ROYAL

COMPOSITIONS

NAME

VERNON ROYAL LINE

Hans Holt Anker
No 77891
Sherrod ~~Thes~~ Elwood Jensen

CLASS PROGRAM

NAME _____ ADDRESS _____

SCHOOL _____ CLASS _____

		PERIOD 1	PERIOD 2	PERIOD 3	PERIOD 4	PERIOD 5	PERIOD 6	PERIOD 7	PERIOD 8
TIME	FROM								
	TO...								
MONDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
TUESDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
WEDNESDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
THURSDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
FRIDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
SATURDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								

MANUFACTURED BY S. E. & M. VERNON, INC., NEW YORK, U. S. A.

Albert Levan
Inst. of Genetics, Lund,
Lund, Sweden

Vicia Faba }
Allium Cepa }

Hadorn (mutations by Phenol)

Tjio and L. Phenols, Amines. Pyrogallol, Hydroquinone
Paraquinone

" " Quinoline, Acridine derivatives

Kihlman and L. Caffeine, Purines

---

caffeine 0.02 to 0.4 % gm/100 cc

Bengt Kihlman and A. L.
Hereditas p. 109 XXXV 1949
The cytological effect of
caffeine

Phaseycaffein

Banding

Serratia H 9 strain (grown in broth) (red)
plated on synthetic medium
gave 1% whites, mostly (reverts to red)
growing in ~~[illegible]~~ synthetic
medium gives more whites
[looks something which grows
more slowly than cell on synthetic
medium]
does not seem to be selection

Within

B/r lac+ 1 in 20000 lac− spont

spontaneous lac− are stable [28 isolations]

(less than $1:10^{10}$) ~~both~~ both to

spontaneous and U.V.

U.V. induced lac−' one quarter unstable to spont. reversions and strongly responding to U.V. induction (spont. revers ~~[illegible]~~ from 10^{-10} to 10^{-7} rate)

Ratio of UV induced to spontaneous mutations (in UV produced lac−) is constant

---

Jesse Flint:

Sir

Zinder

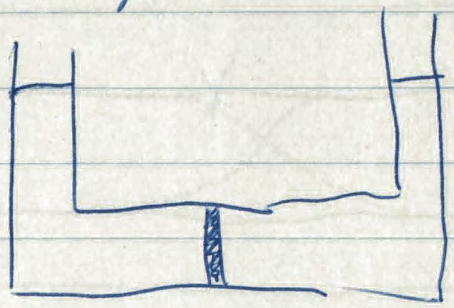
H

T_2 H^-H^- ~~Fg~~ X T_{22} [Phe all + Trypt] $^-$ Trypt $^-$

A 1 in 1000 fermentation.

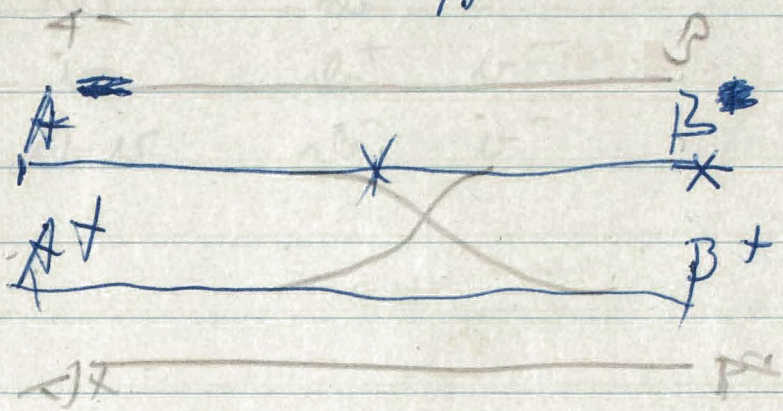
B

all prototrophs like B



Bonner

1.) macin or hypostphane requiring



Nonrein use (discuss again)

Allen S. Fox

Wild	vb^+	v^+	(I) ← residual
vb	vb^-	v^+	
v	vb^+	v^-	
$vb\,v$	vb^-	v^-	

For Davis

Take Temp sensitive and make it drug resisting. —
~~Mutate~~ Pick mutants, (non allelic) which [showing suppressor] ~~[illegible]~~ at high Temp are slow growers. —
Expectation: Temperature sensitive part will remain drug resistant. Non Temperature resistant part will be drug sensitive. —

Quarbad

Urethane
Phenol
Formalin
Ethylen Oxide ?

---

mustard oil no large deletion
Formalin and mustard gas give large deletion

Mosaic in F2 what protein (2 genes)

What is his story of third brood
has highest mutation manifestation
(doubling up third broods) mutations ↑

saturation of effect after
30 min

Factor 100 from 5°C to 37°C
Temp effect

---

progress resistance
lactose fermentation
and 5 auxotrophic reversal tested
Tryptophan
2 methionine

} in addition to streptomycin indep.

no specificity of effect

UV + Urea treatment gives fewer mutants
than UV alone or Urea alone

β propiono lactone no killing
mutagenic! –

Demerec

Sd-4 → Sgens → Sres.. 1.4×10^{-8} / Brot

0.0 M/~~liter~~ MnCl2 1 hour

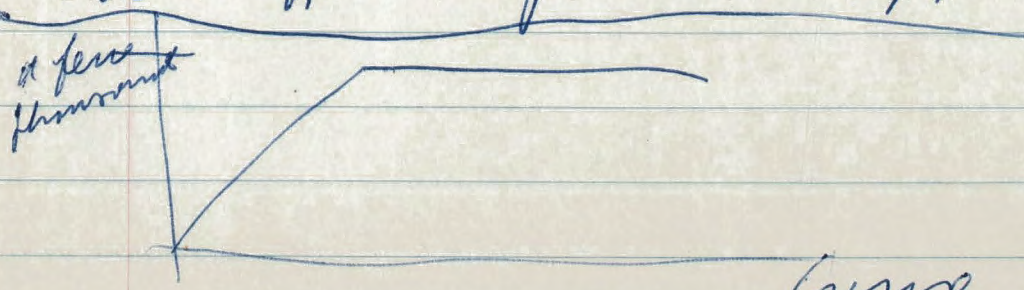
0.15 Molar NaCl

0.05 Dextrose good added to MnCl2 solution

Resting >>> growing
aerated >>> not aerated

Mg bad for effect

Ph Buffer improves effect



Atwood

Discussion: Guthrie (Sloan Kettering)

Mass

Removing magnesium

E.D.T.A.

ethylendiamine tetra acetic acid [Versene]

[column better!!]

Inst. of genetics
Kopenhagen

Westergaard (Mogens)
dose dependence recession

Bromomethane
Formaldehyde } may cause mutations without chromosome breaks
UH_2O_2

Phenols (Pirogallol, Orthochinon
Urethane
Ketene C_2H_2CO
Ethylene imine
C_2 " oxide

no recessions but mutation (alleles) in flies and chromosome breaks in plants

Sanderson
Jour. of exp. Zoology (1930)
2 Papers on Sternostenum

Ruth Sager

Perkins (David) Stanford
Fungus (mut) single cells

T^+L^- × T^-L^+

Chlamydomonas reinhardii used by Sager
possibly used by some grad. students
of Smith (retired)

Dr. Darrell Hepney succeeded Smith

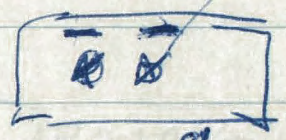
Within (paper)

[Lederberg suggests spores of bacterial spore formers because they are uninucleate]

[AB] [A]/10^8 [B]/10^8 bacteria

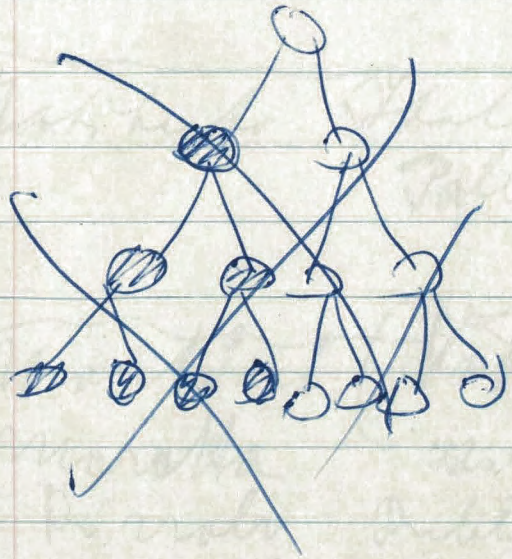
$$\frac{[AB]}{[A][B]}$$

Lac⁻ V^R normal



no rec

Lac⁻ V^S + Lac⁺ V^R



Antonio Carelli Istituto di Fisica, ~~Ital~~ Università di Napoli. Naples Italy

Buzzati Traverso, Univ of ~~Padua~~ Pavia
Dept. of Genetics

Assistant 22 – 26 [32,000/month
for single man
625 lire = $1
1.5 times cheaper to live. — ~~for~~

Extraordinario [52000/month
for single man
after three years

Professor [58000 to – 78000 at high age /month]

Istituto Italiano di Idrobiologia
Pallanza, Novara, Italy

Montini (Vatican)
Marotta Istituto di sanità pubblica Roma
Rizzoli Publisher Milano
Marzotto Wool manufacturer Valdagno
Brusadelli Cotton " Milano (Vicenza

