

Notebooks in Experimental Cytology

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Desk 6.

Monday, January 4, 1943

- 2 AM

(write large report
on Colchicine)

Examine Mouse 472, 100 μ Colchicine 10 hours since

First spermatocytes from very early leptotene to
pachytene, seen as bi, tetra-nucleates

One case of anaphase non-disjunction

Some blocked, varying contracted, gonial

2nd spermatocytes "descripted" intermittently
bi, quadri-nucleate Sertoli cells, teased!

since early spermatids

binucleate seen, Sertoli and blocked metaphase

Somatic pairing (not very close) of chromosomes

1 gonium with two blocked meta's very closely associated

Some regular gonial metaphases.

Meiotic anata, anaphases perfectly reconcilable with
type

124. Allium roots into .005% colch. (dil. from saline)

4

Tuesday, January 5, 1943
Allium swollen.

Talks to Laurie about
colchicine project.

Dessert mouse at 10 PM
Examine for fetalities

Wednesday, January 6, 1943

all 300 - 350 γ mice dead
 Longitudinal growth of tumour continues, in Allium
 solution changed.

Make drawings for
 publication of onion
 root tip material

Re-examine Allium - colchicine material, discuss
 publication with W. G. Whaley. Decided to publish
 in PNAS, Simont as communicator, under title of
 "A Colchicine Susceptibility Gradient in Onion Root Tip"
 - It should be in print in a month or six weeks.

Louis accepts project; presumably will work as
 Gross and Ledebey. "Mechanism of Cell-Enlargement
 in Colchicine Treatment of Onion Root Tips". Perhaps
 this title is not valid. Certainly the central cells do
 enlarge but Hawkes claims that the volume of the "tumour
 cells" is not ~~is~~ greater than that of the linear elements. A
 careful study should be made of the morphogenesis of
 colchicine treated material in order that some notion be
 formulated of the nature of the "differentiation process".
 Today, indeed, one cannot even clearly state the problem
 for fear of making implicit assumptions that one has no
 right to. We should like to know how a meristem leads
 to the formation of a root. This is an indeterminate system
 perhaps making the attack simpler, the analysis more
 difficult than is the case in the embryonic development
 from single cells. The perfect regulation of the meristem
 demands a precise regulation and coordination of the
 various processes that must be taking place. While
 the morphological problem of the histogenesis of the

1/6/43

various tissue elements which are present, the importance of the problem lies in the mechanism of differentiation. The first problem: is the potency of a cell internally determined, or is the immediate fate of the cell determined by its position, or its relation to some physiological gradient. The immediate problem can be stated: what is it that determines that a cell shall divide again, or that it shall absorb solutes, enlarge, deposit cellulose, and differentiate?

Cell-division cannot be simply a matter of cell size; perhaps cytoplasm is the fundamental ratio. Do cells which are elongating secrete or circulate substances which inhibit nuclear multiplication, or are there secretory processes in the focus of the meristem which inhibit cell division and protoplasmic synthesis?

The testing of these preliminary hypotheses is made extremely complicated by the effects of wounding on plant tissues. An extensive series of experiments have to be run on the effects of cutting at different points in the meristem. In particular can a meristem, a root cap be regenerated; how many cells are required for such regeneration; Does the meristem ~~grow~~ change in size during the life of the root. What factors are responsible for branch root formation. Does the auxin theory explain every detail? Is the differentiation hypothesis just a matter of auxin gradients, or are other substances (lyptohormones, etc.) involved?? Experiments on the effects of auxin on roots, and the interaction of auxin and colchicine and of cutting are required; in particular, a careful study of colchicine effects when momentarily, intermittently, and continuously applied, should be made.

Thursday, January 7, 1943 12 — AM

Drawings for PNAS '43 paper.

Clean up; check out Chem II Lab. at Powell's
Office; learn to apply for Med School, Sept. '44
not here in evening.

Friday, January 8, 1943;

Lab: demonstrations

Saturday, January 9, 1943.

Allium tumores stopped growing longitudinally.
 Replace in ~~0.4% colchic~~ water!

Another onion to grow.

[1] 2] 2]
 10PM-2AM Close observation of Mues, Hull. Am about
 ready to make drawings, but too tired...

The brilliance of the chromosome stain is inversely proportional
 to the comfortability of the chromosome stain. The Benda
 method might have been preferable.

[1] - mouse

[2] - ?

Monday, January 11, 1943

11PM Wh. onion in Sulfanilamide .02M

11PM Onion in .004M Colchicine.

New permeristms forming; branch roots in colch. stuff

Cytology drawings to 2 AM

Tuesday 1/12/43

Cytology drawings

$$.02M = 2 \times 3.44g$$

$$= .6\%$$

Wednesday; January 13/1943

Alburn in sulfonamide growing very vigorously;
Smear: to

In .004% Colchicine, not visibly affected.

High mitotic index; possibly, especially for area, telophases. Some cells may have abnormally large nuclei, but bi nucleate, (as Trach reported) is not to be found, strikingly. In the smears, of course, cell walls are not emphasized.

Saturday Sunday, January 17, 1943

4 PM Zoo/US Drawings complete

Hold for
"nails"

Monday, January 18, 1943
A.M. - 33rd Pine St. for Physical Exam.
P.M.

[= US Navy
V-12
qualification
bitten fingernail
an issue]

Wednesday January 20

Thursday January 21, 1943
Moved to 1511 Schenckhorn Extension.
Writing 300117 papers.

