**The Prolongation of the Short-timed Peroxidase Reaction
between Sato-Sekiya's Original Method and
Tohoku Pediatric Method as a Sign of
Avitaminosis B. Clinical Study.**

151st Report of the Peroxidase Reaction.
(98th Human Milk Study.)

By

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Introduction.

The short-timed peroxidase reaction of leucocytes has been wont to be examined by the use of Sato-Sekiya's¹⁾ original method, but T. Suzuki and Shiraishi (Cf. the 23rd Hematological Paper)²⁾ from our Laboratory proposed to use the Tohoku Pediatric Method³⁾, a modification of the former method. Their conclusions are as follows: 1) The normal shortest peroxidase stain-time of the Tohoku Pediatric method is 4" (4 seconds) and a prolongation of the time is a symptom of B-avitaminosis; and 2) the short-timed peroxidase reaction can be shown more precisely by the new method than by the original method, because a prolongation of the shortest peroxidase stain-time is exaggerated in the former method. So I studied further the short-timed peroxidase reaction using the "new technique" proposed by Suzuki and Shiraishi²⁾. In this treatise the experience in cases of breast-fed infants and mothers will be discussed.

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1) A. Sato and S. Sekiya, Tohoku Igaku-Zasshi, 1924, 534; Tohoku J. Exp. Med., 1928, 7, 11.

2) T. Suzuki and S. Shiraishi, Tohoku J. Exp. Med., 1938, 34, 24.

3) A. Sato, T. Suzuki and Ry. Shibata, Tohoku J. Exp. Med., 1934, 24, 195.

Method of Experiment.

(1) Testing of the shortest peroxidase stain-time.

Blood was taken from the ear-lobes of infants and mothers. The short-timed peroxidase reaction^{4) 5)} was performed by use of Sato-Sekiya's original copper method and by the Tohoku Pediatric Method, a modification of the former. Each of them was applied on different blood films from the same cases. The technique used will be described here.

A. Testing the shortest peroxidase stain time with Sato-Sekiya-Suzuki's short-timed peroxidase method^{1) 4)}.

This method will be called the "old technique" for simplicity's sake.

To a fresh, dry blood smear apply Solution I (0.5% copper sulfate solution). Pour off most of it and apply Solution II (saturated solution of benzidine, to which 3% hydrogen peroxide has been added in the amount of 2 drops per 100 c.c.) for as much time or for as many seconds (timed by use of metronome). The metronome is started to count seconds. Solution II is prepared fresh at each examination.

B. Testing of the shortest peroxidase stain time with the Tohoku Pediatric Method.

This method will be called the "new technique." On an air-dried fresh blood smear Solution A (10% copper sulfate solution) was poured and thrown away immediately; and then as soon as Solution B (the same as in the original Sato-Sekiya's method) was poured on it, the metronome was started to count seconds. Neutrophile leucocytes in non B-avitaminotic cases will be stained in 4 seconds.

(2) Testing of Arakawa's reaction (Cf. 31st Report of the Peroxidase Reaction)⁶⁾.

Milk from each mother was examined by Arakawa's reagent. Cases were divided into three groups according to the intensity of Arakawa's reaction.

a. The normally or strongly positive group: Arakawa's reaction of milk from both breasts is normally or strongly positive in one minute.

b. The utterly Arakawa-negative group: Arakawa's reaction of milk from both breasts is almost or entirely negative after five minutes.

4) K. Suzuki, Zikwa Zassi, 1925, 1416; Tohoku J. Exp. Med., 1932, 19, 262.

5) T. Suzuki, Tohoku J. Exp. Med., 1934, 23, 23.

6) T. Arakawa, Tohoku J. Exp. Med., 1930, 16, 107.

c. The weakly Arakawa-positive group: This is an intermediate reaction between the above described reactions.

Result.

All the cases examined numbered 254 (Cf. Tables 1, 2 & 3). Each case, mother and infant, was examined with the "new technique" as well as with the "old technique" for the shortest peroxidase stain-time. In the present work I will report of a prolongation of the shortest peroxidase stain-time in cases of infants and mothers according to Arakawa's reaction, and show how more sensitive the "new technique" is.

A. The shortest peroxidase stain-time in infants.

TABLE 1.

Prolongation of the shortest peroxidase stain-time in the normally or strongly Arakawa-positive group.

Case No.	Date	Name	Age m = month or months	Diagnosis	Food	Arakawa's reaction		Shortest stain-time				Remark
								Infant		Mother		
						Right	Left	The "old technique"	The "new technique"	The "old technique"	The "new technique"	
1	29. III	Y.M.	8m	He	m.m.	1(++)	1(++)	2"	4"	2"	4"	as ss
2	31. "	K.E.	3m	A	m.m.	1(++)	1(++)	2"	4"	2"	4"	
3	18. IV	S.K.	7m	R	m.m.	1(++)	1(++)	2"	4"	2"	4"	
4	6. V	K.M.	10m	He	m.m.	1(++)	4(++)	2"	4"	2"	4"	
5	6. "	K.H.	4m	He	m.m.	2(++)	1(++)	2"	4"	2"	4"	
6	6. "	A.Y.	7m	He	m.m.	1(++)	1(++)	2"	4"	2"	4"	
7	6. "	K.A.	9m	He	m.m.	2(++)	1(++)	2"	4"	2"	4"	
8	6. "	R.N.	2m	He	m.m.	4(++)	1(++)	2"	4"	2"	4"	
9	6. "	I. S.	11m	He	m.m.	2(++)	2(++)	2"	4"	2"	4"	
10	6. "	M.S.	10m	He	m.m.	1(++)	1(++)	2"	4"	2"	4"	
11	6. "	A.Y.	10m	He	m.m.	2(++)	3(++)	2"	4"	2"	4"	
12	6. "	Y.S.	10m	He	m.m.	2(++)	3(++)	2"	4"	2"	4"	
13	7. "	T.O.	12m	He	m.m.	1(++)	1(++)	2"	4"	2"	4"	
14	7. "	M.K.	6m	He	m.m.	1(++)	1(++)	2"	4"	2"	4"	
15	7. "	K.A.	6m	He	m.m.	3(++)	2(++)	2"	4"	2"	4"	
16	7. "	Y.S.	8m	He	m.m.	1(++)	2(++)	2"	4"	2"	4"	
17	7. "	S.H.	11m	He	m.m.	1(++)	1(++)	2"	4"	2"	4"	
18	7. "	M.T.	8m	He	m.m.	1(++)	1(++)	2"	4"	2"	4"	
19	7. "	H.K.	12m	He	m.m.	5(++)	1(++)	2"	4"	2"	4"	
20	7. "	T.S.	10m	He	m.m.	3(++)	1(++)	2"	4"	2"	4"	
21	8. "	Y.T.	10m	He	m.m.	3(++)	4(++)	2"	4"	2"	4"	
22	8. "	M.O.	10m	He	m.m.	3(++)	3(++)	2"	4"	2"	4"	
23	8. "	S.H.	10m	He	m.m.	1(++)	2(++)	2"	4"	2"	4"	
24	8. "	K.S.	8m	He	m.m.	1(++)	2(++)	2"	4"	2"	4"	

TABLE 1. Continued.