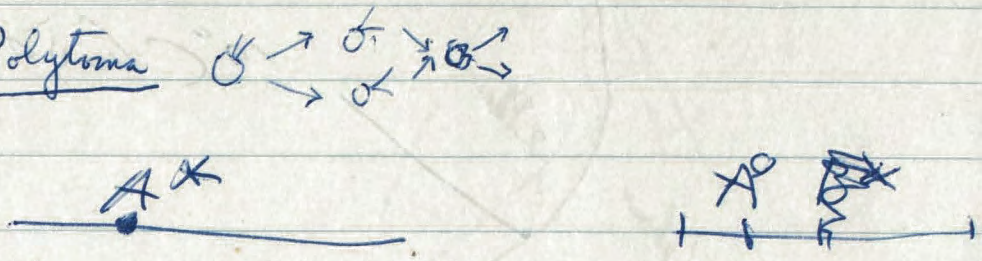
Ochromonas
eat + photosynthesis
B12 requirement
B12
methionine

Plubnes

does not grow in the dark

Chlamydomonas moewusii } sexual
reinhardi }

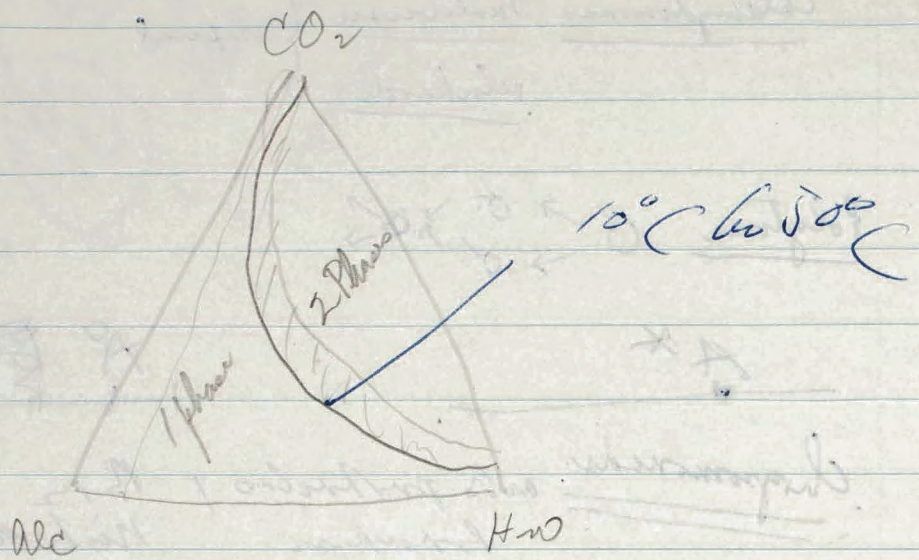
Polytoma



Chrysomonads eats particles / B12 assay
Bacteria Nostoc
Nicotinid alexandri

Ferric phosphate ~~at P.H.~~
above P.H. 5.5 gives precipitate

Chelating agent (citrate 0.05 %)
Na3 citrate 2H2O
Citrate. [Pho above 7] more stable in light
Versene ~~PH~~ not metabolized, use at all PH - J


CO_2
10°C to 50°C
2 Phase
1 phase
Alc
H_2O

Tom F. Anderson Johnson Farrand

Number of F_1's which give no unpaired gives number of albinos

5% of those missing

O × + =

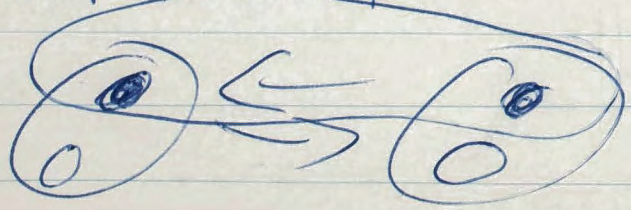
O
O
O
O
+
+
+
+

A B B C A E

lines lines plend

unpaired

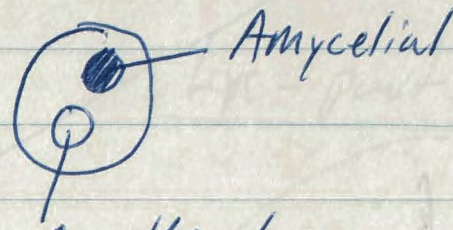
~~of the a pair of unlike genes which gives~~



29/0 gives heterozygous of unpaired crossing over

Amycelial

A B
95% 5%



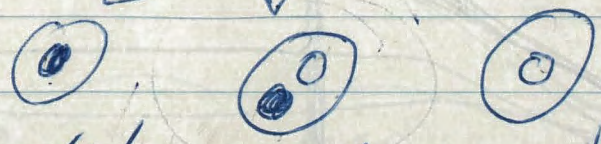
+ UV

Normal growth on minimal

Plate on minimal

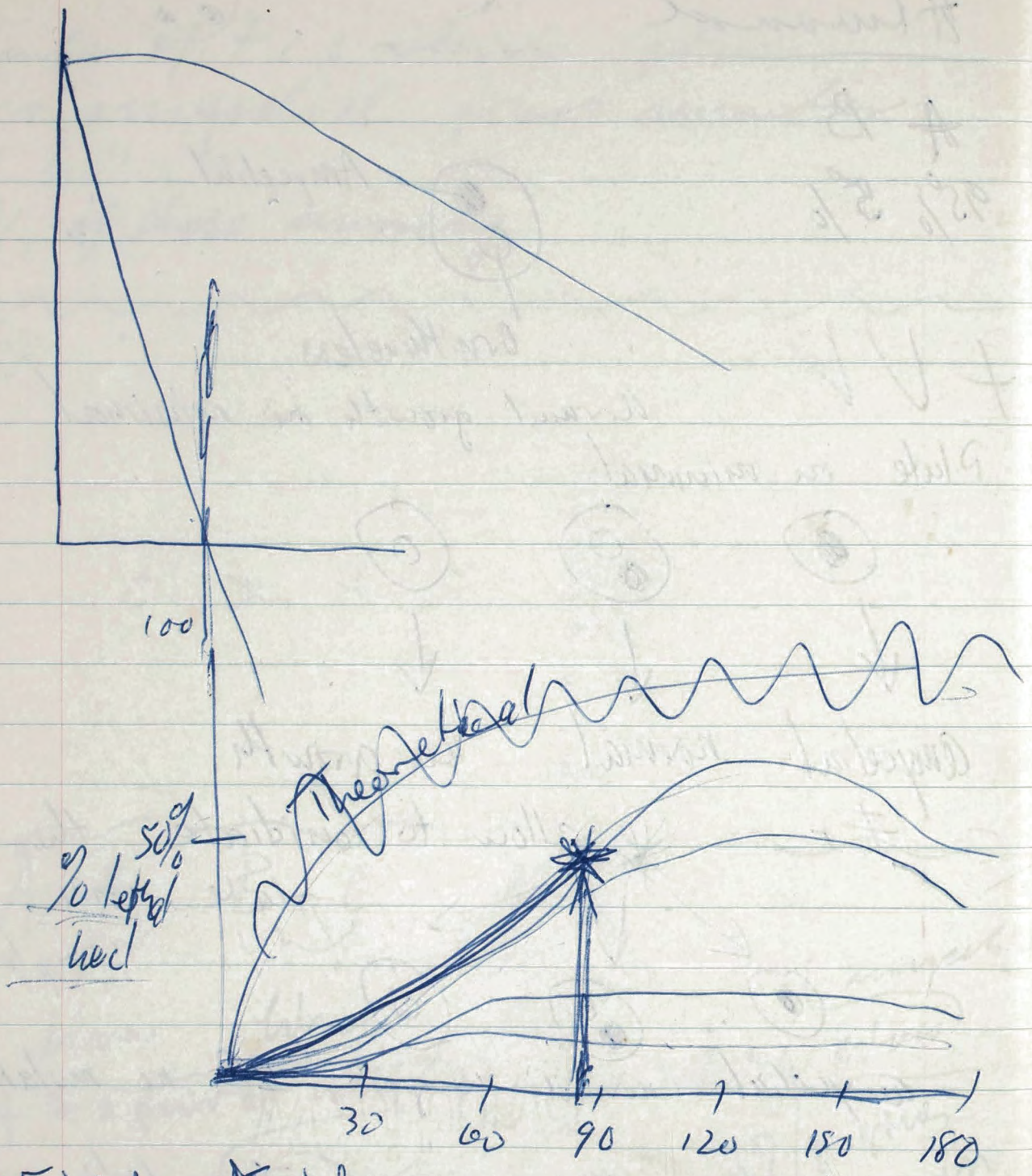
amycelial normal no growth

7, allow to conidiate then plate on complete



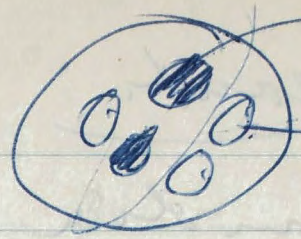
amycelial normal no growth If no mutation

no growth " " If mutation in amycelial



15 Watt Heinlamp, 15 mm distance

4



Lysineless
pantothenicless

nutr plate

150

Lys-pant plate

300

isolate these
and retest.

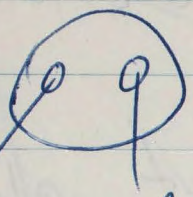
All homoklamyons

$10^4/10^8$

1000

$10^7/10^8$

Abrand cont.

