

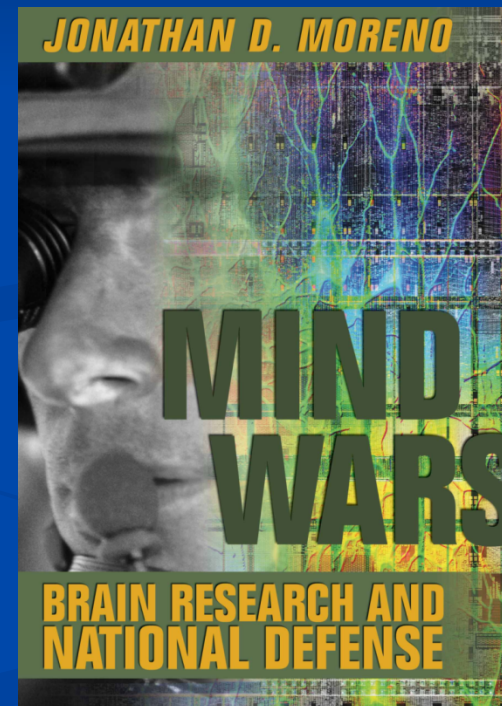
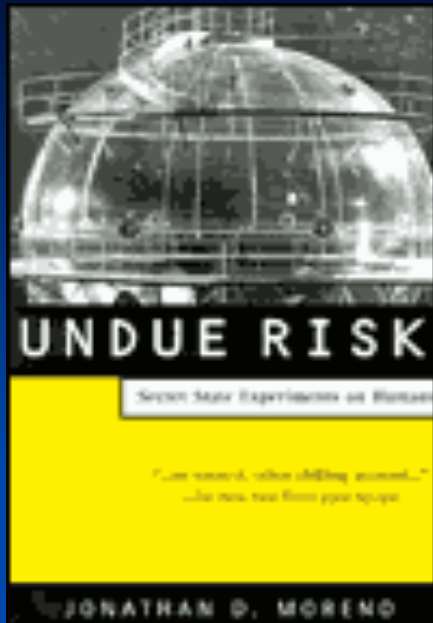
Mind Wars: Brain Research and National Defense

