

No. 5—(continued).

2694.

Mule 3359.
 Horse 3270.
 Horse 3406.
 Horse 3356.
 Mule 3564.
 Mule 3650.
 Donkey foal 3711.
 Donkey foal 3712.

Re- action.	Incub. + R.	Result.	Tested.	VIRUS.				Result.	Remarks.
				Inj.	Orig.	Qual.	Gen.		
(days)	(days)		1908.						
6	13	R †							
5	11	"							
—	—	R ?	Aug. 14	S. 3	3592	Tzn.	8	R D †	
—	—	No R							
7	13	R †							
—	—	No R	Sept. 9	S. 3	—	Polyv. VI	—	R †	Simult. 300 c.c. serum.
9	17	R & D	" 9	"	—	"	—	No R	" " "
5	9	R †							
4	8	"							
5	11	"							
—	—	R ?	—	—	—	—	—	—	Killed on account of debility, Sept. 18, 1908.
7	13	R †							
5	11	"							

R—Reaction. R?—Doubtful reaction. R†—Reaction and died. R & D—Reaction with dikkop. RD†—Reaction with dikkop and died.

EXPERIMENT

TYPE

VI Generation,
VII Generation,
VII Generation,
VII Generation,

Gen.	Date of Injection.	Species.	No.	VIRUS.				Reaction from.	Incub.
				Inj.	Orig.	Gen.	Date.		
VIII	1908. July 1	Horse	3723	S. 2	3578	7	1908. June 29	1908. —	(days) —
	" 21			I. 2			" 29		
	" 4	Horse	3737 3239	S. 5	"	"	" 29	July 12 to 22	7
	" 4 " 21			S. 2 I. 2	" "	" "	" 29 " 29		
	" 4 " 21	Horse	3268	S. 2 I. 2	" "	" "	" 29 " 29	— —	— —
	" 31			Horse	3767	S. 5	"	"	" 29
	" 31	"	3769			"	"	" 29	—
	" 31	"	3782	"	"	"	" 29	—	—
	Aug. 14	Horse foal	3594 3597	S. 2	"	"	" 29	—	—
	" 14			"	"	"	" 29	Aug. 20 to 26	5
	" 14	Horse	3813	S. 3	3661	"	Aug. 11	" 21 to	6
	" 14			"	3815	"	3676	"	Sept. 2 Aug. 20 to 26	5

No. 5—(continued).

2694

Mule 3359.
 Donkey foal 3578.
 Donkey foal, 3661.
 Donkey foal 3676.

Re- action.	Incub. + R.	Result.	Tested.		VIRUS.				Result.	Remarks.
					Inj.	Orig.	Qual.	Gen.		
(days)	(days)			1908.						
—	—	No R R ?	1	Aug. 11	S. 1	3557 3270	Tzn.	8 7	No R	Simult. 300 c.c. serum.
11	18	"	2	Sept. 9 July 29	S. 3 S. 2	— 3650	Polyv. VI Tzn.	— 7	R R †	" " "
—	—	No R	1	Aug. 11	S. 1	3557 3270	Tzn.	8 7	R & D	Simult. 300 c.c. serum.
—	—	No R	2	" 27	S. 3	—	Polyv. VI	—	Slight R	" " "
—	—	No R	—	" 11	S. 1	3557 3270	Tzn.	8 7	R D †	" " "
—	—	No R	1	" 11	"	3557 3270	"	8 7	No R	" " "
—	—	"	2	Oct. 13	S. 2	—	Polyv. VI	—	"	" " "
—	—	"	—	Aug. 11	S. 1	3557 3270	Tzn.	8 7	"	" " " of debility, Oct. 14, 1908.
—	—	"	1	" 11	"	3557 3270	"	8 7	"	Simult. 300 c.c. serum.
—	—	R ?	2	Sept. 9	S. 3	—	Polyv. VI	—	R D †	" " "
7	12	R †	—	—	—	—	—	—	—	—
13	19	R & D	—	Sept. 9	S. 3	—	Polyv. VI	—	R	" " "
7	12	R †	—	—	—	—	—	—	—	—

R—Reaction. R?—Doubtful reaction. R†—Reaction and died. R & D—Reaction with dikkop. RD†—Reaction with dikkop and died.

