

Notebook 7

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27 February 1952 - 13 November 1952

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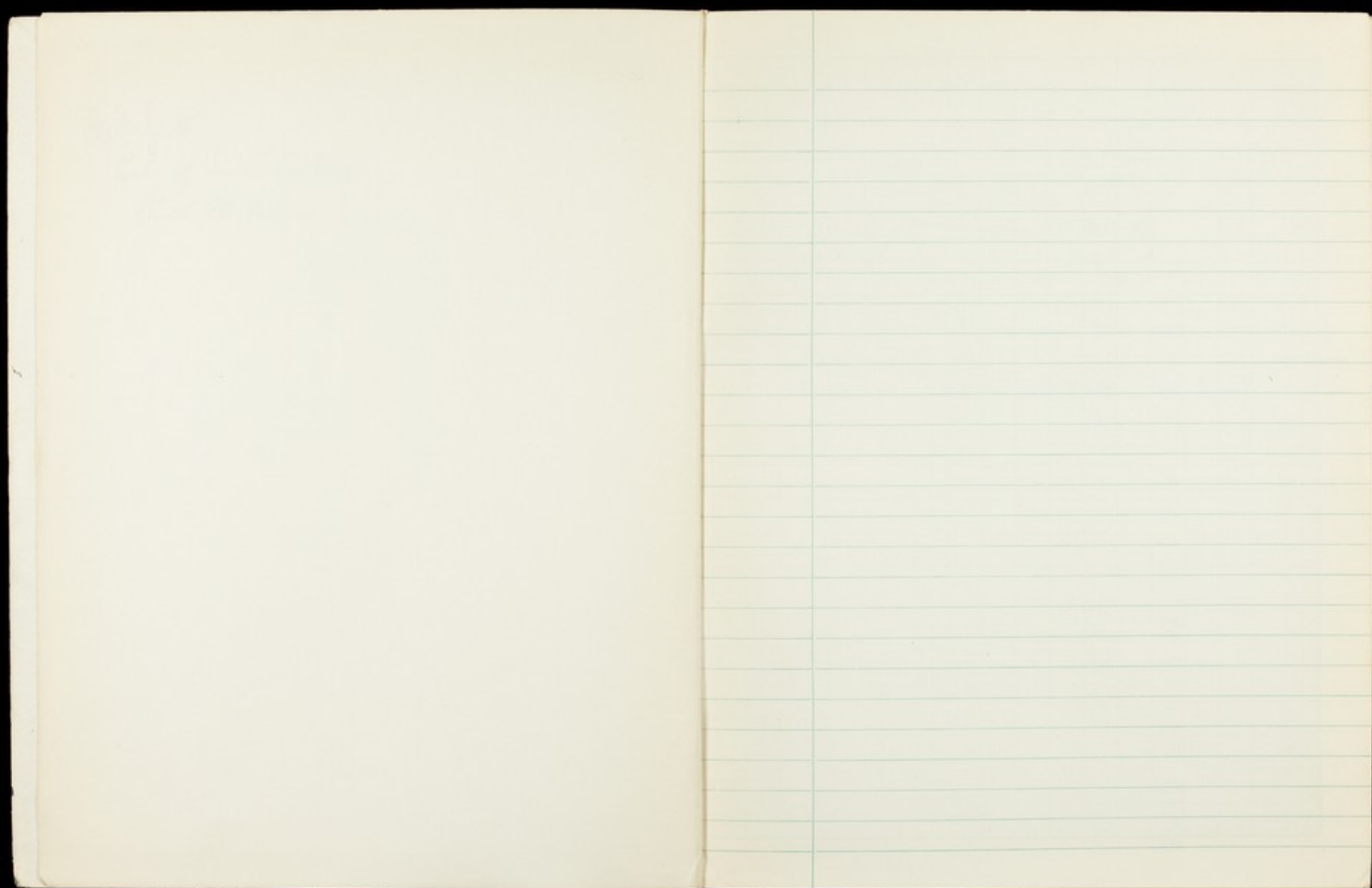
March 1952 — November 1952.

7

PP/GRW/A/6

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Wm m



TZ ⁺ -1	5 min		10		20		40	
	Yields	Ratio	Yields	Ratio	Yields	Ratio	Yields	Ratio
A	2.26	29.8	2.12	29.8	2.41	29.0	3.35	34.3
T	1.74	22.9	2.14	30.1	2.64	31.8	3.57	36.6
G	.24	16.3	1.19	16.7	1.49	17.9	1.79	18.3
B	0.86	11.3	0.85	12.0	0.69	8.3	1.05	10.8
	6.10	80.3	6.30	88.6	7.23	87.0	9.76	91.2
P.Y.	2.21	2.21	2.11	2.07	2.47	2.42	3.11	3.12
Yields	2.20	2.08	2.08	2.97	2.97	3.12	3.12	3.12
corrected	7.59	7.10	8.31	10.70				
R	80.5%	88.8%	87.0%	91.1%				

27-11-52

Phage DNA HCOOH hydrolysis times

4 samples SSC's TZ⁺-1 DNA each 0.5 mg + 0.05 ml
88% HCOOH, cook 173-175° S, 10, 20, 40 min. Drydown,
+ 25 µl N-HCl. In 2x 8.3 spots, 2x 1.95 for P.
Chromatogram ⑤ dropped: Fells spots, exp. on 10 min C.

		G	A	C	T
B	1	.012	.011	.275	.250
	2	[.023]	.013	.010	.009
	$\bar{x}$	.014 (assumed)	.012	.009	.009
S	1	.046	.302	.099	.100
	2	.154	.308	.098	.177
	$\bar{x}$	.150	.306	.099	.174
10	1	.136	.294	.090	.138
	2	.145	.288	.098	.206
	$\bar{x}$	.145	.288	.098	.206
20	1	.131	.276	.089	.170
	2	.179	.323	.083	.244
	$\bar{x}$	.177	.326	.078	.247
40	1	.178	.325	.081	.246
	2	.164	.313	.072	.210
	$\bar{x}$	.172	.319	.076	.228

	T2r-2			T4r-3			T6r-4			T6r+		
	Yrds	Ratio	/100	Yrds	Ratio	/100	Yrds	Ratio	/100	Yrds	Ratio	/100
A	2.65	34.1		2.28	34.0		1.89	35.1		2.58	34.1	
T	2.86	36.8		2.46	36.7		1.97	36.6		2.72	35.9	
G	1.54	19.8		1.22	18.2		0.93	17.3		1.41	18.6	
CX	0.73	9.4		0.74	11.0		0.59	11.0		0.86	11.4	
	7.78	10.1		6.70	99.9		5.38	121.0		7.57	100.0	
P.Y.	2.55	2.56		2.16	2.18		1.84	1.83		2.45	2.44	
	2.56			2.20			1.81			2.43		
Yrds. comp. for base	7.46	8.79		5.35	7.48		5.34	6.28		7.22	8.88	
R	18.5			89.6			85.8			90.4		

5-11-52

Mass test of flagon DNA's.

0.6 mg T2r-2, 5 0.5 mg each T2r-2, T6r-4, & T6r+. ↑ 55% 898
 4000+ 175° 40 min. By, ↑ 25% N-110, take 2x 195 for P, 2x 8.3 apta.
 All about CX & a weak spot about 1/2 way between it and T, call Y, & put out.

		G	A	CX 250	T	Directly against the Y 265
B	1	.014	.012	.009	.036	
	2	.013	.014	.010	.043	280 .011
	$\bar{x}$	.014	.013	.010	.040	270 .007
T2r-2	1	.183	.354	.083	.266	.018
	2	.183	.359	.090	.268	.017
	$\bar{x}$	.183	.357	.087	.267	.018
	$\bar{x}-B$	.169	.344	.077	.227	.018
T4r-3	1	.147	.310	.084	.233	.017
	2	.148	.310	.092	.239	.017
	$\bar{x}$	.148	.310	.088	.236	
	$\bar{x}-B$	.134	.297	.078	.196	.017
T6r-4	1	.118	.257	.069	.196	.020
	2	.114	.258	.075	.198	.019
	$\bar{x}$	.116	.258	.072	.197	
	$\bar{x}-B$	.102	.245	.062	.157	.020
T6r+	1	.169	.345	.100	.252	.021
	2	.168	.350	.100	.259	.017
	$\bar{x}$	.169	.348	.100	.256	
	$\bar{x}-B$	.155	.335	.090	.216	.019

10-iii-52.

Diode Tests (Rhona)

Make up: BSNA 2.5 mg $\uparrow$ 25 ml of. dist + 2 drops N-NaOH.
 NaTN (55c) 1 mg $\uparrow$ 10 ml " + 1 drop "
 ERg 0.6 mg $\uparrow$ 6 ml " "
 T2r-2 1 mg $\uparrow$ 10 ml " "

Diastole over weekend.

From each, take 2 x 1 ml for diastole, 2 x 0.4 for P.

Results:

	Diastole, E/ml	P, Y	1P/ml	Diastole E/Y P
BSNA	240 } 242	3.10 } 3.09	7.73	78.8 31.4
	244 }	3.08 }		
NaTN	227 } 239.5	2.98 } 3.005	7.51	78.8 31.9
	242 }	3.03 }		
ERg	122 } 129.5	1.49 } 1.475	3.69	84.0 22.4
	117 }	1.46 }		
T2r-2	125 } 125	1.52 } 1.49	3.72	84.0 33.6
	125 }	1.46 }		

Repeats: additional
 more ERg to same
 sol'n, + made
 repeat T2r-2
 at mg/4 ml

ERg

NaTN

	Units	Ratio	Units	Ratio
A	2.69	35.7	2.34	29.0
T	2.40	31.8	2.04	25.3 ← low because back to bit!
G	1.30	17.2	1.88	23.3
C	1.15	15.3	1.705	21.2
MC	[0.01]		0.092	1.14
[U]	[0.11]		[0.075]	
	7.54	100.0	8.06	
PV	2.32		2.56	
Units comp to base	2.33 } 2.34 2.37 } +8.03		2.58 } 2.54 2.47 } -8.71	
R	93.9		92.5	

12-iii

HClO₄ : ERg & NaTN

0.5' avg each DNA ↑ 5' jul 70% HClO₄, cool 100' 1 hr. (vented 102° for short time). Add 22 jul 40, ~~the~~ grind residue, take 3x1.95" for P, 2x8.3 for T for.

	G	A	C	T	MC	U
P						
1	.045	.04	.013	.038	.008	.015
2	.016	.015	.013	.037	.009	.014
Σ	.06	.015	.013	.038	.009	.015
ERg						
1	.159	.26	.134	.229	.009	.025
2	.158	.364	.134	.228	.011	.023
Σ	.159	.365	.134	.229	.010	.024
Σ-B	.143	.350	.121	.191	.001	.009
NaTN						
1	.221	.316	.191	.200	.017	.017
2	.224	.321	.193	.200	.019	.016
Σ	.223	.319	.192	.200	.018	.017
Σ-B	.207	.304	.179	.162	.009	.002

15-iii-57

Search for CX in *E. coli* B.

Cobain hypophosphite *E. coli* B 443 mg ↑ 10 ml 1 N-NaOH.

27°C. 2 days.

17-iii

Spin 10,000 10 min → big gummy pellet. ppt. clear yellow.

ppt = H₂O (0.6 ml) + EtOH (10 ml) → goosy white ppt.

Spin down, dry, weigh (=52 mg) into bomb tube, add

1.5 ml 88% HCOOH, cook 175° 25 min, dry → tar, add

0.1 ml N-HCl, affy as bomb on sheet What #3, run

ascending in isoprop. AlCl 48 hrs. Elute band 2. Run

spot in brom-NH₄ → big C spot, faint one in C₂ position

Elute 3.5 ml 1/6 N-HCl & send directly against band.

2815	.0185	
280	.021	.90
278	.0215	
275	.022	.96
270	.0225	.91
265	.022	
260	.022	

19-iii

100 mg *E. coli* whole ↑ 1.5 ml 88% HCOOH, cook 175° 40 min.

Blow up! —

22-iv

80 mg *E. coli* whole ↑ 1.0 ml 88% HCOOH 175° 40 min. OK.

Dry down → mud tar. ↑ N-HCl, spread on big sheet What #3, run
uphill in isoprop. AlCl

17-iii

Effect of NaOH on phage DNA

3.0 mg T6⁺-2 whole phage + 0.2 ml N-NaOH 27°C

48 hrs.

19-iii

Acidify to 0.22 ml HAc → no ppt. Add 0.25 ml 85% H₂SO₄ → good ppt.
Spin down, dry 100°, add 0.05 ml 86% H₂CO₃ work 176° to 10 min.

Blow up!

24-iii

Repeat.

- see phages of 27-iii for analysis.

	T2r-2		T4r-3		T6r-4		T6r+	
	Yields	R ₂ Er	Yields	R ₂ Er	Yields	R ₂ Er	Yields	R ₂ Er
A	3.02	33.8	1.25	34.4	1.59	33.8	2.08	33.7
T	3.22	36.1	1.494	32.9	1.69	36.1	2.18	35.4
G	1.65	18.5	0.673	18.5	0.846	18.0	1.13	18.3
CX	1.04	11.6	0.514	14.1	0.571	12.2	0.771	12.5
	8.93		3.631		4.697		6.161	
P ₁	$\frac{2.44}{2.44} \frac{2.46}{2.46}$ $\frac{2.34}{2.34} \frac{2.36}{2.36}$		$\frac{1.12}{1.09} \frac{1.11}{1.11}$		$\frac{1.62}{1.61} \frac{1.62}{1.62}$		$\frac{2.05}{2.05} \frac{2.06}{2.06}$	
Sample from H ₂ O	9.81		3.81		5.26		7.04	
R	9.09		95.4%		84.6%		87.3%	

2+iii

Phage DNA's

T2r-2 DNA 0.6 mg } weighed carefully (small tube in large).
 T4r-3 0.3
 T6r-4 0.6
 T6r+ 0.6
 Each + 0.05 ml 58% HCOOH 174° 40 min.

Dry, + 25 µl N-H₄OH, take 2x8-3 spots, 2x1.95 for P.

		G	A	CX ₂₀	T	260	265	270
B	1	.013	.011	.010	.040	.012	.018	.01
	2	.017	.011	.010	.038	.014	.018	.012
	$\bar{x}$	.012	.011	.010	.039	.013	.018	.0115
T2r-2	1	.191	.396	.114	.289	.023	.024	.022
	2	.196	.410	.123	.301	.025	.026	.024
	$\bar{x}$	.194	.403	.119	.295	.024	.025	.023
$\bar{x}-B$	1	.182	.392	.109	.256	.011	.0125	.0115
	2	.087	.174	.062	.131	.013	.013	
	$\bar{x}$	.086	.174	.064	.134	.013	.013	
T4r-3	1	.074	.163	.054	.095	.0025		
	2	.103	.216	.068	.169	.020		
	$\bar{x}$	.103	.220	.072	.176	.020		
$\bar{x}-B$	1	.103	.218	.070	.173	.020		
	2	.093	.207	.060	.134	.0085		
	$\bar{x}$	.093	.207	.060	.134	.0085		
T6r-4	1	.135	.279	.089	.206	.0087		
	2	.136	.283	.092	.215	.019		
	$\bar{x}$	.136	.281	.091	.212	.019		
$\bar{x}-B$	1	.124	.270	.081	.173	.0065		
	2							
	$\bar{x}$							

	T2c-2	T2c-1	T4c-2	T6c+
	Count Ratio	Count Ratio	Count Ratio	Count Ratio
A	2.63 2.63 33.1	2.07 2.07 33.2	2.01 2.01 33.3	1.98 1.98 33.0
H	2.87 36.1	2.30 2.30 36.5	2.15 35.6	2.22 37.1
G	1.51 19.0	1.37 21.3	1.20 19.9	1.20 20.0
CX	0.94 11.8	0.57 0.57 9.05	0.68 4.3	0.59 9.8
	7.95 10.0	7.95 10.0	6.04 10.1	5.99 9.9
P, Y	2.58 2.57	2.00 1.98	2.10 2.07	2.05 2.04
R	88.5	6.83	7.17	7.04
	89.9%	92.3%	84.3	85.2

25.00

Phage DNA

T2c-2 (0.5 mg)
T2c-1 (0.5 mg)
T4c-2 (0.5 mg)
T6c+ (0.6 mg)

Each ↑ 50 µl 88% HCOOH 170° 40 min,
dry down, ↑ 25 µl N-HCl. Cook 2x 8.3 µl,
2x 1.95 for P. (This just uses all but 1 µl).

		G ₂₅₀	A ₂₆₀	CX ₂₅₀	T ₂₅₀	Y ₂₆₀
B	1	.016	.015	.010	.089	.012
	2	.016	.015	.012	.029	[.016]
	$\bar{x}$	.016	.015	.011	.034	
T2c-2	1	.181	.349	.108	.264	.024
	2	.183	.365	.112	.289	.025
	$\bar{x}$	.182	.357	.110	.262	
	$\bar{x} - B$	.166	.342	.099	.228	
T2c-1	1	.161	.289	.071	.219	.023
	2	.166	.283	.071	.215	.022
	$\bar{x}$	.164	.287	.071	.217	
	$\bar{x} - B$	.148	.272	.060	.183	
T4c-2	1	.148	.276	.082	.209	.018
	2	.148	.276	.082	.201	.018
	$\bar{x}$	.148	.276	.082	.205	
	$\bar{x} - B$	.132	.261	.071	.171	
T6c+	1	.148	.271	.071	.204	.022
	2	.148	.272	.074	.207	.022
	$\bar{x}$	.148	.272	.073	.211	
	$\bar{x} - B$	.132	.257	.062	.177	

	T4r-3		T4r-2		T6r-4		T6r-NaOH phage	
A	1.94	33.6	2.44	34.1	2.32	34.3	7.99	35.4
T	2.06	35.7	2.45	34.4	2.45	36.2	9.28	41.1
G	1.027	17.8	1.336	18.7	1.127	16.65	2.84	17.4
CX	0.752	13.0	0.925	12.7	0.867	12.8	1.42	6.3
	5.779	100.1	7.131	100.0	6.764	91.95	22.05	
P.Y	1.90	1.92	2.31	2.32	2.32	2.30	8.04	8.06
	1.93		2.31	2.32	2.31		8.08	
Comptoban	6.59		7.96		7.89		27.6	
R	87.8		89.5		85.8		81.6	

27.iii.52

Phage DNA's

T4r-3 0.7 mg
T4r-2 0.6 mg
T6r-4 0.6 mg
T6r- whole phage at NaOH

each 50 µl 88% H₂O₂ 11005M 175° 40 min

		G	A	C ₂₅₀	T	Y ₆₆₅
B	1	.020	.016	.014	.013	.013
	2	.020	.016	.014	.013	.013
	$\bar{x}$	.020	.016	.014	.013	.013
T4r-3	1	.131	.265	.091	.092	.206
	2	.134	.270	.094	.212	.024
	$\bar{x}$	.133	.268	.093	.209	
$\bar{x}-B$		.113	.252	.079	.164	
T4r-2	1	.165	.331	.106	.241	.024
	2	.169	.334	.112	.239	.023
	$\bar{x}$	.167	.333	.109	.240	
$\bar{x}-B$		.147	.317	.095	.195	
T6r-4	1	.143	.319	.104	.238	.030
	2	.144	.315	.105	.242	.031
	$\bar{x}$	.144	.317	.105	.240	
$\bar{x}-B$		.124	.301	.091	.195	
T6r ⁺ NaOH	1	.435	1.07	.164	.163	.771
	2	.433	1.04	.165	.163	.795
	$\bar{x}$	.445	1.055	.163	.163	.783
$\bar{x}-B$		.425	1.039	.149	.149	.738

	T2c-2		T4c-3		T4c-2		T6c+	
A	2.15	33.8	3.295	32.4	3.78	33.3	3.675	33.4
T	2.225	35.0	3.72	37.8	4.27	37.6	4.04	36.8
G	1.19	18.7	1.78	18.1	2.21	19.4	2.055	18.7
CX	0.80	12.6	1.09	10.7	1.86	9.7	1.22	11.1
	6.365	100.0	9.845	100.0	11.37	100.0	10.99	100.0
R	2.11	2.13	3.21	3.24	3.85	3.81	3.57	3.49
	2.16		3.27		3.76		3.46	
Comp. to base	7.31		11.11		13.06		11.96	
R	87.1		88.5		87.2		91.7	

2-11-52

Phage DNA's.