Case No.	Date	Name	Age m = month or months	Diagnosis	Food	Arakawa's reaction		Shortest stain-time				Remark
								Infant		Mother		
						Right	Left	The "old technique"	The "new technique"	The "old technique"	The "new technique"	
25	16. V	J. U.	5m	G	m.m.	4(++)	1(##)	2"	4"	2"	4"	
26	27. "	S. K.	4m	D	m.m.	1(++)	1(++)	2"	4"	2"	4"	
27	30. "	J. H.	10m	R	m.m.	2(++)	2(++)	2"	4"	2"	4"	
28	2. VI	S. T.	17m	Hm	m.m., rice	1(++)	2(++)	2"	4"	2"	4"	
29	2. VI	H. K.	4m	G + E	m.m.	2(++)	1(++)	2"	4"	2"	4"	
30	4. "	T. A.	7m	G	m.m.	1(++)	1(++)	2"	4"	2"	4"	
31	6. "	K. K.	19m	D	m.m., rice	1(++)	1(++)	2"	4"	2"	4"	
32	14. "	M. S.	2m	He	m.m.	2(++)	1(++)	2"	4"	2"	4"	
33	23. "	K. T.	2m	S	m.m.	1(++)	1(++)	2"	4"	2"	4"	
34	23. "	S. S.	15m	Ep	m.m., rice	1(++)	1(++)	2"	4"	2"	4"	
35	29. "	H. K.	7m	D + G	m.m.	3(++)	1(++)	2"	4"	2"	4"	
36	1. VII	T. S.	10m	D + G	m.m.	1(++)	1(++)	2"	4"	2"	4"	
37	6. "	T. U.	1m	O	m.m.	1(++)	1(++)	2"	4"	2"	4"	
38	14. IX	S. K.	2m	Hi	m.m.	1(++)	3(++)	2"	4"	2"	4"	
39	16. "	K. S.	5m	A	m.m.	3(++)	4(++)	2"	4"	2"	4"	
40	18. "	N. K.	8m	An	m.m.	1(++)	1(++)	2"	4"	2"	4"	
41	1. XI	N. I.	3m	R	m.m.	1(++)	4(++)	2"	4"	2"	4"	
42	15. "	H. K.	2m	D	m.m.	1(++)	1(++)	2"	4"	2"	4"	
43	21. "	B. A.	20m	R	m.m., rice	5(++)	5(++)	2"	4"	2"	4"	
44	6. XII	T. E.	6m	R	m.m.	2(++)	2(++)	2"	4"	2"	4"	

§ Mother has been taking vitamin B.

§§ Mother and infant have been taking vitamin B.

1. Cases with the normally or strongly Arakawa's reaction:—There are 44 cases showing normal or strong Arakawa's reaction. In all 44 cases of infants, the shortest peroxidase stain-time by the "new technique" was 4" and, of course, was 2" by the "old technique." So, the sucklings nursed by the normally or strongly Arakawa-positive milk shows the normal shortest peroxidase stain-time even by the "new technique," which is more sensitive than the "old one." The infants belonging to this group may well be considered as normal or at least not very B-avitaminotic.

2. Cases with the weakly Arakawa-positive reaction:—Of all 155 cases of sucklings, 32 cases (21%) showed a prolongation of the shortest peroxidase stain-time with the "old technique," while that of the "new technique" was 4" in 90 cases (58%), 5" in 36 cases (23%)

REMARK A.

Table of Signs for showing different Arakawa's reaction.

		1'	2'	3'	4'	5'			1'	2'	3'	4'	5'
1.	1(##) stands for	##	##	##	##	##	25.	8(±) stands for	±	±	+	++	##
2.	1(++)	"	++	##	##	##	26.	9(±)	"	±	±	+	##
3.	2(++)	"	++	++	##	##	27.	10(±)	"	±	±	+	++
4.	3(++)	"	++	++	++	##	28.	11(±)	"	±	±	+	++
5.	4(++)	"	++	++	++	##	29.	12(±)	"	±	±	±	++
6.	5(++)	"	++	++	++	++	30.	13(±)	"	±	±	±	++
7.	1(+)	"	+	++	##	##	31.	14(±)	"	±	±	±	+
8.	2(+)	"	+	++	++	##	32.	15(±)	"	±	±	±	±
9.	3(+)	"	+	++	++	##	33.	1(-)	"	-	±	+	##
10.	4(+)	"	+	++	++	++	34.	2(-)	"	-	±	+	##
11.	5(+)	"	+	+	++	##	35.	3(-)	"	-	±	+	##
12.	6(+)	"	+	+	+	##	36.	4(-)	"	-	±	+	+
13.	7(+)	"	+	+	++	++	37.	5(-)	"	-	±	±	+
14.	8(+)	"	+	+	+	##	38.	6(-)	"	-	±	±	±
15.	9(+)	"	+	+	+	++	39.	7(-)	"	-	±	±	±
16.	10(+)	"	+	+	+	++	40.	8(-)	"	-	-	±	±
17.	11(+)	"	+	+	+	+	41.	9(-)	"	-	-	±	+
18.	1(±)	"	±	+	++	##	42.	10(-)	"	-	-	±	+
19.	2(±)	"	±	+	+	##	43.	11(-)	"	-	-	±	±
20.	3(±)	"	±	+	++	++	44.	12(-)	"	-	-	±	±
21.	4(±)	"	±	+	+	##	45.	13(-)	"	-	-	±	±
22.	5(±)	"	±	+	++	++	46.	14(-)	"	-	-	-	±
23.	6(±)	"	±	+	+	++	47.	15(-)	"	-	-	-	±
24.	7(±)	"	±	+	+	+	48.	16(-)	"	-	-	-	-

Explanation to the table:—

Take, for instance, the sign: 2(++). This stands for Arakawa's reaction with the course (++)1' (++)2' (##)3' (##)4' (##)5'. The sign does not express any prompt result of the reaction, so the prompt reaction of the sign: 2(++) may be (-)0', (±)0', (+)0' or even (++)0', but this will not matter much, as the result of the reaction in one minute is the most important.

