

# Simplicity and Complexity in Science Communication

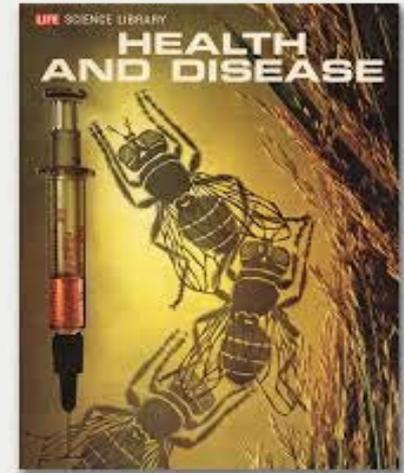
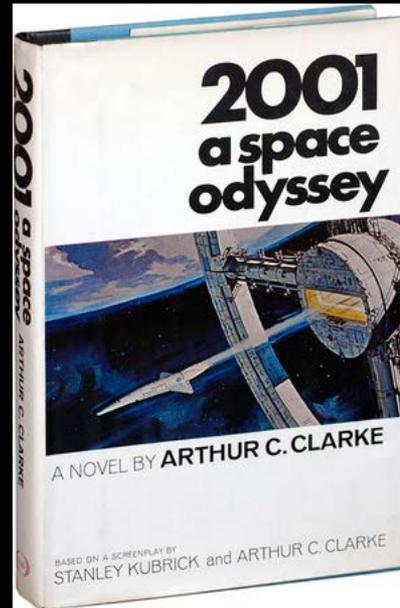
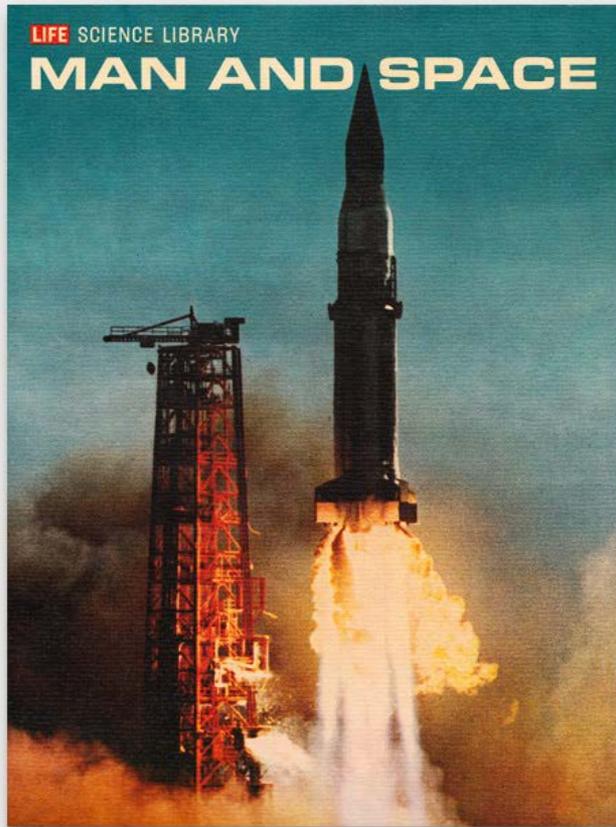
Professor Joan Leach, Director

Australian National Centre for the Public  
Awareness of Science



Australian  
National  
University

# 1960's mood board...



# Dialectic of complexity and simplicity in science communication

Science is becoming more complex.