Friday January 22, 1943

Worked, for Ryan: 3 hours. 3:15 - 6:15 P.M.

Write up Zoo 117 papers.

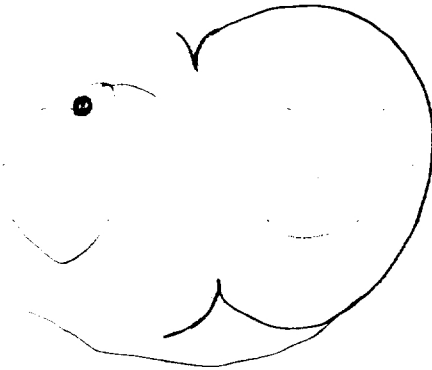
Saturday

Sunday
Review Zoo 125 for exams ↓

Monday, January 25, 1943

January 29, 1943 Friday.

While I have a few days time before the beginning of next semester, it is very likely that my time then will be severely restricted, and that research activities may be sharply curtailed. I am therefore suspending the mouse research for a couple of weeks until I know just how much time I will have available for this work. Things are too unsettled now. So meanwhile I am wasting much time, reading, movies and some Math and Physics Study.



January 30, 1943 Saturday
Library works.

Summary of colic works to date:

Hours	50V	100V	200V	350V	400V	500V	1000V
1/2							
1						432	
2							
3			448	460		427	
4							
6			449	461			
8		472S	450	462			
12							
16						433	
18			454	463			
20			451				
22							
24							
26			452 447	455		429 437	
30						X	
36			478S				X
40				X			
48	445	444	456		439	446	
72			457				
96							
3 da							
4 da							
7 da							
14 da			458				

Pat:

Monday, February 1, 1943

Worked 5h.

Humanities readings; M104

Tuesday 2/2/43

11:30 AM 4/5 B o⁷ inj .2 mg

Classes —

Work 2:15

457

Rd St. Augustine.

to be seen 11 PM 2/3/43

Wednesday, February 2, 1943 to be changed ✓
 9AM - Phys 9 lecture for laboratory assignment ✓
 2PM - Humanities quiz.

< 3PM Animal # 473 deceased. Found buried
 in straw; was in cage with vigorous female.
 ? - Is brachyuria a sex-linked character?

Classes. Work - (washes, labels for museum)
 Study, incl. Phys 10.

No mice now available. Cabs very short.

Thursday, February 4, 1943 9-7:30

Classes (Leman 6 not given; Chem 242; sit in Zoo 118.

Work: 11:30-12:00 Bath 30 min
3:30-7:00 Ryan 3:30

Study: Humanities, Phys 10, Chem 66; Do Math Probl.
- to NYPL vainly for books; see Kent Vincent about
some for exchange with Keller: "Romeo + Julia"

Read: Humanities Bx 4-10 Finish tomorrow.

$$dz = \frac{\partial z}{\partial x} dx + \frac{\partial z}{\partial y} dy + \dots$$

Ten
To
St
the
if
of
St
the
re
be

Friday, February 5, 1943 10-10:30
 Classes to 2. Crans on St. Augustine
 Nobel works yet. (nm)
 Work PM; wash glassware; prep for Chem 66L, begun
 very successfully and properly.
 PM+... Dante; Math 104 HW Math 34 HW

u.
 r
 Dante: Read Dante
 Let's. Delcourt

Saturday, February 6, 1943 12-
 Work to 4:30 Eat (Home 4:30??)

Read Dante; do Chem 66 calculations; Math homework

Tomorrow:

Study the history of σ -cytes in
 the 700v series; determine
 if possible the earliest occurrence
 of multinucleate cells.

Study 24 hour slides for
 the multinucleate condition
 reported in the literature.

Do Math HW's. Phys 10.

Return journals at Pt S library
 Renewed.

Do: Math 104 ✓
Math 34R ✓
Physico 10
Dante
English C4 ✓

SE .11

Sunday, February 7, 1943; 12:45 — 6:30
P+S Library (Rd Lits 1936)
Do Math HW Work 15m gratuitously.
Schedule to be aily 2 hours daily, 5 ~~hours~~ days.

Monday, February 8, 1943; 9:30 - 11:30

Classes - 3PM

Works - 5PM ✓ - 5:45

Supper - 5:30

Phys 10 - 7:00

Chem 66 - 7:30

Microscopy - 8:30
 Janta 8:30 - 10 ^{English C} catch up.

Math 104 5:45 - 6:15

most time spent
 on Math HW.

463A, 4374 apparently shows the gonial
 cuticled chromosomes now condensed in the
 formation of nuclei. No discrete micronuclei
 seen. This is 500V-30h

454A2 conditions too bad for significant observation.
 The gonial conditions in 200V/18h are most inter-
 esting: discrete clumping; doubling; possibly injection
 to spindle.

457A 200V 73h. Despered-clumped gonial mitoses
 can be seen.

500V 25h. Desperse stage Doubling and mitotic
 pairing cannot be doubted; the peculiar cyte phenomena.

450V 46 Desp. clumping stage.



See Wralley for some
colleagues
See Schoenheimer about
more mice. In preparation
that new series be begun:
careful sections at hourly
intervals; sections at the
important stages
Repeat Math work.

