

It's Boxes All the Way Down!

Elements & Their Relationships

R. Scott Granneman & Jans Carton



Slides

[granneman.com/downloads/web-dev/
Block-Inline.pdf](http://granneman.com/downloads/web-dev/Block-Inline.pdf)

chnsa.ws/block-inline-slides



Notes

[granneman.com/downloads/web-dev/
Block-Inline.txt](http://granneman.com/downloads/web-dev/Block-Inline.txt)

chnsa.ws/block-inline-notes



All of my presentations

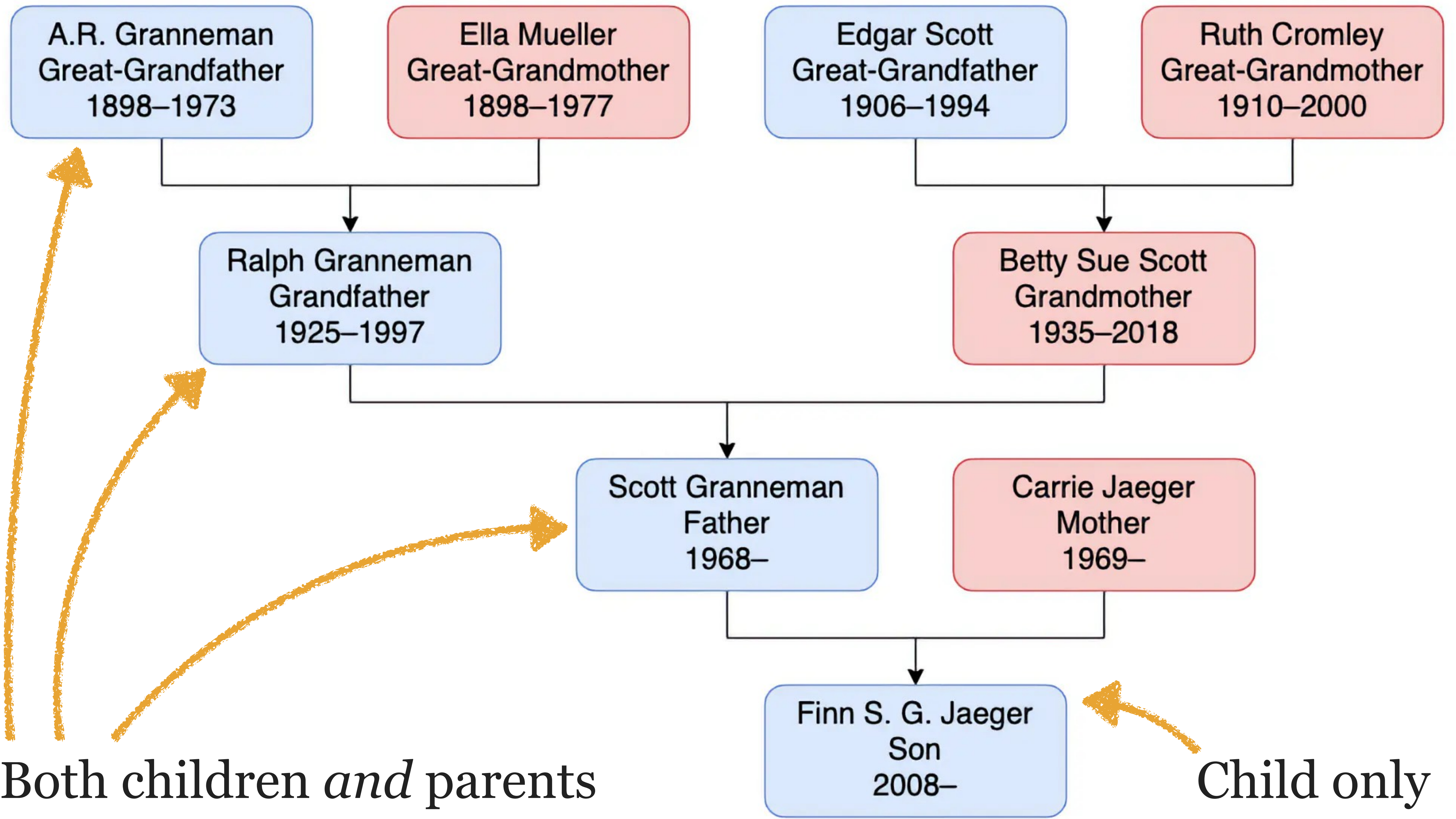
granneman.com/presentations/all-presentations

