

How A Thermostat Works
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I

Do you live in a house? Is there heat in the air?
The chances are good there's a thermostat there!
If your room is too cold — with the twist of a dial —
 A thermostat turns on the heat for a while.
But if warming the house is your only desire,
With the heat on forever, you'd soon be afire.
 The heater must turn on to warm up the air
But it ought to turn off once the temperature's where
 You set it to be; then it turns on once more
If you let in the cold when you open the door.
So how does it know (if it doesn't have skin)
The heat of the house, or the room that it's in?
 And how can it see (if it doesn't have eyes)
When the knob has been turned for the temperature rise?
Well, in this day and age we all use machines:
they might grow alfalfa; they might shrink our jeans.
Some machines built today, we are told, are so smart:
 They help cure diseases; they study fine art.
And buried inside there's a triumph of science —
 The microprocessor; a modern reliance.
It makes billions of complex decisions each second
Far faster than you could have possibly reckoned.
But the thermostat's simple. It can only decide
If it should or should not bring the heat up inside.
It doesn't need eyes and it doesn't need brains.
It doesn't want freedom; it cannot feel pain.
 The principles guiding its service to you
 Are based around simpler sciences, too:
 So that is why I think there may be a way
 To show how it works with a poem today.

II

Back when toilets with plumbing caused rapture and merriment,
The watchmaker Harrison did an experiment.
He knew that when heated, some metals expand
And thought this phenomenon he might command.
So he joined steel and brass, by the edge from the tip,
And he made what is called a bimetallic strip.
It curled up to the right if he made it get hotter
And went back to the left if doused in cold water.
Brass expands quicker than steel, so it's neat
That something so simple could measure the heat!
And curled in a coil, inside your own home
Is that very same strip, enclosed in a dome
With temperatures printed around its perimeter
So that when it is turned it will act as a limiter —
You rotate the knob to set hot or cold,
and (though these are no longer legally sold)
A tiny glass vial¹ attached to the strip
Holds quicksilver metal that easily drips
Between two electrodes, which turns on the heater!
But please don't go home yet, for it gets even neater...
If the strip gets too warm, it is sure to curl back
And the vial turns over and breaks the contact!
And once it cools down after not being heated,
it tilts back once more and the whole thing's repeated.
And now I have taught you (though I don't mean to boast)
Why your heater won't make you a human pot roast.

¹ If you find one of these, please don't take it to bits;
The poison inside will cause headaches and fits!

III

Dear grown-ups, I hope that this has been a thing
That you enjoyed reading with your own offspring.
I now come to you with a humbling admission:
Of thermostat models I made an omission.
If you have a new house you'll no doubt understand
The digital ones bear the brunt of demand.
But I think the analog holds the right qualia
To reward savvy inquiries amongst *Animalia*.
Its elegance trounces a modern appliance;
One sits on my desk, in quiet defiance —
Of those who hide learning away out of reach;
Of those who won't learn and yet still try to teach.
Of those who look down upon unsanctioned science —
Or condemn curiosity over compliance.
It reminds me that skill is a kite on a string
And that those who ask questions gain understanding.
That the world is suffused with such simple devices
That do just what they're told and accept all advices.
And the means to control them; a gift and a curse
Whose bearers must use it for better, not worse.
So I hope when you read this, you'll take it to heart:
Go find something cheap and then take it apart.
And see what it does to accomplish its function
And go tell your kids (if you feel the compunction)!
You can do it right now — it takes but an hour —
And know that it grants you a prodigious power.
And now that you've finished the sermon preceding
I'll step off my soapbox and say, "thanks for reading".