Jonathan D. Moreno
David and Lyn Silfen University Professor

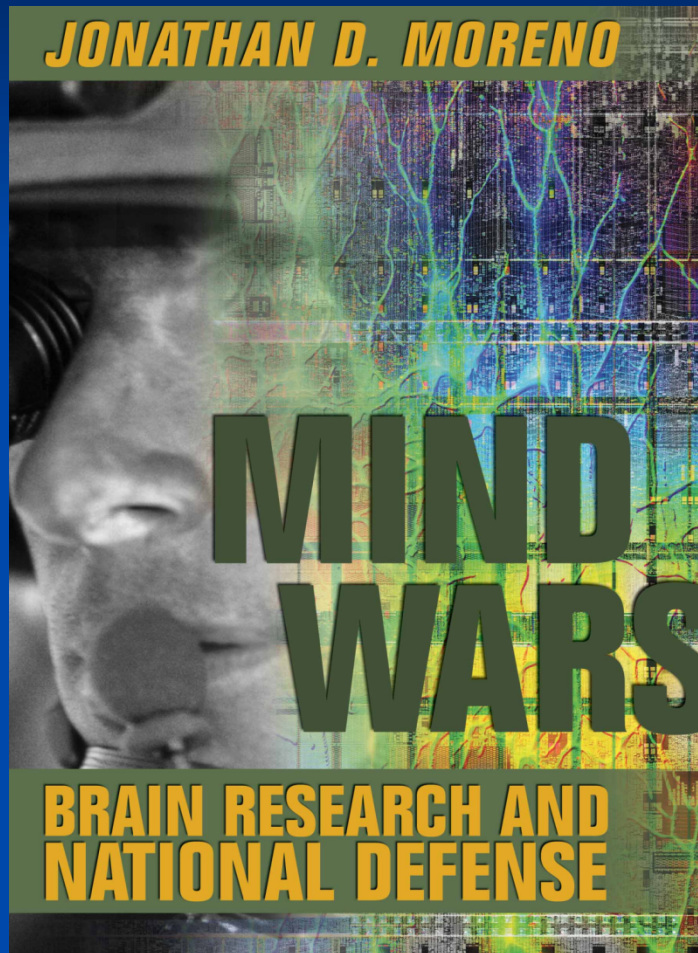
Date

Recent Academies Projects

- Committee on Military and Intelligence Methodology for Emergent Physiological and Cognitive/Neural Science Research in the Next Two Decades, *Emerging Cognitive Neuroscience and Related Technologies*, August 2008
- Committee on Opportunities in Neuroscience for Future Army Applications, *Opportunities in Neuroscience for Future Army Applications*, May 2009
- Committee on Field Evaluation of Behavioral and Cognitive Sciences-Based Methods and Tools for Intelligence and Counter-Intelligence, Workshop September 2009



National Security, the Brain and Behavior: Post WW II-era



- Hallucinogens
- Neuropsychiatry of stress
- Personality theory
- Parapsychology



Allen Dulles

- **Legendary CIA director**
- **Commissioned Wolf-Hinkle report on “brain washing”, 1953**
- **Subsequently supported various hallucinogenic and innovative human experiments**



Sidney Gottlieb



- CIA spymaster
- Developed toxic items for assassination (Castro, Patrice Lumumba)
- Funded hallucinogen experiments
- Architect of MKUltra program

8-15
Boston

DRAFT- [REDACTED] A
9 June 1953

MEMORANDUM FOR THE RECORD

SUBJECT: Project MKULTRA, Subproject 8

1. Subproject 8 is being set up as a means to continue the present work in the general field of L.S.D. at [REDACTED] until 11 September 1954. B
2. This project will include a continuation of a study of the biochemical, neurophysiological, sociological, and clinical psychiatric aspects of L.S.D., and also a study of L.S.D. antagonists and drugs related to L.S.D., such as L.A.E. A detailed proposal is attached. The principle investigators will continue to be [REDACTED] all of [REDACTED] C B
3. The estimated budget of the project at [REDACTED] is \$39,500.00. The [REDACTED] will serve as a cut-out and cover for this project and will furnish the above funds to the [REDACTED] as a philanthropic grant for medical research. A service charge of \$750.00 (2% of the estimated budget) is to be paid to the [REDACTED] for this service. B
4. Thus the total charges for this project will not exceed \$40,250.00 for a period ending September 11, 1954.
5. [REDACTED] (Director of the hospital) are cleared through TOP SECRET and are aware of the true purpose of the project. C

for [REDACTED] A
Chemical Division/TSS

APPROVED:

[REDACTED]
Chief, Chemical Division/TSS

PROGRAM
[REDACTED]

