Dynamic Blocks… for the win!

Customize Gutenberg without living in fear of validation errors.

Hi, I’m Joni!

- **Nerd Life:** Developer @ Georgetown University
- **Home Life:** Mom to an adorable 3 year old
- **Hobby Life:** Runner, reader, terrible ukulele player

Expectation setting

- Technical talk for developers
- Lots of talk about JS and PHP
- Knowledge of Gutenberg block creation is helpful

How this all started

- Migrating from Drupal to WordPress
- Decided to embrace Gutenberg in its alpha stage
- Learned React / Gutenberg API on the go

A simple example

Once upon a time...

Jordan, who manages the library site, asks for a website block that can display a book's title and author.

No problem, you say! We can create a custom Gutenberg block for that.

Book block!

Let's create the block, the standard way.

Step 1

Register the block.

```
import BookEdit from './edit.js';
import BookSave from './save.js';

const Book = ( () => {

  const { registerBlockType } = wp.blocks;

  registerBlockType( 'my/book', {
    title: 'Book',
    description: 'A simple book block.',
    category: 'text',
    icon: 'book-alt',

    attributes: {
      title: { type: 'text' },
      author: { type: 'text' }
    },
```

Step 2

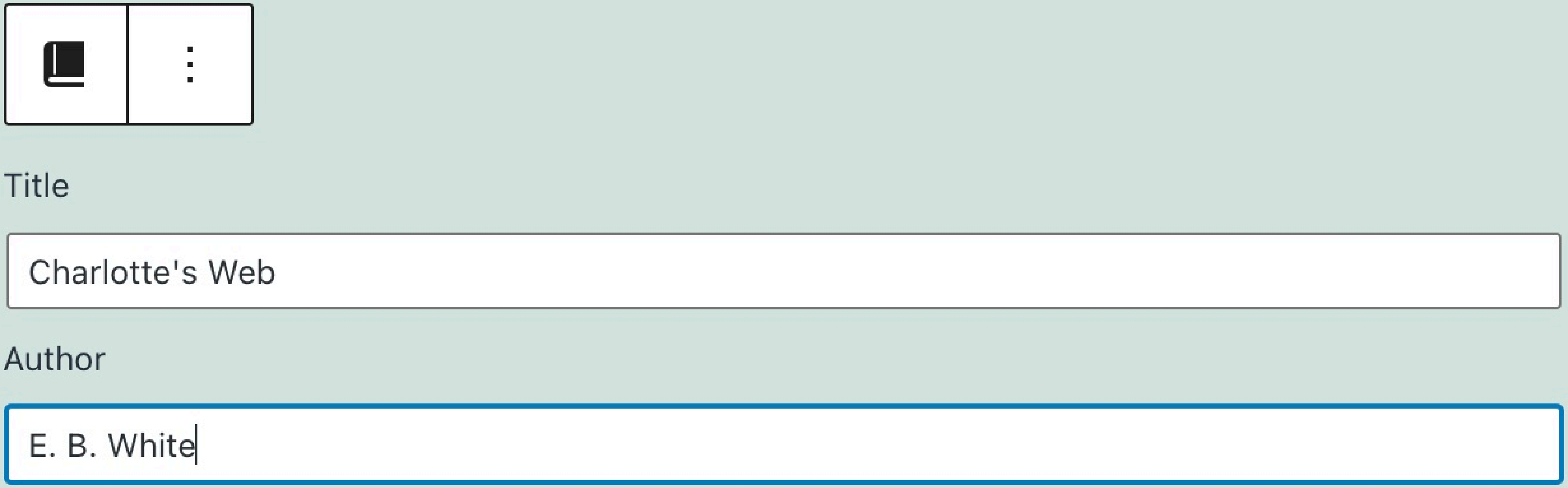
Add the editor UI.

```
const BookEdit = ( props ) => {

  // Get WP packages.
  const { TextControl } = wp.components;
  const { Fragment } = wp.element;

  // Get block properties.
  const { setAttributes } = props;
  const { title, author } = props.attributes;

  // Set on change callbacks.
  const onChangeTitle = ( value ) => {
    setAttributes( { title: value } )
  };

  const onChangeAuthor = ( value ) => {
    setAttributes( { author: value } )
  };
```

