

Using Generative AI to Aid in the Description of Historic Postcards

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PastForward WPL's Digital Repository

- Began in 2012
- Preserving materials of historical value
- Public access to Winnipeg and Manitoba History

pastforward.winnipeg.ca

The Rob McInnes Collection

- Began in 2012 as PastForward's first collection
- 2000 early 20th Century Winnipeg postcards
- Scanning & cataloguing contracted out
- Descriptive quality issues
⇒ brought in-house

A Rookie Mistake

- 2013: High descriptive standard set
 - Transcribe title or create one
 - Create a description of the photo, often requires research
 - Street view link
 - Photographer
 - Sender
 - Recipient
 - Recipient address
 - Portrait subject
 - Annotations
 - Transcribe message
 - Notes from the developer
 - Postal data: stamps, postmarks (sending P.O. & date, receiving P.O. & date, Special cancellation stamps)
 - Publisher
 - Printer & Printer location
 - Series number
 - Serial number
 - Year of creation
 - Date mailed
 - Physical description
 - Identifier
 - Language
 - Historical names
 - Signs and banners
 - Subject geography, address, and latitude and longitude

Scope Creep

- 2014: McInnes more than doubled donation, now 5,000+ postcards
- 2015: Martin Berman donation of another 5,000+ postcards
 - WPL scanned his collection and the City of Winnipeg Archives houses them for physical access

Reprise

- 2016: **Hired** 0.7FTE trained and experienced cataloguer
- 1200 cards published per year

(And there was much rejoicing)

Image source: Monty Python and the Holy Grail

Temporary Reprise

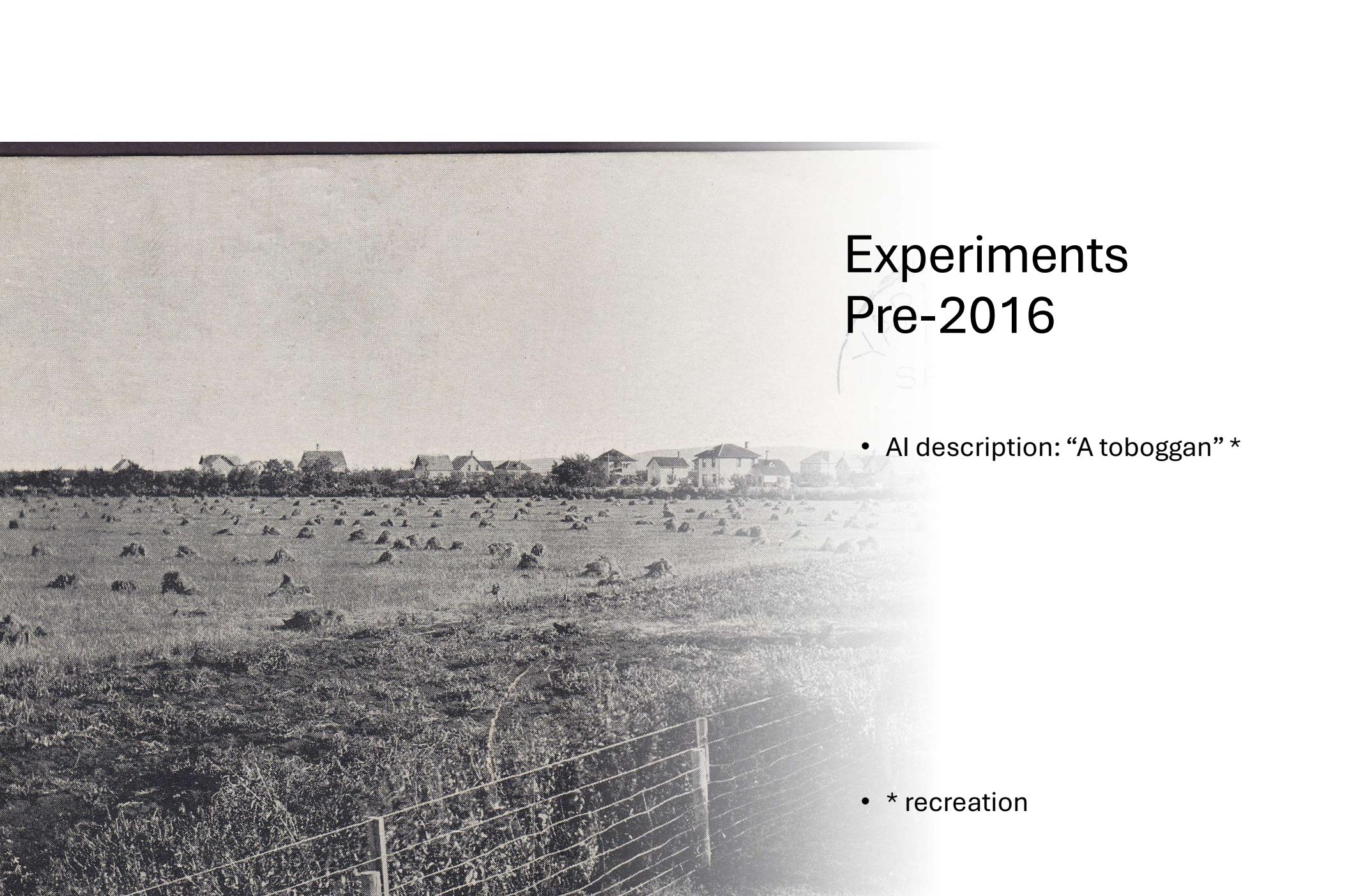
- 2023: **Lost** 0.7FTE trained and experienced cataloguer

(Run away!)