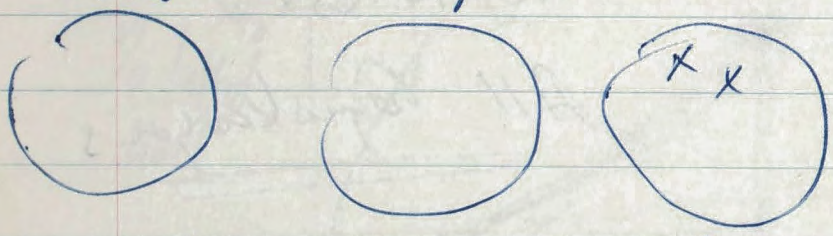


conidia (2 ~~cell~~ nuclei mean)

Lenc typ.

irrad

plate on minimal with sorbol
pick colonies [AB]
from each colonie grown on agar
take conidia. ~~take~~ which are
AA AB BB
polyploid
lenin. spore mix



m+x m+y m

when

Bauer

Niels Fries strain of yeast grows ~~the~~ as haploid [Hendricks]

Talk:

H. influenzae — work of Alexander and Leidy [P.S. at Jan. at Pub. Med. Spring 51]

gram negative, complex growth factors (hiresalts type strain)

- capsular transformations -

Austrian and McLeod

Hutchinson — Produced from R with SP factor

0.15 μg/cc	RP	S
	5000 cells	10
	?	?

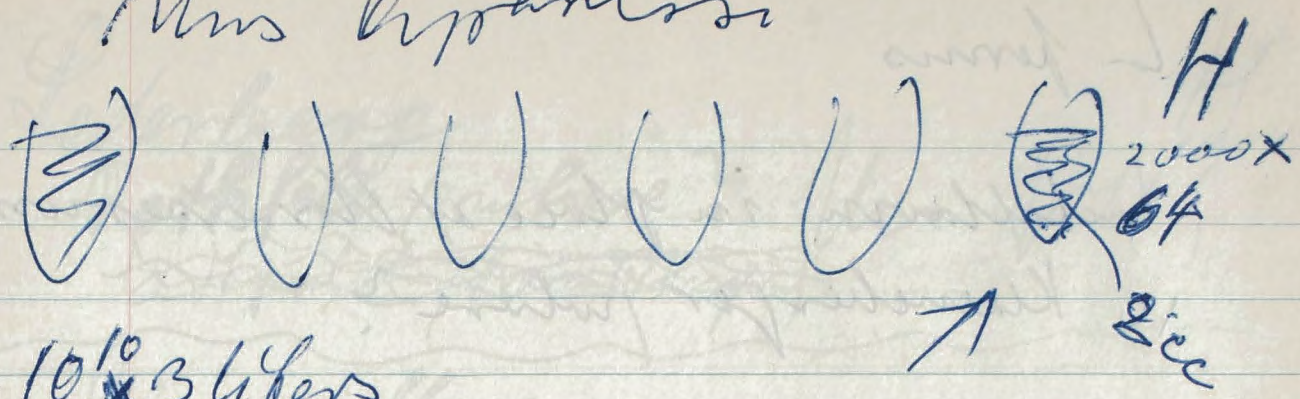
Penicillin	0.	30 min	90 min	180 min
0.60	200000	300000	450000	1,000000
0.02	200	2100	3600	90 000
0.03	1	1200	2000	50 000
0.04	0	200	700	60000
0.05	0	0		75000
0.06	0	0		1000

Induced by a SP strain

resistant to 0.30

$R \rightarrow RP_5 \rightarrow RP_{12} \rightarrow RP_{24}$

Mus Rhohmossi



$10^{10} \times 3$ libers

30 cc stock

0.1 cc

add

$1:10^4$.

$\frac{3 10^{13}}{30} = 10^{12}$

10^8

10^7 bacteria ~ 200,000 bacteria

50

L pernis

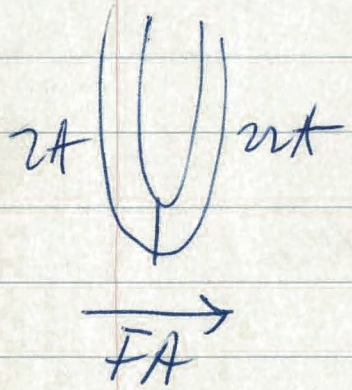
Lactoflavin in place of Horse serum
11. Kidneberger pulvere?

1.

Lederberg
Rothfels (where? Ann Arb)
~~[illegible]~~

Salmonella;
1 in 10^5 recombinations

1 in 10^7 ~~for~~ recombination with
Davis contraceptive



58°C 30 min
precip. Ab.
will not destroy FA
neither will

Kleinschenger Bacteriological Reviews
(to come)

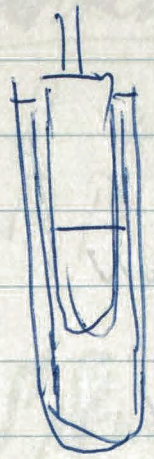
Penicillin active in placental plasma
1 Unit/ml

Mary Kayle

Emulsifier: Potter Elvejhem

Arthur H. Thomas ~~Pla~~ Phila.

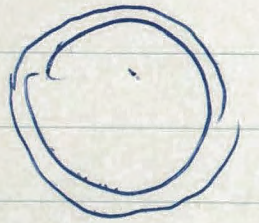
or. Central Scientific

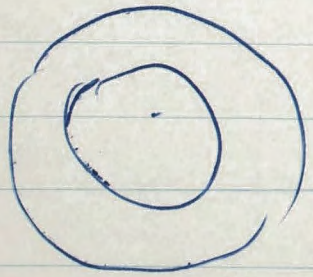


1	$1 + 1a,b$	$\longrightarrow$	~~1b~~ $(= 2a)$
1c	$1 + 1c$	$\longrightarrow$	N
	$1a,b + 1c$	$\longrightarrow$	N
1c	$1c + 1c$	$\longrightarrow$	$(1c)$
	$1, 1a,b,c + 2$	$\longrightarrow$	~~2~~ + few N
	$1c + 2a$	$\longrightarrow$	~~2~~ + N

a

①  Paggld by anti-R and anti-S

②  " anti-S

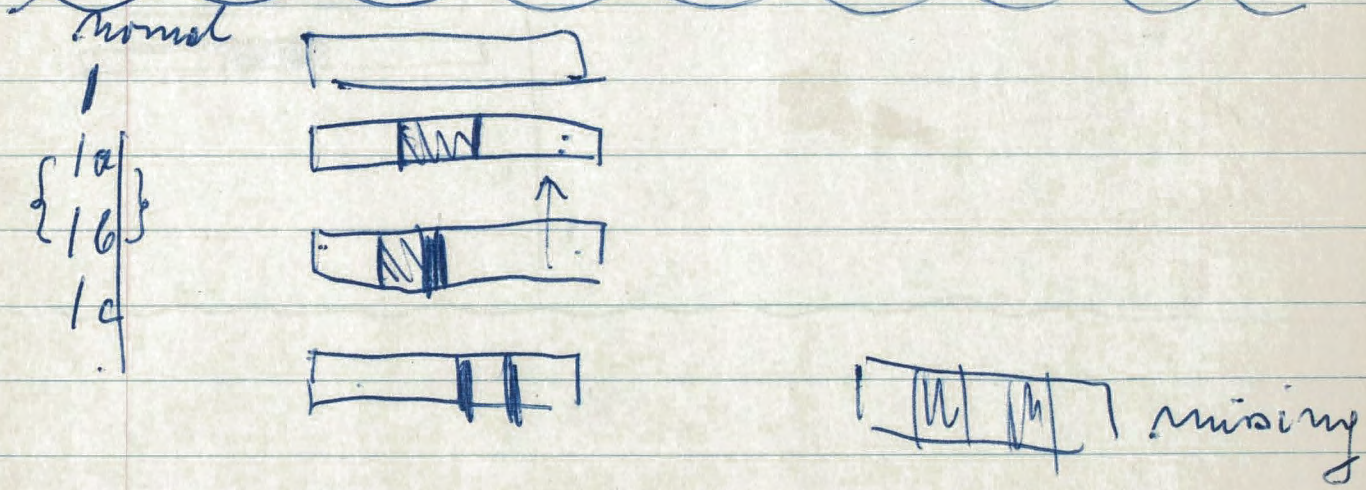
N  " "

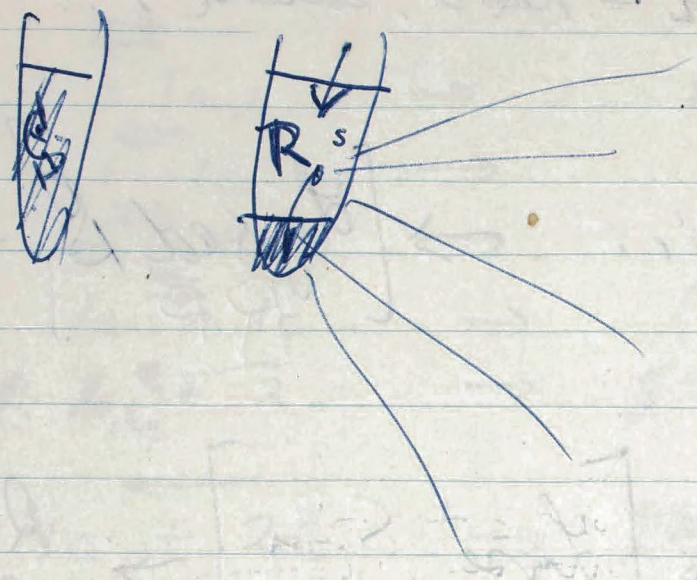
Mrs. Ephrussi – talk, cont'd.