- 9:30-10 Library ✓
- 10-11 Class Ch 242 ✓
- 11-12 Discuss coll project
- 12-1:30 Zool 118 ✓
- 1-1:30 Lunch ✓ with.
- 1:30-2 { see 3x day unnecessary now.
- 2-3 Math 34R not done.
- ~~3-5~~ Work not done.
- 5-6 Chem 66 Colloquium Rib q.v.
- 6-10 Class
- 10-11 Research.

Tuesday February 9, 1943 9:30 —

Seminar:

The Quantitative Study of the Anaphase movement
of chromosomes. Hanks & Ris.

"mysteries of mitotic forces".
Anaphase chromosome movement most striking and per-
sistent, most easily measured. Various elementary hypo-
theses proposed; now pessimistic. While ultimate description
must be physical; but exact biological data must first be
established. But how explain actually the poleward movement.
— Movement of chromosomes; see d A Thompson — But these
propositions are not shown.

1. How do chromosomes move, as Belar. Experimental
analysis of mitosis in terms of cell structures.
 1. Centres: asters, central spindle - granules case penetration.
 2. Nuclear material: nuclear spindle "do not"
(Schmidt - orientation of long patches).
- The spindle is animal material, usually elongated. In plants
may not. Cell (spindle) elongation may coincide with cleavage.
kinetochore. Necessary for orientation and anaphase;
"chromatid coherence" till anaphase.

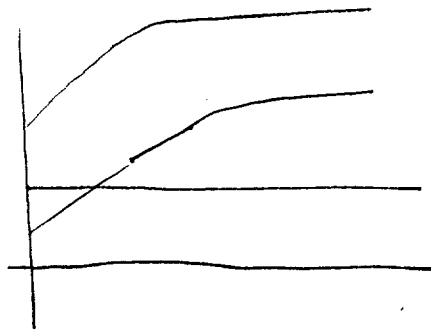
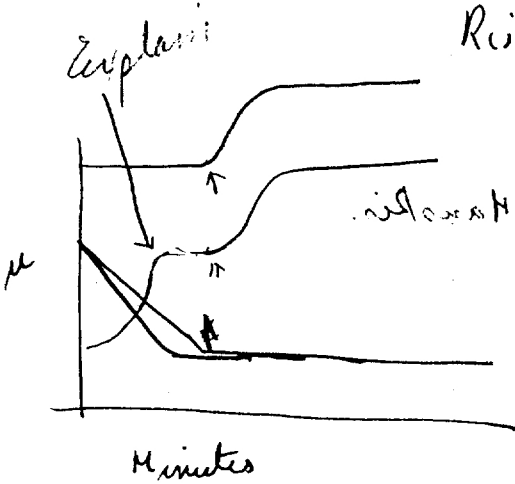
Bacher '39 chromosome 1. Plotted kinetochore distances. But
time intervals not too large.

Hphids were found to be very good material; dissect out testes from
males in paraffin oil, mitosis continue for 10 hours. Similarly,
parthenogenetic females for embryos.

The kinetochore moves in a curved path in grasshopper.
(Accuracy of observations)?

μ
-
Prot
&
P
Ng

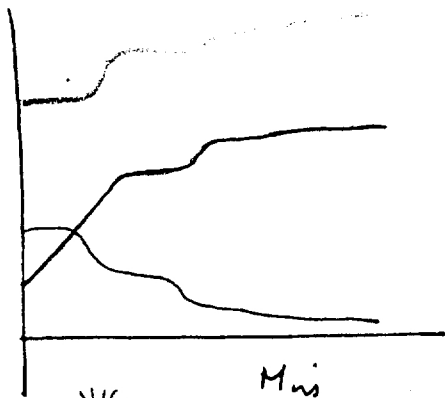
Ris Sumner: February 9, 1943



Protenor Thelia I
 aphid II
 Protenor gamma
 Aphid embryos.

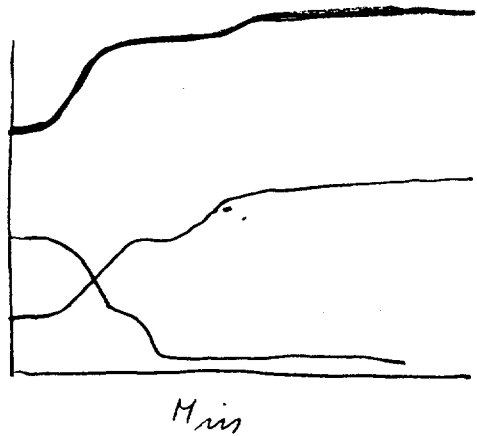
I Aphid Tarnalia

diffuse attachment



Meiosis I

Choristopus
 Melanofolius



Meiosis II

cut
 apu-
 w
 ation
 at he
 vernal
 these
 infel
 ation
 Meats
 vage
 cut
 from
 lady,
 hoppers

