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2. Introduction

The Embryo Project (EP), and its primary product, the *Embryo Project Encyclopedia*, have many structures and functions. This handbook is a first step to help you learn about those two things and about their many structures and functions. More importantly, it provides a manual to help you contribute products to the *Embryo Project Encyclopedia*. Before we introduce this handbook and the products it will help you create, let us first introduce the Embryo Project and the *Embryo Project Encyclopedia*.

The Embryo Project is comprised of a group of researchers who pursue a set of goals related to university education, research into the history and philosophy of science, and public outreach. The EP started in 2007 with a US National Science Foundation grant to Jane Maienschein and Manfred Laubichler in the School of Life Sciences at Arizona State University, in Tempe, Arizona. Since then, more than one hundred researchers have contributed to the EP in different capacities, from undergraduate and graduate students, to postdoctoral researchers, professors, computer programmers, and librarians, just to name a few. Those people have come from disciplines such as biology, history, law, English, philosophy, art, and computer science, also just to name a few. Insofar as you use this handbook to create products for the EP, you join that legacy of people who make the EP successful. Let us now detail some of the goals of the EP.

For those reading this handbook, two of the three families of goals are the most important: university education and public outreach. For anyone interested in the third component, research into the history and philosophy of science, we are happy to point you toward resources in that area as this handbook will not engage with those goals. For university education, EP researchers fashion classes in which students improve their ability in skills traditionally taught by different parts of the university. For instance, in the Embryo Project Writing Seminar, students learn how to write and workshop papers, research primary resources, and present information historically, all skills traditionally taught in humanities programs. Simultaneously, those students learn to understand and critique scientific results and evidence, to connect science to broader issues, and to locate and summarize complex scientific publications, all skills traditionally taught in science programs. EP classes also introduce students to digital classrooms and collaboration, and they structure assignments such that final products have value beyond those of traditional classes. Students who make good final products see their work published in the *Embryo Project Encyclopedia*, the main outlet by which EP researchers achieve their public outreach goals.

For public outreach goals, EP researchers recognize several facts. First, non-scientists increasingly must learn about embryos, development, and reproductive medicine. People must vote on public policy relating to embryos, choose reproductive methods, or understand how genetics impacts their lives. Second, few resources exist where people can learn about those
issues from sources that are neither too full of jargon nor too light on science. Third, studies show that even as the amount of data created by scientists skyrockets, non-scientists remain ignorant of that data, how to interpret it, and how to evaluate it. EP researchers work to create products that, without “dumbing down” science, will help non-scientists learn how to think scientifically. The primary outlet by which EP researchers strive to meet that goal is the Embryo Project Encyclopedia.

The Embryo Project Encyclopedia is an online encyclopedia about embryology, developmental biology, and reproductive medicine. The encyclopedia primarily targets an inclusive audience of people who are not specialists in those disciplines, but who have between nine and sixteen years of education, so high school and early undergraduate education. The encyclopedia publishes short descriptive articles about topics from the three aforementioned disciplines, as well scholarly essays, photos, videos, scientific illustrations, and other types of objects. EP researchers publish the encyclopedia according to Open Access (OA) best practices and Creative Commons (CC) licensing, which together entail that the encyclopedia’s contents are free to anyone with an internet connection, and that they may be shared and used as long as they are not done so for profit. EP researchers strive for the content of the encyclopedia to surpass the quality of many other OA and CC products, so they publish new content only after they have subjected it to rigorous peer and editorial review.

The goal of the EP Encyclopedia is to improve, among non-specialist and inclusive audiences, widespread scientific literacy about embryology, development, and reproductive medicine. To accomplish that goal, and in light of the facts listed two paragraphs earlier about how everyday people interact with science, EP researchers rely on historiographical methods to construct the articles that they publish in the EP Encyclopedia. EP researchers hypothesize that history is a good method by which to introduce, contextualize, and explain science to many people. The EP Encyclopedia is the primary product of that hypothesis, and its effectiveness to increase public scientific literacy provides the test of the hypothesis.

You need not care about embryology to help test that hypothesis or to contribute to the EP Encyclopedia. People who have participated in the EP have many interests. Some care about embryology, some about learning how to write, research, or construct histories. Some care about unraveling the histories and senses of concepts. Some care about developmental biology, some about reproductive law. The point is that you do not need to care about embryos or embryology to succeed in the Embryo Project or to write for its Encyclopedia.

You must, however, care about increasing widespread scientific literacy among inclusive audiences. For the Encyclopedia, the primary audience is paramount, and everything published in it is constructed with the primary audience in mind: people who have at least between nine and sixteen years of education, but who are not professionals in embryology, developmental biology, or reproductive medicine. That audience is porous, however, and the encyclopedia has many secondary audiences. Do not strive to exclude members of different audience, but work to include the primary audience as your focus.
This handbook will help you write short descriptive articles about topics from embryology, development, and reproductive medicine, articles aimed for inclusive audiences via the *EP Encyclopedia*. This handbook collects years of insights from dozens of researchers about how to identify topics, research those topics, write well, write histories, and write good encyclopedia articles.

If you want to maximize the chances that the articles you write pass peer and editorial review and get published, read every word of this manual. This is the third edition of the handbook, the first was written in 2007 and the second in 2011. We hope that future contributors, editors, instructors, and researchers will make this handbook, as well as the *Encyclopedia* in general, more perspicuous, complete, and concise.
3. Article Categories

There are fourteen categories of *EP Encyclopedia* articles. Every *EP Encyclopedia* article written and published falls into one of the fourteen categories. A list of them is below, along with their abbreviations. It is easier to write about topics that fall within the categories at the top of the list than it is to write about topics that fall within the categories at the bottom of the list.

The abbreviations listed below are part of what you use when naming your files. Please see file naming conventions found in the section “10: Page and File Name Formats and Sample Articles” for more information.

- People: Pe
- Experiment: Exp
- Technology: Tech
- Literature: Lit
- Law: Law
- Organization: Orgz
- Concept: Con
- Image: Img
- Context: Cxt
- Ethics: Eth
- Award: Awd
- Place: Pl
- Religion: Rel
- Organism: Org
4. The Process of Writing Articles

Below is a description of a general writing process for *EP Encyclopedia* articles. Before you write an article, you must have several bits of information. First, you must have the name of your topic. Second, you must be able to locate your topic in time and space. Third, you must have the article category your topic best fits. Finally, you must also be able to state clearly why your topic is significant to the history of embryology, development, or reproductive medicine. Once you have those bits of information, you can research your topic and write your article’s first draft. The steps described below are general, and different people will take them in slightly different orders.

a) Do preliminary research to determine which topics interest you.
b) Pick a topic, and pick a category into which it fits. Beginners should start with a People article to familiarize themselves with the style of the *EP Encyclopedia* before moving on to more complex categories.
c) Search the *EP Encyclopedia* website to see if it already has an entry on your topic. If not, check the list of list of taken topics, and work with an editor to see if anyone has claimed your topic.
d) If your topic is free, refine it so that it is specific to a period of time, a place in space, and some people. For instance, if your topic is the concept of body plans, two possible refinements are: Body Plan Concepts in Germany (1800–1830), or Karl Ernst von Baer’s Concept of Body Plan.
e) Learn why your topic is significant to the history of embryology, development, or reproductive medicine. Be able to write that significance in one sentence.
f) Read the specialized writing guide for your category, and be able to answer most of the questions in that guide.
g) Research your topic further. Find and read journal articles, developmental biology textbooks, and scholarly books, *not just websites*, to learn about your topic. Those articles and books will comprise your works cited and your primary source material.
h) Outline your article. Use the specialized writing strategies to help you. Use your statement of significance to help you decide what to include and what to exclude from your article.
i) Write your article’s first draft. Your statement of significance should be at the end of your first paragraph.
j) Workshop your article.
k) Revise, revise, revise.
l) Polish your article. Make sure it follows the format of the sample article at the end of this handbook. The sample articles are only for format, not content or length.
m) Submit your article for editing.
n) If you get your article back with suggestions for improvements, incorporate them and resubmit your article as soon as possible.
o) If you are in a writing seminar, once your instructor has approved your work for the class, she will send it to the editing team, who will decide publish it, request revisions from the author with the guidance of an editor, or decline it.
5. General Remarks about Style

Introduction

This and the next few sections provide a framework, both grammatical and stylistic, to help you learn to write well or better than you currently do. The framework will also help you learn to write encyclopedia articles that tell histories. This section, as its title indicates, provides a broad foundation for that framework. The next section provides more specific strategies that you should employ to write well. The section after that provides a list of style issues specific to the EP Encyclopedia, and you should keep that section handy as you write your articles.

The framework stems from one principle that is core to the EP Encyclopedia: our writers do not “dumb down” or obfuscate science. Rather, they write their articles according to several principles of style. Researchers developed those principles after studying how people comprehend and retain information presented in English prose. When writers follow those principles, people who read their prose retain and understand the content of that prose better than if the writers had followed different principles.

The framework described below distills key points from several sources. If you would like to read those sources, or if you want to learn more about how to write well, you can find the most important sources in the bibliography of this Handbook. The most important sources, in descending order of importance, are:

- Style: Lessons in Clarity and Grace, by Williams and Colomb
- “The Science of Scientific Writing,” by Gopen and Swan
- The Elements of Style, by Strunk and White
- On Writing Well, by William Zinsser

Why Read or Follow These Remarks on Style?

Writers new to the EP are often skeptical that these sections on style are important for them. They commonly hold at least one of two positions. Let us describe those positions and then explain how they go wrong.

First, many writers new to the EP believe that they already write well, and that they have little to learn about English prose style. In fact, many writers new to the EP do write well, and the EP would not have accepted them if they did not. Writers new to the EP often participate in the EP Writing Seminar, and that seminar aims to transform people who write well into people who write well about complex topics, such as science and its history. To do that, new EP writers often need to refresh their knowledge about style and grammar, and they need to learn new ways to manipulate style and grammar to learn how to write about science for inclusive audiences. So while many new EP writers write well, they still have much to learn about English prose style.
Second, many new EP writers feel that the framework for style and grammar presented in this and the next section is arbitrary, and they feel that they have no obligation to follow it. For example, imagine a new EP writer writes the sentence:

(1) The gastrulas that had been irradiated by Williams on Sunday morning and by Johnson on Sunday night had decreased involution and increased green colors.

EP researchers would encourage the new writer to translate the sentence into something like:

(2) Williams irradiated the gastrulas Sunday morning, and Johnson irradiated them Sunday night. Afterwards, compared to normal gastrulas, the irradiated gastrulas appeared greener and less coiled.

New EP writers sometimes object that the first sentence (1) has the same content as the second sentence (2), which is correct. New EP writers will often then conclude that, as the two sentences have the same content, we should not prefer (2) to (1). That conclusion relies on the assumption that only a sentence’s content, and none of its other properties, make the sentence good or bad. That assumption is false, so the conclusion does not follow.

Sentences are never just good or bad, they are good or bad for the audience that reads them. The EP Encyclopedia aims to write articles primarily for an audience of non-specialists, people who have between nine and sixteen years of education. If people in that audience can retain and understand the content of sentences from the EP Encyclopedia, then those sentences are good for that audience. Research indicates that people who read English sentences understand and retain the content of sentence (2) better than sentences like (1).

Furthermore, sentences are good for the writer if those sentences help the writer accomplish her goals. One of the primary goals of the EP Encyclopedia is to increase scientific literacy among its primary audience. To do so, the audience needs to understand the science being presented in the article. Insofar as people understand and retain the content of sentences like (2) better than sentences like (1), when you choose to write an article filled with sentences like (2), then you help the EP Encyclopedia achieve its primary goal.

Researchers have shown that the principles of style below apply to audiences beyond just those with between nine and sixteen years of education. If you can apply such principles with the EP Encyclopedia to write about the history of science for inclusive audiences, that writing style is transferrable and will allow you to write English prose about any topic for any audience.

**Basic Sentence Grammar**

To review basic sentence grammar and get at the best stylistic practices, it is important to review the most basic of sentence grammar. For native English speakers, such a remedial lesson may seem arduous, but how we choose to structure the parts of speech in sentences for the EP
Encyclopedia is one of the primary mechanisms of style we employ. Small modifications to the structure and type of subjects and verbs you use when writing for the public can have a substantial impact on retention and engagement with the material. To continue, the primary components of a descriptive sentence are the subject, the verb, and the object:

Subject: The thing performing an action.
Verb: The action.
Object: The thing acted upon by the subject.

For example:

(3) Mangold sutured the tissues.

In (3), “Mangold” is the subject, “sutured” is the verb, and “the tissues” is the object. Every sentence has a subject and a verb, but not every sentence has an object. For Example:

(4) The sea urchin gastrulas developed.

For sentences more complex than (3) and (4), it is more difficult to identify the subject, verb, and object. For instance, referring back to the previous page, (1)’s subject is “the gastrulas that had been irradiated by Williams on Sunday morning and by Johnson on Sunday night,” the verb is “had,” and the object is “decreased involution and increased green colors.” Many people think that the sentence’s verb is “had been irradiated,” others think that the verb is “decreased” or “increased.” The words just quoted are conjugated verbs, but none of them function as the verb of the sentence. Instead, they function as parts of complex noun phrases, phrases that fill subject and object places of the sentence.

Good writers know, for any sentence they write, which words function as the subject, which as the verb, and which as the object. Furthermore, they can identify the subjects, verbs, and objects of other people’s sentences. You should practice identifying subjects, verbs, and objects in your sentences and in those of other writers. As you write for the EP Encyclopedia, be aware of your subjects, objects, and verbs in sentences. That will better help you identify how to adhere to the style conventions outlined below.

Active sentences and passive sentences

English prose sentences fall into roughly two categories, active and passive. You can translate most any sentence from one category into a sentence of the other category. Sentences of either category are grammatically correct, but they are not equally good for EP Encyclopedia’s writers or audience. Before we talk about the costs and benefits of each kind of sentence, let us look at the differences between sentences of the two categories.
Active sentences, like (3), place the thing performing an action before the verb and the verb before the thing acted upon. Passive sentences change the order of the things represented in the sentence. For passive sentences:

- **Subject:** The thing acted upon by the object.
- **Verb:** The action.
- **Object:** The thing performing an action.