Hotchkiss

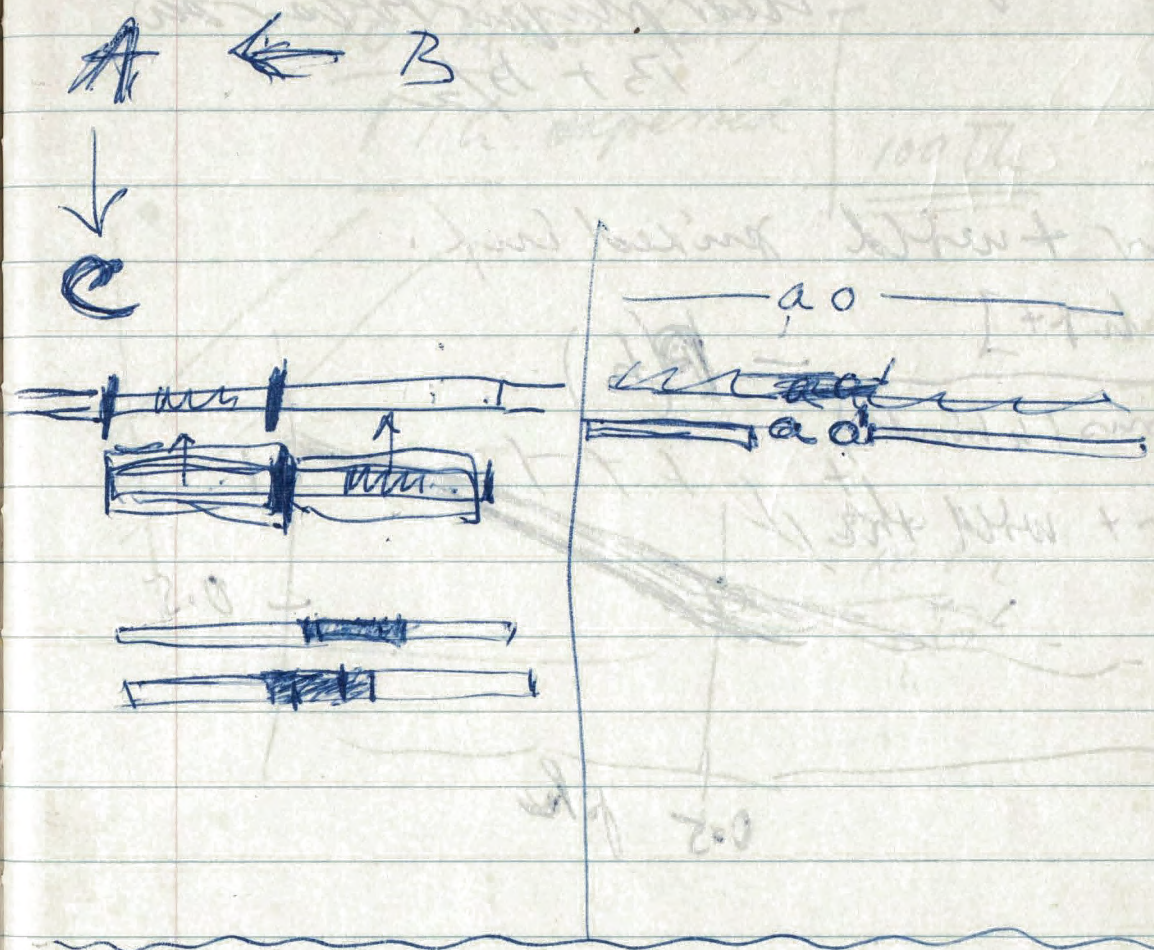
S + penic. → [Lysed S] → SP
RP RP RP

S Strm → [Lyse S Rh] → R Strm P
RP RP SP
RP




R
s

Nowick's interpret of Mus Epinussi



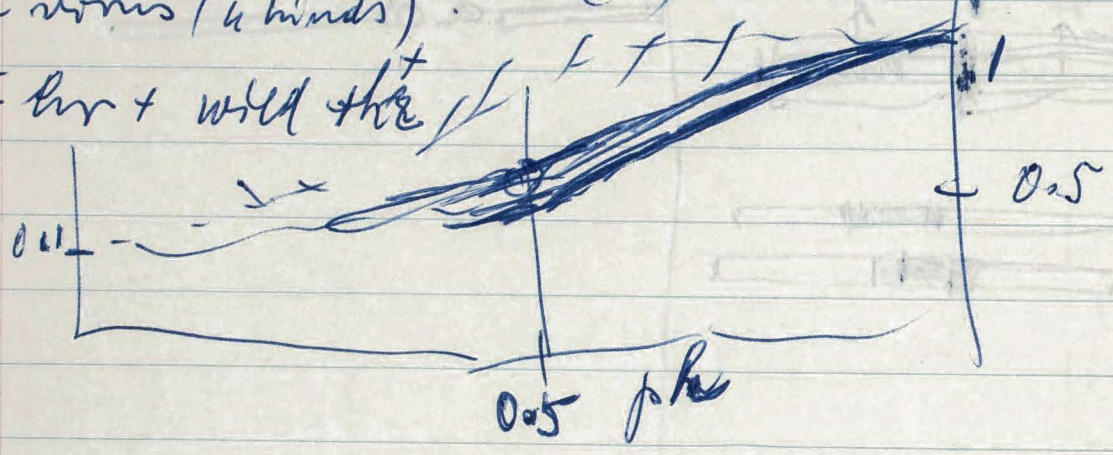
Hershey

$$\text{exp} = \frac{\text{total no. on } B/2}{\text{clear plaque total no. on } B + B/2}$$

hr + wild mixed inf.

$$\frac{[\text{hr and hr}^+]}{\text{all virus (4 kinds)}} = P(h)$$

hr⁺ hr + wild ~~the~~



10^6 | $\frac{10^8 \text{ plugs}}{10^6 \text{ bacteria}}$

1

B x T2

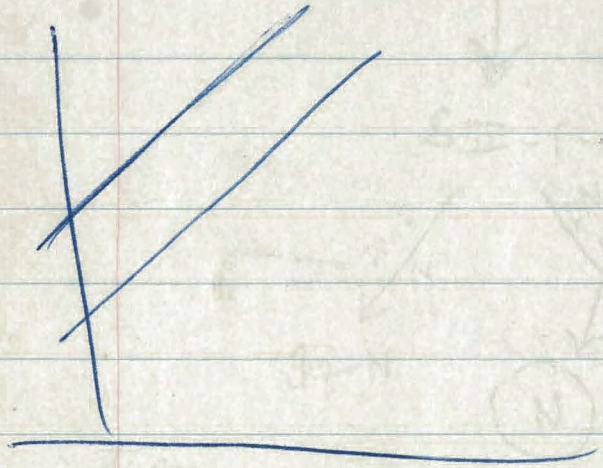
10 Th (unrubbed)

1 Th expressed

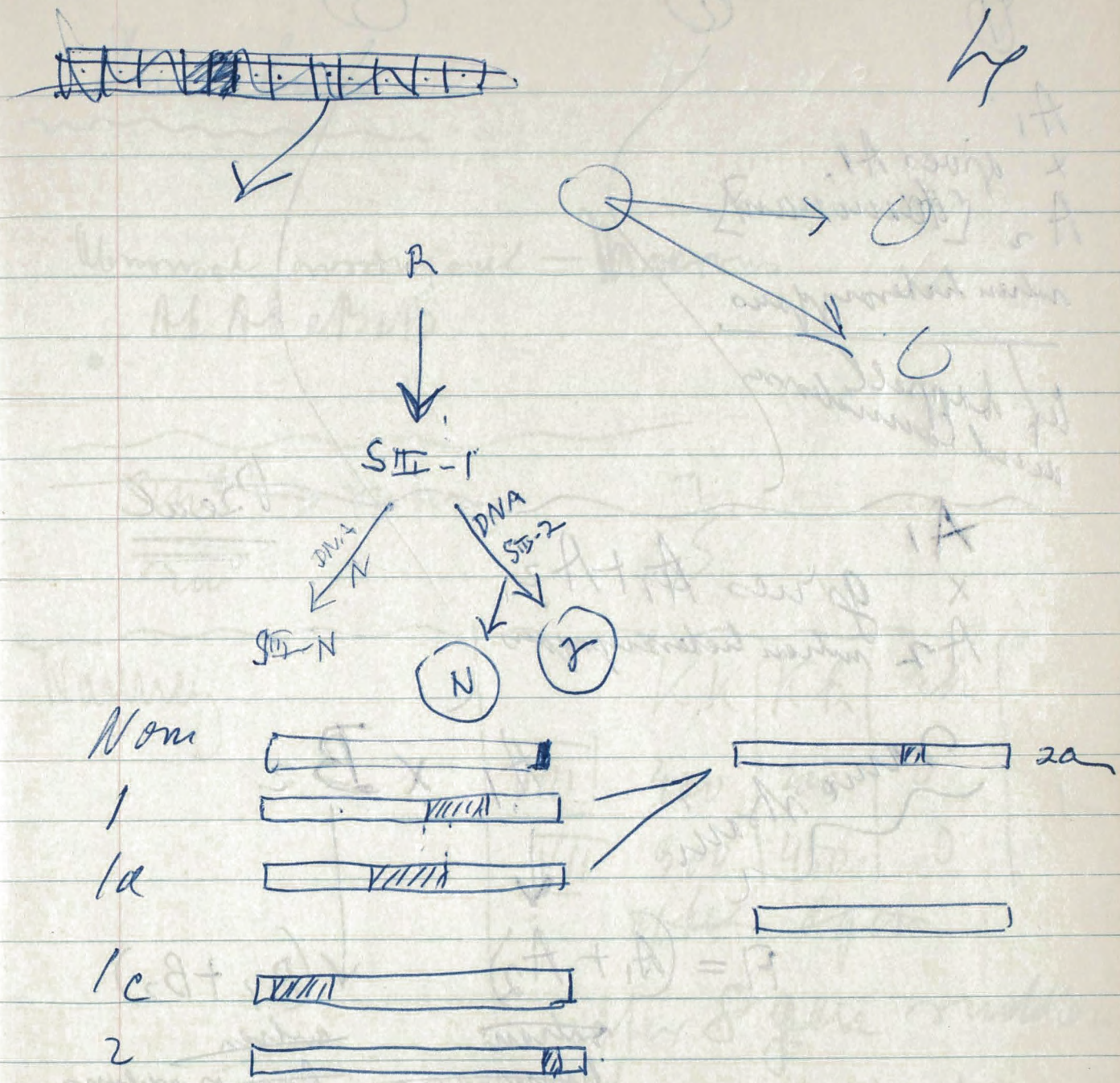
100 Th

11 infected / B/2

1100 expressed



10 T2 / 1 T2


R
SII-1
DNA
N
SII-N
DNA
SII-2
N
γ
Nom
1
1a
1c
2
2a

(1) (2) (3)