REMARK B.

Abbreviations used in Table 1, 2 and 3.

A=Atrophy
An=Anemia
Ar=Anorexia
B=B-avitaminotic dyspepsia
Bm=Bad milk
Br=Bronchitis acuta
C=Conjunctivitis
Ec=Eczema
Ed=Erythrodermia
Ep=Epilepsy
G=Grip
Gr=Granuloma umbilici
H=Hypotrophy
Hd=Hemorrhagic diathesis
He=Healthy
Hi=Hernia inguinalis
Hm=Heine-Medin's disease
Hp.=Hypogalactia
Ht=Hydrocele testis
Hy=Hydrocephalus

Hr=Hare-lip
Ib=Infanti'e beriberi
It=Intertrigo
L=Lues congenita
Lm=Lymphadenitis submaxillaris
M=Megacolon
O=Obstipation
P=Peritonsillitis
Pg=Pharyngotracheitis
Ph=Pharyngitis
Pm=Pneumonia
Pn=Poor nutrition
Pt=Pertussis
R=Rhinopharyngitis
Ra=Rachitis
Sg=Spasm of glottis
St=Stomatitis aphthosa
W=Wry-neck
Wm=Weakness of mind

TABLE 2.

Prolongation of the shortest peroxidase stain-time in the weakly Arakawa-positive group.

Case No.	Date	Name	Age m = month or months	Diagnosis	Food	Arakawa's reaction		Shortest stain-time				Remark
								Infant		Mother		
						Right	Left	The "old technique"	The "new technique"	The "old technique"	The "new technique"	
1	6. I	G.S.	4m	R	m.m.	5(±)	10(+)	2"	4"	2"	4"	§
2	7. "	G.S.	5m	G+D	m.m.	16(-)	4(-)	2"	5"	2"	4"	
3	11. "	Y.T.	6m	G+Hp	m.m.	14(-)	6(±)	3"	6"	3"	6"	
4	14. "	M.A.	12m	R+H	m.m., rice	6(±)	13(-)	3"	6"	2"	5"	
5	14. "	Y.I.	20m	D	m.m., rice	13(-)	11(±)	2"	5"	2"	4"	
6	14. "	K.S.	22m	Pn	m.m., rice	6(±)	11(+)	2"	4"	2"	4"	
7	21. "	Y.S.	11m	G	m.m.	9(+)	10(+)	3"	5"	2"	5"	
8	24. "	S.H.	15m	R	m.m., rice	7(+)	7(-)	2"	4"	2"	4"	
9	25. "	K.N.	2m	A+L	m.m.	13(±)	6(-)	3"	6"	2"	4"	
10	27. "	M.T.	2m	D	m.m.	11(-)	5(±)	3"	6"	2"	5"	
11	29. "	H.S.	5m	Pm	m.m.	6(±)	16(-)	2"	5"	2"	5"	
12	31. "	K.I.	2m	D	m.m., rice	6(±)	9(-)	2"	4"	2"	4"	
13	2. II	R.T.	3m	Ag+G	m.m.	8(+)	11(+)	2"	4"	2"	4"	§
14	2. "	H.H.	7m	R	m.m.	10(+)	8(+)	2"	5"	2"	4"	
15	2. "	K.M.	2m	H	m.m.	11(-)	7(-)	3"	6"	3"	6"	
16	3. "	K.M.	4m	D+G	m.m.	14(-)	13(-)	3"	6"	2"	5"	
17	9. "	N.K.	13m	H+An	m.m., rice	6(±)	3(±)	3"	6"	2"	6"	
18	9. "	H.H.	12m	H	m.m., rice	16(-)	10(±)	3"	6"	2"	4"	
19	12. "	Y.K.	6m	L	m.m.	3(+)	6(+)	2"	4"	2"	4"	
20	25. "	M.Y.	1m	L	m.m.	7(±)	11(-)	2"	4"	2"	4"	
21	21. "	T.S.	21m	D+R	m.m., rice	6(±)	13(±)	2"	5"	2"	4"	
22	21. "	G.Y.	11m	Br	m.m.	4(±)	14(-)	2"	5"	2"	4"	
23	23. "	M.I.	4m	G	m.m.	11(±)	9(±)	2"	4"	2"	4"	
24	24. "	R.T.	9m	D+G	m.m.	16(-)	11(±)	3"	6"	2"	5"	
25	1. III	I. H.	3m	B	m.m.	4(-)	15(-)	2"	5"	2"	4"	
26	2. "	M.N.	5m	H+R	m.m.	14(±)	6(+)	2"	5"	2"	4"	
27	2. "	K.E.	2m	A	m.m.	1(+)	2(-)	2"	5"	2"	4"	
28	4. "	K.S.	16m	R	m.m., rice	3(±)	3(±)	2"	4"	2"	4"	
29	7. "	K.N.	3m	He	m.m.	5(+)	6(+)	2"	4"	2"	4"	§
30	7. "	T.A.	20m	Ra	m.m., rice	4(-)	7(-)	2"	5"	2"	5"	
31	10. "	M.E.	5m	Ar+G	m.m.	5(±)	12(-)	2"	5"	2"	4"	
32	11. "	K.O.	7m	D+G	m.m.	16(-)	2(+)	2"	4"	2"	4"	
33	14. "	K.K.	5m	R+H	m.m.	2(±)	4(±)	2"	4"	2"	4"	
34	20. "	S. M.	5m	St	m.m.	3(-)	1(±)	2"	4"	2"	4"	
35	30. "	S. E.	2m	O	m.m.	7(-)	2(±)	3"	6"	3"	6"	

TABLE 2. Continued.