Image source: Monty Python and the Holy Grail
Image upscale: ChatGPT
Arthur excitement boost: ChatGPT (unrequested)

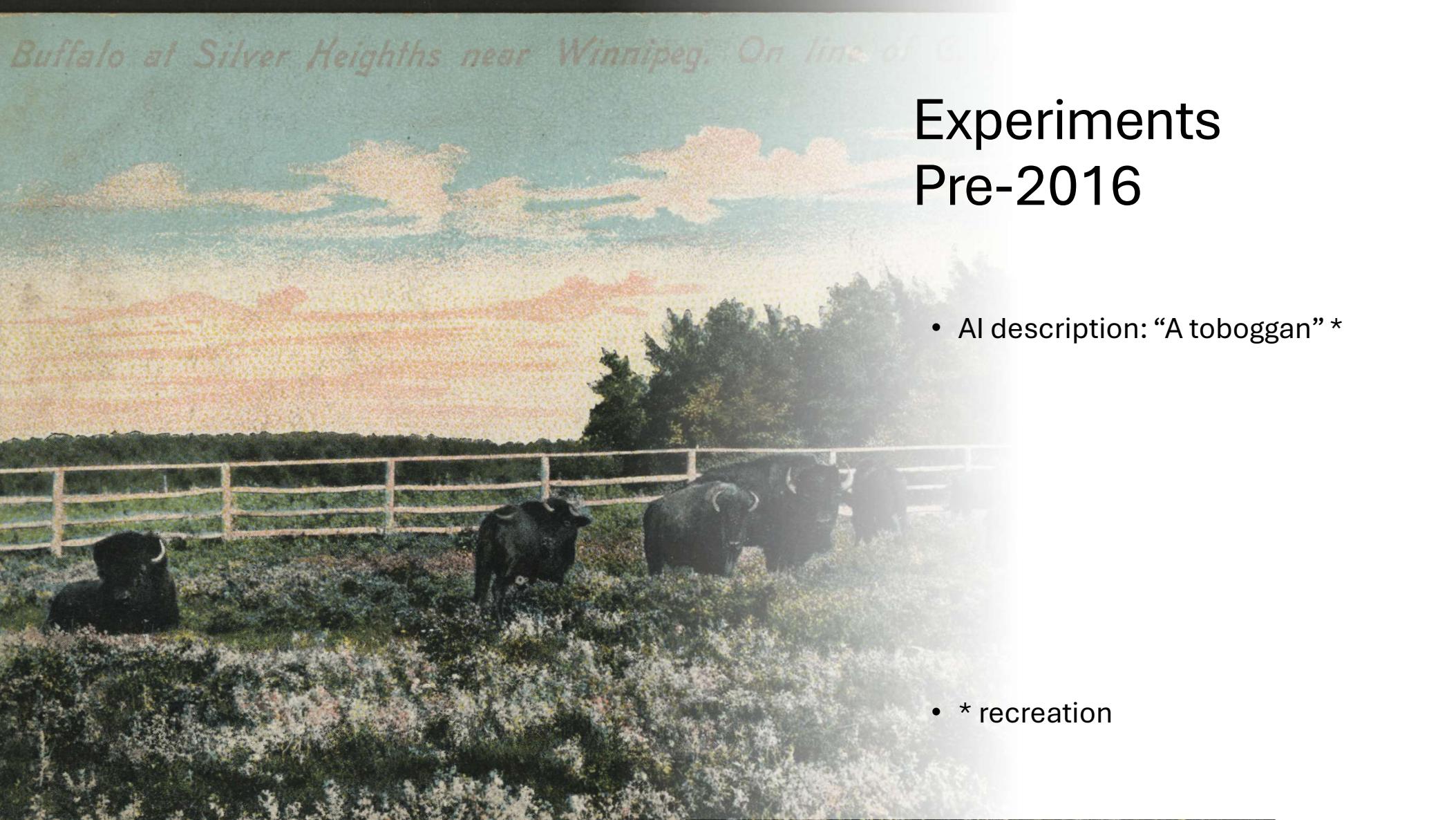
Tech to the Rescue?

- Scanning and ingestion had already been automated early on
- Industry standard OCR (ABBYY, etc.) was too error-prone on type and useless on handwriting
- Early AI misfires...



