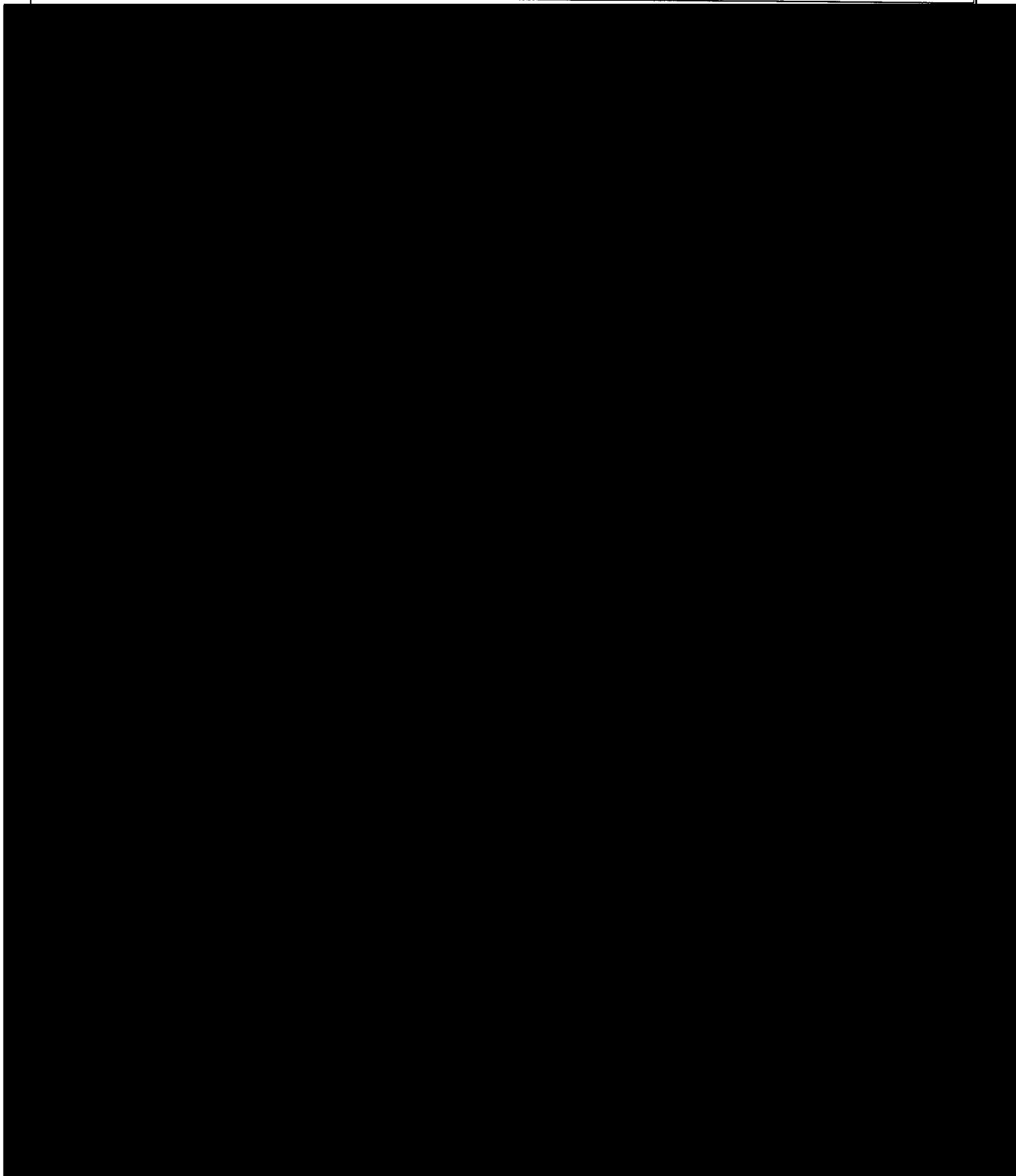
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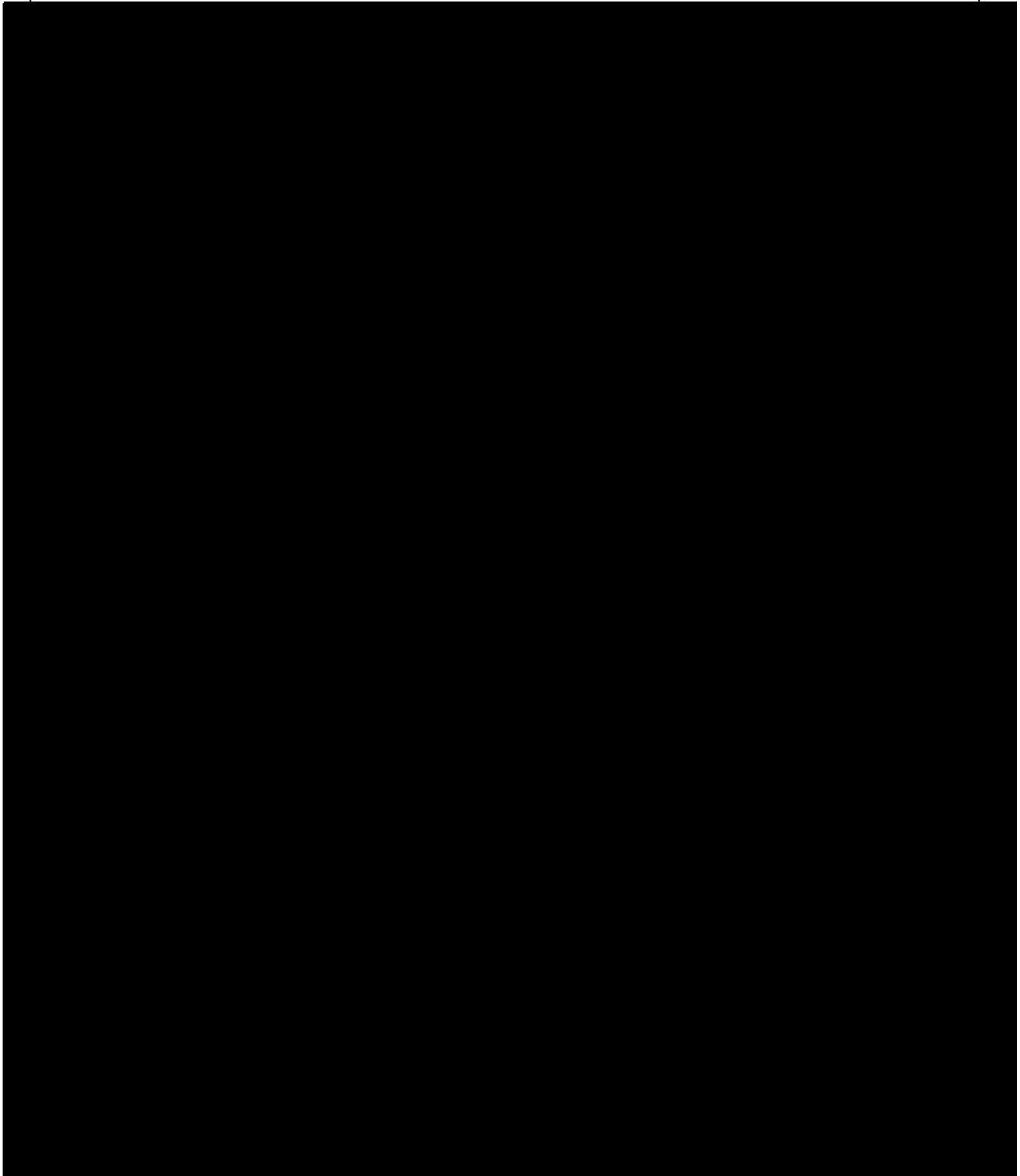