EXPERIMENT
TYPE

VI Generation,
VII Generation,
VIII Generation,
VIII Generation,
VIII Generation,
VIII Generation,
VIII Generation.

Gen.	Date of Injection.	Species.	No.	VIRUS.				Reaction from.	Incub. (days)
				Inj.	Orig.	Gen.	Date.		
IX	1908. June 15	Horse	3628	S. 2	3569	8	1908. June 8	1908. —	—
	July 4	Horse	3633	S. 10	"	"	" 8	July 8 to 12	4
	June 15			"	"	"	" 8	—	—
	July 4			I. 2	"	"	" 8	—	—
	July 21			"	"	"	" 8	—	—
	June 23	Horse	3646	S. 2	3592	8	June 22	—	—
	„ 23	„	3647	I. 2	„	„	„ 22	June 28 to July 4	5
	Aug. 14	„	3741	S. 3	„	„	„ 22	Aug. 23 to Sept. 3	8
	„ 14	„	3747	„	„	„	„ 22	—	—
	June 26	„	3710	S. 5	3576	„	„ 24	—	—
July 21	I. 2			„	„	„ 24	—	—	
„ 15	Horse	3364	S. 2	3570	8	„ 11	July 19 to 25	4	

VI Generation,
VII Generation,
VII Generation,
VIII Generation,
VIII Generation,
VIII Generation,
VIII Generation.

Gen.	Date of Injection.	Species.	No.	VIRUS.				Reaction from.	Incub. (days)
				Inj.	Orig.	Gen.	Date.		
IX	1908. July 22	Horse	3758	S. 2	3737	8	1908. July 18	1908. July 27 to 30	5
	Aug. 14	„	3613	I. 10	„	„	„ 18	—	—
	July 29	„	3617	S. 10	3741	9	„ 28	—	—
	Aug. 24	„	3859	S. 2	3597	8	Aug. 21	—	—

No. 5—(continued).

2694.

Mule 3359.
 Horse 3464.
 Horse 3579.
 Horse 3569.
 Mule 3592.
 Donkey foal 3576.
 Horse 3570.

Re- action.	Incub. + R.	Result.	Tested.	VIRUS.				Result.	Remarks.	
				Inj.	Orig.	Qual.	Gen.			
(days)	(days)		1908.							
—	—	No R								
4	8	R †								
—	—	No R								
—	—	"	—	Aug. 11	S. 1	3557	Tzn.	8	R †	Simult. 300 c.c. serum. Simult. 400 c.c. polyv. serum.
—	—	"	—	July 14	S. 3	3270	"	7	"	
—	—	"	—			—	Polyv. VI	—	"	
6	11	R †								
12	20	R D †								
—	—	No R	—	Sept. 9	S. 3	—	Polyv. VI	—	R D †	Simult. 300 c.c. serum.
—	—	R ?								
—	—	No R	—	Aug. 14	S. 2	3749	Tzn.	21	R †	After 2 days 200 c.c. serum.
6	10	R D †								

Mule 3359.
 Donkey foal 3578.
 Horse 3464.
 Horse 3737.
 Horse 3741.
 Horse foal 3594.
 Horse foal 3597.

Re- action.	Incub. + R.	Result.	Tested.	VIRUS.				Result.	Remarks.	
				Inj.	Orig.	Qual.	Gen.			
(days)	(days)		1908.							
3	8	R †								
—	—	No R	—	Sept. 9	S. 3	—	Polyv. VI	—	No R	Simult. 300 c.c. serum. " " " 3 Days later, 300 c.c. serum.
—	—	"	1	Aug. 14	"	3592	Tzn.	8	"	
—	—	"	2	Sept. 9	"	3564	"	7	"	
—	—	"	—	" 11	"	3678	Polyv. VI Tzn.	— 6	R † R †	

R—Reaction. R?—Doubtful reaction. R†—Reaction and died. RD—Reaction with dikkop. RD†—Reaction with dikkop and died.

ANALYSIS OF RESULTS—TYPE 2694.

“A.” *Susceptibility.**Results.*

1. Of 51 subcutaneous injections into susceptible horses, 4 reacted and recovered, 14 reacted and died, 33 did not react.
2. Of 17 intrajugular injections into susceptible horses, 9 reacted and died, 8 did not react.
3. Of 5 subcutaneous injections into susceptible mules, 4 reacted and recovered, 1 did not react.
4. Of 2 intrajugular injections into susceptible mules, 1 reacted and recovered, 1 reacted and died.

