Paradoxes of Induction

Day 6 – Philosophical Method

Support for the contrapositive

Conditional statement:

If a person lives in Staunton, then that person lives in Virginia.

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*Its **contrapositive** :*

If a person does not live in Virginia, then that person does not live in Staunton.

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A conditional statement and its contapositive are equivalent.

Support for the contrapositive

Conditional statement:

If a person lives in Staunton, then that person lives in Virginia.

Its contrapositive :

If a person does not live in Virginia, then that person does not live in Staunton.

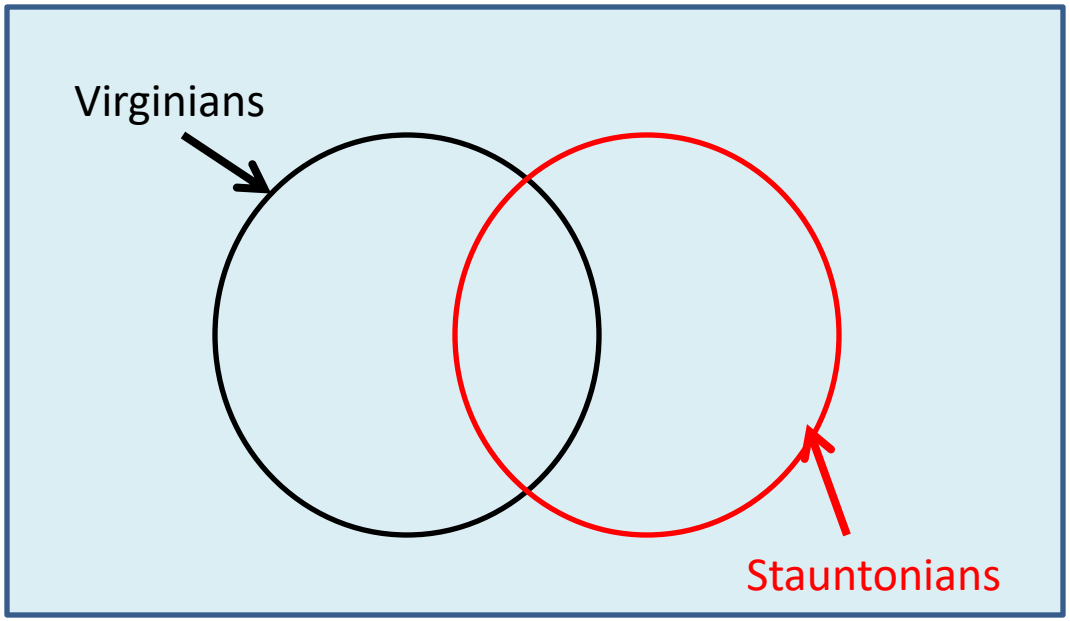
A conditional statement and its contapositive are equivalent.

If one of them is true, then the other has to be true also.

Support for the contrapositive

Suppose the conditional statement is true:

If a person lives in Staunton, then that person lives in Virginia.

