# Opacity Explained

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**Abstract**

I decided to reduce my explanation of opacity to the simplest possible case.The result is illuminating.

## 1 Definitions

Let

$$P(x) = (\exists y)\, B(y) \wedge S(y, x)$$

And

$$Q(x) = (\exists y) \neg B(y) \wedge S(y, x)$$

## 2 The Reasoning

If you have x = Cicero and B be Tom's believing that the object corresponding to his idea y denounced Catiline and S is a relation between ideas and objects..

$$P(\text{Cicero}) = (\exists y) B(y) \wedge S(y, \text{Cicero})$$

Consider its negation.

$$\neg P(\text{Cicero}) = \neg(\exists y) B(y) \wedge S(y, \text{Cicero})$$

But this is false. There is such a y, Tom's idea of Cicero. What is true is:

$$Q(\text{Cicero}) = (\exists y) \neg B(y) \wedge S(y, \text{Cicero})$$

Here y is Tom's idea of Tully.

## 3 Quine's Fallacy

Quine conflates ideas (and here words could be used instead of idea).

Let R(x) = Tom believes x denounced Catiline.

Now R(Cicero) is true

and R(Tully) is false.

And Cicero = Tully

Defying that one can substitute identical entities.

The falliccy is that the beliefs are in terms of ideas (or words would do here).

And Tom's idea of Cicero is not identical with his idea of Tully.

Also the word "Cicero" is not identical woith the word "Tully".