Taking these figures out according to percentages,

	Reactions.	Deaths.	No Reaction.
	%	%	%
Subcutaneous injections into horses caused	34	26	64
” ” ” mules ”	80	Nil	20
Intrajugular ” ” horses ”	52	52	48
” ” ” mules ”	Not sufficient numbers.		

Conclusions.

1. The susceptibility of mules is greater than that of horses.
2. The subcutaneous injection of virus, type 2694, is more fatal for horses than for mules.
3. The intrajugular injection into horse or mule is more fatal than the subcutaneous injection.
4. The subcutaneous injection was resisted to a greater extent by horses than by mules.

“B.” *Resistance.*

1. Four horses which did not react to the subcutaneous or intrajugular injection of virus, type 2694, all died when tested with the same type.
2. Of 14 horses which did not react to the subcutaneous or intrajugular injection of virus, type 2694, 9 died and 5 reacted when tested with the same strain, different type.
3. Of 8 horses which did not react to the subcutaneous or intrajugular injection of the virus, type 2694, 1 reacted and 7 died when tested later with a different strain of virus.
4. One mule which did not react to the subcutaneous injection died when tested later with a different strain.
5. Three horses which did not react to the subcutaneous injection of 2 c.c. virus died when injected intrajugularly with the same dose of the same virus.
6. Two horses which did not react to the subcutaneous injection of 2 c.c. virus died when injected intrajugularly with 10 c.c. same virus.

7. One horse which did not react to a subcutaneous injection of 10 c.c. nor to an intrajugular injection of 2 c.c. gave a reaction when tested with the same strain, different type.

8. One horse which did not react to a subcutaneous injection nor to an intrajugular injection of 2 c.c., and which did not react to a subcutaneous injection of 1 c.c. virus of a different type, gave a reaction when injected subcutaneously with 3 c.c. virus, different strain.

9. Of two horses which did not react to a subcutaneous or an intrajugular injection of 2 c.c. virus, one reacted and the other died when tested with virus of a different type.

10. One horse which did not react to a subcutaneous injection and two intrajugular injections died when tested with a different type, same strain.

11. One horse which did not react to a subcutaneous injection of 2 c.c. virus died when tested with the same virus, different type.

“C.” Virulency.

Results.

1. Of 25 susceptible horses injected with horse virus, 1 reacted and recovered, 10 reacted and died, 14 did not react.
2. Of 3 susceptible mules injected with horse virus, 2 reacted and recovered, 1 did not react.
3. Of 19 susceptible horses injected with mule virus, 2 reacted and recovered, 8 reacted and died, 9 did not react.
4. Of 4 susceptible mules injected with mule virus, 3 reacted and recovered, 1 reacted and died.
5. Of 16 susceptible horses injected with donkey foal virus, 1 reacted and recovered, 5 reacted and died, 10 did not react.

Taking these figures out according to percentages,

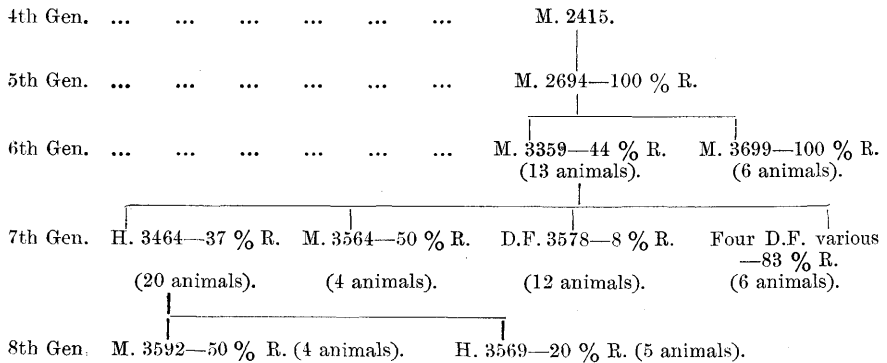
	Reactions.	Deaths.	No Reaction.
	%	%	%
The injection of horses with horse virus caused	44	40	56
“ ” mules ” ” ” ”	67	—	33
“ ” horses ” mule ” ”	55	45	45
“ ” mules ” ” ” ”	100	25	Nil.
“ ” horses ” donkey foal virus caused	40	34	60

Conclusions.