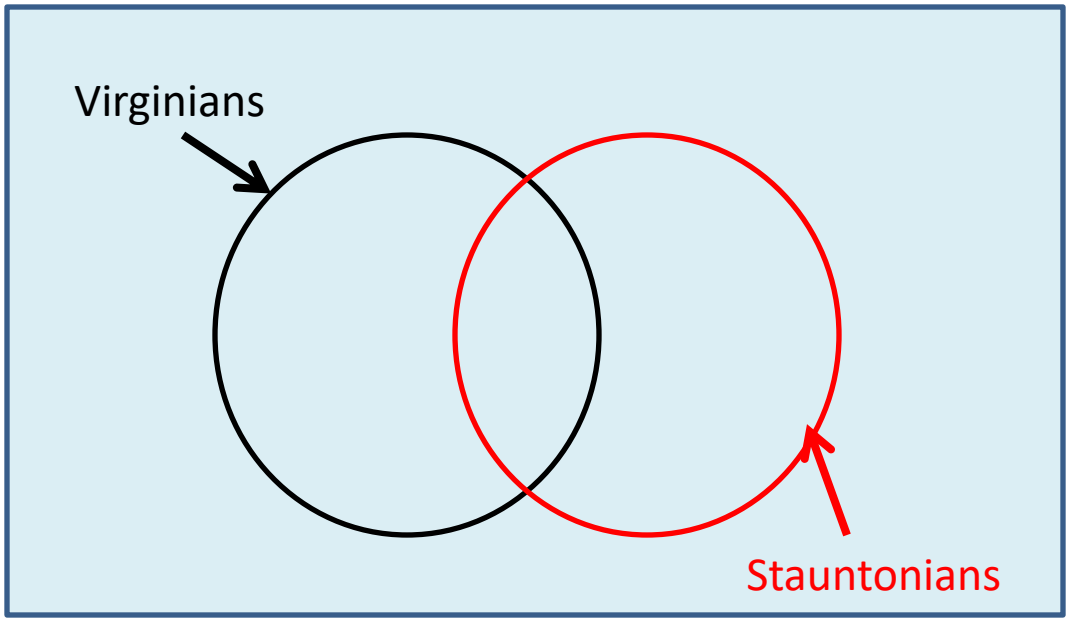


Support for the contrapositive

Suppose the conditional statement is true:

If a person lives in Staunton, then that person lives in Virginia.

This means that anyone in the red circle is also in the black circle.

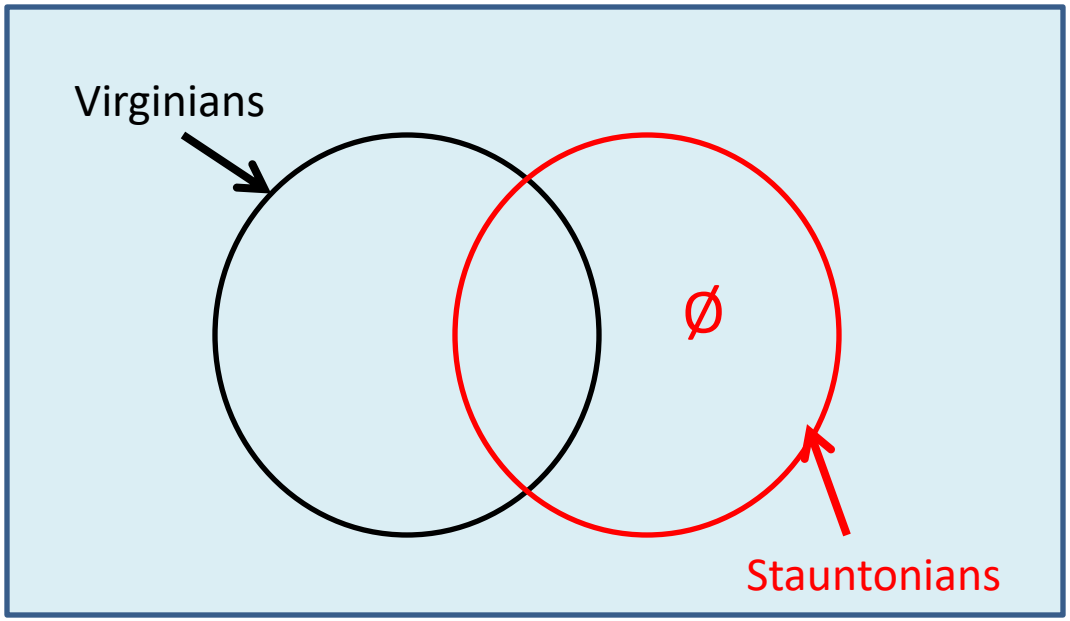


Support for the contrapositive

Suppose the conditional statement is true:

If a person lives in Staunton, then that person lives in Virginia.