Case No.	Date	Name	Age m = month or months	Diagnosis	Food	Arakawa's		Shortest stain-time				Remark
						reaction		Infant		Mother		
						Right	Left	The "old technique"	The "new technique"	The "old technique"	The "new technique"	
36	5. IV	K.N.	3m	Ib	m.m.	10(±)	7(-)	3"	6"	3"	6"	s
37	11. "	Y.I.	3m	H	m.m.	10(-)	5(±)	3"	5"	2"	4"	
38	12. "	Y.E.	2m	W	m.m.	10(-)	6(-)	2"	5"	2"	4"	
39	13. "	M.K.	12m	Hr	m.m., rice	10(-)	4(-)	2"	4"	2"	4"	
40	15. "	T.K.	7m	R	m.m.	5(±)	6(±)	2"	4"	2"	4"	
41	15. "	H.I.	3m	H	m.m.	14(-)	11(±)	2"	5"	2"	4"	
42	20. "	H.S.	2m	M	m.m.	12(-)	10(±)	2"	4"	2"	4"	
43	20. "	S.H.	2m	D	m.m., rice	6(-)	10(±)	2"	5"	2"	4"	
44	21. "	M.I.	2m	D	m.m.	16(-)	6(-)	2"	5"	2"	4"	
45	23. "	K.S.	5m	B	m.m.	16(-)	4(-)	2"	5"	2"	4"	
46	25. "	R.N.	2m	Ar	m.m., rice	5(±)	4(±)	2"	4"	2"	4"	
47	25. "	K.K.	4m	Hi	m.m.	6(+)	4(±)	2"	4"	2"	4"	
48	27. "	R.H.	6m	D	m.m.	6(-)	3(±)	2"	5"	2"	4"	
49	27. "	T.M.	6m	H+R	m.m.	5(±)	16(-)	2"	4"	2"	4"	
50	2. V	M.H.	2m	R	m.m.	14(-)	7(±)	3"	6"	2"	5"	
51	2. "	T.Y.	3m	Ib	m.m.	3(±)	11(±)	3"	6"	2"	5"	
52	5. "	M.O.	10m	He	m.m.	5(+)	15(±)	2"	4"	2"	4"	
53	5. "	S.S.	11m	He	m.m.	1(+)	16(-)	2"	4"	2"	4"	
54	6. "	Y.A.	2m	He	m.m.	3(±)	6(-)	2"	5"	2"	4"	
55	7. "	M.S.	11m	He	m.m.	1(+)	8(±)	2"	4"	2"	4"	
56	8. "	Y.S.	9m	He	m.m.	4(±)	2(±)	2"	4"	2"	4"	
57	8. "	J.T.	5m	He	m.m.	8(±)	6(+)	2"	4"	2"	4"	
58	13. "	K.W.	2m	Ip	m.m., rice	8(+)	10(±)	2"	5"	2"	4"	
59	21. "	T.T.	8m	Pm	m.m.	10(+)	6(±)	2"	6"	2"	5"	
60	22. "	A.A.	11m	Br+D	m.m.	11(±)	11(-)	3"	4"	2"	4"	
61	23. "	S.F.	2m	D	m.m.	7(±)	6(+)	2"	6"	2"	5"	
62	24. "	I.O.	8m	Pm	m.m.	5(±)	5(±)	2"	4"	2"	4"	
63	24. "	O.K.	6m	D	m.m.	9(-)	8(-)	3"	5"	2"	4"	
64	26. "	T.O.	14m	D	m.m., rice	1(±)	4(±)	2"	5"	2"	4"	
65	26. "	Y.O.	6m	D	m.m.	6(+)	8(+)	2"	4"	2"	4"	
66	28. "	T.S.	7m	He	m.m.	10(+)	1(-)	2"	4"	2"	4"	
67	28. "	T.O.	14m	D+H	m.m., rice	2(-)	1(±)	2"	4"	2"	4"	
68	30. "	M.E.	5m	D	m.m.	2(-)	16(-)	3"	4"	2"	4"	
69	30. "	J.T.	8m	G+Pt	m.m.	3(-)	3(-)	2"	6"	3"	5"	
70	30. "	J.M.	4m	He	m.m.	4(-)	2(-)	2"	5"	2"	4"	
71	30. "	E.T.	10m	H	m.m.	3(+)	16(-)	2"	4"	2"	4"	
72	30. "	S.M.	2m	L	m.m.	13(±)	14(±)	2"	4"	2"	4"	
73	31. "	K.H.	4m	He	m.m.	9(±)	1(±)	2"	4"	2"	4"	
74	31. "	M.S.	10m	H+G	m.m.	10(±)	4(+)	2"	4"	2"	4"	
75	1. VI	H.H.	5m	H	m.m.	2(+)	7(±)	2"	4"	2"	4"	
76	1. "	S.E.	4m	R	m.m.	6(-)	3(±)	3"	4"	2"	4"	
77	2. "	E.T.	10m	L	m.m.	3(±)	16(-)	2"	6"	2"	5"	
78	2. "	H.I.	4m	G	m.m.	11(+)	2(+)	2"	4"	2"	4"	

TABLE 2. Continued.