T2c-2 0.6 mg } each ↑ 50 µl 88% HCOOH 175° 40 min
 T4c-3 0.9 mg }
 T4c-2 0.7 mg }
 T6c+ 0.7 mg }

		G	A	CX ₂₀	T	Yeh
D	1	.017	.022	.015	.060	.016
	2	.017	.020	.014	.051	.016
	3	.017	.021	.015	.051	
T2c-2	1	.146	.297		.229	.024
	2	.140	.303	.099	.226	.024
	3	.148	.300		.229	
T4c-3	1	.131	.279	.084	.177	
	2	.212	.440	.125	.340	.040
	3	.214	.442	.124	.348	.036
T4c-2	1	.213	.449	.125	.347	
	2	.196	.428	.110	.296	
	3	.208	.421	.124	.292	.032
T6c+	1	.261	.513	.130	.392	.036
	2	.260	.512	.132	.391	
	3	.243	.491	.117	.340	
T6c+	1	.243	.498	.143	.369	.040
	2	.242	.498	.143	.374	.034
	3	.243	.498	.143	.372	
T6c+	1	.226	.477	.128	.321	
	2					
	3					

Maximin				BS	For
	pH 1	pH 7-8	pH 13	4	2
① desoxythylol acid	279	272	272	A	1
②	279	272	272	20	13
③	279	271	272	Th	4
④	284	274	276		

8-11-52.

CX nucleotide.

1.0 mg BSKA } each $\uparrow$ 0.25 ml of NaOH , add 0.05 ml
1.1 mg T6⁺ DNA } 0.1% DMSO in 0.04 M MgSO_4 . Adjust pH.

12 M.

a few μl 0.1 N NaOH , a keep at 7-8 $\circ$ for several additions NaOH .
After 3 hrs, no further release of acid observed. 3 $\frac{1}{2}$ hrs, adjust to
pH $\approx$ 8.6 $\circ$ NaOH , add 0.1 ml Stepan (1:10,000) as adjust to 8.5-9.0
minutes at 27 $\circ$ 2 hrs. Then take down, adjust to 8.5-9.0 very down.
keep at room temp. 5 hrs, then to fry overnight.

9-11

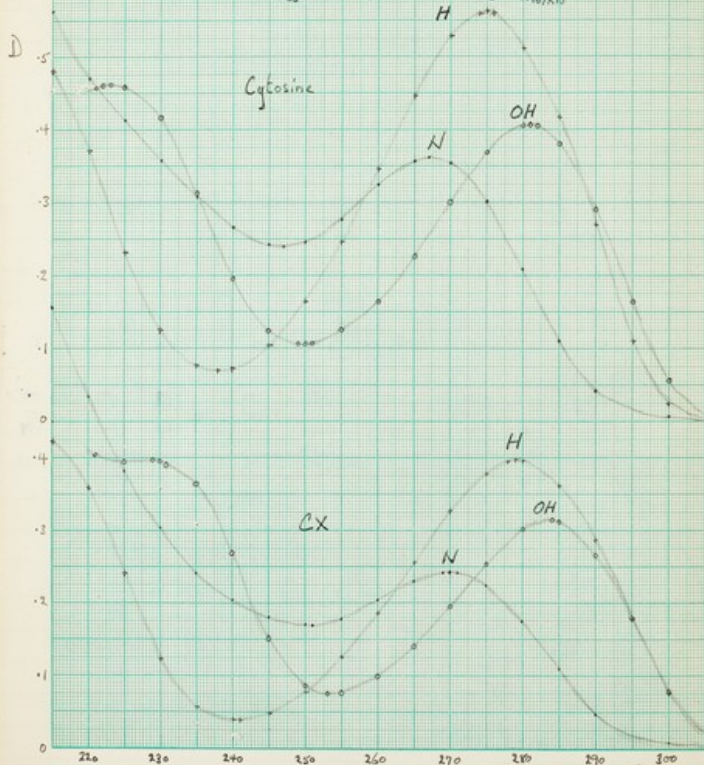
Evap. to dryness, $\uparrow$ 20 μl N-HCl, warm to 80 $\circ$ 2 min. Transfer to
plate, mixing $\approx$ 10 μl H $_2$ O. Run in strip of 75 $\circ$ C. (DCA)
BSKA $\rightarrow$ 4 good spots = G, A, desoxythylol acid, thymidylol acid
T6⁺ $\rightarrow$ good G, A, $\circ$ thymidylol spots, v. weak DCA, 1 black band to origin.

7	1	13	7	1	13	7-2	1	13
261	725							
270	729	.750	.140	.147	.133	.089	.092	.088
271	730	.795	.141	.164	.134	.087	.091	.087
271	713	.4085	.792	.139	.131	.085	.101	.079
278		1.075		.169	.170(270)		.104	.077
280	279	1.08		(280) .167	.118		(279) .1035	
282		1.00						
285		1.01			.092		.099	

7	1	1	13	13
265				
270	.078		.069	.075
273	.081		.073	.0765
275	.0815	.0875	.075	.078
276			.076	.0785
277			(276) .074	
278	.075	.0835	(277) .073	
280		.084	.066(278) .077	
283		.086		
285	.077	.0865	.094	
286		.095		

DH and B of original Nucleoside in original EN E of 3N-mol

C	0.570	$570 \times \frac{1}{1000}$	0109×10	$570 \times \frac{1}{1000}$	0109×10	3520	10.600
CX	0.406	$406 \times \frac{1}{1000}$	0109×10	$406 \times \frac{1}{1000}$	0109×10	2830	8.500



7-iv

CX W Nuclei

CX prop (w. 15-100) avail'd to degree, ↑ 0.1 and 11.0.

Isolation paper: $2 \times 8.3 \mu\text{l}$ for UV
 $1 \times 21.1 \mu\text{l}$ for N
 $1 \times 42.2 \mu\text{l}$ for N } run in isopropanol 91% → some impurity of lower RF.

Identical results to cytosine. Elute over in H₂O, one in 1/10 HEP. H₂O and 33-44.5% acetonitrile in H₂O and 44.5% acetonitrile.

λ	pH 7.0		pH 1.0 (eluted by CX)		pH 1.0 (eluted by CX)		pH 1.0 (eluted by CX)	
	C	CX	C	CX	C	CX	C	CX
310	007	007	003	008	006	008	008	008
300	007	008	024	076	026	078	028	078
295	018	018	110	179	164	179	164	179
290	041	047	270	287	291	266	291	266
285	110	109	447	362	447	362	447	362
280	209	174	572	396	572	396	572	396
275	300	224	216	260	216	260	216	260
270	254	241	224	272	224	272	224	272
265	161	241	224	272	224	272	224	272
260	324	203	224	272	224	272	224	272
255	277	177	224	272	224	272	224	272
250	248	168	224	272	224	272	224	272
245	240	169	224	272	224	272	224	272
240	242	180	224	272	224	272	224	272
235	266	244	224	272	224	272	224	272
230	318	241	224	272	224	272	224	272
225	357	303	224	272	224	272	224	272
220	413	382	224	272	224	272	224	272
215	470	464	224	272	224	272	224	272
210	563	602	224	272	224	272	224	272

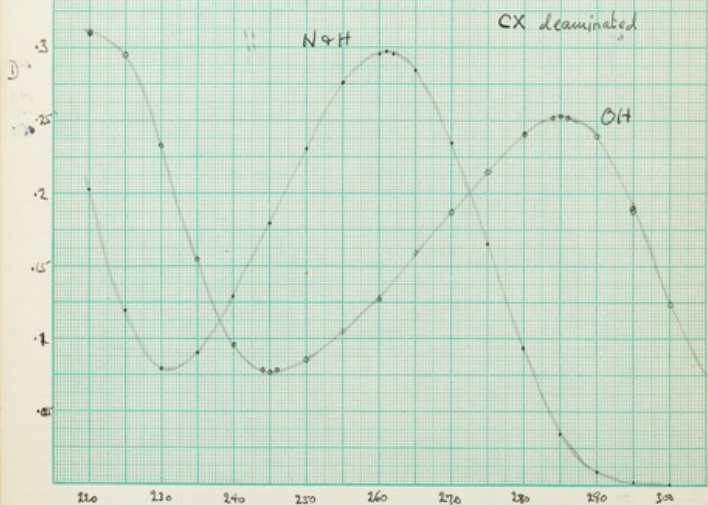
C: $D_{275}^{1\text{M}} = 567, 573 = 570$

CX: $D_{275}^{1\text{M}} = 401, 411 = 406$

Optimum

Optimum

	pH 1	pH 7	pH 13	pH 1	pH 7	pH 13
CX	279	270	284, 289	241	251	253
lysine	275	267	281, 283	238	247	250
CX deaminated	261	261	285	231	231	245
Uracil	289	289	283	230	230	242



9-10

CX deamination

Deaminates of CX pref. (n 20 µl) dist., ↑ 35° at 2 M NH_4NO_3
 + 7 µl glacial HAc , to 27° overnight.

10-11

Transfer whole to paper, drying on spot. Run in formic-NH_3 .

12-11

→ single big spot, = RF slightly greater than CX. Elute in H_2O .

CX deamm

	pH 7	1	13	13	13	13
200	.080	-.002	.124	.124	.124	.124
295	.002	0	.192	.192	.192	.192
298	.009	.006	.239	.239	.239	.239
298	.035	.029	.252	.252	.252	.252
280	.093	.087	.241	.241	.241	.241
274	.166	.147	.216	.216	.216	.216
272	.235	.227	.187	.187	.187	.187
266	.284	.272	.169	.169	.169	.169
265	.296	.287	.172	.172	.172	.172
260	.276	.267	.106	.106	.106	.106
253	.221	.222	.086	.086	.086	.086
246	.179	.169	.077	.077	.077	.077
244	.129	.117	.097	.097	.097	.097
238	.090	.076	.146	.146	.146	.146
232	.077	.067	.232	.232	.232	.232
229	.119	.090	.295	.295	.295	.295
220	.262	.163	.310	.310	.310	.310

30-IV-52

UV shift of CX in alkali.

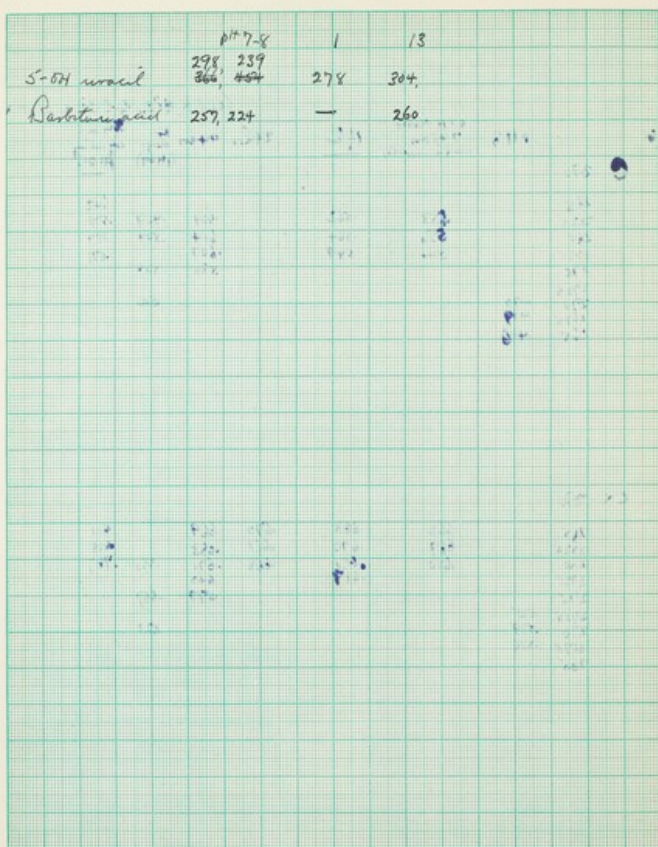
Spots of CX (recryst) & C off neutralized imp. HCl chromatogram
 ↑ 4 ml of dist. along = blank. Add K_2HPO_4 to 0.01 M = pH 8.85

i-v

	pH 8	0.1 N-NaOH 2.45 ml. neutralized	$\frac{1}{2}$ hr	24 hrs	44 hrs	4 days (44 hrs)	95 m. adjusting pH 8.5
290							
265							.642
282.5		.553	.562	.604	.459		.578
280		.556	.564	.614	.504		.587
277.5		.544	.549	.607	.586		.572
278					.529		
272.5							
270		.470					.332
267.5		.419					
265		.428					

CX 290

	.662	.663	.670	.669	.611
265					
282.5	.669	.670	.671	.683	.688
280	.650	.657	.668	.671	.685
277.5		.619		.640	.787
275				.599	.607
271.5	.525				
270	.539				.62
267.5	.536				
265					



6-V-52.

5-OH-nicotinic acid & Barbituric acid

Made up 10 g/l in water (+ 0.04 mol % K_2HPO_4), $\frac{1}{10}$ HCl, $\frac{1}{5}$ NaOH.

5-OH-nicotinic				Barbituric		
pH	1	13	8	1	13	
205	358	307				
200	365	305	.006	.000		
298	366					
295	364	273	287			
290	355	.273	.261	.007	.000	.029
285	334	.451	.227	.008		
280	314	.488	.196	.014	.000	.070
275	291	.485	.171	.061		.176
270	280	.447	.164	.308	.003	.492
265	.286	.382	.160	.788		.960
260	.317	.205	.232	1.51	.031	1.21
255	.362	.231	.309	1.58	.038	1.09
250	.409	.175	.379	1.20	.038	.792
245	.440	.150	.427	.788	.031	.517
240	.454	.170	.447	.450	.024	.362
235	.449	.236	.450	.319	.024	.321
230	.425	.333	.469	.292	.026	.354
225	.396	.435	.459	.279	.117	.356
220	.382	.510	.698	.276	.356	.362
215	.405	.586		.271	.650	
310	.337	.040	.296	210	.237	.776
305	.303		.270			
320	.241		.237			
330	.136		.164			
340	.045		.104			

12-V-62

Isolation of cytosine from DNA - test procedure for CX.

200 mg N8C DNA + 200 mg bovine serum albumen, in two tubes, each 2 ml HCOOH (4 ml total) cook 175° (150 on thermostat) for 30 min. Open, allow to dry in oven. ↑ 2 ml HCOOH. Distribute as bands on 2 sheets What. #3: ~ 1 ml on sheet 1, + 0.6 ml on sheet 2. (≅ 125 mg DNA = 75 mg nucleotides). Run descending in isoprof. 94%.

15-V

~ 40 hrs.

6-CH₃ uracil pH 7.8 1 13

261 261 276

15-V-52.

6-CH₃ uracil

Sample from Column 1.2 mg + 1 ml aq. dest., dil. 1:100 in
 1/10 HCl, 1/10 NaOH, + water + K₂HPO₄ 0.005 M.

	pH 7.8	1	13	13 Titrated	Uracil pH 13
305	.002		.013		
300	.007		.018		
295	.024	.002	.277		
290	.049	.029	.512		
285	.102	.058	.660		1.216
280	.256	.226	.710	.724	282 1.240
275	.529	.526	.796	.731	282 1.219
270	.778	.806	.704	.709	1.181
265	.950	1.02	.618		1.073
260	1.00	1.07	.577		
255	.921	.975	.480		
250	.777	.826	.371		
245	.588	.623	.281		
240	.408	.434	.250		
235	.273	.285	.329		
230	.214	.220	.571		
225	.270	.276	.740		
220	.438	.459	.885		
215	.647	.688			
212	.751	.800			

Coli DNA: $CX = \frac{0.004}{1.24} \times 100 = 0.3$ molar % of C, or $\frac{0.3}{100} \times 7.6 = 0.023\%$ of total DNA.

T6⁺: $C = \frac{0.0085}{10.5} \times 111 \times \frac{100}{45} \times \frac{2.5}{1000} = 0.004\%$ of phage, or 0.01% of phage DNA.

BSNA: $MC = \frac{2.04}{5 \times 743} \times \frac{1.05}{0.98} \times 100 = 5.9$ molar % of C. (Old figure, 6.4)

$CX = \frac{0.0085}{5 \times 743} \times 100 = 0.23$ molar % of C, or 0.014% of DNA

Whole coli: $CX = \frac{0.078}{10.2} \times \frac{100}{33} \times \frac{100}{1000} = 0.23$ molar % of C
 $= \frac{0.078}{10.5} \times \frac{100}{1000} \times \frac{100}{270} = 0.0014 + 22\% = 0.0019\%$ of coli

7-11-52.

Max. values for CX in BSNA + coli, & C in T6⁺.

Readability against blank cell spectrum; standard 0.001 at 275.

	270	C	275	280	275	CX	280	285	MC	285	290	line by CX
Old chromatograms												270 (275) 280
Young whole coli	2.75		.033	.039	.032							

Coli crude DNA (NBT)	1.24		.006	.005								
----------------------	------	--	------	------	--	--	--	--	--	--	--	--

H ₂ O T6 ⁺	.009	.0095	.009									
----------------------------------	------	-------	------	--	--	--	--	--	--	--	--	--

Fresh												
190 mg whole coli	1.05	1.49	.364	.353				.064	.062			
	E	7.45	.230									

Young BSNA	1.5	.743	.010	.0095	.009	.202	.204	.202		.056	.053	.051
------------	-----	------	------	-------	------	------	------	------	--	------	------	------

10-11

Whole coli "CX" fraction combined (80 + 190 mg) concentrated in vacuum 5 mm in vacuo. HCl, along CX marker. Could see nothing in CX fraction, but elute appropriate bands and directly against blank.

CX marker	Coli CX fraction	band above CX	265	.062
270	.142	.071	270	.067
275	.163	.076	275	.064
278	.169	.077	280	.055
280	.169	.077	285	.061
283	.164	.073		

alkali

- similar to fraction not CX.

16-V-52.

Big CX prep.

20.8 g. Diaper Volume "T6 concentrate" $\uparrow$ 1000 ml 0.15 M NaCl. Shake. Add 360 g. water, shake, warming, until dissolved. $\rightarrow$ pH $\approx$ 6. Add 25 ml 0.2 N NaOH $\rightarrow$ pH $\approx$ 8.5. Leave room temp overnight.

17-V-52.

Viscosity has dropped on standing. Serving in tins (28??) until not much gel formed. $\rightarrow$ Is opt. add $\approx$ 1 vol. 280H + $\frac{1}{2}$ vol 600H + H₂O $\rightarrow$ pH 5. Ppt. forms, fine cloudy at first, then aggregating. Spin down $\rightarrow$ white flaky pellet. Yellowish absolute opt = (D). Pellet = (C). Pellet $\uparrow$ 100 ml water + few drops $\frac{1}{2}$ N HCl $\rightarrow$ turbid somewhat viscous sol.

Plots for Desbourn:

Long point Absolute opt Pellet (C) in
100 ml 1:100
(D) 1:10

265	1.10	1.98
260	0.130	1.16
255	1.15	1.98
240	0.71	1.12
235	0.58	0.90
230	0.54	0.90

Total HA in fraction: $1.16 \times 0.04 \times 10 \times 2500$ $2.03 \times 0.04 \times 10 \times 2500$
 $0.12 \times 0.04 \times 10$
 $\times 3000 = 0.91$ $= 1.16$ g. $= 810$ mg

To HA soln (C) in 100 ml add 7 ml N-HCl $\rightarrow$ pH 1.6. Varnish in 50°. Does not dissolve. Leave at 40°. After 8 hrs, mostly dissolved. Transfer to dialysis bag, & dialyze against 0.025 N HCl (pH 1.6) at 37° 12 hrs. Change to 2000 ml eq. dist. (D).

R-V.