1. The injection of mule virus caused the greatest percentage of reactions.
2. The injection of mule virus caused the greatest mortality.
3. The least mortality and the least reactions were caused by the injection of donkey foal virus.

4. Horse virus failed to cause reactions in a greater percentage of horses than in mules.
5. Mule virus failed to cause reaction in a greater percentage of horses.
6. Donkey virus failed to produce reactions in the greatest percentage.

“D.” Variability.



Conclusions.

1. The virulency of virus is not affected by the generation. It varies within the same generation between the horses, mules, and donkeys, and again between the various lots of donkeys and two different mules.
2. It is remarkable that the virus of the mule caused more reactions than that of horses.
3. The virulency was particularly affected by mule 3699.

“E.” Influence of dose and manner of injection.

Injections of virus of type 2694.

1. In the dose of 2 c.c. subcutaneously, 3 reacted and recovered, 8 reacted and died, 18 did not react.
Of these 18 non-reacters, 11 were tested later by subcutaneous injections of 1 and 2 c.c. (same strain), all reacted and 5 died. One was tested with 10 c.c. and reacted and died; 6 were tested with 3 c.c. (different strain), all reacted and died.
2. In the dose of 3 c.c. subcutaneously, 3 reacted and recovered. 2 reacted and died, 2 did not react.
When tested later by subcutaneous injection of 2 c.c. (different strain), both reacted and died.
3. In the dose of 5 c.c. subcutaneously, 2 reacted and recovered, 2 reacted and died, 5 did not react.
Of these 5 non-reacters, 4 were tested subcutaneously with 2 c.c. (different strain), all reacted and died; and 1 was tested with 2 c.c. (same strain) and reacted and died.

4. In the dose of 10 c.c. subcutaneously, 5 did not react.

Four were tested later with the same strain and reacted and recovered; 1 was tested with a different strain and reacted and recovered (doses 1, 2, and 3 c.c.).

5. In the dose of 20 c.c. subcutaneously, 1 reacted and recovered.

6. In the dose of 50 c.c. subcutaneously, 1 did not react.

When tested later by subcutaneous injection of 2 c.c. (same strain) this animal reacted and died.

7. In the dose of 2 c.c. intrajugularly, 2 reacted and died.

8. In the dose of 5 c.c. intrajugularly, 2 reacted and died.

9. In the dose of 10 c.c. intrajugularly, 1 reacted and recovered.

EXPERIMENT

With Mule Virus, Type 2732,

HORSE 1087

I. Generation,
II Generation,
III Generation,
IV Generation.

Gen.	Date of Injection.	Species.	No.	VIRUS.				Reaction from.	Incub.
				Inj.	Orig.	Gen.	Date.		
V	1907. April 2	Mule	2732	S. 2	2415	4	1907. Jan. 2	1907. April 8 to 16	(days) 6
VI	1908. Feb. 26	"	3286	S. 2	2732	5	April 12	1908. —	—
	Mar. 20	Horse	3431	"	"	"	" 12	March 25 to 30	5
	Aug. 17	"	2838	I. 5	"	"	" 11	Aug. 24 to 28	7
	April 6	Mule	3398	S. 2	"	"	" 12	April 12 to 17	6
	1907. July 27	"	2894	S. 2	2732	5	" 11	—	2894 pr not vi
VII	Aug. 11	"	2957	S. 5	2894	6	Aug. 11	No reaction	—
	1908. April 20	"	3361	S. 2	3398	6	1908. April 14	April 25 to May 3	5
	" 20	Horse	3451	"	"	"	" 14	April 26 to May 5	6
	May 12	"	3306	"	"	"	" 14	May 19 to 26	7
	" 29	"	3252	"	"	"	" 14	June 3 to 8	5
	July 21	"	3356	"	"	"	" 14	July 28 to Aug. 5	7
VIII	May 12	"	3524	"	3451	7	" 29 1907.	May 17 to 22	5
VI	Oct. 8	Mule	3900	"	2732	5	April 12	Oct. 12 to 24	3
	" 8	"	3954	"	"	"	" 12	" 15 to 24	6
	" 8	"	3972	"	"	"	" 12	" 14 to 24	5

No. 6.