For instance, we can translate (3) into:

(5) The tissues were sutured by Mangold.

Furthermore, you can drop the object of a passive sentence, the thing performing the action, from any passive sentence. For example:

(6) The tissues were sutured.

Note that (5) and (6) require the verb phrase “were sutured,” whereas (3) requires “sutured.”

There are several good but imperfect methods to identify passive sentences. You can identify passive sentences by looking for verb phrases that begin with conjugated “to be” and “to have” verbs (e.g. is, was, were, be, been, have, has, had). You can also identify passive sentences by looking for verb phrases before words that describe the thing acting. Also, if you cannot identify in a sentence the thing acting, as in (6) where presumably a surgeon is suturing the tissues, then you have found a passive sentence.

Let us discuss the costs and benefits of the two kinds of sentences. In much of academia and especially in science, people write passive sentences. They do so for rhetorical reasons. They claim that if you write passive sentences, then you can grammatically drop the thing performing the action from the sentence, and your sentence therefore sounds more general. They hold that, especially when reporting procedures, you should write sentences like (6) and not sentences like (3). When people read sentences like (6), they will not think that the success of the procedure depended on something subjective to the person performing the procedure, lending the passive sentence an air of legitimacy and finality.

For the *EP Encyclopedia*, we encourage you to write active sentences. We have our own rhetorical reasons. Generally, people who read English prose understand the contents of active sentences better than they do that of passive sentences. Also, passive sentences, especially many in a row, bore readers. We also seek to identify the context and nuance of science and history, which is harder to do when using passive sentences. Good writers, and good *EP Encyclopedia* writers, aim for active sentences.
At times passive sentences or the use of “to be” and “to have” verbs are rhetorically necessary to side-step including a concrete subject in a sentence. We understand that, but want you to be aware of when and why you are choosing to use those stylistic conventions, and limit their usage as much as possible.

**Principle: Write active sentences.**

A final note about passive sentences. Some people believe that any sentence is passive if it has a “to be” or a “to have” verb in it. That belief is false, and you should not use it to avoid those verbs. Passive sentences most often have a “to be” or a “to have” verb as part of a verb phrase, but not all sentences that use one of those verbs are passive. For instance:

(7) The lab had one primary investigator, two technicians, and thirty cows.

The sentence (7) is not passive. However, if you string together many active sentences in which you use “to be” and “to have” verbs, then you will have the same effect upon your readers as if you had written passively. You will bore them to sleep.

**Nominalizations**

When writers transform a word that is normally a verb into a noun, we call that noun a nominalization. Writers use nominalizations to refer to actions not with verbs, but with nouns, and then they use those nouns as the subjects or objects of sentences. You can identify two common types of nominalizations by looking at the last few letters of the word. If the word ends in “-ion” or in “-ing” then there is a good chance that it is a nominalization. For example:

<table>
<thead>
<tr>
<th>Verb</th>
<th>Nominalization</th>
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<tr>
<td>mutate</td>
<td>mutation</td>
</tr>
<tr>
<td>react</td>
<td>reaction</td>
</tr>
<tr>
<td>nominalize</td>
<td>nominalization</td>
</tr>
<tr>
<td>manipulate</td>
<td>manipulation</td>
</tr>
<tr>
<td>read</td>
<td>reading</td>
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<tr>
<td>differentiate</td>
<td>differentiating</td>
</tr>
<tr>
<td>imprint</td>
<td>imprinting</td>
</tr>
<tr>
<td>sequence</td>
<td>sequencing</td>
</tr>
</tbody>
</table>

When people read English prose, they struggle with nominalizations for at least three reasons. First, English readers expect to find the verb of a sentence, not the subject or the object, representing the important action. Compare:
(8) Irradiation of the flies by Muller was able to lead to mutations in them.

to

(9) Muller irradiated the flies, and then they mutated.

In (8), we nominalized the important actions in “irradiation” and “mutations.” The nominalizations force us to use a complex noun-phrase for the subject of the sentence, “Irradiation of the flies by Muller,” and they force us to use the boring verb “was.” In (9), we refer to the interesting actions with the verbs “irradiated” and “mutated,” and we lose the complex noun phrase and the boring verb. In (8), we do not represent the important actions in the verbs of the sentence where English readers expect to find them, and we instead hide them in the sentence’s subject and in its object. When you nominalize verbs, you frustrate the norms of clarity, style, and active writing that English readers expect you to follow.

Second, when you nominalize verbs into nouns, you construct concepts that seem more abstract than the original concept. The more complex the concept, the more English readers struggle to understand it. Is the concept associated with “irradiation” really more complex than that associated with “irradiate”? For our purposes, the answer does not matter. English readers indicate in surveys and in tests that the nominalized concepts seem more complex and harder to understand than the simpler verbs from which writers construct them. For the EP Encyclopedia, we care about seeming overly complex to inclusive audiences, and we try to avoid it when possible.

Finally, English readers struggle with nominalizations because those words are often ambiguous, or have multiple meanings, or associate with multiple concepts. When people read English prose that includes nominalizations, they struggle to discern the appropriate concept with the nominalization. Many nominalized words refer to a process and to the result of that process. For example, “mutation” can mean the process by which something mutates, or it can mean the result of that process. We find such ambiguity especially among nominalized words that end in “-ing”. For instance, “patterning”:

(10) Once an embryo exhibits axis patterning, then it can begin limb patterning.

In (10), “axis patterning” probably refers to the result of a process, while “limb patterning” probably refers to a process itself. But non-specialists will struggle to discern the appropriate meaning of each word. And the more you read things written by scientists, the more you will suspect that they too struggle with the task.

Principle: Avoid nominalizations, especially for the subjects of your sentences.
Much bad style stems from nominalized verbs and from passive sentences. Furthermore, as indicated by several of the above example sentences, many passive sentences have nominalizations for the subjects of those sentences, and many sentences with nominalizations exhibit passive grammar.

When we revise sentences to remove nominalizations, we often change the grammar of the sentences to make them active. Similarly, when you begin to revise sentences to make them active, you may have to excavate the active verbs from nominalizations in the sentence.

**Clichés and colloquial words and phrases**

The long and the short of it is that when writers use those old saws that make the world go 'round, clichés, they tend to fumble at the goal line or look like loons on a ledge; their readers never get a good sense of the action, they mosey on down the line as if their lives depended on it, and they avoid that writer like the plague.

On the other hand, their good buddies who scribble colloquial words or phrases as if for the tube or the big screen, they too screw up their scratch, especially for the olds, who get tongue-tied and straight-jacketed at the thought of picking out the wheat from the chaff.

**Principle: Do not use clichés or colloquialisms.**

Many people struggle to understand clichés and colloquialisms, especially those for whom English is not their first language. Cliches and colloquialisms also work against the goal of clarity for articles in the *EP Encyclopedia*.

**Principles of style, not strict grammatical rules**

In this chapter and in the one that follows, we examine several principles of style. Principles of style differ from grammatical rules in that writers follow principles of style to make sentences better or worse, whereas they follow grammatical rules to ensure that the words they string together form sentences rather than nonsense. When we write passive sentences or sentences with nominalizations in them, we follow English grammatical rules and construct legitimate sentences. The problem with those sentences is not grammatical, it is stylistic. They are hard for most English readers to understand.

Most writers struggle, in every sentence that they write, to satisfy all of the principles. Sometimes for a given subject matter, the principles conflict. In order to write an active sentence, sometimes you must use a nominalization as the subject. Sometimes to avoid a nominalization, you must write a passive sentence. Good writers, however, understand the principles, how to deploy them, and when they conflict. Even better writers occasionally flout those principles to make their sentences better than they normally would have been. Any principle is sometimes dashed for the sake of clarity. For your *EP Encyclopedia* articles, learn and follow the principles as best as you can. As you grow as a writer beyond the EP, learn how to occasionally flout them.
6. How to Write Well

This chapter discusses four main topics: how to write good sentence, how to write good paragraphs, how to write good papers, and how to write good EP Encyclopedia articles. The content in this chapter builds on the principles discussed in the previous chapter. The chapter ends with a list of the primary principles that you should follow as your write articles for the EP Encyclopedia.

How to Write Good Sentences

First, English readers look for things that can perform actions to be the subjects of sentences. People, organizations, animals, and other corporeal things make good subjects, while nominalizations do not. Compare:

(11) Fixation of the flies on a pinboard by Morgan was what enabled the examination.

to

(12) Morgan affixed the flies to a pinboard, which enabled him to examine their features.

In those two sentences, “Morgan” is a better subject than “Fixation of the flies to a pinboard by Morgan.”

Second, English readers look for verbs to represent the important action of the sentence. In (11), the important verb is encased in the nominalization “Fixation.”

Third, English readers struggle to understand a sentence when the sentence’s verb is far from the beginning of the sentence. In (11), the sentence’s verb is “was,” which is ten words into the sentence. In (12), the verb “affixed” is the second word of the sentence.

Furthermore, English readers struggle to understand a sentence, even if the sentence is active, if the verb is far from the subject. Compare (12) to:

(13) Morgan with his fruit flies of the species Drosophila Melanogaster (D. Melanogaster)—well on their way to model organism status in early to mid twentieth century genetics labs, especially at Columbia University, but in other places as well—for the summer traveled to Woods Hole, Massachusetts.

The sentence (12) has zero words between the subject “Morgan” and the verb “affixed,” but (13) has thirty-nine words between the subject “Morgan” and the verb “traveled.” English readers understand sentences like (12) much better than they do sentences like (13).
Principle: Use words that refer to corporeal things for subjects and words that refer to interesting actions for verbs. Keep those words close together and put them at the beginning of your sentences.

Finally, readers perceive a topic position and a stress position in every English sentence. If we speak loosely, the topic position is roughly the first half of an English sentence, and the stress position is roughly the second half. We discuss topic and stress positions more in the following section, but we introduce them now. Good writers use topic and stress positions to their advantage.

Writers use topic and stress positions to help sentences flow together and to help readers identify new content. Most every English prose sentence introduces new content to its readers, but it is also part of a larger text. Good writers use the topic position to connect a sentence to its predecessors in the text. They use the stress position to introduce new content. The topic position includes the subject of the sentence and often transitional phrases, subject-qualifiers, and sometimes the verb of the sentence. Good writers use the subjects or objects of previous sentences in the topic position. The stress position includes the object of the sentence and often extra clauses and qualifications. It can also include the verb of the sentence. In the stress position, good writers introduce new information to the reader.

(14) Morgan affixed the flies to the pinboard, which enabled him to examine their features. He recorded his observations into a green lab notebook. With the pinboard and the notebook he then traveled to Woods Hole, Massachusetts, for the summer.

In (14), the three sentences use topic and stress positions to their advantage. “Morgan” is the subject of the first sentence, and “Morgan” remains the subject in the second and third sentences. The topic position of the second sentence connects to the content of the first sentence by using the same subject, while the topic position of the third sentence connects to the previous sentences by using the same subject and by using some of the information introduced in each of them: the pinboard and the notebook. The stress position of the second sentence introduces the new content of the green lab notebook, while the stress position of the third sentence introduces the new content of the trip to Woods Hole for the summer.

Principle: Use the topic position of a sentence to tie it to the content of previous sentences, and use the stress position of a sentence to introduce new content.

Now that we have discussed how to construct good sentences, let us discuss how to use them to build good paragraphs.
How to Write Good Paragraphs

Good paragraphs exhibit several features: topic sentences, an understanding of topic and stress positions, careful pronoun use, and identifying when transitions are needed between paragraphs.

First, good paragraphs have a topic sentence. A topic sentence is like a thesis statement for your paragraph. It unites the content of the paragraph into a whole unit, it helps you excise from the paragraph sentences that have content disconnected from the content of the other sentences in the paragraph, and makes explicit for your readers the purpose of the paragraph. Furthermore, if the topic sentence is like a thesis, then the other sentences in the paragraph provide the evidence to show that the topic sentences is true. If at first you struggle with topic sentences, do not despair. Often, people write topic sentences for paragraphs as they revise their papers and better see the organizational flow of topics.

Second, in good paragraphs, writers string their sentences together according to the above principle about topic and stress positions. To do so, writers use just a few different sentence subjects per paragraph. Many good paragraphs have a primary subject, just as good sentences do. To identify the subject of a paragraph, look for the subject of the topic sentences, and look for the subject in the majority of the paragraph’s sentences.

Third, good paragraphs lack pronouns in their first sentences. Insofar as writers mention a thing or person in the first sentence of a new paragraph, they provide the name of that thing or person and do not use a pronoun. In general, anytime you refer to someone for the first time in a new paragraph, you should use that person’s name and not a pronoun. If you mention the person for the first time in the paper, use the person’s full name. If you have already mentioned that person earlier in the paper, then just use the person’s last name.

Fourth, good writers often use the last sentence of a paragraph to transition to the next paragraph. Writers often struggle with transitions. Many think that transitions are hard to write, but generally the problem is that not all paragraphs require transitions to and from them to help with the broader stylistic and organizational goals of the paper. To write a good transition between paragraphs, first locate the stress position of last sentence of the paragraph. Introduce information in that stress position that will be in the topic position of the first sentence of the next paragraph.

To identify when you need a transition, this handbook will not be much help, as its writers cannot distill a principle to guide the use of transitions. The best we can say is that writers often use transitions well when they link paragraphs that present information chronologically. If you are in the writing workshop, feedback from your peers will help distinguish when transitions are needed, and how best to go about revisions to incorporate needed transitions.

Now that we have discussed how to construct good paragraphs, let us discuss how to use them to build good papers.
How to Write Good Papers

Good papers exhibit several features. Foremost among them is organization. A paper’s organization is its pattern by which it provides information. Furthermore, good papers have clear theses. A thesis is a statement that describes the conclusion reached by the writer in the paper. Let us first review theses and then organization.

Good theses have several characteristics. First, they are clear and succinct, often composed in a single sentence. Writers who compose succinct and clear theses for their papers reap several rewards. Such theses provide writers a kernel around which to organize the rest of their papers, they enable writers to excise unnecessary information from their papers, and they make explicit to the reader the purpose of the paper. Second, good theses appear early in the paper, often in the first paragraph, a placement that helps readers decide if they will continue to read the paper. Finally, good writers explicitly label their theses, a practice that enables readers to identify the most important message of the paper.