Experiments Pre-2016

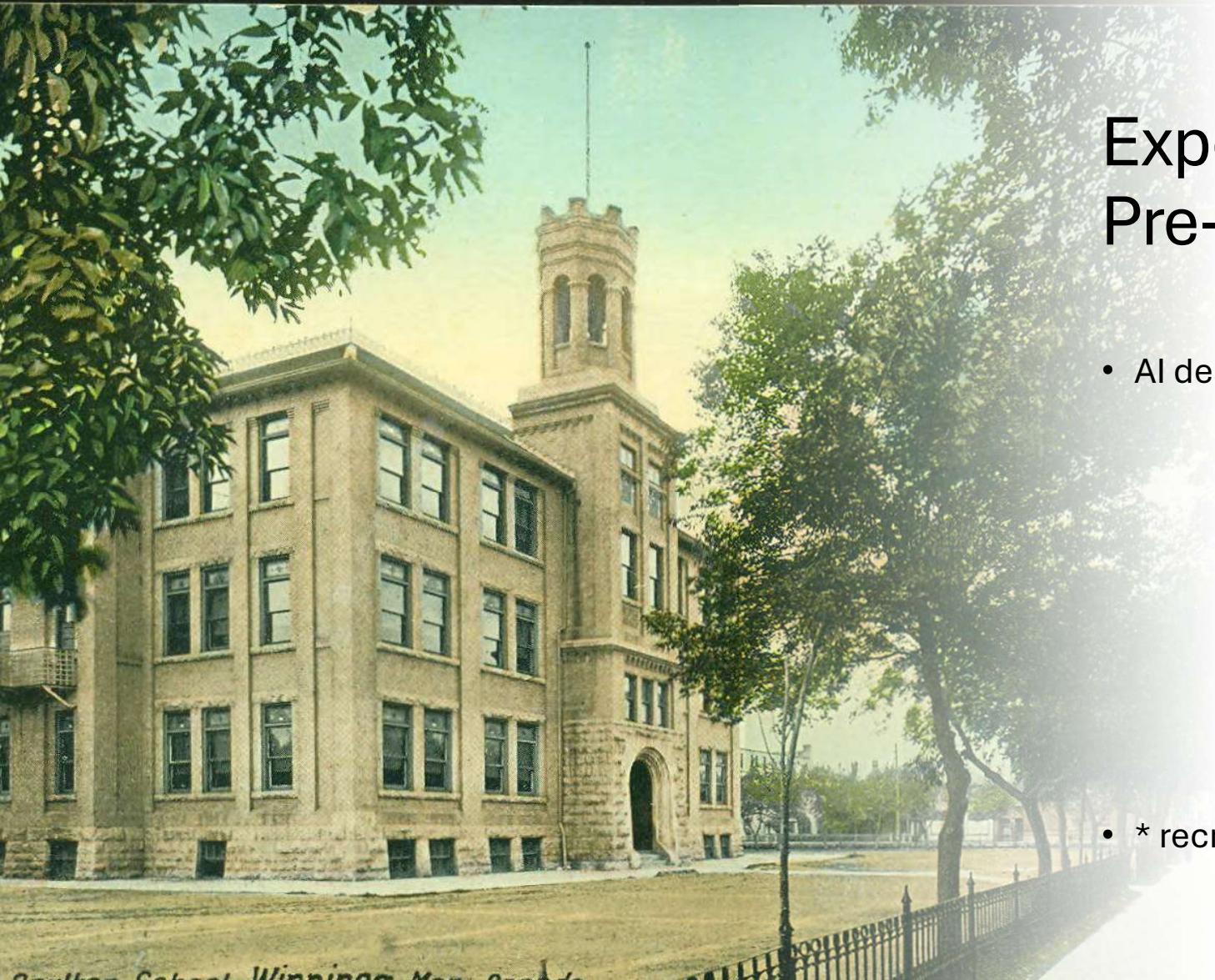
- AI description: “A toboggan” *
- * recreation



A historical photograph showing several bison grazing in a grassy field. In the background, there's a wooden fence and a line of trees. The sky is filled with large, colorful clouds, ranging from yellow to orange and red. The image has a slightly grainy texture and a vintage color palette.

Experiments Pre-2016

- AI description: “A toboggan” *
- * recreation



Experiments Pre-2016

- AI description: “A toboggan” *
- * recreation

Carlton School, Winnipeg, Man., Canada

2016 Microsoft's Machine Vision API

I am not really confident, but I think it's a building with a clock on the side of a road.



- Early signs of usefulness
- However, lack of depth or sophistication

I think it's a train crossing a bridge over a river.



2016 Microsoft's Machine Vision API

- Early signs of usefulness
- However, lack of depth or sophistication

I am not really confident, but I think it's a young girl wearing a hat and she seems 😊.



2016 Microsoft's Machine Vision API

- Early signs of usefulness
- However, lack of depth or sophistication

2016 Microsoft's Machine Vision API

- Early signs of usefulness
- However, lack of depth or sophistication

I think it's a vintage photo of a city street.



2016 Microsoft's Machine Vision API

- Image to text worked on hand-printing... if the text was black.
- Wrote script to send cards to Microsoft and pre-fill title for cataloguer
- Cataloguer reported correcting errors took more time than manual transcription



Preview JSON

\11 GOVAN RIVERS'MANY

White text = bad results

Image URL Submit Browse



Preview JSON

VIMY*
5 m -107. 3
THE B)
SCALPIS 1]

Noise from signs in image

SWAN RIVER, MAN.
MAIN STREET

Correct Title

Image URL Submit Browse

GPT-4 Breakthrough

- 2023: GPT-4 introduced
- Testing \Rightarrow reasonably accurate, useful results
- Built automated description workflow

How To

- Create OpenAI developer account (not free)
- Write script to send each card image to OpenAI
 - Specify account key
 - Specify GPT version to use
 - Specify prompt *
- Receive, convert, and save response.