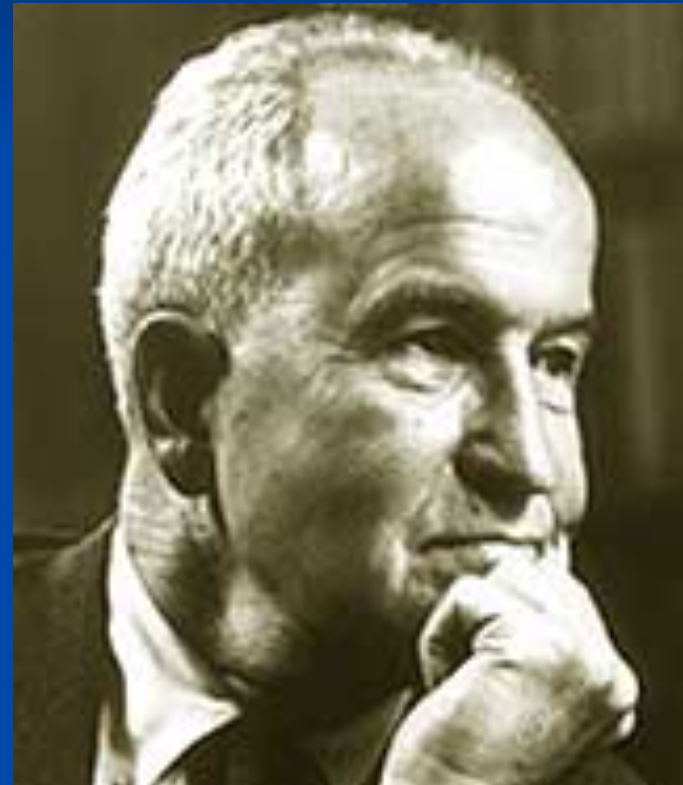
Henry Beecher



- Icon of human research ethics
- Harvard anesthesiology professor
- Work on LSD supported by CIA
- Reported foreign science contacts to CIA through the 1950s

Henry A. Murray

- Father of personality theory
- Director of Harvard Psychological Clinic
- *Explorations in Personality*, 1938
- Developed Thematic Apperception Test for the US Army during WWII
- First chief psychologist in the OSS
- *Assessment of Men*, 1948



The Professor and the Unibomber



Kurt Lewin



- **Founder of modern social psychology**
- **Advised OSS on psychological warfare**
- **Perhaps up to a third of major research university faculty were supported by security agencies after WWII**

J.B. Rhine

- Distinguished Duke U. parapsychology researcher
- ESP studies
- CIA supported starting in 1952
- “Psiops”



The “Mind Race”

“The claimed phenomena and applications” ...presented by several military officers, “range from the incredible to the outrageously incredible. The ‘anti-missile time warp,’ for example, is somehow supposed to deflect attack from nuclear warheads so that they will transcend time and explode among the ancient dinosaurs....One suggested application is a conception of the ‘First Earth Battalion,’ made up of ‘warrior monks’ ...including the use of ESP, leaving their bodies at will, levitating, psychic healing and walking through walls.”

- “Enhancing Human Performance: Issues Theories, and Techniques,” Committee on Techniques for the Enhancement of Human Performance, The National Research Council, 1988

Summer Budget Travel Tips from Gadling

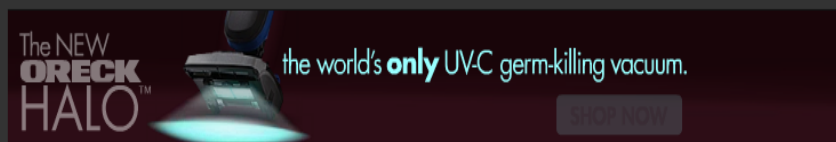


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Fantastic Fest Review: The Men Who Stare at Goats

by William Goss Sep 29th 2009 // 5:32PM

Filed under: [Comedy](#), [Drama](#), [Fantastic Fest](#), [George Clooney](#), [War](#)



War, as they say, is hell. So what's to be said of peace, of employing any and all means necessary to avert violence instead of propagating it? If *The Men Who Stare at Goats* is to be believed, the forces of peace are crazy and covert and even at war with themselves, and if fellow Fantastic Fest attendees are to be believed, it's at best a loose adaptation of journalist Jon Ronson's truly remarkable true-life tale.

After all, Ronson from Wales is now Bob Wilton from Ann Arbor (as played by Scotland's own Ewan McGregor), a journalist newly keen on covering the Iraq

Headlines



Exclusive: 'The Missing Person' Poster Premiere



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Girls On Film: Whip It's Undeserved Box Office Bust



Why Zombies Make Better Horror Movies Than Vampires



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Reviews

Fantastic Fest Review: Rampage

Review: The Invention of Lying

Review: Toy Story and Toy Story 2 in 3D

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Review: Zombieland



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MY PROFILE SHOP JOBS PROPERTY CLASSIFIEDS

From The Sunday Times

November 1, 2009

Psychic computer shows your thoughts on screen



The telepathic abilities that feature in the film X2 are a step closer to reality

Chris Gourlay

8 COMMENTS RECOMMEND? (7)

Scientists have discovered how to "read" minds by scanning brain activity and reproducing images of what people are seeing — or even remembering.