Good theses help writers organize their papers in several ways. First, a good thesis provides a target for all of the topic sentences from most of the paragraphs in a paper. The topic sentences should jointly show that the thesis is true: they should justify or substantiate the thesis. If a paragraph’s topic sentence does not work with the topic sentences from other paragraphs to substantiate the thesis, then the writer has reason to believe that the paragraph has no function in her paper. The writer might revise the topic sentence, or she might revise the whole paragraph. Second, good theses help writers organize papers because writers use them to “roadmap” and to summarize arguments. Moving on, papers with good organizations exhibit several features. First, just as readers can easily identify the theses of good papers, they can identify the function of each paragraph within the papers, and see how the paragraphs work together to substantiate or justify the theses.

There are several types of common organizations for papers: essay, chronological, and inverted pyramid. The essay format provides an introduction with an explicit thesis and a clear “roadmap” of the paragraphs to follow, followed by the paragraphs, followed by a conclusion that reviews the thesis and how the paragraphs jointly justify the thesis. Chronological organizations tell stories, often historical, and they have beginnings, middles, and ends. In chronological organizations, writers often relax principles that call for explicit theses and topic sentences. Finally, inverted pyramid organization places the most important information first, with the information decreasing in importance as the paper continues.

You will often hear EP researchers say that new EP Encyclopedia writers face a steep learning curve. One cause of the learning curve is the unique organization required of many EP Encyclopedia articles. No EP Encyclopedia articles follow just essay format or just chronological format or just inverted pyramid format. Rather, most of those article follow a format that requires a mixture of all three organizational strategies. Let us now see how to write good EP Encyclopedia articles.
How to Write Good *EP Encyclopedia* Articles

*EP Encyclopedia* articles all share the same stylistic conventions, and require content that is similar across all articles, even when topics differ dramatically. The articles tell histories, they are about science, they are written for inclusive audiences, they are fact-heavy encyclopedia entries, and they exist in a digital format. Those features all influence the structure and style of *EP Encyclopedia* articles. Below, we discuss some of the key features of the articles.

First sentences

Pay special attention to the first sentences of your articles. Make sure that you discuss the the topic of the paper in your first sentence. As our articles are encyclopedia entries, they *do not* begin with hooks, questions, quotes, or evaluations. As our audience is mostly non-experts, your first sentence should explicitly state the topic and *locate it in space and time*. Often the topic of the paper serves well as the subject of the first sentence. If your topic is about some biological concept, make explicit the scope of that concept, especially with regard to the taxa it applies to. Some good first sentences are:

- “*Johann Gregor Mendel* studied plants and their patterns of inheritance in Austria during the nineteenth century.”
- “*Johann Friedrich Meckel* and Antoine Etienne Reynaud Serres developed the basic principles of what later became called the Meckel-Serres Law in the early 1800s.”
- “*Mesenchyme is a type* of animal tissue comprised of loose cells embedded in a mesh of proteins and fluid, called the extracellular matrix.”
- “*The Uniform Anatomical Gift Act* (UAGA or the Act) was passed in the US in 1968 and has since been revised in 1987 and in 2006.”
- “*David Starr Jordan* studied fish and promoted eugenics in the US during the late nineteenth and early twentieth centuries.”
- “*The Notch signaling pathway* is a mechanism in animals by which adjacent cells communicate with each other, conveying spatial information and genetic instructions for the animal’s development.”
- “*Frederik Ruysch’s cabinet* of curiosities, commonly referred to simply as the Cabinet, was a museum Ruysch created in the Netherlands in the late 1600s.”

Significance statements

Significance statements make explicit the significance of your topic for the history of embryology, developmental biology, or reproductive medicine. They have special importance for your articles as they are the theses. They also align the content of your article with the goals of the *EP Encyclopedia*. All of your paragraphs should work together to substantiate your significance statements. As theses, significance statements help you eliminate unnecessary content from your articles, identify the need for your article in the *EP Encyclopedia*, and organize your article.
New writers often struggle to formulate significance statements. Many new writers wrongly think that any biological topic has a place in the *EP Encyclopedia*. The *Encyclopedia* publishes articles only about topics significant to the history of embryology, developmental biology, or reproductive medicine. If you cannot explain why your topic of interest is significant for those three fields, then your thesis is not relevant to the goals of the *EP Encyclopedia*.

Writers often revise their significance statements several times. They often start with the phrase: “Topic X is significant to the history of field Y because of reasons Z.” Next, a writer replaces “Topic X” with her topic, “field Y” with embryology or developmental biology or reproductive medicine, and “reasons Z” with the relevant reasons. Next, the writers massages the sentence to remove the formulaic sound. Some good significance statements are:

“*The Bioethics Act* is the first law in South Korea to regulate research on embryonic stem cells and in vitro fertilization.”

“*Gonzales created the* precedent that anyone who delivers and kills a living fetus could be subject to legal consequences, unless he or she performed the procedure to save the life of the mother.”

“*Though current treatments* of vesico-vaginal fistulas have evolved since the nineteenth century, some of the basic principles utilized by Sims have been incorporated into present day surgeries.”

“*This study revealed* that embryos may be able to control their developmental environment by modifying their behavior.”

“*Biologists throughout the* twentieth century used Woltereck’s concept of *Reaktionsnorm* to develop theories and experiments to explain the evolution of adaptive developmental responses to environmental conditions.”

“*The bicoid gradient*, which extends across the anterior-posterior axis of Drosophila embryos, organizes the head and thorax.”

“*While the meaning* and significance of the genotype-phenotype distinction has been a topic of debate—among Johannsen’s contemporaries, later biological theorists, and historians of science—many consider the distinction to be one of the conceptual pillars of twentieth century genetics.”

**First paragraphs**

For any given article, the first paragraph is the most important. It has the first sentence of the article and provides the significance statement. If you use the first sentence to identify your topic and locate it in space and time, and if you place the significance statement near the end of your first paragraph, then you will construct a good first paragraph.

Keep your first paragraphs short. Give your readers a flavor of the topic, but not a summary. In Word documents, your first paragraphs should be between seven and ten lines of text. Finally, only in special cases do we provide an outline or roadmap for *EP Encyclopedia* articles, and when that is required, it does not belong in the first paragraph.
In the *Encyclopedia*, the first paragraph also serves as an abstract for the digital article that is posted online, contained in the metadata. You do not need to know the specifics of how metadata functions, but do be aware that in addition to the tenets outlined above, the first paragraph should include relevant keywords that allow users to search for your article.

**Conclusion paragraphs**

Some writers really like conclusions, but *EP Encyclopedia* articles rarely need them. If you feel you need a conclusion, follow the advice at the end of the specialized style guides.

**Organization**

*EP Encyclopedia* articles exhibit organizations that use some elements of essay, chronological, and inverted pyramid patterns, but they do not rely on any one of those patterns. Like essays, *EP Encyclopedia* articles have a clear first paragraph that introduces the topic and makes explicit a significance statement, which functions as a thesis. Like chronologies, *EP Encyclopedia* articles tell the histories of their topics. Often, but not always, most of an article’s internal paragraphs exhibit a chronological pattern. Like inverted pyramids, the content at the beginning of *EP Encyclopedia* articles is more important than content at the end, and the articles rarely require conclusion paragraphs.

For each article category, look to the good examples of articles for ideas on how to organize your articles and reference the specialized style guides later in the handbook for specific advice on organization.

**Locate things in space and time**

Members of our audience often do not know the people and things we talk about, and *EP Encyclopedia* articles help them place those people and things in space and time. Everyone you know may know who Lamark was and when and where he lived, but do not assume that your readers do.

As you write your articles, when you introduce a new character into your history, briefly say where that person lived during the relevant point in the chronology. The more important you think the character is to the history of your topic, the more specific you should be about that person’s details. If the new character is a scientist, briefly say what biological objects the character studied. For organizations, briefly describe where the organization was located, or where it was headquartered. Some examples:

“**Two years before** Sharpey described and classified the epithelium, Wilhelm His at the University of Basel, in Basel, Switzerland, expanded the nomenclature of epithelium beyond structural or physiological characters with the introduction of the term endothelium.”

“**Five years later**, Harvard Medical School doctoral student Julia Platt, in Cambridge, Massachusetts, provided evidence based on her studies of *Necturus maculosus*
embryos, a type of aquatic salamander, that the mesenchyme that developed into the skeletal elements of the branchial arches derived from ectoderm.”

“The impetus for the creation of the HBF came from Gosney, a citrus magnate who had become interested in the benefits of selective breeding through his work in the Arizona Wool Growers Association, then in Flagstaff, Arizona, and in the development of lemon and orange groves around Los Angeles, California.”

Biological research, organisms, and taxa

Often, historians and scientists present the results of biological research with little if any mention of the type of organism used by scientists to conduct their research. They do so often to present the results as general beyond the organisms used, so that results from salamander research, for example, appear as if they generalize to amphibians or vertebrates or animals or all organisms.

For EP Encyclopedia article, when we recount the history of an experiment or of some other type of research, we aim to identify the species from which the researchers used organisms. Furthermore, if we can, we aim to identify the taxonomic scope that researchers argued their results generalized to. The first of those tasks is often easy, and the second is often more difficult.

We identify species for several reasons. Often, readers can imagine individual organisms from species easier than they can identify the mechanisms within those organisms. If a reader must learn about a new process, it often helps them to situate that process inside of an organism. Furthermore, if we include species names in our articles, then we can more easily link our content to projects like the Encyclopedia of Life.

When you introduce a species, try to find the common name and the scientific name for the species. Give the common name first, and then the scientific name in parentheses. For example: Eastern Newt (Notophthalmus viridescens).

Do not

For the EP Encyclopedia, we eschew several practices common to other forms of prose style. Below is a list of things that you should avoid in your articles.

- Do not speculate. Describe events that happened, not events that could have happened.
- Do not write hagiographies. If you write for the EP Encyclopedia, you probably like science and scientists, and you may develop affinities for your topics. Do not let those affinities infect your articles. Scientists are not unassailable, benevolent and kindly keepers of all that is good in humanity, so do not treat them as such, and do not fawn over their good qualities. EP writers are historians, not cheerleaders.
- Do not evaluate. Encyclopedia articles do not evaluate their topics. For EP Encyclopedia articles, we do not evaluate people, events, technologies, or religions. We do not write that events are fortunate or unfortunate, that a researcher was the “father of” a discipline,
that a technology was revolutionary, or that concepts were key to a movement. Insofar as you must write an evaluative statement, attribute the statement to another person like an historian of biology.

- **Avoid attributing mental states to people.** Rather than saying that “Joan believed X,” say that “Joan said X” or “Joan argued for X.” Rather than saying that “Ronald wanted Y,” say that “Ronald sought Y.” Rather than saying that “Z intrigued Maria,” say that “Maria studied Z.”

- **Avoid talking about discipline names.** There are important differences between morphology and anatomy, between taxonomy and systematics, between developmental genetics and transmission genetics, between experimental embryology and developmental mechanics, between Darwinian evolutionary biology and Neo-Darwinian evolutionary biology, between evolutionary development and developmental evolution. But for the most part, those differences do not matter in the slightest for the *EP Encyclopedia*’s primary audience. Furthermore, discipline names have so much meaning associated with them that they can be daunting for non-specialists, and conversely, are often disputed and difficult to determine the boundaries of for specialists. Do not detail the history of science by cloaking it in a string of discipline names, which remove the objects of study from view. For example: Rather than saying that “Cope was a paleontologist,” say that “Cope studied fossils.”

- **Do not attribute nationalities to people.** People move all of the time, often for strong political reasons. If a scientist born in Germany in 1920 moved in 1935 with her family to Canada, where she lived eighty years and researched, should you call her German or Canadian or German-Canadian? What were her thoughts on her nationality? Often there is no way to tell, so avoid discussing nationalities altogether. Rather than attributing nationalities to people, locate them in space and time. Name the cities and nations they lived in, and say when they lived in those places.
7. Specific Issues of Style

Below is an index of specific issues about style. Pay special attention to capitalization, italicization, and number conventions as they occur frequently. Refer back to this section as you write, edit, and revise articles.

Abbreviations

- No periods are required in degree abbreviations, e.g. PhD and MD.
- Use lowercase when referring to any master’s degree but capitalize when specifying actual degree title, e.g. “Master’s of Science.”
- United States of America is abbreviated USA or the US without periods or spaces.
- Similarly, United Kingdom is abbreviated UK.
- Do not use spaces or punctuation for organization abbreviations, e.g. FDA, NIH, MBL.
- Introduce a person in text by full name the first time, then use last name only.
- Name initials must have periods and a space between initials, e.g. T. H. Morgan.
- For species, give the common name followed by the species name in parentheses. Give the whole species name the first time it appears and use the common abbreviated form thereafter. Capitalize the genus name, but not the species name. Standard abbreviation form is the capitalized genus initial and the species name. For example, write *C. elegans* for *Caenorhabditis elegans*. For very common experimental organisms, using only the genus name is permissible, e.g. *Drosophila, Xenopus, and Bacillus*.
- Do not use “%,” but spell out “percent,” e.g. sixty percent.

Capitalization, Titles, Headings, and Sub-Headings

- Only capitalize the title of a person or department or the words “university” or “college” when referring to the official name.
- Nationalities and languages are always capitalized, e.g. English, Cuban, Hindi.
- In titles, headings, and sub-headings, capitalize all major words (generally no prepositions, conjunctions, or articles).
- Capitalize named periods of time, e.g. Middle Ages, Renaissance.

City Style

- For cities in the US and Canada, introduce City, State/Province, e.g. Toronto, Ontario.
- For all other cities, introduce them as City, Nation, e.g. Freiburg, Germany.
- After you have introduced a city and its state/province or nation in an article, do not include nation or state/province information with further instances of the city’s name.
Dates
- Use day month year format (without punctuation), e.g. 28 August 1956.
- Write dates without commas, e.g. “In May 1894 she joined…”
- Decades do not need apostrophes, e.g. 1750s, 1860s, and 1970s.
- Spell out numbered centuries without capitalization, e.g. sixteenth century.
- Capitalize named periods of time, e.g. Middle Ages, Renaissance.

