Reaching New Audiences: Using Technical Reports for Research in the Humanities and Social Sciences

October 19, 2021

Tom Rohrig, Associate Librarian, Texas Tech University
and
Larayne Dallas, Engineering Librarian, University of Texas at Austin

Our Plan for Today:

- The basics of technical reports
- A discussion of the value of technical reports for research beyond STEM
- Recommendations for identifying and locating reports for humanities and social science research

What are Technical Reports?

Modified from: https://www.osti.gov/what-is-a-technical-report

- Sources of scientific and technical information***
- Derived from research projects
- Describing processes, progress, and results
- Including conclusions of the research
- Often including more comprehensive or detailed information than scholarly papers or presentations

Why a Technical Report?

- Reporting on an investigation
- Informing a funder
- In-depth discussion
- Not usually peer reviewed
- May be easily/quickly issued
- “User directed” - known reader (Brearley, p.118)

Historical Information & Context

- Informal scholarly communications as technical reports
- Government agencies
    - For example, NACA and National Bureau of Standards (now NIST)
- Research laboratories - universities, companies, other
- Post World War 2 boom
- Primary source material
- Considered to be a type of grey literature -- from agencies or organizations whose primary activity is not publishing (Bobick & Berard, p.137)

Access - Historically

- Often hard to discover and locate
  - Limited or non-mainstream indexing
  - Limited availability
    - Can anyone else find it if cited?
- Disappearing organizations and agencies

Access Evolves

- The Internet
- New access & new expectations
  - Indexing
  - Text

Access Evolves - More

- Enhancement in older products to include document text
  - NTIS / NTRL, DTIC, Catalog of U.S Government Publications (CGP)
- New products with document text
  - Single agency: Department of Energy, NASA, RAND, Mitre.org, university repositories
  - Multiple agency: TRAIL
- Real hope of finding document text!

Electronic Tools . . . Change in Thinking

- Able to think of technical reports as a “regular” source of information
- Improved indexing
- Easier to verify
- Easier to find

Expanding Usefulness of Technical Reports Beyond STEM

- History of science
- Adding research depth -- background information and data -- to historical topics
- Other subject areas have been there all along
  - Including: architecture, human factors, education, anthropology, psychology, and sociology

Literature Review

1. The presenters feel that humanities and social sciences researchers can supplement their research by examining their topics' coverage in technical reports.
2. The presenters looked at topics in the humanities and social sciences to find applicable examples of technical reports that would supplement research based primarily in non-science areas.
3. We used the Hyatt Walkway collapse familiar to members of TRAIL the Lubbock Tornado familiar to Tom, and brainstormed for other examples

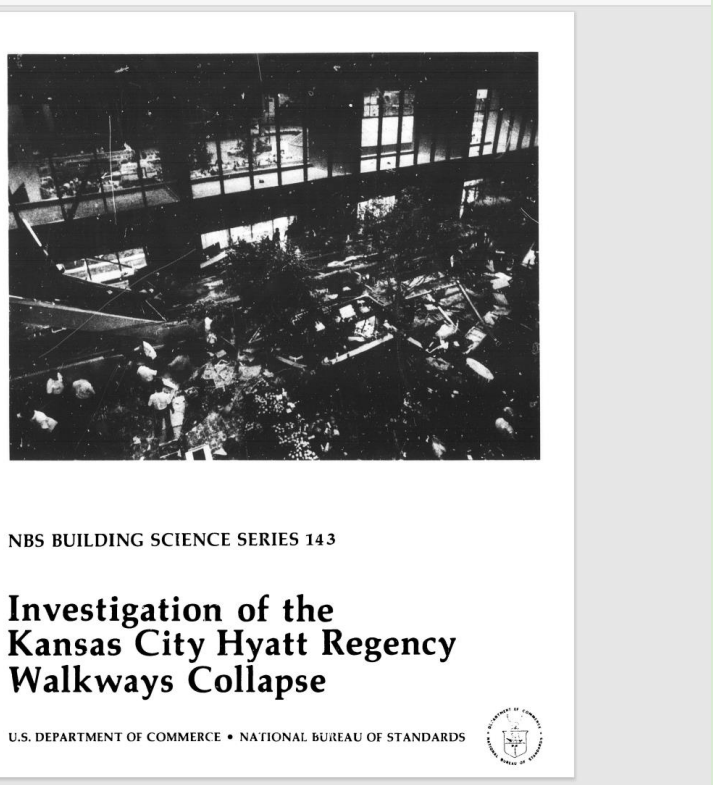
Some Examples

- Investigation of the Kansas City Hyatt Regency Walkways Collapse - UNT Digital Library
- Lubbock, Texas tornadoes
- Early aircraft, including the Caproni Seaplane
- Historic fishing methods in American Samoa