chnsa.ws/all-presentations

Elements & Family Trees

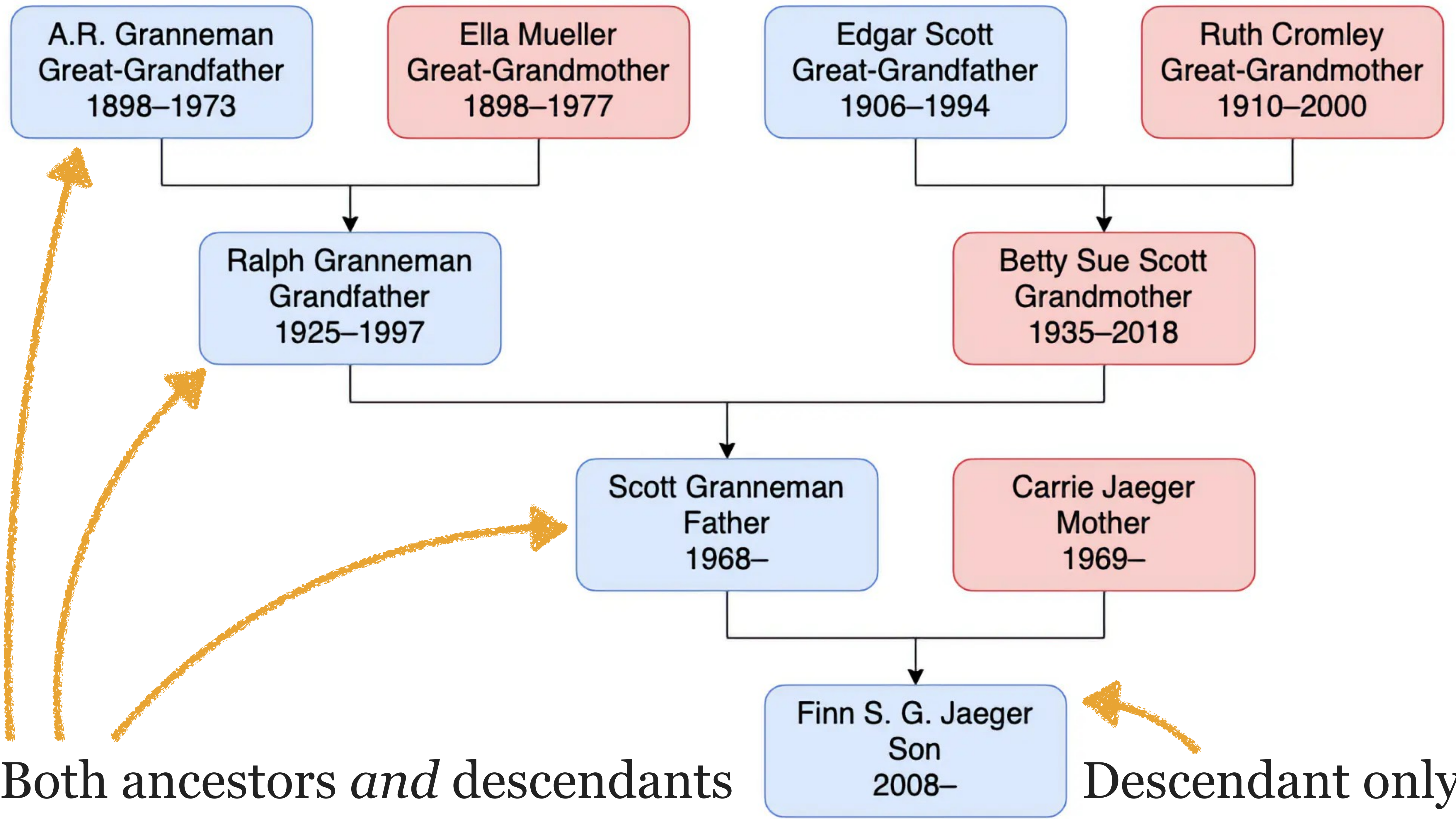
Finny & Daddy, 1st day
of 2nd grade, August
2016