Prompt “Engineering”

- The prompt is never finished (probably)
- Every additional request is another opportunity to discover a new problem

Prompt (as of late 2024)

Attached is an image showing the front (left) and back (right) sides of an historic postcard. DESCRIBE USING ALL OF THE FOLLOWING (BUT LEAVE BLANK IF NOT KNOWN, **do not put in placeholders like unknown, not applicable, none identified). Use contextual clues like automobiles and clothing styles to help estimate date of creation. respond formatted as JSON. Much of the information is available at <http://pastforward.winnipeg.ca> including descriptions of cards with the same photos on them. You can use these when describing the subject of the photo, its location, etc.; but not title, serial number, or information from the back of the postcard, or especially not the identifier. Do not leave any fields out, especially identifier.

Complete: Yes

Title: Either OCRed text from the front (without square brackets) or a short description you write (placed in square brackets). Do not put OCRed text in square brackets.

Description: Your description of the image on the front card. Do not use flowery prose like, "It provides a glimpse into early 20th-century farming techniques." Do not use information from the title to augment your description. The description should only contain information that can be verified from the content of the image.

Street View: leave blank

Photographer: The photographer, if possible.

Photography Studio: The photography studio, if possible.

Sender: If the card was sent by someone, then this is their name.

Recipient: If the card was sent to someone, then this is the recipient's name.

Recipient Address: If the card was sent to someone, then their address.

Portrait Subject: If the picture on the front is of a person, their name.

Annotation: Additional notes or annotations on the card, after the card's main use (by collectors, etc.)

Message: Transcription of any message written on the card. Do not try to preserve layout, particularly do not use \\n.

Postal Data: Postmarks, postage stamps, and cancellation stamps. The lowest digits on a postmarks are typically the year either four digit or two. E.g., "Postmarks: CITY PROV. MMDD YY (or YYYY); Postage: [describe stamp]; [mention special advertising stamps]"

Publisher: The publisher of the postcard.

Publisher Location: Location of the publisher.

Printer Location: Location of the printer.

Serial Number: Serial number, if applicable.

Date Mailed: Date the postcard was mailed. Use YYYY-MM-DD format. Do not use the square brackets here. This should be learned from the postmark, not a handwritten date in the message section.

Physical Description: Physical description of the postcard. Estimate dimensions of the postcard based on 600dpi scan, give results in mm. Do not mention that it is based on the scan resolution.

Identifier: {IDENTIFIER}

Language: Language of the written message on the postcard.

Historical Names: Historical names (famous people, former names of buildings or places, etc.) associated with the postcard.

Signs and Banners: Descriptions of signs and banners in the image. Titles of the postcard are not included. Sign must be part of photo. Do all that you can recognize. Signs cannot be on the back of the card.

Subject: Subjects of the photo using TGM controlled vocabulary, semicolon separated, with first letter of the first word in each subject capitalized. Note that ampersands are used instead the full word "and", the term is "Churches" not "Church buildings", and that there is no term "Streetcars" rather one uses "Street railroads" similarly, it isn't "Railway cars" but rather "Railroad cars". "Stairways" is used while "Staircases" is not. "Bands" is used, "Bands (Music)" is not. "Comic books" is used, "Comic books & strips" is not. Note that related terms are often combined, it's not "City halls" but it is "City & town halls", if you have the functionality to verify that the entries are actually TGM terms then do so.

Geography: Geographic coverage of the postcard like "Downtown, Winnipeg" or "Exchange District, Winnipeg". This is only for when there are photos or illustrations of actual places. It is not enough for a card to be titled, "Winnipeg," for it to get an entry here.

Subject Address: Address of the subject like 123 Main Street, Winnipeg, Manitoba, Canada, H0H 0H0. This is only for when there are photos or illustrations of actual places. It is not enough for a card to be titled, "Winnipeg," for it to get an entry here.

Geographic Coordinates: latitude and longitude of the subject. This is only for when there are photos or illustrations of actual places. It is not enough for a card to be titled, "Winnipeg," for it to get an entry here.

Date Range: The earliest the photo could have been taken to the latest. Use postal information (must be younger than any dates stamped or written on card), clothing and automobile styles, and the presence of a building or combination of buildings.