Step 3

Create the front-end markup.

```
const BookSave = ( props ) => {

  const { title, author } = props.attributes;

  return (
    <div class="my-book-block">
      <p>{ title }</p>
      <p>{ author }</p>
    </div>
  );

}

export default BookSave;
```


Title

Charlotte's Web

Author

E. B. White

My Favorite Books

Charlotte’s Web

E. B. White

Our story continues

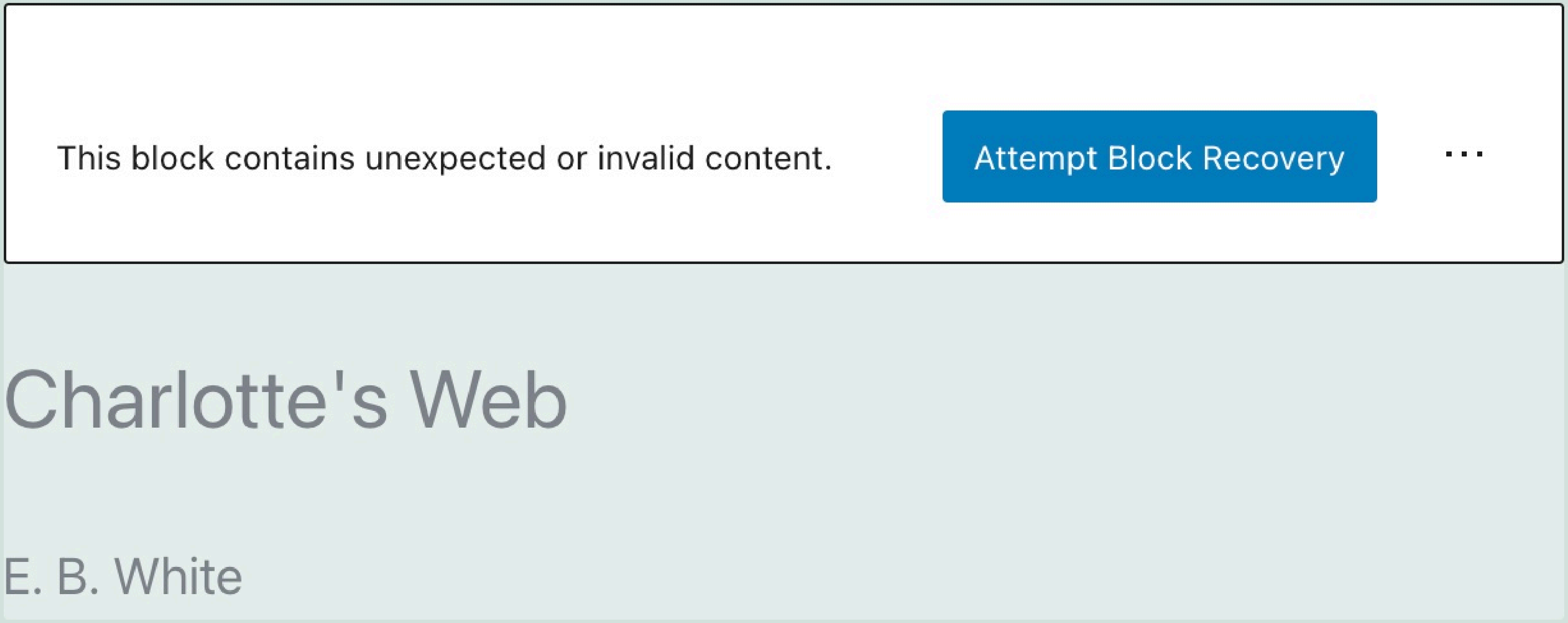
Jordan loves the new Book block! However, it looks a bit plain. Can we change the title so that it is a header instead of a paragraph?

Sure, you say! Easy peasy.