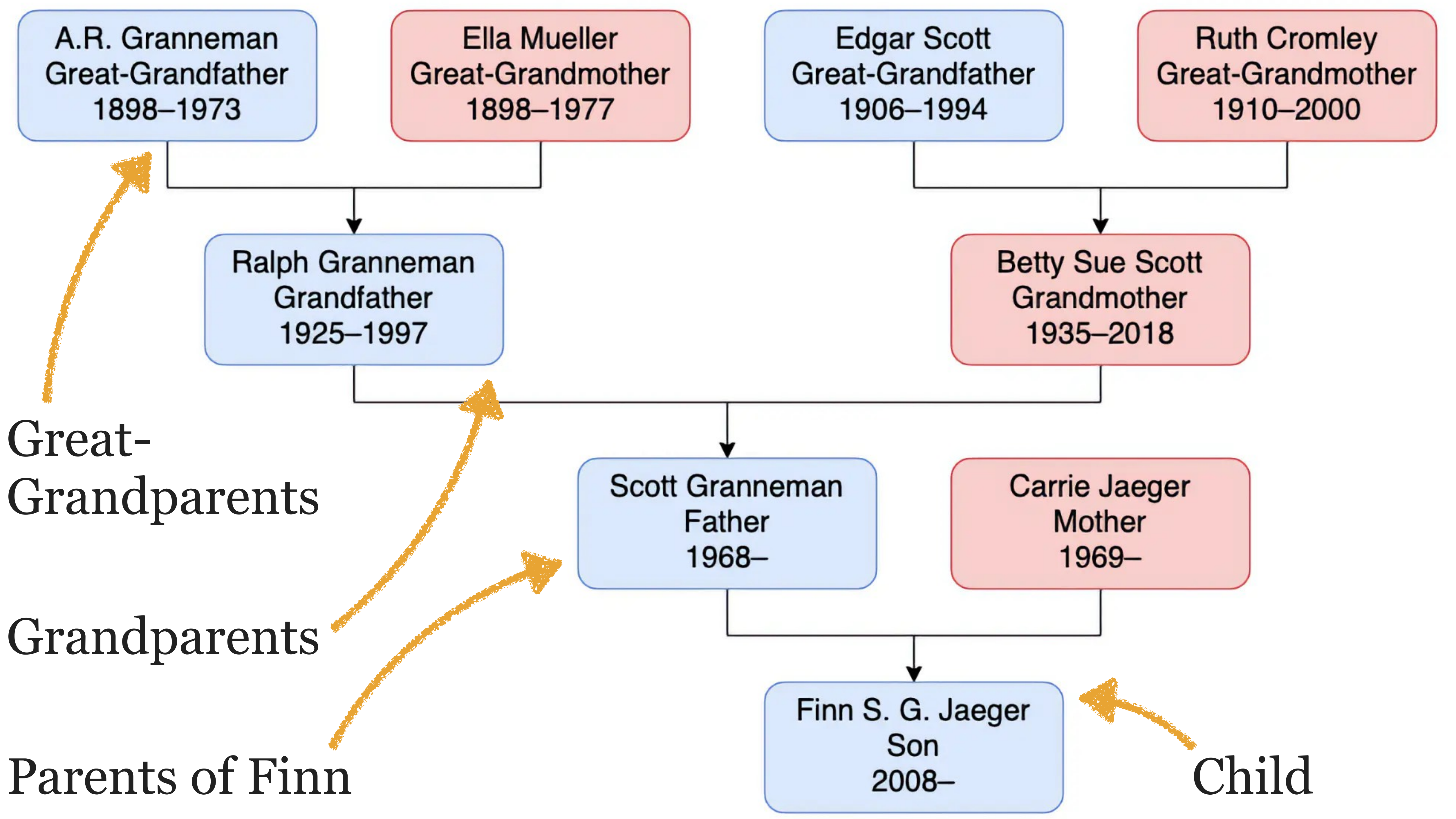




Both children *and* parents

Child only





Great-Grandparents

Grandparents

Parents of Finn

Child

When the rendering engine parses your HTML & CSS,
it creates a *document tree* (the *DOM*)

```

<html>
  <head>
    <meta charset="UTF-8">
    <title>Herbert West
Landscaping</title>
  </head>
  <body>
    
    <h1>We'll fix your
lawn... <i>for good</i>!</h1>
    <p>We apply it all:
fertilizers, mulch, &
blood</p>
  </body>
</html>

```

HTML

```

- Document
  - html
    - head
      - meta
      - title
        - "Herbert West
Landscaping"
    - body
      - img
      - h1
        - "We'll fix..."
          - i
            - "for good"
      - p
        - "We apply..."

```

DOM tree

- Document
 - html
 - head
 - meta
 - title
 - "Herbert West Landscaping"
 - body
 - img
 - h1
 - "We'll fix..."
 - i
 - "for good"
 - p
 - "We apply..."

How's the document tree similar to a family tree?

We use the same concepts & terms...

- » children and/or parents
- » ancestors and/or descendants
- » siblings
- » parents or grandparents or great-grandparents or ...
- » all at the same time!

But there are differences too!

- Document
 - html
 - head
 - meta
 - title
 - "Herbert West Landscaping"
 - body
 - img
 - h1
 - "We'll fix..."
 - i
 - "for good"
 - p
 - "We apply..."