All Search Years: A semicolon-separated list of all years in the date range. E.g., 1901-1903 becomes 1901; 1902; 1903

Type: Still image

Format: Postcard

Collector: Martin Berman

Usage Statement: Public domain

Digital Publisher: Winnipeg Public Library

Binder: {BINDER}

Type: Still image

Format: Postcard

Collector: Martin Berman

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Required corrections in red

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Format: Postcard

Collector: Martin Berman

Usage Statement: Public domain

Digital Publisher: Winnipeg Public Library

Binder: {BINDER}

Type: Still image

Format: Postcard

Collector: Martin Berman

Usage statement: Public domain

Digital Publisher: Winnipeg Public Library

Sample Response

{

"Complete": "Yes",
"Title": "Manitoba Wheatfield",
"Description": "The image shows a wheat field with several stacks of harvested wheat. In the background, there is a horse-drawn carriage with a person seated.",
"Street View": "",
"Photographer": "",
"Photography Studio": "Blackwood & Hagel, Winnipeg, Man.",
"Sender": "W. A. Adams",
"Recipient": "Miss Monaghan",
"Recipient Address": "Cookstown, Co Tyrone, Ireland.",
"Portrait Subject": "",
"Annotation": "",
"Message": "All well.",
"Postal Data": "Postmarks: WINNIPEG CANADA APR 30 2:30 PM 1906; Postage: two 1 cent Canada stamps featuring Edward VII.",
"Publisher": "",
"Publisher Location": "",
"Printer Location": "",
"Serial Number": "",
"Date Mailed": "1906-04-30",
"Physical Description": "Approximately 140 mm x 90 mm",
"Identifier": "B3A001",
"Language": "English",
"Historical Names": "",
"Signs and Banners": "",
"Subject": "Horses; Carriages & coaches; Wheat",
"Geography": "Manitoba, Canada",
"Subject Address": "",
"Geographic Coordinates": "",
"Date Range": "1906-1906",
"All Search Years": "1906",
"Type": "Still image",
"Format": "Postcard",
"Collector": "Martin Berman",
"Usage Statement": "Public domain",
"Digital Publisher": "Winnipeg Public Library",
"Binder": "B3A"

}



Perfection? No. But not bad.

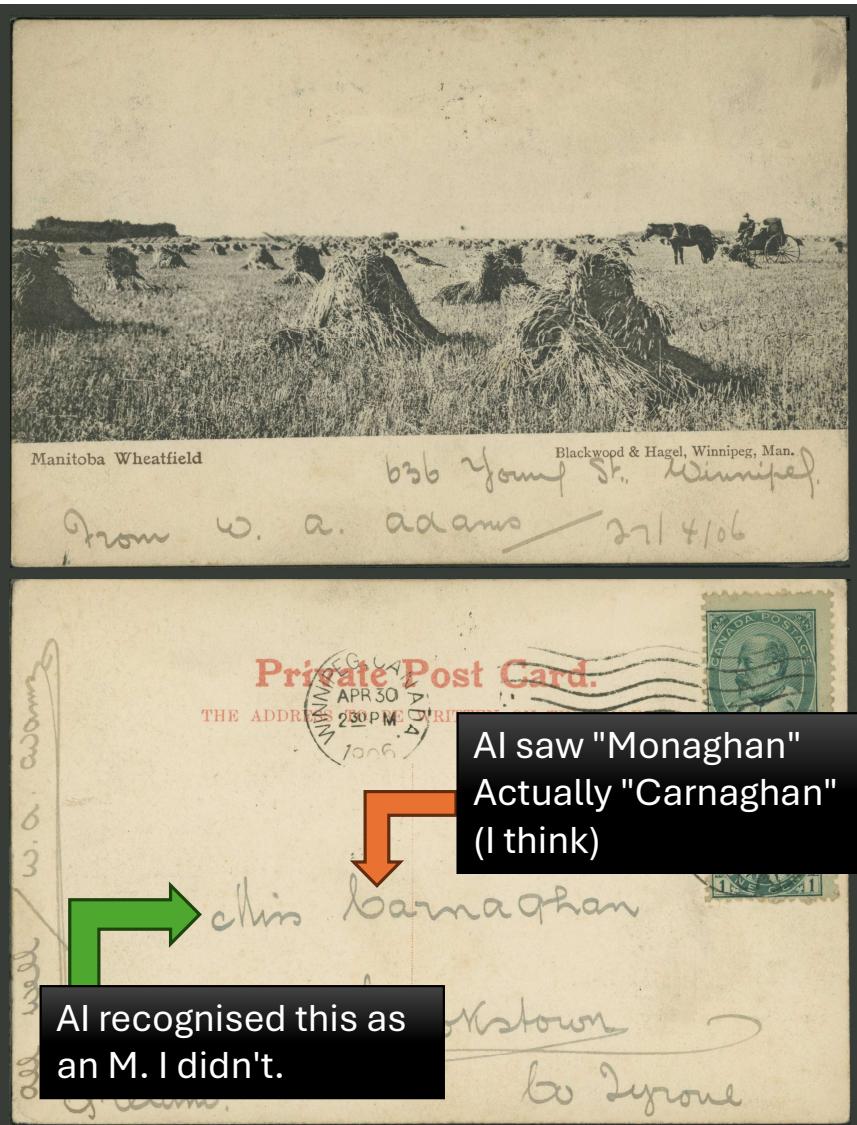
{

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"Title": "Manitoba Wheatfield",
"Description": "The image shows a wheat field with several stacks of harvested wheat. In the background, there is a horse-drawn carriage with a person seated.",
"Street View": "",
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"Subject Address": "",
"Geographic Coordinates": "",
"Date Range": "1906-1906",
"All Search Years": "1906",
"Type": "Still image",
"Format": "Postcard",
"Collector": "Martin Berman",
"Usage Statement": "Public domain",
"Digital Publisher": "Winnipeg Public Library",
"Binder": "B3A"