Book block, v2

Update the markup in the `save()` function to use a `<h3>` tag instead of a `<p>` tag.

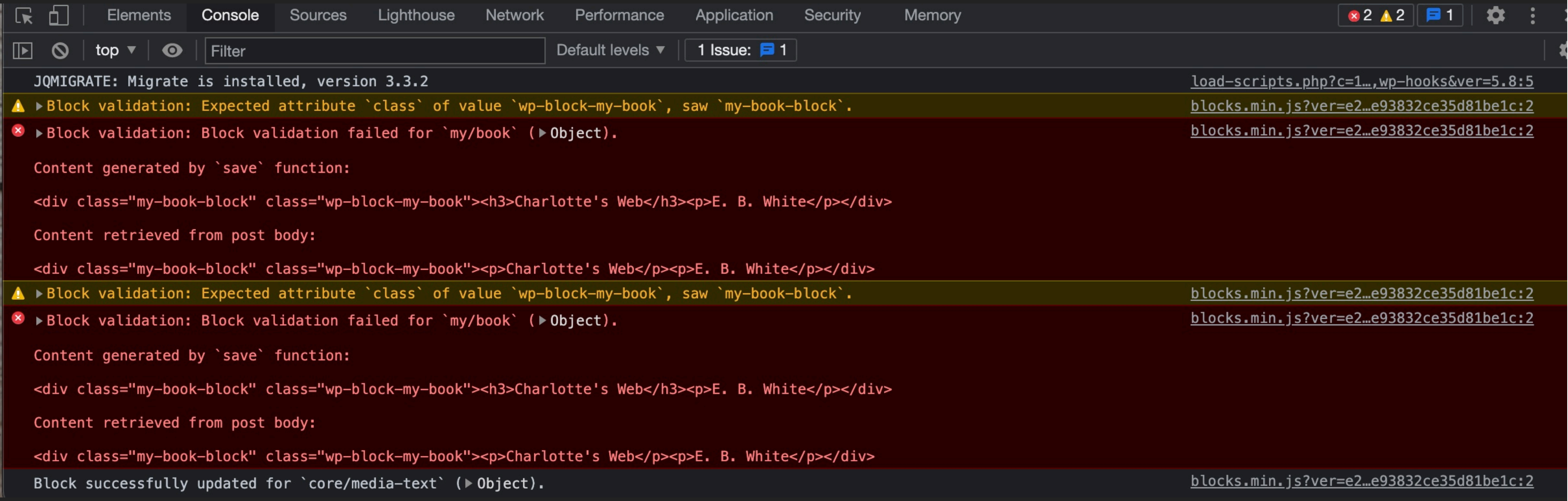
```
return (
  <div class="my-book-block">
    <h3>{ title }</h3>
    <p>{ author }</p>
  </div>
)
```


This block contains unexpected or invalid content.

Charlotte's Web

E. B. White

Block Validation Error!


Elements Console Sources Lighthouse Network Performance Application Security Memory

top ▼ Filter Default levels ▼ 1 Issue: 1

```
JQMIGRATE: Migrate is installed, version 3.3.2                                  load-scripts.php?c=1…,wp-hooks&ver=5.8:5
▶Block validation: Expected attribute `class` of value `wp-block-my-book`, saw `my-book-block`.   blocks.min.js?ver=e2…e93832ce35d81be1c:2
▶Block validation: Block validation failed for `my/book` (▶Object).                blocks.min.js?ver=e2…e93832ce35d81be1c:2

Content generated by `save` function:

<div class="my-book-block" class="wp-block-my-book"><h3>Charlotte's Web</h3><p>E. B. White</p></div>

Content retrieved from post body:

<div class="my-book-block" class="wp-block-my-book"><p>Charlotte's Web</p><p>E. B. White</p></div>
▶Block validation: Expected attribute `class` of value `wp-block-my-book`, saw `my-book-block`.   blocks.min.js?ver=e2…e93832ce35d81be1c:2
▶Block validation: Block validation failed for `my/book` (▶Object).                blocks.min.js?ver=e2…e93832ce35d81be1c:2

Content generated by `save` function:

<div class="my-book-block" class="wp-block-my-book"><h3>Charlotte's Web</h3><p>E. B. White</p></div>

Content retrieved from post body:

<div class="my-book-block" class="wp-block-my-book"><p>Charlotte's Web</p><p>E. B. White</p></div>
Block successfully updated for `core/media-text` (▶Object).                      blocks.min.js?ver=e2…e93832ce35d81be1c:2
```

Block validation

Gutenberg likes to make sure the block's front-end code is what it expects it to be.