How's the document tree different from a family tree?

With the document tree

- » There's only ever 1 parent
- » We only care about certain relationships: children, siblings, & descendants

```
HTML
1 <h1>The Colour out of
  Space<small>H.P. Lovecraft</small>
  </h1>
2
3 <p>
4   West of Arkham the hills rise
  wild, and there are <span>valleys
  with deep woods that no axe has ever
  cut</span>. There are dark narrow
  <i>glens</i> where the trees slope
  fantastically, and where thin
  <i>brooklets</i> trickle without
  ever having caught the glint
  of sunlight.
5   </p>
6
7
8 <blockquote>
9   <p>
10  On the gentler slopes there are
  farms, ancient and rocky, with
  squat, moss-coated cottages brooding
  eternally over old New England
  ...
CSS
JS
```

The Colour out of Space

H.P. Lovecraft

West of Arkham the hills rise wild, and there are valleys with deep woods that no axe has ever cut. There are dark narrow *glens* where the trees slope fantastically, and where thin *brooklets* trickle without ever having caught the glint of sunlight.

On the gentler slopes there are farms, ancient and rocky, with squat, moss-coated cottages brooding eternally over old New England secrets in the *lee* of great ledges; but these are all vacant now...

The old folk have gone away, and foreigners do not like to live there.