TIMES RECOMMENDS

- ▶ 'You assume your child isn't being reckless'
- ▶ Viewers will all be gripped by the Grewals
- ▶ I suggest a night at the theatre, Mr Cameron

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THE MARINE CORPS RESEARCH UNIVERSITY

DATE PREPARED: 19 September 2001

APPLIED RESEARCH LABORATORY/THE PENNSYLVANIA STATE UNIVERSITY

TASK DESCRIPTION

1. TITLE

A Technical Assessment of the 81mm NL Mortar Munition (81NLMM)

2. TYPE OF TASK

- ☒ Term/Severable
☐ Term/Non-Severable
☐ Completion

3. ESTIMATED COMPLETION DATE
6 months After Receipt of Order (ARO)

4. TOTAL ESTIMATED COST (\$)

In-House: \$88,750
Subcontract: 0
TOTAL: \$88,750
Staff Hours: 433

5. SPONSOR TECHNICAL REPRESENTATIVE
(Name, Code, Agency, and Address)

Dr. Mark J. Grussendorf
Joint Non-Lethal Weapons Directorate (JNLWD)
3097 Range Road
Quantico, VA 22134-5100
Fax: 703-784-3178

6. SPONSOR TELEPHONE (Commercial and DSN)
703-784-2646 x243

7. SPONSOR INTERNET ADDRESS
GrussendorfMJ@JNLWD.USMC.MIL

8. MCRU/PSU TECHNICAL REPRESENTATIVE
(Name and Address)

N.C. Nicholas
Applied Research Laboratory
The Pennsylvania State University
P.O. Box 30
State College, PA 16804-0030

MCRU POC:
R. R. Madrid

9. ARL/PSU TELEPHONE
814-865-5684

10. ARL/PSU INTERNET ADDRESS
ncn3@psu.edu

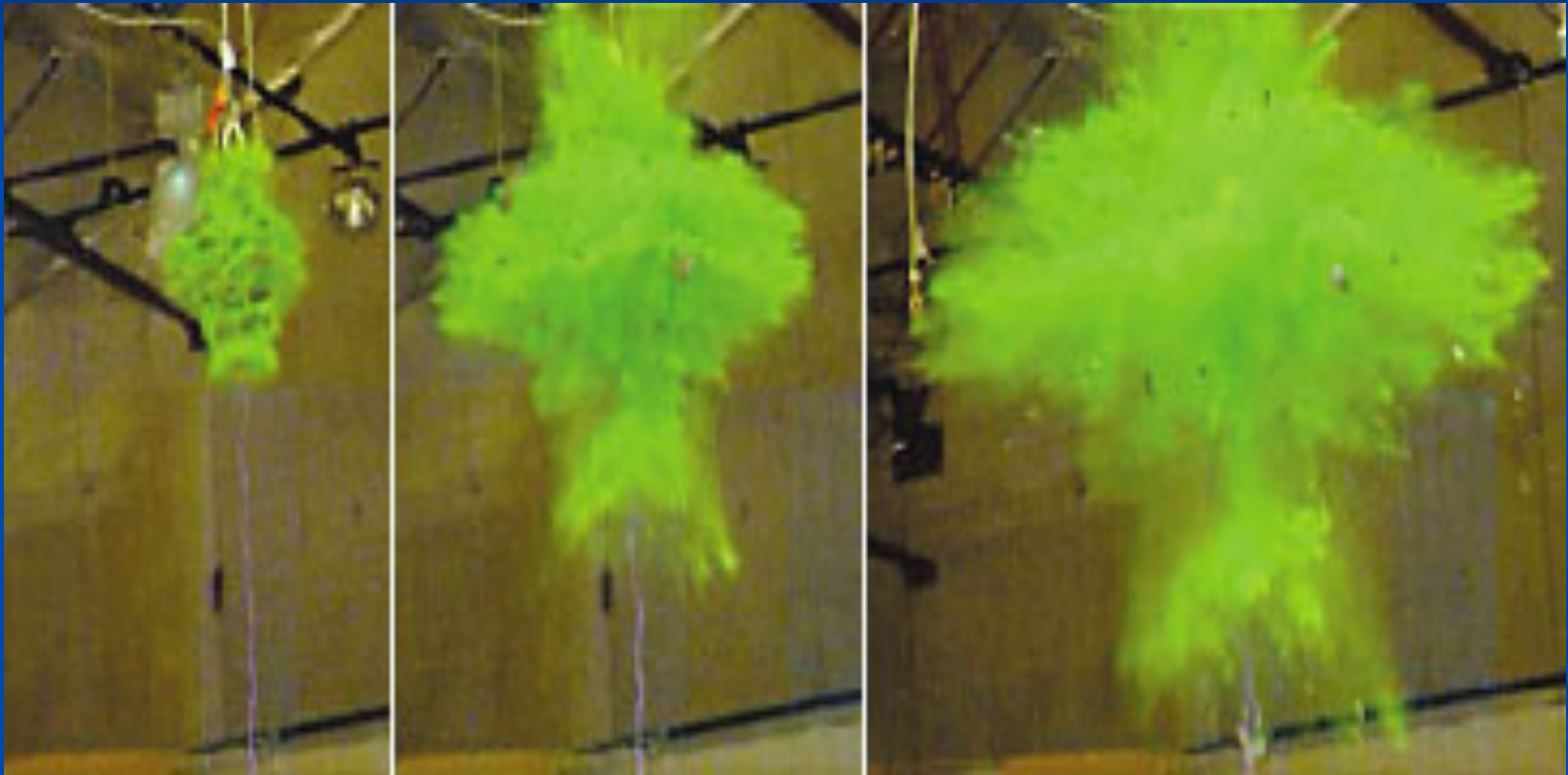
11. SECURITY CLASSIFICATION*
UNCLASSIFIED