A_1
x gives A_1
A_2 [dominant]
when heterozygous

Cf. Lappell and Lamberson

Beul

A_1
x gives $A_1 + A_2$
A_2 when heterozygous

same thing

$A_1 \times B_2$

$F1 = (A_1 + A_2)$ ~~when heterozygous~~ $(B_1 + B_2)$ ~~when heterozygous~~

In heterozygote

Sonneborn

Unusual crossing over — Paramecium
AA AA aBeB

$m^+ \rightarrow$ mutin
m^0

Nanney	KK	Kk	kk
VIII	400	200	0
VII	900	450	0

~~after 8 gen~~

after 8 gen mutation drop (or rise)

Beal (Edinburgh)

$T_1 \times T_h$

Freetswipe C. Pz. 1950 or 1951

3 or 4 males

Breitsinger — Martha Sheek

30 brothers with T_2

always picking for T_4 but range leaves 1/2 of depressor effect.

~

~~Brothers~~ $T_4 r \times T_2 +$

Then pick $T_2 r$ $T_2 r \times T_2 h$

pick $T_2 hr \times T_2$

pick $T_2 h+$ ~~repeat~~ $\times T_2 r$

pick $T_2 hr$ $T_2 hr \times T_2 ++$

etc 8 times

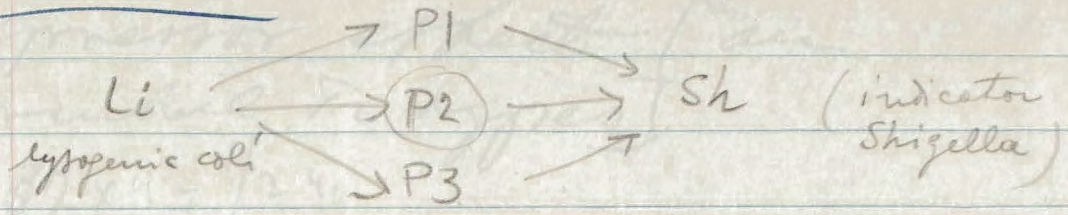
leaves 3/4 of depressor effect.

However always picked rabbit resistance (coming from T_4)

In last cross $T_2^x \times T_2$ both resistance

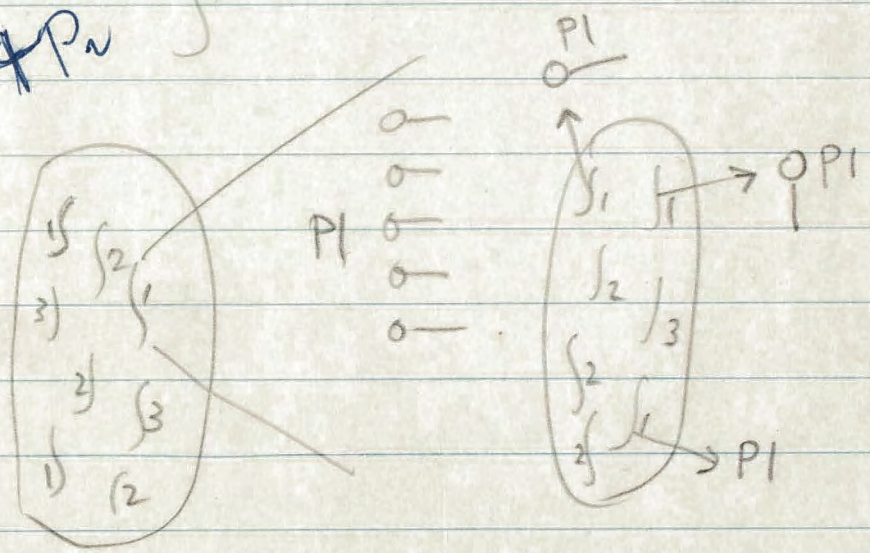
Bertrand

Bordet ~~Belgique~~ Liège



P2 + Sh → Sh/2 · lysed per 55 min
+ Sh(P2)

Sh(P2)
Sh + Pn
} same burst size = 170



100 1 0.01

P2 h
P2 h_B

P2 + clear & irregular
P2 hz turbid & round

P2 hz h → Sh(P2)