Validation process

- Pre-render the block using the current `save()` function and block attribute data.
- Compare pre-rendering to the code in the database.
- If it matches, **Success**!
- If it does not match, look for known deprecations.

In the database

```
<!-- wp:my/book {"title":"Charlotte's Web",
"author":"E. B. White"} -->
<div class="my-book-block" class="wp-block-my-book">
<p>Charlotte's Web</p>
<p>E. B. White</p>
</div>
<!-- /wp:my/book -->
```

Remember

This is our `save()` markup:

```
<div class="my-book-block">
  <h3>{ title }</h3>
  <p>{ author }</p>
</div>
```

Deprecations

Deprecations are previous versions of the block that WordPress can use to validate updated blocks.

```
const BookDeprecated = [
  {
    attributes: {
      title: { type: 'text' },
      author: { type: 'text' }
    },

    save: ( props ) => {
      const { title, author } = props.attributes;

      return (
        <div class="my-book-block">
          <p>{ title }</p>
          <p>{ author }</p>
        </div>
      );
    }
  }
```

Every time you change the expected output, you need a new deprecation object item.

Dynamic blocks to the rescue!

Definition:

Static block

- Block is registered in the JS
- Markup is created by the JS `save()` function
- Markup is saved in the DB as part of the post content

Definition:

Dynamic block

- Block is registered in both the JS and PHP
- Only block attribute data is saved to the DB
- No markup is saved to the DB
- Markup is rendered by the PHP

Book block, take 2

Dynamic edition

Step 1

Register and render the block in PHP.

```php
class Book {

  public function __construct() {
    add_action( 'init', [$this, 'register'] );
  }

  public function register(): void {
    register_block_type( 'my/book', [

      'attributes' => [
        'title'  => [ 'type' => 'string' ],
        'author' => [ 'type' => 'string' ]
      ],

      'render_callback' => [ $this, 'render' ]
    ] );
  }
```