“Because the science we have now so vastly exceeds all that has gone before, we have entered a new age that has been swept clear of all but the basic traditions of the old...it is so complex that many of us begin to worry about the sheer mass of the monster we have created”

Derek de Solla Price *Big Science, Little Science*  
(1962)

# But what to do about that?

## Consideration 1: study it...

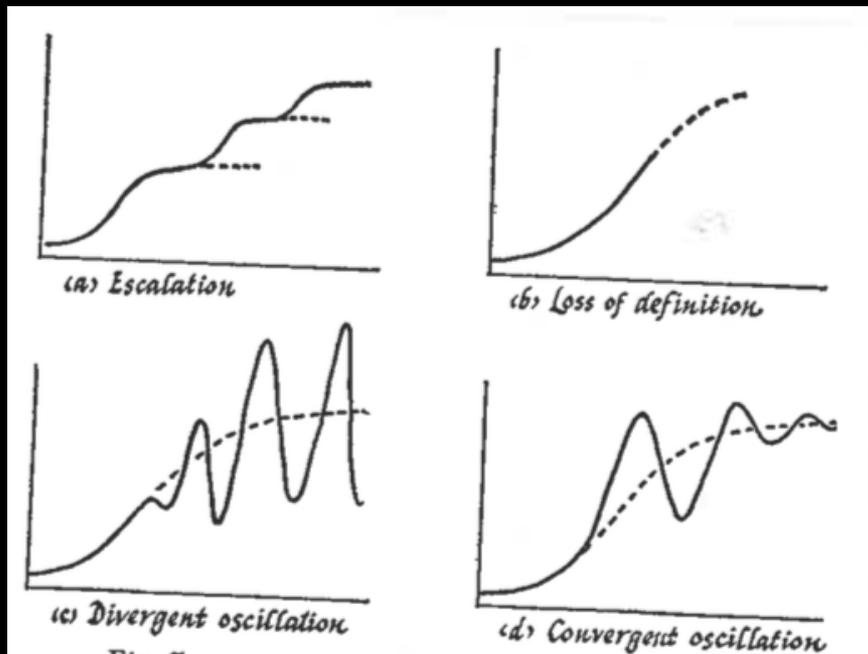


Fig. 7. WAYS IN WHICH LOGISTIC GROWTH MAY  
REACT TO CEILING CONDITIONS

In escalation, new logistics are born as the old ones die, in loss of definition it becomes impossible to continue to measure the variable in the same way or in the same units, and in oscillation (convergent and divergent) cybernetic forces attempt to restore free growth.

# Consideration 2: worry about it

“...a second basic law of the analysis of science: all the the apparently exponential laws of growth must ultimately be logistic and this implies a period of crisis on either side of the date of midpoint for about a generation. The outcome of the battle at the point of no return is complete reorganization or violent fluctuation or death of the variable...I will suggest that at some point during the 1940s or 1950s we passed through the midperiod in general growth of science’s body politic.”

Derek de Solla Price

# Consideration 3: What to do about communicating in the face of complexity?

1. Don't let scientists know about the evolution of 'the monster' (The Kuhnian solution)
2. Professional communication must change...  
“...scientific communication by way of the published paper is and always has been a means of settling priority conflicts by claimstaking rather than avoiding them by giving information..scientists have a strong urge to write papers but only a relatively mild one to read them....scientists must aim to establish and secure the prestige and priority they desire by means more efficient than the traditional device of journal publication. “ Derek de Solla Price

# Public communication—the good news

## “FRONTIERS of SCIENCE”

Everybody is science-conscious these days, and this new strip feature, intelligently presented and attractively drawn, will enable newspaper readers to get a better grasp of what is going on in the world today.

FRONTIERS OF SCIENCE runs on week after week, but here is the new approach . . . each week a new subject is started which runs right through from Monday to Friday. Readers become interested right at the start and will want to get each copy of the paper that week to keep completely up-to-date.

Here is one week's release:

### FRONTIERS OF SCIENCE

### This week: RELATIVITY — Part 1

MON. →

THE IMMINENT PROSPECT OF SPACE TRAVEL NOW BRINGS MANKIND FACE TO FACE WITH ONE OF THE MOST BAF-FLING CONCEPTS IN THE WHOLE OF SCIENTIFIC KNOWLEDGE...