and sensitives had same
depressor effect [on
prewhel Tr types]
2 x 4 = 1/240

Norwich N.Y.C. June 10

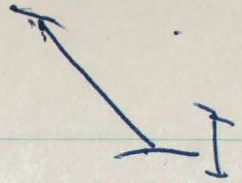
10^{∞} 10th 100 smoked

10^{∞} 3 10^{∞}th " 10^{4}th , 10^{10}th

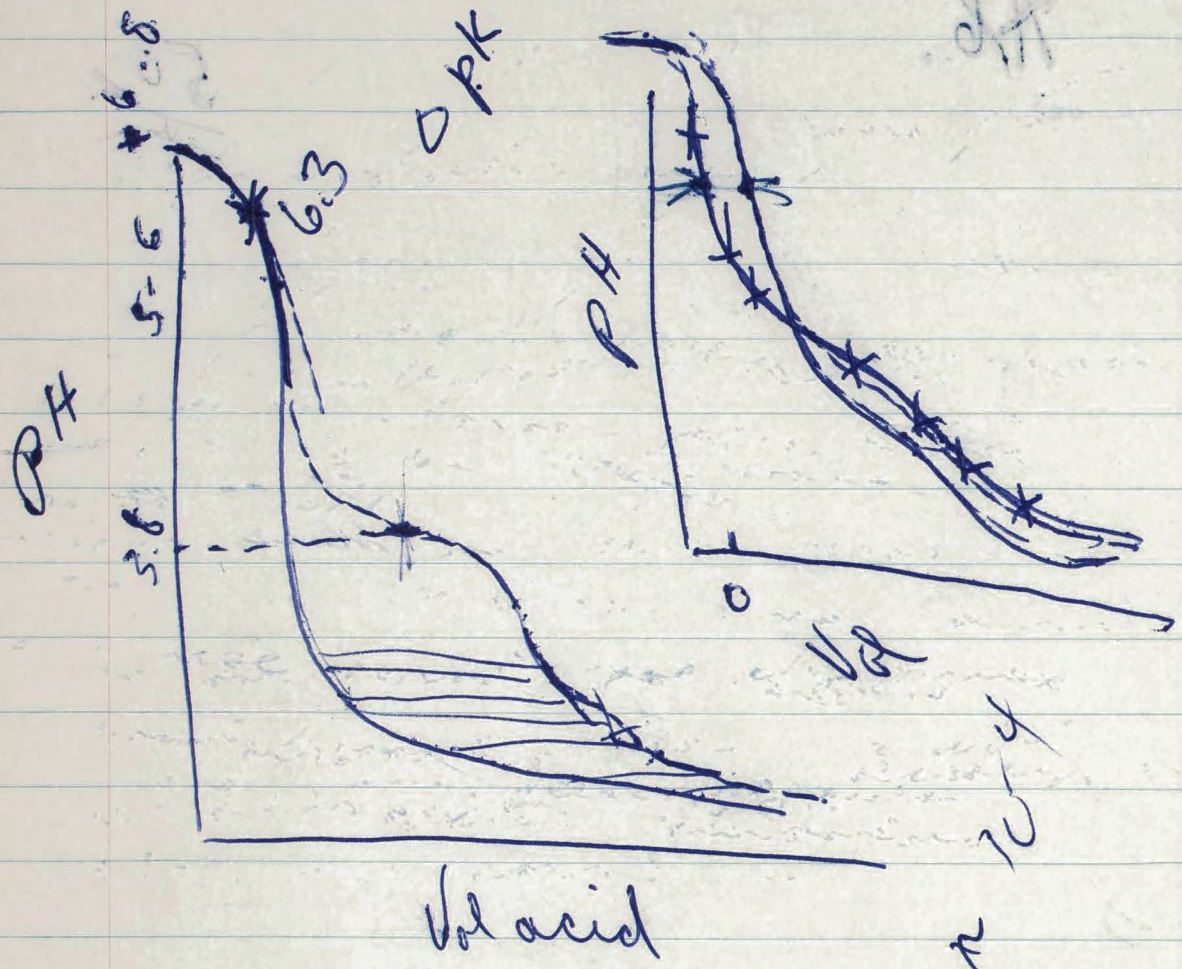
10 100 10^{∞}

A  B l

A A6



50



$K_a \sim 10^{-4}$

Order ** glass electrode || another Calomel electrode

Na lactate (Amber) saturation

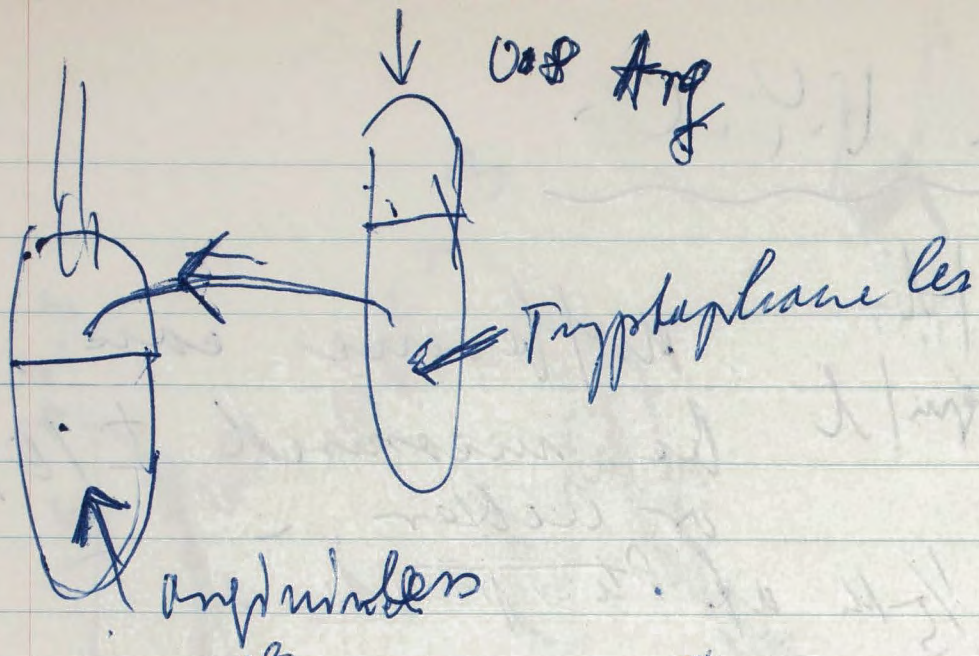
Fansteel Chemical Co

For V.M.C.

2 gm/l
2.2 gm/l

difference can be measured ± 10% or better.

with 1/5th of Phosphate of F medium.—



Meat Institut: Schweigert

$$n_2 = n_1 \frac{1}{\frac{w_1+w_2}{V_2} - \alpha_2} \frac{w_1}{V_2}$$

$V_1 = 20$

$\tau_1 = 2$ hrs

$W_1 = 10$ cc per hour

a) $\frac{w_1+w_2}{V_2} = 1\,hr^{-1}$

b) $\frac{w_1+w_2}{V_2} = 2\,hr^{-1}$

for $V_2 = 20$ cc

make $\tau_2 = 50$ min

and arginine 10 times as much in

Amber

1.) Bacteriostat (radiation)
B/t/arg

2.) B/t + B/arg (no radiation)

3.) same as 1 with (rad.) guanine
Thymine
Thymidine [Korloff
Miriam Banks

→ second tank plan in first tank.

First growth tube at 2.5 10^8/cc

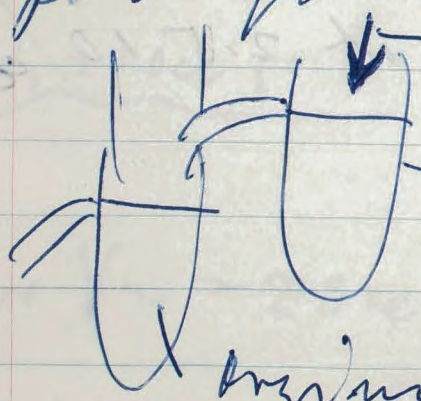
6.) Adenine limited, with "n" go down with increasing τ

rather look at DNA for different τ with tryptophane control

7.) Adenine control; mutation rate as function of τ

Biological
Salisbury Cove Laboratory
Mount Desert Island Maine
B & W 592 W2

Exp. for determining level at which wild type takes up arginine.



arginine 1/4 of amount needed for growth
+500 γ tryptophane

B/1t

arginineless (T5 resist test)
no tryptophane
no added arginine

Nowtek

1.) $\tau >> 20$ hrs what about mutations

2.) Thermostat T_{-}; T_{2} h

3.) B/6 with Theophylline
Tryptophane controll
~~[illegible]~~ lactate controll
amount B/6 at t_2 = hr to t_3 = hr
catch low, fort strain $2,5 \times 10^{8}$
80 cc growth tube
centrifuge ~~[illegible]~~ 20 cc
plate $2 \times 1/2$ cc

4.) 1% B/6 + 99% B
in chemostat

5.) ~~The~~ Spontanous
and Theophylline induced
return of B/6 to B/15
on B, lactate ~~[illegible]~~ + Tryptophane

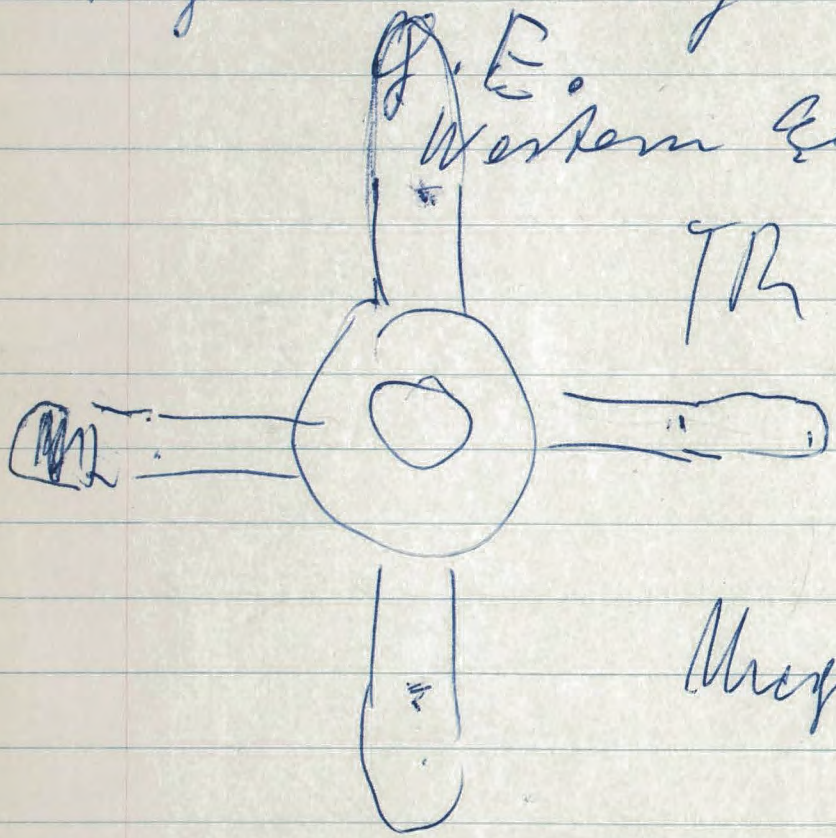
For Fox (Pönröi) determine phosphate in Phosphorus lfd. exp. (suggestion fisher growing long may have more nucleic acid and more phosphorus)

~~Pulser tr dt $250~~

life 250. hours minimum.

For auxiliary equipment by Browning Co

G.E.
Western Electric } TR.



Magnetron ~~[illegible]~~ watt pulser

Radar system and equipment
"transmitters" P. D. D & D in
"Electronics" Myers guide
G.E.; RCA; Spring ster

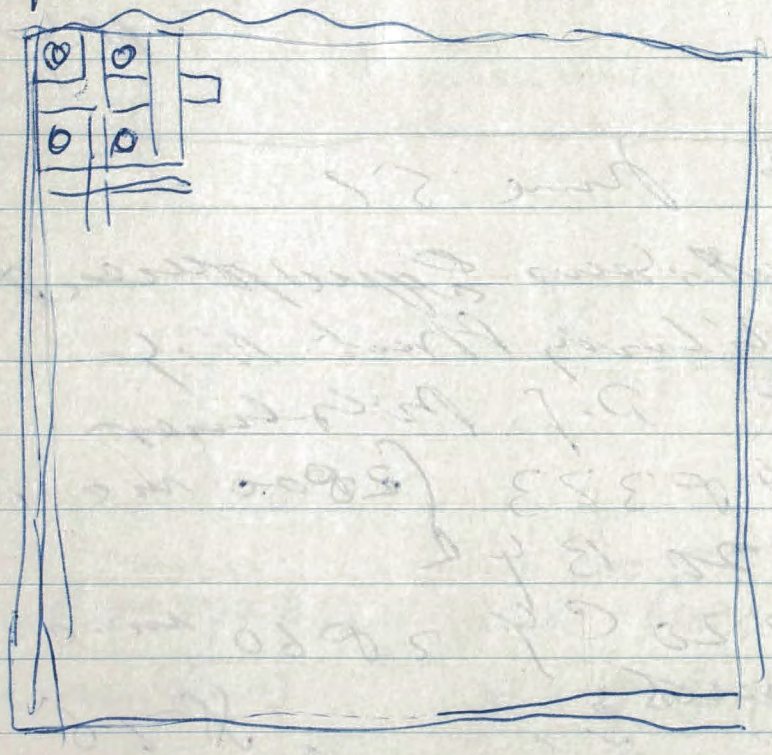
Uvon

Magnetron 4J70
8000 megacycles ~~[illegible]~~ 3 cm
0.3 megawatt pulse
225 watt average
minimum 20 to 23 KV
pulsing voltage - 27 1/2 amps
on 0.002

~~[illegible]~~ Sylvania Electric
Products Inc. 1740 Broadway
N.Y.