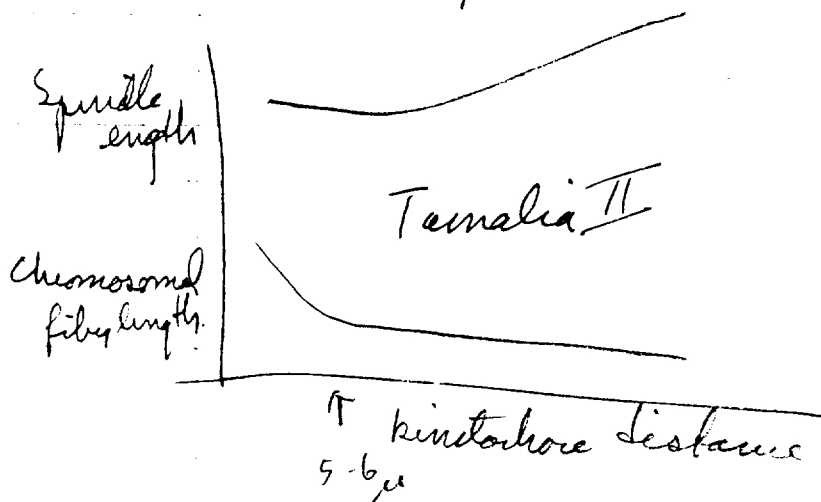
Small kivalents may occur near spindle axis in the first grasshopper

But the elongation of the ~~chromosomes~~ spindle occurs at about the same time.

Until chromosomes are completely separated; slow, fast, slow, fast....

Cell begins to elongate about the same time as the ~~re-~~ movement of the chromosomes.

Plot spindle against kinetochore distance

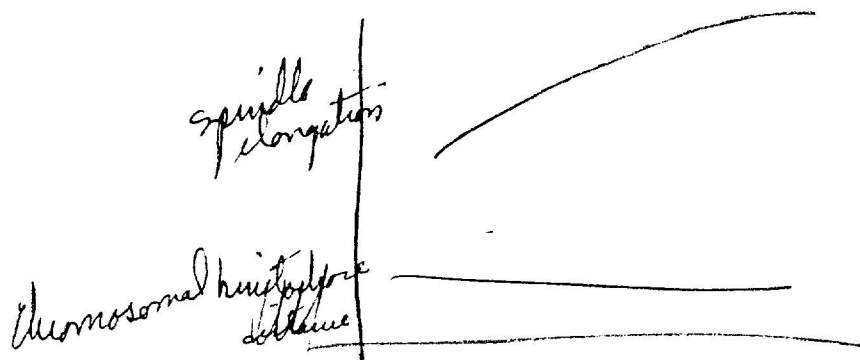
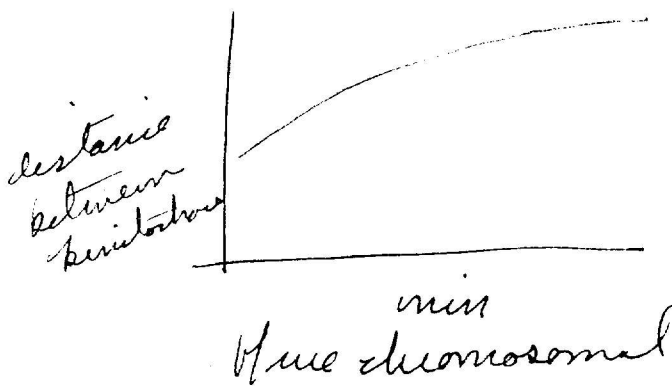


Cleavage furrow just after spindle starts to elongate.

(Jeff
the w
line
dot)

Actual resultant path of the chromosomes

Tamalia I



Protenor, *Tamalia I* like the standard types.
 In Protenor ^(which lays), the first factor is the rate difference during chromosomal fiber contraction CI

(Jeffrey method).

In *M. elongatus*, elongation begins during (CI)

are not the kind later as in *Tamalia* sketched.

Meiosis II < time of division ?? Possible shrinkage in spindle during Metakinesis I.

In *Grasshopper*, always fastest at the end of division. Beginning elongation of spindle is seen in I. *Orthopygia II*: 2 = fibers plus early in anaphase movement.

Subtractives from each other to signify contraction

How do estimates of CI length compare with those in physical fibers!

Complexity of some demands several "What's accumulating at poles."

"sp of pull chromosomes to the poles" ??
Elongation of spindle.

Attention apparently exists between cell elongation and CI contraction.

In diffuse form. — In what respects are they different ??

Stammkörper: Main weakness: no breaks in fibers: contain ~~no~~ sutures found.

Differential stretching indicated in accentuated motions

Barth: diameter of spindle no use.

~~Barth~~: Schradu: flow?

Consider using Uranium salts to discharge the very troublesome electrostatic charges on ribbons.

10a

Restain
Settle with
Whaley
Class:
2-4 u
Phys 10
7-8 H
8-9 H
has some
in English
9+ W

Tomorrow

Wednesday, February 10, 1943.

was

Restain 9-10 AM

Settle with Schrader "series" → f. (F & Hem) 448/451 449/454 447/461 461/462

"

Whaling - 11 AM

463/446 ✓ 5 PM. thru oral; M₆₀, etc.

"

Class: 10-11; 12-1; -2

11:30 - into Hemiplexus, after thorough washing.

big

2-4 Work

movie PM; reading, etc.

Phys 10 5-7

7-8 Math 34R

8-9 Math 104

at

has seen to read some bits; progress in English; put in several hours work.

9+ Work

time

time

2/11/43

See 462A - at 377-1228-

Badly organized day.

9:30
10-
12
1-
3-
5:3
6-
10
11-

2/12/43 Friday.

9:30-10:00 Work.

10-12 Class

12-1 Lunch

1-3 Class

3-5:30 Work

5:30-6 Study Hunt.

