

## James Deane and Edward Hitchcock's Argument A Lesson for Gr. 9-12

**Introduction:** In 1844, James Deane and Edward Hitchcock used the *American Journal of Science* as their means for making public their dispute over who should rightly claim first discovery of the dinosaur tracks found in the Connecticut River Valley. Although Deane admitted to not being a geologist, still, he felt his observations merited attention and he claimed that Hitchcock routinely ignored or discredited him. Hitchcock responded that although Deane was somewhat versed in the field of geology, it was as an amateur who had not done enough research, and the matter of interpreting the tracks was best left in the hands of a true scholar such as himself. In this lesson students will divide into groups to use Readers' Theater to present Deane's claims and Hitchcock's response. They also compose letters of advice to each man. In a wrap-up discussion, students will explain which man they agree with most and why.

**In Preparation:** For an overview and background information students can read in the story, "Whose Discovery Was It?":

- Chapter 2: "Publication: the Claim to Priority"
- Chapter 3: "The Conflict Begins"
- Chapter 4: "Hitchcock Feels Betrayed"
- Chapter 5: "The Gloves Come Off"
- Chapter 6: "The Argument in the American Journal of Science"

### Teaching the Lesson:

1. Divide the class into 4 groups. Explain that 2 groups will create and perform Readers' Theater pieces, one taking on the role of James Deane, and the other Edward Hitchcock. Both groups will read excerpts from the October, 1844, issue of the *American Journal of Science*, but with a different focus and task, as described in the bulleted items below. Each group can work as a whole to decide which excerpts to use and what further dialog they might want to create. Each group's piece can be performed by one or several students, to be decided by each group.

- One group takes on the role of James Deane to express his impression of wrongs done to him by Hitchcock. Students should take note of Deane's emotions throughout the excerpts so that they can be conveyed when they perform their piece for the rest of the class.
- Another group "becomes" Edward Hitchcock to create a piece that defends his actions, clarifies his thinking, and conveys his emotions.

The other two groups will keep their role of modern-day students to create letters of advice to be read aloud after the Readers' Theater pieces have been performed. Each group will read excerpts from both men, but one group will describe what they think of one man's behavior and offer advice, while the other group addresses the other man. Each group will be ready to describe how their assigned person might have better handled the situation.

2. Deane's Readers' Theater piece should be performed first, followed by Hitchcock's. Then, letters should be read aloud in the following order: advice to Deane, advice to Hitchcock.

3. Hold a wrap-up discussion. Ask:

- Does either Readers' Theater group care to respond to the advice given to them?
- Who do you side with and why?

Remember that Reader's Theater is "acting with your voice". Use intonation and expression to convey meaning. Hand gestures and minimal movement can be used, but no props. Lines do not have to be memorized.

Full texts of the letters in the October 1844 issue of the *American Journal of Science* can be viewed here:

"On the Discovery of Fossil Footmarks", by James Deane

"Rejoinder to the preceding Article of Dr. Deane", by Edward Hitchcock

"Answer to the 'Rejoinder' of Prof. Hitchcock", by James Deane

<https://www.dinotracksdiscovery.org/supporting/evidenceitem/?page=&q=1844>

## English Language Arts Standards » Reading: Informational Text

### Grade 9-10

#### CCSS.ELA-LITERACY.RI.9-10.1

Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

#### CCSS.ELA-LITERACY.RI.9-10.2

Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.

#### CCSS.ELA-LITERACY.RI.9-10.4

Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).

#### CCSS.ELA-LITERACY.RI.9-10.5

Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).

#### CCSS.ELA-LITERACY.RI.9-10.6

Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose.

#### CCSS.ELA-LITERACY.RI.9-10.8

Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.

### Grade 11-12

#### CCSS.ELA-LITERACY.RI.11-12.1

Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

#### CCSS.ELA-LITERACY.RI.11-12.2

Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.

#### CCSS.ELA-LITERACY.RI.11-12.3

Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.

#### CCSS.ELA-LITERACY.RI.11-12.5

Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.

#### CCSS.ELA-LITERACY.RI.11-12.6

Determine an author's point of view or purpose in a text in which the rhetoric is particularly

effective, analyzing how style and content contribute to the power, persuasiveness or beauty of the text.

CCSS.ELA-LITERACY.RI.11-12.7

Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

## English Language Arts Standards » Writing

### Grade 9-10

CCSS.ELA-LITERACY.W.9-10.1

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

CCSS.ELA-LITERACY.W.9-10.1.A

Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence.