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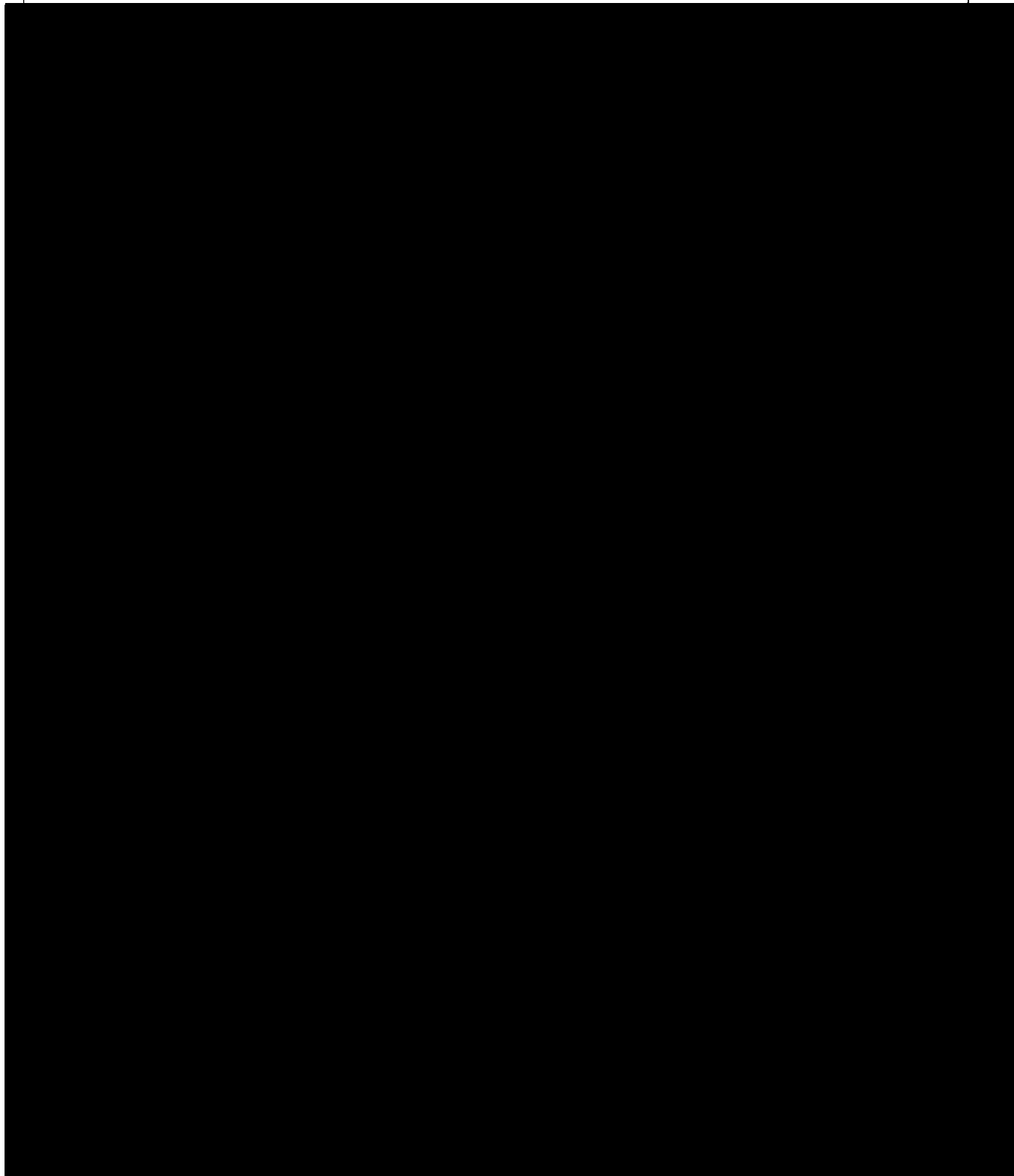
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