6-10 Chem lab

10-11 Work.

11-11:30 Inject a cat.

2/13/43 Sat Day
Phys Lab; day wasted

2/14/43 Sunday
Preliminary electrostatic experiments.
Work 2 h. for Ballantine

Monday, February 15, 1943 9:30 - 12

AM: classes -

Cult Phys Ed: "Cold weather. Mouse and rat work ~~and~~ PM

Photomicrography - 8 PM.

Works for Ryan 2 hrs.

476, 477.

Ad library.

.10 bet with H. Taylor on
issue of military importance

Hydethodes in grasses?

Examine normal mouse smear:

binucleate not found; gonial metaphases quite normal;
with elongate chromosomes

No mitoses found in post hepatectomies

In 477, accumulations of irregular micronuclei may
represent α -mitosis.

Tuesday, Febr. 16, 1943; 9:30 - 10:45

Take care of filed material; ✓

Review Math

↳ them calculation

Examine injected frog: (478)

↳ these cells, apparently a spermatocyte, with scattered chromosomes seen; if there were more such cells, they would be better than mouse

Hepatectomy (nearly total)

on mouse or rat;

hybrid mice....

Collect pachytene

Clean out Cytology ✓



↳ cells impossible to see.

l;

ray

36

Wednesday 930-6
Severing in VI
Classes -

Thursday, February 18, 1943
Classes - 2
Chem 66 calculator

Monday, Febr. 22, 1943

Univ. Holiday: Wash Birthday

Work: 9-11

Thurs 2-25-43
inj. Rab of 500V 3P4
| Mouse stub tail of 400V

Made up new colchicine solution: $99 \pm .5$ mg
in $49.5 \pm .5$ cc H₂O.

25h. 400V

Amniocytes



"Clumps" of 60+ chromosomes
no cell boundary observable.



~~75~~ 75-80 chromosomes.

another. 80ca.

In some, the chromosomes are more rod-like,
perhaps some orientation; in no:

one "syncytium?" was seen with hundreds of
chromosomes. A few entirely clumped,
pycnotic cytes.

Rel 25h 500V

#480



Sunday, Febr. 28, 1943
 Rat of 2-28 found dead PM. ?! Is the
 rat so much less resistant than the mouse;
 conditions of non-watering should be mentioned

481

4PM 2-28-43 400V *Bradypus albino*

482

$\frac{1}{2}$ gm capsule Sod Numbital in 8 cc H₂O. of
 this solution, .2 cc to a 20 (ca) g. black, full
 tail mole mouse, subcutaneous testes descend
 rapidly! Dysticid by, possibly injured - tried to
 scratch his ear. Paralysis setting in. Washing
 face. Back of his body probably paralyzed. Cannot
 move his legs. Stiggle about. Moves about
 several times in circles. Has some traction in
 legs; cannot stay up. In about 2 mins. Stops
 moving; breathing a little irregular eyes open;
 testes descended. No sign of anesthesia
 Convulses if touched. No climbing reflex. Ears
 quite warm. Does not turn over if upset; penis
 retracted testes again retracted. Extremities
 shunt

Recovered in 1 hr.

Repeat injection

Recovered again (about 40 mins.)

Time .4 cc. Partial right orchiectomy
 after 10 mins of anesthesia.

7 PM 2-28-43

Smear Examined:

Some abnormalities seen:
 polynucleate pachytene (early)
 bi nucleate metaphase
 2 spindles apparently good, but

 fairly common among normals

Some abnormal chromosome arrangements
 Chromosomal configurations irregular early
 and late anaphase apparently normal.

Procl metaphase chromosomes unusually large;
 perhaps some c-dispersion; no contraction



483

Remove other testis ~~sample~~

Fix Flem., Changay, Bouin, Carnoy, Act

- Smear:

As above

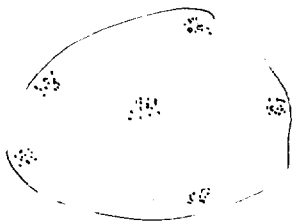
Unusually high proportion of procl anaphases. Can
 these be the sensitive phase; the source of binucleates?

Tyros root tips.

Peculiar "cell". No nucleus.

Not uncommon. (always amongst files)

faint
 globules
 (pt?)



9:30 AM Monday 3-1-43

- 484 Injct. 4cc of Nembutal solution described above; legs. Injct, because another
Perhaps too profound. Near apnea; no response to stimulus of touching, etc. Testes completely descended.
12 M. found dead May have drowned!

481 looks sick 10 PM 3-1-43. (306.) (400 V)
Put in ice box about 13° ^{with} a control
~~cont~~ (brown, full tail, ♂) to test viability at cold.

Tuesday 3-2-43

481 found Saturday control!!
Injct control 450 V, ca., and put into ice box
ca. 11:10. next day



485

.3cc solution described (fresh) into gray ♂
Nembutal.

4:30 reptd
Injct. .4cc

No great effect
anesthesia prolonged
not lethal.

survived.

Can
tes?

Thursday 3-4-43

Sunday 3-7-43

from Kumb. - 4 cc H₂O.

486

Rat #1 ~~4cc~~ 1.3 cc anesth. quickly
anesthetized. Radical (partial hepatectomy) ~~performed~~
fairly done, but incisions unnecessarily long
Recovered nicely.