Example 1 - *Investigation of the Kansas City Hyatt Regency Walkways Collapse - UNT Digital Library*

Description

Report issued by the National Bureau of Standards documenting investigations conducted on construction failures of two suspended walkways in a Kansas City hotel. It includes tables, illustrations, photographs, and other details of the investigation.



Example 1 - *Investigation of the Kansas City Hyatt Regency Walkways Collapse - UNT Digital Library*

Recent usage

Usage by Month/Year

Year	January	February	March	April	May	June	July	August	September	October	November	Decemb
2021	299	224	271	268	239	349	813	175	222			
2020	189	249	228	194	293	126	193	140	194	243	219	287
2019	240	250	344	980	521	279	244	158	145	240	335	147
2018	360	262	838	415	345	197	202	347	301	388	379	167
2017	510	221	295	345	185	170	163	153	206	342	302	245
2016	529	716	688	797	560	363	363	558	565	563	617	403
2015	544	443	531	610	506	473	591	677	627	905	919	562
2014	112	118	206	335	333	326	499	359	498	497	526	428
2013	10	36	35	49	46	31	109	153	143	175	164	127
2012	0	0	0	0	0	0	0	0	0	0	0	5

Example 1 - *Investigation of the Kansas City Hyatt Regency Walkways Collapse - UNT Digital Library*

370 page report

Provides detailed description of incident and subsequent investigation.

Has been used as source material in various news stories.

Information provided can be used in engineering ethics, legal, city government, etc. discussions.

12 chapters include

> “Chapter 4 summarizes events preceding and following the collapse and eyewitness accounts of the collapse. This chapter also discusses the walkway occupancy prior to the collapse and presents what is believed to be a credible estimate of walkway occupancy at the time of collapse.”
>
> “Chapter 11 summarizes the findings of the investigation and presents conclusions reached by the NBS investigative team. “

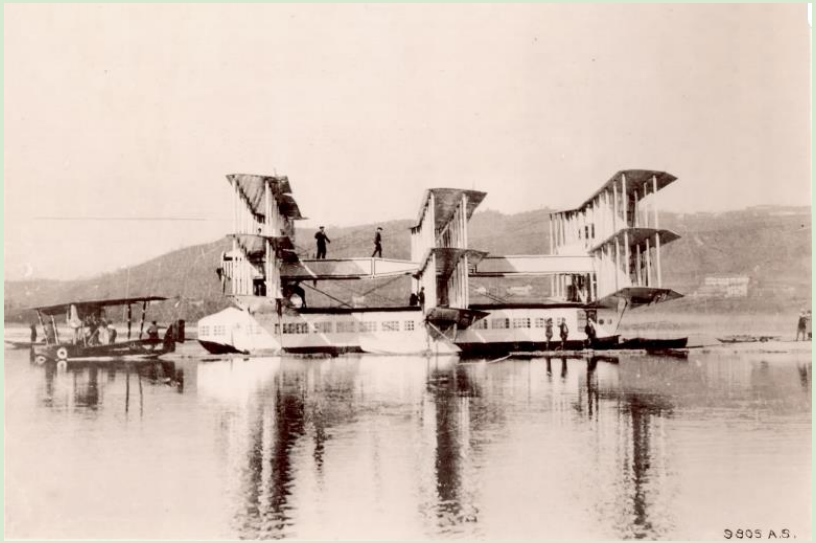
Example 2 - The Lubbock Tornado

1. Lubbock Tornado May 11, 1970 Documents and Reports contains several technical reports
   a. The Lubbock, Texas Tornado May 11, 1970 A Report to the Administrator U.S. Dept. of Commerce, Environmental Science Services Administration Natural Disaster Survey Report 70-1
   b. Lubbock Tornadoes of 11 May 1970 - Tetsuya Theodore Fujita
   c. Response of Structural Systems to the Lubbock Storm Texas Tech University Storm Research Report 03
2. Lubbock tornado Website - “The Lubbock Tornado occurred Monday, May 11, 1970 resulting in close to 200 million dollars in damage, over 1500 injuries, and 26 deaths.”
3. “The Wind Science and Engineering (WISE) Research Center at Texas Tech University was established in 1970 , following a tornado in Lubbock that caused 26 fatalities and more than 100 million in damage.”