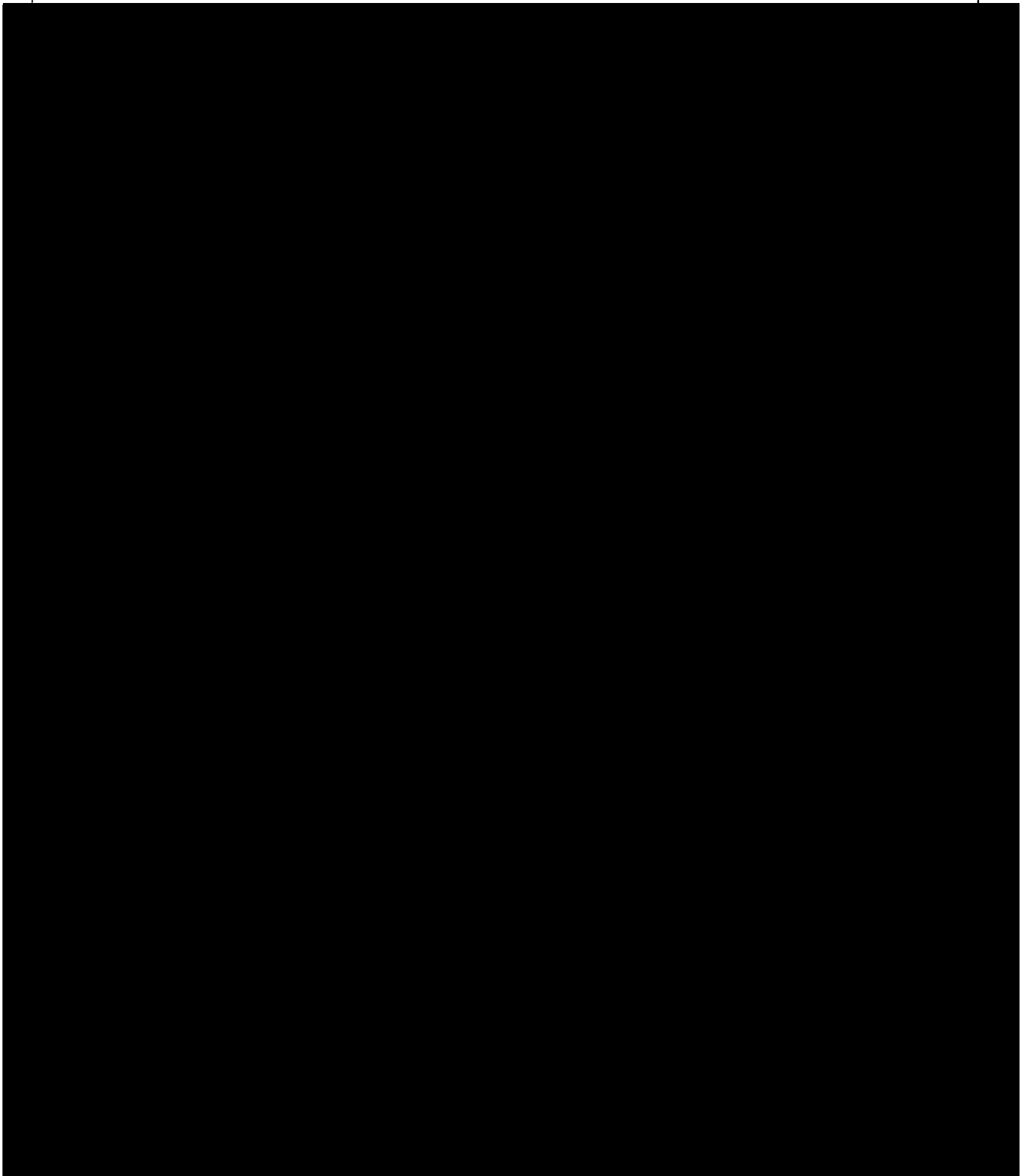
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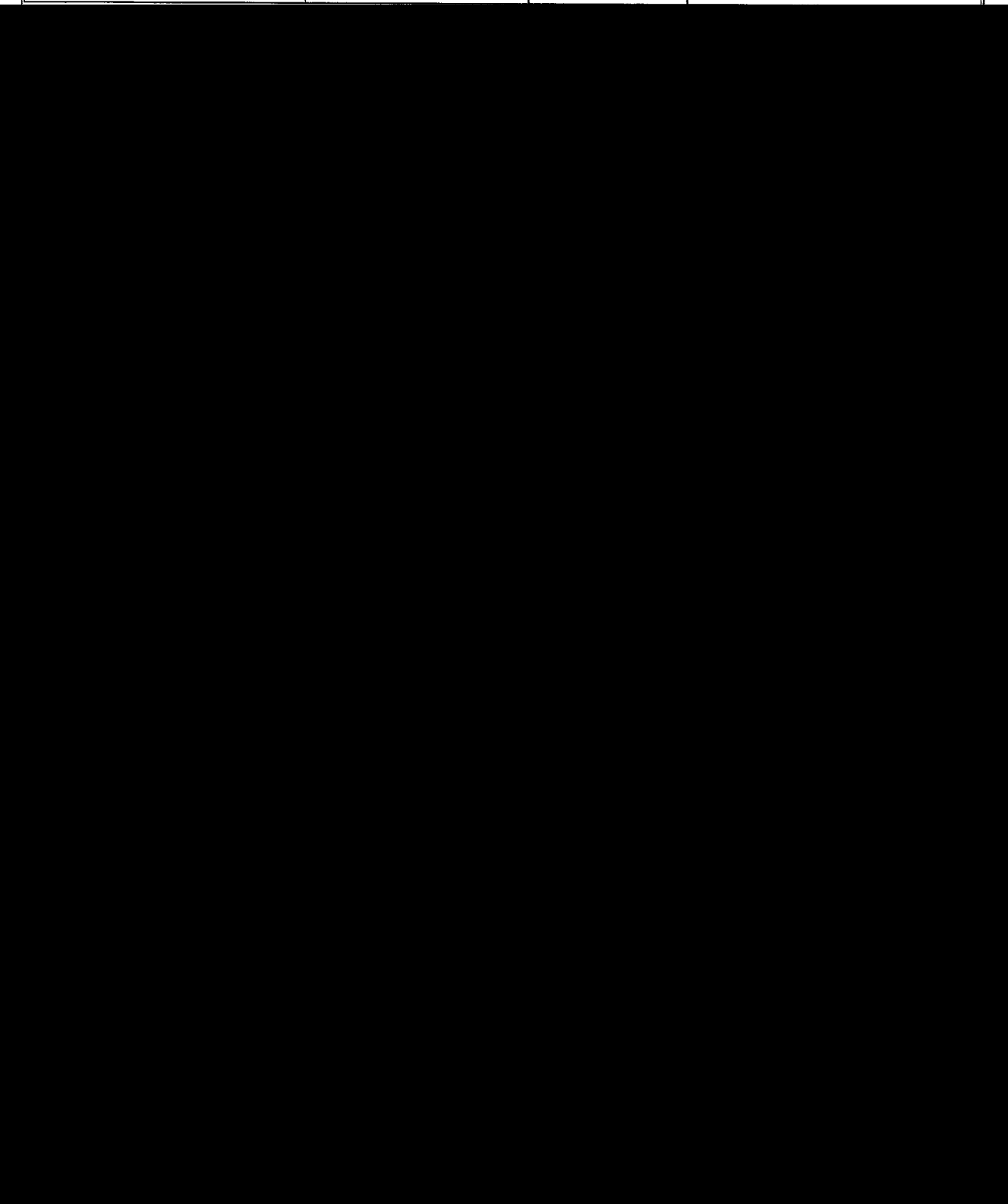