Beckman readings				
Sluff	Dispersed H ₂ O	Dispersed water	"Aqueous mud"	Dispersible solids
Dilution	1:10	1:10	1:100	1:100
Total vol.	1000 ml	1800 ml	196 ml	10
27.2			.360	.323
270	1:10	0.164	.271 .589 26.9	.608
260	1:22	0.176	.287 .584	.612
262	1:24			
260	1:24	0.176	.572	.580
255	1:24	0.171		.526
259	1:24			
250	1:24	0.153		.460
245				.428
Total H ₂ O from (sum of 15) vol → $\Delta = 1.0$ at 260				
	$1.2 \times 10 \times 1000 \times 0.002$	$0.176 \times 10 \times 1000 \times 0.002$	$0.579 \times 10 \times 1000 \times 0.002$	$0.618 \times 10 \times 1000 \times 0.002$
	= 190 mg	= 48 mg	= 170 mg	= 9.2 mg
				= 417 mg
Recounts	①	②	③	
280	.371	.332		
278	.374			
275	.369	.363		
270	.334	.373	.479	
265		.384	.580	
260	.232	.377	.530	
260				
260	.154	.316	.427	
240	.115			

19-V-52

Cx prep. cont'd.

Still some undissolved material in dispers. an. Spin off after 19 hrs. @ 1000 rpm + 10 ml $\frac{1}{2}$ N NaOH = ②

APA sol'n ① neutralized $\approx$ 2 ml 0.2 M NaOH, then wrap in water bath to digest $\rightarrow$ brown tar.

20-V

Take 2 ml (11000), transfer to 2 paper tubes, min = 1 min each. Cook 165° N₂ for 20 min, del. $\approx$ H₂O ($\rightarrow$ from ppt) with activated charcoal, warm, filter $\rightarrow$ brown sol'n. Evap. to tar to remove 11000, $\uparrow$ $\approx$ 25 ml H₂O, neutralize $\approx$ solid NaOH $\rightarrow$ white ppt. (Ba₂(PO₄)₃?). Filter.

Filterate still brown, wrap. B.W.D. to $\approx$ 12 ml. Add $\approx$ 2 ml solid picric acid.

21-V

No ppt. Evap. to $\approx$ 2 ml, spread on 2 sheets What #3. Paint H₂O.

26-V

Several bands:

Clute little squares $\uparrow$ $\frac{1}{2}$ H₂O for test

Clute bands.

_____ 1. dark
 _____ 1. along
 _____ 12 and

18-V

Clute of band ① del. 1:3:40 in H₂O

2.75 1.80
 2.79 1.88
 2.83 1.80

_____ 1. outland
 _____ 1. joint
 _____ 1. paper edge

$$\text{Total} = \frac{1.88}{10.5} \times \frac{25}{100} \times \frac{1}{0.75} \times \frac{1}{1} = 2.4 \text{ mg}$$

i	f	R (B.P. pft)	i dialyzed				
			1:50	1	2	3	4 5
240	1:50	1:50	2.61	1.04	.93	.40	.17 .97
250	2:15	0.46	2.45	2.61			
250	1:56	0.92	2.67	.79	.64	.31	.14 .95
260	1:57	0.64	2.54	.62	.50	.26	.11 .94
270	1:18	0.49	2.36	.47	.39	.40	.09 .43
275		0.50					

Points from chromatogram of R.			4 drops remaining water dialyzed	
			"pft fraction" 1:25	"water pft fraction" 1:25
265	.071			
280	.050			
278	.080			
278	.078		270	.091
270	.069	.109	265	.098
265		.124	260	.099
260		.118	255	.092
250			250	.087
			240	.066
			230	.061

$\downarrow$
 6x
 A

Total NA (40 pft 0.60) =
 $0.098 \times 25 \times 0.04 \times 350 = 34 \text{ mg}$

19-V.

Cx prep. cont'd.

Alcoholic ppt (L) from 17-V neutralized (little NaOH), waf. on 18-V to ~500 ml (so much just remains in sol'n). Add ~50 ml sat'd RnOH $\Rightarrow$ milky ppt. Spin down... Pft. try to hydrolyze: black.

21-V

Pft. still milky. Boil, let cool, & spin again $\Rightarrow$ more ppt. Pft. added once i water, try

$\begin{array}{r} 270 \\ 265 \\ 260 \\ 255 \\ 240 \end{array} \begin{array}{r} 1.96 \\ 2.07 \\ 2.17 \\ 2.44 \\ 1.57 \end{array}$
 attempt to hydrolyze: black.

Pft (K) 1:30. Total NA has $\approx 2 \times 0.04 \times 20 \times 500 = 300 \text{ mg}$.

Evap. under vac., & try to distl off wter. Not successful. Solid

residue & water: does not dissolve. Stand several days.

Filter; filtrate = (L). Which residue: had water. Washing = (J)

6-V

(i) gets ppt. on standing couple of days. Dialyze against 5' lvs. of. dist.

Dialyze not yet complete, but want to test. Dist. 1:50

CX prep.

6-VI Long protein filtered off from water-chloroform alcohol mixture. Littered discarded. Protein allowed to dry overnight, then $\uparrow$ 200 ml 0.1 N-NaOH $\rightarrow$ gray turbid suspension. Spin 9000 5 min.

	Before spinning 1:50	After 9000 5 min old turbid	After 10-11 spinning 1:50
270	1.04	0.99	0.97
260	1.11	1.07	1.03
255	1.20	1.16	1.07
250	1.30	1.29	1.14
240	1.62		

21-VI Remnants of material not filtered by alcohol from water, collected & dropped against spinning wheel, then 0.03 M HCl at 5000, then water. Same - now filtered out from Prof. 82.

	Dispersate ①	②	③	Prof. ①	Prof. ②
	HCl	water	water		turbid
	24 hrs	7 hrs	17 hrs		
	3000 rpm	2000 rpm	2500 rpm		
260	.478	.117	.066	.246	.718
270	.610	.050	.044	.291	.791
265	.642	.107			
260	.619	.160	.087	.287	.731
255	.615	.184			
250	.549	.139	.016	.250	.581

Total base .649 x .015 = .009735
 = 29 mg
 = 4.5 mg CX
 = 16 x .05 = .80
 = 6.7 mg
 = 2.35 + .32 = 2.67
 5.5 $\rightarrow$ 2 mg CX

27-VI

H-methyl-cytosine

From Brundel. Dissolved at arbitrary conc. in water, made up in $\frac{1}{10}$ HCl, $\frac{1}{10}$ NaOH, & water + P04, 11.7.

	pH 7.5		13
205		004	008
208			
295		074	052
290	014		134
285		240	218
280	189	420	270
277		441	278
276	239	448	274
275		448	274
270	280	404	244
268	284		
265	277	331	
260	242		149
255		171	
250	154		096
248	154	069	096
247	145		107
245			
240	167	046	153
238		048	
237		048	
235		070	
230	261	086	278
225			
220	307	288	336
215	340	326	352
210	370	351	

	T2r ⁺ -5			T6r-6			T6r ⁺ -2		
A	5.17	33.6	33.3	4.31	33.5	33.2	4.01	33.6	33.3
T	5.48	35.6	35.2	5.00	38.8	38.4	4.10	34.4	34.0
G	2.78	18.1	17.9	1.94	15.1	14.9	2.15	18.0	17.8
60-960	2.13			1.76			1.80		
CX (wt-%)	14.6	12.7	13.7	16.2	12.6	13.5	16.6	13.9	14.9
15.56				13.01			12.06		
15.34	100.0	100.1		12.87	100.0		11.92	100.0	
P	5.00	4.99		4.56	4.56		3.82	3.78	
4.97				4.56			3.81		
Completion	17.1			15.6			12.96		
R	96.0			83.4			93.4		

28-V

Whole flasks in HCOOH to check G: CX ratio.

T2r⁺-5 (not fresh) } 1.5' very much ↑ 0.15' and HCOOH, cook
 T6r-6 (-) } 175° (thinner 179°) 30 min.
 T6r⁺-2 (old)

		G	A	CX ₁₀₀	T
B	1	.029	.024	.019	.059
	2	.037	.025	.017	.045
	$\bar{x}$	.033	.025	.018	.051
T2r ⁺ -5	1	.336	.689	.223	.486
	2	.342	.704	.233	.487
	$\bar{x}$	.339	.697	.224	.487
	$\bar{x}$ -3	.306	.672	.206	.436
T6r-6	1	.236	.560	.180	.432
	2	.236	.609	.196	.466
	$\bar{x}$	.246	.585	.188	.449
	$\bar{x}$ -3	.213	.560	.170	.398
T6r ⁺ -2	1	.266	.542	.191	.378
	2	.274	.580	.193	.376
	$\bar{x}$	.270	.546	.192	.377
	$\bar{x}$ -3	.237	.521	.174	.326

Rachman readings on dihydropyridine:

	①	②	③	④	⑤
<u>Solution</u>	0.025 M HCl	0.025 M HCl	0.025 M HCl	0.025 M HCl	0.025 M HCl
<u>Volume</u>	100 ml	75 ml	75 ml	75 ml	75 ml
<u>Dihydropyridine</u>	5 hrs	18 hrs	22 hrs	5 hrs	10 hrs
D 235	.068	.290	.136	.010	1.452
240	.084	.371	.154	.010	1.456
265	.094	.416	.178	.011	1.493
260	.096	.426	.183	.010	1.184
285	.094	.427	.184	.009	.750
250	.088	.388	.129	.009	.712
<u>Total bases of 4 bases = 10</u>	140 Y	470 Y	180 Y	72 Y	195 Y

28.1

Depurination of whole phage.

10 mg T6+6 + 5 ml ag. soln. pour into dialysis sac, put in 100 ml 0.025 N-HCl (pH 1.6), incubate at 37°; 3 changes HCl for total 45 hrs. Then remove from sac, washing out 5 ml ag. soln. 5 min. Piled: dry. Transfer to hydrolysis tube, add 0.2 ml H₂O, cook 175° (not 180) 30 min. Chromatograms got phenol.

Rachman's data on dihydropyridine purines.

	% P	% DNA	repeat DNA
13-11-52			
Prof ① "T6 concentrate"	1.92	19.1	19.2
Prof ② "T6"	2.05	17.0	17.0

Analyses			Analyses (APM)			Total N (g)	Total N (g)
①	②	③	①	②	③		
0.025 N HCl 2.000 ml 7 hrs. 1:5	HCl 2.000 ml 16 hrs. 1:5	water 2.500 ml 4 hrs. 1:5	first 24 hr 2.000 ml 1:25 2.125	additional reagent from 2nd day 2.500 ml 1:25 2.125	2.500 ml 1:1 2.500		
27.5	0.069	.37	1.08	0.52	.46	1.07	1.02
27.0		.48	1.23	0.60	.60	1.21	1.06
26.5	0.100	.55	1.27	0.62	.69	1.23	1.05
26.0	.102	.56	1.21	0.60	.89	1.16	0.98
25.5	.103	.56	1.11	0.58	.90	1.04	.90
25.0	.092	.51	1.01	0.52	.63	.97	.71
Total N (g) from if 2.5% formalin			0.145 x 2.000 x 2.5 = 0.725	0.145 x 2.500 x 2.5 = 0.906	0.145 x 2.500 x 2.5 = 0.906	1.27 x 2.5 x 3.30 x 2.5 = 1.015	1.27 x 2.5 x 3.30 x 2.5 = 1.015
= 15.5 mg			= 8.4 mg			= 27.9 mg	
Approximate: 15.5 x 3.4 x 2.8 x 2.1 = 15.9			= 22.5				

10-VI

Second Ox. prep.

Reagent Rohm's Meand. batch: 7.0 g T 300 ml 0.15 M NaOH
0.01 M. Na nitrate. Add 10% g. urea. Dissolve, leave at room
temp. 2 hrs.; Working blend, 100 mg. Forget to adjust pH
(=6): add ~ 1 ml HCl to pH ~ 8.5. 3 x (incomplete: still
→ gel). Re-emulsify gel ~ 100 ml 36% urea, spin, to further reagent.

Aqueous phase: dialyze overnight to running water.

Dialyze against 0.025 N-HCl at 35°, as on off page.

Cryst. under vac. (b.p. ~ 30°) to total vol. 2.00 ml, dialyze overnight
against water.

11-VI

12-VI

13-VI

14-VI

Cryst. under vac. to dryness. Dissolve in 2.0 ml 80% HClO₄, and under vac.
to ~ 3 ml, add ~ 3 ml. Pipette into 4 tubes, seal, heat 16.5° 15 min.
open on 8 sheets What #3, run in 10% H-NH₃ (bottom NH₃ first),
4 min in 10% HCl. Also filter paper = 10 g in 10% HCl.
Filter paper: not well washed, but clear after in 4 ml.

A		T	
283	0.321	283	0.321
279	0.713	279	0.713
275	0.902	275	0.902

$$\text{Total Ox} = \frac{0.93}{1.04} \times \frac{4}{1000} \times 125 \times \frac{6.00}{10} = 27 \text{ mg}$$

17-VI

Cryst. from 10% HClO₄ paper, run 4 days.

A		B		C	
283	0.321	283	0.321	283	0.321
279	0.713	279	0.713	279	0.713
275	0.902	275	0.902	275	0.902

Cryst. concentrated in vac., offed
to 2 sheets What #3, run in 10% H-NH₃

ffl. & washings

	① ffl.	② washings	③ ffl. + wash
	2.2 x 4.4 x 1.1	2.2 x 4.4 x 1.1	2.2 x 4.4 x 1.1
283	.253	.001	.009
278	.262	.003	.009
275	.262	.003	.009
262	.181	.001	.001
240	.098	.012	.013

$$\text{Total } C_x = \frac{.262 \times 125 \times 4 \times 3}{10.5 \times .002 \times 1000} = 12.5$$

19-VI.

BuOH-NH₂ paper bands 1/4" eluted.

First 1/4" eluted (4 strips) Second 1/4" eluted

283	1.55	1.140
279	1.63	0.194
275	1.60	0.214

$$\text{Total } C_x = \frac{1.6 \times 125 \times 4 \times 14}{10.5 \times .002 \times 1000} = 10.7 \text{ avg.}$$

25-VI

BuOH eluate crop in vac. to dryness, and ffl. eluate, dry again, dry overnight in desiccator. Residue in ~ 0.2 ml H₂O. Very acid. Reconstitute: 0.2 N-H₂SO₄ (takes ~ 1 ml) → brown fluorescent ffl. Spin down, wash ffl, spin down

10-VII

After several re-ffl. runs, solid material still slowly brownish.

"C_x" + 0.75 ml 1:500 ffl. 0.9 ml 1:500

280	0.97	1.06
278	0.97	1.06
275	0.93	1.02
240	0.104	1.43

Total C_x

$$\frac{0.97 \times 125 \times 0.75 \times 800}{10.5 \times .002 \times 1000} = 6.9 \text{ avg.}$$

$$\frac{1.06 \times 125 \times 0.9 \times 800}{10.5 \times .002 \times 1000} = 9.1 \text{ avg.}$$

Total = 16 avg.

Chromatography on T6+ DNA

5.9 mg DNA, dried overnight in vacuo over silica gel $\uparrow$ 25 ml water = 236 μ l

Substance	Sample size	X found	Y found	% of weight
DNA (Dried, SSNA treated)	0.5	90.8, 88.6, 81.9, 79.4	179, 161.6	73.9, 68.5
P	0.2	3.09, 3.14	1.36	6.61
N	2.0	54.4, 54.2	27.2	11.5

$$N/P = 1.74$$

Diagnosis:

	① HCl 900 ml 20° 15 hr	② HCl 1000 ml 20° 16 hr	③ water 1300 ml 20° 16 hr	④ water 500 ml 20° 14 hr	⑤ water 500 ml 14° 15 hr	⑥ water 500 ml 14° 15 hr
280	1.14	1.14	1.14	1.1	1.1	2.6
270	1.925					3. ?
260	1.07					2.96
250	1.10	2.82	1.64	0.98	2.82	2.74
240	1.11	3.05	1.85	0.92	2.44	2.41
230	1.01	2.76				
(optimum)						3.0 x 0.015 x 500 = 22.5

16-11-52.

Third prep.

4.5 g. Sample & solvent prep. ② $\uparrow$ 250 ml 0.15 M Na-EC 0.01 M Na acetate. Add 90 g. water, dissolve, add $\sim$ 4 ml 0.2 N-NH₄OH $\rightarrow$ pH 8.5. Centrifuge, leave 3 hr., centrifuge in large rotor. (8:11:18), spin. Leaving 4x $\rightarrow$ v. little gel. Add $\sim$ 150 ml 3% urea & leave 3x. First aqueous phase becomes extract for gel.

265	0.815	1.140	1.140
260	0.74	1.155	1.155
255	0.92	1.149	1.149

Add for drops HCl $\rightarrow$ pH 4.5. Pour both extracts into 1000 ml 95% EtOH. Leave overnight at 4° C. Spin down ppt.

Acetol. urea ppt

265	1.1
260	1.01
255	1.04
250	1.04
240	1.05
235	1.04

Total NA = $0.70 \times 0.04 \times 1200 = 34$ mg. Recover by concentrating in vacuo & drying away the urea.

DNA ppt. urea ppt. = 70% EtOH, once extract 95% & absolute. Dry overnight over silica gel in vacuo. Weight: 665 mg.

19-VI.

500 mg T6+ DNA $\uparrow$ 50 ml water $\rightarrow$ slightly opalescent solution. Dialyze in mechanical stirring against 1000 ml 0.03 M HCl at 88.9° F (32° C). 4 pm.

28-VI

10 am change HCl. 4:30 pm. change to water & to room temp.

26-VI

After all dialyses, conc. dialysate in vac. to 5 ml. freeze dry.

3-VI

Dry wt = 235 mg.

220 mg $\uparrow$ 1.5 ml 8% HCOOH, heat 165° 20 min. Spread on one sheet What #3, run in isoprop. HCl $\rightarrow$ Pos. G (weak), G (weak) (A (weak, strong), Cx (strong), - T (strong). Elute Pos-G & Cx.

Load dialysis water (s) also consid. hydrolyzed, & run. Similar hydrolyzed bands (one)

Ques T6 r⁺ DNA

$P = \frac{6.59}{6.62 + 6.56} \cdot 6.59 = 22.6$ (rounded to base)
 $R = 93.5\%$

CX ref (cont'd)

~~X prof (cont'd)~~ from writing HCL paper.
CX situation: 200 Hcl

280	.452
278	.460
275	.451

$$\text{Total } C_x = 0.46 \times 125 \times \frac{10}{100} \times 200 = 11.5 \text{ mg}$$

Concentrations apply to paper for Panso. Concentration is also collected specimens

Glute both Ed bands combine

Sim9ul la clasa 1:200 2nd anul clasa 1:100

260	.300				.720
279	.506				.
278	.508				.139
275	.494				.140

$$x = \frac{0.94 \times 200 \times 12.6}{2} = 12.6 \text{ mm}$$
$$\frac{105}{3.5} \times \frac{14}{125} (2.2) = 32$$

10-VII Combine all Cu from 2nd & 3rd bps. should be 27 mg in 0.2 ml. Spin off some in test. Add 60 mg ferric acid dissolved in 0.1 ml hot water $\rightarrow$ for 1st run.

[illegible]

14-8. A few big atoms in flask!! Concentrate to ~ 0.5 ml, stand 3 hrs in frig. after
atoms ~ 0.4 ml H_2O : warning (not a slightly turbid). Leave in frig overnight.

18-1

Demonstration chromatogram

- ① BSA 1.0 mg $\uparrow$ 10 μ l 70% HCl 100° 1 hr. Add 15 μ l H₂O.
② T6+ DNA (over) 1.0 mg " " " "
③ T6+ DNA (over) 1.0 mg $\uparrow$ 50 μ l 88% HCOOH 170° 1 min. Dry $\uparrow$ 2 μ l H₂O.

20-51.