Tzaneen strain, fifth generation.

(ORIGIN).

Mule 1965.
 Mule 1996.
 Mules, Natal.
 Mule 2415.

Re- action.	Incub. + R.	Result.		Tested.	VIRUS.				Result.	Remarks.
					Inj.	Orig.	Qual.	Gen.		
(days)	(days)			1907.						
8	14	R & D	1	April 23	S. 2	2148	Tzn.	—	No R	
			2	May 7	S. 6	2709	Ord.	—	"	
						2148	Tzn.	—	"	
						2168	Bul.	—	"	
—	—	R	—	—	—	—	—	—	—	Died 12/4/08 of pneu- monia in- terstitial.
5	10	R D †								
4	11	R †								
5	11	Recovd.	1	1908.	S. 2	2891	Tzn.	4	"	
			2	April 20	"	3494	P.P.R.	1	"	
				May 7	"	3501	CD VI	1	"	
					"	3272	CD V	1	"	
obably rulent	—	Indef. R	—	1907.	S. 2	2884	CD	3	"	Simult. 150 c.c. serum.
				Aug. 22						
—	—	R ?	—	Oct. 4	I. 5	2172	Bul.	—	Slight R	
				Nov. 21	"	3126	CD Mixt.	—	R D †	
8	13	Recovd.	1	1908.	S. 2	2891	Tzn.	4	No R	
			2	May 7	"	2884	CD	3	Slight R	Simult. 100 c.c. serum.
				June 2						
					"	3272	CD V	1	"	" "
					"	2501	CD VI	1	"	" "
					"	3494	P.P.R.	1	"	" "
9	15	"	—	May 23	T.	3544	Simp. III	—	No R	
					8500					
7	14	R & D	—	June 14	T.	3608	Tzn.	19	R	
					10000					
5	10	R D †								
8	15	Recovd.	—	Aug. 14	S. 2	3749	"	21	No R	After 48 hrs. 200 c.c. serum.
				Sept. 2	T.	3816	"	24	"	
					10000					
5	10	R †								
13	16	Recovd.	—	Oct. 29	S. 3	—	Polyv. VI	—	"	Simult. 100 c.c. serum.
10	16	"	—	" 29	"	—	"	—	"	" "
11	16	R & D	—	" 29	"	—	"	—	"	" "

R—Reaction. RD—Reaction with dikkop. R?—Doubtful reaction. RD†—Reaction with dikkop and died. R†—Reaction and died.

EXPERIMENT

TYPE

IV Generation,
V Generation,
VI Generation,
VII Generation,

Gen.	Date of Injection.	Species.	No.	VIRUS.				Reaction from.	Incub. (days)
				Inj.	Orig.	Gen.	Date.		
VIII	1908. May 7	Mule	3433	S. 5	3361	7	1908. April 29	1908. May 15 to 23	8
	" 7	"	3509	I. 5	"	"	" 29	" 11 to 20	4
	" 7	Donkey foal	3205	"	"	"	" 29	" 12 to 21	5
	" 14	Horse	3424	S. 2	"	"	" 29	May 22 to June 1	8
	" 21	"	3535	"	"	"	" 29	May 30 to June 6	9
	" 29	"	3571	"	"	"	" 29	June 6 to 13	8
	June 3	Mule	3389	"	"	"	" 29	" 10 to 17	7
	" 3	Horse	3480	"	"	"	" 29	" 14 to 22	11
	" 3	"	3492	"	"	"	" 29	" 12 to 15	9
	" 5	"	3547	"	"	"	" 29	" 11 to 16	6
	" 5	"	3553	"	"	"	" 29	" 14 to 23	9
	" 26	"	3579	"	"	"	" 29	—	—
	" 30	Mule	3529	"	"	"	" 29	July 4 to 11	4
	July 4	Horse	3625	"	"	"	" 29	" 8 to 11	4
	" 4	"	3629	"	"	"	" 29	" 8 to 11	4
	IX May 21	"	3555	"	3509	8	May 20	May 31 to June 4	10
	June 3	Mule	3559	"	3535	"	June 1	—	—

No. 6—(continued).

2732.

Mule 2415.
 Mule 2732.
 Mule 3398.
 Mule 3361.

