

Vestib. Symptom

①

Workshop I — MECHANISMS — THURS. Nov. 16, 1978

London - ^{Don}Parker & ^{Ken}Money

Third Shift - Need continuing research?

My friends - Cohen & Gaybird work

- 2 - Difficult to procure credible mechanisms
fl. sheet mounted but 5x clear in
pl.
- 3 - No. 15 of anecdotal evidence to Ward
From Tilt, etc.
- 4 - Improving features of Ross. to select
needed specimens.

Pos. Endone - 1. 50% incidence to nuclear atresia

2. 7 model in Mammals Series
- C.P. Ship & Capt. are not
mutually exclusive
3. Evidence the auditing thresholds
are modified by head down
tellt.
4. Misc. - V. of Land in London group
have minority of changes in persons
in minor cases
Astor reports
A.H. in cats
V.S.A. studies
Burgess observation of will changes

Comments

Grading - 2 months

Can we prevent the susceptible
don't volunteer?

Since Russia don't use drugs &
comphet is it said that
these people let pop the

Sawtooth - Used to granitoid flint chips - ultramylonite,
red siltstones, V.C. - etc.

Gain - Bandwidth highly viscous normally. If fl. control
P, system gain would P. Time course?

(2)

Merrill surgery - effective only if 15 glycerol pos. (glycerol $\rightarrow$ denser $\rightarrow$ improvement in Lx).

Order Case. M.B. very imp. - him

Block - Hydrops. Chondro. negative. Sudden occlusion / Lx $\rightarrow$ tremendous swelling in head, but no vertib Lx (the no procedure attempted) - I do get papilledema.

Electrolyte changes would have to go to both heads before changed in int. ears.

But ch. in osseoint. do occur quickly - in endolymph / perilymph.

Middle ear block - undisturbed $\rightarrow$ asymmetric responses in vestib. system.

Takes goes to dent. hydrops = gradual occlusion.

Levin - Can induce hydrops quickly in head noise (170 db). But if get hydrops

can detect tissue changes - Merrill's membrane stretched.

Concl. - Parham

- hypothesis less attractive, but not in a position to reject yet.

Money - should we continue to pursue in 9/8 program.

Marbleton - Would not care to spend time or money on it.

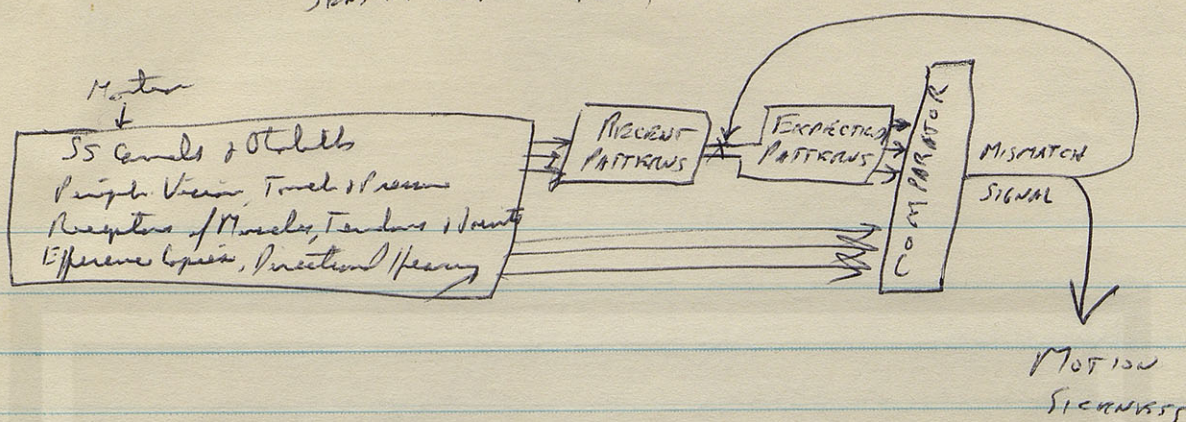
L. Young - Seems we have good reason now to forget 5 numbers on a P.I. particularly unhelpful.

Lechner - Very tedious

Stuck - 75 question not really answered completely.