Case No.	Date	Name	Age m = month or months	Diagnosis	Food	A r a k a w a 's		Shortest stain-time				Remark
						reaction		Infant		Mother		
						Right	Left	The "old technique"	The "new technique"	The "old technique"	The "new technique"	
79	2. VI	M.H.	3m	Br+H	m.m.	7(-)	3(±)	2"	4"	2"	4"	S
80	3. "	I. H.	2m	D	m.m.	1(±)	1(±)	2"	4"	2"	4"	
81	3. "	Y.I.	11m	He	m.m.	14(±)	3(+)	2"	4"	2"	4"	
82	4. "	Y.T.	2m	He	m.m.	7(±)	2(-)	2"	4"	2"	4"	
83	6. "	H.T.	3m	R	m.m.	1(+)	10(±)	2"	4"	2"	4"	
84	7. "	K.N.	19m	Pm	m.m., rice	16(-)	1(+)	2"	4"	2"	4"	
85	7. "	K.K.	5m	Pr	m.m.	7(-)	3(+)	2"	4"	2"	4"	
86	8. "	N.K.	12m	R	m.m., rice	8(±)	3(±)	2"	4"	2"	4"	
87	8. "	S.G.	20m	R	m.m., rice	3(±)	4(+)	2"	4"	2"	4"	
88	8. "	I. I.	9m	Wm	m.m.	6(-)	2(+)	2"	4"	2"	4"	
89	10. "	T.O.	16m	Pn	m.m., rice	11(±)	9(±)	2"	4"	2"	4"	
90	10. "	K.M.	4m	D	m.m.	4(+)	4(-)	3"	4"	2"	4"	
91	11. "	K.K.	6m	D	m.m.	11(±)	8(-)	2"	6"	2"	5"	
92	13. "	S.S.	14m	Br	m.m., rice	5(+)	6(±)	2"	5"	2"	4"	
93	13. "	T.M.	2m	He	m.m.	7(±)	7(±)	3"	4"	2"	4"	
94	14. "	T.T.	13m	Ec	m.m., rice	2(+)	11(±)	2"	6"	2"	5"	
95	16. "	A.S.	2m	Pg	m.m.	11(+)	14(±)	2"	4"	2"	4"	
96	16. "	H.A.	7m	D+L	m.m.	5(+)	7(±)	2"	4"	2"	4"	
97	16. "	K.N.	5m	Ph	m.m.	15(±)	4(±)	2"	4"	2"	4"	
98	17. "	H.E.	3m	D+Ph	m.m.	6(+)	2(+)	2"	4"	2"	4"	
99	17. "	M.K.	11m	H	m.m.	6(+)	11(±)	2"	4"	2"	4"	
100	18. "	T.W.	6m	Hg	m.m.	1(±)	1(+)	2"	5"	2"	4"	
101	18. "	T.K.	3m	Dy	m.m.	13(±)	11(±)	3"	4"	2"	4"	
102	23. "	H.O.	4m	Pt	m.m.	7(-)	12(+)	2"	6"	2"	5"	
103	23. "	E.C.	10m	Hm	m.m.	3(±)	16(-)	2"	4"	2"	4"	
104	23. "	T.H.	4m	D	m.m.	9(±)	12(±)	2"	5"	2"	5"	
105	24. "	A.A.	12m	D+H	m.m., rice	5(±)	1(+)	3"	4"	2"	4"	
106	24. "	H.I.	4m	G	m.m.	11(±)	1(+)	2"	6"	2"	5"	
107	24. "	Y.S.	15m	H	m.m., rice	13(±)	5(±)	2"	4"	2"	4"	
108	25. "	M.I.	3m	Br	m.m.	4(-)	3(±)	2"	4"	2"	4"	
109	25. "	Y.I.	11m	He	m.m.	14(±)	6(+)	2"	4"	2"	4"	
110	28. "	T.S.	19m	Hm	m.m., rice	12(±)	1(±)	2"	4"	2"	4"	
111	2. VII	K.S.	9m	R	m.m.	7(±)	3(±)	2"	4"	2"	4"	
112	2. "	Y.N.	15m	D	m.m.	8(±)	6(+)	2"	4"	2"	4"	
113	4. "	M.Y.	6m	Lm	m.m.	1(±)	1(+)	2"	4"	2"	4"	
114	6. "	K.M.	5m	Ip	m.m.	11(-)	9(±)	3"	4"	2"	4"	
115	11. "	Y.N.	5m	D	m.m.	5(±)	15(±)	2"	6"	3"	6"	
116	30. "	Y.T.	1.5m	He	m.m.	11(+)	9(-)	2"	4"	2"	4"	
117	6. VIII	K.K.	5m	G	m.m.	7(-)	6(+)	2"	4"	2"	4"	
118	7. IX	K.S.	4m	R	m.m.	7(±)	4(-)	2"	4"	2"	4"	

TABLE 2. Continued.

Case No.	Date	Name	Age m = month or months	Diagnosis	Food	Arakawa's reaction		Shortest stain-time				Remark
								Infant		Mother		
						Right	Left	The "old technique"	The "new technique"	The "old technique"	The "new technique"	
119	8. IX	I. I.	9m	He	m.m.	1(+)	2(±)	2"	5"	2"	4"	
120	10. "	K.M.	4m	G	m.m.	4(-)	4(-)	3"	4"	2"	4"	
121	13. "	K.K.	6m	D	m.m.	7(±)	9(-)	2"	6"	2"	5"	
122	17. "	T.M.	2m	Hb	m.m.	7(±)	7(±)	2"	5"	2"	5"	
123	24. "	A.S.	2m	Pg	m.m.	11(+)	8(-)	2"	4"	2"	4"	
124	28. "	H.W.	8m	Hm	m.m.	7(±)	12(-)	2"	5"	2"	4"	
125	29. "	Y.M.	9m	H	m.m.	6(+)	9(+)	2"	5"	2"	5"	
126	29. "	S.K.	2m	Pt	m.m.	7(±)	9(+)	2"	4"	2"	4"	
127	5. X	M.T.	2m	Gr	m.m.	6(-)	5(±)	2"	4"	2"	4"	
128	6. "	K.K.	8m	D	m.m.	9(+)	5(±)	2"	4"	2"	4"	
129	8. "	M.H.	2m	St	m.m.	1(+)	7(±)	2"	5"	2"	5"	
130	11. XI	H.B.	2m	Hm	m.m.	9(-)	4(-)	3"	4"	2"	4"	
131	12. "	T.T.	9m	D	m.m.	2(+)	3(+)	2"	6"	3"	6"	
132	12. "	S.T.	10m	G	m.m.	4(+)	16(-)	2"	4"	2"	4"	
133	13. "	K.K.	6m	D	m.m.	1(+)	12(-)	3"	4"	2"	4"	
134	15. "	H.K.	1.5m	He	m.m.	1(+)	2(+)	2"	6"	2"	4"	
135	16. "	Y.N.	4m	H	m.m.	6(±)	7(±)	3"	4"	2"	4"	
136	24. "	E.H.	5m	D	m.m.	6(±)	11(±)	2"	6"	3"	6"	
137	29. "	T.M.	5m	R	m.m.	4(+)	6(-)	2"	5"	2"	4"	
138	1. XII	Y.A.	12m	Br	m.m.	12(-)	12(-)	2"	4"	2"	5"	
139	2. "	J.O.	13m	He	m.m., rice	4(-)	2(-)	3"	4"	2"	4"	
140	2. "	T.Y.	11m	D	m.m., rice	6(-)	2(-)	2"	6"	2"	5"	
141	3. "	S.K.	8m	Pg	m.m.	14(-)	7(+)	2"	4"	2"	4"	
142	5. "	E.T.	4m	Ph	m.m.	2(+)	5(±)	2"	4"	2"	4"	
143	6. "	T.E.	6m	R	m.m.	4(+)	4(+)	2"	4"	2"	4"	
144	9. "	T.N.	1m	D	m.m.	12(-)	1(±)	2"	4"	2"	4"	
145	9. "	T.A.	12m	D	m.m., rice	12(-)	4(+)	2"	4"	2"	4"	
146	9. "	H.M.	14m	Hg	m.m., rice	12(-)	3(±)	2"	4"	2"	4"	
147	9. "	K.M.	8m	H+R	m.m.	5(±)	4(+)	2"	4"	2"	4"	
148	9. "	K.T.	2.5m	D	m.m.	1(+)	4(-)	2"	4"	2"	4"	
149	20. "	K.K.	4m	G	m.m.	3(+)	5(±)	2"	4"	2"	4"	
150	21. "	M.C.	9m	C+H	m.m.	2(±)	3(±)	3"	4"	2"	4"	
151	21. "	H.S.	11m	H	m.m., rice	11(±)	13(±)	2"	6"	2"	5"	
152	22. "	K.T.	6m	G	m.m.	14(-)	11(±)	2"	4"	2"	4"	
153	23. "	M.C.	10m	Hm	m.m.	16(-)	3(-)	3"	5"	2"	4"	
154	26. "	J. M.	9m	R	m.m.	8(±)	7(±)	2"	6"	2"	5"	

§ Mother has been taking vitamin B.

and 6" in 29 cases (19%). Thus, in this group, the normal shortest peroxidase stain-time was seen in 79% among them with the "old technique" and in 58% of the cases with the "new technique." And

TABLE 3.