Degrees
- No periods are required in degree abbreviations, e.g. PhD and MD.
- Use lowercase when referring to any master’s degree but capitalize when specifying actual degree title, e.g. “Master’s of Science.”
- Terminal doctoral degrees outside of the US and Germany are often not abbreviated PhD. Refer to doctoral degrees as doctorates. If you find documentation that the person earned a PhD, then you may refer to the degree as such.
- Medical degrees are not everywhere abbreviated as MD. Refer to medical degrees as medical degrees unless you find documentation that the person earned an MD.
- Undergraduate degrees are labeled and abbreviated differently throughout the world. If you cannot find documentation that explicitly names a person’s undergraduate degree, call it an undergraduate degree.

Foreign Words, Names, and Titles
- Italicize non-English words, and include an English translation in parentheses afterwards, e.g. bauplan (body plan).
- If a document was published in a language other than English, and you mention that title in text, give the foreign title and then enclose an English translation in parentheses, e.g.:
  - “…then Zhang authored her first book Wo de yi jiao rensheng (My Life as a Doctor and Teacher)…”
  - “…Mangold’s experiments, which she published in 1924’s “Über Induktion von Embryonalanlagen durch Implantation arfremder Organisatoren” (Induction of Embryonic Primordia by Implantation of Organizers from a Different Species), prompted her to…”
- If a document was published in a language other than English, and you cite it in your references, give the foreign title and then enclose an English translation in brackets, e.g.:
Genes and Gene Products

- Every time you discuss a gene or a gene product, label them as such, e.g. “...researchers used the gene *hedgehog*, which coded for the protein hedgehog...”
- Except for human genes, italicize gene names, but not the names of the genes’ protein products, e.g. *ospA* gene, OspA protein.
- Write the names of human genes in all caps and without italicization, e.g. CD5.
- Capitalize only the first letter of animal genes, e.g. Mouse Cd5.
- Virus and fungus gene names are italicized, lowercase, and usually three letters, e.g. *src*.
- For other issues, follow the CDC guidance on gene nomenclature. [http://wwwnc.cdc.gov/eid/pages/scientific-nomenclature.htm](http://wwwnc.cdc.gov/eid/pages/scientific-nomenclature.htm)

Hyphens, Em Dashes, and En Dashes

- Use a hyphen to join a prefix with an adjective, e.g. anti-Darwinian.
- Do not hyphenate “-ly” adverbs, e.g. highly developed species.
- Use em dashes—the longest dash—sparingly to indicate a strong break in the sentence.
- Do not put spaces before or after dashes.
- Use en dashes to denote an inclusive range, e.g. 1943–1998, pp. 234–45.
- Avoid substituting dashes for “through” or “to” in your text, e.g. from 1920 through 1925, they weighed from three to four grams.
- On a Macintosh, make an en dash by holding “option” and the hyphen “-” key, and make an em dash by holding “shift” and “option” and the hyphen key.
- On a PC and in Word, make an en dash by typing letters, then a space, then two hyphens, then a space, then more letters. The text autocorrects, e.g. word – word (be sure to remove the spaces on each side of the inserted en dash). To make an em dash, type letters, then two hyphens, then more letters. The text autocorrects, e.g. word—word.

Italicization

- Italicize non-English words.
- Italicize rather than underline book and journal titles that you refer to in your text.
- Do not italicize journal article titles, even if in a foreign language. Use quotation marks.
- Italicize TV shows, but not individual episodes nor station names, and movie titles, e.g. the *NOVA* episode “The Miracle of Life” on PBS.
- Italicize species names and their abbreviated forms (check Taxonomy).
- Italicize gene names, but not their protein products (check Genes and Gene Products).
- Italicize court decisions in article titles and text, e.g. *Weber v. Stony Brook*.
- Italicize abbreviations of court decisions, e.g. …the *Weber* decision left many…
- Do not italicize court decisions in the resources, e.g. *Weber v. Stony Brook Hospital*, 60 N.Y. 2d 208 (1983).
- Do not italicize statute names.
Laws

- Check **Italicization** for those rules.
- The first time you mention a law, categorize it as a law, e.g. “...scientists had to follow the law *Weber v. Stony Brook*...”
- Do not include the full legal citation in the text, but only on the sources.
- With the first introduction of a law in an article, include the law’s year of origination at the end of the law’s name, e.g. *Weber v. Stony Brook* (1983). Do not include the year after the initial introduction.

Literature

- Italicize journal, magazine, book, and TV show titles. Check **Italicization** for more rules.
- Put titles of articles from journals, magazines, and TV show episodes, in quotation marks, e.g. “1953 and all That: A Tale of Two Sciences” (1984).
- With the first introduction of a piece of literature in an article, include the literature’s year of origination at the end of the piece’s name. See the above bullet for an example. Do not include the year after the initial introduction.

Names

- Introduce people and things with their full names.
- After the first use of the full name, if you refer to the person or thing again by name, use only the last name or abbreviated names.
- Use names, not pronouns, when you first talk about people or things in any paragraph.

Nationalities

- Do not attribute nationalities to people. Instead, locate them in space and time according to **City Style**.

Nobel Prize

- This is the correct way to refer to the Nobel Prize in Physiology or Medicine. Unless you are only saying “Nobel Prize” in general, use the full and correct title as shown above.

Currency

- When less than 100, small monetary denominations are spelled out with the currency indicated afterwards, e.g. fifty-five cents, ninety-eight pounds, seventy-six euros.
- For more than one hundred but less than a million, numerals are used preceded by the currency abbreviation (e.g. $85,000, £110).
- For more than a million decimals and the monetary denomination is used (e.g. $25 million, €6.5 billion).
Numbers

- Use Arabic numerals for all units of measure, e.g. 400 mm.
- Use Arabic numerals for fractions, ratios, and comparisons, e.g. 1.5 percent, 1/5, or 5 out of 40 mice.
- Do not use “%,” but spell out “percent,” e.g. sixty percent.
- Spell out whole numbers zero through one hundred, e.g. four liters, thirty-two children.
- For numbers over 100, use Arabic numerals, e.g. 110, 85,000, 999,999.
- For numbers over a million, follow above rules for whether to spell out the number and write the largest denomination, e.g. five million, 150 million, 1.5 million.
- Spell out numbers related to time (through one hundred), e.g. eighty days, 120 years.
- Major exception: embryonic stages must remain as numerals, e.g. stage 1, etc.

Punctuation and Space Placement

- Use serial commas, e.g. red, white, and blue.
- Commas and periods go inside quotation marks; semicolons, colons, and question marks (if not part of the quotation) go outside.
- Use a comma after city and state or country: “Born in Scandiano, Italy, on...”
- Use a space between all numbers and units of measure (4 mm).
- Use quotation marks around article titles in text.
- Use one space after the ending of any sentence.

Taxonomy

- For Linnaean names, italicize genus and species names.
- Capitalize the genus name, but not the species name.
- Give common name with the whole species name the first time it appears and use the common abbreviated form thereafter, e.g. gastric brooding frog (*Rheobatrachus silus*) followed by *R. silus*.
- Standard abbreviation form is the genus initial (capitalized) and the species name. For example, write *C. elegans* for *Caenorhabditis elegans*.
- For very common experimental organisms, using only the genus name is permissible, e.g. *Drosophila, Xenopus, and Bacillus*.

Titles

- No honorifics before name. Do not refer to people with titles like Professor, Dr., Mr., etc.
- If a person has a British title, such as Sir or Dame, or a Germanic title, such as Duke, use those titles in People article titles and when you first introduce that person in her People article. (While the Germanic particle “von” or “zu” can denote nobility prior to the abolition of monarchy in the early nineteenth century, they are generally considered part of the person’s surname.)
- Introduce a person in text by full name the first time then use last name only.
Spelling
- Use American, rather than British, spelling.

This/That
- “This” and “that” have different functions as pronouns.
- “This” is self referential, e.g. “In this paper, I argue...”
- “That” is not self referential, e.g. “Bonner wrote a book. In that book, he said...”, not
  “Bonner wrote a book. In this book...”
- Only rarely should you use “this” as a pronoun.
- If you use “this” or “that” as pronouns, make sure their referent is clear.

These/Those
- “These” and “those” have different functions as pronouns.
- “These” is self referential, e.g. “In these pages I use 500 verbs.”
- “Those” is not self referential, e.g. “Gilbert had four shelves. On those shelves he had...”, not “Gilbert had four shelves. On these shelves he had...”
- Only rarely should you use “these” as a pronoun.

That/Which
- When you have a clause that describes a subset of the objects to which a word can refer, do not separate the clause with a comma, but use “that” as the first word in the clause. e.g. “She used the frogs that were brown in her experiment.”
  - “Frogs” is a word that refers to many animals. The clause “that were brown” describes a subset of those animals. We do not separate the clause with a comma.
- When you have a clause that further describes the noun immediately before the clause, separate it with a comma and use “which” as the first word in that clause. e.g. “She used the salamanders, which were green, in her experiment.”
  - The salamanders she used were each green.
8. Specialized Writing Guides

The guides on the following pages will help you organize your article. The questions within the guides provide entry points for research and ideas about how to link to other *EP Encyclopedia* articles. Do not treat the guides as checklists, but as starting points to organize your articles. In most cases, you will do better to mimic the style and organization of the articles listed as good examples than you will do to follow exactly the specialized guides.

Some categories of articles are easier to write than others, especially for beginners. People, Experiment, and Technology articles are good articles for beginners to write. Sets of them are also good bases for Organization, Concept, and Context articles. As you start writing your first articles, or you start writing new clusters, start by writing articles of the first three kinds, and then build from them to other kinds of articles. A good strategy is to pick a person for a People article, read her primary works related to embryology, read key secondary literature about her, and then write the article. Then, based on her primary works, which you have already read, write Experiment, Literature, and Technology articles.

The criteria for each category are suggestions to help you research your topic and order your article. Your topic may not meet all of the criteria. If you cannot answer many of a category’s questions for your topic, then consider a different category (e.g. a researcher’s most popular published article may qualify as a literature, experiment, technology, or concept article depending on how it is framed). You may need to further bound your topic in time, place, or surrounding a person. Or you may need to switch to a topic with more complete and available resources.

The formats and paragraph numbers are also suggestions. Once you learn how to write *EP Encyclopedia* articles, then you may write your articles with formats different from the suggested ones.

Many of your articles will rely on old books and articles as primary sources. Always check to see if you can find those documents at the following sites. If you find the complete documents, list the links to the appropriate pages in your Sources.


Specialized Guide for PEOPLE Entries

Notes:

● New writers for the *EP Encyclopedia* should begin with a People article, as the organization of a person’s life is chronological with a clear beginning, middle, and end. People articles allow you to write for the style of the *Encyclopedia* without having to worry about what to include and exclude in less discrete article subjects. After you have written a People article, you may branch out to more complex types of article.

● Always start your research for People entries by checking the [Complete Dictionary of Scientific Biography](https://www.oxforddictionaries.com/us/ oxford-dictionaries/biography) and the [National Academy of Sciences online biographies](https://www.nasonline.org/). Also, you should read several of the person’s authored works that are significant to embryology’s history before you write. Focus on books, research articles, popular articles, etc.

● This guide focuses on scientists, but People entries can be about non-scientists too, just interpret this style guide more generally.

Good Examples:

*Gunther von Hagens* (1945– )
*John Bertrand Gurdon* (1933– )
*David Starr Jordan* (1851–1931)
*Wilhelm Ludvig Johannsen* (1857–1927)
*James Marion Sims* (1813–1883)

Title

Use the full name of the person. List the name in order of given, middle, and family name. After the name, include the year of their birth and death in parentheses. For people who are still alive, leave the year of death blank. Use en dashes to separate the years.

Introduction (~1 paragraph)

*Identify the person.*

● Follow style guide conventions for first sentences. Who is the person, when and where did they work, and what general research did they conduct?

● What was or is the full name of the person? If the name is in a language other than English, report both the original name and the English translation. For those whose name changed through marriage or choice, use the last name that the person adopted in the title and throughout the article.

● When and where did the person live? In what major institutions did she work? (Avoid ascribing a nationality to the person, e.g. British, German, American, etc.)
What were the person’s important experiments, technologies, or concepts that are relevant to the description of the person’s work? (Try not to categorize a person into disciplines such as anatomist, biologist, morphologist, etc.)

Follow style guide conventions for significance statements. Why is the person important to the history of embryology, developmental biology, or reproduction? What is the significance of her main contributions?

Body I (~1 paragraph)
Describe early life and family history.

Who were the person’s parents? Name the mother first, followed by the father. When and where was the person born? How many siblings?

Elaborate upon the person’s childhood and early character if information is available. What formative experiences did she have as a child?

What early education did she receive (private tutor, primary school, high school)? What childhood hobbies did she pursue?

Body II (~1-2 paragraphs)
Describe education and early career.

What schooling or training did the person pursue? Elaborate upon the schooling and achievements. What degrees did she pursue (institution, plan of study, research area)?

Describe her graduate work. What was the subject of the master’s thesis or doctoral dissertation? Who was the private investigator of the lab she worked in, or who served as the chair for her graduate committee?

Did the person work with figures also important to the history of embryology such as other mentors, collaborators, or colleagues?

Can you show examples that demonstrate the main features of the person’s personality, or ascribe those personality traits to a biographer? How did those examples influence her life or career trajectory?

Body III (~2–5 paragraphs)
Describe scientific career and achievements.

Track the person’s research trajectory by relying on original sources like journal articles and books she published. Simultaneously track the person’s personal milestones, like marriage, the birth of children, divorce, etc. Try to integrate both into the narrative.

When discussing her scientific achievements, contextualize them historically by including information about the findings and concepts of preceding scientists that made her work possible.

If a person has a rich research career, focus on the work most relevant to the EP. You can include a brief description of other research endeavors, provided they are not the focus.
Answer the following questions to guide the discussion of her career:

- Did the person write important books or articles? What are their titles? What are they about? Be specific.
- With whom did the person collaborate? With whom did the person debate? What was the dispute, and how did that controversy and debate arise?
- Did the person invent any instrument or procedure important to embryology? Did she contribute to the understanding of specific mechanisms? Did the person shape or modify key embryological concepts?
- What are the major institutions where the person worked? Did the person help create any organizations? Did she contribute to the growth of preexisting institutions?
- Are there important biographies about the person? Which ones? Who are the authors and what kind of perspective do they provide on the person’s work?