So there's no one in the part of the red circle outside of the black circle.



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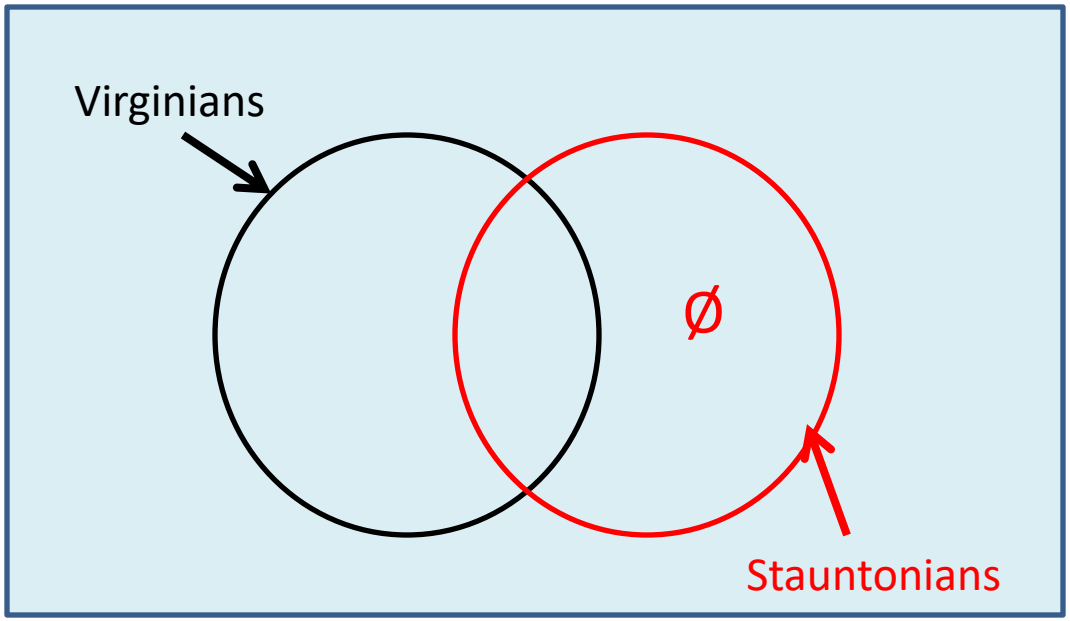

The set of Stauntonians — the set of Virginians = Ø

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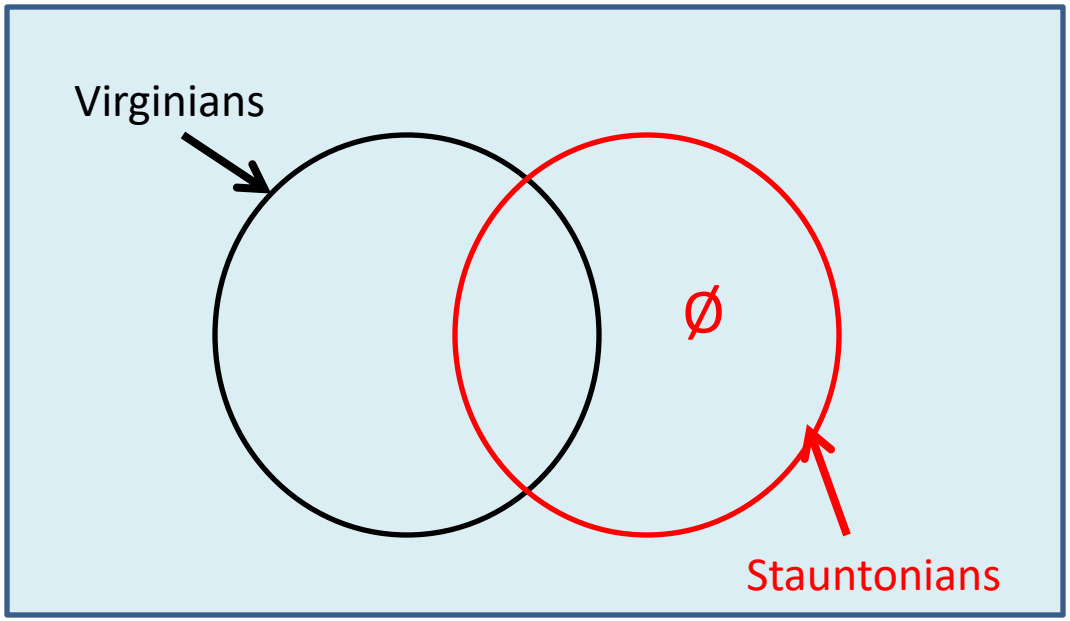