Proc. IRE June 52
Communications Equipment
Co 131 Liberty Street N.Y.
Dept 1-6 D.F. Polsheer
Main 4 8373 {2800 mc, 1000 kw
Tube 720 B4
720 C4 2860 m.c. 1000 kw
Firms:
H.R.E - Greenbay N75
1948 A 950 (Under Tubes)
See also Electronics buyers guide

2000 lbs a 10 cent / lbs
K 200 per day
replacement K 100 for each
manipulation every 10 days or
400 dollars per 10 days. —
1) heatings after processing
2.) window holes synchronized with
magnetic deflection
3.) rotating eyes
4.) general manipulation in
sequence



Western Electric
write to
O. Carpenter

Hydrogen Thyratrons
Westinghouse

See Review of Sci. Instruments

Mg for 7 MEV electrons
25000 Gauss cm

---

gives 20,000 lb/day
3 shifts

Assume need: 1 kg per 10 sec or
2000 cal ≈ 10 KWatt in 10 seconds
or 1 KW ~~out~~ out put or 4 KW input
this may mean 4 magnetrons
& 1 Megawatt pulse 1000 pulses per sec

MIT { ask Hägel
Purdue

Atomic Energy Research Establishment. –

10^6 Watt

0.1 Amp

Fry Nature 160, 357 1947
Gaillet and Lusch Proc. Phys Soc. 61
Harvie " " Sept 40 " "
2 M Watt at 50 M/sec. = 100
mean power in Beam 60 watts
30% efficiency

2 M Watt 2 10^{-6} sec. 50 = 200 Watt in R.F. –
tube length = 2 meters
gives 4 MEV
For steel load see
Radio Res. Lab. Harvard Univ
Confid. report No RR 1 411-229

Nature 162 (859, 1948

D. W. Fry

E. L. Chu, W. W. Hansen J. Applied Phys. 18. 996 (1947)

Chu M.L. Report 140 May 51

quotes:

J. E. Becker, D. A. Cornell
Rev of Sc. Instr to be publ. Nov

R. B. Neal M.L Report 132 (1950

X Linzbon Hansen and Kennedy Rev. of Sident. Instr. Feb 1948

Hansen and Post J. Appl. Phys 19 1058 (1948)

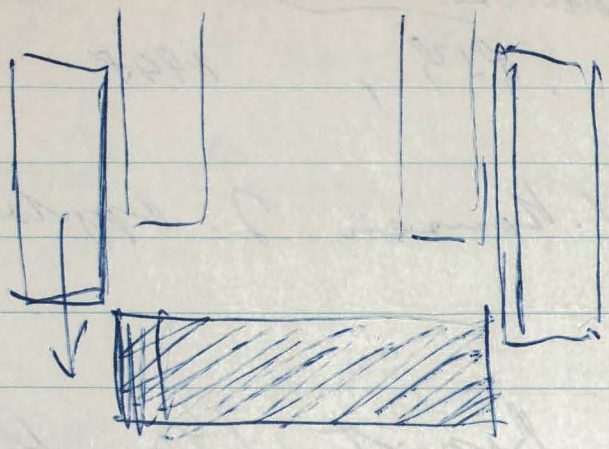
X Proc. Phys. Soc 61 267 1948
R.B.R Shersby-Harvie (1948)

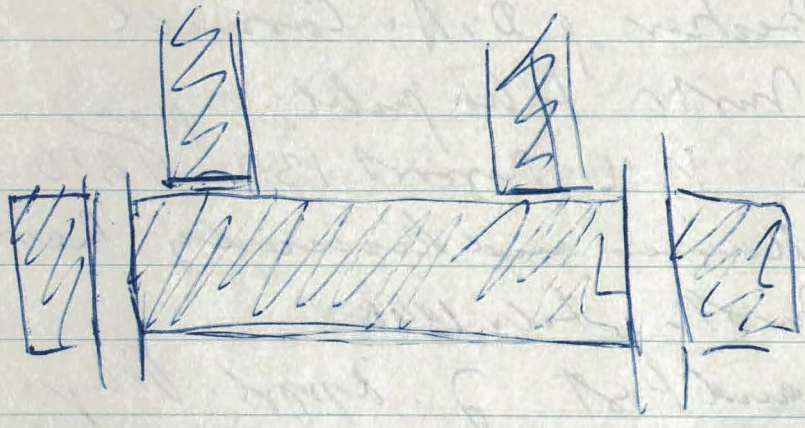
W. Walkinshaw Proc. Phys. Soc. 61, 246 1948

X Chu Journ of Applied Physics

Chu, Hansen The theory of disk loaded wave guides

W. Walkinshaw Journ of applied Phys. 20 634 (1949)



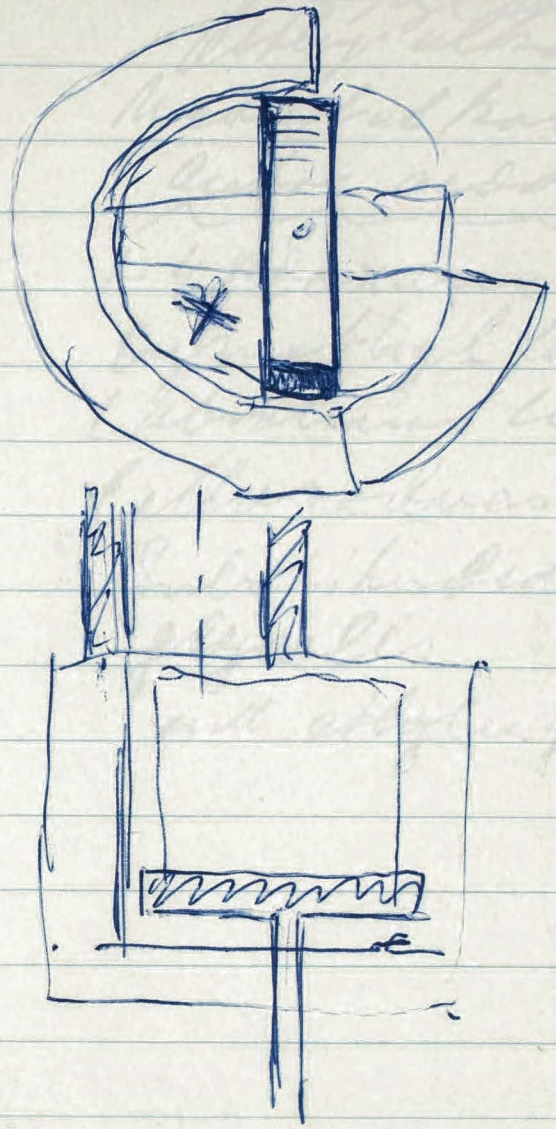


1 kg water to boil, 2.5 oz
in 20 sec,

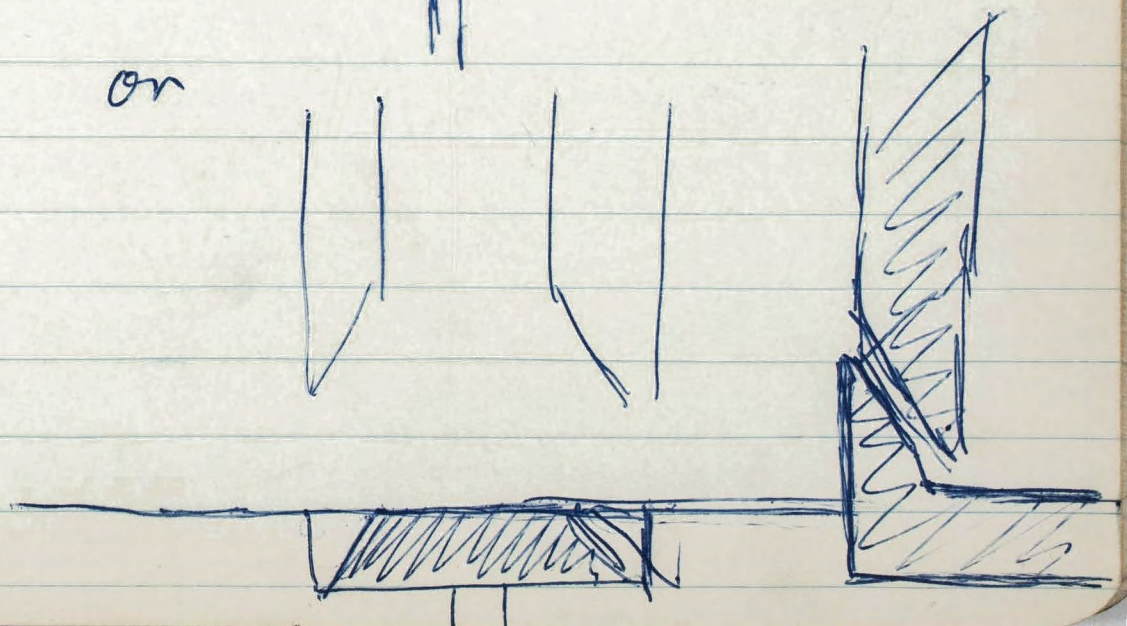
10 kWatt-sec in 10 sec is

1 kW

10,000 watts / 24 hrs



or



Lemon

Glucose
Sorbitol
Glycerol

Solvent
Benzyl alcohol
Ethyl alcohol
Methyl Cellosolve
Acetic acid

1-4 Dioxane
Dimethyl formamide
(Abraham Lois)
Cellosolves:
Substituted ethylene
glycols
and ethylene glycol itself.