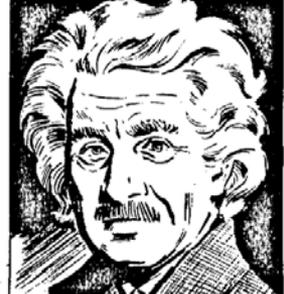
IMAGINE A SPACE TRAVELLER SETTING OFF ON A LONG JOURNEY INTO OUTER SPACE, LEAVING A TWIN BROTHER ON EARTH.

RETURNING TO EARTH AFTER WHAT HAD BEEN TO HIM A JOURNEY OF A YEAR AT VERY GREAT SPEEDS, THE TRAVELLER WOULD FIND THAT HIS TWIN BROTHER HAD AGED TEN OR EVEN TWENTY YEARS...



..... AND IF THE TRAVELLER STAYED AWAY WHAT WAS, FOR HIM, TWENTY YEARS, HE WOULD FIND THAT ON HIS RETURN CENTURIES HAD PASSED!

IT WAS EINSTEIN WHO EXPLAINED HOW IT IS POSSIBLE TO TRAVEL IN TIME, AS WELL AS IN SPACE, IN HIS THEORY OF RELATIVITY.



# 1962



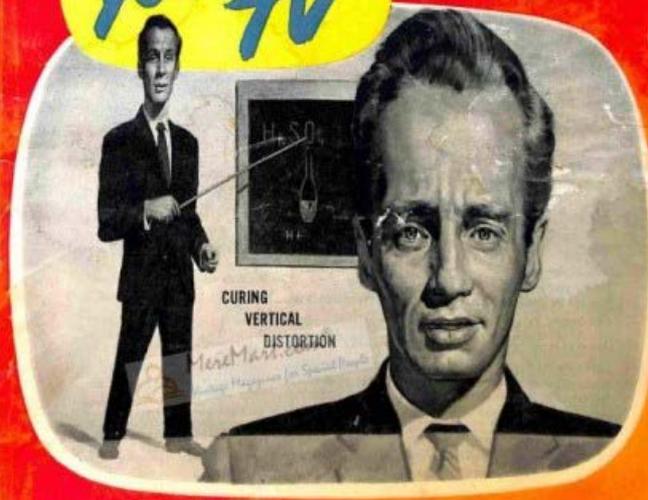
Tricks for Driving Two-Lane Roads PAGE 43