12. TASK OBJECTIVE

The objectives of the 81NLMM Assessment are to:

U.S. Test of Simulated Non-Lethal Mortar Round, 2002

(Image from Project Sunshine)



The Moscow Theater Tragedy, October 2002

- Chechen terrorists occupy Russian theater during play
- Fentanyl pumped into the heating ducts
- Emergency teams not informed of the nature of the agent
- 128 die



The New York Times

National

November 6, 2002

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CHEMICAL WARFARE

Report Urges U.S. to Increase Its Efforts on Nonlethal Weapons

By WILLIAM J. BROAD

The American military should redouble its efforts to develop and deploy nonlethal weapons, an expert panel reported on Monday. Written before the recent hostage crisis in Moscow, the report backed drugs similar to the knockout gas used in Moscow to free hundreds of people, as well as other weapons.

The Pentagon insists it has stopped all work on incapacitating chemicals, an

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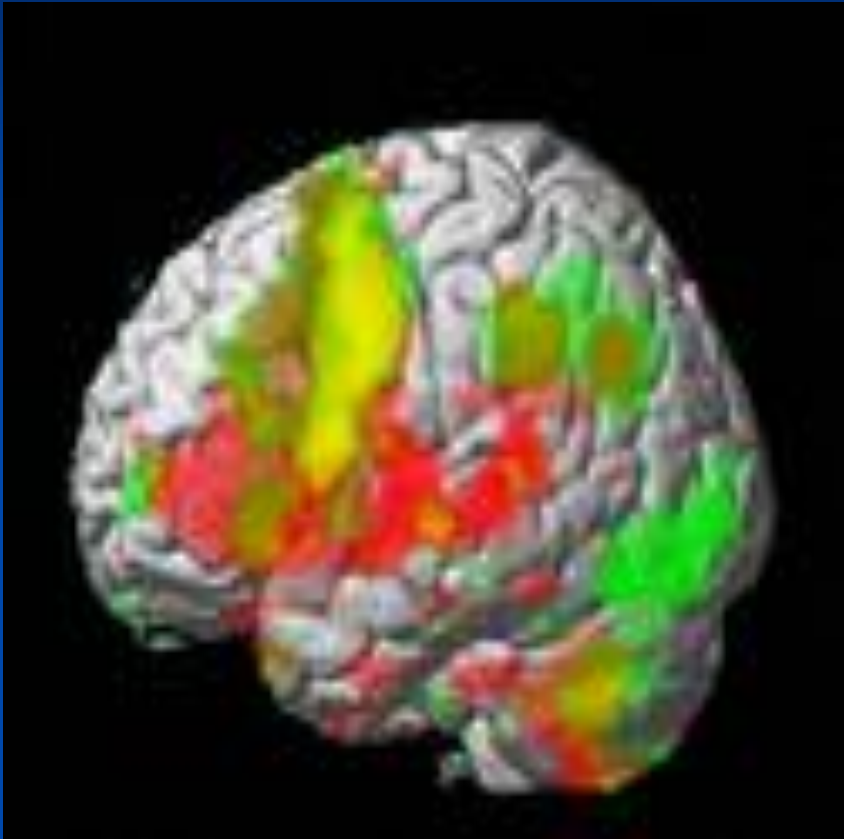
Kay, K. N., Naselaris, T., Prenger, R. J. & Gallant, J. L. Nature advanced online publication doi:10.1038/nature067,