Vorian Arcades
924 Wash St
San Carlos Cal

10^{-5} cm/m Hg Hans Urah

10^{-6}

THE QUADRANGLE CLUB
CHICAGO

Terman 200 Million volts Fry

Ginzton
E.L.Z

Uhtrowich

$17 \cdot 10^6$ Watt per pulse

Clystron (Stanford) 60 pulses/sec

Magnetron

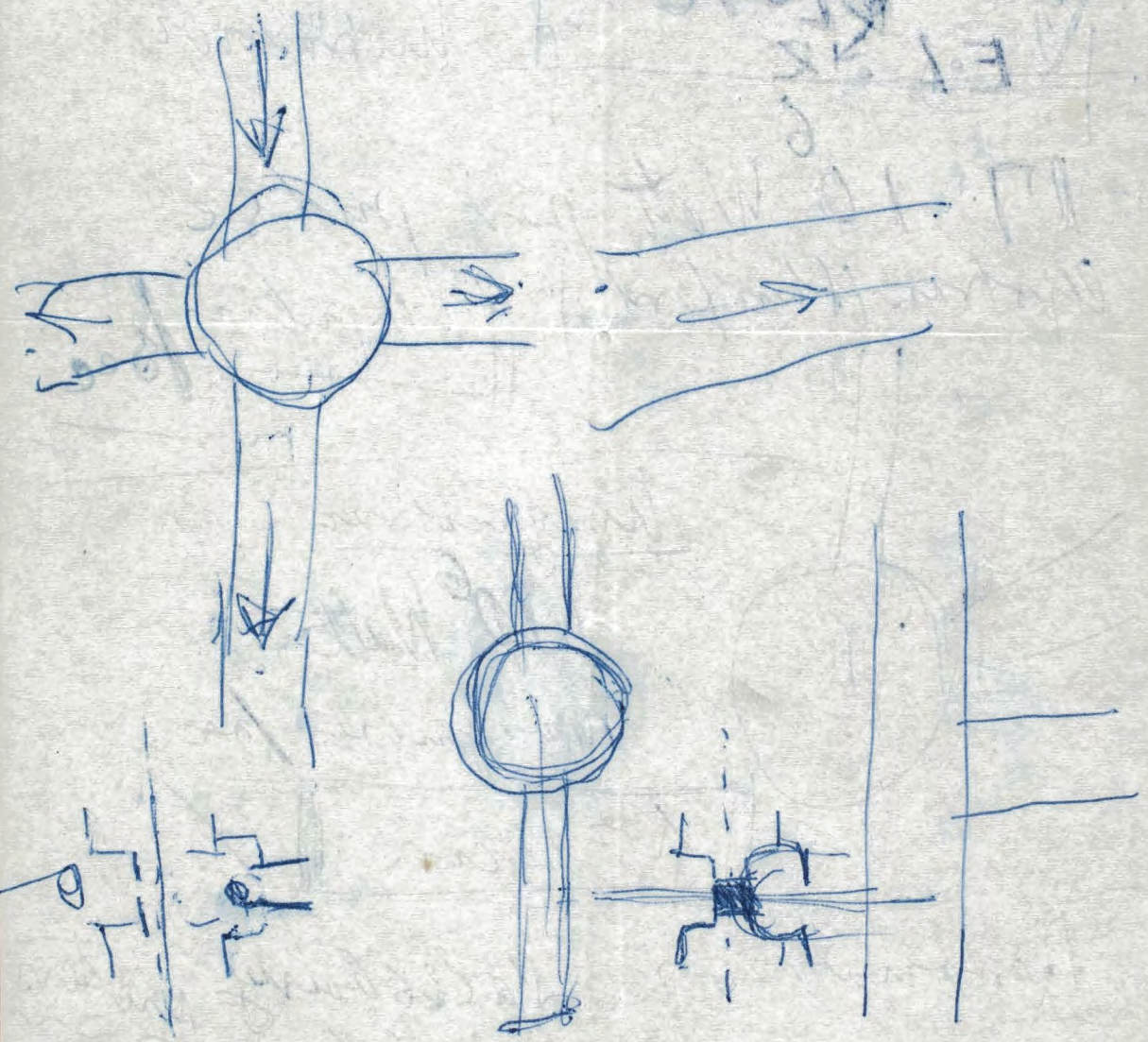
1×10^6 Watt

10 vs pulses/sec

$\lambda = 10$ cm

Resonators Salisbury meters
in Berkeley

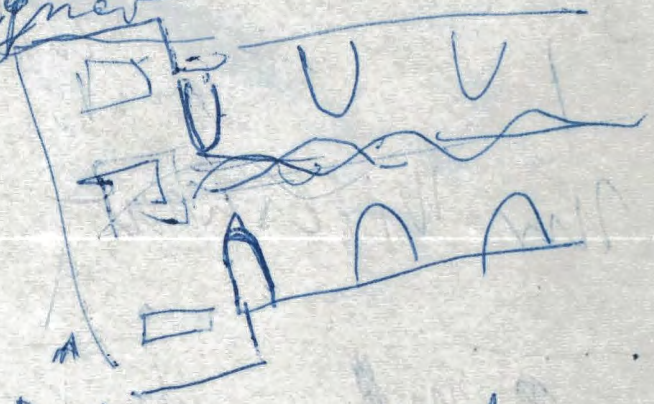
T. R. Mules



Ed T. Jaynes Stanford

instructor

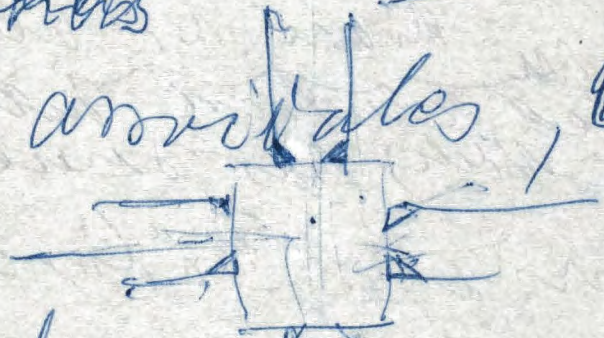
was with Wigner



Varian

~~Brothers~~

Varian associates, San Carlos Cal.



Lipund

Russel (theor.)

[20 min from Stanford.]

English

THE QUADRANGLE CLUB
CHICAGO

25 cm magnetron
10 to 20 megavolts
G.E.C. and Prof Thomson
Vienstein

Mr. Willshaw

215

2 cm diameter beam
Associated Electrical Industries
(metro Vick) has same
Commercial British
Mullard in England
(Philips!) makes 5 to 6
million Volt X ray tube

Miscellaneous

$$\frac{30\,10^6 \times 1000 \times}{300}$$

Volt. of shot

erg/cc

or for 1000 cc

10^8 erg/cc

10 Joule

$2\frac{1}{2}$ C

For Summer

Too long time spontaneous with B/1c
spot/d plate with T5 and T6 no assay
but Bacteriophage once a week. —
One mock exp. with theophyllin 150 mgm/l
After each ~~fall preserve pi~~
collection part 1 cc of juice in
ice box and make slant after
each fall (and before)

For Howard $\bar{\tau} >> 20$ hours

B/5 - 1

3 experiments

For Victorine prepare
B/arg
B/arg/tr. (res to T1)
lebit mutant ~~to~~ arginine leaves

Persons

W. Szybalski Cold Spring Harbor

Reprints of Cold Spring Harbor papers

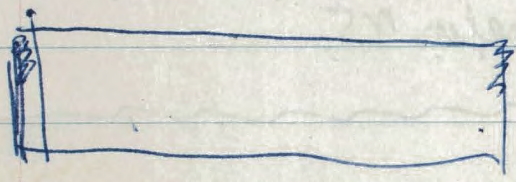
S.G. Stephens, Dept of Agronomy, N.C. State College, Raleigh N.C.

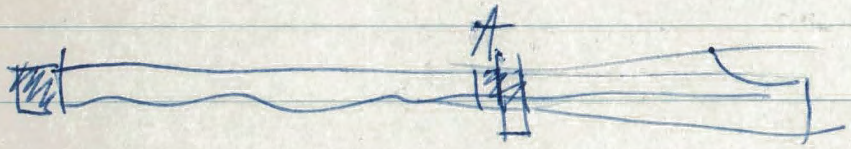
C.S. Pittendrigh Dept of Biology, Princeton University Princeton N.J.

A. Gibbons book
Oklahoma A. & M. College
Dept. of Botany.

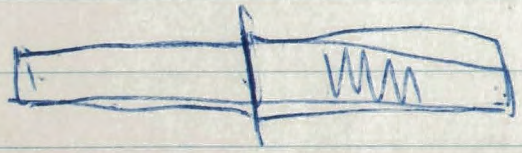
Dr. Leslie R. E. Flory RCA
Princeton N.J.
"Vidicon" pick up tube
"

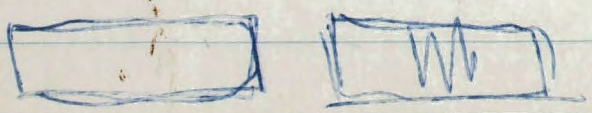
Introductory Microbiology
2 Dimm?





Tube





CoSH Syps
3 31 pm 3:30 Sunday

Tari

~~5-17~~
446
7/2

Urnas Je 8 4027

WA 40752

Quebe : Uranod (Jacques)

La technique de culture continue, theorie et applications.

Annales de l'Institut Pasteur Tome 79 p. 390

Aug 15, 16, 17 Brooklynen

Dasomethane
Formalin
Peracetic Acid