- French-Canadians have tried it,
- Italians have tried it,
- and the Poles have come and departed.

```
HTML
farms, ancient and rocky, with
squat, moss-coated cottages brooding
eternally over old New England
secrets in the <i>lee</i> of great
ledges; <small>but these are all
vacant now...</small>
11 </p>
12 <p>
13 The old folk have gone away, and
foreigners do not like to live
there.
14 </p>
15 </blockquote>
16
17 <ul>
18 <li>French-Canadians have tried
it,</li>
19 <li>Italians have tried it,</li>
20 <li>and the Poles have come and
departed.</li>
21 </ul>
22

CSS
JS
```

The Colour out of Space

H.P. Lovecraft

West of Arkham the hills rise wild, and there are valleys with deep woods that no axe has ever cut. There are dark narrow *glens* where the trees slope fantastically, and where thin *brooklets* trickle without ever having caught the glint of sunlight.

On the gentler slopes there are farms, ancient and rocky, with squat, moss-coated cottages brooding eternally over old New England secrets in the *lee* of great ledges; but these are all vacant now...

The old folk have gone away, and foreigners do not like to live there.

- French-Canadians have tried it,
- Italians have tried it,
- and the Poles have come and departed.

Siblings all share the same parent

The Colour out of Space

H.P. Lovecraft

West of Arkham the hills rise wild, and there are valleys with deep woods that no axe has ever cut. There are dark narrow *glens* where the trees slope fantastically, and where thin *brooklets* trickle without ever having caught the glint of sunlight.

On the gentler slopes there are farms, ancient and rocky, with squat, moss-coated cottages brooding eternally over old New England secrets in the *lee* of great ledges; but these are all vacant now...

The old folk have gone away, and foreigners do not like to live there.

- French-Canadians have tried it,
- Italians have tried it,
- and the Poles have come and departed.

Siblings have the same colors

What about descendants?

The Colour out of Space

H.P. Lovecraft

West of Arkham the hills rise wild, and there are valleys with deep woods that no axe has ever cut. There are dark narrow *glens* where the trees slope fantastically, and where thin *brooklets* trickle without ever having caught the glint of sunlight.

On the gentler slopes there are farms, ancient and rocky, with squat, moss-coated cottages brooding eternally over old New England secrets in the *lee* of great ledges; but these are all vacant now...

The old folk have gone away, and foreigners do not like to live there.

- French-Canadians have tried it,
- Italians have tried it,
- and the Poles have come and departed.

Some elements are parents, some are children, & some are both

Boxes

All* HTML elements inside `<body>` generate boxes when they are rendered

* OK, almost all, since some don't (e.g., `
`)

HTML

```
1 <blockquote>
2   <p>
3     Ph'nglui mglw'nafh <i>Cthulhu</i> R'lyeh
4     wgah'nagl fhtagn!
5   </p>
6 </blockquote>
```

CSS

```
1 blockquote {
2   border: 4px solid red;
3 }
4
5 p {
6   border: 4px dotted blue;
7 }
8
9 i {
10  border: 4px dashed green;
11 }
12
```

Ph'nglui mglw'nafh *Cthulhu* R'lyeh wgah'nagl fhtagn!

Boxes inside boxes inside boxes...

There are several kinds of boxes, but let's look at 2 that are very common:

- » Block
- » Inline

Block-Level Boxes

Block-level boxes...

- » line up vertically, or stack, relative to parents & siblings
- » 100% of the width of their container (e.g., `<body>` or `<div>`)*

* OK, some block-level boxes are not 100%, but we'll get into that later

Some elements that are block boxes (by default, thanks to the CSS built into browsers):

- » `<p>`
- » ``
- » `<main>`
- » `<footer>`
- » `<h1>–<h6>`
- » `<div>` (more on that later in the course)



Block layout means that boxes are vertically adjacent



Block-level children stacked inside
block-level parents use block layout

```
HTML
1 <h1>H.P. Lovecraft's "The Call of
  Cthulhu"</h1>
2 <p>The older matters which had made the
  sculptor's bas-relief so significant
  formed the second half of his long
  manuscript.</p>
3 <blockquote>
4   <p>Professor Angell had seen the
    hellish outlines of the nameless
    monstrosity and heard "Cthulhu".</p>
5   <p>This earlier experience had come
    when the American Archaeological Society
    held its meeting in St Louis.</p>
6   <p>Professor Angell had had a prominent
    part in all the deliberations.</p>
7 </blockquote>
8 <footer>
9   The chief of these outsiders was a
    commonplace-looking middle-aged man who
    had travelled all the way from New
    Orleans.
10 </footer>

CSS (SCSS)

JS
```

H.P. Lovecraft's "The Call of Cthulhu"

The older matters which had made the sculptor's bas-relief so significant formed the second half of his long manuscript.