15 March 2008).

“In the experiment, the brain activity of two subjects was monitored while they were shown 1,750 different pictures. The team then selected 120 novel images that the subjects hadn’t seen before, and used the previous results to predict their brain responses. When the test subjects were shown one of the images, the team could match the actual brain response to their predictions to accurately pick out which of the pictures they had been shown. With one of the participants they were correct 72% of the time, and with the other 92% of the time; on chance alone they would have been right only 0.8% of the time.”



Non-invasive Brain Imaging



- Uses fMRI (oxygenation) or PET scans (glucose)
- Correlations of neurochemistry with behavior
- NIRS (Near Infrared Spectroscopy) cheaper and portable, also records oxygenation but poor temporal resolution

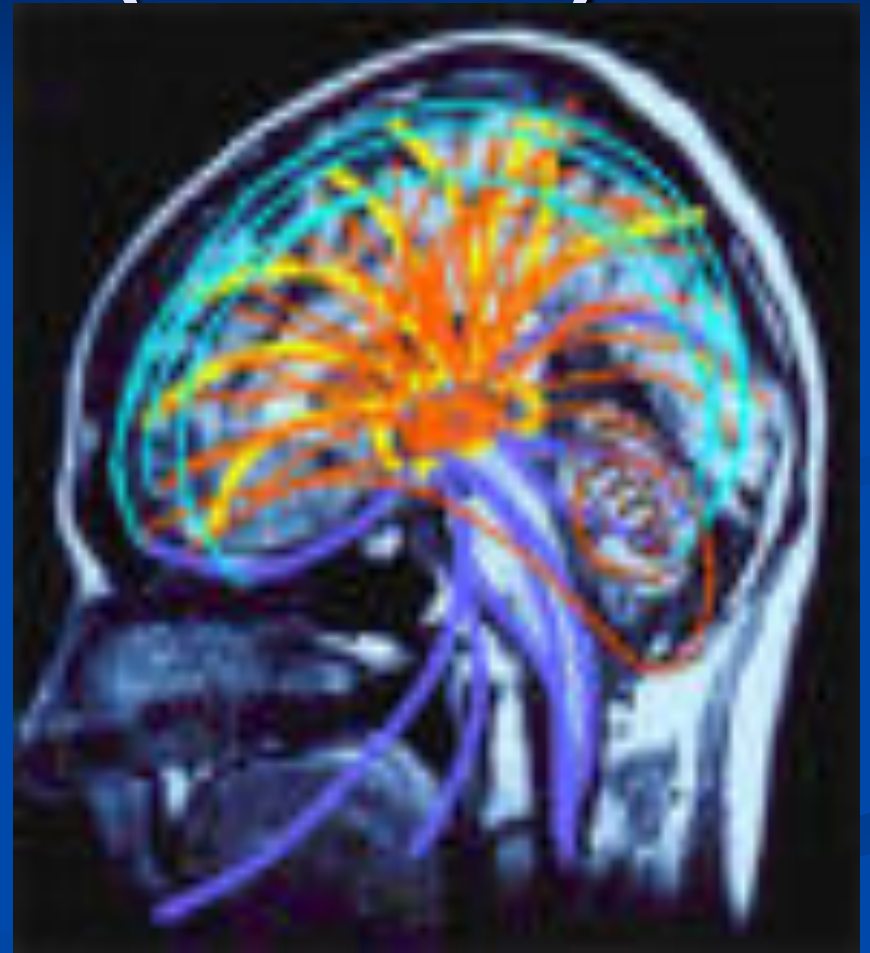
Transcranial Magnetic Stimulation



- Induces changes in brain activation
- Could be used to alter a person's social behavior or attitudes
- Influence brain functions including physical movement, visual perception, memory, reaction time, speech and mood

Neuroimaging and the “Head Web” (DARPA)

- Noninvasive brain monitoring devices
- Contract: “Head Access Laminar Optoelectronic Neuroimaging System”
- Contract: “Wireless Near-Infrared Devices for Neural Monitoring in Operational Environments”
- Security and medical uses





October 13, 2003 22:00:51

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Monkey Mind Power Moves Robot

Oct. 13, 2003

FREE VIDEO

 [Paralysis Help Via Monkeys?](#)



A monkey used in the Duke experiment (Photo: CBS)

QUOTE

"We couldn't believe it, it was almost like the monkey was telling us, 'Believe me, I can do it.'"

Duke University researcher Miguel Nicolelis

"So we realized she had got it. That she had learned that our computer models were reproducing those movements very precisely. And she could actually play the game just by thinking about it," Nicolelis told **CBS News Correspondent Mark Strassmann**.