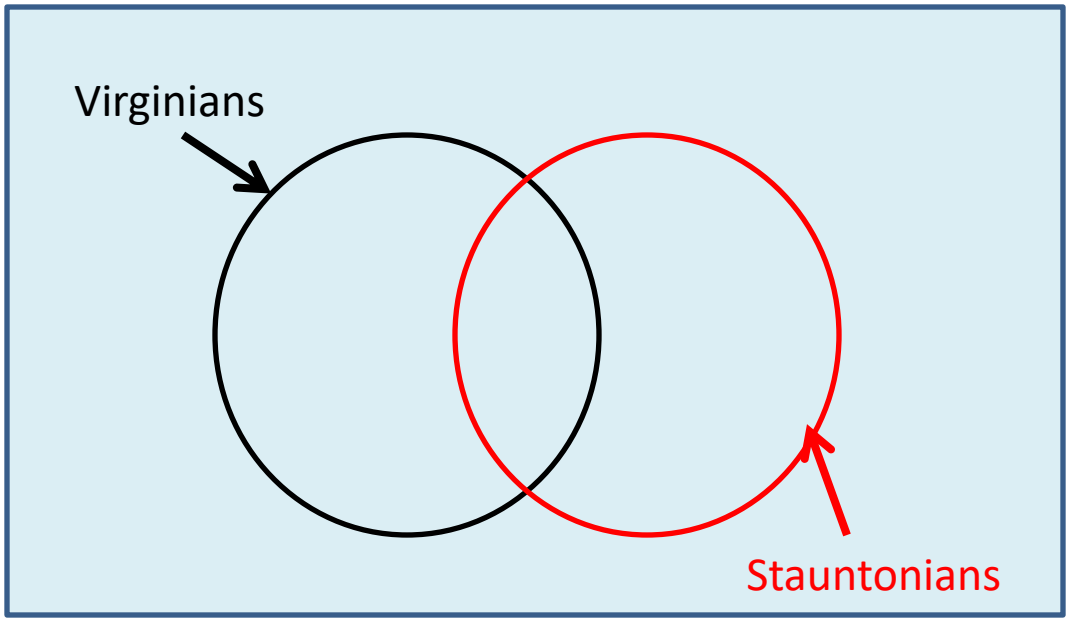
The conditional statement does not assert that anyone lives in either Staunton or Virginia or anywhere else!

Support for the contrapositive

Now suppose the contrapositive statement is true:

If a person does not live in Virginia, then that person does not live in Staunton.

This means that anyone not in the black circle is also not in the red circle.