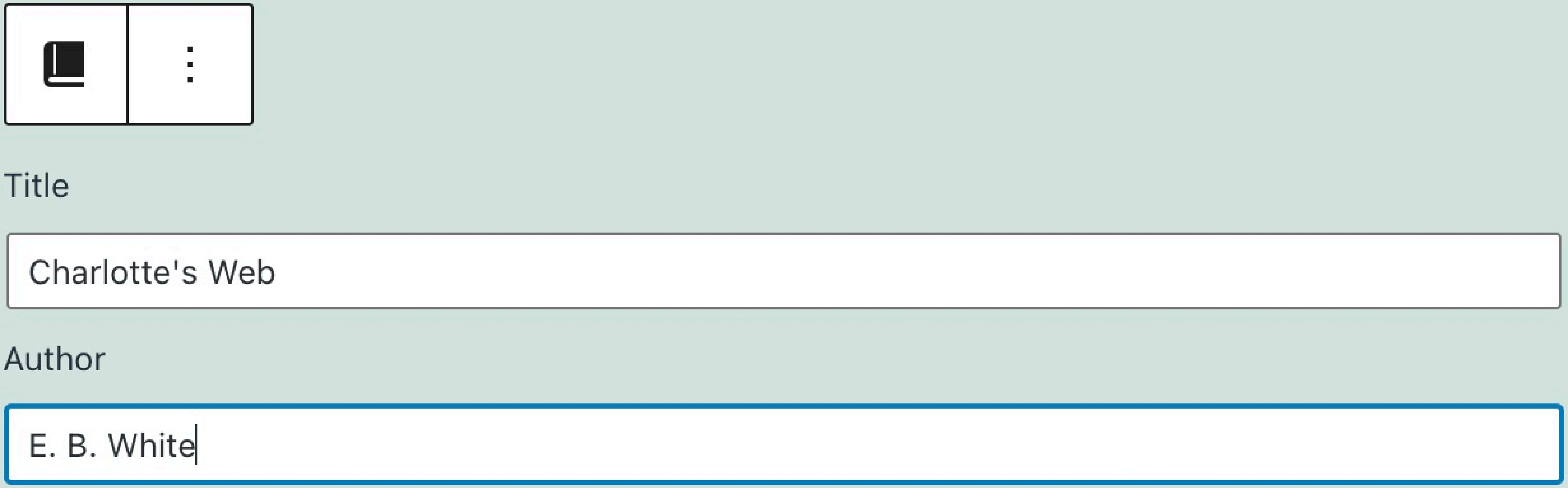
Step 2

- Remove the attribute declaration from the JS registration
- Update the `save()` JS function to return `null`

```
registerBlockType( 'my/book', {
  title: 'Book',
  description: 'A simple book block.',
  category: 'text',
  icon: 'book-alt',

  edit: ( props ) => {
    return ( BookEdit( props ) );
  },

  save: () => {
    return null;
  }

} );
```

Step 3

Nothing! The edit function is the only thing left and that can stay the same.


Title

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Charlotte’s Web

E. B. White

In the database, take 2

```
<!-- wp:my/book {"title":"Charlotte's Web",
"author":"E. B. White"} /-->
```

One more request...

"This is wonderful!" Jordan ponders, "But... can we also add a summary of the book?"

Yes! So easy, for real this time!

Book block, v3

- Add the `summary` attribute in the PHP
- Update the PHP `render()` function
- Add a control to the JS edit interface

Step 1

Update the PHP.

```
'attributes' => [
  'title'   => [ 'type' => 'string', 'default' => '' ],
  'author'  => [ 'type' => 'string', 'default' => '' ],
  'summary' => [ 'type' => 'string', 'default' => '' ]
]
```

```
public function render( $attributes ): string {
  $title = $attributes['title'];
  $author = $attributes['author'];
  $summary = $attributes['summary'];

  return <<<HTML
    <div class="my-book-block">
      <h3>$title</h3>
      <p>$author</p>
      <p>$summary</p>
    </div>
HTML;
}
```

Step 2

Update the JS `edit()` function.