487

Rat #2 .75 cc anesth.
hepatectomy. Did not survive

488

Mouse #1 (485) .1 cc anesth.
hepatectomy. Recovered ~~well~~ nicely

Recovery too slow in all cases.
Perhaps the anesthetic is ill suited; Asyptic
precautions should be a little changed

489

Rat alb. Attempt to put piece of ~~kidney~~ liver
in kidney. Died post suture, before recovery from
anesthetic. .75 cc overanesth.

490

Rat alb. .4 cc ^{very complete} hepatectomy. Liver stopped; considerable
hemorrhage but stopped. Doing well but not yet

recovered: etc.

Tabulation of mortality

Survived
 486 hepatectomy
 488 mouse "
 490 good hepatectomy

Died in operation & cause
 489 hemorrhage (renal)

Died postop cause
 487 anesth.
 490 ? humb. shock

has recovered in all respects; shows "interest in life"
 etc.

Similarly very active.

491 - hemorrhage (aspiration)

492 - hemorrhage?
 shock (aspirated)

^{colch.}
 Inject 400 μ into 486

Sacrifice 488; Ac Lammie, (testis and liver)

History of 488:

hepatectomy 7PM 3-7-43

Colchicine ~~100 μ~~ 200 μ 3-9-43 10:30 AM

Sacri 8PM 3-10-43.

Very little liver was left; apparent fatty (yellow) degeneration.

In liver, many cells show scattered micronuclei and/or chromosomes, odd shaped nuclei. Prophase seen.

In testis: gonial show regularly dispersed chromosomes; cytes well clumped; 4-, 8-nucleate spermatids.
 (Should have fixed better!!! Very sorry!)

Reaction (c. rather acute. Test Pal tomorrow

46

486 found dead out of cage 3-11-43 6 PM
Cause: unquestionably colic

3-28-43

5 small ♂ 200V colds 10 AM
 All fatalitis. Beginning of epidemic??
 in 24-36 hours.

Sunday April 11, 1943

Colicine 400V administered subcutaneously.

1 young mole 10:50 A.M.

492. Have in possession 6 more young ♀ rats, only
 this single male

4-12- Severe diarrhea. A.M.

Diarrhea still 4PM

pronounced.

Hughes - Schroeder. Early meiotic chromosome phenomena.

Little literature on "prophase problems".

In these meiotic, 6 different meiotic prophase can be detected.

1. * ends, early leptotene: all aggregate toward center. The poles begin to move through 3, 4, 5, 6. Then released.
2. Late pachytene: ends applied to regions of membranes near center (double bouquet to to center division ~~in pachytene~~ of nuclear membranes)
- 3) chromosomes relax; no further activity of ends.
4. Kinetochores move rapidly to the poles. Head attachment.
5. A reapproach of the kinetochores (contraction of kinetochore)
- c. Chromosomes to the equator forming metaphase plate.

In 4, little synchrony. The equatorial ones are most attracted.

plane of separation random to spindle planes.

First noted by White
in *Scyph. Mantis*
suggested the spindle was forming
then sudden spindle disintegration.

Stagonomantis carolinia

Monday, May 31, 1943; 3 PM

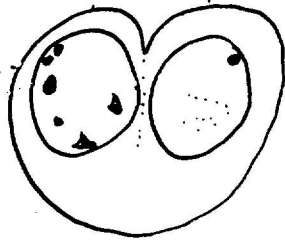
Look over and draw slides, colchicine.

Abandon elutriation project on theoretical grounds.

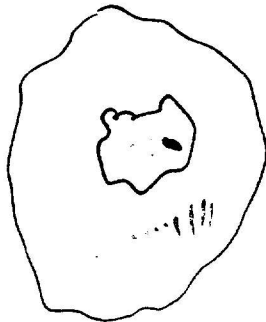
drawings of 350 V - material spermatocytes

432:01 3500 V 1 1/2 h.

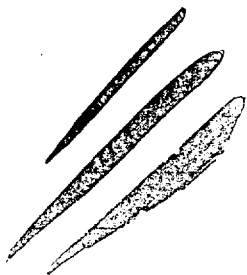
On early prophase of the character (possibly interphase)



This is a fairly young testis, and few cells are mature spermatocytes. There are no spermatids. Such spermatocyte metaphases as occur are blocked.



Soocytes demonstrate normal mitosis, but these of cells and their chromosomes are unusually small and, small cyto-pycnosis.



There are fairly large numbers of clumped spermatogonia, in some regions.

427A3 looks highly overfitted (500V - 3h).

Will stain 427A1

427A8 - Fix and stain: rather fuzzy, but better than A1..

The ~~spermatogonia~~ germlial chromosomes are unexceptionably discretely dispersed.

This may differ from clumping only in the position.
 will check with smears.

Spermatocytes are not quite so tightly condensed.

460B: 350V 3h. This is a Boum - Urdet, and did not come out too clearly. So far as can be told, cycles are in the stage of aberrant mitosis, which can readily be seen.

Tuesday, June 1, 1943; 10 AM.

350V 461 A3. An excellent videt preparation. The gonial chromosomes are dispersed and generally show the projections mentioned. The chromosomes are indisputably doubled.

Cytoplasmic chromosomes are in rings and chains. There are ~~no~~ ^{are} polar views of aberrant mitosis.

Be careful focusing:

No certain polyploidy or multinucleation



462A 350V 9 1/2 h. Very poor slide. Essentially normal spermatocytes, meiosis; others as above. Gonias as above.

new slides essential!