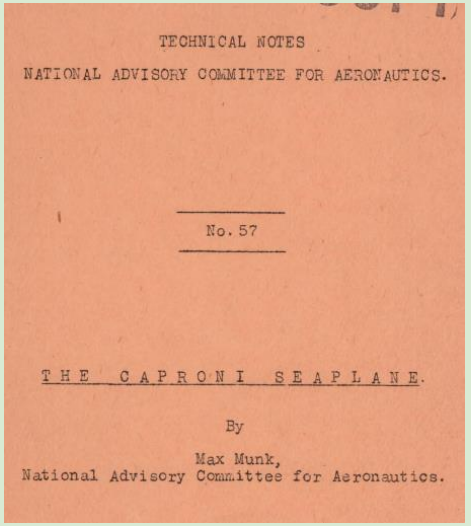
Example 3 - History of Science

From NTRS (NASA Technical Reports Server)

Caproni Seaplane, by Max Munk
NACA-TN-57 (1921)



(https://ntrs.nasa.gov/api/citations/19930080852/downloads/19930080852.pdf)



TECHNICAL NOTES
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

No. 57

THE CAPRONI SEAPLANE.

By

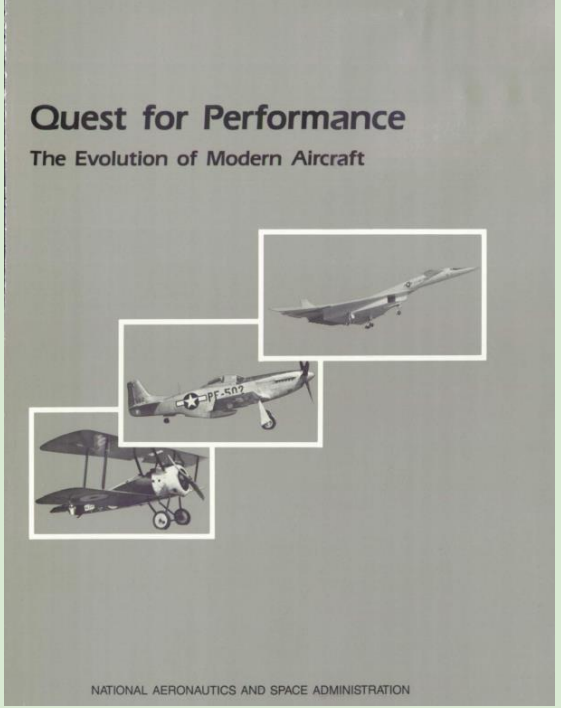
Max Munk,
National Advisory Committee for Aeronautics.

An astonishing experimental airplane and an explanation of why it didn't fly by the impressive Max Munk, German-American expert on aerodynamic theory.

Example 3 - History of Science

From NTRS (NASA Technical Reports Server)

Quest for Performance: The Evolution of Modern Aircraft, by Lawrence K. Loftin, Jr. NASA-SP-468 (1985)



https://ntrs.nasa.gov/api/citations/19850023776/downloads/19850023776.pdf

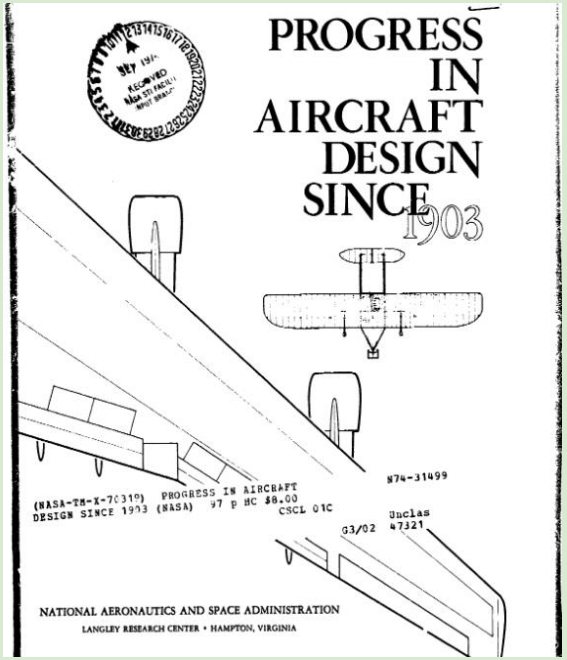
https://ntrs.nasa.gov/api/citations/19850023776/downloads/19850023776.pdf