}



Perfection? No. But not bad.



```
{  
    "Complete": "Yes",  
    "Title": "Manitoba Wheatfield",  
    "Description": "The image shows a wheat field with several stacks of harvested wheat.  
        In the background, there is a horse-drawn carriage with a person  
        seated.",  
    "Street View": "",  
    "Photographer": "",  
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    "Usage Statement": "Public domain",  
    "Digital Publisher": "Winnipeg Public Library",  
    "Binder": "B3A"  
}
```

AI correctly understood that the photo could be no later than 1906, but wrongly stated that it couldn't be older

After Response

- Convert from JSON (JavaScript Object Notation) format to TSV (Tab Separated Values).
- Run our digital repository's ingest process
- Vet and correct results*
- Approve and publish cards

* This is where the time goes

Automating the Process

- For each card under a given folder on disk a python script was written to:
 - load a front/back image pair from a directory structure
 - pre-process them
 - send them to OpenAI with the prompt
 - save the JSON response to the directory structure for the card
- Another script was written to convert the JSON response into a TSV file that our DRM software understands for import.

<https://github.com/pr3sidentspence/CONTENTdm-OpenAI>

How Many? How Quickly?

- OpenAI can do a card in seconds
- Still needs human vetting!
- New workflow estimate^{*}:
 - Can do work that used to take a year in about a month
 - Roughly 10x improvement in speed

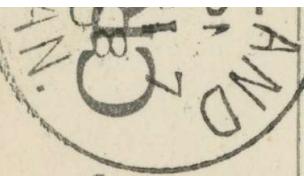
* hard to say for sure, difficult to make a direct comparison

What about Quality?

- **Not as good as our human cataloguer**
- **But... good enough**

(Especially as compared to the rather sparse descriptions other repositories provide. Although, others are beginning to make use of handwriting recognition)
- All postcards described with the aid of AI have the following added to the notes field when published:
 - **OpenAI GPT-4o used to generate some of the information in this record. Use with caution. Report errors to eref@wpl.libanswers.ca .**

PRIVATE POST



all well. With love
I remain
Yours affec Aunt
Addie.

THIS SPACE MAY BE USED FOR CORRESPONDENCE

H
4
SPRINGFIELD,
ONTARIO,
CANADA
Sep 17th 1908.
Dear Florence.
We are here
at this pretty little town
A place of about 400 inhab-
itants. Theo was out duck
shooting on a lake in a
row boat this morning
with a young man a friend
of ours. He got up about 5
O'clock & they drove 4 miles
to the lake. Got home about
11:30 after having lots of fun
& getting tired & dirty & no
ducks. We expect to be home
early in October. Hope you are

Funny Problems

- Once the OpenAI's transcription gets something wrong, the rest is usually a hallucination, and it rarely recovers.
- Actual message:

Sep 17th 1908, Dear Florence,
We are here at this pretty little
town A place of about 400
inhabitants. Theo was out duck
shooting on a lake in a row boat
this morning with a young man
a friend of ours. He got up about
5 O'clock & they drove 4 miles
to the lake. Got home about
11:30 after having lots of fun &
getting tired and dirty & no
ducks. We expect to be home
early in October. Hope you are
all well. With love, I remain
yours [?] Aunt Addie.

Voice source: <https://speechactors.com>

PRIVATE POST

all well. In the love
of remain
Yours affec friend
Addie.

THIS SPACE MAY BE USED FOR CORRESPONDENCE

H
AN. AND ONLY THE
SPRINGFIELD,
ONTARIO,
Dear Florence. Sep 17th 1906.
We are here
at this pretty little town
A place of about 400 inhab-
itants. Theo was out duck
shooting on a lake in a
row boat this morning
with a young man a friend
of ours. He got up about 5
O'clock & they drove 4 miles
to the lake. Got home about
11.30 after having lots of fun
& getting tired & dirty & no
ducks. We expect to be home
early in October. Hope you are

Funny Problems

- Once the OpenAI's transcription gets something wrong, the rest is usually a hallucination, and it rarely recovers.
- OpenAI's transcription:

Dear Florence, Sept 17/06.
We are at this fair. A little
impulse made us stop and go
grub fishing after 4 o'clock
lunch. Sleeping in a real duck
about 15 miles in the lake.
Harry got a young mom. A
young looking slug of her lost
her about 5. The fake of this
show 4 miles long and 11.30 at
night plenty of fun about 4 or 5
on reach to go on. See you are
easy figuring out. Yours, Harry

Voice source: <https://speechactors.com>

PRIVATE POST

Holland. June. 2nd, 1909

Printed in Germany

THIS SPACE MAY BE USED FOR CORRESPONDENCE.