493 6/1/43 ~~11:45-12:15~~ Kill by concussion. Put testis into colchicine solution.

494 same time: inject 1000V.


493 A2 500V 16h. All cells have only clumped cytoplasmic chromosomes: Gonias dispersed.



463: 350V 196. Good Violet preparation.

The cyte chromosomes are beginning to disperse out of their clumped state. There is ~~no~~ evidence yet of a spindle ^{some indication.}

The typical orientation is on the surface of a hollow hemisphere.

 My theoretical interpretation is that a center at one side of the agglomerated mass of chromosomes begins its activity, hollowing out half a sphere. A spindle develops about some of these. If correct, 350V, >196, should be abundant mitotic. Unfortunately there are ~~no~~ such preparations. In some cases, the hemisphere is almost spherical.

493- *Actinomyces suavis*. Results inconclusive. Normal(?) zonia. Young animal. No cytes

Flem:

494- *Actinomyces suavis*. Definite pyknotic clumping of cyte chromosomes in 1/2 hours. No normal recesses. One despusi, no other zonia found.

Chaupey

Benda

Sunday, 15 Aug. 1943.

All preparations hence are prefixed N (for Navy) followed by characteristic numeral.

In AM, hunted *Anasa tritris* and *Melanoplus femur-rubrum*, and dissected some in P. 14. Was so well impressed by the clarity of the *Melanoplus* material that I decided to conclude my collection work thereon. I will spend 6 weeks, no more, on the problem.

First some normal material (inclusions too) and then colchicinized. This should not appear to reveal a colchicine bug in me, but I would like to put an appropriate end to this pursuit, and not leave it hanging in mid-air.

Attempt also to see live mitoses. nvg

Flem: 15, 4, 1

N1 Flemmy *Anasa*

~~N2 Banda~~ "

~~N3 Champy~~ "

N4 F *Melanoplus*.

N5 B

N6 C

Champy 77 #

Banda 15, 4, 3 drops

Monday 16 Aug. 1943

N1, N4, N6 in H₂O
N5 in mordant.

54

Tuesday, 17 Aug 0945

W1 into 30
NY change H2O.

Thursday, 19 Aug.

- (B) → Add to ~~100~~ 100.00 cc H₂O .99 cc of standard A M.B. Resulting solution = .005%
 add in .1cc increments to .5cc, then separately .5cc + .1cc increments, etc., and calculate calibration curve. dilute this B solution 1/2 (5cc to 10) and use also.
- (c) and use also.

[start another project.
 competitive adsorption of
 methylene blue / sulfanilamide on charcoal.

Saturday 21 Aug.
 add 20cc "A" to 500. cc H₂O. and thru to

1g. Nuite A. (Eq A, Pharm. grade)
 Equilibrium assumed in 20 mins. A = 16.7
 ≈ .00035%

add 40cc "A" to 460cc H₂O. Add 1g N-A
 thru to.
 Av. = 62.9

Take 2: c + 100cc H₂O C₂ = 4.8
 .000451

CNP	# and other data	Colchicine - R	Results	dose	
3 277C1	9 1 26 32 10 1 29 29	11 0 33 21	tot 2 87 82	5 27	
3 277B1	11 15 31 27 12 10 17 21	13 11 23 30	tot 36 71 78	5 27	
282	1 13 33 33	2 12 20 31	3 9 21 27	tot 34 74 101	5 25A
3 283A	24 24 29 54 25 22 28 41	26 20 30 41	tot 66 87 138	5 24	
2 283B	13 58 10 38 14 38 7 44	15 45 8 48	tot 141 25 130	5 24	
3 280 B	8 7 53 15 9 4 53 12	10 5 57 24	+ 16 163 51	6 8	
3 285	20 0 27 32 21 0 45 50	22 0 60 71	+ 0 122 153	6 1/2	
3 328A	25 1 29 32 26 3 28 21	27 5 21 24	+ 9 78 77	6 2	
3 329A	25 2 37 42 26 1 30 42	27 4 30 50	+ 7 97 134	6 2	
3 330A	21 6 24 19 22 9 29 43	23 9 41 29	+ 24 114 91	6 3	
3 330 B	16 5 25 22 17 11 18 30	18 10 18 30	+ 26 61 82	6 3	
331 B	13 26 11 24 14 16 11 22	15 19 11 16	+ 61 33 62	6 4 1/2	
331 C	26 28 6 21 27 35 12 22	28 15 8 12	+ 78 28 55	6 4 1/2	
332	8 73 4 39 9 66 3 34	10 78 3 39	+ 217 10 112	6 8	
333A	14 34 6 10 15 58 4 10	16 62 8 11	+ 154 18 31	6 12	
333 B	37 76 11 44 38 69 5 34	39 61 11 36	+ 206 27 114	6 12	
334A	14 21 20 32 15 13 21 12	16 8 10 10	+ 42 51 54	6 22	
334B	13 59 7 27 14 69 15 28	15 54 7 32	+ 182 29 87	6 22	
335A	18 5 14 21 19 2 16 15	20 7 23 31	+ 145 36 76	6 46	
335 B	15 17 8 17 16 13 9 19	17 13 8 16	+ 43 25 52	6 46	
262 2	1 87 11 03 2 109 13 70	3 87 6 38	1:3 68 15 30	5 +	
262 4	2 64 7 94 1 105 3 45	3:1 64 17 92	1/2 212 36 167	5 +	
351A	6 0 24 51 17 0 25 32	18 0 28 35	+ 0 77 174	6 0	
351 B	1 0 62 81 2 0 66 73	3 0 82 87	+ 0 190 241	6 0	
353 A	1 27 19 - 22 18	- 29 23	1 78 60	6 2	
{ 353 B	2 0 15 29 3 0 27 30	39 0 16 17	40 0 25 21	6 2	
	4 0 23 17		3 1/5 0 54 114	6 2	
{ 355 A	1 13 3 20 2 9 4 18	3 9 8 13	4 19 5 21	6 4	
	5 12 4 18		3 1/5 37 4 60	6 4	
{ 355 B	6 12 7 20 7 10 6 14	8 5 7 23	9 4 8 18	6 4	
	10 8 6 20		3 1/5 23 20 57	6 4	
361 A	10 18 3 18 11 17 0 31	12 23 0 19	+ 58 3 68	6 7	
363 A	A 71 10 5 0 13 0 19	C 11 0 7	+ 35 1 20	6 8	
365 A	32 40 1 25 33 54 0 36	34 42 0 18	+ 136 1 79	6 9	
365 B	12 44 0 18 13 52 0 19	15 80 2 26	+ 176 2 63	6 9	
367 A	2 09 9 29 1 62 3 14		3 1/2 180 18 63	6 10	
367 B	15 24 1 8 11 19 0 8		3 1/2 23 2 24	6 10	