"We couldn't believe it, it was almost like the monkey was telling us, 'Believe me, I can do it.'... She was very happy; she was very enthused about the fact she could do it." The second monkey also stopped using the joystick.

The work was reported Monday in the first edition of the journal *PLoS Biology*, a free, peer-reviewed scientific journal published online by the Public Library of Science.

The Duke researchers had previously wired the brains of monkeys to allow

(CBS/AP) Monkeys with brain implants were trained to move a robot arm with their thoughts, a key advance by researchers who hope one day to allow paralyzed people to perform similar tasks.

A series of electrodes containing tiny wires were implanted about a millimeter deep into the brains of two monkeys. A computer then recorded signals produced by the monkeys' brains as they manipulated a joystick controlling the robotic arm in exchange for a reward — sips of juice.

The joystick was later unplugged and the arm, which was in a separate room, was controlled directly by the brain signals coming from the implants. The monkeys eventually stopped using the joystick, as if they knew their brains were controlling the robot arm, Duke University researcher Miguel Nicolelis said.

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IN THE SPOTLIGHT



The Odd Truth

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Strange but factual tales from around the world compiled by **CBSNews.com**.

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Monkeys using only their thoughts have moved a robot arm in an experiment conducted by scientists at Duke University. The technology could help those in paralysis, Mark Strassmann reports.

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SCIENTISTS CONTROL RAT'S MOVEMENTS

1. The scientist sends signals to a rat's brain.



Start

2. The rat is instructed which way to move by the technology contained in its brain.

Finish

No Bull: Jose Delgado's “Stimoceiver”, 1958



Modafinil (Provigil)

- Possible replacement for amphetamines



Ready for battle?