Money - Surgery English Theory

Sensory Conflict Theory



Mary - Tom hypothesis

1. Slow angular movement, that stops linear
 2. Keep eyes closed as much as possible
- ↓ copy

Tobias - reported to city Motion sickness

Questions:

Importance of sleep? also in 1985.

Can pure proprioceptive info → motion sickness? ^{if possible} addressing

Morikawa - suggest studying people with adult onset (acquired)

developmental defects (Amy. Tox., Mangelts, etc.)

Concise - Most to control because some
vestibular function usually remains

Nov. 16, 1981 VERRILLI'S PROPOSITION

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WORK SHOP II

Lachman + Gendry

PREDICTION OF DURABILITY

Gendry - Intro - I lack of definition of what is being predicted. Survival tests - permeability - permeation tests, etc. Literature search - need to eval. criteria. (Casper. tests of air seal aspects, etc. - but ranges are wide - those who went out to the physiologically sick - some don't report - some not sick - all ranges - groups not homogeneous) Models encountered very difficult

Re SRS, There have been 2 or 3 people who were very resistant & just got sick in space. These events may have outweighed the fact that there is some prediction. Correlation may be better than we think. Prob. will never be 1.0 - poss. can be as good as 0.7 right now.

Lachman

Quantitative techniques - Can screen many people quickly. Qualitative - Many not familiar to use of SRS. Subjects have diff. backgrounds - diff. kinds of exposures at diff. frequencies. Gen. quite reliable, however. Susceptibles have fewer exposures & more maps.

Don't tell you anything re adaptability out of 5 - build up or retention of adaptability.

Feel you need to determine those 3 & use specific tests

Money induces imp. of adaptability. Needs provocative testing because those people will not tell you about it.

Money - can also set standards too high - must be careful.

Lockman - Suggest diff kind of tests - one for SSC's - one for O'levels - one answer for both.

Questionnaires - Do we need to develop another one (Have been using Rosenberg one)? (Hornish) - need to say well devised if avoid problem of candidate who really wants to fly. Early processing is no possibility (Rankin). Issues - problem of interpretation of consistency (people who interpret question are often the problem).

Level of new questionnaire - Prob. not worth it - Priority 3. Personality conditions - Pause.

Provocative Tests:

Should be cover all receptor types (SSC's, O'levels, etc.) Correlation of scores to Coriolis' miniature form - also form written. Consistency of response very important - i.e. pattern of response. On the other hand, inconsistency could mean a better response.

Better to give to specific conflicts - SPV Can also give clue to specific conflict or conflict causing SSC's.

Money - But too is to expose to exactly the situation - if imp. enough use veteran crews. Prob. best to use brigades

axis - you really feel you are in a gravity (has used 20 Rpm on self) - can do use as adaptability test.

Grading - Same test also attractive. Have SSC ⑤ + little of any other ⑤.

~~Over~~ ~~Over~~ - Must be careful - power motor may not be the same as other than. Pass 10013, - battery is best.

^{Gang}
A few (Benjamin, L. Yang, Langston) - have + are working on visual ⑤ alone. Langston says should run to peak mounting. Lachner has done visual + head movements - get pseudo Gieseler

2 axis rotation → less by testing efforts → see R5 Room.

What would a typical test battery now? - Horvick Possible R5

Horizontal Axis Rotation - + Vision

More 1/2 kind of Vision vestibular interaction Test

1. Give on 1st visual test to people moving.
2. More 1/2 kind.

Coreolis

Eyes Open Fixed Field Vision Condition, Vision Ability Tests

Group is prone to tests - Maturity? Horizontal and Space + Approximation - 10's measured as well as others the

less > normals. Blue-gray EV → exercise in 1 week time. Relationship to M5-test not clear.

Printy I

Vestibular Reflex Response Correlation

Tests of postural capacity. I no relationship to M5. in can't predict 2 OCA. Cal. Emigot, a good general show predisposed to 10's or any other M5. At least no relationship to off Vestibular Rotation Test responses. NOT RECALLED. Horizontal and 1/2.

⑦

Donna - Protein Adaptation does correlate

Quelley - Much not done, but evidence not convincing
tho it would be worth while undoubtedly get
into system interactions. Priority 3 or less.