Good after. ② $\rightarrow$ no ex, but free-G

(3) $\rightarrow C_X$, some $\text{pr-}G \triangleright Y (\text{pr-}U)$

Customs rate ③

	G	A	CX ₂₅₈	T	Pro-Ga Basis gemittelt
R	1	0.020	0.018	0.015	0.021
	2	0.021	0.021	0.016	0.048
	Σ	0.021	0.020	0.015	0.050
T6r + DNA	1	0.430	0.935	294	0.660
(Beload) 2	351	768	238	540	
2	429	939	291	660	
Σ	430	937	293	660	
$\Sigma - B$	409	917	278	610	

15. $\frac{1}{2}$

After down flt. ^(in vac., overnight) by $\frac{1}{2}$ transfer to small tube, dry overnight. Near white state = 2.5 mg
Residue in big tube + 0.25 ml $\frac{1}{2}$ HCl. 2 x 0.08 ml for H_2O stable. (-1% flt. ^{lost} ~~residue~~)

2x 0.0165 and 4.8 up for D

2 x 0.016 and 1 for chromatogram

N/3/nd. cells

	280
	279
	278
$\frac{D_{279}}{D_{241}} = 8.4$	
	262
	242
	241
	240
	239

$$D_{279} \text{ of org soln} = 0.899 \times \frac{4.0}{1.241} = 2.165$$
$$N/\text{vol of org soln} = 0.875 \times 1.03 \times 10^{-2} \times 0.0166 \text{ mg}$$
$$E = 216.5 \times 14.01 = 3,037.0$$
$$\Sigma \text{ of } 3 \text{ N for med} = 60,100$$

(over)

4-VII-52

Purification through picric acid: Test α -xytose.

20 mg xytose + 2 ml warm water. Add 2 ml sat'd picric acid $\rightarrow$ big ppt. Leave overnight in frig.

7-VII

Spin down, leave off ppt. Add 5 ml of sat'd + 0.1 ml 9N-H₂SO₄. Boil on warming. Extract picric acid $\pm$ 4 3-ml portions toluene, then 2 3-ml portions ether. Neutralize $\pm$ Ba(OH)₂.

8-VII

Comp. aqueous soln to a spin down BaSO₄. Evap. ppt. to $\sim$ 2 ml. Is yellow (got some picric acid from rubber stopper). Add 0.2 ml 0.4N H₂SO₄, re-extract $\pm$ toluene & ether, re-neutralize, re-spin. Evap to $\sim$ 0.5 ml, stand in frig.

Cx prep. cont'd.

16-VII

21.5 mg 2x distilled H₂O + 0.5 ml H₂O, warm to dissolve. pH $\sim$ 6.5.

Add $\sim$ 5 μ l sat'd sol'd Ba(OH)₂ ($\approx$ 0.3 mg Ba(OH)₂) $\rightarrow$ pH $\sim$ 7.5.

Boil for 30 min. Spin, keeping hot ($\sim$ 80°), pipette off from small hot residue & let ppt. leave in frig overnight.

17-VII

Spin, leave off liquor, dry H₂O. = 15.4 mg. 3x distilled.

22-VII

Recovery of cold fraction.

Old fraction flange DNA hydrolyzed, run in strip. -HCl, then Ba(OH)₂·NH₃ on washed paper. Elute $\uparrow$ 13 ml.

Time	253	254	255	256	257	258	259	260	261	262
1:50	279	284	289	294	299	304	309	314	319	324
in eq. dist.	275	280	285	290	295	300	305	310	315	320
	271	276	281	286	291	296	301	306	311	316
	270	275	280	285	290	295	300	305	310	315
	265	270	275	280	285	290	295	300	305	310

Total C₂ = $\frac{49}{100} \times \frac{13}{100} \times 50 = 32.5$ mg.

E_N :

$$N = \frac{0.0468 \times 4}{0.8} \times 100 = 23.4$$

pH 1. $\frac{D \text{ of orig soln}}{241} = \frac{0.629 \times 5.3}{0.5} = 1611$

N found = 0.0468 mg/ml $E_N = 11.11 \times \frac{14.01}{0.0468} = 3,330$

3 N found, $E = 9,990$

$E_{241} = \frac{0.77}{0.629} \times 10,000 = 1220$

$E_{251} = 4160$

pH 7.4 $E_{249} = \frac{0.372}{0.629} \times 10,000 = 5,920$

pH 13 $E_{252} = \frac{0.487}{0.629} \times 10,000 = 7,750$

$E_{254} = 1940$

Mac

Min

	mp	E	mp	E
pH 7.4	269.5	5,920	251	4160
pH 1	279.5	9,990	241	1220
pH 13	283.5	7,750	254	1940

17-11-52.

Cx UV Kties.

3x stallid Cx 0.8 mg ↑ 4 ml of sol. dist.
2x 1.0 ml for N; for UV, 0.3 ml for N; 5.3 ml, by adding 5's and solvent.

pH 1, % H ₂ O	pH 7.4, 0.01 M	pH 13,
①	Pos. buffer	0.1 N-NaOH
310 0.12 006	001 0.02	318 004 0.06
305 0.12 024	003 0.02	310 0.10 0.16
300 1.85 120	005 0.05	027 0.56
		122 1.90
295 4.37 284	019 0.29	278 4.33
290 6.93 430	062 0.97	445 6.46
285 8.35 575	159 2.44	463 7.62
280 9.66 628	264 4.05	478 7.77
275 9.65 620		489 7.99
270 9.45 627		499 8.02
265 9.30 609		
260 8.02 521	271 3.70 6.66	
255 6.79 415	270 3.72 5.71	306 4.76
	269 3.72 5.71	
	268 3.72 5.71	219 3.41
260 4.66 303	264 3.46	
255 3.17 206	274 4.21	157 2.05
250 2.66 134	281 4.52 4.02	124 1.93
245 1.37 089	262 4.02	132 1.90
242 1.20 078		141 2.30
241 1.18 077		
240 1.12 079		
235 1.74 113	280 4.30	247 3.85
230 3.49 227	322 4.94	432 6.74
225 6.51 423	376 5.77	530 9.04
220 9.66 627	468 7.18	531 9.66
215 11.55 781	566 9.00	532 9.68
	730 11.20	533 9.68
	895 13.72	534 9.68

$D_{279} = 8.2$
 D_{241}

18.11.52

Melting points.

5-methyl-cytosine (Boherty)

Darkens 270-280.

Melts (brown) 289° (Mixture of 2 components
(2° different, narrow).)
(Reverse: melts 270°.)

Barbitone acid (N.B.C.)

Effervesces at 250. Does not liquify by 265. (Should be 261 d.)

L-Aspartic acid - nothing up to 293

Cx - Red into black at 240. Yellows immediately; turns fuming
orange - then solid brown up to 280. Does not melt by 320.

		A_{260}				C_{275}				C_{279}			
		Blank	Sppt	Δ	$\Delta\bar{x}$	B	S	Δ	$\Delta\bar{x}$	B	S	Δ	$\Delta\bar{x}$
a	1	37	661	624						23	293	270	
	2												
b	1	50	1093	1043		0.35	672	637		31	349	358	
	2	59	1092	1033	1038	0.39	674	635	636	37	349	352	356
c	1	48	1060	1012		0.32	660	628		30	358	328	
	2	52	1077	1025	1019	0.33	664	631	630	31	362	331	330
d	1	41	1102	1061		0.29	670	641		29	350	321	
	2	46	1091	1026	1044	0.30	683	653	647	31	356	325	323
e	1	42	1055	1019		0.30	646	616		25	224	209	
	2	42	1055	1013	1013	0.25	636	606	611	22	226	204	207
		D for 1.95 μ l		Yards corr. to blank (5.345)		A		C		Cx (R=0.000)		%	
		Yards	corr.	Yards	corr.	Yards	corr.	Yards	corr.	Yards	corr.	Yards	corr.
a		5.33	5.39	18.48	18.80	0.260		2.70	0.146				
b		7.24	9.24	31.65	7.98	2.52	6.06	0.91	3.56	1.12	77		
c		9.08	9.11	31.22	7.84	2.51	6.00	1.92	3.30	1.06	73		
d		9.52	9.51	32.60	8.04	2.47	6.16	1.89	3.23	0.99	68		
e		9.16	9.12	31.27	7.79	2.49	5.82	1.86	2.07	0.66	45		

23-VII-57.

Destruction of Cx in hydrolysis.

0.6 mg crystalline Cx } $\uparrow$ 0.8 ml 88% HCOOH.
10.2 mg BSA

Into each of 5 tubes, 0.15 ml

Lead as follows:

- a. 100° 2 min. Control
- b. 165° 30 min
- c. 170° 30 min
- d. 175° 30 min
- e. + 2.0 mg serum albumin. 175° 30 min.

Expt. to depress partial vac, avoiding heat. Control (a) lost, so run last 205 ml of mixture, $\uparrow$ 15 ml. After, $\uparrow$ 30 ml N-HCl. 2 x 5.345 μ l, 2 x 1.95 μ l P. Chromatograms: paper 17" square. Spot 3" from edge. Run first in 100% HCOOH, dry, run in 100% H-NH₂. Print: good separation. Cut out & plate A, C, & Cx, along: blank for each from each paper.



a
b
c
d
e

31-VIII-52

Repeat determination of OC in hydrolysis.

0.4 mg stable ^{14}C } $\uparrow$ 0.5 ml 88% HCOOH.
6.0 mg BSNA

0.15 ml pattern sealed in tubes elevated: (a) 100° 2 min.

(b) 175° 30 min.

(c) + 1.8 mg bromine succinimide 175° 30 min.

Wipe down, avoiding head, $\uparrow$ 30 μl H₂O, take 2 x 800 cts, 2 x 195 for P.
Run 2 dominantly as before. 24 hrs in P-114, 20 hrs in P-114-NH₃.

		A 460				C 275				OC 279			
		B	S	Δ	ΔZ	B	S	Δ	ΔZ	B	S	Δ	ΔZ
a	1	47	1020	971	984					[51]	529	494	501
	2	42	1040	998						35	542	507	
b	1	46	1030	984	993	21	611	580	593	34	420	386	392
	2	47	1050	1001		24	640	606		31	429	398	
c	1	56	1070	1016	1024	34	647	615	619	33	350	217	318
	2	89	1120	1031		36	657	623		36	354	318	

		A		C		OC (8.9630)		g ₀
	P for 95% $\times$ 3.43	Y undist ¹	undist ² P	Y undist ¹	undist ² P	Y undist ¹	undist ² P	
a	861 869	8.65	29.65	7.57	0.256	5.20	0.175	[1.00]
b	884 886	8.85	30.35	7.64	0.252	5.65	0.186	76.6
c	896 887	8.91	30.60	7.87	0.258	5.90	0.193	61

Kjeldahl on sol'n 3.074 mg/0.01 ml

$$1 \text{ ml} \rightarrow 0.0916, 0.0910 \text{ mg N} = 0.0913 \text{ mg}$$

$$\% \text{ N} = \frac{0.0913 \times 100}{0.3674} = 24.7\%$$

$$\text{Calc. for } \frac{1}{2} \text{ H}_2\text{O} = 28.0$$

$$\text{Calc. for anhydrous} = 29.8$$

$$E \text{ based on N} = \frac{0.845}{0.0913} \times \frac{14.01 \times 5 \times 25}{1.004} = 9690$$

$$\text{Correcting for } 99.5\% \text{ recovery, } 9640$$

12-III-52

Extinction coefficients of synthetic OC

3.074 mg synth. OC, dried in vac over silica gel, weighed i
micro. balance onto small cup. Add 10 ml up. dest. dissolve
Dilute 1.0 ml portion to 25 ml. $M \text{ for } \frac{1}{2} \text{ H}_2\text{O} = 150.3$

% HCl	0.01 M Pz buffer	% NaOH
281 .840	271 .495	285 .658
280 .845	270 .497	284 .661
279 .844	269 .497	283 .661
278 .840	268 .494	282 .658
243 .109		255 .168
242 .107	232 .353	254 .166
241 .107	251 .354	253 .166
240 .109	250 .353	

	Blank	E	Blank	E
pH 1	279.5	$\frac{0.845}{0.0913} \times \frac{14.01 \times 5 \times 25}{1.004} = 9690$	241.5	1360 1230
pH 7+	269.5	6060 5710	251	4310 4060
pH 13	283.5	8050 7290	254	2010 1890

Fresh sol'n, 1.280 mg $\uparrow$ 100 ml $\frac{1}{2}$ HCl

280 .879	$E = \frac{0.880 \times \frac{14.01 \times 5 \times 25}{1.280}}{1.004} = 10,330$	9720
279 .880		
242 .107	$E = 1260$	$\frac{C_{max}}{C_{min}} = 8.21$
241 .107		

TNA		T6r+DNA			T6r+APA		
Yields	Ratio	Yields	Ratio	Yields	Ratio	Yields	Ratio
A	3.89	28.2	3.88	32.3	31.6	0.91	5.7
T	3.85	27.9	4.08	33.9	33.2	5.14	32.4
G	3.08	22.8	2.06	17.1	16.8	0.89	3.7
C	2.82	20.5	2.00	16.6	16.3	2.67	16.8
MC	0.143	1.06					
	13.78	12.02	999	979			
P	4.24	4.24	3.68	3.68	4.67	4.63	
Comp. 8.6%	14.55	12.28			15.89		
R	94.6%	97.9%					

18-11-12.

Misc. Analyses

Phoria's new Thymine DNA, 0.8 mg } each 10.15 and 88% HCOOH, each
 from T6r+ DNA 0.8 mg }
 from T6r+ APA 0.7 mg } 175° 30 min. By down, ↑
 25 μl HCl, take 2 x 8.3 spots, 2 x 1.95 for P.
 Elute in 4 ml HCl.

	G	A	T	C	MC	T	MC
B	1	.017	.017	.017	.016	.060	.018
	2	.019	.018	.019	.016	.070	.018
	Σ	.018	.018	.018	.016	.065	.018
TNA	1	.386	.524	.312	.302	.360	.021
	2	.385	.524	.312	.300	.382	.022
	Σ	.386	.524	.314	.300	.371	.022
Σ-B		.338	.506	.296		.306	.014
T6r+DNA	1	.246	.521	.202	.209	.378	
	2	.243	.525	.204	.209	.400	
	Σ	.245	.523	.203	.209	.389	
Σ-B		.227	.505	.193		.324	
T6r+APA	1	.085	.129	.274		.459	
	2	.081	.132	.273		.486	
	Σ	.083	.136	.274		.473	
Σ-B		.065	.118	.258		.408	

	T2NA(a)		T2NA(b)		T2r-5 phage		T6r-6 phage	
	Yards	Ratio	Yards	Ratio	Yards	Ratio	Yards	Ratio
A	2.52	33.4	1.975	33.0	5.24	32.9	3.07	32.8
T	2.59	34.3	1.95	32.5	5.62	35.3	3.535	37.9
G	1.345	17.8	1.10	18.4	2.755	17.3	1.40	14.9
OC	1.10	14.6	0.974	16.2	2.31	14.5	1.36	14.5
	7.585	100.1	5.999	100.1	15.925	100.0	9.38	100.1
P.Y	2.447/2.46		1.78/1.75		4.52/4.54		3.05/3.02	
	2.48		1.72		4.56		3.00	
Corrected	8.44		6.00		15.60		10.40	
R =	89.6%		100%		102%		90.1%	

19-VIII

Phage r. checks

- (a) T2r-2 DNA 0.6 mg ↑ 0.35' and 11.000+
 (b) " " 0.6 mg ↑ 0.15' and 11.000+
 T2r-5 phage 1.5' mg ↑ 0.15' and 11.000+
 T6r-6 phage 1.5' mg ↑ 0.15' and 11.000+
 } 17.5° 30 min.

		G	A	OC ₂₁₉	T
B	1	.017	.014	.012	.017
	2	.017	.016	.014	.019
	$\bar{x}$	.017	.015	.013	.018
T2NA(a)	1	.164	.342	.118	.250
	2	.166	.344	.120	.258
	$\bar{x}$	.165	.343	.119	.254
	$\bar{x}-3$	.148	.328	.106	.206
T2NA(b)	1	.136	.271	.106	.199
	2	.139	.272	.108	.207
	$\bar{x}$	.138	.272	.107	.203
	$\bar{x}-3$	.121	.257	.094	.153
T2r-5	1	.321	.699	.234	.494
	2	.319	.693	.237	.496
	$\bar{x}$	.320	.696	.236	.495
	$\bar{x}-3$	.303	.681	.223	.477
T6r-6	1	.169	.416	.142	.329
	2	.173	.412	.146	.330
	$\bar{x}$	.171	.414	.144	.330
	$\bar{x}-3$	.154	.399	.131	.282

28-VIII

Phage DNA: effect of HCOOH volume.

Weigh out own T6⁺ DNA; using micro-balance:

- (a) 0.71 mg + 0.05 ml 88% HCOOH } Cook 176° 35 min. (retained)
 (b) 0.73 0.10 } (Most common the most)
 (c) 0.71 0.15 } Dry. + 25 μ l N.HCl.
 (d) 0.70 0.25 } 195° for P, 8.3 for of for.

Noted that less than is formal in hydrolysis, with bigger volumes.

		G	A	OC ₂₇₉	T	Y	66
B	1	0.32	0.25	0.18	0.54	0.24	0.21
	2	0.32	0.26	0.20	0.56	0.22	0.20
	$\bar{x}$	0.32	0.26	0.19	0.55	0.23	0.21
(a)	1	2.89	5.31	1.73	3.73	0.52	0.12
	2	2.45	5.31	1.76	3.86	0.45	0.14
	$\bar{x}$	2.52	5.31	1.75	3.80		0.18
$\bar{x}-B$		2.20	5.05	1.56	3.25		0.27
(b)	1	2.77	5.57	2.03	3.79	0.45	0.14
	2	2.62	5.48	1.97	3.67	0.41	0.10
	$\bar{x}$	2.70	5.53	2.00	3.84		0.12
$\bar{x}-B$		2.38	5.27	1.81	3.29		0.21
(c)	1	2.73	5.48	2.06	3.66		0.17
	2	2.61	5.40	2.09	3.76		0.14
	$\bar{x}$	2.67	5.44	2.08	3.71		0.16
$\bar{x}-B$		2.35	5.18	1.89	3.16		0.15
(d)	1	2.43	5.50	2.20	3.69		0.12
	2	2.67	5.44	2.18	3.74		0.11
	$\bar{x}$	2.75	5.47	2.19	3.72		0.12
$\bar{x}-B$		2.43	5.21	2.00	3.17		0.11

	a				b				c				d			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
A	3.59	3.36	3.22	4.06	3.32	3.04	3.99	3.31	3.08	4.01	3.27	3.20				
T	4.09	3.53	3.17	4.14	3.39	3.10	3.97	3.30	3.07	3.98	3.24	3.18				
G	2.00	17.2	15.5	2.16	17.7	16.2	2.14	17.8	16.5	2.21	18.0	17.7				
OC	1.615	13.9	12.8	18.75	15.3	14.0	19.46	16.2	15.1	2.07	16.9	16.5				
(C. 7.90)	[0.342]			[0.266]				[0.190]				[0.139]				
	11.595	10.0	8.99	12.735				91.6	12.056			93.1	12.27			98.0
P, V	3.60	3.62		3.76	3.70			3.88	3.86			3.73	3.73			
	3.64			3.72				3.83				3.72				
R	12.32			12.94				13.35	13.23			12.90	12.79			
R 4 notes	92.8			94.7				90.4	91.2			95.3				
R 4 notes	92.0			91.8				93.2	94.1			98.2	97.9			
7% P	6.57			6.69				6.72				6.67				

Revised of order
is in experiment: 7
sample weights

Rhonia analysis on Spizgin's "T7"

Sample	Conc.	Y P Original % of wt.	Y DNA Original % of wt.	Y P Original % of wt.
1 (R.F.)	10.0 mg + 10 ml 1% HCl	50.8	40.4	4.04
2 (G.W.)	50.0 mg + 10 ml "	21.8	177.6	3.66

"c" Band from isopropanol. Band shifted toward origin in 100% HCl along with water.
→ big C after, little if any OC. Elute

OC	Blank	Spiz	Δ	R	S	Δ
2.03	.014	.026	.010	2.25	.026	0.915
2.79	.015	.026	.011			
2.75	.018	.023	.010			

$$OC = \frac{0.011 \times 105}{0.989} = 1.2\%$$

Yields	Recovery
A	1.97
T	2.20
G	1.22
C	1.90
	7.24

P, r
1.097 + 1.1 = 2.197
R = 95%

27-VIII-52.