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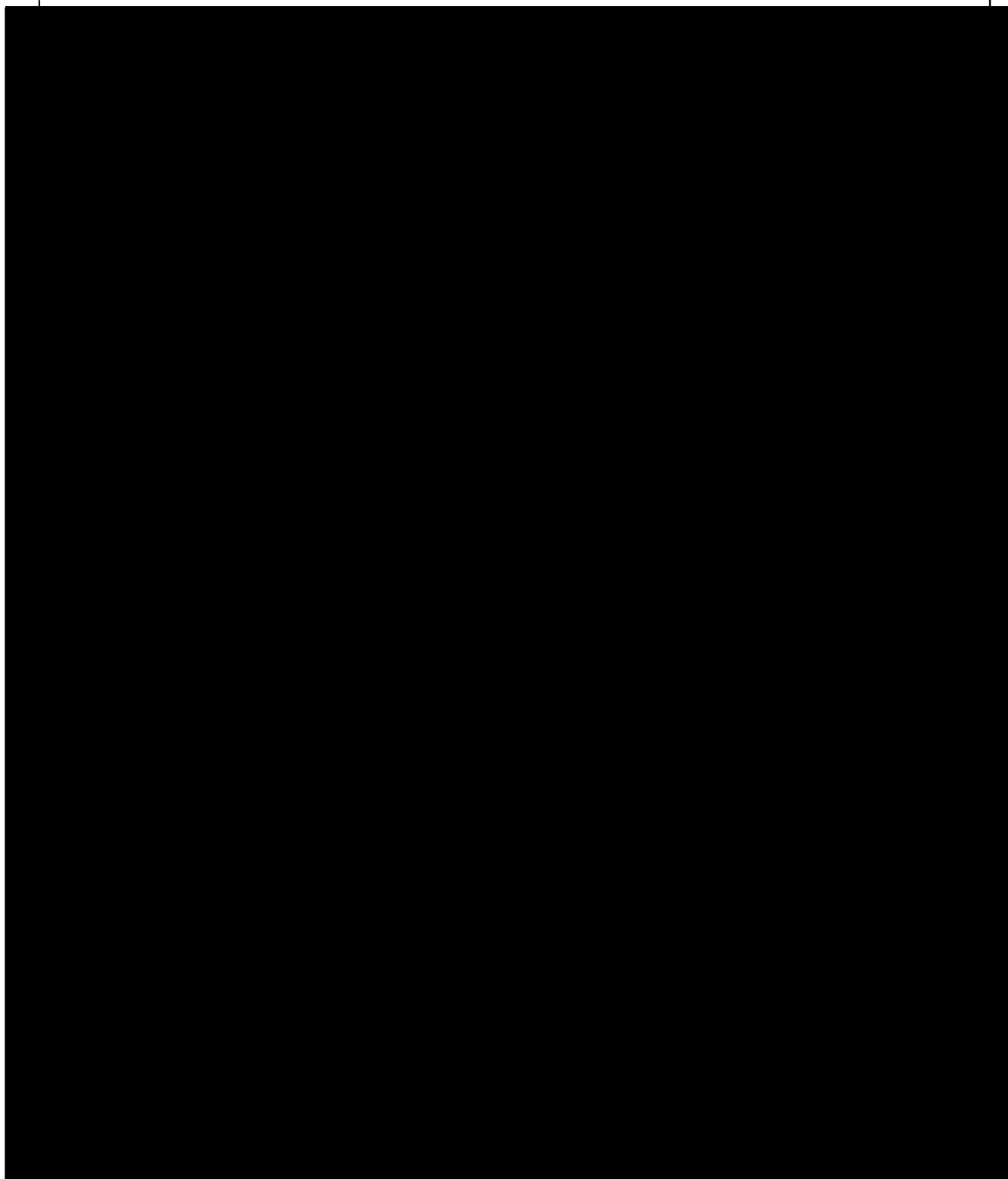
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