Miss

604

Dear Maggie
just a line to see
if any of you are
sick. As I haven't heard
from home for three
weeks. I guess you
must have forgotten
all about me I have
wrote twice to Annie
and once to you
and I could not think
was was up. not think
I remain your Sister, with love

Funny Problems

- Once the OpenAI's transcription gets something wrong, the rest is usually a hallucination, and it rarely recovers.
- Actual message:

Holland. June 2nd, 1909

Dear Maggie, Just a line to see if any of you are sick as I haven't heard from home for three weeks. I guess you must have forgotten all about me I have wrote twice to Annie and once to you and I could not think was [sic] was up. with love I remain your Sister Winnie. write soon

Voice source: <https://speechactors.com>

PRIVATE POST

Holland. June. 2nd, 1909

Printed in Germany

THIS SPACE MAY BE USED FOR CORRESPONDENCE.

Mess.

604

Dear Maggie
just a line to see
if any of you are
sick. As I haven't heard
from home for three
weeks. I guess you
must have forgotten
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written twice to Annie
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- Actual message:

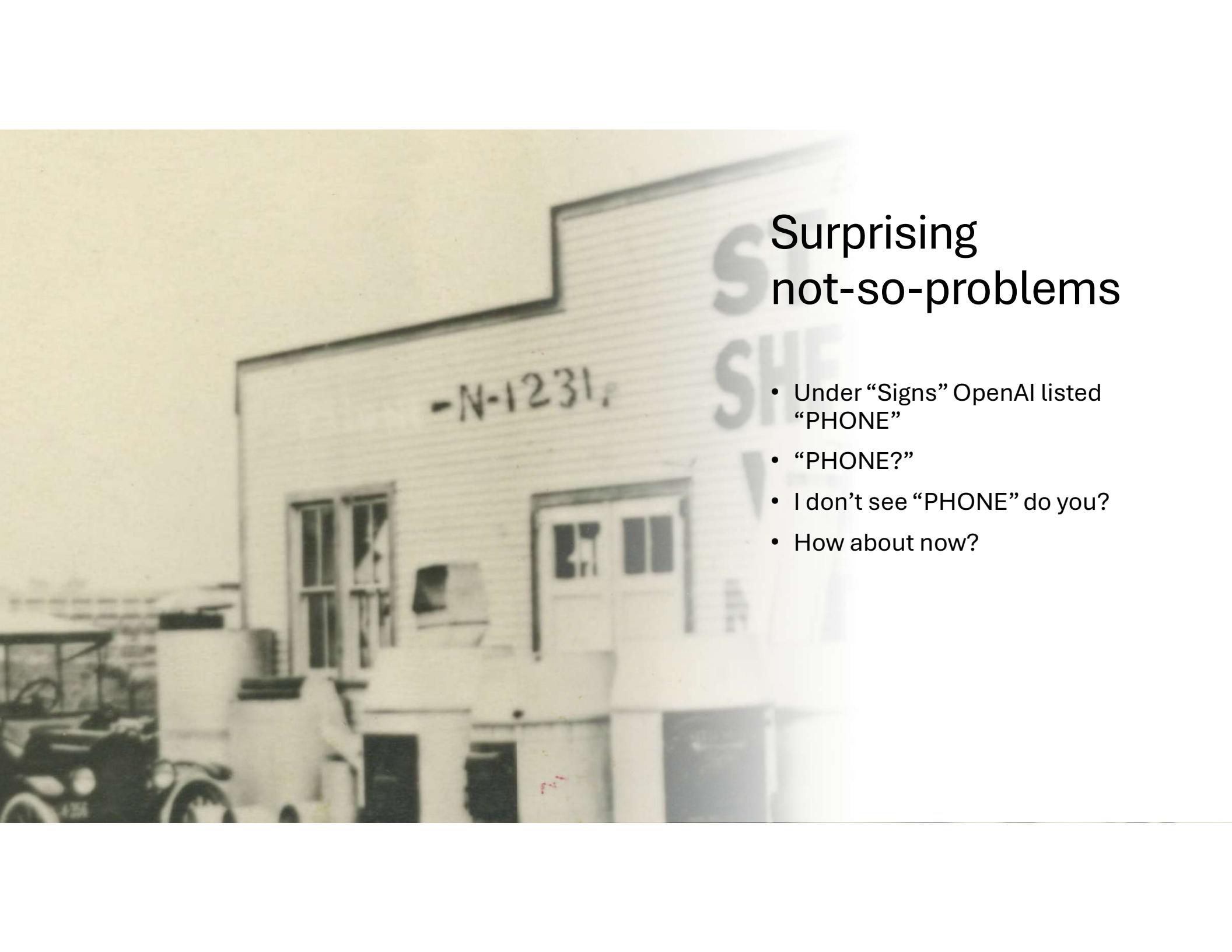
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Dear Maggie, Just a line to see
if any of you are sick ^{of}
~~Holland. Thanks! I'm~~ home for
three weeks. I guess ~~I must~~
~~forget you all about me. I~~
~~guess you are dead or lost to~~
me!