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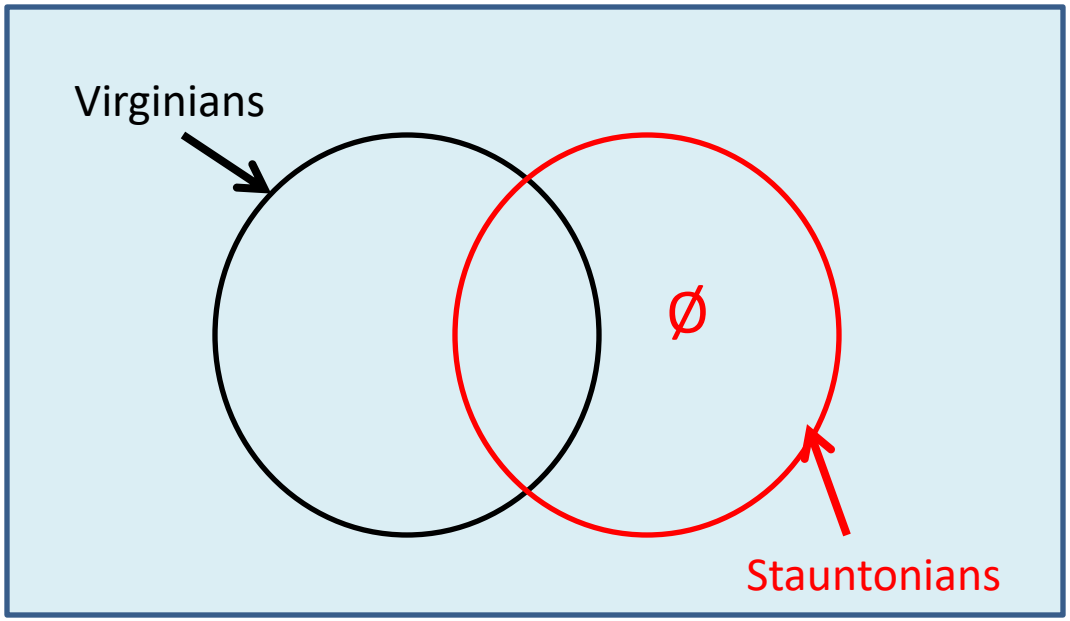

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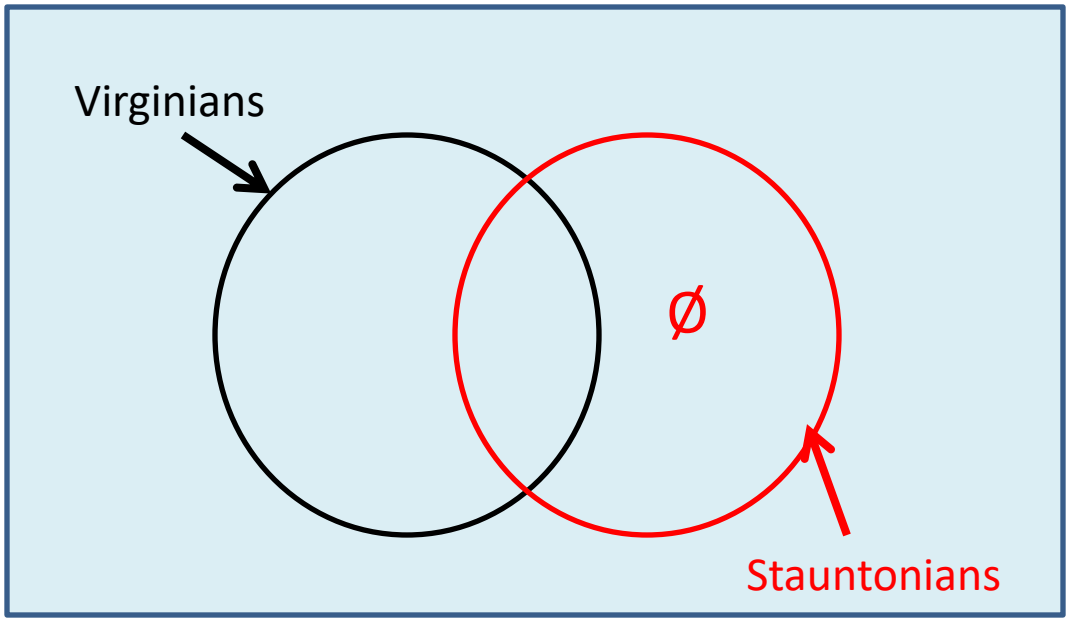