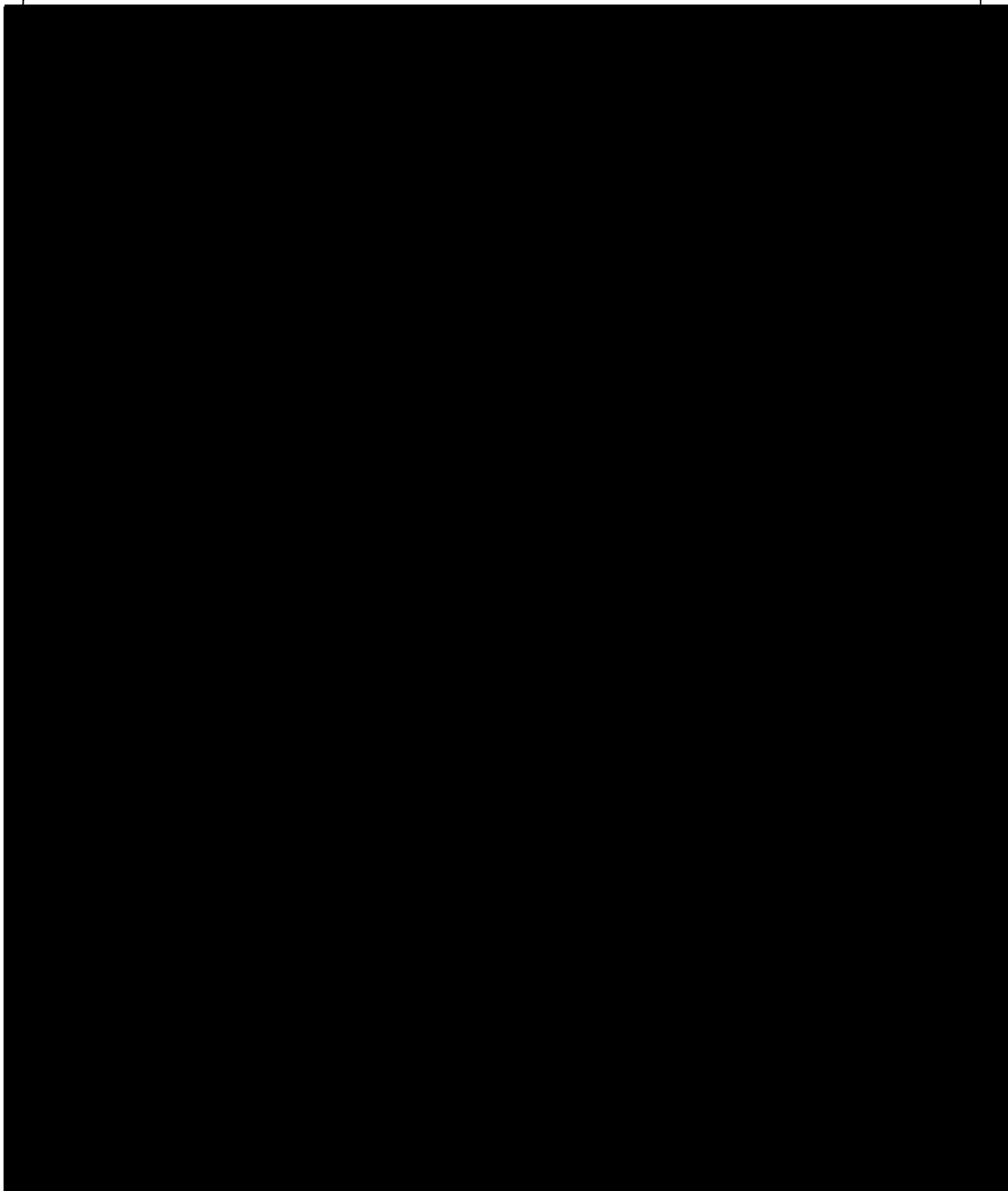
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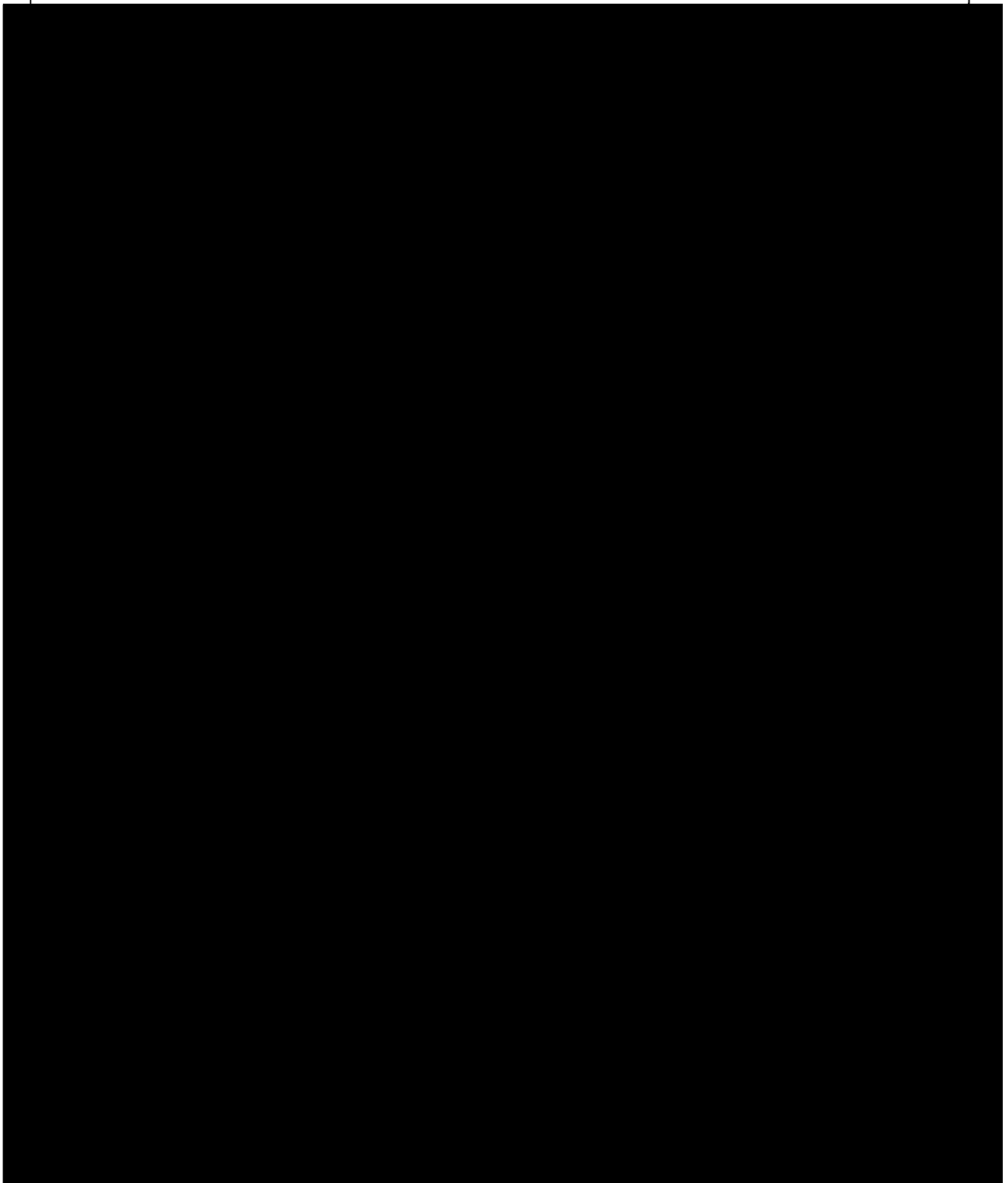