Body IV (~1-2 paragraphs)
Describe impact and reception of research.

- Are the person’s achievements contentious or still debated? If yes, why, and by whom? Report the main aspects of the debate.
- Discuss the awards and distinctions the person may have achieved. If you can detail those achievements in chronological context do so to the extent that it is possible. If that interrupts the flow and chronology, memberships in societies, awards, and affiliations can also be listed at the end of the article.
- Most researchers will have a huge number of affiliations, awards, and distinctions at the end of their career. Sort through to determine the most prestigious and significant.

Conclusion (~1 paragraph)
End the article with the date and place of the person’s death. For people still alive, end the article with a description of where they live or work and with their most recent activities. Do not summarize the person’s life or significance.
Specialized Guide for EXPERIMENT Entries

Notes:

- Generally, if a scientific article has a methods section that describes the process by which people conducted research, you should treat the scientific article as the primary source for an Experiment article, and not as the primary source for a Literature article.
- Primary research articles from academic journals are where you will find the information for many Experiment articles, but the subject of Experiment articles is the research within the article and not the primary resource itself. (See the style guide for Literature article if you prefer that focus.) You can report the title of the primary research article in which researchers published their results, but do not make that literature the subject of your first paragraph or of most of your sentences. The experiment and the research is the focus.
- Refer to the introduction and literature review at the beginning of the article to serve as the author’s reported motivation and justification for the experiment, as it will help inform the intellectual history of how the research and experiment developed. Report that history of the experiment, then move on to chronologically to describe the experiment’s beginning, middle, and end.
- *EP Encyclopedia* writers have written two kinds of Experiment articles. In the first, EP writers highlight one journal article as a primary source, and the research described in it as the subject of their encyclopedia article. In the second, they report the research described across several journal articles over a span of time. You may follow either format, but if you highlight the research from one journal article, you still must contextualize it with information from other primary sources.
- Experiment articles are about research, so in addition to bench science you may write about a qualitative study, a survey, a computer simulation, etc.

Good Examples:

Highlighting research from a single primary source:

"Behavioral Thermoregulation by Turtle Embryos" (2011), by Wei-Guo Du, Bo Zhao, Ye Chen, and Richard Shine

The First Successful Cloning of a Gaur (2000), by Advanced Cell Technology

Corticosteroids' Effect on Fetal Lung Maturation (1972), by Sir Graham Collingwood Liggins and Ross Howie

"Further Experiments on Artificial Parthenogenesis and the Nature of the Process of Fertilization" (1900), by Jacques Loeb

“On the Nature of the Process of Fertilization and the Artificial Production of Normal Larvae (Plutei) from the Unfertilized Eggs of the Sea Urchin” (1899), by Jacques Loeb
Highlighting research from a series of primary sources:

The inductive capacity of oral mesenchyme and its role in tooth development (1969–1970), by Edward J. Kollar and Grace R. Baird


Alexis Carrel's Immortal Chick Heart Tissue Cultures, (1912–1946)

Title

Name the experiment something you think fits, attribute it to a person or a research group, and bound it within a timeframe. If drawing the experiment from a single resource, the title should not be the title of the primary research article. For example:

- Jacques Loeb's Experiments with Artificial Parthenogenesis in Marine Worms (1900–1901)
- China’s First Baby Conceived through In Vitro Fertilization-Embryonic Transfer (1988), by Zhang Lizhu

Introduction (~1 paragraph)

Identify the experiment(s).

- Follow style guide conventions for first sentences. What is the experiment? Who conducted the experiment (full names, never use “et al.”)? When and where did the researchers conduct their experiment?
- State that the subject of your article is an experiment, to quickly establish what type of content a reader should expect from the article.
- What was the phenomenon investigated in the experiments? What was the problem addressed? What were the main results of the experiments?
- Follow style guide conventions for significance statements. Why is the experiment important to the history of embryology, developmental biology, or reproduction? What is the significance of its contributions?

Body I (~2 paragraphs)

Provide historical and conceptual background to understand the experiments.

- Provide basic background information about the scientist or the group of scientists who conducted the experiment. Where did they work, for how long, what area of expertise did the researcher(s) possess?
- In what institutional context did the scientists conduct the experiments? Be specific. When, in what country, and in what historical period?
• What concepts, theories, and ideas constitute background for the understanding of the experiments? What were the main ideas about the phenomenon at the time the experiments were performed? How did the experiment’s results help change them?
• What were the specific phenomena that the scientists investigated through the experiments? What concepts, mechanisms, or entities arose from the investigation?
• Where are the experiments first described and by whom? In what book or article? Did other articles refer to the experiments in the history of embryonic research?

Body II (~3 paragraphs)

*Describe experimental design, methodology, and results.*

• Did the researchers test hypotheses? If so, what were they? If not, what other questions did the researchers ask to motivate their investigations?
• What predictions did the scientists have based on their hypotheses? Even experiments without explicit hypotheses often have predictions that shape how researchers design their experimental methods.
• How did the scientists design their experiments? What procedures and instruments did the scientists use to conduct the experiment? Why did the scientists choose to design their experiment in that manner? Provide a detailed description of the experiment.
• Did the researchers encounter any difficulties in performing their experiment (human error, technical factors, background “noise,” unexpected results, etc.)? How did they respond to those difficulties?
• What were the results? What kind of data or observations did researchers obtain? How did scientists interpret the results? Were the observations unambiguous? Were they contentious? Have other experiments confirmed or overturned the results?

Body III (~2 paragraphs)

*Describe impact and consequences of the experiment.*

• How did the scientific community react to the authors publishing the results of their experiment? Are the experiments relevant to disciplines other than embryology? Are the experiments still discussed and referenced today in the scientific community?
• Did the experimental results fall out of favor or become obsolete over time? How did the significance of such findings shift over time?
• Did scientists or the public debate the interpretation or impact of such experiments? What sort of societal reaction occurred (religious, social, political institutions, etc.)?

Conclusion (~1 paragraph)

Do not summarize the article. Reiterate why the experiment is significant to the history of embryology, and name a few of the important things that the experiment influenced, be they other experiments, people, laws, etc.
Specialized Guide for TECHNOLOGY Entries

Notes:

- Technology articles are best suited to discussing the development of a particular procedure, instrument, or technique. Technology topics best suited to *EP Encyclopedia* article are generally bound in some manner unless the technology is discrete or short lived. Ways to frame your article and keep it from becoming unruly include limiting the discussion of the technology to its original incarnation as an inventor’s novel development, to how it evolved over a certain period of time in a particular place, or an institutional tradition of the technology’s use.

Good Examples:

- James Marion Sims's Treatment of Vesico-Vaginal Fistula
- Gunther von Hagens' Plastination Technique
- Nuclear Transplantation
- 2D Obstetric Ultrasound
- Ziegler Wax Embryo Models

Title

The name of the technology generally suffices, however if your article is bound by a person, place, or time, include those specifics in the title.

Introduction (~1 paragraph)

*Identify the technology.*

- Follow style guide conventions for first sentences. What is the technology? Provide a simple definition. Who invented or modified the technology? When and where was it invented?
- When first referring to the technology, include its full name. If the technology has both a scientific and a more common name, place that common name in parentheses following the first use of the original name. Use either name, just be consistent. If the original name of the technology was not in English, provide the original name followed by a translation.
- Describe the purpose of the technology and why it was developed.
- Briefly describe the technology, who uses it, and how it is used.
- If the technology changed over time, explain that shift in use, function, or application.
- Follow style guide conventions for significance statements. Why is the technology important to the history of embryology, developmental biology, or reproduction? What is the significance of its contributions?
Body I (~2 paragraphs)

*Provide historical background to understand the technology.*

- Who, in more depth than the first paragraph, invented the technology? Describe previous technologies or research and how the inventor built on that previous work.
- In describing that history of the technology’s emergence, how did institutional, cultural, and social contexts influence its development?
- What were the specific phenomena that the technology helped to explain? What concepts, theories, or ideas constitute the necessary background for the understanding of its invention? Introducing that background knowledge here allows your audience to better follow along in the next section where you detail the technology.
- Where is the technology first described and by whom?

Body II (~3 paragraphs)

*Describe the technology in detail.*

- Describe the form of the technology. What are the steps of the procedure? Or what are the parts of the instrument and how are they assembled? How did the steps of the procedure or the parts of the instrument change over time?
- Describe the function of the technology. What are the instruments used in the procedure, or conversely, during what procedures was the instrument used? How did that change over time?
- Is the instrument or a procedure an improved version of an older incarnation? If so what and how did it evolve?
- Under what conditions and why did people use the procedure or instrument? How did those conditions or reasons for use change over time?

Body III (~2 paragraphs)

*Describe impact and consequences of the technology.*

- How did the scientific community react to the technology’s invention? Was the use of the technology contentious?
- What was the reaction of religious organization or other social and political institutions to its use? What are their positions now?
- What experiments have made use of the technology in the history of embryonic research? In what articles were these experiments reported?
- Is the technology important for disciplines other than embryology? Is it still used today?

Conclusion (~1 paragraph)

Do not summarize the article. Reiterate why the technology is significant to the history of embryology, and name a few of the important things that the technology influenced, be they other technologies, experiments, people, laws, etc.
Specialized Guide for LITERATURE Entries about Books

Notes:
- Recent books can be problematic as subjects of *EP Encyclopedia* entries. The more recent the book is, the harder it is to identify the significance to embryology’s history. If you pick a recent book, look for reviews, popular press articles, and science outreach articles that describe and contextualize its significance.
- Verb tenses for Literature entries are tricky. When you talk about the history and context of the literature, use past tense. When you talk about the content of the literature, you may use present tense. An example, with the different verb tenses italicized: “Thomas published his book in 1934. In the book, Thomas argues that large fish eat too many tadpoles.”
- Remember that you are writing the biography of the book, so you need to detail the literature’s history and the context of its creation, in addition to the content of the book, and its reception after publication.
- Movies also follow the format below.

Good Examples:

*Our Bodies, Ourselves* (1973), by the Boston Women's Health Book Collective
*Form and Function* (1916), by Edward Stuart Russell

Title
Use the title of your book in italics as the title of your EP entry, followed by the year of publication in parentheses, a comma, “by,” and finally the primary author’s name. If writing on a movie, do not include an author name in the title.

Introduction (~1 paragraph)

*Introduce the book.*
- Follow style guide conventions for first sentences. What is the title of the book, who wrote it, and when was it published? Provide a simple explanation of the overall thesis or topic of the book.
- What is the full name of the book? If the title was in a language different than English, report first the original title and then the English translation in parentheses. You may then refer to the English title throughout the article.
- Elaborate on publishing details. When, where, and by whom was the book published?
- Elaborate on the author. Include both the person’s full name and literary name if the two differ. Also include where that person worked, and a brief motivation for the book.
Elaborate on the topic and main theses of the book.
Follow style guide conventions for significance statements. Why is the book important to the history of embryology, developmental biology, or reproduction? What is the significance of its contributions?

Body I (~1-2 paragraphs)
Provide context for understanding the book and its significance to the history of embryology.
- What kind of book is it? Is it a scientific book, a textbook, a novel, a collection of essays, or something else? In what language was the book written? Was the book translated into other languages? Is it one volume of a larger collection? Are there different editions?
- Who was the intended audience of the book? Has the audience changed over time? Is it a book for specialists? Is it a popular book?
- Provide a brief biography of the author as it relates to the book. Where did the author live and work while writing the book? Was the author affiliated with any relevant institutions or organizations? Was she influenced or motivated by any specific people, theories, or beliefs in writing the book? What were her stated intentions for writing the book?
- Did other literature, experiments, or theories important to embryology’s history influence the creation of the book? If so, elaborate on how the book is situated in that particular research tradition.

Body II (~3-5 paragraphs)
Describe the book in detail.
- How many chapters compose the book and how is it organized? This type of article is the exception to the “no roadmap” rule of the EP Encyclopedia, and you can begin this “Body II” section with a short description of the book’s composition as you intend to address it in the article.
- If it is a collected work, or only some of the chapters are relevant to the history of embryology, provide a brief description of the non-relevant content but make the focus of your article the most relevant chapters.
- Summarize the content and main theses of the book as they are presented in the literature. You can choose how to organize the content you discuss in the article, provided it unfolds in the same manner as the book. One way to do that is discussing the content chapter by chapter, although some books allow you to group like chapters together in a thesis-based or topic-oriented organization.
- Describe the multimedia of the book provided it is relevant. Are there images, graphs, or tables that are integral to understanding the book? Is the cover design notable?
- Are there different editions of the book? Did the organization or theses of the book change with subsequent revisions? Did the author introduce new chapters or sections?
Body III (~1-2 paragraphs)

Describe reception and impact of the book.

- What impact did the book have at the time of its publication? How did the scientific community receive it? Was the book important outside a community of specialists? If so, describe its broader impact and how it appealed across audiences.
- What impact did the book have on society at the time of its publication? Did important journals and scholars review the book? Did the book’s theses provoke important debates?
- What is the history of the book’s circulation? Did its impact and importance stretch beyond the initial publication run? Is the book relevant today?
- Did the book influence subsequent publications by academics or the general public in direct opposition or accordance with the theses the book details?
- Did the book influence further publications or research trajectories by the author that were important to the history of embryology? If so, which?