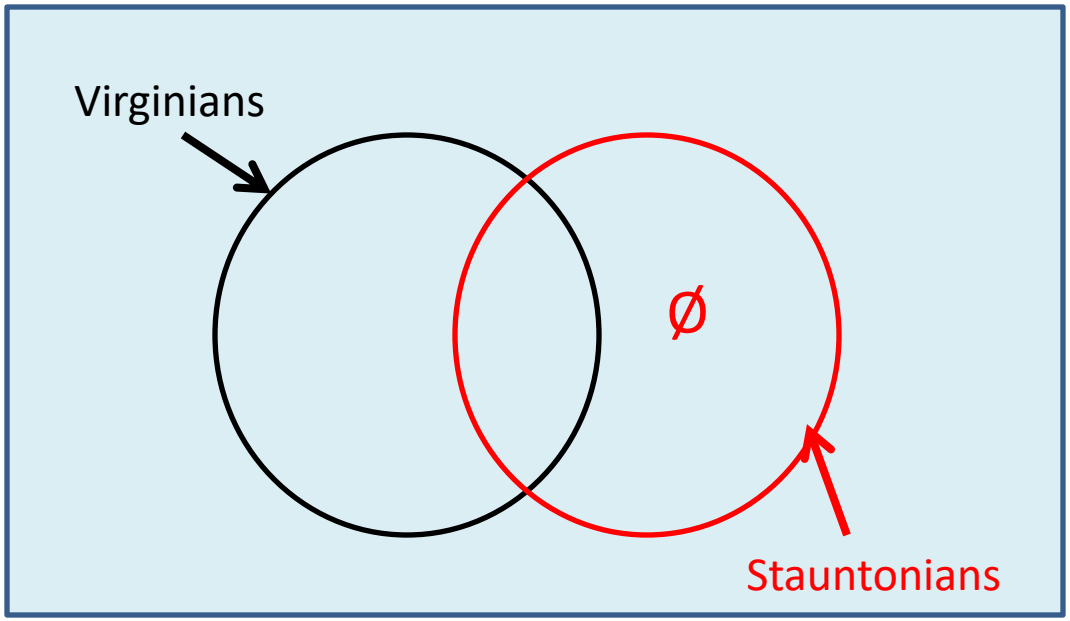
The set of Stauntonians — the set of Virginians = Ø

Support for the contrapositive

Now suppose the contrapositive statement is true:

If a person does not live in Virginia, then that person does not live in Staunton.

This means that anyone not in the black circle is also not in the red circle.



The contrapositive statement also does not assert that anyone lives in either Staunton or Virginia or anywhere else!

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Carl Hempel's Raven Paradox:

Since a conditional and its contrapositive are equivalent, any evidence which supports the one statement should also support the other.

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Since a conditional and its contrapositive are equivalent, any evidence which supports the one statement should also support the other.

Conditional statement:

If *x* is a raven, then *x* is black.

Support for the contrapositive

Carl Hempel's Raven Paradox:

Since a conditional and its contrapositive are equivalent, any evidence which supports the one statement should also support the other.

Conditional statement:

If *x* is a raven, then *x* is black.

Evidence:

x_1 is a raven and x_1 is black; x_2 is a raven and x_2 is black; …

Support for the contrapositive

Carl Hempel's Raven Paradox:

Since a conditional and its contrapositive are equivalent, any evidence which supports the one statement should also support the other.

***Contrapositive* statement:**

If *x* is not black, then *x* is not a raven.

Support for the contrapositive

Carl Hempel's Raven Paradox:

Since a conditional and its contrapositive are equivalent, any evidence which supports the one statement should also support the other.

Contrapositive statement:

If *x* is not black, then *x* is not a raven.

Evidence:

my shirt is not black and it is not a raven;

my hat is not black and it is not a raven; etc.

Support for the contrapositive

Carl Hempel's Raven Paradox:

Since a conditional and its contrapositive are equivalent, any evidence which supports the one statement should also support the other.