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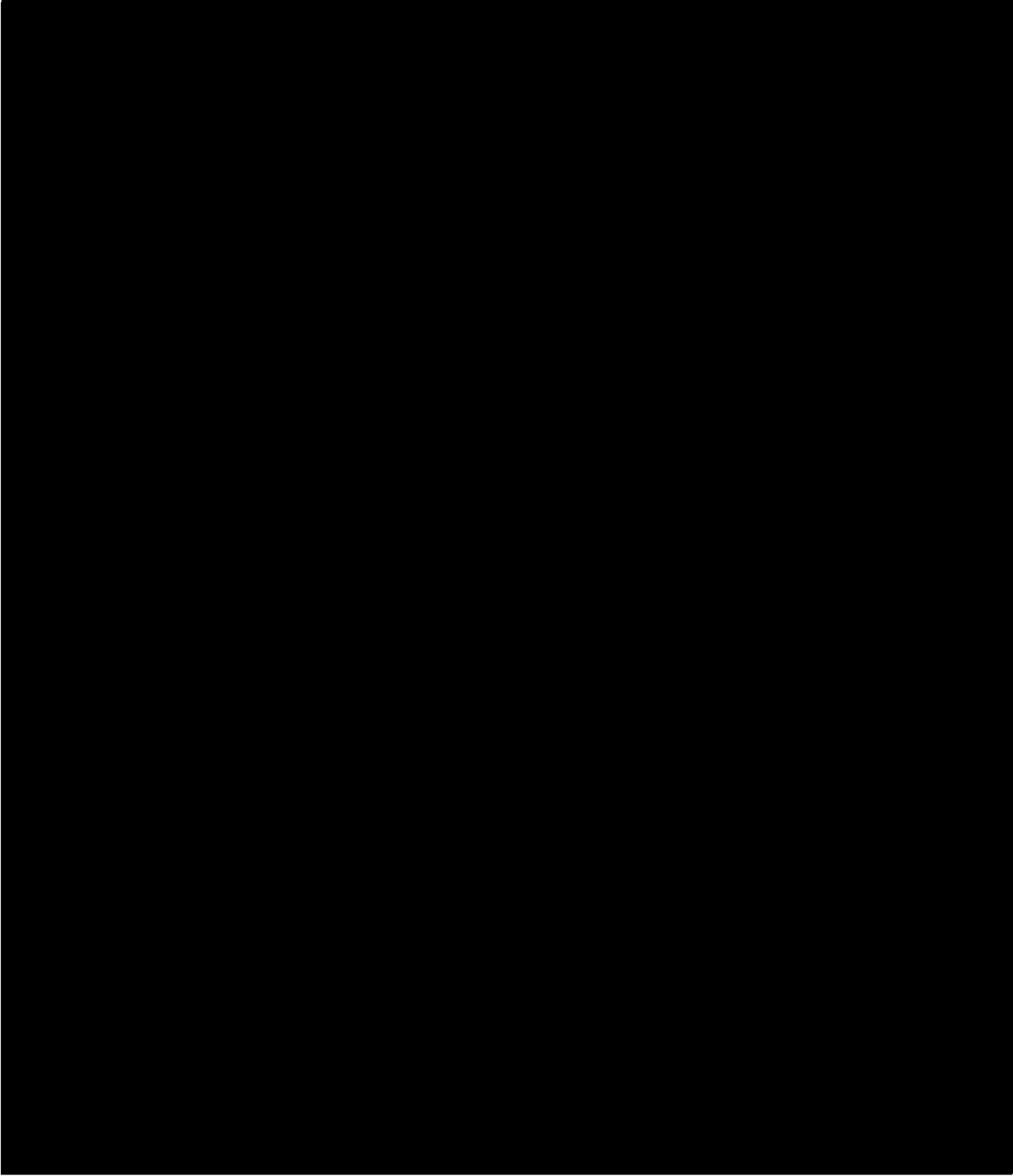
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