Conclusion (~1 paragraph)

Do not summarize the article. Reiterate why the literature is significant to the history of embryology, and name a few of the important things that the literature influenced, be they other pieces of literature, experiments, people, laws, etc.
Specialized Guide for LITERATURE Entries about Articles

Notes:
- Generally, if a scientific article has a methods section that describes the process by which people conducted research, you should treat the scientific article as the primary source for an Experiment article, and not as the primary source for a Literature article. Some exceptions can be made. For instance, it may be more difficult to describe the experimental design relevant to some research articles published in the eighteenth and nineteenth centuries, and those may be better suited to a Literature article.
- When perusing research journals, opinion pieces, review articles, and letters to the editors can make for good Literature articles.
- Just because a piece of literature fits one of the categories in the previous bullet point, it does not mean the piece of literature is a good subject for an encyclopedia article. Recent articles can be problematic as subjects of *EP Encyclopedia* entries. The more recent the article is, the harder it is to identify the significance to embryology’s history. For articles published in the twentieth and twenty-first centuries, check the number of citations they have. If an article has not been cited many times, you have reason to conclude that it is not very significant.
- Verb tenses for Literature entries are tricky. When you talk about the history and context of the literature, use past tense. When you talk about the content of the literature, you may use present tense. An example, with differently tensed verbs italicized: “Thomas published his article in 1936. In the article, he argues that fish eat too few tadpoles.”
- Remember that you are writing the biography of the article, so you need to detail the literature’s history and the context of its creation, in addition to the content of the article, and its reception after publication.
- Television episodes also follow the format below.

Good Examples:
"The Chemical Basis of Morphogenesis" (1952), by Alan M. Turing
"Cell Deaths in Normal Vertebrate Ontogeny" (1951), by Alfred Glucksmann
"Mechanistic Science and Metaphysical Romance" (1915), by Jacques Loeb
NOVA’s “The Miracle of Life” (1983)

Title
Use the title of the literature as the first part of your entry’s title, followed by the year of the publication in parentheses, a comma, “by,” and finally all of the cited authors’ names. Put the literature’s name in quotes, and if quotation marks are within the title of the literature change those to single quotes (e.g. “An Article ‘Title’ Worth Reading” (2015), by John Doe).
Introduction (~1 paragraph)

*Identify the article.*

- Follow style guide conventions for first sentences. What is the title of the article, who wrote it, when was it published? Provide a simple explanation of the overall thesis or topic of the article if it is not self-explanatory by the title.
- In the first sentence, if more than three people wrote the article list the primary investigator(s) with “and colleagues,” “-’s research group,” or something to that effect and elaborate on the full authors in the next paragraph. Do not use “et al.”
- Also include where that person, team, or research group worked, and a brief motivation for writing the article, to be elaborated upon in the next paragraph.
- What was the full name of the article? If the original title was in a language different than English, report the original title and then the English translation in parentheses. You may then refer to the English title in the article.
- Elaborate on publishing details. When was the article published, and in what journal?
- Elaborate on the topic and main theses of the article.
- Follow style guide conventions for significance statements. Why is the article important to the history of embryology, developmental biology, or reproduction? What is the significance of its contributions?

Body I (~1 paragraphs)

*Provide context for understanding the article and its significance to embryology.*

- What kind of article is it? Is it a review article, commentary, an opinion piece, a clinical case, a letter to the editor, or something else? If the article was written in another language than English, when was it translated for an English-speaking audience?
- Provide a brief biography of the authors as it relates to the article. Where did the author, team, or research group work while writing the article? If they collaborated across different institutions, be specific about individual expertise or involvement in the creation of article. If the author(s) are affiliated with institutions or organizations that could be considered a conflict of interest, or motivation for the positions they take, disclose that.
- Did other literature, experiments, or theories important to embryology’s history influence the creation of the article? If so, elaborate on how the article is situated in that particular research tradition.

Body II (~3 paragraphs)

*Describe the article in detail.*

- What are the main parts or organization of the literature? This type of article is the exception to the “no roadmap” rule of the *EP Encyclopedia*, and you can begin this “Body II” section with a short description of the literature’s composition if that structure will help the audience better follow along with your discussion.
● Summarize the content and main theses of the article as they are presented in the literature. You can choose how to organize the content you discuss in the article, provided it unfolds in the same manner as the literature.
● What is the content of the article? What are the conclusions of the article? Be specific.
● Describe the multimedia of the article provided it is relevant. Are there images, graphs, or tables that are integral to understanding the article?

Body III (~1-2 paragraphs)

Describe the reception and impact of the article.

● What impact did the article have at the time it was published? Is it a highly cited article? How did the scientific community receive it? How did other communities receive it?
● What impact did the article have on society at the time of its publication? Did important scholars respond to the article? Did the article’s theses provoke important debates?
● Is the article still cited, and if so, in what way do people refer to it? Are there important historical works talking about the article and its authors?
● Did the article influence further publications or research trajectories by the author that were important to the history of embryology?

Conclusion (~1 paragraph)

Do not summarize the article. Reiterate why the literature is significant to the history of embryology, and name a few of the important things that the literature influenced, be they other pieces of literature, experiments, people, laws, etc.
Specialized Guide for LAW Entries about Case Laws

Notes:

- Before writing your article, read the original court decision and any relevant statutes challenged in the court decision. You can find the court decision and relevant statutes on LexisNexis (behind a paywall). Do not rely solely upon others’ interpretations of the initial ruling, but do read others’ interpretations to get at the significance of the decision.
- Italicize case law names, and their abbreviations, in your text. Do not italicize them in the title or references cited section of your article.
- Court systems differ by state, and between the state and federal levels. You will have to understand the court hierarchy relevant to the jurisdiction in which your case was tried.
- A complete list of the federal court system is located here: http://www.library.unt.edu/govinfo/assets/images/judicialorg.gif/.
- Here is an example of the court system for Virginia: http://www.courts.state.va.us/courts/orgchart_jud_system.pdf.
- Do not use the terms “plaintiff” and “defendant,” as they differ when the case progresses through the different levels of the court system. Refer to the litigants by last name.

Good Examples:
Gonzales v. Carhart (2007)
Berman v. Allan (1979)

Title
Use the title of the case, followed by its year in parentheses.

Introduction (~1 paragraph)

Identify the case.

- Follow style guide conventions for first sentences. What is the case’s name, when was it decided, and what was the decision?
- Where was the case decided, at what level (e.g. state appellate court, state supreme court, US Supreme Court, etc.), and whom (e.g. single judge, panel of justices, a jury, etc.)?
- Who were the litigants and what were their positions? Provide brief information to be elaborated upon in the next paragraph.
- Elaborate on the ruling, holding, or finding of the decision to provide the necessary background for the decision’s significance.
- Follow style guide conventions for significance statements. Why is the decision important to the history of embryology, developmental biology, or reproduction? What is the significance of its contributions?
Body I (~1-2 paragraphs)

*Provide context to understand the history of the case and its significance to embryology.*

- Describe the history of the litigants. Who were the parties involved? What was the basic issue that caused one of the litigants to file suit? Explain who each of the litigants were, their positions, and how the suit arose. Explain who argued the case for each litigant and any relevant legal or personal history to the case.
- Describe the history of relevant case law. If the case is challenging the constitutionality of a statute, what is the name of that statute, and what does that statute say? Who enacted that statute and when?
- Describe relevant legal precedent. On what precedents did the case rely? When and where were those decisions occur, and what were the details of such?
- Does the case fit into a social or scientific contexts external to the court? How did those public opinions influence or respond to the case?
- Were there any *amicus curia* briefs from external parties filed? If so, who authored them and what did they argue?

Body II (~2-4 paragraphs)

*Describe the legal process in detail.*

- Trace the case’s history of decisions through lower courts. Include relevant dates, rulings, and judges. Do not “lose the people” in this process. While you are writing a history of the case law, focusing on the litigants, lawyers, judges, and expert witnesses is integral to writing law for a public audience.
- Describe the key legal arguments of the case. If the case relied on precedents or prior case law, how did the new decision affect how lawyers argued and judges relied on the old precedents?
- Describe the role of science in the case. What scientific concepts were used in the case’s history and who introduced them? Did the case rely on any testimony from scientists? If so, whom, and what was the content of that testimony? Did the case rely on any literature that was important to the history of embryology? If so, what was the literature?
- Who were the judges that authored the decision, what was the vote of the court, and were there any dissenters? If so, introduce the argument(s) of their written dissent.

Body III (~2-3 paragraphs)

*Describe the reaction and impact of the case.*

- Was the case appealed? If so, when, by whom, and to what court? Did the court accept the appeal, and if so, what was the decision? If one of the litigants appealed and the appellate court rejected the case, include that as well.
- How has understanding of the case’s ruling been used through time? Did the case become an important precedent for other laws? If so, which laws?
● What was the scientific and social impact of the case ruling? Has any literature important to the history of embryology been published regarding the case? If so, what is it, who authored it, and why is it important?
● Is the finding of the case still valid in its jurisdiction? Have courts of similar jurisdiction decided similarly?
● What became of the litigants involved in the case?

Conclusion (~1 paragraph)
Do not summarize the article. Reiterate why the law is significant to the history of embryology, and name a few of the important things that the law influenced, be they other laws, organizations, pieces of literature, people, ethics, etc.
Specialized Guide for LAW Entries about Promulgations

Notes:
- Promulgations include legislation, executive orders, statutes, codes, etc.
- Before writing your article, read the original legislative or executive decision. Do not rely solely upon others’ interpretations of the law as a substitute for the primary material, but do read others’ interpretations to get at the significance of the decision.
- Do not italicize the title of the legislative or executive decision. If relevant to the discussion of case law, do italicize case law names and their abbreviations everywhere but in your “Sources” section.
- The process for enacting a legislative or executive decision differs based on the level at which it occurs (e.g. municipal, state, federal, etc.). You will have to understand the legislative or executive process relevant to the law on which you are writing.

Good Examples:
- Uniform Anatomical Gift Act (1968)
- China's One-Child Policy
- South Korea's Bioethics and Biosafety Act (2005)
- Barack Obama Executive Order 13505, November 2008

Title
Use the title of the law, followed by its year in parentheses. If the law has a common name, use it in the title, but cite the technical name in the “Sources.”

Introduction (~1 paragraph)
Identify the law.
- Follow style guide conventions for first sentences. What is the law’s name and when was it passed? What legislative body or individual passed the law, and very briefly what did the law regulate or require if that is not self-evident by the law’s name?
- Where was the law passed, at what level (e.g. municipal, state, federal), and by what regulatory agency, legislative body, or individual?
- What was the jurisdiction of the regulation, and the impact of the law on that jurisdiction?
- What was the purpose of the law? What did the law regulate or require?
- Briefly describe any previous regulations necessary to understand the law’s significance.
- Follow style guide conventions for significance statements. Why is the law important to the history of embryology, developmental biology, or reproduction? What is the significance of its contributions?
Body I (~1-2 paragraphs)

Provide context to understand the law and its significance to embryology.

- What was the basic issue that caused someone to author the law? Who were the parties involved, what were their positions, and what role did they play in the passage of the promulgation?
- Who authored the law? What is their history and motivation for authoring the law?
- Describe the role of history of science and the law. What scientific concepts were used in the law’s passage and who introduced them? Did the case rely on any literature that was important to the history of embryology? If so, what was the literature?
- Describe relevant legal precedent influencing the law. On what legislative, regulatory, executive, or case law precedents did the law rely? When and where were did those decisions occur, and what were the details of such?

Body II (~1-3 paragraphs)

Describe how the law came into being and its details.

- Trace the law’s history as it makes its way through the legislative, regulatory, or executive process. Include relevant dates and decisions. Do not “lose the people” in this process. While you are writing a history of the law, focusing on the politicians, government workers, and expert witnesses is integral to writing law for a public audience.
- Describe the role of science and the law. What scientific concepts were used in the law’s composition and who introduced them? Did the case rely on any testimony from scientists? If so, whom, and what was the content of that testimony?
- Was the law associated with any scientific organizations, theories, organisms, or technologies relevant to the history of embryology? How did those academic interests shape the composition of the law and influence the passing of the law?
- Did the law impact private industry, nonprofits, or the public? How did those private, public, and social reactions shape the composition of the law or influence its passing?
- Detail what the law says.
- Who passed the law? If it relied on a larger body of individuals, what was the vote, and were there any notable dissenters? To the extent that it is available, introduce the argument(s) of the dissenting minority.

Body III (~1-3 paragraphs)

Describe the reaction and impact of the law.

- What was the scientific and/or social impact of the law?
- How has understanding of law been used through time? Did the law become an important influence for other laws? If so, which laws and how?
- Is the law still valid in its jurisdiction? If not, explain why.
- Did the law cause anyone to file a lawsuit? If so, when, by whom, and to what court? Did the court accept the suit, and if so, what was the decision? Did the suit have an appellate process? If so, briefly describe that process. If one of the litigants appealed and the appellate court rejected the case, include that as well.
- Has any literature important to the history of embryology been published regarding the law? If so, what is it, who authored it, and why is it important?
- What became of the primary people involved in the composition and passing of the law?

**Conclusion (~1 paragraph)**
Do not summarize the article. Reiterate why the law is significant to the history of embryology, and name a few of the important things that the law influenced, be they other laws, organizations, pieces of literature, people, ethics, etc.
Specialized Guide for ORGANIZATION Entries

Notes:

● Organization articles are easiest to write when they are discrete and directly related to the history of embryology. If it is a large organization with varied interests, or has a substantial history of existence, you may benefit from framing your approach to writing the article in a manner that makes it more manageable. Ways to frame your article and keep it from becoming unruly include limiting the discussion of the organization to a specific department or laboratory, or examining the organization specific to a certain period of time like the tenure of a president or primary investigator.

● Remember that you are writing the biography of the organization, so you need to detail the organization’s history and the context of its creation, in addition to its evolving composition and mission, and the broader social reception of the organization.

Good Examples:

Human Betterment Foundation
Oregon State Board of Eugenics
Carnegie Institution of Washington Department of Embryology
General Embryological Information Service, published by Hubrecht Laboratory, 1949–1981
The Marine Biological Laboratory

Title
Use the name of the organization. If you are writing about an organization that does not exist anymore, include its years of activity into brackets. If you have framed your article specific to a particular department, laboratory, or time period, include that information as well.

Introduction (~1 paragraph)

Identify the organization.

● Follow style guide conventions for first sentences. What is the organization’s name, where is it located, when was it founded, and by whom? What is the mission?

● What was the full name of the organization? What was the organization, a laboratory, a research institute, a regulatory body, etc.? If non-English, report first the original title and then the English translation. You may use either name provided you are consistent.

● When, where, and by whom was it first established? What was the mission and purpose of the organization? What are the main steps in its historical evolution?