CCSS.ELA-LITERACY.W.9-10.1.B

Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns.

CCSS.ELA-LITERACY.W.9-10.1.C

Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

CCSS.ELA-LITERACY.W.9-10.1.D

Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

CCSS.ELA-LITERACY.W.9-10.1.E

Provide a concluding statement or section that follows from and supports the argument presented.

### Grade 11-12

CCSS.ELA-LITERACY.W.11-12.1

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

CCSS.ELA-LITERACY.W.11-12.1.A

Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence.

CCSS.ELA-LITERACY.W.11-12.1.B

Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases.

CCSS.ELA-LITERACY.W.11-12.1.C

Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

CCSS.ELA-LITERACY.W.11-12.1.D

Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

CCSS.ELA-LITERACY.W.11-12.1.E

Provide a concluding statement or section that follows from and supports the argument presented.

*American Journal of Science* Excerpts (October, 1844, pgs. 383-390) from James Deane to Edward Hitchcock

I likewise reiterated my unchangeable conviction "that these impressions are genuine, and if so they prove an interesting subject for the geologist." This declaration shows that although I was not a practical geologist, I was nevertheless able to appreciate the results indicated by these extraordinary relics.

...but he [Hitchcock] subsequently saw the specimens, and admitted the correctness of my views, which he has since repeatedly done; views which have never been refuted by persons competent to appreciate them. The love of possession might have induced me to retain so rich a treasure, yet I presented it to Mr. H.....Self-love too, might have induced me to establish the honor of original discovery by recording its history, but I yielded this point to him in the implicit confidence that he would render the subject and myself impartial justice. In a letter dated Sept. 15, 1835, he informed me that in a paper he was about to publish in this Journal, he should "not fail to acknowledge his indebtedness to me for the first discovery." The performance of this pledge consisted in the remark, that "*his attention was first called to the subject*" by me, but no mention whatever was made of my relations to the discovery.

Had the facts in connexion with this discovery been duly accredited, the necessity of appearing upon these pages to vindicate my claims, and to recover a field too inconsiderately surrendered, would happily have been obviated. I look upon a controversy, as this will doubtless seem to be, with unmitigated aversion. To Mr. H. I am conscious of no unkindness. I am bound by many obligations to him; and he will understand that my motives are not to assail his reputation, but to sustain my own. This reclamation therefore, must be ascribed to the prerogative of self-defence, which will be justified by additional facts and particulars.

The grand results of the researches of Mr. H. were published in his Final Report to the Legislature of Massachusetts, which professedly embodied all facts related to the subject, up to the time of its publication in 1841, yet no allusions are made to the foregoing correspondence; every fact associated with my labors being omitted. The only mention of me in the voluminous essay, is in the description of the original slabs, as having been "*pointed out*" by me to him, and in dedicating a particular variety to my name as a testimony of respect for having "*first called his attention*" to the subject of fossil footmarks. I felt the coldness of these ambiguous compliments, for in his conclusions from the facts, and elsewhere in this learned work, its author was compelled by controlling necessity, to adopt facts, opinions and arguments which were emphatically expressed to him ere his scepticism had been dispelled; yet I did not complain.

My explorations about the year 1841 were crowned with the discovery of several varieties of bipedal, quadrupedal and vegetable impressions of peculiar beauty and value, which I presented to Mr. H., as has been my invariable custom with every new variety, that the collection in Amherst College might be complete. Of the expenditure of time and money in procuring these fossils, I need only say, that these items were by no means inconsiderable, but I was laboring for the love I bore the cause.

...a communication appeared in the Northampton newspaper.... to so much of the address of Mr. H. on footmarks as relates to their discovery. The obvious import of the allusion to this subject, was to weaken the validity of my claim, by conferring the honor of discovery on a Mr. Moody and some others; Mr. M. having seen imprints in the year 1802. The particulars relating to Mr. M. were full, while the only notice of myself was the somewhat equivocal expression, that the subject was first "*pointed out*" to me by a Mr. Wilson, in 1834 (I never saw them until 1835,) and by me in turn to Mr. H.! Thus in stereotype phrase, making me a mere negative instrument between the pretended discoverer and his historian. When I knew that the authorship of this letter was due to Mr. H., when its object was apparent, I could not repress the consciousness of my humble efforts to supply him with *materiel* for his periodical

memoirs. I felt the injustice of this deliberate attempt to place me in a position, not only subordinate to himself, but to another to whom I declare I was never under an obligation of any nature whatsoever; and after all that had passed between Mr. H. and myself, the manner and matter of this publication, filled me with vexation and astonishment.