Another triplane

Example 3 - History of Science

From NTRS (NASA Technical Reports Server)

Progress in Aircraft Design Since 1903 NASA-TM-X-70319 (1974)



https://ntrs.nasa.gov/api/citations/19740023386/downloads/19740023386.pdf

“Significant developments in aviation history are documented to show the advancements in aircraft design which have taken place since 1903. Each aircraft is identified according to the manufacturer, powerplant, dimensions, normal weight, and typical performance. A narrative summary of the major accomplishments of the aircraft is provided. Photographs of each aircraft are included.”

(Photograph quality is poor in the NASA scan.)

Example 3 - History of Science

From *Progress in Aircraft Design Since 1903* (page 8):

ROYAL AIRCRAFT FACTORY R.E.8

In retrospect, the significance of this aircraft is seen more in its concept than in the execution of that concept. It stemmed from a late 1915 requirement for an airplane that could be used for artillery spotting and reconnaissance with the British Expeditionary Force in France, and that could defend itself against enemy fighters.

Until then, airplanes used for observation had been designed to be stable in the air, to provide a steady working platform. For some reason, the R.E.8 was designed to be much less stable, apparently on the theory that it would be more maneuverable and capable of dog-fighting with an enemy.

The result was predictable. R.E.8s acquired a terrible reputation as the result of many crashes in early action at the front, and it was several years before pilots had any faith in the type as a flying machine. By then, their confidence in it as a defensive weapon was at a low point, because it was hopelessly outclassed by the light, agile single-seat fighters the Germans were producing by the hundreds.

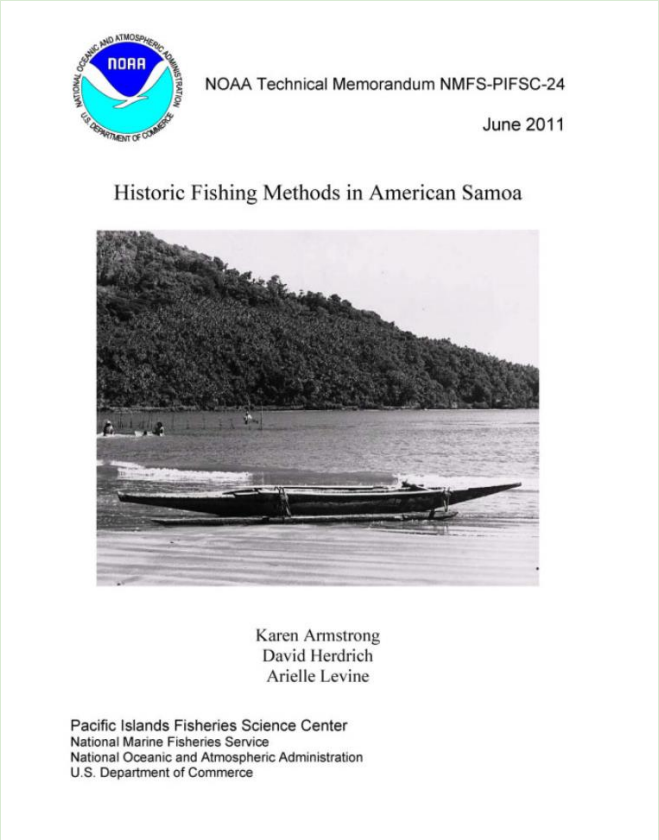
But with archetypical British bulldoggedness, thousands were built and pressed into service. By the end of the war, the R.E.8 had become the standard observation plane in service with corps reconnaissance squadrons.

It was called the "Harry Tate" after a British music-hall entertainer of the day, but there was nothing entertaining about the aircraft, said the pilots. They had their own, and less happy, nicknames. It was built by six other contractors, mostly automobile companies, as well as by the Royal Aircraft Factory, and among its few advantages was its relatively low cost.

ROYAL AIRCRAFT FACTORY R.E. 8: It was a good idea that turned out poorly.

Historic Fishing Methods in American Samoa

“Report discussing the historic fishing practices that are common among American Samoans.”