Conditional:

If *x* is a raven, then *x* is not black.

Evidence:

my shirt is not black and it is not a raven;

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Carl Hempel's Raven Paradox:

Since a conditional and its contrapositive are equivalent, any evidence which supports the one statement should also support the other.

Conditional:

If *x* is a raven, then *x* is not black.

Evidence:

my shirt is not black and it is not a raven;

my hat is not black and it is not a raven; etc.

So I can collect lots and lots of evidence for this ornithological hypothesis about ravens by walking around inside my house looking at things that are not black, and confirming that they are not ravens!

Support for the contrapositive

Carl Hempel's Raven Paradox:

Since a conditional and its contrapositive are equivalent, any evidence which supports the one statement should also support the other.

Conditional:

If *x* is a raven, then *x* is not black.

Evidence:

my shirt is not black and it is not a raven;

my hat is not black and it is not a raven; etc.

We need an account of induction which explains why evidence for the contrapositive is not equally good evidence for the conditional.

Grue

Nelson Goodman's Grue Paradox:

Even if we find an account of induction which gets around Hempel's Raven Paradox, we still face Goodman's Grue Paradox, which applies to the original conditional.

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If *x* is an emerald, then *x* is green.

Grue

Nelson Goodman's Grue Paradox:

Even if we find an account of induction which gets around Hempel's Raven Paradox, we still face Goodman's Grue Paradox, which applies to the original conditional.

If *x* is an emerald, then *x* is green.

Evidence:

x_1 is an emerald and x_1 is green;

x_2 is an emerald and x_2 is green; …

Grue

Nelson Goodman's Grue Paradox:

If *x* is an emerald, then *x* is green.

Let's add times to our observations:

Evidence:

x_1 is an emerald observed at time t_1 and x_1 is green;

x_2 is an emerald observed at time t_2 and x_2 is green; …

Grue

Nelson Goodman's Grue Paradox:

If *x* is an emerald, then *x* is green.

Now lets define *grue.*

An object is *grue* if and only if it is green at all times up to time **T**, and blue thereafter.

Grue

Nelson Goodman's Grue Paradox:

An object is *grue* if and only if it is green at all times up to time **T**, and blue thereafter.

New geological hypothesis:

If *x* is an emerald, then *x* is *grue*.

Grue

Nelson Goodman's Grue Paradox:

An object is *grue* if and only if it is green at all times up to time **T**, and blue thereafter.

New geological hypothesis:

If *x* is an emerald, then *x* is *grue*.

Do we have any evidence for this new hypothesis?

Grue

Nelson Goodman's Grue Paradox:

An object is *grue* if and only if it is green at all times up to time **T**, and blue thereafter.

New geological hypothesis:

If *x* is an emerald, then *x* is *grue*.

Yes! All of our evidence for the original statement about emeralds is also evidence for this one.

Grue

Nelson Goodman's Grue Paradox:

An object is *grue* if and only if it is green at all times up to time **T**, and blue thereafter.

New geological hypothesis:
If *x* is an emerald, then *x* is *grue*.

Evidence: (with all times t_1, t_2, etc. < **T**)
x_1 is an emerald observed at time t_1 and x_1 is green;
x_2 is an emerald observed at time t_2 and x_2 is green; …

Yes! All of our evidence for the original statement about emeralds is also evidence for this one.

Grue

Nelson Goodman's Grue Paradox:

An object is *grue* if and only if it is green at all times up to time **T**, and blue thereafter.

New geological hypothesis:
If *x* is an emerald, then *x* is *grue*.

Evidence: (with all times t_1, t_2, etc. < **T**)
x_1 is an emerald observed at time t_1 and x_1 is green;
x_2 is an emerald observed at time t_2 and x_2 is green; …

We need an account of induction which explains why evidence for the original hypothesis about emeralds is not also equally good evidence for the grue hypothesis.