T7. prep. rec'd. 26-VIII from Spizgin.

32 mg + 1.0 ml 88% HCOOH. Cook 175° 30 min. Dry.
+ 0.2 ml N-HCl. Put on 2.83 μl of 1.9% for P. + 8' band.
Spots exceedingly weak. Discard.

Isolation of NA.

1.0 g. "T7" + 50 ml 0.2 N-HCl + 18 g. urea.
Stand 2 hrs. pH = 7.0. Swag + x → small gel at first,
then weak brownish gel. Stand some on heat swag. Add
100 ml 95% EtOH + 2 drops HCl → fine ppt. Spin
down. Wash = 30 ml EtOH, spin down. Dry.
Weighs 45 mg.

2-ix

5.0 mg + 1.0 ml HCOOH, cook 175° 45 min. (intended 30).
Dry. + 0.15 ml. Take 166 spots, 1.9% for P. + band across page.

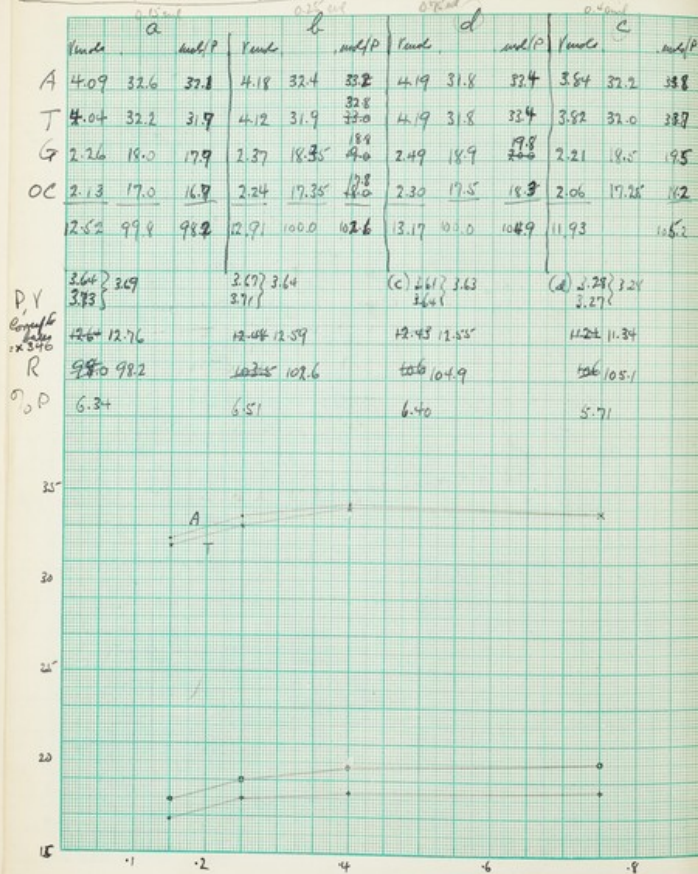
Read directly against blanks:

	G_{250}	A_{260}	"C"	T_{260}	Post-T
1.166 μl only.	.134	.250	230 .185 234 .190 238 .194 242 .197 246 .198 250 .199 254 .199 258 .198 262 .196 266 .193 270 .190	.175 270 .169 260 .166	260 .614 265 .825 270 .113 275 .126 280 .138 285 .163 290 .149 295 .120

From here on, E_{279} at pH 1 for OC = 9700.

Calculated to be 100% OC

Assumed to be 100% OC



28.11.52.

Further amounts of $HCOOH$.

Chem. Th. + DKA, weighed in micro-balance.

- (a) 0.74 mg + 0.15 ml $HCOOH$
 - (b) 0.71 mg 0.25 ml "
 - (c) 0.72 mg 0.75 ml "
 - (d) 0.73 mg 0.40 ml "
- 175° 30 min. Dry, + 25° 140°
8.3 for (a), 1.95 for (b)

Read sample 1+2 in cells -0.9 + -1.7 simultaneously, against air blank.

		G_{279}	T_{279}	OC_{279}	T_{279}	G_{279}
B	1	1.81	0.82	0.82	0.112	2.60
	2	1.41	0.82	0.82	0.103	2.45
	$\bar{x}$	1.86	0.82	0.82	0.108	2.40
a	1	0.376	0.620	0.620	0.431	0.43
	2	0.393	0.626	0.626	0.427	0.43
	$\bar{x}$	0.385	0.623	0.623	0.429	0.43
b	1	0.249	0.532	0.532	0.321	0.32
	2	0.384	0.630	0.630	0.437	0.43
	$\bar{x}$	0.410	0.637	0.637	0.434	0.43
c	1	0.397	0.634	0.634	0.436	0.43
	2	0.261	0.543	0.543	0.328	0.32
	$\bar{x}$	0.328	0.588	0.588	0.380	0.38
d	1	0.395	0.595	0.595	0.410	0.41
	2	0.379	0.590	0.590	0.412	0.41
	$\bar{x}$	0.387	0.592	0.592	0.411	0.41
	1	0.274	0.545	0.545	0.333	0.33

T7 M by biological test = 2.46×10^6 (Petersen 1950) = $10^{-15.4}$ g protein
 M by S & D = 31×10^6 =
 Infection serial = $10^{-16.3}$ g of N (Galy et al 1950) = $10^{-16.3}$ g protein
 If $M = 31 \times 10^6$, 10^8 particles per g $\frac{10^8}{6.2 \times 10^{15}} \times 31 \times 10^6 = 5 \times 10^{-2} = 0.05$ g
 = 5% of wt.

Spizizen's "T7 lot #1" mcd 14-X-52.

17-X-52 Rhoads' analysis: P = 3.36%
 D NA = 4.0%

120 mg hydrolyzed (3 tubes, each 60 mg + 20 ml 1% KOH) spread on
 filter sheet 1.1. Elute C band + run ~ 40 hrs in Borst-NH₃.

Directly against blank: C in 4 ul 275 .061
 .10 + (1) 279 .054

4-X

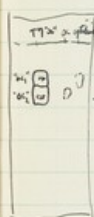
T7 re-examined for C & OC (started 30)

18 mg T7 NA + 1.5 ml HCOOH 175° 40 min.
 Evap. to ~ 0.1 ml, spread on one piece paper.

5-X

Elute C band, conc., run in Borst-NH₃.

→ big C spot, & faint crescent-shaped spot on
 some background streak in OC position. Elute OC
 position into 0.1 ml pipette, conc. on paper, & run in
 Borst-NH₃ again.



Read directly against blanks in 0.1N-HCl.

C in 8 ul	OC ₁ in 4 ul	OC ₂ in 4 ul
		270 .033
275 2.18	275 .036	275 .027
279 2.09	279 .033	279 .021

Max OC = $\frac{0.021 \times 100}{2.18 \times 2} = 0.5\%$ of C.

22-X

50 mg whole crude T7 in 2 tubes each 25 mg in 1.5 ml HCOOH,
 175° 30 min, spread in 8" band on What #3, run in Borst-NH₃.
 → C spot, no OC. Elute:

C in 4 ul	OC in 4 ul
275 .631	275 .012
	279 .011

Max. OC = 2% of C

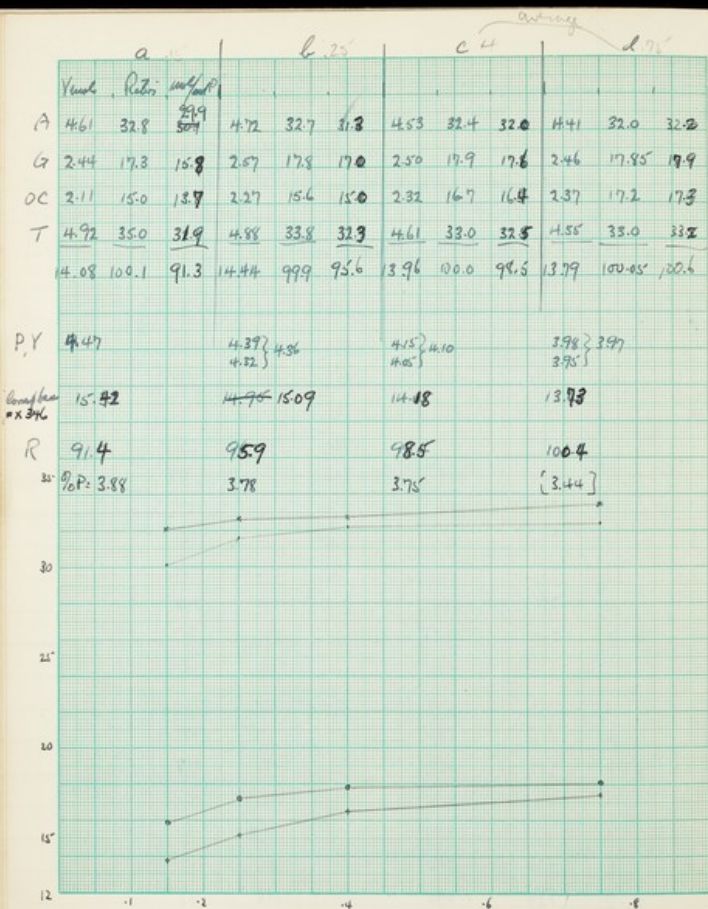
	(a) BSNA		(b) Blank T6+DNA		(c) SSC T6+DNA		(d) SSC T2+2 DNA	
	Units	Ratio	Units	Ratio	Units	Ratio	Units	Ratio
A	3.51	28.0	3.86	32.2	3.59	32.7	2.27	32.4
T	3.45	27.5	3.86	32.2	3.61	32.9	2.25	32.1
G	2.84	22.6	2.20	18.35	2.02	18.4	1.264	18.1
CE	2.57	20.5	2.07	17.3	1.74	16.0	1.216	17.4
mc	2.37	18.6	1.99	16.05	1.98	16.0	7.00	16.0
P.Y	2.38	18.7	2.49	20.7	3.10	21.3	1.99	20.0
	2.63	20.2	3.40	28.0	3.15	28.1	2.00	20.0
Yields (samples)	12.40		11.89		10.72		6.86	
R	101%		101%		102%		102%	
%P	7.94		6.68		5.94		4.17	

8-1x.52

Min. DNA is increased vol. HCOOH.

- a. Blank BSNA 0.58 mg.
 b. Blank T6+DNA 0.66 mg.
 c. SSC T6+DNA 0.67 mg.
 d. SSC T2+2 DNA 0.61 mg.
- Each + 0.25 ml 88% HCOOH
 175° 30 min. by 90025
 ml 40, 6.83 g. 195 for P.
- Read samples 102 minutes in all 09 & 17 against air blank.

		G	A	225	C+OC	T
B	1	.094	.064	.050	.048	.083
	2	.094	.062	.050	.048	.086
	$\bar{x}$	.094	.063	.050	.048	.085
a	1	.407	.521	.320	.306	.361
	2	.407	.517	.320	.306	.357
	$\bar{x}$	.407	.519	.320	.306	.359
	$\bar{x} - 3$	.313	.456	.270	.274	.274
b	1	.337	.565	.244	.249	.396
	2	.335	.562	.243	.248	.387
	$\bar{x}$	.336	.564	.244	.249	.392
	$\bar{x} - 3$	.242	.501	.201	.201	.307
C	1	.315	.530	.212	.218	.375
	2	.316	.529	.214	.220	.369
	$\bar{x}$	.316	.530	.214	.219	.372
	$\bar{x} - 3$	.222	.467	.171	.171	.288
d	1	.233	.359	.166	.165	.265
	2	.232	.357	.165	.165	.262
	$\bar{x}$	.233	.358	.166	.166	.264
	$\bar{x} - 3$	.139	.295	.118	.118	.179



10.18.52

Effect of vol. of HCOOH on whole phage.

(a) T6+2 phage 1.50 mg. + 0.15' vol HCOOH

(b) " 1.50 + 0.25' vol " 175° 30. min. By.

(c) " 1.46 + 0.40' vol " + 0.025' vol, Tubes

(d) T6+2 0.8 } 1.50 + 0.75' vol " 8.3 after 5/1.95' for P.

Read 2 tubes against air blank:

	G	A	OC	T
B	1	.094	.062	.047
	2	.095	.067	.091
$\bar{x}$		.095	.065	.089
a	1	362	665	252
	2	364	663	251
$\bar{x}$		363	664	252
$\bar{x} - B$		268	599	205
b	1	376	678	267
	2	380	680	267
$\bar{x}$		378	679	267
$\bar{x} - B$		283	614	220
c	1	366	648	272
	2	374	660	271
$\bar{x}$		370	654	272
$\bar{x} - B$		275	589	225
d	1	362	637	278
	2	368	639	276
$\bar{x}$		366	638	277
$\bar{x} - B$		271	573	230

0.1 M Na_2CO_3 9.6 ml $\rightarrow$ 0.008 M
 0.1 M NaOH 60.0 ml $\rightarrow$ 0.05 M
 water 50.4
 120.0

16-ix-52. Check insect virus for OC.

945 am. 606 mg Pipe $\uparrow$ 120 ml 0.008 M Na_2CO_3 - 0.05 M NaOH .
 see Cp 1/1

Hydrolysis 4.0 mg dry virus $\uparrow$ 1.0 ml
 4.0 " " $\uparrow$ 1.0 ml } 175° 30 min.
 26 mg clean - $\uparrow$ 0.75 ml } Combine, dry, weigh.
 to ~ 0.1 ml, spread on paper.

18-ix Elute "C" band in ~ 0.5 ml, w/ 10% to 20% $\uparrow$ deep water.

apply to pipe. run in Borel-NT₂.
 20-ix big C spot, only faint streak in OC position. Elute.
 read directly against B.

	OC in 4 ml		C in 8 ml
284	.029	280	.712
279	.037	275	.761
275	.040	270	.720
270	.037		

$$A_{\text{max}} \text{ OC} = \frac{0.037 \times 100}{2 \times .761} = 2.4 \%$$

27-ix Check for P loss = DNA under hydrolytic conditions.

6.3 mg. Rhona's DNA $\uparrow$ 2.0 ml H_2O . Add $\sim 10 \mu l$ $HCOOH$ - heat to 100° to depolymerize. Pipette 0.2 ml samples into 6 tubes (5 commercial 0.5% 1 hour incubation 0.5 min). Dry in vac.

(a) Large tube. Control, unheated.	$\uparrow$ 1.0 ml H_2O ^{2.0 ml} _{0.5% 0.5 min}
(b) " " $\uparrow$ 0.05 ml $HCOOH$, heat 175° 30 min.	$\uparrow$ 1.0 ml H_2O _{0.5% 0.5 min}
(c) " " $\uparrow$ 0.15 " " " "	" " " "
(d) " " $\uparrow$ 0.40 " " " "	" " " "
(e) " " $\uparrow$ 0.75 " " " "	" " " "
(f) Small tube. 0.40 " " " "	0.9 " " "

From each. 2 x 0.1 ml for P

P, mean of 2 dil's:	(a) 4.91 Y
	(b) 4.91
	(c) 4.93
	(d) 4.91
	(e) 4.94
	(f) $5.17 \times \frac{9}{10} = 4.65$

No difference at all!

17-ix

Where does the P go?

Check loss of P during evaporation of formic acid -
Into each of 4 paper tubes pipette 0.05 ml ~ 0.05 M. KH_2PO_4 (~ 0.0775 mg P). Dry in vac.

Add: (a) nothing
(b) 0.05 ml H_2O
(c) 0.15 ml " "
(d) 0.5 ml " "

evap. to dryness under vac. over.
 $\uparrow$ 1.0 ml 1 N-HCl.

Take 0.05 ml samples for P.

P, Y	a	$\frac{2.95}{2.00}$	2.98
	b	$\frac{2.86}{2.95}$	2.92
	c	$\frac{2.95}{2.95}$	2.92
	d	$\frac{2.87}{2.92}$	2.90

- difference small, if significant

25-ix Into each of 4 tubes. 0.05 ml ~ 0.05 M. KH_2PO_4 , dry in vac.

Int. soln. = 5 min.	(a) No hydrolysis. Small tube.	P = $\frac{4.41}{4.40}$	4.41
	(b) $\uparrow$ 0.05 ml $HCOOH$, 175° 30 min.	$\frac{4.59}{4.58}$	4.57
	(c) $\uparrow$ 0.50 ml " "	$\frac{4.51}{4.51}$	4.51

Int. soln. = 9 min. (d) Big tube, $\uparrow$ 0.50 ml $HCOOH$, 175° 30 min.
Evap. to dryness, $\uparrow$ 1.0 ml 1 N-HCl, take 0.05 ml samples for P.

$\frac{4.39}{4.43}$ 4.47

	(a) BSNA		(b) Rhonin		(c) Worthington		(d) Schuchardt	
	Units	Ratio						
A	4.24	27.8	4.43	28.1	3.44	28.1	4.12	26.3
T	4.25	27.8	4.32	27.4	3.31	27.1	4.50	28.7
G	3.44	22.5	3.58	22.7	2.86	22.9	3.40	21.7
C	3.17	20.8	3.24	20.5	2.535	20.7	3.42	21.8
MC	0.173	1.16	0.214	1.4	0.143	1.2	0.245	1.6
	27.3	100.0	27.8	100.1	12.228	100.0	15.685	100.1
P, Y	4.36 } 4.40 4.44 }		4.56 } 4.58 4.60 }		3.64 } 3.67 3.70 }		4.81 } 4.85 4.88 }	
Gravito Index	15.09		15.70		12.59		16.61	
R	101.9%		100.5		97.3		94.5	
70 P	7.21		7.48					

19-11-52.

DNA's for Dieck standard.

(a) Lion DNA 1.55 mg } Each + 0.5 ml 88% HCOOH, 175° 30 min
(b) Rhonin DNA 1.56 } Dry down. + 0.05 ml H-HF.
(c) Worthington DNA 1.51 }
(d) Schuchardt DNA 1.54 }
Index: 2 x 8.3 fgs
2 x 1.95 1P
2 x 1.1 N

		G	A	C ₂₇₅	20 MC	210	T
B	1	.109	.073	.059	.054	.051	.050
	2	.102	.069	.057	.050	.048	.047
	$\bar{x}$	.106	.071	.058	.051	.050	.049
A	1	.487	.626	.392	.069	.069	.066
	2	.483	.618	.390	.065	.064	.062
	$\bar{x}$	.485	.622	.391	.067	.067	.064
B - B	1	.379	.551	.333	.016	.017	.014
	2	.379	.551	.333	.016	.017	.014
	$\bar{x}$	.379	.551	.333	.016	.017	.014
C	1	.415	.519	.324	.067	.066	.064
	2	.412	.517	.324	.063	.062	.060
	$\bar{x}$	.414	.518	.324	.065	.064	.062
B - B	1	.308	.447	.266	.014	.014	.013
	2	.308	.447	.266	.014	.014	.013
	$\bar{x}$	.308	.447	.266	.014	.014	.013
d	1	.450	.606	.419	.075	.074	.072
	2	.450	.607	.414	.074	.073	.070
	$\bar{x}$	.450	.607	.417	.075	.074	.071
B - B	1	.374	.536	.359	.024	.024	.022
	2	.374	.536	.359	.024	.024	.022
	$\bar{x}$	.374	.536	.359	.024	.024	.022

Cytosine $\cdot$ H_2O has $M = 129.2$
 $N = 32.5\%$.

29-ix.

Cytosine extinction coefficient.

100 mg roughly cytosine 2 x re-crystallized from water
 $\rightarrow$ 60 mg. Dried overnight in vac over silica gel at room temp.
 weigh out 20.9 mg into 25 ml volumetric.

For ϵ , dilute 1.0 ml to 100 ml $\frac{M}{10}$ H₂O.