NOAA Technical Memorandum NMFS-PIFSC-24

June 2011

Historic Fishing Methods in American Samoa

Karen Armstrong
David Herdrich
Arielle Levine

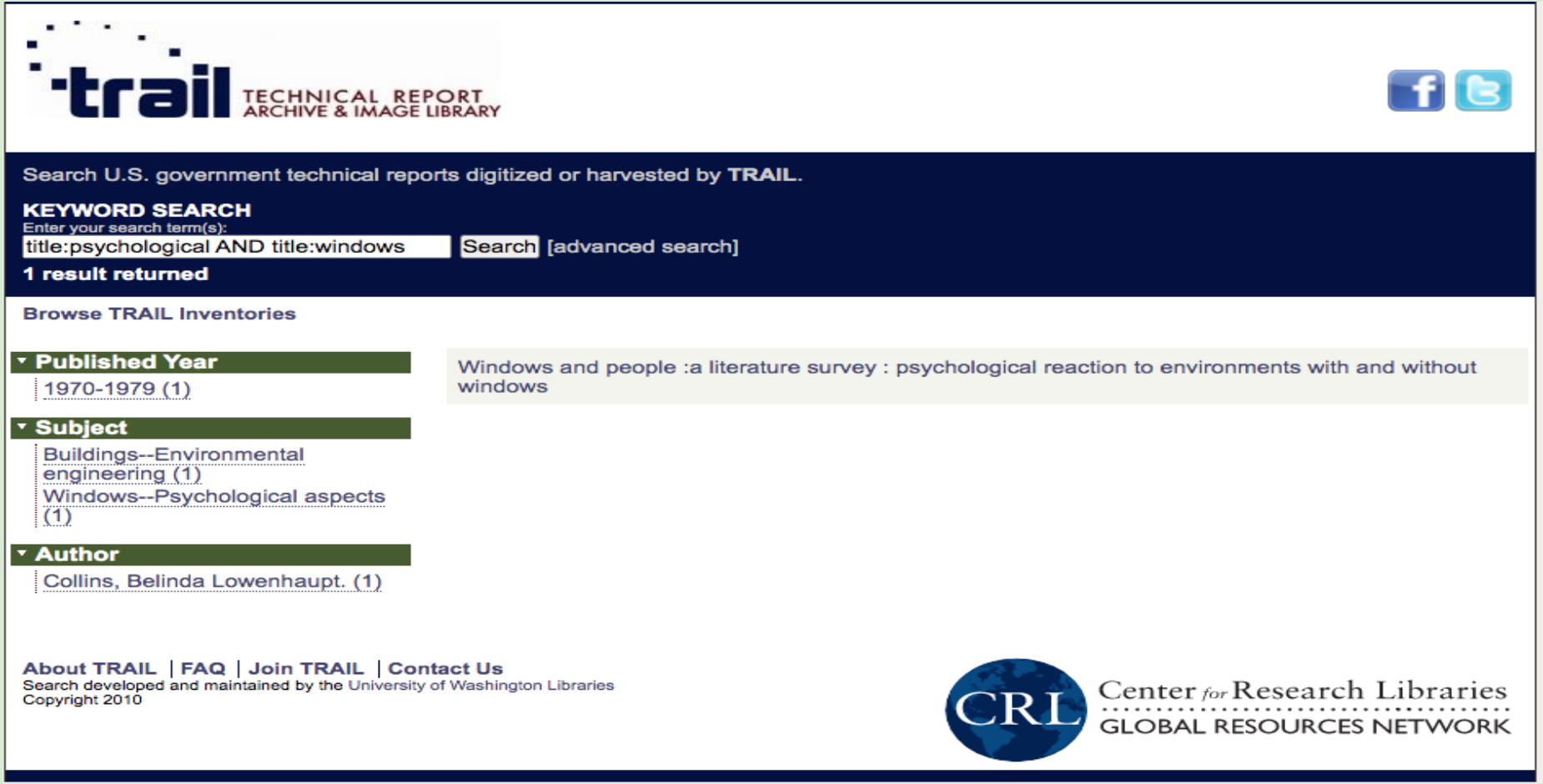
Pacific Islands Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Found through NTIS/NTRL:

- Historical and Architectural Documentation of the Interurban Trolley Bridge at Three Mile CreeK, Fort Riley, Kansas (2009)
- Evaluation and Rehabilitation of Historic Metal Truss 5. Report Date June 2004 Bridges: Preservation Issues (2004)
- Reinvesting in Arts Education: Winning America's Future Through Creative Schools (2011)
- Fortress America: The Aesthetics of Homeland Security in the Public Realm (2017)

Found through TRAIL or OSTI.gov:

- Psychological Aspects of Accident Prevention (1948)
- Physical Fitness Studies in Children Exposed to the Atomic Bomb in Hiroshima (1953)
- The Tragic Bazooka Accident at Los Alamos on July 14, 1962 (2017)
- A Whirlwind History of Cryptography (2020)
- Coal-dependent Communities in Transition: Identifying Best Practices to Ensure Equitable Outcomes (2021)



http://www.technicalreports.org/trail/search/

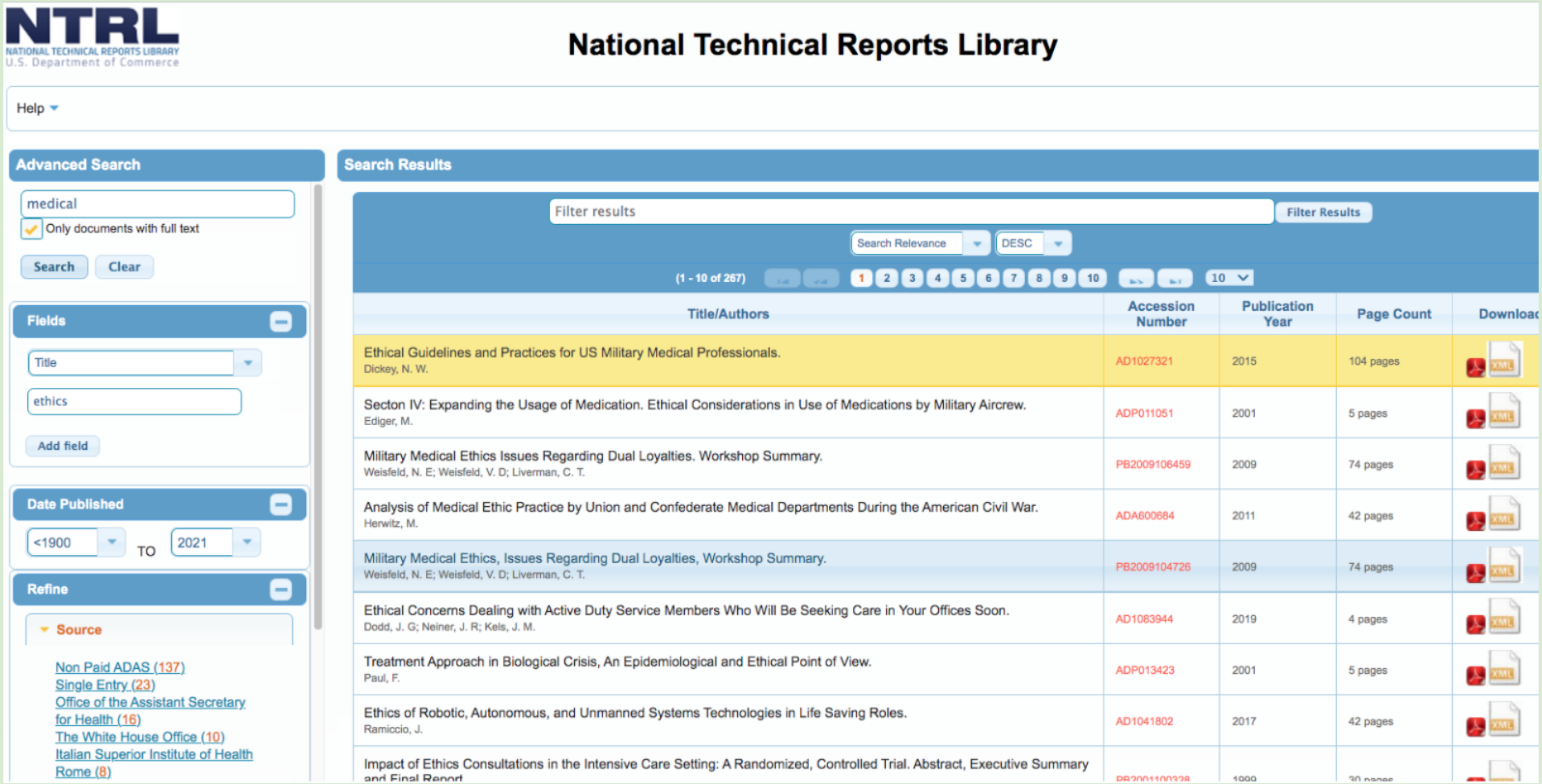
NBS BUILDING SCIENCE SERIES 70

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

Windows and People: A Literature Survey

Psychological Reaction to Environments With and Without Windows

https://babel.hathitrust.org/cgi/pt?id=mdp.39015086577528&view=1up&seq=1

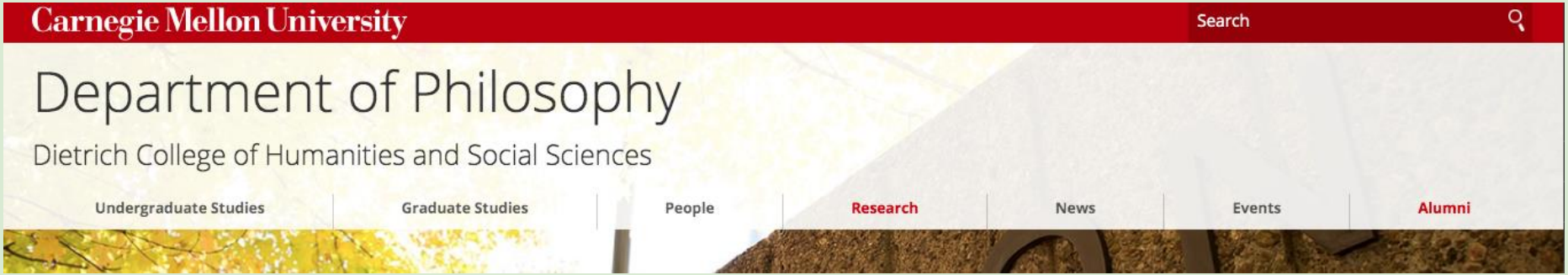


https://ntrl.ntis.gov/NTRL/

Defense Health Board

Ethical Guidelines and Practices for U.S. Military Medical Professionals

March 3, 2015



Technical Reports

2016

194	Daniel Malinsky and Peter Spirtes	Estimating Causal Effects with Ancestral Graph Markov Models

2015

193	Isaac Davis, Erich Kummerfeld, David Danks, and Sergey Plis	Inferring Observed Structure For Dynamic Graphs with Unobserved Variables
192	Patricia Rich and Kevin Zollman	Honesty through repeated interactions