Professor Angell had seen the hellish outlines of the nameless monstrosity and heard "Cthulhu".

This earlier experience had come when the American Archaeological Society held its meeting in St Louis.

Professor Angell had had a prominent part in all the deliberations.

The chief of these outsiders was a commonplace-looking middle-aged man who had travelled all the way from New Orleans.

```
HTML
1 <h1>H.P. Lovecraft's "The Call of Cthulhu"</h1>
2 <p>The older matters which had made the sculptor's bas-relief so significant formed the second half of his long manuscript.</p>
3 <blockquote>
* CSS (SCSS)
1 h1 {
2   background-color: #B58DAE;
3 }
4
5 p {
6   background-color: #A2BF8A;
7 }
8
9 blockquote {
10  background-color: #ECCC87;
11 }
12
13 footer {
14  background-color: #86C0D1;
15 }
```

H.P. Lovecraft's "The Call of Cthulhu"

The older matters which had made the sculptor's bas-relief so significant formed the second half of his long manuscript.

Professor Angell had seen the hellish outlines of the nameless monstrosity and heard "Cthulhu".

This earlier experience had come when the American Archaeological Society held its meeting in St Louis.

Professor Angell had had a prominent part in all the deliberations.

The chief of these outsiders was a commonplace-looking middle-aged man who had travelled all the way from New Orleans.

Inline-Level Boxes

Inline boxes...

- » are only as wide as their content
- » break horizontally across lines when they are too wide to fit their containers, but are still one box

Some elements that generate inline boxes:

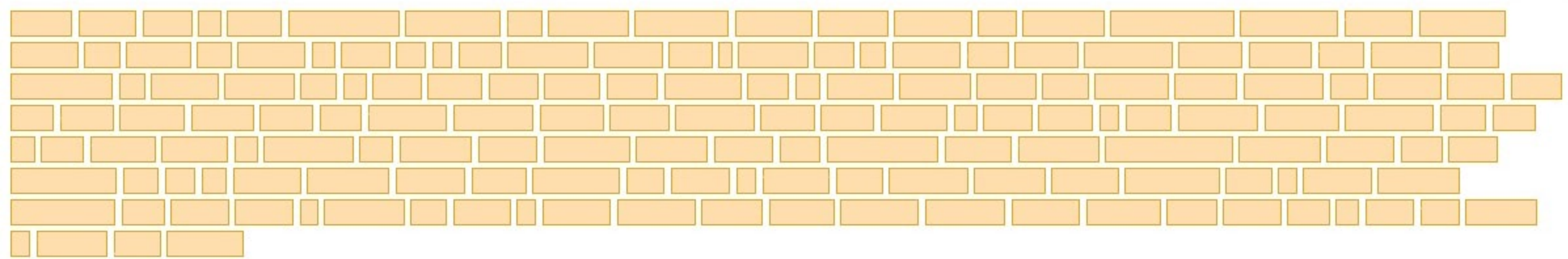
» `<i>` & ``

» `` & ``

» `<a>`

» `<small>`

» `` (more on that later in the course)



```
HTML
1 <h1>The Colour out of Space<small>H.P.
  Lovecraft</small></h1>
2
3 <p>
4   West of Arkham the hills rise wild,
  <span>and there are valleys with deep woods
  that no axe has ever cut</span>. There are
  dark narrow glens where the trees slope
  fantastically, and where thin <span>brooklets
  trickle without ever having caught the glint
  of sunlight</span>.
5 </p>
6
7 <p>
8   On the gentler slopes there are farms,
  ancient and rocky, <span>with squat, moss-
  coated cottages brooding eternally</span> over
  old New England secrets in the lee of great
  ledges; but these are all vacant now...
9 </p>
10

CSS
1 span {
2   border: 4px solid orange;
3 }
4

JS
```

