Richard Owen’s Giant Mystery
by Quinn Berentson

Overview

Richard Owen was a British scientist of the early nineteenth century, most famous for his identification and naming of dinosaurs. This article reports on the role he played in unravelling the mystery of the moa and in identifying it as the largest bird ever known to humans. The nature of scientific endeavour is conveyed well, from the initial presentation of a bone fragment and through the research needed to have a new species recognised.

The article is at the upper end of year 6 ability, but the topic and its engaging retelling will make it of high interest to students. Most students will know something about the (extinct) moa and the article also contains much contextual learning (for example, about science and travel in the Victorian era). It may require numerous rereadings and teacher support.

The article links well with the fictional “Spirit of the Bird” in this Journal, as well as the texts listed below.

Texts related by theme
“Mary Anning: Fossil Hunter” SJ L3 Sep 2012 | “The Dinosaur Hunter” SJ L3 Sep 2012

Text characteristics from the year 6 reading standard

- recounts the identification of the moa and its scientific name
- refers to the scientific processes of observation, comparison, and classification
- requires students to keep track of many different pieces of information throughout the story
- contains explanations and poses questions that provoke thinking
Possible curriculum contexts

**SCIENCE (Nature of Science)**
Level 3 – Understanding about science.

**ENGLISH (Reading)**
Level 3 – Ideas: Show a developing understanding of ideas within, across, and beyond texts.

**ENGLISH (Writing)**
Level 3 – Ideas: Select, form, and communicate ideas on a range of topics.

Possible reading purposes
- To identify the challenges involved in the discovery and identification of moa bones
- To find out how persistence resulted in the identification of moa
- To identify and describe the processes used in scientific research
- To find out about the work of an important scientist.

Possible writing purposes
- To research and report on how Richard Owen discovered and identified dinosaurs
- To investigate and report on a famous New Zealand scientist
- To interview a scientist about their work
- To make a poster that illustrates the steps or stages involved in proving that moa existed.

Text and language challenges

**VOCABULARY**
- The glossary, which includes “deoxyribonucleic acid”
- The derivation and root words of “dinosaur” and the scientific name for moa, Dinornis novaezealandiae.

Possible supporting strategies
Some of these suggestions may be more useful before reading, but they can be used at any time in response to students’ needs.
- Review students’ familiarity with the use of a glossary, providing a demonstration if necessary.
- Review students’ knowledge of words and terms that relate to scientific investigations, including the use of Latin words to name living things. Link this to activating prior knowledge as described in the next section.
- If necessary, provide support for the pronunciation of Latin words and the complex word, “deoxyribonucleic”. You could carry out a separate word study of the way scientific terms can be constructed from parts with individual meanings (morphemes) that together have a new meaning.
- See also ESOL Online, Vocabulary, for examples of other strategies to support students with vocabulary.

**SPECIFIC KNOWLEDGE REQUIRED**
- Knowledge about the moa and its extinction
- Familiarity with and ability to understand comparisons between other large animals, including very large birds
- Knowledge about the discovery of proof of prehistoric dinosaurs
- Understanding of the nature of science and work of scientists, including the use of observation, theory, evidence, and proof
- Some knowledge of the classification system used to identify and name living things
- Some knowledge of life in mid-19th century Britain and New Zealand.

Possible supporting strategies
- Ask students to share what they know about the nature of science: How do scientists make new discoveries? Direct them to focus on the scientists who discover ancient bones: How do you think they proved what they were? English language learners could discuss the topic in their home language before sharing their ideas with the class.
- Use a concept map to chart information, ideas, and words associated with the article. Use other resources as necessary to help build the specific knowledge students will need for understanding the article.
- Prompt students to locate and use the clues in the text that show life 175 years ago was very different from nowadays.
- Provide information as necessary to support students to understand life, travel, and technologies in nineteenth century New Zealand and Britain.

**TEXT FEATURES AND STRUCTURE**
- Non-fiction text that contains a lot of competing information
- Use of headings that indicate the theme of each section
- The use of explanations
- The need to make inferences, including between paragraphs and sections of the text
- The informal expressions: “it all began…” , “It went like this …” , “knew a thing or two” , “How could he not be?” , “Really?”
- Speaking to the reader: “Remember that this was only 1839.”
- Varied sentence structures, including questions
- Rhetorical questions: “How could he not be?”; “The biggest bird in the world? Really?”
- Use of italics for stress: “bone did look like”; “in the world”;
- “had once”
- The use of illustrations, photographs, and a map.