*Prolongation of the shortest peroxidase stain-time in the
utterly Arakawa-negative group.*

Case No.	Date	Name	Age m = month or months	Diagnosis	Food	A r a k a w a ' s		Shortest stain-time				Remark
						reaction		Infant		Mother		
						Right	Left	The "old technique"	The "new technique"	The "old technique"	The "new technique"	
1	2. I	H.M.	11m	Ib	m.m.	16(-)	12(-)	3"	6"	3"	6"	ss
2	28. "	T.S.	8m	D+P	m.m.	16(-)	7(-)	2"	5"	2"	4"	
3	22. "	H.Y.	4m	Ib+H	m.m.	15(-)	16(-)	3"	6"	2"	4"	
4	31. "	T.S.	2m	Ed+H	m.m.	15(-)	16(-)	2"	5"	2"	5"	
5	31. "	M.A.	2m	Ib+D	m.m.	8(-)	8(-)	3"	6"	2"	4"	
6	2. II	S.S.	4m	Ed	m.m.	14(-)	14(-)	3"	6"	2"	5"	ss
7	14. "	B.H.	2m	Ht	m.m.	7(-)	14(-)	2"	5"	2"	4"	
8	15. "	K.K.	3m	D	m.m.	11(-)	16(-)	3"	6"	2"	5"	
9	4. III	K.O.	2m	Ib	m.m.	8(-)	14(-)	3"	7"	3"	6"	
10	14. "	H.S.	2m	B	m.m.	16(-)	16(-)	3"	6"	3"	5"	
11	16. "	H.S.	5m	H	m.m.	16(-)	16(-)	3"	6"	2"	4"	ss
12	20. "	K.A.	2m	D+It	m.m.	12(-)	15(-)	3"	6"	2"	5"	
13	5. IV	T.K.	2m	Sg	m.m.	12(-)	16(-)	3"	6"	3"	5"	
14	11. "	S.T.	2m	A	m.m.	16(-)	16(-)	3"	6"	2"	4"	
15	15. "	E.S.	2m	R	m.m.	14(-)	15(-)	2"	5"	2"	4"	
16	18. "	T.S.	7m	A	m.m.	11(-)	15(-)	2"	5"	2"	4"	ss
17	6. V	K.E.	2m	B	m.m.	16(-)	16(-)	3"	6"	2"	5"	
18	9. "	Y.K.	14m	R	m.m., rice	16(-)	15(-)	2"	5"	2"	4"	
19	13. "	T.S.	20m	R	m.m., rice	12(-)	14(-)	2"	4"	2"	4"	
20	25. "	I. I.	11m	D	m.m.	14(-)	14(-)	3"	6"	2"	5"	
21	28. "	T.S.	2m	Bm	m.m.	16(-)	15(-)	3"	6"	2"	5"	ss
22	28. "	T.S.	2m	B	m.m.	16(-)	16(-)	3"	6"	2"	5"	
23	1. VI	J.K.	18m	R+H	m.m., rice	14(-)	12(-)	2"	4"	2"	4"	
24	5. "	S.K.	5m	H	m.m.	16(-)	16(-)	3"	6"	3"	5"	
25	10. "	Y.K.	2m	D+Ag	m.m.	12(-)	8(-)	2"	5"	2"	4"	
26	13. "	K.T.	15m	D+Ph	m.m., rice	15(-)	16(-)	2"	4"	2"	4"	ss
27	13. "	M.S.	2m	D	m.m.	15(-)	15(-)	3"	6"	2"	5"	
28	16. "	M.O.	11m	D	m.m., rice	8(-)	16(-)	2"	4"	2"	4"	
29	17. "	S.S.	16m	Pn	m.m., rice	7(-)	16(-)	2"	5"	2"	4"	
30	18. "	M.T.	19m	Hm	m.m., rice	16(-)	16(-)	2"	4"	2"	4"	
31	20. "	M.H.	11m	Ar	m.m.	16(-)	16(-)	3"	6"	2"	4"	ss
32	20. "	M.N.	2m	An	m.m.	16(-)	15(-)	2"	4"	2"	4"	
33	20. "	M.N.	8m	D+A	m.m.	11(-)	11(-)	3"	6"	2"	4"	
34	30. "	K.N.	11m	Hm	m.m.	12(-)	12(-)	2"	5"	2"	4"	
35	2. VII	M.T.	11m	B	m.m.	16(-)	16(-)	3"	6"	2"	5"	
36	4. "	T.T.	11m	A+Ph	m.m.	14(-)	15(-)	3"	6"	2"	5"	ss
37	11. "	K.S.	5m	D	m.m.	16(-)	16(-)	3"	6"	2"	4"	
38	28. VIII	S.O.	11m	H+Pm	m.m.	16(-)	16(-)	2"	5"	2"	4"	

TABLE 3. Continued.