● Follow style guide conventions for significance statements. Why is the organization important to the history of embryology, developmental biology, or reproduction? What is the significance of its contributions?
Body I (~2 paragraphs)

*Provide a description of how the organization’s foundation and background.*

- Who are the founders of the organization? Where did they live and work? Were they affiliated with other institutions? Were they influenced or motivated by any specific people, theories, beliefs, religions, or movements?
- What concepts, theories, or ideas motivated the foundation of the organization? What were the intentions of those who founded the organization?
- What was the organization’s initial purpose and function? Did that change over time?
- What kind of funding established the organization? Did other institutional entities affect the foundation of the organization? Which ones, and how?

Body II (~2 paragraphs)

*Describe the historical development of the organization.*

- What are the main stages in the development of the organization? Did the organization change significantly over time? If yes, how and why? According to what ideas? Depending on what social and historical circumstances?
- How was the organization structured? Did that structure change over time?
- Who held significant leadership roles in the organization? Include full names, specific job titles and responsibilities, dates of appointment, and any other useful information.
- Who were the significant people that worked at the organization? How did they contribute to the history of embryology with their research?
- Are there any concepts, ideas, or discoveries that developed specifically in that organization? Any important technologies or instruments invented at the organization?
- Are there important journals or books published by the organization? What are those and what significance do they have to the history of embryology?

Body III (~2-5 paragraphs)

*Describe the relationship of the organization to other institutions in the society of the time.*

- What impact did the organization have in the society of the time? Did that change?
- Did the agenda of the organization conflict with the ideas of religious institutions or other political or social organizations?
- Did the kind of work done at the organization provoke important debates? Are there important monographs or article that discuss with those issues?

Conclusion (~1 paragraph)

Do not summarize the article. Reiterate why the organization is significant to the history of embryology, and name a few of the important things that the organization influenced, be they other organizations, laws, pieces of literature, people, ethics, etc.
Specialized Guide for CONCEPT Entries about Mechanisms or Entities

Notes:

- Concept article are difficult for new EP Encyclopedia writers because it can be difficult to determine what to include and exclude from the article. We recommend you write Concept articles only after you have written articles on more concrete subjects, such as People, Experiment, Technology, or Literature. Those types of articles have a more clearly defined beginning, middle, and end. For Concept articles, it can be more difficult to define what information belongs in the article and where to put it.
- Concept articles are easier to write if they are discrete and bounded well. If you find your concept article becoming unmanageable, limit the scope of your article to figure out what to include and exclude from the article. The concept can be limited by associating it with an individual, a time period, an organization, or a research tradition.

Good Examples:
Mechanisms:
The Notch Signaling Pathway in Embryogenesis
The Process of Implantation of Embryos in Primates
Gastrulation in Mus musculus (common house mouse)
Entitles:
Mesenchyme
Epithelium
Spemann-Mangold Organizer
Bicoid
Enamel Knots

Title
Use the name of the mechanism or entity. If bound to an individual, time period, organization, or research tradition, also include that information in the title.

Introduction (~1 paragraph)
Identify the mechanism or entity.

- Follow style guide conventions for first sentences. What is the concept? To the extent that it is possible, who first described the concept, where, and when?
- What is the name of the mechanism or entity? Does it have both a scientific and common name (e.g. one named for who described it)? If so, provide the scientific name first, followed by the common name in parentheses. After the first usage, you may use the scientific or common name, just be consistent.
Body I (~2 paragraphs)

Provide the conceptual and historical understanding for the mechanism or entity.

- Provide the reader with the history necessary to understand the concept. What theories, experiments, and technologies preceded the mechanism or entity and need to be explained for an audience to understand the significance of the concept?
- Who described the mechanism or entity, when, where, and under what conditions? Did those scientists receive awards for their investigations? In what historical periods did they operate? In what institutions?
- What kind of instruments allowed the discovery of the mechanism or entity? Are there important experiments that facilitated the discovery?
- What are the most important publications that explain the mechanism or entity?
- Did ideas of the entity or mechanism change over time? If the mechanism or entity has a long history as an object of scientific inquiry, mention the most important steps of its investigation.

Body II (~3 paragraphs)

Describe the understanding of the mechanism or entity relevant to the time period in which you are discussing it (e.g. current understanding, bound to the nineteenth century, etc.).

- Chronologically, discuss the most relevant researchers and their literature or experiments as a means of understanding the entity or mechanism.
- What instruments, technologies, or theories facilitated investigation of the entity or mechanism?
- Discuss the entity or mechanism’s defining characteristics. What are the main parts that constitute the entity or mechanism? At what level of biological organization does the entity operate (genetic, molecular, cellular, etc.)?
- Discuss how the entity or mechanism operates. If an entity, what mechanisms allow it to function? What are the main states that characterize the operation of the mechanism? How does its level of biological organization facilitate the function of the mechanism?
- Discuss the importance of the entity or mechanism. What is its purpose? How did the entity or mechanism evolve to its current incarnation? What happens if the entity or mechanism has some structural or functional defects? Are there specific diseases that derive from a that defective operation?
Body III (~2 paragraphs)

Describe if and how investigations of the mechanisms caused public debates

- Did the investigation of the mechanism or entity cause debate in the scientific community? Describe the positions of that debate.
- Does the investigation of the mechanism or entity raise ethical questions? If yes, in what context and why?

Conclusion (~1 paragraph)

Don’t summarize the article. Reiterate why the entity or mechanism is significant to the history of embryology, and name a few of the important things that the concept influenced, be they other concepts, people, pieces of literature, laws, ethics, etc.
Specialized Guide for CONCEPT Entries about Theories and Movements

Notes:

- Concept articles are difficult for new EP Encyclopedia writers because it can be difficult to determine what to include and exclude from the article. We recommend you write Concept articles only after you have written articles on more concrete subjects, such as People, Experiment, Technology, or Literature. Those types of articles have a more clearly defined beginning, middle, and end. For Concept articles, it can be more difficult to define what information belongs in the article and where to put it.
- Concept articles are easier to write if they are discrete and bounded well. If you find your concept article becoming unmanageable, limit the scope of your article to figure out what to include and exclude from the article. The concept can be limited by associating it with an individual, a time period, an organization, or a research tradition.

Good Examples:
Theories:
- Wilhelm Johannsen's Genotype-Phenotype Distinction
- John von Neumann's Cellular Automata
- The Meckel-Serres Conception of Recapitulation
- The Source-Sink Model
- Richard Woltereck's Concept of Reaktionsnorm
Movements:
- Spermism
- Preformationism in the Enlightenment

Title
Use a common name for the theory or movement. If bound to an individual, time period, organization, or research tradition, also include that information in the title.

Introduction (~1 paragraph)
Identify the theory or movement.
- Follow style guide conventions for first sentences. What is the concept? To the extent that it is possible, who first described the concept, where, and when?
- What is the full name of the theory or movement? Does it have both a formal and common name? If so, provide the formal name first, followed by the common name in parentheses. If the name is in a language other than English, report the original name followed by the English translation in parentheses. You may refer to either name throughout the article, just be consistent.
● Who are the most important people that contributed to the theory or movement? What are their institutional affiliations and why did they support the movement or theory?
● When and where was the theory or movement created? When and where did it develop?
● What was the theory or movement about? Highlight the key aspects.
● Follow style guide conventions for significance statements. Why is the concept important to the history of embryology, developmental biology, or reproduction? What is the significance of its contributions?

Body I (~2 paragraphs)

_Contextualize the origins and development of the theory or movement._

● Provide the reader with the history necessary to understand the concept. What theories, experiments, and technologies preceded the theory or movement and contributed to its tenets, and do those need to be understood to contextualize the significance of the theory or movement?
● Who are the main people that contributed to the elaboration of the theory or movement? In what historical period did they operate? Where did they work? What institutional and organizational affiliations did they have? What were their motivations for adopting the theory or movement?
● What are the most important publications that explain the theory or movement?
● Did the theory or movement spread quickly? Why or why not? Did it find resistance in the scientific community of the time? If so, why?
● Did ideas of the theory or movement change over time? If the theory or movement has a long history as an object of scientific inquiry, mention the most important steps of its investigation and popularization.

Body II (~2 paragraphs)

_Describe the main conceptual aspects of the theory or movement_

● Chronologically, discuss the most relevant researchers and their literature or experiments as a means of understanding the theory or movement.
● Are there important experiments that were performed by proponents of the theory or movement? Are there important publications?
● Are there specific instruments or procedures developed to test or apply the theory?
● Define the characteristics of the theory or movement. What were the main problems that the theory addressed? What were the specific embryological phenomena that it helped to explain? What were the main ideas and values that characterized it?
● Did the theory or movement oppose other specific theories and movements? If yes, which ones? Did the theory or movement represent the evolution of an old one? If so, what were the older theories that it referred to?
Body III (~2 paragraphs)

Describe the reaction to the theory or movement.

- Did the theory or movement stimulate debate in the society of the time? Did it address issues that were ethically contentious?
- Did the movement have a political agenda? Did it contribute to the creation of important institutions? Do those institution still exist?
- Do religious or social institutions express an opinion about the theory or movement?
- Did the theory or movement influence the production of specific laws?

Conclusion (~1 paragraph)

Do not summarize the article. Reiterate why the concept is significant to the history of embryology, and name a few of the important things that the concept influenced, be they other concepts, people, pieces of literature, laws, ethics, etc.
Specialized Guide for CONCEPT Entries about Diseases, Syndromes, and Disorders

Notes:

- Concept article are difficult for new *EP Encyclopedia* writers because it can be difficult to determine what to include and exclude from the article. We recommend you write Concept articles only after you have written articles on more concrete subjects, such as People, Experiment, Technology, or Literature. Those types of articles have a more clearly defined beginning, middle, and end. For Concept articles, it can be more difficult to define what information belongs in the article and where to put it.

- Concept articles are easier to write if they are discrete and bounded well. If you find your concept article becoming unmanageable, limit the scope of your article to figure out what to include and exclude from the article. The concept can be limited by associating it with an individual, a time period, an organization, or a research tradition.

- Concept entries about diseases, syndromes, and disorders are not like webMD articles. The *EP Encyclopedia* does not aim to help people identify and self-diagnose health issues. Write your article to tell the history of how researchers came to identify and treat the phenomena, and how that concept has changed over time.

**Good Examples:**

- Birth Defects Caused by Agent Orange
- Androgen Insensitivity Syndrome
- Fetal Alcohol Syndrome (FAS)
- Mitochondrial Diseases in Humans

**Title**

Title your entry after the most commonly used name for the disorder, be it vernacular or scientific. If the most commonly used name is scientific, you may include a common vernacular name in parentheses after the scientific name, and vice versa.

**Introduction (~1 paragraph)**

*Identify the disease, syndrome, or disorder.*

- Follow the style guide conventions for first sentences. What is the concept? To the extent that it is possible, who first described the concept, where, and when?

- What is the name of the disease, syndrome, or disorder? Does it have both a scientific and common name (e.g. one named for who described it)? Provide the scientific name first, followed by the common name in parentheses. After that you may use either name.
• What are the main features of the disease? Provide a definition and a brief description of its causes and of its consequences.
• Who are some key people associated with the concept?
• Follow the style guide conventions for significance statements. Why is the concept important to the history of embryology, developmental biology, or reproduction? What is the significance of its contributions?

Body I (~2 paragraphs)
Provide the conceptual and historical context for the understanding of the disease, etc.
• Provide the reader with the history necessary to understand the concept. What theories, experiments, and technologies preceded the disease process and are relevant to it being understood or its significance?
• Who described the disease, syndrome, or disorder and under what conditions? Were they scientists or personalities that contributed to the understanding of the disease? When and where did they work? Did they publish their results? Did they receive important awards?
• What kind of instruments or mechanisms allowed for the discovery of the disease process? Are there important experiments that facilitated our understanding of the causes of the disease? Did our understanding of the disease change over time?
• What kind of instruments and procedures were used for the prevention or cure, if any, of the disease? Are they actually effective? Did they change over time?

Body II (~4 paragraphs)
Describe the understanding of the mechanism or entity relevant to the time period in which you are discussing it (e.g current understanding, bound to the nineteenth century, etc.).
• Chronologically, discuss the most relevant researchers and their literature or experiments as a means of understanding the disease, syndrome, or disorder.
• What instruments, technologies, or theories facilitated investigation of the concept?
• Describe the disease’s defining characteristics. What are the symptoms that constitute the concept, and how does the disease develop?
• Describe how the disease manifests. How does the disease develop? How and when in the process of development is it possible to detect? Through what kind of instruments and procedures?
• Describe the mechanism for the disease. What is the current explanation for the occurrence of the disease? Do we know the mechanisms that cause?
• Describe the treatment. Are there standardize procedures to cure or prevent the disease? Who invented them? When? If not, what measures are used to address the symptoms of the disease’s expression?
• Is there consensus in the scientific community about the disease process (its mechanism, symptoms, treatment plan, etc.)? Present the main ideas and highlight areas of conflict.
Body III (~2 paragraphs)

*Describe if and how the concept provoked public debate*

- Does the concept provoke debate in the scientific community or in the public more broadly? Describe the positions of that debate.
- What are the legal and ethical issues surrounding the concept? Are there laws that specifically regulate the cure, prevention, or treatment of the disease? Do doctors and scientists face ethical concerns in their assessment and treatment of the disease process?
- What is the position of major religious authorities about the cures, prevention, or treatment of the disease?

Conclusion (~1 paragraph)

Do not summarize the article. Reiterate why the concept is significant to the history of embryology, and name a few of the important things that the concept influenced, be they other concepts, people, pieces of literature, laws, ethics, etc.
Specialized Guide to Writing IMAGE Entries

Notes:
- We do not have many image articles, so there are few working examples of how to best structure an article. Please follow the style guide and those examples that are available to help guide your article.

Good Examples:
- Images of Embryos in Life Magazine in the 1950s
- Hartsoeker’s Homunculus Sketch from Essai de Dioptrique (1694)

Title
Titling Image articles can be difficult. Use the title of the image, followed by a comma, “by,” the primary creators’ names, and the year of the publication parentheses. If that format will not work, follow one of the examples above, or create one specific to your topic. Make sure you include year(s) in the title.