Possible supporting strategies
- Spend time reading the text yourself to identify words, sentence types, or sections that may need support. For example, note the use of the informal expressions that may not be understood by English language learners. Introduce or teach these before or during reading.
- With the students, list some of the text features they notice before, during, and after reading. These can be discussed later and the list used as a resource for the students’ own writing.
- As they read, students could complete a 4 by 3 information grid like the one below. After reading, they can use the grid as a prompt and scaffold for writing a text summary. You can change the headings and the size of the matrix to suit your teaching purposes.

<table>
<thead>
<tr>
<th>Main Characters</th>
<th>Three Main Ideas</th>
<th>Three Scientific Facts</th>
<th>Three New Words</th>
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<tbody>
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First reading

- Share the purpose for reading with the students.
- Explain to the students that this text concerns the discovery and identification of moa bones. Ask them to turn to a partner and share briefly what they know about moa. What will you expect to see, read, and learn in this article? What questions do you have as you read this article?
- skim and scan the text together, asking the students to use the text features to gain an overall idea of what they will be reading. Are there any surprises so far? What more can you say about what will be in the text?
- Direct the students to work in pairs and read one section at a time, stopping to discuss each section, summarise the events, and clarify meaning before moving on.

If the students struggle with this text
- skim and scan the text as described, then read the introduction (page 28) aloud. Discuss the setting and the two characters, and prompt the students to ask questions of the text. You may need to model this first. They may also be ready to form some hypotheses about what will happen next.
- list the title and the section headings on a whiteboard. For each section, ask the students to use the heading to predict what they will read, then change or confirm their predictions after reading the section.
- If necessary, use a framework and support the students to clarify and record information as they read. Discuss the ideas they suggest to ensure that students get the gist of each section.

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<tbody>
<tr>
<td>An Amazing Story</td>
<td>John Harris</td>
<td>– was given a bone</td>
<td>on the East Coast</td>
<td>early 1800s</td>
<td>by local Māori</td>
<td>as a gift</td>
</tr>
<tr>
<td>Waste of Time</td>
<td>John Rule</td>
<td>– told Richard Owen the bone was like a bird’s bone</td>
<td>in the Hunterian Collection</td>
<td></td>
<td></td>
<td>because he wanted Owen to find out more about the bone</td>
</tr>
<tr>
<td>Like No Other Animal</td>
<td>Richard Owen</td>
<td>– compared the bone with many other bones – found that it was like an ostrich bone, but much bigger</td>
<td></td>
<td></td>
<td></td>
<td>to see if it was like any other kind of animal</td>
</tr>
</tbody>
</table>

Subsequent readings

The teacher
Check that students understood the overall idea of the article.
- Why didn’t Owen believe Rule when he saw the first bone fragment?
- Why did Owen finally agree that the bones he received came from a bird, not any other animal?
- Why did it take so long to prove it was from a moa?
- What was special about the moa?

The teacher
With the students, review the section "Not Impressed" or direct them to think, pair, share these questions:
- What do the many questions in this section tell you about the way scientists work?
- What answers could Owen give them?
- Was it fair of the Royal Zoological Society to turn down his discovery? Why do you think that?
- What kind of evidence would they accept?
- How do you think Owen felt after the meeting?

The teacher
Direct the students to work in pairs or small groups to identify the qualities of a good scientist.
- Using your own knowledge, ideas from this text, and ideas you’ve read or seen elsewhere, list some important qualities and abilities of a scientist.
- We don’t know if John Rule was actually a scientist, but what characteristics of his showed he might be?
- How does Richard Owen match up to your list?
- In your own science work, which qualities do you think you possess? What evidence would support this?

GIVE FEEDBACK
- Making notes under the headings as you read helped you locate information later when you wanted to answer a question with finer details.
- You identified the information about Owen’s work on dinosaurs as interesting but not directly relevant to his work on moa bones. You also inferred that his work on dinosaurs might have made it more likely he would be believed the second time around.

METACOGNITION
- What reading strategies were most useful to you as you read this article? Tell me how you used them and why they were useful.
- How does reading about the work of famous scientists like Owen help you understand the nature of science? How can you relate this to your own life?
Before Professor Owen could complain about the interruption, John Rule begged him to listen to his story. It went like this: John Rule had a nephew in New Zealand named John Harris. He was the first European trader to live on the East Coast. Local Māori had given Harris the bone, saying it was very special and had come from a giant bird. Harris then gave it to his uncle John Rule in Sydney, and now Rule had sailed halfway round the world to show it to the professor. There was another thing. How could such a huge animal end up in such an isolated place? Why would it only be on a few islands in the South Pacific? ... None of these birds could fly or swim, so how could a similar species make it all the way to New Zealand?

All Owen could do was hope that someone, somewhere, would find more evidence of this mystery giant.

A Long Wait

For almost four years, Richard Owen heard nothing from New Zealand ...

Meanwhile, there had been a development back in New Zealand.