Antecedent to the delivery of this identical address, no other notice was taken of my correspondence or of my labors in this geological field.....

With singular zeal to mete out a fair equivalent of justice to the original observer, it is not a little unaccountable that he was so tardy in the performance of the act. The specimen of Mr. Moody was purchased in 1839, and although the Final Report and other able treatises appeared subsequently, still the paramount claims of Mr. M. have ever been overlooked. In the year 1842, I remitted to Dr. Mantell of England, a small but very fine collection of footmarks, with a private communication detailing the obvious meaning of these fossils and incidentally alluding to my relation to the discovery. The greatest scepticism then existed in England, as to the inferences drawn from this discovery, and it was therefore an unexpected compliment to me that my communication was presented by Dr. M. to the notice of the London Geological Society, and that this gentleman afterwards wrote to me in reference to its reception, "it cannot fail, sir, to be gratifying to you, to know that your brief but lucid description, illustrated by the highly interesting suit of specimens, has placed this important subject before the geologists of England in a most clear and satisfactory point of view, and that the thanks of the Society were warmly and unanimously expressed for so valuable a communication."

Now the most inexplicable part of this address is this, that having arrayed a company of original discoverers, Mr. H. should entirely cancel their claims, by appropriating to himself the honor of original discovery on the assumed ground of science! In Sept. 1835, after he had settled upon his scientific nomenclature, he acknowledged to me that I was the original discoverer, and the spirit of his early correspondence testified to the sincerity of this admission. The deliberate assumption, that although others had *found* these important fossils, *he* only had *discovered* them, penetrated me with a keen sense of its injustice. It was enforced by allusions, degrading me on the ground of incompetency to understand a self-evident truth. In my first letters to Mr. H. I admitted that I was not a geologist, and this admission he turns into a keen weapon against me. I also, most unscientifically, suggested the variety of bird that made the impressions, and he alludes to this as corroborating evidence of incompetency; he even thinks that *Mr. Wilson* did not suggest this idea to me, and that it was original with me! Mr. H. should be slow to taunt an associate or an adversary on the score of hasty and erroneous conclusions. Even on the subject of these footmarks, Mr. H. himself is not quite clear of mistakes, for he has dropped several of his species, after a full and *scientific* description of them....

In connection with my inability to comprehend the meaning of the original fossils, Mr. H. alludes to himself as one whose "professional business it was to examine such objects," and repudiates the idea that *my* opinions could make an impression upon him, although he had hitherto repeatedly acknowledged the correctness of my views.

I acknowledge that accidentally blundering upon a thing, irrespective of those mental relations, that appreciate causes from the results of causes and effects, does not constitute a claim to original discovery. But are we to infer that the history of these impressions would still be a blank, had not the scientific pen of Mr. H. recorded it? Was *his* agency an indispensable requisite in promulgating a knowledge of their existence and character? If this be true, his exclusive claim is impregnable. If the application of science to this subject, consists in arbitrary classification; in the adoption of terms of non-committal import in essential particulars; in applying to the acknowledged footmarks of birds, terms which belong

exclusively to reptiles; in founding species upon distorted and doubtful examples; in throwing doubts around self-evident truths, and in the adoption of erroneous conclusions, and the assumption of theories, then the claim of original discovery rests upon a broad basis. But, if by science is understood the comprehension of an eternal truth, unbiassed by theory, then is this claim less unquestionable. Mr. H. performs an act of injustice to himself, if he entertains for a moment any belief that had he not published the history of this discovery, I should not have done so; and I now question him, if notwithstanding his science and my supposed incompetency, he was not under the lively apprehension that I should precede him in this matter? This is indeed true, and no fallacy of argument can overthrow the simple fact, that if I had not *found* or *discovered* the footprints, put it in either contingency, neither would Mr. H. nor either of his numerous company of claimants, have *found* or *discovered* them.

In the pride of honorable learning, Mr. H. has too far underrated my humble exertions to elucidate the history presented by the eloquent imprints upon the sandstones of the Connecticut River. Who first might have seen them is unimportant, so long as the world was none the wiser; who first proclaimed their true meaning, the candid reader must determine. I accord to Mr. H. the highest considerations of respect, for the ability and zeal with which he has followed up a subject which, personally, I must always maintain was begun by me with an earnestness that gave no indications of too hastily abandoning it. I have hitherto refrained, contrary to the advice of many friends, from entering upon the defence of my labors in this beautiful department of geological science; and it is with pain and reluctance, that I perform that service now, for by the common standard of observation, I am sensible that these statements must clash with other views, entertained by one whose friendship I appreciate, and should deeply regret to lose.