# POPULAR SCIENCE

60 AUGUST • 35c Monthly

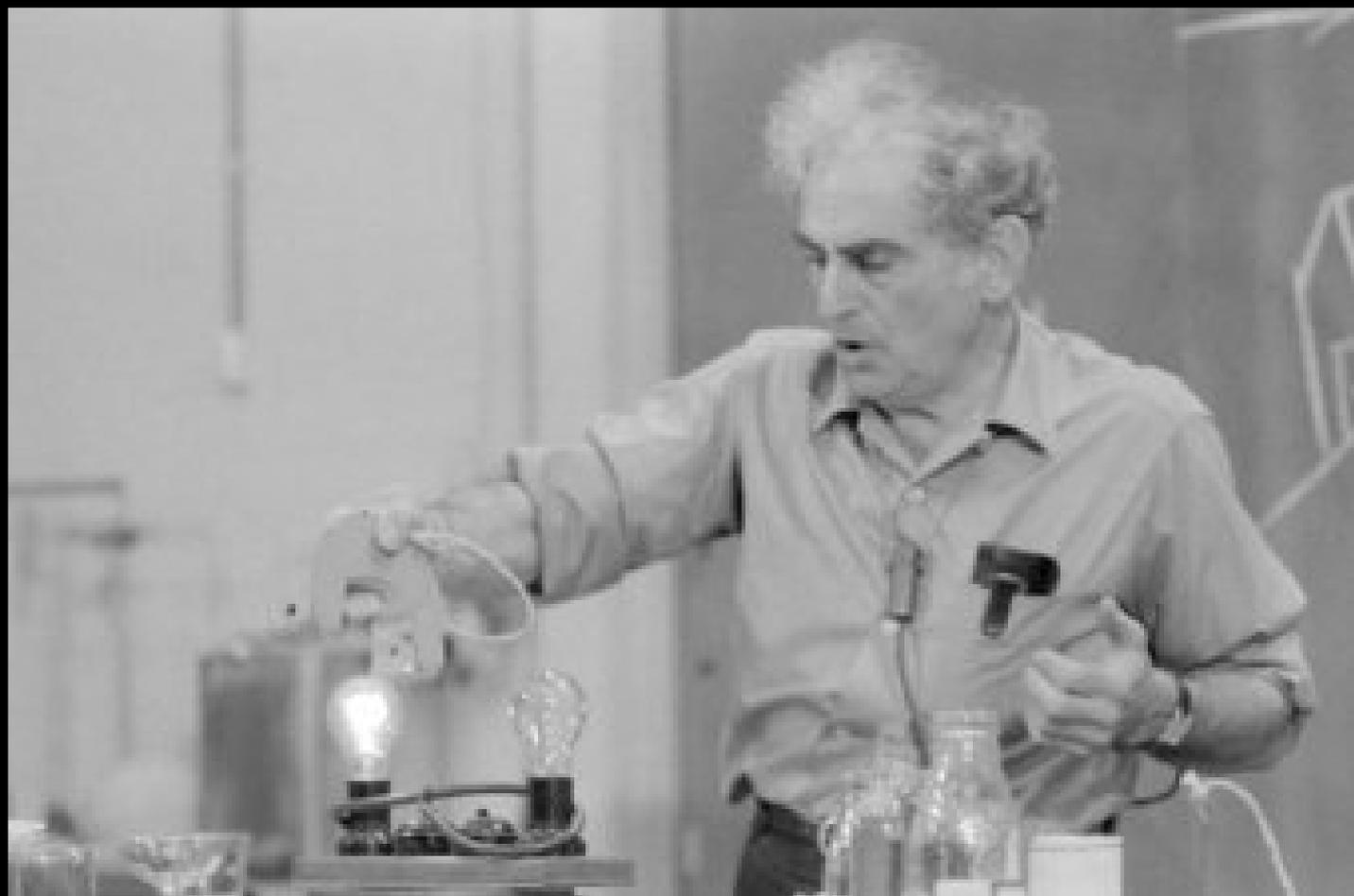
Fixing  
Your Own  
TV

Money-saving  
series starts  
in this issue PAGE 141



CURING  
VERTICAL  
DISTORTION

Here's How  
to Fix Your TV for Good



# The diversity and energy of science communication shifts focus to literacy

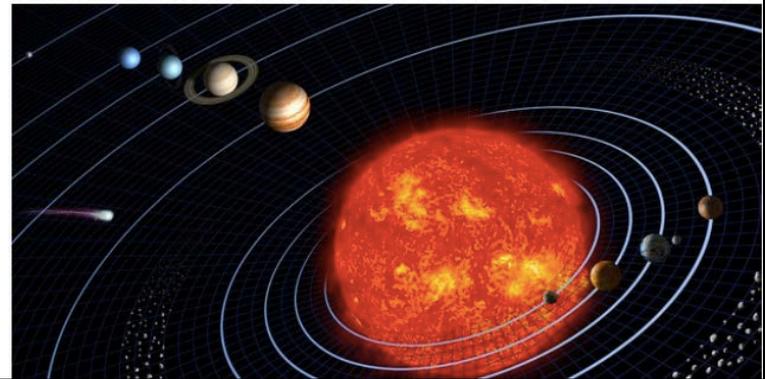
## Image of the Scientist among High-School Students

A Pilot Study

Margaret Mead and Rhoda Métraux

## What Americans Don't Know About Science

On a recent survey, just 74 percent of Americans said that the Earth revolves around the sun.



# 1960s responses to complexity of and in science

1. May have negative impact on scientists—  
how they see science, the difficulty of crises.
2. Diversity of popularisation is desirable and  
quite viable—simplification is not a ‘problem’  
but an opportunity.
3. The image of science in general in the public  
mind is central.