Re-action.	Incub. + R.	Result.	Tested.	VIRUS.				Result.	Remarks.
				Inj.	Orig.	Qual.	Gen.		
(days)	(days)		1908.						
7	15	Recovd.	June 2	S. 8	2884 3272 3501 3494	CD CD V CD VI P.P.R.	3 1 1 1	R ," ," ,"	Simult. 100 c.c. serum.
9	13	Recovd.	" 2	"	2884 3272 3501 3494	CD CD V CD VI P.P.R.	3 1 1 1	Indef. R ," ," ,"	
9	14	"	—	—	—	—	—	—	
9	17	R D †	—	—	—	—	—	—	
7	16	"	—	—	—	—	—	—	
7	15	R & D	1 June 30 2 July 23	S. 2 T. 10000	3619 3749	Tzn. "	20 21	R & D Slight R	
7	14	Recovd.	June 26	S. 3	—	Polyv. VI	—	No R	
8	19	R D †	—	—	—	—	—	—	
3	12	R †	—	—	—	—	—	—	
6	12	R †	—	—	—	—	—	—	
9	18	Recovd.	" 30	S. 2	3619	Tzn.	20	R	Died 20/7/08 of pneu- monia. After 48 hrs. 200 c.c. serum.
—	—	Indef. R	July 29	"	3749	"	21	R †	
7	11	R †	—	—	—	—	—	—	
3	7	"	—	—	—	—	—	—	
3	7	"	—	—	—	—	—	—	
4	14	"	—	—	—	—	—	—	
—	—	Irreg. R D and Piro. equi	June 26	S. 3	—	Polyv. VI	—	R	

R—Reaction. R & D—Reaction with dikkop. R †—Reaction and died.
 R D †—Reaction with dikkop and died.

EXPERIMENT

TYPE

VII Generation,
VIII Generation,
VIII Generation,

Gen.	Date of Injection.	Species.	No.	VIRUS.				Reaction from.	Incub. (days)
				Inj.	Orig.	Gen.	Date.		
IX	1908. May 21	Mule	3529	S. 2	3205	8	1908. May 19	1908. —	—
	June 9			I. 2	"	"	" 19	—	—
	May 21	Horse	3547	S. 2	"	"	" 19	—	—
	June 3	"	3588	"	"	"	" 19	—	—
	" 3	"	3613	I. 2	"	"	" 19	—	—
	" 11	"	3620	I. 10	"	"	" 19	June 18 to 23	7
	" 23	Mule	3652	" 2	"	"	" 19	—	—
	July 4	Horse	3604	S. 2	"	"	" 19	—	—
	" 21	"		I. 2	"	"	" 19	—	—
	May 21	Horse	3549	S. 2	3433	"	" 18	May 29 to June 3	8
	" 21	Mule	3508	"	"	"	" 18	—	—
	June 11	"		I. 2	"	"	" 18	—	—
	" 3	Horse	3608	S. 2	"	"	" 18	June 14 to 21	11
" 3	Mule	3531	"	"	"	" 18	" 10 to 21	7	
" 4	Donkey foal	3575	I. 10	"	"	" 18	—	—	
July 4	Horse	3632	S. 2	"	"	" 18	—	—	
X	" 21	"		I. 2	"	"	" 18	June 26 to July 3	5
	June 23	Mule	3651	S. 2	3620	9	June 22	June 27 to July 8	4

No. 6—(continued).

2732.

Mule 3361.
Donkey foal 3205.
Mule 3433.