Summary of experiments
 results: Colchicine: Spring 1942

R = F.J. Ryan
 B = Barth, L.C.
 RB = Robert Ballintini

Work Schedule

January, 1943	22 F	3 hours	3:15 - 6:15	R
	23 S	2 hours	3:30 - 5:30	R <u>pd.</u>
	28 Th	15 m	AM	B
	29 F	20 M	AM	B (Ms)
February, 1943	1 M	3:15	3:30 - 6:45	B, R.
5		1:45	7:45 - 9:50	B R
	2 T	15 M	11:15 - 11:30	B A
6:45		1:30	2:45 - 4:15	R
		2:30		
	3 W	3:30	3:30 - 6	B, R
10:15		1:00	6:15 - 7:15	
	4 Th	:30	AM - 11:30	
14:15		3:30	3:30 - 7	
15:30	5 F	3:05 1:15	3:05 - 4:20	R, B.
<u>4:30</u>	6 S	11:45 - 4:15		Ryan (9 hrs)
<u>20:00</u>				
	7 S	15 m.		Barth's voice
	8 M	4:45 - 5:45		papers - up/out, etc.
1:15		10:10 - 10:25		Barth.
20	9 T	4 - 4:20.		
2:00	10 W	9:30 - 11:30		
2:5m.	11 Th	PM		
	12 F	9:30 - 9:50 AM		
	13 S			

pd

15 M	2:30	Ryan, Baith		
16 T	20m	Baith		
17 W	15m	Baith		
18 Th	30m	Baith		
19 F	20m		8:10	
20 S	4:15	Ryan		
21 S	2:35	Ryan. (11:45 - 2)		45 1:30 2:15
22 M	1:30	Baith, Ryan (7:30-11)AM		10:45
23 T	:25			2:15
24 W	:25			:25
25 T	:20, 25 15	/ 3:20		1:00
26 F	—	ave 6:40		4:05
27 S	—			
28 S	12-3			3h.

paid

March

41	4-4:25 (Pollster's errand)	5:00-6:30 (Schrag's errand)	10-10:20 Baith.	2:35
W 2	→			
T 3	15m. B			
F 4	2:20-6:20	2h. Schrag 1:45 Ryan	Baith. 4:00	:15 } :10
S 5				:15
S 6	7-9:40			2:40
M 7	:10 Baith			
T 8	2:05 Schrag	:20 Baith		
W 9		:25 Baith		
T 10	:20 Ryan	:40 Ryan	1:40 Baith, Ryan	
F 11	:20 Baith			
S 12	:20 Baith			
S 13	1:50 Baith, Ryan.	(7:10) 2:50 due.		24. due.
M 14	3h	BR		

6:50
7:15
2:40
9:50

6:10
(3:50 due)

1:55 }

T	:20	B	
W	:15	B	
T	:20	B	
S	2:45	B,R	Friday:15
S	5:20	B,R	

10.00

1:55
 2:45
 4:40
 5:20

1:15-6:35

T. Ryan : 2,0 2:30 } 3:00
 W.

S M T W T F S

~~3 4 5 6 7 8~~

~~10 11 12 13 14 15 16~~

~~17 18 19 20 21 22 23~~

~~24 25 26 27 28 29 30~~

~~31 1 2 3 4 5 6~~

~~7 8 9 10 11 12 13~~

~~14 15 16 17 18 19 20~~

~~21 22 23 24 25 26 27~~

28 1 2 3 4 5 6

7 8 9 10 11 12 13

14 15 16 17 18 19 20

21 22 23 24 25 26 27

28 29 30 31 1 2 3

4 5 6 7 8 9 10

11 12 13 14 15 16 17

18 19 20 21 22 23 24

25 26 27 28 29 30 1

2 3 4 5 6 7 8

9 10 11 12

January

February

March

April

May

< July 1, 1943 in USNR, active duty.