What about Prop Tact? (Quelley)

Robert - Linear Prediction Models as very sensitive to
number of variables

Veetec. Symposium Nov. 16, '77

WORKSHOP III TRAINING

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Frederick, Lockman & Oman

Oman - Learning Targets to Motion operate in closed loop fashion.

Issues for Training Continuance:

Obj: Rapid On-Orbit Adaptation, Productivity, Safety
+ Skill as Observer, Scientific Return

Some Issues:

Single vs. Multi-Modal Stimuli

Mechanisms for -

① work specific adaptation

Generalized Tolerance

Retention

Active vs. Passive { Random } Movement

Prob of Non-Utilization Cases

What info used in retention & control of posture & movement?

How does Learning Capital influence Reception

Model Explainer

Issues for Training Continuance

1. Subject aware to a variety of manuevers ①
+ simulated fl. shifts

② Objectives: Improved Response

Use of SE Technology

Some family of susceptibility devices may also work.

③ Retention?

Expensive in new time.

2. Active/Passive Body Movement in KC135, etc -

1/2 or specific productivity

3. Training in On-Orbit So Management Techniques

Limit/Body Movement

Optimize/learned strategies

On-Orbit Adaptation Schedule

Incremental exposure to actual load & body movements.

Ok. More rapid devel. of approp. internal models; gen. tolerance.

Conflict does not have to be steady state. Can be ~~periodic~~ intermittent & response predicted.

Jim Cochran - Interested in Conroy's M3 End Point

Psychiatric Categorization Issues. Also in provocative

tests - end point is important. What pattern of Σ does

Conroy see? 6 RPT - 8 RPT data

Conroy's brown C5I test - Tr. simulation (2) resulted in

loss of Σ entirely until suddenly ^{all Σ appeared}

Σ 's - most later in future RPT's

Fri AM 11-17-78

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Workshop III (Cont.)

Over-adequate Training does not $\rightarrow$ complete immunity
but does help - esp. early in flt.

Post conditions $\bar{c}$ age } in return
longer

Test Bx - Heavy H₂O.

Review - Don't do anything with any flt crew
unless trained well (especially, proper habitation
training).



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Graybill - Past Work.

Problem 9 Subjects will vary in test to test
using same drug

② Retention of Adaptation to SAR -
up to 3-5 mos.

Must have a good subject pool for these subjects

Ex End point - ~~Standard deviation~~ & ~~De~~ ~~known~~ - 1/1000

Tested: APR 10 2100 APR 20 (A.H. Robbins lung
- New - 25 mm
after found)

M 30 }
E 25 }

M 25 }
E 25 }

S 0.3 }
S 0.6 }

P 12.1 } P 21 } P 21 }
E 12.1 } E 25 } E 12.1 }

E 12.5

D 25 }
E 25 }

TT5 2 TT5-2

Confid

Q - Di Gregorio - Bo. (lands) ? Same (lands) ?
Really, good question. Do need this info -
on these lands + optimal times.
Gregoire - Would be costly - /de

Di byzou - Will try to correlate peak saliva levels - CRF + brown tissue levels + human response peaks.



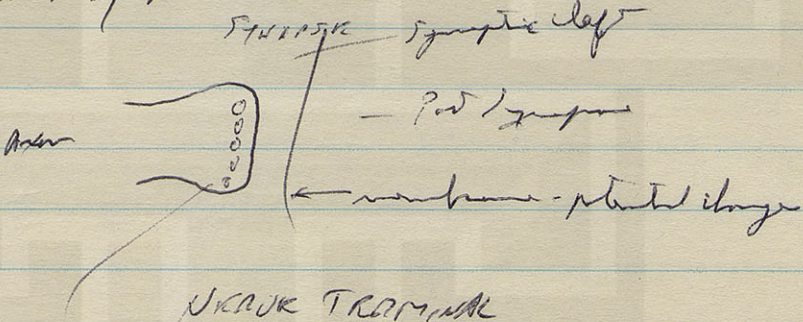
Measurement - ① Sp. Neurotransmitters - much too early but can examine some systems

② What criteria we would like to determine what neurotransmitters are involved

③ How can we test. Pharmacological test using known neuro activity

Process of Neurotransmission

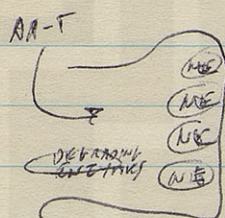
Cell Body



Neurotransmitter (chemical)