Case No.	Date	Name	Age m=month or months	Diagnosis	Food	Arakawa's		Shortest stain-time				Remark
						reaction		Infant		Mother		
						Right	Left	The "old technique"	The "new technique"	The "old technique"	The "new technique"	
39	3. VIII	S. T.	2m	B	m.m.	16 (—)	16 (—)	3"	6"	2"	5"	
40	5. "	M.S.	8m	B	m.m.	16 (—)	16 (—)	3"	6"	2"	5"	
41	10. "	R.K.	3m	B	m.m.	8 (—)	11 (—)	3"	6"	3"	6"	
42	11. IX	Y.S.	6m	D	m.m.	7 (—)	16 (—)	3"	6"	2"	6"	
43	17. "	N.S.	9m	He	m.m.	8 (—)	8 (—)	2"	5"	2"	4"	
44	21. "	A.O.	2m	B	m.m.	16 (—)	16 (—)	3"	6"	2"	5"	
45	4. X	M.S.	2m	Pm	m.m.	16 (—)	16 (—)	3"	6"	2"	5"	
46	8. "	K.S.	12m	Dy	m.m.	14 (—)	14 (—)	3"	6"	2"	4"	
47	20. "	K.S.	3m	D	m.m.	16 (—)	14 (—)	3"	6"	2"	5"	
48	20. "	M.T.	3m	D	m.m.	16 (—)	14 (—)	3"	6"	3"	5"	
49	22. "	J. O.	5m	R	m.m.	13 (—)	13 (—)	3"	6"	2"	5"	
50	2. XII	M.M.	1m	B	m.m.	13 (—)	16 (—)	3"	6"	2"	5"	
51	3. "	S. T.	1.5m	B	m.m.	16 (—)	16 (—)	3"	6"	2"	5"	
52	5. "	M.S.	8m	D	m.m.	16 (—)	16 (—)	3"	6"	2"	4"	
53	10. "	R.K.	2.5m	B	m.m.	12 (—)	12 (—)	3"	6"	2"	5"	
54	26. "	T.H.	11m	R+D	m.m.	15 (—)	12 (—)	3"	6"	2"	4"	
55	26. "	R.O.	2m	R	m.m.	14 (—)	11 (—)	2"	5"	2"	4"	

§ Mother has been taking vitamin B.

prolongations of the shortest peroxidase stain-time were seen in 21% with the former and in 42% with the latter.

3. Cases with negative Arakawa's reaction:—There were 55 cases showing the negative Arakawa reaction. Of this group 18 cases (33%) showed the normal shortest peroxidase stain-time (2 seconds) and a prolongation of it was seen in 37 cases (67%) with 3 seconds by the "old technique." The shortest stain-time of the "new technique" was normal (4") in 6 cases (11%), 5" in 12 cases (22%), 6" in 36 cases (65%) and 7" in the remaining 1 case (2%). By the latter technique, prolongations were seen in 49 cases (89%) in sum total.

B. The shortest peroxidase stain-time in mothers.

In this group one will at once notice a smaller percentage of cases with a prolongation by the old method. In the normally or strongly Arakawa-positive group, there were no cases with any prolongation with either the "old or the new technique." In the weakly Arakawa-positive group, there were: 1) 8 cases (5%) with a prolongation by the "old technique;" 2) 35 cases (22.5%) with a prolongation (5 seconds)

TABLE 4.

Distribution of infantile cases of the three different groups of Arakawa's reaction according to the shortest peroxidase stain-time and to the original Tohoku Pediatric Method.

Arakawa's reaction	Total No. of cases	Shortest peroxidase stain-time					
		The "old technique"		The "new technique"			
		2 seconds	3 seconds	4 seconds	5 seconds	6 seconds	7 seconds
Normally or strongly positive group (mother)	44	44 cases (100%)	44 cases (0 %)	0 case (100%)	0 case (0 %)	0 case (0 %)	0 case (0 %)
Weakly positive (mother)	155	123 " (79 ")	32 cases (21 ")	90 " (58 ")	36 cases (23 ")	29 cases (19 ")	0 " (0 ")
Negative group (mother)	55	18 " (33 ")	38 " (67 ")	6 " (11 ")	12 " (22 ")	36 " (65 ")	1 " (2 ")

TABLE 5.

Distribution of maternal cases of the three different groups of Arakawa's reaction according to the shortest peroxidase stain-time and to the original and Tohoku Pediatric Method.

Arakawa's reaction	Total No. of cases	Shortest peroxidase stain-time					
		The "old technique"		The "new technique"			
		2 seconds	3 seconds	4 seconds	5 seconds	6 seconds	7 seconds
Normally or strongly positive group (mother)	44	44 cases (100%)	0 case (0 %)	44 cases (100%)	0 case (0 %)	0 case (0 %)	0 case (0 %)
Weakly positive (mother)	155	147 " (95 ")	8 cases (5 ")	120 " (77.5 ")	28 cases (18 ")	7 cases (4.5 ")	0 "
Negative group (mother)	55	48 " (87 ")	7 " (13 ")	27 " (49 ")	25 " (45.5 ")	3 " (5.5 ")	

with the "new technique." In the Arakawa-negative group, there were 7 cases (13%) with 3" by the "old technique," while there were 25 cases (45.5%) with 5", in 3 cases (5.5%) with 6" by the "new technique".

C. Comparison of the prolongations of the shortest stain-time by the two methods (Cf. Tables 6 and 7).

Now I have already shown that the "new technique" is more sensitive than the "old one" in maternal cases as well as in infantile cases. And it may be interesting to compare a prolongation by the

TABLE 6.

*Comparison of the prolongation of the shortest stain-time
according to the "old" and "new technique"
in infantile cases.*

Arakawa's reaction	Not prolonged		Prolonged	
	The "old tech- nique"	The "new tech- nique"	The "old tech- nique"	The "new tech- nique"
Normally or strongly positive group	100%	100%	0 %	0 %
Weakly positive group	79 "	58 "	21 "	42 "
Negative group	33 "	11 "	67 "	89 "

TABLE 7.

*Comparison of the prolongation of the shortest stain-time
according to the "old" and "new technique"
in maternal cases.*

Arakawa's reaction	Not prolonged		Prolonged	
	The "old tech- nique"	The "new tech- nique"	The "old tech- nique"	The "new tech- nique"
Normally or strongly positive group	100%	100%	0 %	0 %
Weakly positive group	95 "	77.5 "	5 "	22.5 "
Negative group	87 "	49 "	13 "	51 "

"new technique" with that of the "old one." If one takes a glimpse at Tables 6 and 7, one will at once notice a larger percentage of cases with prolongations by the "new technique."

First see the cases belonging to the weakly Arakawa-positive group. In the infants fed on the weakly Arakawa-positive milk, cases with prolongation were seen in 21% with the "old technique," and in 42% with the "new one." With the latter technique, there were precisely as many cases with prolongation as in the former. In this group a prolongation was seen in 22.5% of maternal cases with the "new technique," though only 5% were seen with the "old one." In infants fed on the Arakawa-negative group, a prolongation was seen in 67%

of the cases with the "old technique," or in 89% of them with the "new technique." In the maternal cases, a prolongation was seen in 13% of them with the "old technique" or in 51% of them with the "new technique."