The Colour out of Space

H.P. Lovecraft

West of Arkham the hills rise wild, and there are valleys with deep woods that no axe has ever cut. There are dark narrow glens where the trees slope fantastically, and where thin brooklets trickle without ever having caught the glint of sunlight.

On the gentler slopes there are farms, ancient and rocky, with squat, moss-coated cottages brooding eternally over old New England secrets in the lee of great ledges; but these are all vacant now...

The old folk have gone away, and foreigners do not like to live there.

Inline boxes break across lines,
but are still 1 box

The image shows a code editor with two tabs: 'HTML' and 'CSS (SCSS)'. The 'HTML' tab is active, displaying the following code:

```
1 <h1>The Colour out of  
  Space<small>H.P.  
  Lovecraft</small></h1>  
2  
3 <p>  
4   West of Arkham the hills rise  
  wild, <span>and there are  
  valleys with deep woods that no  
  axe has ever cut</span>. There  
  are dark narrow glens where the  
  trees slope fantastically, and  
  where thin <span>brooklets  
  trickle without ever having  
  caught the glint of  
  sunlight</span>.  
5 </p>  
6  
7 <p>  
8   On the gentler slopes there
```

The 'CSS (SCSS)' tab is also visible, showing the following code:

```
1 h1, small, p, span {  
2   display: inline;  
3 }
```

The Colour out of SpaceH.P.

Lovecraft West of Arkham the hills rise wild, and there are valleys with deep woods that no axe has ever cut. There are dark narrow glens where the trees slope fantastically, and where thin brooklets trickle without ever having caught the glint of sunlight. On the gentler slopes there are farms, ancient and rocky, with squat, moss-coated cottages brooding eternally over old New England secrets in the lee of great ledges; but these are all vacant now... The old folk have gone away, and foreigners do not like to live there.

All boxes are inline by default

Fortunately, all web browsers come with a default CSS file that specifies that certain elements, when rendered, ...

- » are block
- » have specific margins & borders
- » & much more!

Web developers can supply their own CSS files too

```
HTML
1 <h1>The Colour out of
  Space<small>H.P. Lovecraft</small>
  </h1>
2
3 <p>
4   West of Arkham the hills rise
  wild, and there are <span>valleys
  with deep woods that no axe has
  ever cut</span>. There are dark
  narrow <i>glens</i> where the trees
  slope fantastically, and where thin
  <i>brooklets</i> trickle without
  ever having caught the glint of
  sunlight.
CSS
12 i {
13   background-color: #FFC0DB;
14 }
15
16 small {
17   background-color: #FDFD96;
18 }
19
20 span {
21   background-color: #89CFF0;
22 }
JS
```

The Colour out of Space

H.P. Lovecraft

West of Arkham the hills rise wild, and there are valleys with deep woods that no axe has ever cut. There are dark narrow *glens* where the trees slope fantastically, and where thin *brooklets* trickle without ever having caught the glint of sunlight.

On the gentler slopes there are farms, ancient and rocky, with squat, moss-coated cottages brooding eternally over old New England secrets in the *lee* of great ledges; but these are all vacant now...

The old folk have gone away, and foreigners do not like to live there.

- French-Canadians have tried it,
- Italians have tried it,
- and the Poles have come and departed.