	(1)	(2)	
276	.676	.794	$D_{276} \bar{x} = 0.675$
275	.676	.674	
274	.674	.673	
239	.086	.086	
238	.085	.085	
237	.086	.086	

$$\epsilon_{276}, \text{ assuming } M = 129.2, = 0.675 \times 129.2 \times 100 \times \frac{25}{20.9} = 10,420$$

$$\text{Kjeldhal: } N \text{ found} = \left. \begin{array}{l} 0.2674 \\ 0.2660 \\ 0.2676 \end{array} \right\} 0.2669 \text{ mg.}$$

$$\epsilon_{276}, \text{ based on } N = 0.675 \times 100 \times \frac{3 \times 14.01}{0.267} = 10,620.$$

	a		b		c		d	
	Kuado	Rubio	Kuado	Rubio				
A	3.98 2.67	27.25	3.70 2.488	27.3	3.87 2.615	26.9	4.10 2.78	26.9
T	4.34	29.7	4.02	29.7	4.32	30.1	4.60	30.2
G	3.16	21.6	2.90	21.4	3.09	21.5	3.245	21.3
C	2.94	20.1	2.76	20.4	2.925	20.3	3.11	20.4
	4.42	98.6	4.38	98.8	4.205	98.8	4.555	98.8
	14.60		13.54		14.39		15.24	
P	3.94 } 3.95 3.96 }		3.48		3.77 } 3.75 3.73 }		3.94 } 3.95 3.96 }	
R	13.54		11.92		12.85		13.54	
	105		114		112		112	

30-ix-52

Effect of HCOOH vol. on TNA + albumin.

Chrom's TNA (17 mg.) + bovine serum albumin (86 mg wet dry, 279 mg dry weight)
ground together. 4.0 mg protein weighed into 4 tubes 10x75 mm tubes.

Add (a) 0.25 and 8% HCOOH } Cook 175° 30 min. Dry down (partial
(b) 0.50 } vac. < 60° ↑ 25 ul N-HCl, take 2x 8-3
(c) 0.75 } spots, 2x 1.95 for P. Elute + loss.
(d) 1.0

		G	A	C	T
B	1	.107	.064	.055	.084
	2	.107	.066	.056	.086
	$\bar{x}$	.107	.065	.055	.085
a	1	454	583	366	431
	2	454	579	362	428
	$\bar{x}$	454	581	364	430
	$\bar{x} - \bar{B}$	347	516	309	345
b	1	427	546	350	410
	2	425	544	340	400
	$\bar{x}$	426	545	345	405
	$\bar{x} - \bar{B}$	319	480	290	320
c	1	450	570	366	432
	2	443	566	357	426
	$\bar{x}$	447	568	362	429
	$\bar{x} - \bar{B}$	340	503	307	344
d	1	465	598	386	458
	2	463	598	376	448
	$\bar{x}$	464	598	381	451
	$\bar{x} - \bar{B}$	357	533	326	366

	a		b		c		d	
Yards	Feet							
A	3.31	31.9	4.45	32.0	3.41	32.5	3.50	32.7
T	3.51	33.8	4.61	33.2	3.66	34.9	3.77	35.2
G	1.79	17.2	2.475	17.8	2.04	19.4	2.08	19.4
OC	1.78	17.1	2.37	17.0	1.39	13.25	1.37	12.8
	0.39	100.0	13.905	100.0	10.50	100.05	10.72	100.1
P	3.24	32.7	4.04	4.04	3.10	3.13	3.19	3.21
	3.28		4.03		3.15		3.23	
x346	11.31		13.97		10.83		11.10	
R	91.9		99.6		97.1		96.7	
P%	2.73		3.44		5.60		5.74	

1-x-52.

Phages & Phage DNAs

- (a) T6⁺-6 phage 1.56 mg + 0.5 ml H₂O + 10.75' diam. Paper tubes.
 (b) T2⁺-5 - 1.53 - 175" 30 min. Ag.
 (c) SSC T6⁺ DNA 0.71 - 0.25 ml - ↑ 25' at 8.3' of tube.
 (d) T2⁺-1 DNA 0.71 - 1.95 for P.

	G	A	OC 279	T
B				
1	.096	.060	.052	.079
2	.094	.060	.051	.078
$\bar{x}$	.095	.060	.052	.079
a				
1	292	489	226	365
2	292	491	224	351
$\bar{x}$	292	490	225	358
$\bar{x} - B$	197	430	173	279
b				
1	368	639	284	449
2	365	639	279	439
$\bar{x}$	367	639	282	444
$\bar{x} - B$	272	579	230	365
c				
1	320	505	190	372
2	318	501	184	368
$\bar{x}$	319	503	187	370
$\bar{x} - B$	224	443	135	291
d				
1	327	514	186	383
2	320	516	184	375
$\bar{x}$	324	515	185	379
$\bar{x} - B$	229	455	133	300

3-x-52

Error introduced by proteins.

- (a) 3.9 mg PPA 4-2 + 0.5 ml H₂O 172° 30 min
 (b) 3.9 mg bov. ser. alb. " " " "

Dry. + 25 µl, on 9.3 µl spots in infra-red cell, along with DNA standards.

- (a) shows a faint spot in base position. Do not cut out.
 (b) cut out areas corresp. to spots & read against blank.

G_{260}	A_{260}	C_{275}	T_{260}
0.004	.004	.010	.037

	a			b			c			d		
Yields	Ratio	Wt %	Wt %									
A	4.07	32.5	30.5	4.24	32.8	31.3	4.22	33.1	28.9	3.46	33.6	25.2
T	4.24	33.9	31.8	4.31	33.3	31.8	4.65	36.4	31.8	4.31	41.9	31.4
G	2.24	19.9	16.8	2.32	17.9	17.1	2.26	17.7	15.5	1.97	19.1	14.3
OC	1.96	15.7	14.7	2.08	16.1	15.4	1.64	12.8	11.2	0.56	5.4	4.1
	12.51			12.95			12.77			10.30		
P, Y	3.86	3.86		3.95	3.92		4.24	4.23		4.01	3.98	
x 346	13.35			13.55			14.62			13.76		
R	9.38			9.56			8.74			7.50		
% P	6.63			6.73			7.16			6.74		$\bar{x} = 6.81$

4-x-52.

Effect of atmosphere over HCOOH.

Expt 10x15 mm (a) 0.74 mg over T_{65}° and HCOOH. N_2 atmosphere } 175° 30 min.
 tubes: (A) 0.74 " " " " HCOOH vapor " } By partial vac.
 (C) 0.75 " " " " air " } ↑ 25° and 11-H₂O.
 (d) 0.75 " " " " vacuum pump } 1.95 hr, 8.3 g/L.
 Difficult to get around 8.3 g/L pipetteful, so base calcs. on no. 1. Good enough

		G	A	OC	T
B	1	107	.065	.059	.087
	2	104	.076	.056	.093
	$\bar{x}$	106	.071	.058	.090
a	1	351	599	250	427
	2	353	601	246	427
	$\bar{x}$	352	600	248	427
$\bar{x} - B$	1	246	529	190	337
	2	363	624	263	483
	$\bar{x}$	361	622	260	483
b	1	358	619	256	432
	2	361	622	260	433
	$\bar{x}$	359	620	258	432.5
c	1	358	620	258	432
	2	351	617	252	424
	$\bar{x}$	355	619	255	428
d	1	324	523	116	440
	2	322	519	108	426
	$\bar{x}$	323	521	112	433
$\bar{x} - B$	1	217	450	.054	343
	2	219	452	.056	345
	$\bar{x}$	218	451	.055	344

	a			b			c			d		
	Yards	Plots	sq ft	Yards	Plots	sq ft	Yards	Plots	sq ft	Yards	Plots	sq ft
A	460	32.5	30.0	494	32.4	30.9	527	31.9	31.4	453	32.7	
T	489	34.5	31.9	526	34.5	32.9	550	33.2	32.7	451	32.6	
G	240	16.9	15.6	267	17.5	16.7	296	17.9	17.6	254.5	18.4	
OC	228	16.1	14.9	237	15.4	14.8	281	17.0	16.7	228	16.5	
	4.17	92.4	152.4	95.3	16.54		98.4	13.865				
P ₁	4.03 +38 4.38	4.4		4.57 4.52 4.71	4.55	4.60	4.78 4.75 4.87	4.62	4.83	3.49 3.32 4.19	3.41	
K38	15.34			15.83	16.00		16.09	16.80		11.9	14.2	
R	92			95	95		103	99		98	97.6	
%P	3.87			4.06			4.13			7.02		
				$\bar{x} = 4.02$								

16x
Index made from
Piper's book, 6 mm.
int. dia.

Effect of vol. of HCOOH in HCOOH vapor atmosphere.

- (a) 1.48 mg SSC T2⁺ 5 phase + 0.15 ml 98% HCOOH
(b) 1.47 mg " + 0.25 ml "
(c) 1.52 mg " + 0.50 ml "
(d) 0.74 mg even T6⁺ DNA + 0.25 ml "

400 for elution delivered from bottom pipette = 3.98 ml. allow 1% evap. Index 348

		G	A	OC	T
B	1	94	.062	.052	.090
	2	.095	.062	.051	.086
	$\bar{x}$	.095	.062	.052	.088
(a)	1	360	65.9	272	478
	2	357	62.9	274	474
	$\bar{x}$	359	65.9	273	477
$\bar{x} - B$		264	59.7	221	389
(b)	1	389	701	280	507
	2	389	706	284	504
	$\bar{x}$	389	704	282	506
$\bar{x} - B$		294	642	230	418
(c)	1	420	746	326	527
	2	422	748	323	522
	$\bar{x}$	421	747	325	525
$\bar{x} - B$		326	685	273	437
(d)	1	572	651	284	446
	2	377	650	282	448
	$\bar{x}$	375	651	283	447
$\bar{x} - B$		280	589	221	369

	a		b		c		d	
Yields, μ moles								
A	2.93	32.4	3.85	32.6	4.61	32.5	3.85	32.1
T	2.97	32.8	3.82	32.4	4.60	32.4	3.77	32.4
G	1.64	18.1	2.13	18.05	2.61	18.4	2.10	18.1
OC	1.504	16.6	2.00	16.95	2.37	16.7	1.906	16.4
	9.044	99.9	11.80	100.0	14.19	100.0	11.626	100.0
P, Y	2.73	2.73	3.53	3.52	4.24	4.24	3.48	3.41
	2.73		3.51		4.23		3.43	
x 346	9.45		12.18		14.68		11.80	
	96		97		97		99	
%P	4.89		6.13		7.50		6.28	

21-x-52.
Chromatograms
10.6 mm.

Phage DNA analyses.

- (a) 0.71 μ g T2+2 DNA } $\uparrow$ 0.25' and 88% HCOOH. 175' 30 min.
 (b) 0.73 μ g T2+1 (4) DNA } Dry. $\uparrow$ 25' μ . 8.3 spots, 195' for P.
 (c) 0.72 μ g T2+ (3) DNA
 (d) 0.69 μ g T6+ (SSC) DNA } Good chromatograms. Elute in 4.50 and overexposed

		G	A	OC	T
B	1	102	.061	.056	.085
	2	104	.069	.056	.095
	$\bar{x}$	103	.067	.056	.090
a	1	279	449	203	323
	2	287	447	200	328
	$\bar{x}$	283	448	202	326
$\bar{x} - B$		180	381	146	236
b	1	335	566	250	393
	2	338	567	250	394
	$\bar{x}$	337	567	250	394
$\bar{x} - B$		234	500	194	304
c	1	389	663	287	454
	2	391	669	285	457
	$\bar{x}$	390	666	286	456
$\bar{x} - B$		287	599	230	366
d	1	336	567	244	389
	2	331	567	238	390
	$\bar{x}$	334	567	241	390
$\bar{x} - B$		231	500	185	300

(a) PB₈₀ 80/20

BSNA + all

	Yards	Ratio	Yards	Ratio
A	1.54	29.3	3.55	28.0
T	1.535	29.2	3.51	27.7
G	1.12	21.3	2.86	22.6
C	1.06	20.2	2.60	21.3
[Mc]			0.16	1.33
	5.255		12.68	
f	1.98		3.70	
x P, V	2.05	2.05	3.76	2.7%
x 3%	2.11		3.81	
	7.10		13.00	
% R	74%		97.5%	

Dry wt. = 5.0 mg in 42.7 μ l = 0.117 mg/ μ l

P = 2.05 γ in 1.95 μ l = 1.05 γ / μ l P = 0.90%

N = $\frac{63.2}{64.0}$ 63.6 γ in 3.90 μ l = 16.3 γ / μ l N = 13.9%

N/P = 15.5

DNA in virus = $9.0 \times \frac{74}{100} = 6.7\%$

22-x

PB₈₀ V. Check P recovery.

(a) 5.10 mg PB₈₀/34₂ (dried over P₂O₅ in vac.) } each $\uparrow$ 20 μ l HClO₄.
 (b) 5.0 mg BSNA + albumin (15:85) } 9 heat 100° (BWS) 1 1/2

hrs, shaking occasionally to wash down tube walls. Open, add
 20 μ l of. dist. water, grinding of residues in rod. Vol = (20+20) $\times$ 0.96 + 3.7
 = 42.7 μ l.

Take: 2 $\times$ 8.3 μ l spots

3 $\times$ 1.95 μ l for P (pipetting difficult)

2 $\times$ 3.90 μ l for N (2 $\times$ 1.95 μ l pipette, pipetting difficult; PB₈₀ only).

		G	A	C	T
B	1	.103	.071	.062	.075
	2	.098	.068	.057	.090
	$\bar{x}$	.101	.070	.060	.093
a (PB ₈₀)	1	.224	.270	.174	.218
	2	.224	.270	.168	.212
	$\bar{x}$	.224	.270	.171	.215
	$\bar{x} - B$	.123	.200	.111	.122
b (BS)	1	.417	.531	.335	.374
	2	.413	.531	.330	.369
	$\bar{x}$	.415	.531	.333	.372
	$\bar{x} - B$	.314	.461	.273	.279

	P for 1.92 pl	x 3.46	A		C		OC		R
			1.00/1.00	1.00/1.00	1.00/1.00	1.00/1.00	1.00/1.00	1.00/1.00	
a	8.04	7.99	27.62	6.74	0.244		5.70	0.206	(100)
b	8.24	8.25	28.65	7.26	0.255	5.34	5.55	0.195	94.8

24-X-52

Check recovery of OC soaked in presence of BSNA under new conditions.

5.6 mg BSNA } $\uparrow$ 2.0 ml HCOOH. Two portions each
0.5 mg equal OC } 0.5 ml sealed off in Pyrex Green Tubes.

Heat: (a) 100° 2 min.

(b) 175° 30 min.

Dry down (got up to ~ 80°; (a) got some sediment in it).

$\uparrow$ 2.5 pl. Take 1.95 for P, 83 after some 24 hrs in
vacuum. 8.11, 26 hrs in hot N₂. Elute O, C, & A. i. blanks
as on 23.11.

		A ₂₆₀	C ₂₃₈	OC ₂₃₉
(a)	B			
	1	.137		.074
	2	.112		.076
	$\bar{x}$	.125		.075
	Spot			
	1	1.025		.628
	2	0.976		.628
	$\bar{x}$	1.000		.628
	S-B	0.875		.553
(b)	B			
	1	.112	.075	.076
	2	.125	.077	.075
	$\bar{x}$	.119	.076	.076
	Spot			
	1	1.060	.630	.613
	2	1.065	.641	.617
	$\bar{x}$	1.063	.636	.615
	S-B	0.944	.560	.539

	a (Buv)		b (BS)	
	Ymols	Rctri	Ymols	Rctri
A	1.64	29.0	2.91	28.0 27.6
T	1.72	30.4	2.87	27.6 27.3
G	1.145	20.2	2.35	22.6 22.3
C	1.16	20.5	2.25	21.2 21.4
	5.665	100.1	10.38	99.9 98.6
			MC	1.3
				99.9
P, Y	2.53	2.51	3.23	2.22
	2.49		2.21	
x 324	8.14		10.43	
R	69.6 %		99.4 %	

$\text{Dry wt} = 3.475 \text{ mg} \times 25 \times 0.976 \div 25 = 26.9 \text{ mg} = 0.129 \text{ mg/ml}$
 $P = 2.51 \text{ Y in } 2.11 \text{ ml} = 1.19 \text{ Y/ml} = 0.92\%$
 $\text{DNA recovered} = 9.2 \times 69.6\% = 6.4\% \text{ of virus.}$

282
 PBM V. Check Primary (2)
 (a) 3.5⁵ mg PBM 80/8₂ } each 1 20 ml 70% HCl. Wash
 (b) 2.5⁵ mg BSA-albumin mixture } each 1 20 ml 2 hrs. Add 15 ml of
 dest. Ink 2x 8.4 ml, 2x 2.11 for P. (new pipette)

		G	A	MC 27%	T
B	1	91	59	51	82
	2	94	60	51	84
	$\bar{x}$	93	60	51	83
(a)	1	215	274	171	213
	2	223	272	175	227
	$\bar{x}$	219	273	173	220
	$\bar{x} - B$	126	213	122	137
(b)	1	350	438	286	305
	2	351	438	288	317
	$\bar{x}$	351	438	287	311
	$\bar{x} - B$	258	378	236	228

	a		b		c		d	
	Under Ratio $\frac{b}{a}$ $\frac{c}{a}$ $\frac{d}{a}$							
A	4.62	32.8	3.72	32.8	4.34	32.4	4.43	27.9
T	4.62	33.0	3.76	33.1	4.35	32.5	4.36	27.5
G	2.54	18.15	2.06	18.2	2.49	18.6	3.58	22.55
C, OC	2.27	16.1	1.80	15.9	2.22	16.6	3.30	20.8
[MC]							(0.20)	1.3
	14.10	100.05	11.34	100.0	13.40	100.1	15.87	100.05
P, V	5.17	5.22	3.64	3.64	4.28	4.29	4.95	4.91
	5.26		3.64		4.30		4.87	
x 52+	16.92		11.79		13.90		15.90	
R	83.4%		96.4		96.5		99.8	
% P	4.46		3.09		2.47		2.72	
	4.16		2.88		6.94		8.10	

1-xi-52.

Compressed
Gum.

Phages and DNA's.

- (a) T6+6 phage (prop. rec'd 30-x-52) 1.52 mg } Each ↑ 0.5 and 11.00H.
 (b) T6+6-7 - 1.53 } 172° 30 min.
 (c) T6+6 DNA (own) 0.73 } Dry down ↑ 25% Inhib
 (d) BSNA 0.715 } 8.4 aphid. + 2.11 for P.

		G	A	C 235	X 239	T
B	1	121	77	60	60	99
	2	121	79	63	63	102
	$\bar{x}$	121	78	62	62	101
a	1	403	680		283	470
	2	403	677		281	472
	$\bar{x}$	403	679		282	471
$\bar{x}-3$		282	601		220	370
b	1	346	568		235	401
	2	348	553		238	399
	$\bar{x}$	347	561		237	400
$\bar{x}-3$		226	483		175	299
c	1	392	638		277	447
	2	398	645		277	446
	$\bar{x}$	395	642		277	447
$\bar{x}-3$		274	564		215	346
d	1	508	658		405	446
	2	522	670		413	450
	$\bar{x}$	515	664		409	448
$\bar{x}-3$		394	586		347	347

	a				b				c				d			
Variable	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio
A	3.17	277	26.45	3.28	28.0	27.4	3.27	28.0	27.3	3.32	28.0	27.4				
T	3.16	276	26.35	3.13	26.7	26.1	3.06	26.2	25.5	3.12	26.3	25.8				
G	2.55	223	21.3	2.67	22.8	22.3	2.71	23.2	22.6	2.745	23.2	22.7				
C	2.71	24.8	20.1	2.77	21.1	20.6	2.78	21.2	20.7	2.805	21.2	20.7				
(MC)		(1.3)			(1.3)			(1.3)			(1.3)					
	11.29	98.7	95.5	11.55	98.6	97.7	11.52	98.6	97.4	11.69	98.7	97.9				
P, Y	3.72	3.70	3.67	3.88	3.70	3.72	3.71	3.70	3.68	3.74	3.74	3.74				
x324	11.98			11.98			11.98			12.11						
R	95.6			97.8			97.5			97.9						
%P	8.21			7.64												

3-Xi-52

Precovery from SSNA & vols. HCOOH.