According to Tables 6 and 7, a prolongation of the shortest stain-time is more remarkable in infants than in mothers, and the weaker the reaction, the more the prolongation increases remarkably in percentage with the "new technique" particularly.

D. Comparisons of prolongation of the shortest peroxidase stain-time between two methods (Cf. Tables 8 and 9).

TABLE 8.

Prolongation of the shortest peroxidase stain-time with the two techniques in infantile cases.

Groups according to Arakawa's reaction	1. No prolongation with both techniques	2. Prolongation with the "new technique" alone	3. Prolongation with both techniques
Normally or strongly positive group	100% (all case)	0 %	0 %
Weakly positive group	58 " (91 cases among 155)	21 " (32 cases among 155)	21 " (32 cases among 155)
Negative group	11 " (6 cases among 55)	22 " (12 cases among 55)	67 " (37 cases among 55)

TABLE 9.

Prolongation of the shortest peroxidase stain-time with the two techniques in maternal cases.

Groups according to Arakawa's reaction	1. No prolongation with both techniques	2. Prolongation with the "new technique" alone	3. Prolongation with both techniques
Normally or strongly positive group	100% (all cases)	0 %	0 %
Weakly positive group	78 " (120 cases among 155)	17 " (27 cases among 155)	5 " (8 cases among 155)
Negative group	48 " (27 cases among 55)	38 " (21 cases among 55)	13 " (7 cases among 55)

In Tables 8 and 9 a comparison of prolongation of the shortest peroxidase stain-time between the two techniques is shown. Tables 8 and 9 concern infantile and maternal cases respectively. As will be

seen from these tables, cases of a prolongation are larger in the Arakawa-negative group than in the weakly Arakawa-negative group, and with the "new technique" than the "old technique" increase more. In maternal cases, a smaller percentage is seen than in infantile cases in general. It is needless to add that there is no case of prolongation belonging to the normally or strongly Arakawa-positive group.

Last, but not least, there has been one thing left unsaid so far. In Tables 4~9, 100% or 0% are printed in thick type. These columns belong to the normally or strongly Arakawa-positive group. No case belonging to this group, infantile or maternal, showed a prolongation of the shortest peroxidase stain-time either with the "old technique" or with the "new technique." I shall come upon this point later (see Comment).

Comment.

TABLE 10.

*Results of Suzuki, Shiraishi and my own investigation
criticized on the basis of the prolongation.*

	Weakly positive group				Negative group			
	The "old technique"		The "new technique"		The "old technique"		The "new technique"	
	Infant	Mother	Infant	Mother	Infant	Mother	Infant	Mother
Result in Suzuki's paper	30 %				71%			
Result in Shiraishi's paper	18.7 "	6.2%			69 "	15%		
Result in my own investigation	21 "	5 "	42%	22.5%	67 "	13%	89%	51%

I will briefly comment on the results on the basis of Table 10.

According to the report which was observed by Shiraishi,⁷⁾ 20 cases of infants fed on normally or strongly Arakawa-positive milk showed the normal shortest peroxidase stain-time (2 seconds) with the "old technique." In my own expectation, I thought that a prolongation of the shortest stain-time might perhaps occur in a few infantile cases even with the normally or strongly Arakawa-positive reaction. But against my expectation, I did not experience a prolongation of the shortest stain-time in any of my 44 cases, so I am convinced that such infants are considered at least as not very B-avitaminotic. Moreover, in

7) S. Shiraishi, Tohoku J. Exp. Med., 1938, 88, 73.

cases of healthy babies observed by Suzuki and Shiraishi⁸⁾, there was no case with a prolongation of the shortest peroxidase stain-time by the "new technique." There was, needless to say, no prolongation in lactating mothers with the normally or strongly Arakawa-positive milk.

In infantile cases fed on the weakly Arakawa-positive milk, a prolongation of the shortest peroxidase stain-time occurred, as stated, in 21% with the "old technique" and in 42% with the "new one." The percentage with the former is very similar to Suzuki's and Shiraishi's¹⁰⁾ result. In cases of lactating mothers with weakly Arakawa-positive milk, a prolongation occurred in 5% with the "old technique," which was similar to Suzuki's⁹⁾ result; with the "new technique" my result was 22.5%. The latter result showed a much larger percentage than the former.

At least, in infantile cases fed on the Arakawa-negative milk, a prolongation showed 67% with the "old technique" and 89% with the "new technique." Both Suzuki⁹⁾ and Shiraishi¹⁰⁾ observed 71% and 69% respectively of the prolongations of the shortest peroxidase stain-time with the "old technique" in their cases. These results are nearly similar to my own. But my result with the "new technique" showed that a prolongation showed a higher value than their results. In maternal case, a prolongation occurred in 13% with the "new technique." With the latter, a prolongation showed more than three times as large a percentage as with the former.

As in 1932 Chiba and Abe¹¹⁾, in 1934 Suzuki's⁹⁾ and in 1938 Shiraishi¹⁰⁾ stated, I believe that a prolongation of the shortest stain-time is due to avitaminosis B, and that there is a possibility that a mother secreting Arakawa-negative milk can make her baby more avitaminotic than herself. In the present paper it may be said that I have proved it more precisely that lactating mothers are suffering from avitaminosis B in a less remarkable degree than their own babies.

Conclusions.

1. In cases of mothers with the normally positive Arakawa reaction (with "good milk") and of infants fed on it, the shortest per-

8) T. Suzuki and S. Shiraishi, *Tohoku J. Exp. Med.*, 1938, **34**, 24.

9) T. Suzuki, *Tohoku J. Exp. Med.*, 1935, **25**, 186.

10) S. Shiraishi, *Tohoku J. Exp. Med.*, 1938, **32**, 73.

11) M. Chiba and J. Abe, *Tohoku J. Exp. Med.*, 1932, **40**, 479.

oxidase stain-time of leucocytes was normal i.e. 2" with the "old technique" (or with the short-timed peroxidase technique using the original Sato-Sekiya's method), and 4" with the "new technique" (or with the short-timed peroxidase technique of the Tohoku Pediatric method).

2. In cases of mothers with the negative Arakawa reaction (with "bad milk") and of infants fed on it, the short-timed peroxidase reaction was prolonged in not a few cases; the time was mostly 3 seconds with the "old technique" and 5 seconds or longer with the "new technique."

3. The weaker the reaction of mother's milk, the more remarkable the tendency to prolongation of the short-timed peroxidase reaction of blood leucocytes in mothers and their infants was. And this phenomenon was observed more precisely with the "new technique" than with the "old one."