*American Journal of Science* Excerpts (October, 1844, pgs. 391-398) to be used from Edward Hitchcock to James Deane

If this is indeed a correct view of the case, then I am far more culpable and dishonorable than Dr. Deane represents me; though his charges of injustice are very severe.

...a cloven specimen of sandstone, containing peculiar impressions, was brought to Greenfield, through the agency of Mr. Wilson, and laid by the roadside in the street. Dr. Deane, whom I had known as a respectable young physician, with a predilection for scientific pursuits, sent me an account of them; declaring his unhesitating belief that the impressions were "the tracks of a turkey," stating at the same time that he was "no geologist," and presuming that these appearances, though new to him, were not so to me; and expressing a willingness to have them preserved for me if I desired it.

Dr. Deane was unacquainted with the history of organic remains, or he would not have referred these markings to a living species or even genus of birds...

...that he had not made, nor intended to make, any scientific examination of these tracks, and therefore that his opinion concerning them was the result of casual inspection, and of no more consequence than the opinion of any respectable sagacious man who was not acquainted with the subject.

...I received from him two plaster casts of the impressions, with a note, I think, though I have no recollection of its contents; and unfortunately the original cannot be found on the files of Prof. Silliman or myself. It is easy for Dr. Deane to magnify the importance of this lost document; but I am sure it contained no new facts or reasoning not in his previous letters. Certain I am that it made no impression on me; though the casts excited stronger desire to see the specimens. My doubts were not in the least diminished by any of his letters, just because his first letter showed conclusively that he was not enough acquainted with the subject to judge correctly concerning it, and had given it only the slightest examination. In a few days I visited Greenfield, and found that the specimens had not been removed from the streets; nor did Dr. D. express any unwillingness to let me have them; nor then, or at any subsequent time, did he intimate that he intended to investigate the subject, or publish its history; and since he asks the question, I state most decidedly, that at no time up to this hour, unless my memory deceives me, have I had the least apprehension or suspicion that he might anticipate me in giving an account of the tracks; or that he had any intention or wish to do so. Indeed, excepting a single specimen, I had all the facts in my possession, and how could I fear that any one could publish them? I knew that Dr. Deane's examination consisted only of an occasional inspection of two or three specimens of one species as they lay in the streets. I knew that he had not visited a single quarry, nor had searched for the tracks of living animals in museums and by the rivers. His opinion, therefore, had no weight in removing my doubts.

My intention is, to offer you [Benjamin Silliman, editor of the *American Journal of Science*] a paper on the subject for the January number of the Journal. I shall give to Dr. Deane the credit of having first put me on the *track* after these relics; but I hope you will delay his descriptions until you receive mine: as I am sure I shall be able to present a more full and satisfactory view of the case than he can do.

I supposed that of course the descriptions must be those of Dr. Deane, similar to those he had sent me,- only first impressions from a single specimen,- and I had proceeded so far in my examinations, as to make me feel that it was no vanity to say, that my final account must be more satisfactory than any he could produce from the means I knew him to possess, or rather without any specimens.

....suppose he had actually published all that he ever wrote about that one cloven specimen; it would still be no less true than it now is, that I made the first scientific examination of the footmarks; which is all that I claim. I will add, that not until quite recently, although years of pleasant and friendly intercourse have passed between Dr. Deane and me, have I had an intimation that he was not fully satisfied with the credit which I have awarded him.

His attention was called to the subject about as early as mine; and had he taken the field, the public well know that my labors would have been unnecessary.

Indeed, during the five succeeding years, in which I toiled alone in this untrodden field, I have no evidence that he did any thing on the subject, except occasionally to inquire what progress I made in it. Here was the tug of war; and if he had intended to claim the first and highest honors of victory, he should have been there shoulder to shoulder, or rather before me in battle.

Now in view of this statement, I appeal to naturalists every where, (for they are the only competent jury in such a case,) whether I have not given to Dr. Deane all the notice and credit which belong to him? What could I have said more, unless I had stated what I know to be false, viz. that his reasoning and facts convinced me, and that he had scientifically examined the subject? He speaks slightly of my affixing his name to one of the species. But naturalists know that this is one of the highest honors which they can render to those who aid them by specimens or otherwise; and they never do it unless they conceive the person has unusual merits, because they thus associate him with veterans in science. I appeal too to naturalists to say, whether the only honor I can justly claim in this "seven years' war," consists, as Dr. Deane maintains, in carrying out and illustrating, and very clumsily too according to him, his splendid generalization, "derived from philosophical inductions," that these markings are "real impressions of the feet of some bird, probably of the turkey species."