3.5' mg SSNA + 0.5 ml HCOOH. Into each of 4 tubes (Apex 6 mm) pipette 0.1 ml (≈ 0.7 mg NO).

resp. long

Add: (a) 0 ml HCOOH $\rightarrow$ 0.1 ml } Seal, soak 175° 30 min. By down.
 (b) 0.2 ml $\rightarrow$ 0.3
 (c) 0.4 ml $\rightarrow$ 0.5
 (d) 0.6 ml $\rightarrow$ 0.7
 (a) is known standard. + 30 ml HCOOH.
 Loh 2-11 for 2, 8.4 apolo.

		G	A	C	T
B	1	104	76	57	109
	2	114	96	59	139
	$\bar{x}$	109	86	58	124
a	1	389	497	310	364
	2	388	499	312	386
	$\bar{x}$	389	498	311	375
$\bar{x} - 3$		280	412	253	257
b	1	404	508	317	363
	2	402	515	316	383
	$\bar{x}$	403	512	317	373
$\bar{x} - 3$		294	416	259	249
c	1	407	508	317	364
	2	407	514	318	370
	$\bar{x}$	407	511	318	367
$\bar{x} - 3$		298	425	260	243
d	1	415	517	324	377
	2	406	517	318	367
	$\bar{x}$	411	517	321	372
$\bar{x} - 3$		302	431	263	248

		A		C		OC		$\frac{S}{P}$
P for 24 ml	x 3.24	1 ml diff	1 ml diff P	1 ml diff	1 ml diff P	1 ml diff	1 ml diff P	
a 7.21	7.15	23.16	5.92	0.256		4.97	0.215	
7.49								
b 7.14	7.20	23.32	5.98	0.256	4.48	0.192	4.35	0.187
7.25								86.9

29.11

OC recovery cooked in presence of BSNA

From soln of OC + BSNA in HCOOH made up 24 ml. Loh 2x 0.3 ml. (all I could get).

(a) 100° 2 min

(b) 175° 30 min

By loss. 5 25 ml, take 8.4 spots, 2.11 for P. Run in isoprop. 90° then BrOH. 4H₂. Spots & blanks as before.

		A		C		OC	
a	B	1	109	65		70	
		2	112	72		73	
		Σ	111			72	
	S	1	878			550	
		2	887			537	
		Σ	881			504	
	S-B		770			482	
b	B	1	97	67		70	
		2	109	72		69	
		Σ	103	70		70	
	S	1	881	540		474	
		2	880	539		490	
		Σ	881	540		472	
	S-B		778	470		421	

	a		b		c		d	
Unhydrolyzed, Protein, %P								
A	4.06	32.8	4.05	32.6	4.01	32.5	3.88	31.8
T	4.26	34.4	4.03	32.5	4.03	32.6	4.04	33.1
G	2.19	17.7	2.30	18.5	2.29	18.5	2.285	18.5
OC	1.875	15.1	2.04	16.4	2.02	16.4	2.03	16.6
$\bar{X}$	0.39		0.164		0.164		0.177	
	12.385	100.0	12.42	100.0	12.35	100.0	12.205	100.0
P, Y	4.25	4.20	3.98	4.01	3.97	4.00	4.00	4.00
	4.14		4.04		4.11		4.00	
232+	13.60		12.99		13.10		12.96	
R	91.2		95.7		94.4		94.4	
%P			6.76					

6-xi.

Preparatory from T67 DNA & whole Hecott (again!).

3.5 mg T67 DNA (own) + 0.5 ml Hecott. 0.1 ml phosphate buffer. (a) add 0 = 0.1 ml } 175° 30 min (new solution in bath). Dry. ↑ 25° for 24 hrs. 2.11 for P.

60
80
100
120

		G	A	OC	T	$\bar{X}$ (P.C.)			
B	1	91	60	50	81	255	260	265	270
	2	92	58	49	81	80	66	59	56
	$\bar{X}$	92	59	50	81	78	64	57	54
a	1	332	586	233	412	100	89	82	77
	2	334	586	231	428	113	99	91	84
	$\bar{X}$	333	586	232	420	107	94	87	81
$\bar{X}-3$		241	527	182	339	29	30	30	27
b	1	344	586	248	406		77	70	
	2	345	584	247	411		76	70	
	$\bar{X}$	345	585	248	409		77	70	
$\bar{X}-3$		253	526	198	328		13	13	
c	1	341	580	244	409		78	68	
	2	346	580	248	409		78	71	
	$\bar{X}$	344	580	246	409		77	70	
$\bar{X}-3$		252	521	196	328		13	13	
d	1	338	571	247	400		76	69	
	2	342	574	247	404		79	72	
	$\bar{X}$	340	573	247	402		78	71	
$\bar{X}-3$		248	514	197	321		14	14	

	a		b		c		d	
	Hand	Rebar	Hand	Rebar	Hand	Rebar	Hand	Rebar
A	5.24	32.0	4.11	32.3	3.40	31.9	4.26	32.5
T	5.51	33.7	4.29	33.8	3.58	33.6	4.35	33.2
G	2.96	18.1	2.30	18.1	1.93	18.1	2.42	18.45
OC	2.65	16.2	2.02	15.9	1.75	16.4	2.09	15.9
	16.36	100.0	12.72	100.0	10.67	100.0	13.12	100.0
P ₁	4.76	3.78	3.89	3.87	3.32	3.30	3.89	3.87
x346	4.50		3.84		3.28		3.85	
R	99.0		95.1		93.6		98.0	
70P	4.09		3.35		2.86		3.31	

7-xi-52

Phages.

- (a) 1.52 avg T2+5 q22-v + 0.5 ml H₂O
 (b) 1.50 avg T4+7 q21-x + "
 (c) 1.50 avg T4+8 q21-x + "
 (d) 1.52 avg T4+7 q21-x + 0.65 ml H₂O

175° 30 min. Dig. + 25 ml.
 Take 8.4 sps, 3 x 1.97 for P.

		G	A	OC	T
B	1	92	60	54	80
	2	[92]	60	49	81
	$\bar{x}$	92	60	50	81
a	1	416	742	310	519
	2	420	740	304	519
	$\bar{x}$	418	741	307	519
	$\bar{x}-3$	326	681	257	438
b	1	345	593	247	424
	2	345	594	244	419
	$\bar{x}$	345	594	246	422
	$\bar{x}-3$	253	534	196	341
c	1	307	500	220	370
	2	303	503	220	361
	$\bar{x}$	305	502	220	366
	$\bar{x}-3$	213	442	170	285
d	1	356	614	254	426
	2	360	613	252	428
	$\bar{x}$	358	614	253	427
	$\bar{x}-3$	266	554	203	346

	a		b		c		d	
	Final	Ratio	Final	Ratio	Final	Ratio	Final	Ratio
A	4.20	32.5	1.381	32.4	4.98	32.1	4.89	32.2
T	4.24	32.9	1.320	32.2	5.12	33.0	5.09	33.5
G	2.36	18.3	0.764	18.6	2.80	18.05	2.69	17.7
OC	2.11	16.35	0.691	16.9	2.62	16.9	2.52	16.6
	12.91	100.05	4.106	100.1	15.52	100.05	15.19	100.0
P.V	4.14 } 4.13 4.12 }		1.32 } 1.32 1.32 }		4.96 } 4.91 4.86 }		5.13 } 5.34 5.14 }	
x 324	13.38		4.28		15.59		17.29	
R	96.6		96.0		99.6		89.9	
90P	7.27				3.96		4.25	

13-xi-52.

Phages & DNA's.

6. mm. *Agarose*: (a) T2+ (3) DNA 0.67 mg } All + 0.5' and H₂O₂H
 (b) T2+2 DNA 0.71 mg }
 (c) T2+5 of 22-V phage 1.47 mg } work 170° 30 min. Dry.
 (d) T6+6 of 31-xi phage 1.52 mg } ↑ 250°, 1.5' + 4 phage 2-11 for P

		G	A	OC	T
B	1	97	62	53	87
	2	95	60	52	80
	$\bar{x}$	96	61	53	84
a	1	356	603	259	423
	2	356	610	257	419
	$\bar{x}$	356	607	258	421
$\bar{x} \pm 3$		260	546	205	337
b	1	180	237	121	193
	2	178	231	119	185
	$\bar{x}$	179	234	120	189
$\bar{x} \pm 3$		84	173	67	105
c	1	404	705	309	493
	2	403	710	304	488
	$\bar{x}$	404	708	307	491
$\bar{x} \pm 3$		308	647	254	407
d	1	393	696	299	492
	2	391	697	295	485
	$\bar{x}$	392	697	297	489
$\bar{x} \pm 3$		296	636	244	405

10. *Micro. papilla californiana*

(a)

(d)

Incl	2.484	2.780	4.783	4.787	4.782	6.124	5.891	24.587	24.561	24.564
MT	2.678	2.676	2.673	2.663		16.910	16.900	16.876	16.861	
Diff	2.102	2.087	2.094	2.099		7.679	7.687	7.688	7.699	
	likely to be low from comparison						7.69 = 7.71 μ			

29.x.52.

Micro. papilla californiana

Admin SO_4 (6 mg/cul) ~~delivered~~ delivered on filter paper & distilled water & read % H₂O.
Read 5 260.

Blank	(a)	(b)	(c)	(d)	(e)
paper	new	common	8.40	new	new
		2.1	old (vial)		
5.2	263	246	882	816	995
5.3	261	249	882	819	—
5.2	264	249	882	818	997
5.2	263	247	882	818	996
5.2 - 8	211	195	830	766	944
Volume based on	2.13	1.97	[8.40]	7.75	9.53
(c) = 8.40					
(grammole)					

12.11

Repeat from same soln, but delivering 2 papillules from 1.97 & 2.11.

B	(a)	(b)	(c)	B	1.97	2.11	8.4
5.5	467	444	893	5.5	467	894	890
5.4	466	432	891	5.5	836	888	893
5.4	466	447	892	—	—	—	—
5.4	466	441	892	5.5	—	891	892
5.4 - 8	412	387	838	—	781	836	837
Per filling	206	194	—	—	195	209	—
Vol. based on	2.06	1.94	—	—	1.96	2.10	—

		D.P		Additional Parameters	
		Date	D.P		
BSNA	8-ix	7.94			
	19-ix	7.21			
	1-xi	8.10			
	2-xi	7.64			

Base ratio	Conditions		A	T	G	C	% P recovery	
BSNA	8-ix	0.25 and 11000	28.0	27.5	22.6	20.5	101	
	9-ix	0.25 and	27.8	27.8	22.5	20.8	101	
	1-x	0.5 and	27.9	27.5	22.55	20.8	99.8	
	3-xi	0.5 and	28.0	26.2	23.2	21.2	97.8	1-x
			27.9	27.25	22.7	20.8	100	5.74

Phage DNA
9-ix 0.5' and 28.1 27.4 22.7 20.5

Phage DNA's: analyses to improved conditions (0.7 mg ↑ 0.25' and H₂O₂).

Sample	Date	Conditions	A	T	G	OC	Recovery %
T2r-2	8-ix		32.4	32.1	18.1	17.4	102 17
	21-x		32.4	32.8	18.1	16.6	96 +99
	13-xi	0.5' and H ₂ O ₂ , small amount	32.4	32.2	18.6	16.9	96.0 -
			32.4	32.4	18.2	17.0	
T2r ⁺ (d)	21-x		32.6	32.4	18.05	16.95	97 7.50
	13-xi	0.5' and H ₂ O ₂ 2/1	32.5	32.9	18.3	16.35	96.6 7.27
T2r ⁺ -1 (d)	21-x		32.5	32.4	18.4	16.7	97 6.13
			32.5	32.6	18.25	16.7	
T4r							
T4r ⁺							
T6r							
T6r ⁺ (sc)	8-ix		32.7	32.9	18.4	16.0	102 5.94
	21-x		33.1	32.4	18.1	16.4	98.6 6.23
T6r ⁺ (an)	9-xii	0.5' and	32.1	32.7	18.4	16.8	98.8 6.76
	6-xi	0.5' and	32.6	32.5	18.5	16.4	95.7 6.76
	21-VII		32.7	32.4	18.0	16.9	98.2 6.67
	28-VIII		32.4	31.9	18.35	17.35	102.6 6.51
	8-ix		32.2	32.2	18.35	17.3	101 6.68
	15-ix		32.3	32.7	18.0	16.9	100.3 6.74
	16-x		32.7	32.6	18.4	16.5	99.6 7.03
			32.4	32.5	18.4	16.6	98.3 6.96

Calculation of P based on weight:

$$Obl = 25 \times 0.976 + 1.50 \times 0.7 = 24.4 + 1.1 = 25.5 \mu l$$

$$\%P = \frac{P}{1.96} \times \frac{25.5}{W} \times \frac{100}{1000} = \frac{P}{W} \times 1300$$

$$\text{or } \frac{P}{2.10} \times \frac{25.5}{W} \times \frac{100}{1000} = \frac{P}{W} \times 1.213$$

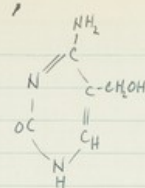
$$Obl = 24.4 + 0.7 \times 0.7 = 24.9 \mu l$$

$$\%P = \frac{P}{W} \times \frac{24.9}{1.96} = \frac{P}{W} \times 1.270$$

$$\text{or } \frac{P}{W} \times \frac{24.9}{2.10} = \frac{P}{W} \times 1.185$$

Whole flaps: analyses i improved conditions. 1.5 and flaps 10.5 and 14.0

Prep'n	Date	Conditions	A	T	G	OC	Purity	%P
T2r-3 (1-1-53)	12-1-53		32.4	33.0	17.8	16.8	97.9	3.50
	12-1-53		32.6	33.8	17.4	16.2	97.1	3.76
	6-11		32.1	33.4	17.6	17.0	97.4	
	12-11		32.3	33.4	17.6	16.7	95.3	
T2r-5 (22-1)	1-X	big tube	32.0	33.2	17.8	17.0	97.6	3.44
	16-X	small tube; 1200ml	31.9	33.2	17.9	17.0	99	4.02
	7-X		32.0	33.7	18.1	16.2	99.0	4.09
	8-X	21A	32.1	33.0	18.05	16.9	99.6	3.96
T4r-7 (21-1)	7-X		32.3	33.8	18.1	16.9	95.1	3.35
	20-X		32.3	33.2	17.9	16.6	93.8	3.49
T4r-8 (21-1)	7-X		31.9	33.6	18.1	16.4	93.6	2.96
			32.2	33.2	18.0	16.3		
T4r-7 (21-1)	7-X		32.5	33.2	18.45	15.9	98.0	3.31
	20-X	Plus unimorph 7.75 μl	32.1	33.1	18.0	16.7	94.4	3.49
	6-X		32.2	33.0	18.4	16.3	96.2	3.35
			32.3	33.1	18.3	16.3		
T5r-6 (21-1)	1-X	big tube	31.9	33.8	17.2	17.1	91.9	2.73
	1-X	small tube	32.8	33.0	18.15	16.1	83.4	4.16
	13-X	21A	32.2	33.5	17.7	16.6	87.9	4.25
T6r-2	10-X	0.4 ml in big tube	32.2	33.0	17.9	16.95	99.4	3.75
	7-X	small tube	32.8	33.1	18.2	15.9	96.4	3.48
T6r-1 (1-1-53)	12-1-53		32.7	33.4	18.15	15.65	99.3	3.26
	12-1-53		32.7	34.1	17.3	16.0	99.4	3.52
	12-11		32.1	33.4	17.6	16.8	97.9	
			32.5	33.4	17.8	16.2	98.5	

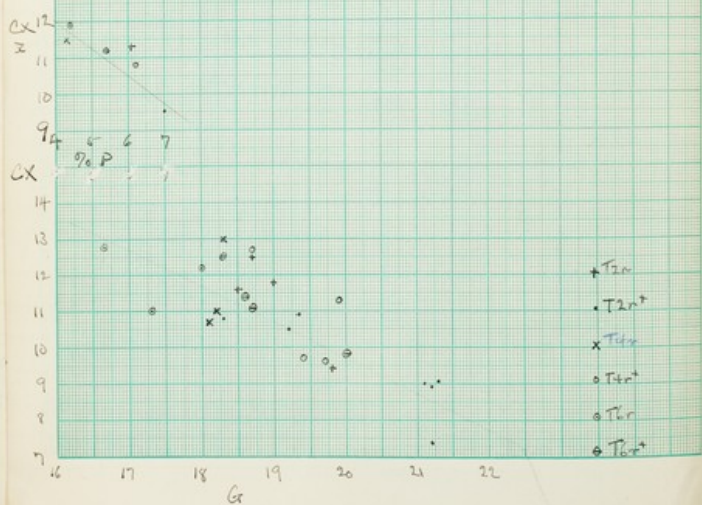


5-methylcytosine

		%					H ₂ O
		M	C	H	O	N	
Cytosine	$C_4H_5ON_3$	111.2	43.2	4.53	14.4	37.8	
5-methylcytosine	$C_5H_7ON_3$	125.3	48.0	5.64	12.8	33.6	
5-methylcytosine	$C_5H_7O_2N_3$	141.3	42.6	5.00	22.7	29.8	26
Cytosine · H ₂ O	$C_4H_7O_2N_3$	129.2				32.5	

Phage DNA's

Phage	No. of analyses	Moles per cent				%P mean	A+T - 3xG
		A	T	G	Cx		
T2r-2	4	33.7	36.0	19.0	11.3	89.1	2.30
T2r ⁺	7	33.5	36.8	20.2	9.5	86.3	2.36
T4r-3	3	33.7	36.7	18.0	11.6	88.6	2.38
T4r ⁺ 2	4	33.6	36.1	19.4	10.8	87.5	2.31
T6r-4	3	34.4	36.3	17.3	12.0	85.4	2.41
T6r ⁺	4	33.6	36.3	18.9	11.2	88.9	2.32



Phage DNA's: HCOOH hydrolysis: Moles per cent.