Putative Neurotransmitter

NORADRENALIN = NE
- Precursor - Tyrosine (Amino Acid)
- Does not get across the blood brain barrier (BBB)



Metabolic Pathway:

Tyrosine → DOPA → DOPAMINE → NE

Each step can be inhibited

Can pharmacologically control by blockers & blocking receptors

Look for function & activity changes

Parkinson's = Def of DOPAMINE - Balance of DOPAMINE & ACETYLCHOLINE is primary. Also RASBUTAMIDE

al-DOPA
↓ ACC & ↑ DOPAMINE, CAN CENTRAL

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Ca important in release of DOPAMINE neurotransmitter

- CRITERIA - ① Brain NT & Metabolites, Enzymes, Receptors
② CSF - Metabolites, NT
③ Plasma ⑤ Pharmacology
④ Urine

Can determine # of neurotransmitters
in area of brain by determining
uptake - simple, well worked
out techniques Can apply to many

Pyrocidine - ↑ 5 Cyclic AMP - A NEW
APPROACH TO DRUGS - LOOKS ATTRACTIVE.
(AVAILABLE ONLY IN BRITAIN NOW).

Chances for developing new drug poor in U.S. Really
must ease on modifying current environment
or modifying man.

Need to work on drugs. Present drugs are
minimal - still much room to play in.

Bullets:

Survey of Drugs Currently Available

Allevil, Imipramine - a class of drugs - antidepressants
- block NE feedback + + methyl choline.
Have there been trials? P. Luyckx. Ans. - Not
yet - depends on type of case. Imipramine (I Top) →
shows too many black & over behavior.
Does drug interfere or improve behavior. Not clear.
Only evidence (imipramine) is in dogs.

Sanford

Battled in America's R. & W. H. H. - Black.

M. B. H. H. H. - Used good animal model.
Need to go ~~out~~ of country.

Living Extract Injection - Why should they be effective

Summary

Hornick - Continued purposes of the Meeting.
- Feels by a large asset

Not caught

Team Effort

Controlled I don't

Ever. Ray Lewis

Grady - Comments Range / paper very good. Good
idea to have people of variety of perspectives coming
together - Work shouldn't be done too often
- Takes much preparation, time lost etc. each
time. Gets redundant. Need to follow up
in formal basis.

Money - Agree. Good meeting. Might have had some
from St. Beniam here. Otherwise all relevant
& useful. Went here. Notes on Workshops. The
ship - some contribution to poverty. Some
rearrangement thing (captain) but gone in
time. Control mechanism - shift of Signs
are still good. Really little new knowledge.
2 Approaches - Panel 6 is a Systematic Approach.
Not re. Systematic. New approach.
should be pursued. Poor new version of description

In space examination by M.S. experts might
be good idea. One might have to expectation of
less of $\pm 1/4$ more ~~days~~ days in pt. $\leftarrow$ 1955.

One fix - Offsetting approach might be worth
pursuing. 10 Recs. used again
Bifurcated planning

Black - Only criticism of Workshop - too short.

Mechanics - one understanding is just inadequate
Need adaptive system framework - Denavit -
Transmission - Mechanics - Need techniques &
info. Making studies but can't ask questions
to standpoint of needs.

2 Major Mech. may be on selection. Vector.
symmetry & 2. Symmetrical bodies. Present
states of Vector system before he goes into space.
Adaptation can be as good, different & direct.
I'm using analysis of 1950-11 problems, 1955.
May show relevance to fl. shift theory. Other
earth conditions have ~~the~~ relevance as possible
model (presented retro).

Should look at prop. 2 or 3. vectors of
motion as function of time. There must
be established. Still don't understand
what I meant. 1 adaptation. I should be
systematically advanced. Meets of adaptation
also - hierarchical relationships & changes.

Info flow, exp.
Continuous - No count.

CH

Charley Wood — Trip. to see how program fits together

On drugs — really have to go to what
we know now. I lost time frame.

Habituation not helped by drugs he feels quite clearly.
Feels much room to ↑ dosage to ↑ effect.

SPR

Outline — Notes

[Signature]