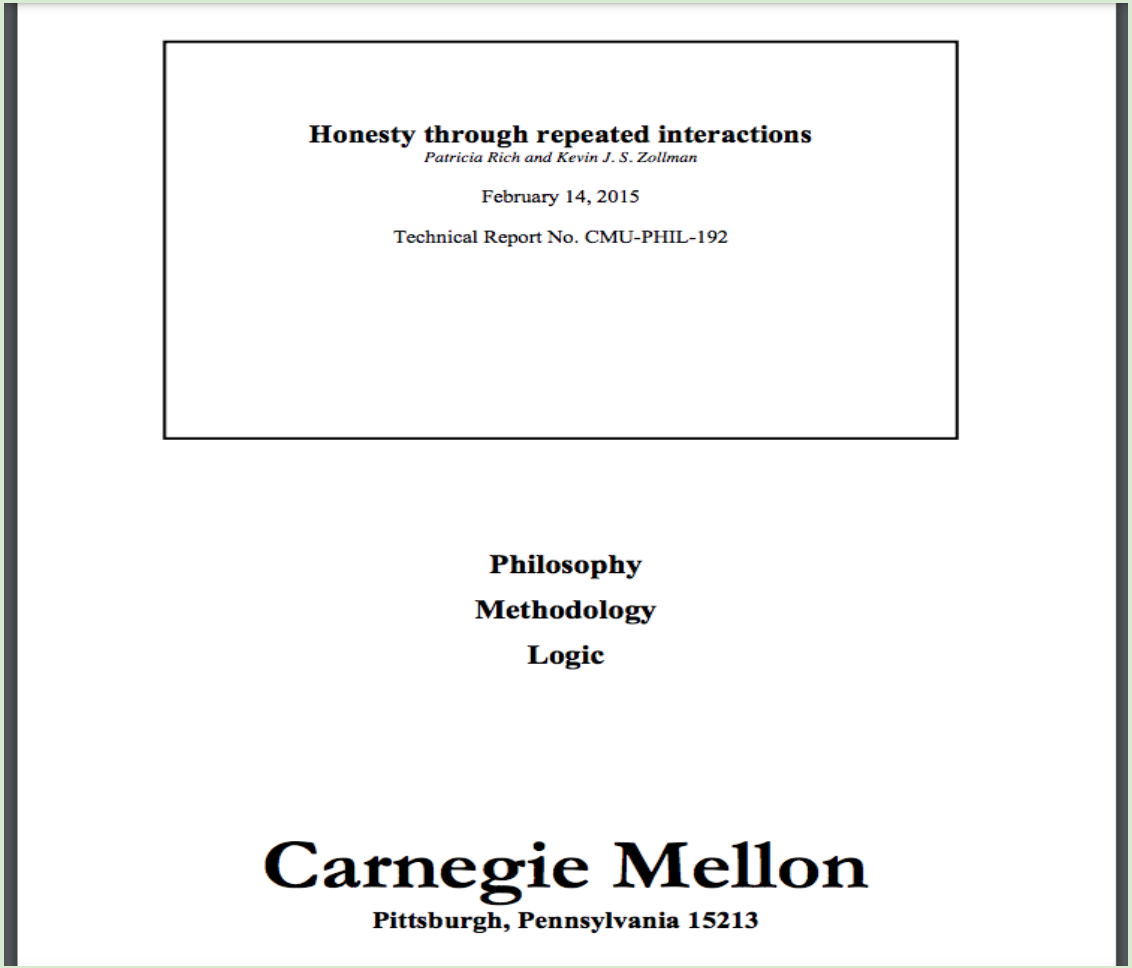
https://www.cmu.edu/dietrich/philosophy/research/tech-reports.html

Research

The areas of research in the department appear non-traditional, but, on closer inspection, are simply modern approaches to answering old questions.

In developing these approaches, we aim to bridge the gap between the humanities and the sciences. Consequently, our work is interdisciplinary and highly focused. Philosophers have a reputation for creating problems. Our department stands in that tradition, but is dedicated to solving problems as well.

https://www.cmu.edu/dietrich/philosophy/research/index.html



Honesty through repeated interactions

Patricia Rich and Kevin J. S. Zollman

February 14, 2015

Technical Report No. CMU-PHIL-192

Philosophy

Methodology

Logic

Carnegie Mellon

Pittsburgh, Pennsylvania 15213

https://www.cmu.edu/dietrich/philosophy/docs/tech-reports/192_Rich.pdf

Discovering Technical Reports - Discussion:

- For topics with a clear connection to government interests
  - By agency
    - OSTI - energy, NASA - aerospace
  - Multi-agency
    - NTIS - wide coverage and including non-governmental
    - TRAIL - wide coverage of federal agencies
    - Science.gov - comprehensive, interdisciplinary,
- Thinking creatively:
  - WorldCat - “technical reports” searchable as a “Genre/Form”
  - “Think tank” websites
    - Rand.com, Mitre.com
  - University research centers
    - Especially as related to local interests and expertise

Other thoughts:

- Value of having technical reports included in federated searches (library “big boxes”)
  - Local decisions on what is included in indexing
- Some categories of reports remain relatively elusive
  - University research center reports:
    - If older, often not indexed or scanned
    - If newer, with less organized-indexing

Conclusions:

- The valuable content of technical reports goes beyond STEM
- Subject coverage is wide ranging, including:
  - History of science and technology
  - Reports on historical events
  - Psychology, philosophy, anthropology, and more
- Indexing and availability of text provide improved access
  - TRAIL, NTIS, NASA, others
- Don’t put technical reports in the rarely consulted category
- Include technical reports on your “checklist” of what to recommend to researchers and students

Selected bibliography:

Bobick, J. E. & Berard, G. L. (2011). *Science and Technology Resources: A Guide for Information Professionals and Researchers*. Libraries Unlimited.

Brearley, N. (1973). Role of technical reports in scientific and technical communication. *IEEE Transactions on Professional Communication, 16*(3), 117-119. https://doi.org/10.1109/TPC.1973.6592685

United States. Department of Energy. Office of Scientific and Technical Information (2016). *What is a Technical Report?* https://www.osti.gov/what-is-a-technical-report