Voice source: <https://speechactors.com>

Not-so-funny Problems

- Despite prompting it to learn-from or refer-to existing PastForward content, it does not (may have to upload it in appropriate format)
- It really struggles with the dates on postmarks
- It rarely gets the date ranges (the start dates) correct
- Will sometimes try to count things (e.g., "Six men on farm machinery") and counts wrong (there were at least 20 people)



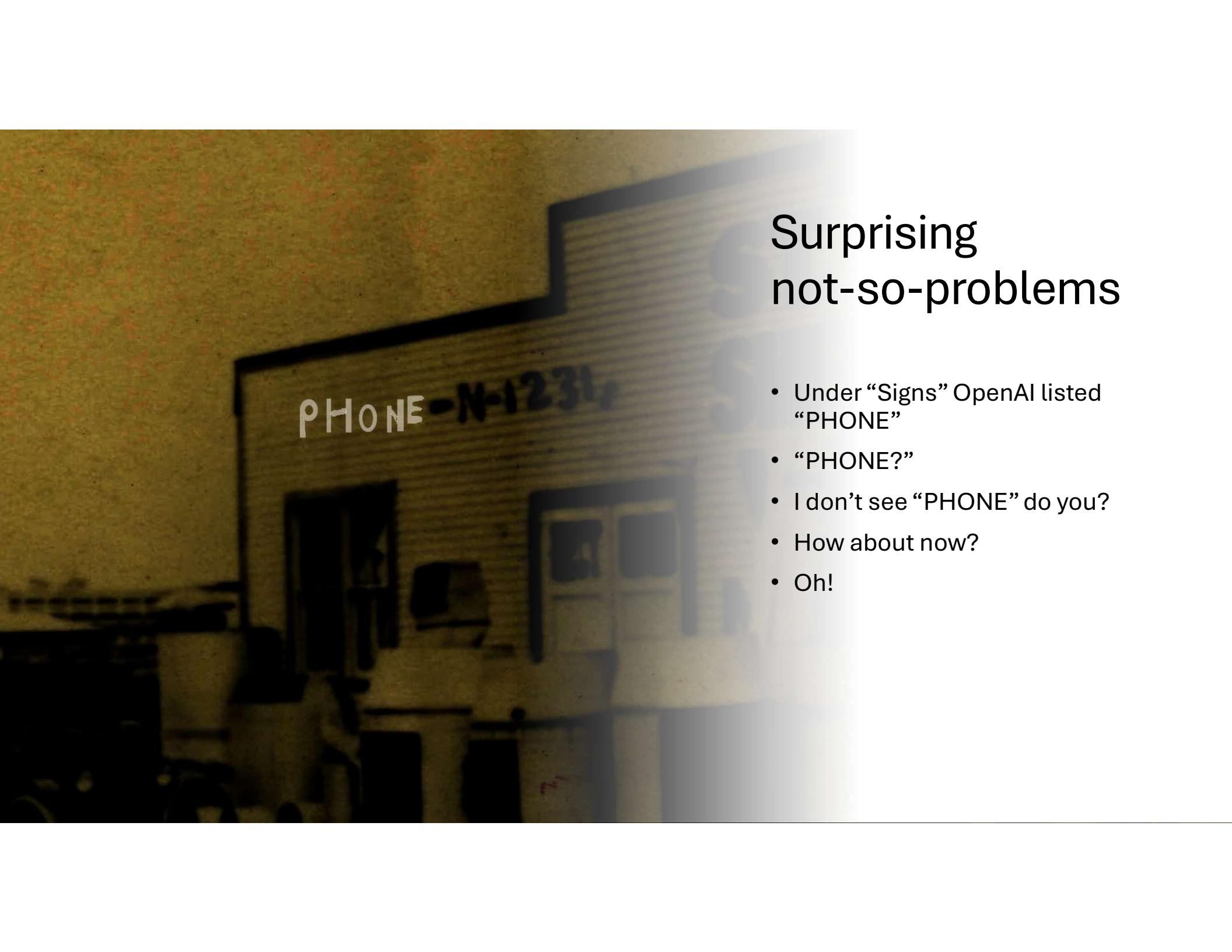
Surprising not-so-problems

- Under “Signs” OpenAI listed “PHONE”
- “PHONE?”
- I don’t see “PHONE” do you?
- How about now?



Surprising not-so-problems

- Under “Signs” OpenAI listed “PHONE”
- “PHONE?”
- I don’t see “PHONE” do you?
- How about now?
- Oh!

A dark, grainy photograph of a wall with a sign that reads "PHONE-N-1234" and a payphone below it.

Surprising not-so-problems

- Under “Signs” OpenAI listed “PHONE”
- “PHONE?”
- I don’t see “PHONE” do you?
- How about now?
- Oh!



Surprising not-so-problems

- OpenAI Description: “The image shows a dirt road lined with tall trees and wooden fences on both sides. There is a horse-drawn carriage in the distance.”

— Dauphin, Man.



Surprising not-so-problems

- OpenAI Description: “The image shows a dirt road lined with tall trees and wooden fences on both sides. There is a horse-drawn carriage in the distance.”

— Dauphin, Man.

Surprising not-so-problems



AI correctly inferred
this was DIAMONDS

In Summary

- AI item descriptions are now possible
- Relatively easy to set up
- Inexpensive (about 15¢ (CAD) per postcard)
- Not good enough to go unvetted, staff still needed
- So far, nothing offensive produced
- Sometimes spots things a human might not