Re- action.	Incub. + R.	Result.	Tested.		VIRUS.				Result.	Remarks.
					Inj.	Orig.	Qual.	Gen.		
(days)	(days)			1908.						
—	—	No R	—	—	—	—	—	—	—	
—	—	No R	—	June 30	S. 2	3361	Tzn.	7	R †	
—	—	Indef. R	—	" 5	"	"	"	"	"	
—	—	No R	1	" 19	I. 20	3508	"	9	No R	
—	—		2	July 4	S. 2	3398	"	6	R & D	
—	—		3	Sept. 2	T.	3841	"	24	R & Piro.	
—	—	Indef. R	1	June 19	S.10	3574	"	7	No R	
—	—		2	July 21	I. 2	"	"	"	"	
—	—		3	Aug. 14	I.10	3737	"	8	Slight R	
—	—		4	Sept. 9	S. 3	—	Polyv. VI	—	No R	Simult. 300 c.c. serum.
5	12	R D †	—	—	—	—	—	—	—	
—	—	No R	—	July 31	S. 2	3699	Tzn.	6	R †	
—	—	"	—	—	—	—	—	—	—	
—	—	"	1	Aug. 11	S. 1	3557	Tzn.	8	R ?	Simult. 300 c.c. serum.
—	—		—	—	—	3270	"	7	"	
—	—		2	" 27	S. 3	—	Polyv. VI	—	Slight R	
—	—		3	Sept. 17	T.	3888	CD VI	—	No R	" "
—	—		—	—	—	10000	—	—	—	
5	13	R D †	—	—	—	—	—	—	—	
—	—	Indef. R	—	—	—	—	—	—	—	
—	—	No R	—	June 6	S. 3	—	Polyv. VI	—	R	
7	18	R D †	—	—	—	—	—	—	—	
11	18	"	—	—	—	—	—	—	—	
—	—	Indef. R	—	—	—	—	—	—	—	
—	—	No R	—	—	—	—	—	—	—	
7	12	R †	—	—	—	—	—	—	—	
11	15	Recovd.	—	July 21	S. 3	—	Polyv. VI	—	Slight R	After 3 days 100 c.c. pol. serum

R—Reaction. R & D—Reaction with dikkop. R?—Doubtful reaction.
RD†—Reaction with dikkop and died. R†—Reaction and died.

ANALYSIS OF RESULTS—TYPE 2732.

“A.” *Susceptibility.**Results.*

1. Of 23 subcutaneous injections into susceptible horses, 5 reacted and recovered, 13 reacted and died, 5 did not react.
2. Of 5 intrajugular injections into susceptible horses, 3 reacted and died, 2 did not react.
3. Of 17 subcutaneous injections into susceptible mules, 10 reacted and recovered, 2 reacted and died, 5 did not react.
4. Of 4 intrajugular injections into susceptible mules, 1 reacted and recovered, 3 did not react.

Taking these figures out according to percentages,

	Reactions.	Deaths.	No Reaction.
	%	%	%
Subcutaneous injections into horses caused	78	56	22
” ” ” mules ”	70	10	30
Intrajugular ” ” horses ”	60	60	40
” ” ” mules ”	25	Nil.	75

Conclusions.

1. Horses were more susceptible than mules.
2. The susceptibility of horses is greater than that of mules in a subcutaneous injection.

“B.” *Resistance.**Results.*

1. One horse injected subcutaneously with 2 c.c. virus did not react, but died when injected with the same virus intrajugularly.
2. One mule injected subcutaneously and intrajugularly in the dose of 2 c.c. did not react, but died when injected with virus of the same type, previous generation.
3. One horse injected subcutaneously and intrajugularly in the dose of 2 c.c. did not react, but when tested with different type gave a doubtful reaction, and on a succeeding test with a different strain a slight reaction resulted.
4. One mule injected subcutaneously and intrajugularly in the dose of 2 c.c. virus did not react, but showed a reaction when tested with a different strain.

“C.” *Virulency.**Results.*

1. One susceptible horse injected with horse virus reacted and died.
2. Of 2 susceptible mules injected with horse virus, 1 reacted and recovered, 1 did not react.
3. Of 21 susceptible horses injected with mule virus, 5 reacted and recovered, 14 reacted and died, 2 did not react.
4. Of 14 susceptible mules injected with mule virus, 10 reacted and recovered, 2 reacted and died, 2 did not react.
5. Of 5 susceptible horses injected with donkey foal virus, 1 reacted and died, 4 did not react.
6. Of 2 susceptible mules injected with donkey foal virus, 2 did not react.

Taking these figures out according to percentages,

	Reactions.	Deaths.	No Reaction.
	%	%	%
The injection of horses with horse virus caused	—	—	—
" " mules " " " "	—	—	—
" " horses " mule " "	90	65	10
" " mules " " " "	85	15	15
" " horses " donkey foal virus			
caused 	20	20	80

Conclusions.

1. Horses were more susceptible to the injection of mule virus than mules.
2. The injection of mule virus into horses caused the greatest mortality.
3. A very high percentage of animals remained refractory to the injection of donkey foal virus.

"D." Variability.