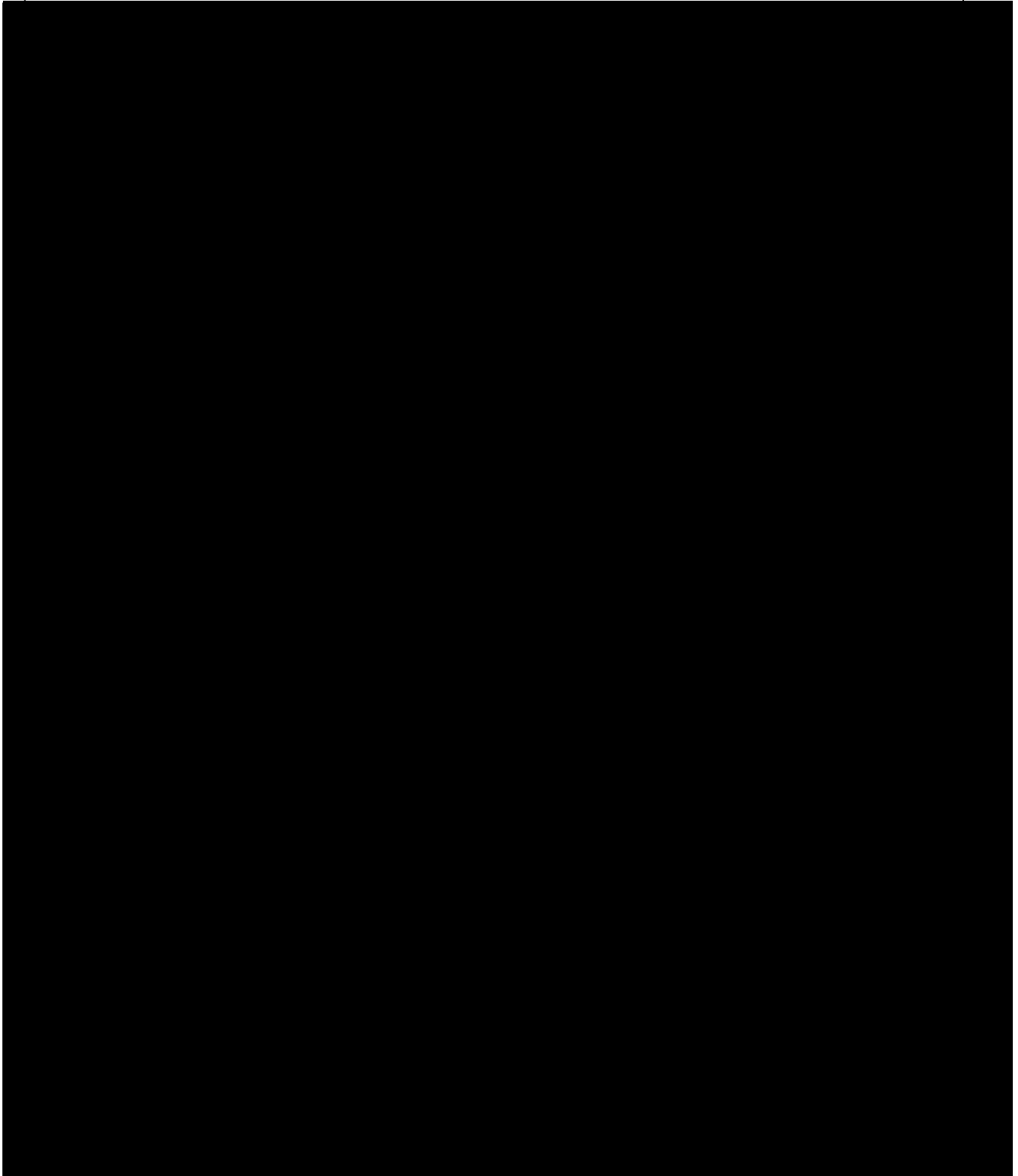
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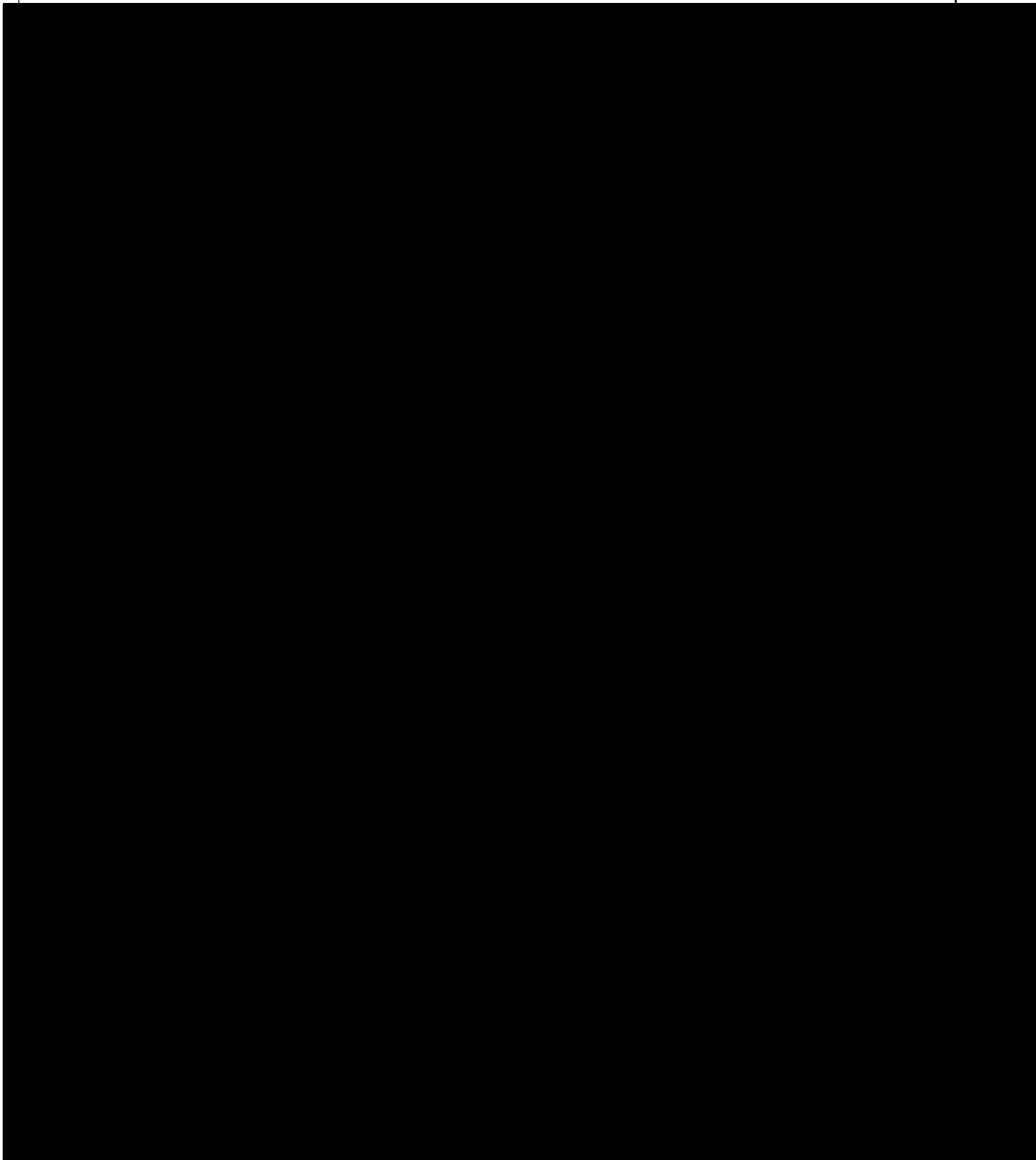