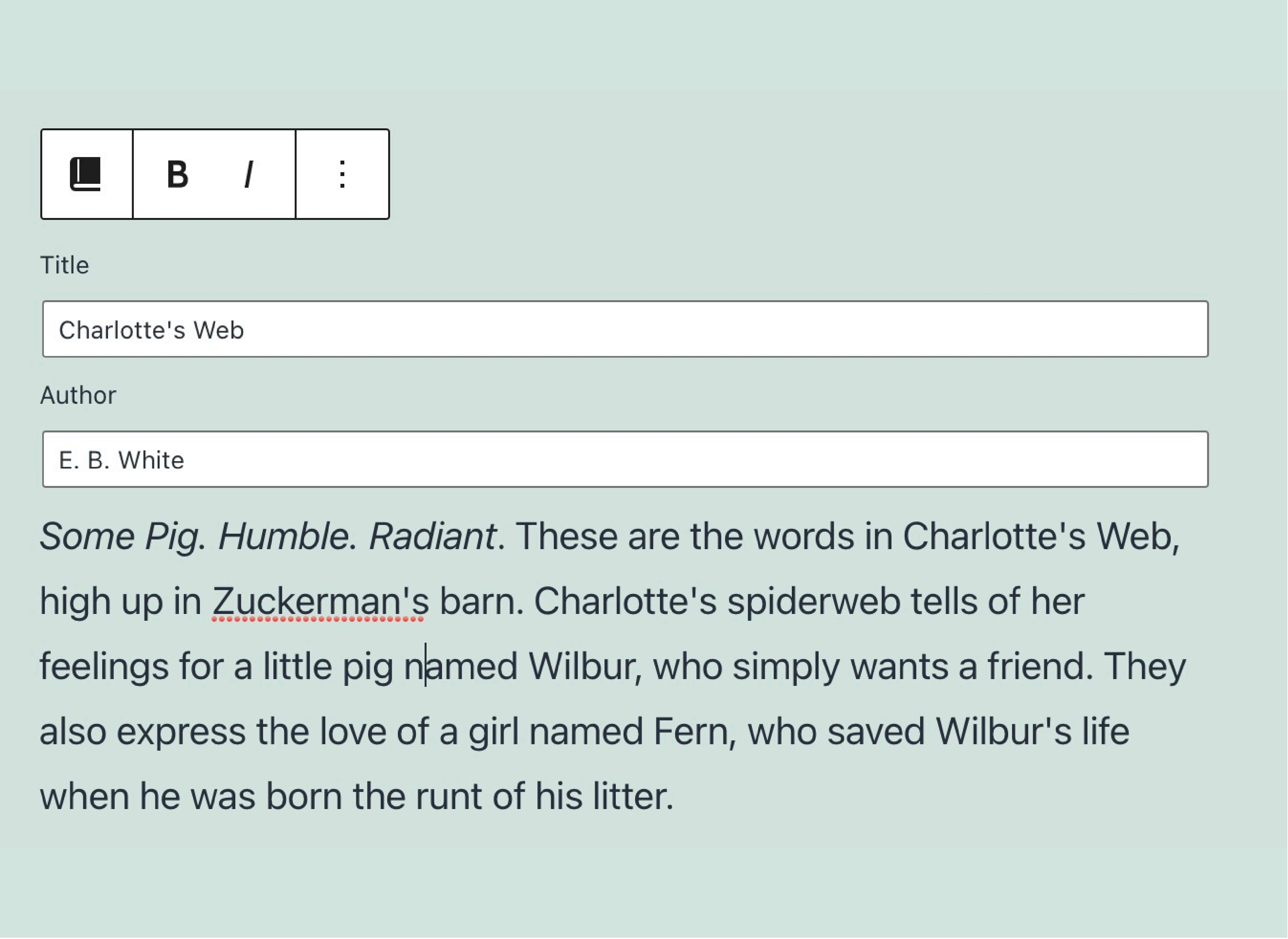
```
const BookEdit = ( props ) => {

  // Get WP packages.
  const { RichText } = wp.blockEditor;
  const { TextControl } = wp.components;
  const { Fragment } = wp.element;

  // Get block properties.
  const { setAttributes } = props;
  const { title, author, summary } = props.attributes;

  // Set on change callbacks.
  const onChangeTitle = ( value ) => {
    setAttributes( { title: value } )
  };

  const onChangeAuthor = ( value ) => {
    setAttributes( { author: value } )
```



Title

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Author

E. B. White

Some Pig. *Humble*. *Radiant*. These are the words in Charlotte's Web, high up in Zuckerman's barn. Charlotte's spiderweb tells of her feelings for a little pig named Wilbur, who simply wants a friend. They also express the love of a girl named Fern, who saved Wilbur's life when he was born the runt of his litter.

My Favorite Books

Charlotte’s Web

E. B. White

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Summary

- Static blocks are great for static data.
- However, if your static block markup changes, you must declare deprecations.
- Dynamic blocks can avoid this - useful if you have a static block that you know will evolve over time.

These slides

https://talks.jhalabi.com/dynamic-blocks

Example code

Static block: https://github.com/That-Dev-Girl-Sites/talks.jhalabi.com/tree/main/dynamic-blocks/examples/static

Dynamic block: https://github.com/That-Dev-Girl-Sites/talks.jhalabi.com/tree/main/dynamic-blocks/examples/dynamic

Thank you!!

- Tweet at me! @jonihalabi
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- Other randomness at jhalabi.com