5th Gen.	...	...	M. 2732—100 % R. (8 animals).	
6th Gen.	...	...	M. 3298—100 % R. (5 animals).	
7th Gen.	...	...	M. 3361—93 % R. (14 animals).	
8th Gen.	...	...	D.F. 3205—12 % R. (9 animals).	M. 3433—80 % R. (5 animals).

Conclusions.

1. In the case of this type the generation seems to affect the virus, but, notwithstanding this, the virulency remains high.
2. Donkey foal virus after passing through a donkey has decreased enormously in virulency.

"E." Influence of dose and manner of injection.

Injection of virus of type 2732.

1. In the dose of 2 c.c. subcutaneously, 13 reacted and recovered, 16 reacted and died, 8 did not react.
Of these 8 non-reacters, 4 were tested later by a subcutaneous injection of 2 c.c., 3 reacted and died, 1 reacted and recovered.
One was injected with 2 c.c. intrajugularly and reacted and died, 3 were injected with 3 c.c. subcutaneously, all 3 reacted and recovered.
2. In the dose of 5 c.c. subcutaneously, 1 reacted and recovered, 1 did not react.
When tested later by intrajugular injection of 5 c.c., this animal reacted and died.
3. In the dose of 2 c.c. intrajugularly, 1 did not react.
When tested later by intrajugular injection of 10 c.c., this animal reacted and recovered.
4. In the dose of 5 c.c. intrajugularly, 1 reacted and recovered, 1 reacted and died.
5. In the dose of 10 c.c. intrajugularly, 1 reacted and recovered, 1 did not react.
When tested later by subcutaneous injection of 2 c.c. this animal, reacted and died.

SUMMARY OF RESULTS GIVEN BY VARIOUS TYPES ARRANGED ACCORDING TO DOSE.

Percentage of Reactions caused by injection of Virus in Varying Doses (as per Col. 1).

	Type 2891.	Type 2694.	Type 2415.	Type 2732.	Type 2539.	Type 1965.
	%	%	%	%	%	%
Subcutaneous injections of 2 c.c.	10	62	11	22	55	31
" " " 3 c.c.	—	30	25	—	—	—
" " " 5 c.c.	—	55	—	—	—	—
" " " 10 c.c.	—	100	—	—	—	—
" " " 20 c.c.	—	—	—	—	—	—
" " " 50 c.c.	—	—	—	—	—	—
Intrajugular injections of 2 c.c.	—	—	—	—	75	—
" " " 3 c.c.	—	—	—	—	—	—
" " " 5 c.c.	—	—	—	—	—	25
" " " 10 c.c.	—	—	—	—	—	33
" " " 50 c.c.	—	—	—	—	—	—
TOTAL	15	54	14	25	55	32

1. Arranged according to virulency, the various types show the following ascending order:—2415, 2891, 2732, 1965, 2694, and 2539.

2. The differences in the virulency is particularly marked; 2891 and 2415 correspond, and these two vira both originated from the Natal virus. Again with types 2539, 2694, and 2732, these all directly descended from type 2415, yet 2732 only causes 25 per cent. reactions, whereas 2539 and 2694 caused 55 per cent. and 54 per cent. respectively.

CONCLUSIONS.

1. The virus Tzaneen has in no instance been virulent for all mules injected; this virulency differs, so to say, from animal to animal; one particular animal seems to influence the virus in such a way that this virulency is either decreased or increased.

2. This reduction of virulency is by no means the result of the dose of virus or of method of injection; small and large doses, injected subcutaneously or intrajugularly, equally fail to produce reactions.

3. This difference in virulency is either due to the virus itself or to the injected animal, but considering that animals which resisted quantities of virus of one particular type, subcutaneously or intrajugularly, contract horse-sickness from a subsequent subcutaneous injection of a smaller quantity, it shows that it is not so much the resistance of the animal but the virulency of the virus of the given animal.

4. It is probably correct to conclude that both animal and virus must be in a certain relation to each other before a reaction can ensue.

G.—FEVER REACTIONS IN HORSES SIMULATING HORSE-SICKNESS.

In a publication of mine, which appeared in the "Deutsche Wochenschrift Thiermedizin" in 1907, I described a fever reaction in horses under the title of "Ephemeral fever in horses," resembling horse-sickness in character, but of a shorter duration and which did not end fatally.