Introduction (~1 paragraph)
Identify the image.
- Follow the style guide conventions for first sentences. What does the image portray? Who created the image? When and where?
- Elaborate on the image’s creation. Who created the image, include the person’s full name and the date of creation. Where did they create it? Briefly introduce basic information about the medium. Is it a photograph, oil painting, sculpture, digital, or other?
- Describe the content portrayed by the image briefly.
- For what reason did the artist create the image? What was the motivation or rationale?
- Follow the style guide conventions for significance statements. Why is the image important to the history of embryology, developmental biology, or reproduction? What is the significance of its contribution?

Body I (~2-4 paragraphs)
Provide the historical and cultural background for the understanding of the image.
- What concepts, theories, ideas, or movements constitute background for the understanding of its creation? What ideas or concepts did the image advance?
- Why did someone create the image? Was it for educational, artistic or other reasons? Who influenced the image’s creation? Did the artist or creator collaborate with anyone?
- Go into further detail on how the image was created. Elaborate on techniques and tools involved in the image’s creation, e.g. new photographic techniques, microscopy, etc.
• Did the image appear first on a textbook, in a journal article, in the personal files of an artist or scientist, or other? Provide full names for those who have owned the image or original video.
• What was the intended audience of the image? Who was supposed to use the image?

**Body II (~2-3 paragraphs)**

*Describe the image.*

• What does the image portray exactly? What are the peculiarities of the image?
• More closely describe what features of the image are relevant to the history of embryology. Explain the significance based on the previous paragraph where you introduced relevant historical and cultural contexts.

**Body III (~1–3 paragraphs)**

*Describe impact and consequences of the image.*

• Chronologically trace the history of the places that displayed the image: magazines, books, journals, newspapers, art galleries, museums, the internet, textbooks, etc.
• What were the reactions in the scientific community to the production of the image? Is the image important for disciplines other than embryology? Is the image still displayed or used today?
• Was the image contentious because of its content? Is it contentious now? What was the reaction of religious organization or other social and political institutions to its production? What are their positions now?

**Conclusion (~1 paragraph)**

Do not summarize the article. Reiterate why the image is significant to the history of embryology, and name a few of the important things that the image influenced, be they other images, people, pieces of literature, laws, ethics, concepts, etc.
Specialized Guide for CONTEXT Entries

Notes:
- Context articles are especially difficult. You cannot write them well until you understand how the EP Encyclopedia relationships work, and have written many accessible, atomistic articles. For those reasons, student contributors may not write Context articles unless they have already fully developed an interrelated cluster of articles.
- Consider focusing on a scientific context, a political context, a religious context, etc.

Good Examples:
- Discovery of Fetal Alcohol Syndrome
- Early Infantile Autism and the Refrigerator Mother Theory (1943–1970)
- Reassessment of Carrel’s Immortal Tissue Culture Experiments
- Seed Collection and Plant and Plant Genetic Diversity (1900–1979)

Title
There is no formula for titling context articles. Work for something that captures the breadth of the period, and try to include the period in the title.

Introduction (~1-2 paragraphs)
Identify the context.
- Introduce the context in one or two sentences.
- Why is this context important to embryology’s history? Explain in one or two sentences.
- How did this context come to matter in embryology? Include dates and consider the relevant social, political, cultural, and scientific actors that influenced its creation, interpretation, and implementation.
- How has the meaning changed over time? Who and what influenced this change?

Body (many paragraphs)
Describe the context.
- Describe the social, cultural, political, and/or scientific factors that influenced the context. Explain its history. What individuals or institutions promoted its use, definition, or meaning, and for what purposes?
- Who was part of the context? Which experiments, technologies, locations, organizations, concepts, literature, laws, and religions constituted the context?
- Describe how its interpretation has changed over time as a reflection of the interactions between individuals and institutions relevant the context’s history.
● What other contexts, problems, theories, or ideas influenced the creation of context?
● What other contexts emerged?

Conclusion (~1 paragraph)
Do not summarize the article. Reiterate why the context is significant to the history of embryology, and name a few of the important things that the context influenced, be they other contexts, people, pieces of literature, organizations, ethics, concepts, etc.
9. Sources and Citation Style

Each article concludes with a list of sources. List only the sources used in your research. Each article should cite at least two to five scholarly books or journal articles, depending on the topic. You may also cite popular press articles, presentations, and websites, but those sources generally may not be your primary information sources. Academic sources should provide the backbone of your research. In general, others of your sources must be trustworthy. For website, avoid most “.coms” and even many “.orgs,” as those sites tend to have missions that strongly influence how they present information.

In-Text Citations

To facilitate the editing process for your articles, please include parenthetical citations while writing your articles for the writer’s workshop. Those citations will be removed during editing and will not appear in the final version published to the website. In-text citations are particularly important if you are referencing a book, and we encourage you to include page numbers as that allows an editor to quickly locate the relevant passages you used for fact-checking purposes. For non-book resources, include the last name (or equivalent) and year in parentheses, e.g. (Adams 2001). For books, please include the page number in addition to the last name and year, e.g. (Adams 2001, pp. 43-50).

If you are more familiar with footnotes, or endnotes, you are welcome to use those as well to show editors how you attribute facts in the article. Please make sure to include page numbers for larger resources. Footnotes and endnotes will also be deleted prior to publishing the article, so do not include information supplemental to the text in either format. Just the shortened citation information to help with editorial fact checking.

Quotations

The EP Encyclopedia rarely quotes resources, and you will need to argue for a quotation to be included in your article. Encyclopedias are repositories of subject knowledge, and your papers will have been peer reviewed and fact checked prior to being published to ensure that high standard. Quotations detract from the authoritative presentation of subject knowledge and attribute the points in support of your thesis or significance statement to some other resource. Using quotations is also a way in which some students avoid synthesizing and paraphrasing information from across resources. By restricting their use we hope you become a better writer and do not rely on others’ to say the things you need to say in an article.

Some exceptions may be made for the inclusion of quotations in EP Encyclopedia articles. Generally, those exceptions are made for law articles where the precise language of the text is important to the understanding of the case law or promulgation.
References Cited

The *EP Encyclopedia*’s citation style follows the fifteenth edition of *The Chicago Manual of Style*. Below are some general considerations and examples of citation style. If you have a question of style not covered in the following pages, refer to *The Chicago Manual of Style*, and for issues of legal style, refer to *The Bluebook: A Uniform System of Citation*.

Some general considerations:
- Double space your citations.
- Use the heading “Sources” rather than “References.”
- Alphabetize your sources by authors’ last names. With more than one source from an author, order by publication date.
- Always list the full first names of authors. Middle initials are acceptable.
- List all authors of a work. Never use “et al.”
- Use en dashes for inclusive page ranges, e.g. “1149–51” not “1149-51.”
- Abbreviate “editor” to “ed.” and “translator” to “trans.” but for non-standard positions spell out the title completely, e.g. transcriber, annotator.
- For articles from online and Open Access journals, provide links to the articles. For articles from subscription journals accessed through an institutional library, do *not* provide links to the articles. They are behind a paywall and unavailable to the average reader without high costs.
- When possible, for articles and books now in the public domain, provide the website from which you can find them. Common sources are:
  - Biodiversity Heritage Library: [http://www.biodiversitylibrary.org](http://www.biodiversitylibrary.org)

Citing Books

*Simple format:*


*Examples:*
- One author
- Two authors
• Four or more authors

• Editor, translator, or compiler instead of author

• Editor, translator, or compiler in addition to author

• Chapter or other part of a book

• Chapter, including intro or preface, of an edited volume originally published elsewhere (as in primary sources)


• Book published electronically
Citing Journal Articles

Simple format:
Last Name, First Name. “Title of Article.” Journal Title Volume No. (Year): Inclusive page numbers separated by en dash.

Examples:
● Article in a print journal

● Article in a non Open Access print journal accessed online

● Article from an online AND open access source.

Citing Other Resources

Popular magazine article

Newspaper article

Book review

Thesis or dissertation

Paper presented at a meeting or conference
Case Law

- State Tort Court
  Weber v. Stony Brook Hospital, 60 N.Y. 2d 208 (1983).

- State Appellate Court

- Federal Tort Court
  United States v. Dennis, 183 F. 201 (2d Cir. 1950).

- US Supreme Court
  Roe v. Wade. 410 U.S. 113 (1973)

Legislation

- US Federal Legislation

- State Legislation

Website


E-mail

John Doe, e-mail message to author, October 31, 2005.

Dictionary of Scientific Biography

Allen, Garland E. “Morgan, Thomas Hunt.” Dictionary of Scientific Biography 9: 515–26. (No date or publisher information required for this resource only.)

Biographical Dictionary of Women in Science

10. Page and File Name Formats and Sample Articles

Below is a description of the format your articles should have before you turn them in for editing. Afterwards are instructions for file name formats. The following pages are examples of properly formatted articles. The examples only show their first and last pages.

Page Format

- Use 12-point Times New Roman font for everything in the paper.
- Double space throughout, including your sources.
- Default Microsoft Word 2010 spacing now inserts 1.15 spacing after paragraphs instead of standard single spacing. When you double-space your text, that extra space after the paragraph becomes even larger. To eliminate that abnormal spacing convention, highlight all the text and click on “Line and Paragraph Spacing” found in the “Paragraph” area of the “Home” tab, followed by “Remove Space After Paragraph.”
- Your title should be left justified and the first line of your page. Bold your title.
- Hit “enter” twice between the end of your title and the start of your first paragraph.
- Indent the start of every paragraph.
- Put right justified page numbers in your footer sections.
- After your final line of text, right justify, hit “enter” twice and then type your name, as you want it to appear on the website. Follow with the draft number, e.g. Draft One.
- After your name, hit “enter” twice and left justify the word “Sources.” Bold it, and attach a colon so you see Sources:
- After Sources: Hit “enter” twice and list your sources as described in the citation style.
- For your sources, use hanging indents, as demonstrated in the example articles.

File Name Format

- Start with the category abbreviation, e.g. Pe for people and Exp for experiment.
- Next use your articles title, or for long titles, understandable abbreviations.
- Finish with your initials.
- For an experiment article about parthenogenesis by Cera Lawrence, the file name is ExpParthenogenesisCL.doc.
- The file naming convention for People articles is slightly different. Use Pe, then the person’s last name, her first and middle initials, followed by your initials. For example, a people article by Ellen DuPont about John Philip Trinkaus is: PcTrinkausJPED.doc
Johann Gregor Mendel (1822–1884)

Johann Gregor Mendel studied plants in Austria during the nineteenth century. His work initiated our current understanding of inheritance. Mendel experimented with the pea plant, *Pisum*, and the publication, “Versuche über Pflanzenhybriden” (“Experiments on Plant Hybridization”), published in 1866, revolutionized theories of trait inheritance. Mendel’s discoveries relating to factors, traits, and how they pass between generations of organisms enabled the twentieth-century scientific community to build theories of genetics.

Born on 22 July 1822 in Heinzendorf, Austria, now Hynčice, Czech Republic, Mendel was the second child of Rosine and Anton Mendel. He had two sisters, Veronica and Theresia, with whom he spent his youth working on the 130-year-old, family-owned farm. This work fostered Mendel’s interest in nature that later motivated his genetic experiments.

At the urging of the vicar and village schoolmaster, Mendel attended a secondary school and gymnasium. In 1840 Mendel entered the philosophy course at the Palacký University of Olmütz, now Olomouc, Czech Republic. During his three years in Olomouc, Mendel studied philosophy, physics and mathematics, and he was beset with financial worries. Due to fiscal pressures, Mendel entered the Augustian St Thomas’s Abbey in Brünn, now Brno, Czech Republic, in 1843, to continue his education. At this time Mendel, born Johann Mendel, adopted the name Gregor and began his scientific work, taking on many roles including...

Amanda Andrei: Draft One

Sources:


Jacques Loeb’s Experiments with Artificial Parthenogenesis in Marine Worms
(1900–1901)

Jacques Loeb showed that scientists could achieve artificial parthenogenesis with one species of annelid worm through a series of experiments in 1900. Loeb published the results of his experiments in 1901 as “Experiments on Artificial Parthenogenesis in Annelids (Chaetopterus) and the Nature of the Process of Fertilization,” in *The American Journal of Physiology*. His results broadened the range of animals to which artificial parthenogenesis applied beyond sea urchins. Scientists could now also cause artificial parthenogenesis with the eggs of *Chaetopterus* [used], a segmented marine worm.

Loeb had detailed his earlier experiments with sea urchins in two papers: “On the Nature of the Process of Fertilization and the Artificial Production of Normal Larvae (Plutei) from the Unfertilized Eggs of the Sea Urchin” in 1899 and “Further Experiments on Artificial Parthenogenesis and the Nature of the Process of Fertilization” in 1900. The three sets of experiments were Loeb’s initial breakthrough with artificial parthenogenesis, and they prompted years of research, which culminated in his 1913 book *Artificial Parthenogenesis and Fertilization*.

Loeb conducted his research with *Chaetopterus* at the Marine Biological Laboratory in Woods Hole, Massachusetts, following a winter spent researching sea urchins at Stanford University’s Hopkins Marine Station in Pacific Grove, California. He had determined the various mixtures of salt waters that…
Sources:


11. Bibliography and Websites

Below you will find the resources and websites helpful to the construction of EP Encyclopedia articles. We include the resources used to compile our best practices for science writing, in addition to articles that have been written about the Embryo Project, Digital History and Philosophy of Science, potential resources to use for context on embryos, and relevant web pages and associated digital projects.

**Embryo Project**


https://docs.google.com/a/asu.edu/file/d/0B68mpBzv7Wd5bHVNWIJKRnL5cm8/edit (Accessed August 31, 2013.)

**Digital HPS**


Embryo Project Context


Writing

Websites
Digital HPS Consortium http://digitalhps.org/
Embryo Project Encyclopedia. http://embryo.asu.edu/
EP Encyclopedia Editing
EP Encyclopedia Writing Seminar https://sites.google.com/a/asu.edu/embryo-project-fall-2013/
EP Info Page http://cbs.asu.edu/embryo-project
History of the MBL Project http://history.archives.mbl.edu/
History and Philosophy of Science Repository. http://hpsrepository.asu.edu/
Biodiversity Heritage Library http://www.biodiversitylibrary.org/
Encyclopedia of Life http://eol.org/