Dr. Deane thinks it strange that I should have been so tardy in awarding justice to those who preceded him in the discovery of these tracks; and he speaks of them (Dr. Dwight, an aged and respectable physician; Mr. Moody, a farmer, but a man of public education; and Mr. Wilson, an ingenious mechanic) as not having "the slightest comprehension of the origin or character" of the tracks. I did not, indeed, think it necessary to name them till some of them intimated to me that they ought to have been mentioned. But an important object is hereby accomplished. However incompetent they are, they certainly discovered these tracks earlier than Dr. Deane, and came to the same conclusion as he did, as to their being bird tracks, and for similar reasons; and I might name fifty others, who, upon looking at my specimens, have expressed the same views at once; so that it does not require scientific investigation to reach this conclusion. But it does demand it to *establish* the conclusion; and this is what I claim to have done independently.

Dr. Deane also manifests great sensibility because I quoted his first letter to show what he terms his "incompetency." Let him understand that I charge him with no intellectual incompetency to investigate this subject. On the contrary, I have a high opinion of his ability for such a work. But I do maintain, that at the time he discovered the tracks, he did not understand the subject in its connection with geology, simply because he had not studied it. And my proof is, his first letter. If, as a geologist, he had examined the subject before I took it in hand, and given his opinion as the result of his investigations, I could have no apology for omitting to notice that opinion. I was compelled therefore to publish that letter, or lie under the imputation of having acted dishonorably.

As to Dr. Deane's efforts to bring discredit upon my published labors concerning the footmarks, I can only say, that none can feel their imperfection more deeply than myself; and it does not become me to doubt, that had he undertaken it, the work would have been more satisfactorily done; and if he now obtains the chief honor of it, I could wish he had had the

labor, and thus several years of my life have been saved for other purposes. I will add however, that as to most of his criticisms, I am confident he never would have made them, had he ever carefully examined my large collection of specimens, or even other quarries, besides the for our five within six or eight miles of his residence.

I declare most emphatically, that I have never received any assistance from Dr. Deane in investigating the footmarks, previous to the publication of my Final Geological Report, except specimens; and that his early opinion as to their origin had no effect whatever in removing my doubts, or in leading me to my final conclusions, because that opinion was not the result of scientific examination, but of the occasional inspection of a single cloven specimen as it lay for a few weeks in the highway- and because I found that the same opinion had been entertained by others many years earlier, and was indeed forced upon every intelligent man, by the first inspection of good specimens. I further maintain, and have endeavored to show chiefly from his own letters, that in 1835, when that opinion was given, he was not familiar enough with geology to appreciate the necessity of those researches...., which in the first instance cost me months and finally years of labor, and without which, no geologist would ever admit these markings to be bird tracks.....

I maintain that I first, and for several years alone, made these investigations in relation to the tracks of this country, and therefore may claim to be the *discoverer*, in a scientific sense, of fossil bird tracks; and to admit the claims of Dr. Deane to a priority to myself in all these respects, and thus make me a mere humble expounder of his views, does me great injustice, and affixes a most unmerited stigma of illiberality and unfairness upon my character. On the other hand, I acknowledge, and from the first have acknowledged- according to the strictest rules observed by naturalists in these matters- my great indebtedness to him for calling my attention to the subject, and for specimens. I admit him to have been in a popular sense, the original *discoverer* of the footmarks; and had it not been for his scientific discernment, probably they would still have remained undiscovered. I admit that since he has turned his attention to this branch of geology, he has shown unusual ability as an observer, and produced some highly creditable papers on the footmarks; and by saying that he was not familiar with the subject in 1835, I merely echo the sentiment of his own letter, and mean not the slightest disrespect to his character.

Had I been alone concerned, I should have borne in silence what seems to me the cruel injustice of having the fruits of several years of hard labor taken from me and transferred to another, just as I seemed on the point of gaining the hard-fought battle.

If the claims now set up are acknowledged, a taint of dishonorable suspicion will attach to me, and the credit be wrested from me, of the most original and laborious scientific efforts of my life- and that too by friends! For in spite of the needless severity of Dr. Deane's article, I will still believe him sincere and honest in maintaining his claims. And now that we have referred our cause to the scientific public, he will, if he chooses, find me ready to reciprocate the offices of private intercourse and friendship.