Battalions of super-soldiers could result from the US army's relationship with novel neurotechnology research

NUTRITION AND STRESS

Supplements supply neurons with the energy they need and rebalance brain chemicals disrupted by tiredness or stress

WEAPON AIM POINT

Illuminated on headgear display. Optoelectronic algorithms highlight the arrival of new people or objects on a scene

UNIFORM

Sensors assess physiological measures and provide information about health and ability to perform a job. Commanders use information to predict how well a unit is likely to perform, or choose to send in a different team

TRIAGE SYSTEM

Enables immediate assessment of injuries and ballistic impact

BRAIN IMAGING AND BIOMARKERS

Predict which soldiers are best suited to different tasks

COGNITION-ENHANCING DRUGS

Developed to improve awareness and concentration

POWERED EXOSKELETON

Enables soldiers to interact with robotics via "third generation" interfaces relying on natural language and gestures

"DIGITAL BUDDY"

Alerts soldier to crucial events in the environment. Buddy also capable of automatic language translation

LOWER-BODY EXOSKELETON

Provides extra leg strength and adapts to individual soldier's gait. Will have its own power source capable of recharging electronics

BOOTS

Incorporate nanomaterials to provide better blast protection, reduce footfall impact and increase endurance



The “Anti-Conscience” Pill



- Beta blockers can be used to treat stress, prevent PTSD
- Suppress release of hormones like norepinephrine that help encode memory
- Might also reduce guilt feelings

The trust drug?



- Natural oxytocin production is associated with trust behavior
- May be artificially administered in a spray to encourage cooperation
- Use in interrogations?

National Research Council

August 13, 2008

- Committee on Military and Intelligence Methodology for Emergent Physiological and Cognitive/Neural Science Research in the Next Two Decades
- Client: Defense Intelligence Agency



National Research Council

May 12, 2009



- **Near term** (within 5 years)
 - Immersive virtual reality
 - Heartbeat variability
 - Galvanic skin response
- **Medium term** (5-10 years)
 - In-helmet EEG for brain-machine interface
 - Head and torso impact protection
 - Biomarkers for predicting soldier response to environmental stress
- **Far term** (10-20 years)
 - In-vehicle deployment of transcranial magnetic stimulation
 - Brain scanning to assess physiology
- **Ongoing** (within 5 years with continued updating)
 - Field-deployable biomarkers of neural state
 - Biomarkers for sleep levels

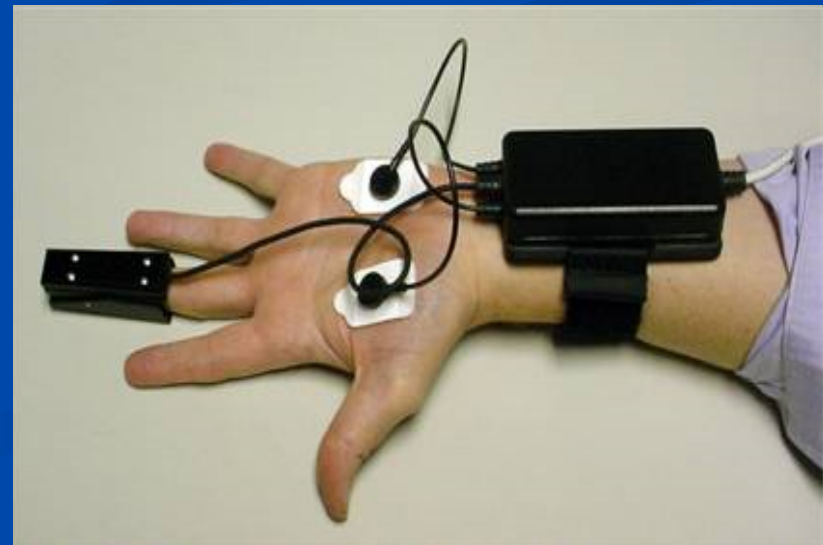
National Research Council 2009

- Committee on Field Evaluation of Behavioral and Cognitive Sciences-Based Methods and Tools for Intelligence and Counter-Intelligence
- Clients are DIA and the Office of the Department of National Intelligence
- Workshop Sept. 22-23

- Goal of workshop: Describe the barriers to field validation of analytic and counter-intelligence tools.

Example: Portable lie-detector:

“Preliminary Credibility Screening System” (PCASS)



Thank you!

- University of Pennsylvania
 - *Department of Medical Ethics*
 - *Department of History and Sociology of Science*
 - *Center for Bioethics*
 - *Center for Cognitive Neuroscience*
- Dana Foundation
- Howard Hughes Medical Institute
- National Research Council