Suddenly the sunshine seemed to lessen without the intervention of **any** discernible cloud. It was a very **peculiar** phenomenon, and was plainly marked by all. A rumbling sound seemed brewing beneath the hills, **mixed strangely with a concordant rumbling** which clearly came from the sky. Lightning flashed aloft, and the wondering crowd **looked in vain** for the portents of storm. The chanting of the men from Arkham now became **unmistakable**, and Wheeler saw through the glass that they were all raising their arms in the rhythmic incantation.

From some farmhouse far away came **the frantic barking of dogs**. The change in the quality of the daylight increased, and the crowd gazed about the horizon in wonder. A **purplish** darkness, born of nothing more than a spectral deepening of the sky's blue, pressed down upon the rumbling hills.

Then the lightning flashed **again**, somewhat brighter than before, and the crowd fancied that it had showed a certain **mistiness** around the altar-stone on the distant height. No one, however, had been using the telescope at that instant.

The whippoorwills continued their **irregular pulsation**, and the men of Dunwich braced themselves tensely against some imponderable menace with which the atmosphere seemed surcharged. Without warning came those deep, cracked, raucous vocal sounds which will **never** leave the memory of the stricken group who heard them.

And because imagination **might** suggest a conjectural source in the world of non-visible beings, the huddled crowd at the mountain's base huddled still closer, and **wincing** as if in expectation of a blow. Ygnailh ... ygnaiih ... thflthkh'ngha ... Yog-Sothoth ... rang the hideous croaking out of space. Y'bthnk ... h'ehye—n'grkdl'lh ...

Block & inline boxes working together

Thank you!

scott@granneman.com

www.granneman.com

[@scottgranneman@mastodon.social](https://mastodon.social/@scottgranneman)

jans@websanity.com

websanity.com



Slides

[granneman.com/downloads/web-dev/
Block-Inline.pdf](http://granneman.com/downloads/web-dev/Block-Inline.pdf)

chnsa.ws/block-inline-slides



Notes

[granneman.com/downloads/web-dev/
Block-Inline.txt](http://granneman.com/downloads/web-dev/Block-Inline.txt)

chnsa.ws/block-inline-notes



All of my presentations

granneman.com/presentations/all-presentations

chnsa.ws/all-presentations

It's Boxes All the Way Down!

Elements & Their Relationships

R. Scott Granneman & Jans Carton

Changelog

2025-03-16 1.10: Updated theme to Granneman 1.14

2024-10-29 1.9: Updated theme to Granneman 1.13;
minor fixes & corrections

2024-02-29 1.8: Changed Twitter link to Mastodon;
added citations for all slides lacking them

Changelog

2024-01-14 1.7: Updated theme to Granneman 1.12; added QR codes; added additional screenshots of inline boxes and block & inline boxes together

2023-09-28 1.6: Updated theme to Granneman 1.11; new title slides; added details re: DOM tree; added or fixed citations so everything is covered

2023-03-02 1.5: Minor wording changes

Changelog

2022-09-27 1.4: Changed theme to Granneman 1.7; fixed minor errors; changed family tree so it's clearer; added citations; better screenshots for *Block-Level Boxes*; added color squares next to hexadecimal values

2020-07-21 1.3: `inline` is the *initial* value for all boxes, not the *default* value

Changelog

2020-07-12 1.2: Changed or updated all screenshots under *Elements & Family Trees*

2018-10-01 1.1: Updated theme to Granneman 1.5; small wording changes

2017-11-01 1.0: Created slide deck on 2016-09-16; finalized slides

Licensing of this work

This work is licensed under the Creative Commons Attribution-ShareAlike 4.0 International License.

To view a copy of this license, visit <http://creativecommons.org/licenses/by-sa/4.0/>.

You are free to:

- » *Share* — copy and redistribute the material in any medium or format
- » *Adapt* — remix, transform, and build upon the material for any purpose, even commercially

Under the following terms:

Attribution. You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. Give credit to:

Scott Granneman • www.granneman.com • scott@granneman.com

Share Alike. If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original.

No additional restrictions. You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

Questions? Email scott@granneman.com