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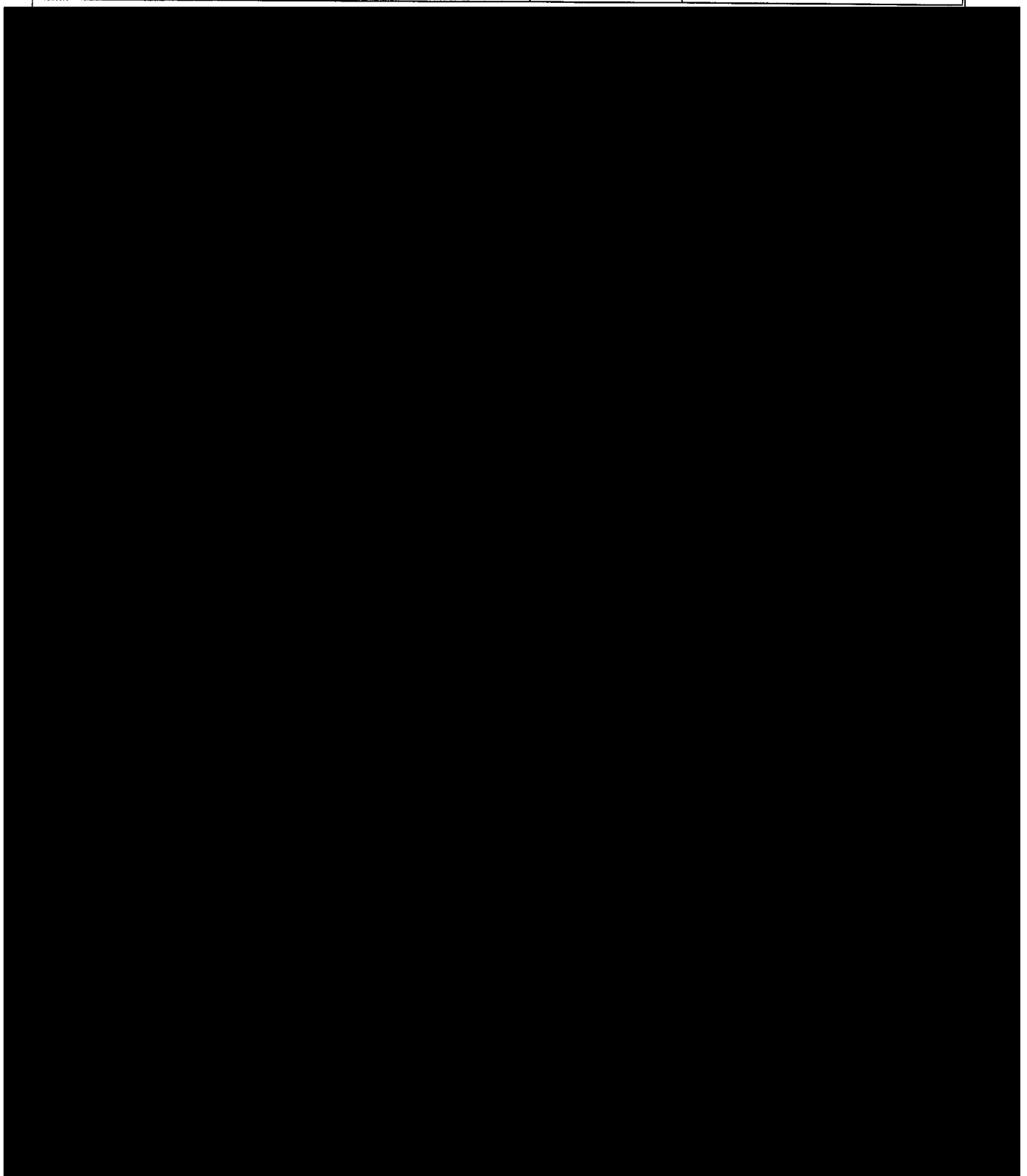
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