# Science Communication now...

How well can scientists communicate about the nature of science? Is that part of the job?



2014 CPAS ANU Poll

74% of scientists YES

82% don't know  
how

70% of public want  
more contact with  
scientists

# science communication to increasingly segmented audiences



SKEPTIC SUMMARIES

WHY WE ARE EXAGGERATING  
"EXTREME WEATHER"



SKEPTIC SUMMARIES

PRESENTATION: THE SCIENCE OF THE  
SKEPTIC POSITION



# Image of science decoupled from science literacy

What Pew said in **2009** about relationship between beliefs “gaps” and trust in science

Despite these differences, science and scientists are viewed positively by those who differ over evolution, global warming and other contentious issues.

## Scientists Viewed Positively, Even By Those Skeptical of Scientific Conclusions

*How much do scientists contribute to the well-being of society?*

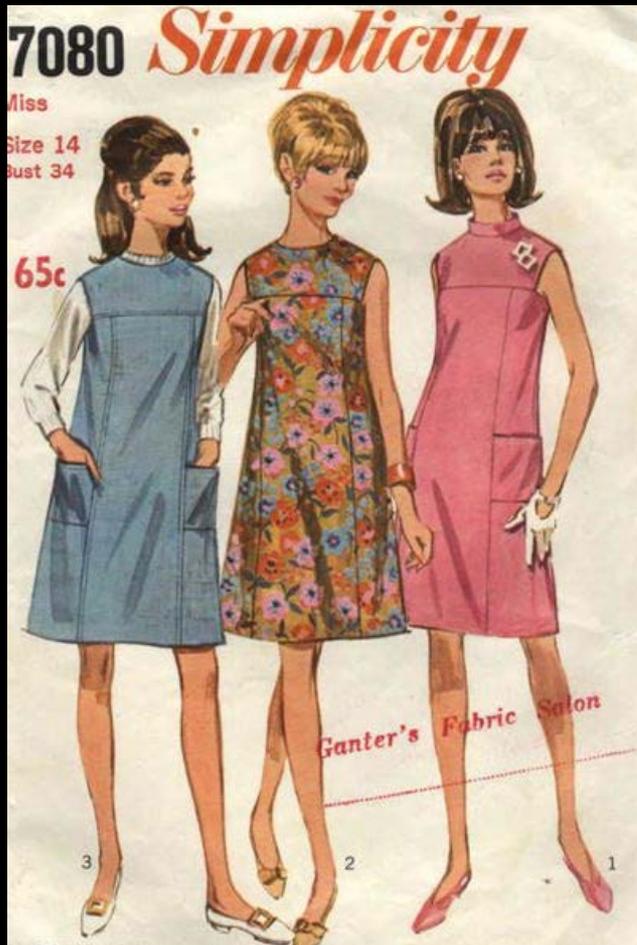
	Not much/			
	<u>A lot</u>	<u>Some</u>	<u>Nothing</u>	<u>N</u>
	%	%	%	
<b><i>View on origins of life...</i></b>				
Believe in evolution due to natural selection	78	19	3	647
Believe beings were created in present form	63	27	7	621
<b><i>Views on climate change...</i></b>				
Earth is getting warmer due to human activity	74	21	4	965
No solid evidence earth is getting warmer	64	25	7	239
<b><i>Science and your religious beliefs...</i></b>				
Science does not conflict w/ my beliefs	72	21	5	1249
Science conflicts w/ my beliefs	67	27	5	694

Figures read across.

# From '60s to now

- Emphasis away from scientists' responsibility to communicate the nature of what they do to public responsibility to become literate
- From diverse popular science with large reach to segmented audiences seeing things separately
- And yet, the image of science is still positive even if skepticism toward specific results is high

# What does this mean in practice?



Time to tackle the complexity of science itself head on

Scientists may need to re-take responsibility

Search for common spaces for science communication