		A	T	G	Cx	P mean
T2r-2	5-11	34.1	36.8	19.8	9.4	88.5
	17r 24-11	33.8	36.1	18.5	11.6	89.9
	17r 25-11	33.1	36.1	19.0	11.8	87.9
	2-14	33.8	35.0	18.7	12.5	87.1
T2r ⁺ 5-11	33.5	36.4	21.1	9.0		82
T2r ⁺ 21-1	32.2	37.6	21.2	8.9		84
	1-11	33.5	36.3	19.3	10.9	87
	4-11	33.7	36.6	19.2	10.5	86
	5-11	33.8	37.6	21.2	7.4	82
	27-11	34.3	36.6	18.3	10.8	91.1
	17r 25-11	32.2	36.5	21.3	9.05	92.3
14r-3	5-11	34.0	36.7	18.2	11.0	89.6
	17r 24-11	34.4	32.9	18.5	11.1	88.4
	17r 27-11	33.6	35.7	17.8	12.0	87.8
	2-14	33.4	37.8	18.1	10.7	88.5
T4r-2	4-11	33.8	36.9	19.7	9.6	89
	17r 25-11	33.2	35.6	19.9	11.3	84.3
	17r 27-11	34.2	34.4	18.7	12.7	89.5
	2-14	33.3	37.6	19.4	9.7	87.2
T6r-4	5-11	35.1	36.6	17.3	11.0	85.8
	17r 24-11	33.8	36.1	18.0	12.2	84.6
	17r 27-11	34.3	36.2	16.65	12.8	85.8
T6r ⁺	5-11	34.1	35.9	18.6	11.4	90.4
	17r 24-11	33.7	35.4	18.3	12.5	87.3
	17r 25-11	33.0	37.1	20.0	9.8	85.2
	2-14	33.4	36.8	18.7	11.1	91.7

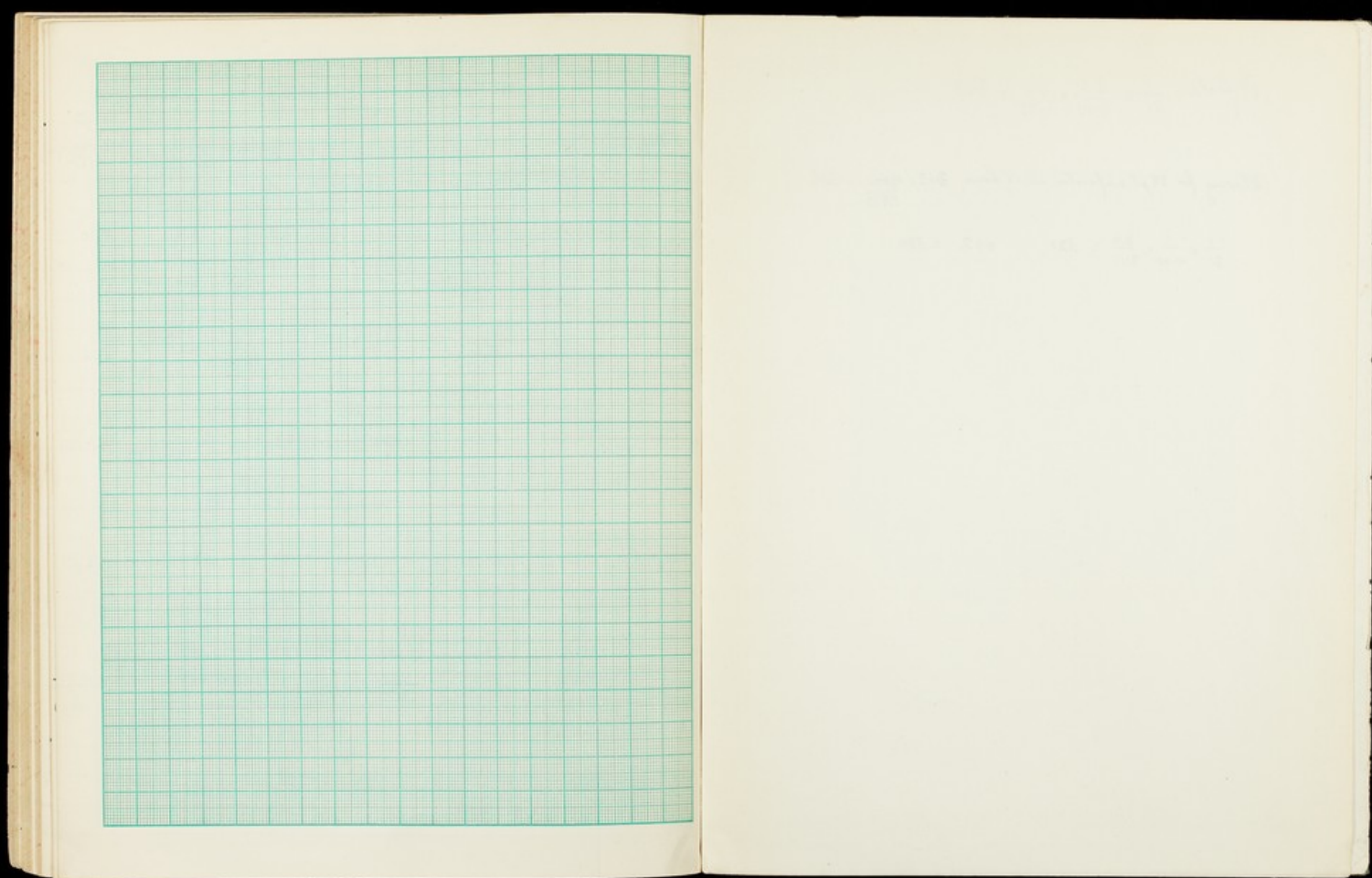
Phage DNA's HCOOH hydrolysis.

	Date	A	T	G	OC	%R
T2r-2	17-III-52 2nd hydro	33.4	34.3	17.8	14.6	89.6
	19-III-52 2nd hydro	33.0	32.5	18.4	16.2	100

T6r⁺
(over)

Whole phages HCOOH hydrolysis.

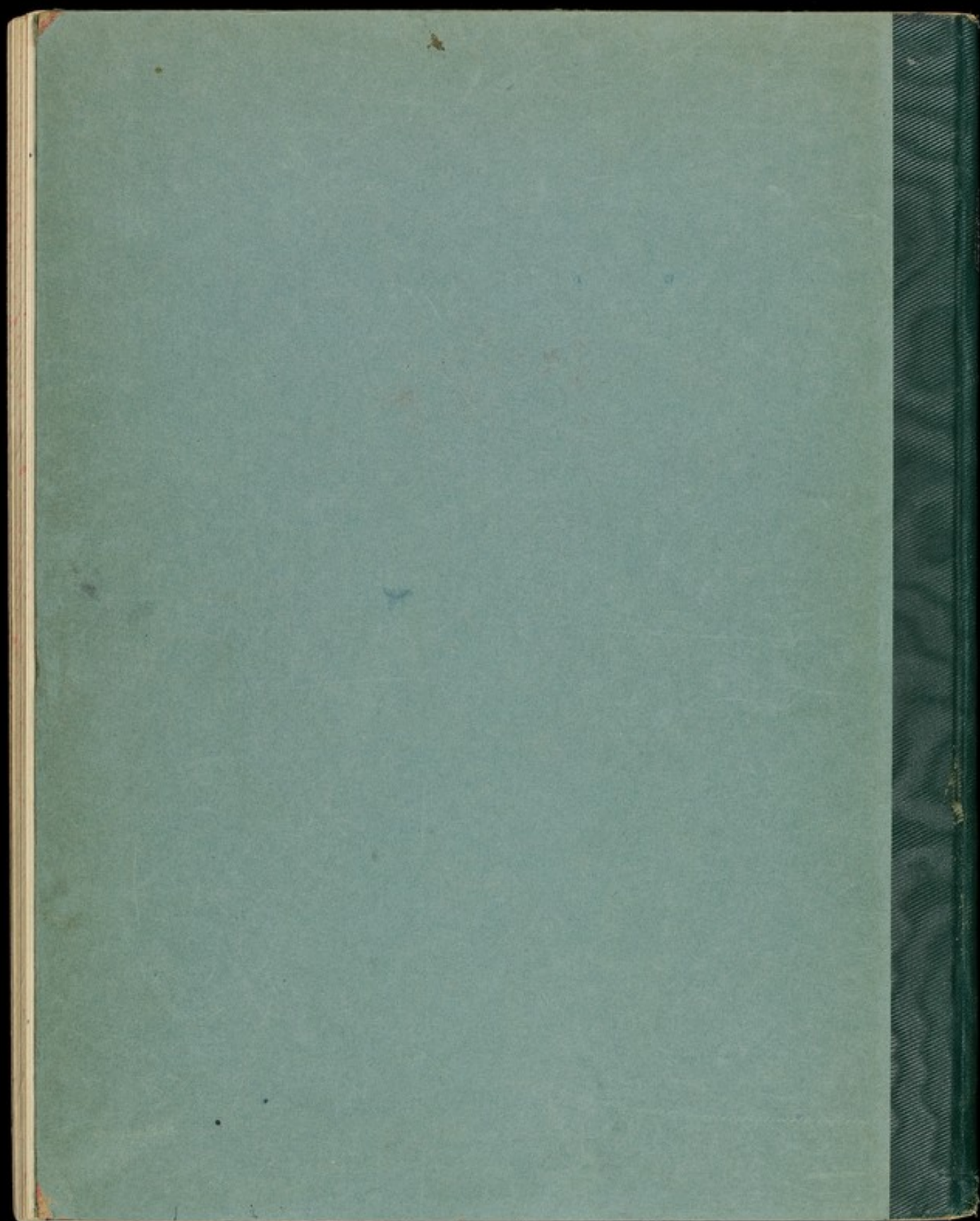
Phage	Date	A	T	G	OC	% P recovery
T2	28-IV-52	33.3	35.2	17.9	13.7	91.0
	19-III-52	32.9	35.3	17.3	14.5	[102]
T4r-8	6-XI-51	32.6	36.2	17.7	13.4	87.3
T4r ⁺	5-XI-51	32.6	35.5	18.2	13.7	91.4 (?)
T6r-6	5-XI-51	33.3	36.2	17.2	13.4	77.5 (?)
	28-IV-52	33.2	38.4	14.9	13.5	83.4
T6r-6	19-III-52	32.8	37.9	14.9	14.5	90.1
	1-XI-51	33.1	37.2	17.9	11.8	91.1
T6r ⁺ -2	28-IV-52	33.3	34.0	17.8	14.9	93.1



$$P \text{ factor } \frac{1}{31} \times \frac{8.3}{4.00} \times \frac{1}{1.95} = 343$$

Allowing for 28 pl evaporation in 18 hours, $343 \times \frac{4000}{3.972} = 346$

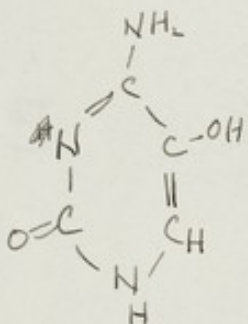
$$\frac{1}{31} \times \frac{1}{4.00} \times \frac{8.4}{2.11} = 321 \quad +1\% = 324$$





ROYAL YORK HOTEL
TORONTO

Canadian Pacific Hotels



Thymine and CX ratios in phage DNA's.

		21-i	1-ii	4-ii	5-ii	27-ii	5-iii	170° 24-iii	170° 25-iii	170° 27-iii	2-iv
T2 ^r	G						19.8	18.5	19.0		18.7
	CX						9.4 ₂₆	11.6 ₂₉	11.8 ₂₆		12.5 ₂₁
T2 ^{r+}	G	21.2	19.3	19.2	21.1, 21.2	18.3			21.3		
	CX	8.9 ₁₈	10.9 ₃₂	10.5 ₂₃	9.0, 7.4 _{21 22}	10.8 ₂₁			9.05 ₂₀		
T4 ^r	G						18.2			17.8	18.1
	CX						11.0 ₂₂			13.0 ₁₉	10.7 ₂₂
T4 ^{r+}	G			19.7					19.9	18.7	19.4
	CX			9.6 ₂₉					11.3 ₂₁	12.7 ₂₃	9.7 ₂₈
T6 ^r	G						17.3	18.0		16.65	
	CX						11.0 ₁₈	12.2 ₁₆		12.8 ₂₃	
T6 ^{r+}	G						18.6	18.3	20.0		18.7
	CX						11.4 ₂₄	12.5 ₂₁	9.8 ₂₈		11.1 ₂₅



ROYAL YORK HOTEL
TORONTO

Canadian Pacific Hotels

W

Phage DNA's - P content from base estimations.

	21-i	1-ii	4-ii	5-ii	27-ii	5-iii	24-iii	25-iii	27-iii	2-iv	
T2r						6.6	6.6	6.7		4.6	6.
T2r ⁺	3.9	8.6	8.5	7.9, [4.8]	8.0			5.2			
T4r						4.7			3.6	4.7	4.
T4r ⁺			7.5					5.4	5.0	7.1	6.
T6r						4.8	3.5		5.0		4.4
T6r ⁺						6.3	4.5	4.4		6.5	5.4

Table II Standard Ultraviolet Absorption Data on Purines and Pyrimidines									
Wave-length, mμ	Thymine			Adenine			Uracil		
	OH	N	H	OH	N	H	OH	N	H
310	0.25	0	0	0	0	0	0	0	0
300	0.27	0	0	0	0	0	0	0	0
295	0.34	0	0	0	0	0	0	0	0
290	0.41	0.02	0.005	0	0	0	0	0	0
285	0.48	0.025	0.01	0	0	0	0	0	0
280	0.56	0.03	0.015	0.04	0.04	0.04	0.04	0.04	0.04
275	0.64	0.04	0.02	0.05	0.05	0.05	0.05	0.05	0.05
270	0.72	0.05	0.025	0.06	0.06	0.06	0.06	0.06	0.06
265	0.80	0.06	0.03	0.07	0.07	0.07	0.07	0.07	0.07
260	0.88	0.07	0.035	0.08	0.08	0.08	0.08	0.08	0.08
255	0.96	0.08	0.04	0.09	0.09	0.09	0.09	0.09	0.09
250	1.04	0.09	0.045	0.10	0.10	0.10	0.10	0.10	0.10
245	1.12	0.10	0.05	0.11	0.11	0.11	0.11	0.11	0.11
240	1.20	0.11	0.055	0.12	0.12	0.12	0.12	0.12	0.12
235	1.28	0.12	0.06	0.13	0.13	0.13	0.13	0.13	0.13
230	1.36	0.13	0.065	0.14	0.14	0.14	0.14	0.14	0.14
225	1.44	0.14	0.07	0.15	0.15	0.15	0.15	0.15	0.15
220	1.52	0.15	0.075	0.16	0.16	0.16	0.16	0.16	0.16
215	1.60	0.16	0.08	0.17	0.17	0.17	0.17	0.17	0.17
210	1.68	0.17	0.085	0.18	0.18	0.18	0.18	0.18	0.18
205	1.76	0.18	0.09	0.19	0.19	0.19	0.19	0.19	0.19
200	1.84	0.19	0.095	0.20	0.20	0.20	0.20	0.20	0.20
195	1.92	0.20	0.10	0.21	0.21	0.21	0.21	0.21	0.21
190	2.00	0.21	0.105	0.22	0.22	0.22	0.22	0.22	0.22
185	2.08	0.22	0.11	0.23	0.23	0.23	0.23	0.23	0.23
180	2.16	0.23	0.115	0.24	0.24	0.24	0.24	0.24	0.24
175	2.24	0.24	0.12	0.25	0.25	0.25	0.25	0.25	0.25
170	2.32	0.25	0.125	0.26	0.26	0.26	0.26	0.26	0.26
165	2.40	0.26	0.13	0.27	0.27	0.27	0.27	0.27	0.27
160	2.48	0.27	0.135	0.28	0.28	0.28	0.28	0.28	0.28
155	2.56	0.28	0.14	0.29	0.29	0.29	0.29	0.29	0.29
150	2.64	0.29	0.145	0.30	0.30	0.30	0.30	0.30	0.30
145	2.72	0.30	0.15	0.31	0.31	0.31	0.31	0.31	0.31
140	2.80	0.31	0.155	0.32	0.32	0.32	0.32	0.32	0.32
135	2.88	0.32	0.16	0.33	0.33	0.33	0.33	0.33	0.33
130	2.96	0.33	0.165	0.34	0.34	0.34	0.34	0.34	0.34
125	3.04	0.34	0.17	0.35	0.35	0.35	0.35	0.35	0.35
120	3.12	0.35	0.175	0.36	0.36	0.36	0.36	0.36	0.36
115	3.20	0.36	0.18	0.37	0.37	0.37	0.37	0.37	0.37
110	3.28	0.37	0.185	0.38	0.38	0.38	0.38	0.38	0.38
105	3.36	0.38	0.19	0.39	0.39	0.39	0.39	0.39	0.39
100	3.44	0.39	0.195	0.40	0.40	0.40	0.40	0.40	0.40
95	3.52	0.40	0.20	0.41	0.41	0.41	0.41	0.41	0.41
90	3.60	0.41	0.205	0.42	0.42	0.42	0.42	0.42	0.42
85	3.68	0.42	0.21	0.43	0.43	0.43	0.43	0.43	0.43
80	3.76	0.43	0.215	0.44	0.44	0.44	0.44	0.44	0.44
75	3.84	0.44	0.22	0.45	0.45	0.45	0.45	0.45	0.45
70	3.92	0.45	0.225	0.46	0.46	0.46	0.46	0.46	0.46
65	4.00	0.46	0.23	0.47	0.47	0.47	0.47	0.47	0.47
60	4.08	0.47	0.235	0.48	0.48	0.48	0.48	0.48	0.48
55	4.16	0.48	0.24	0.49	0.49	0.49	0.49	0.49	0.49
50	4.24	0.49	0.245	0.50	0.50	0.50	0.50	0.50	0.50
45	4.32	0.50	0.25	0.51	0.51	0.51	0.51	0.51	0.51
40	4.40	0.51	0.255	0.52	0.52	0.52	0.52	0.52	0.52
35	4.48	0.52	0.26	0.53	0.53	0.53	0.53	0.53	0.53
30	4.56	0.53	0.265	0.54	0.54	0.54	0.54	0.54	0.54
25	4.64	0.54	0.27	0.55	0.55	0.55	0.55	0.55	0.55
20	4.72	0.55	0.275	0.56	0.56	0.56	0.56	0.56	0.56
15	4.80	0.56	0.28	0.57	0.57	0.57	0.57	0.57	0.57
10	4.88	0.57	0.285	0.58	0.58	0.58	0.58	0.58	0.58
5	4.96	0.58	0.29	0.59	0.59	0.59	0.59	0.59	0.59

Table III Standard Ultraviolet Absorption Data on Purines and Pyrimidines									
Wave-length, mμ	Thymine			Adenine			Uracil		
	OH	N	H	OH	N	H	OH	N	H
310	0.01	0	0	0	0	0	0	0	0
300	0.01	0	0	0	0	0	0	0	0
295	0.01	0	0	0	0	0	0	0	0
290	0.01	0	0	0	0	0	0	0	0
285	0.01	0	0	0	0	0	0	0	0
280	0.01	0	0	0	0	0	0	0	0
275	0.01	0	0	0	0	0	0	0	0
270	0.01	0	0	0	0	0	0	0	0
265	0.01	0	0	0	0	0	0	0	0
260	0.01	0	0	0	0	0	0	0	0
255	0.01	0	0	0	0	0	0	0	0
250	0.01	0	0	0	0	0	0	0	0
245	0.01	0	0	0	0	0	0	0	0
240	0.01	0	0	0	0	0	0	0	0
235	0.01	0	0	0	0	0	0	0	0
230	0.01	0	0	0	0	0	0	0	0
225	0.01	0	0	0	0	0	0	0	0
220	0.01	0	0	0	0	0	0	0	0
215	0.01	0	0	0	0	0	0	0	0
210	0.01	0	0	0	0	0	0	0	0
205	0.01	0	0	0	0	0	0	0	0
200	0.01	0	0	0	0	0	0	0	0
195	0.01	0	0	0	0	0	0	0	0
190	0.01	0	0	0	0	0	0	0	0
185	0.01	0	0	0	0	0	0	0	0
180	0.01	0	0	0	0	0	0	0	0
175	0.01	0	0	0	0	0	0	0	0
170	0.01	0	0	0	0	0	0	0	0
165	0.01	0	0	0	0	0	0	0	0
160	0.01	0	0	0	0	0	0	0	0
155	0.01	0	0	0	0	0	0	0	0
150	0.01	0	0	0	0	0	0	0	0
145	0.01	0	0	0	0	0	0	0	0
140	0.01	0	0	0	0	0	0	0	0
135	0.01	0	0	0	0	0	0	0	0
130	0.01	0	0	0	0	0	0	0	0
125	0.01	0	0	0	0	0	0	0	0
120	0.01	0	0	0	0	0	0	0	0
115	0.01	0	0	0	0	0	0	0	0
110	0.01	0	0	0	0	0	0	0	0
105	0.01	0	0	0	0	0	0	0	0
100	0.01	0	0	0	0	0	0	0	0
95	0.01	0	0	0	0	0	0	0	0
90	0.01	0	0	0	0	0	0	0	0
85	0.01	0	0	0	0	0	0	0	0
80	0.01	0	0	0	0	0	0	0	0
75	0.01	0	0	0	0	0	0	0	0
70	0.01	0	0	0	0	0	0	0	0
65	0.01	0	0	0	0	0	0	0	0
60	0.01	0	0	0	0	0	0	0	0
55	0.01	0	0	0	0	0	0	0	0
50	0.01	0	0	0	0	0	0	0	0
45	0.01	0	0	0	0	0	0	0	0
40	0.01	0	0	0	0	0	0	0	0
35	0.01	0	0	0	0	0	0	0	0
30	0.01	0	0	0	0	0	0	0	0
25	0.01	0	0	0	0	0	0	0	0
20	0.01	0	0	0	0	0	0	0	0
15	0.01	0	0	0	0	0	0	0	0
10	0.01	0	0	0	0	0	0	0	0
5	0.01	0	0	0	0	0	0	0	0

OH, N, and H refer to alkaline, neutral, and acid solutions, respectively; the absorption values are the ratios to a maximum taken as 1.00; max./N_{max} ratios at 250 mμ of an absolute standard.