The Relation between Blood Platelet Count and Arakawa's Reaction in Lactating Mothers Taking Vitamin B.*

132nd Report of the Peroxidase Reaction.

By

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Introduction.

In a preceding paper¹⁾ I reported that most of apparently healthy mothers secreting milk negative to Arakawa's reaction** showed a high blood platelet count; and was able to confirm J. Kimura's²⁻⁴⁾ results.

The cases I reported in the preceding paper were not taking any vitamin B preparation. Then, how about mothers with negative Arakawa's reaction taking it? In the present paper the relationship between the blood platelet count and Arakawa's reaction in the case of lactating mothers taking vitamin B preparations will be related.

* B₁ is meant throughout the article.

** "Arakawa-positive" may be used in two different senses. One of these is: Arakawa-positive in a biochemical sense. A sample of human milk is said to have become Arakawa-positive, when it became blue on the addition of Arakawa's reagent. Here it means that the sample was not negative to Arakawa's reaction. The other of these two senses is: Arakawa-positive in a clinical sense. A sample of human milk is clinically Arakawa-positive only when it shows such a reaction as ++ or +++ in one minute of the addition of Arakawa's reagent. Another sample of human milk may be Arakawa-positive in the first described sense, but yet clinically negative.

- 1) Sh. Kimura, Tohoku J. Exp. Med., 1939, **37**, 241.
- 2) J. Kimura, Tohoku J. Exp. Med., 1934, **23**, 494.
- 3) J. Kimura, Tohoku J. Exp. Med., 1935, **27**, 360.
- 4) J. Kimura, Tohoku J. Exp. Med., 1935, **27**, 374.

Method of Investigation.

1. Materials. Blood was taken from apparently healthy mothers of breastfed patients who had long been taking vitamin B preparations although they were not suffering from beriberi. But the amounts and the kinds of vitamin B preparations which were taken by these mothers were very different, and how long they had been taking them was not clear.

2. Arakawa's reaction.

a. Milk was examined with Arakawa's reagent in each case.

b. I divided all the cases into 4 groups according to the intensity of Arakawa's reaction as in my preceding paper¹⁾. Group I was the only group which ought to be considered as normal as to the reaction in a clinical sense, Group II was a group of Arakawa-negative case (or case with better intermediate Arakawa's reaction), group III was a group of Arakawa-negative case (or case with worse intermediate Arakawa's reaction) and Group IV was a group of completely or almost completely Arakawa-negative case (Cf. Table 1).

TABLE 1.
*Grouping of cases according to the intensity of
Arakawa's reaction of human milk.*

Group	Intensity of Arakawa's reaction of human milk		
	Arakawa-positive or -negative in clinical sense	Expressed in signs	
		one side	the other side
I	Arakawa-positive case (normal case)	(++) 1' (++) 1'	{ (++) 1' (++) 1' (++) 1'
II	Arakawa-negative case (or case with better intermediate Arakawa's reaction)	(++) 1' (++) 1' (+) 1'	{ (±) 1' or (-) 1' (+) 1', (±) 1' or (-) 1' (±) 1'
III	Arakawa-negative case (or case with worse intermediate Arakawa's reaction)	(+) 1' (±) 1' (-) 1'	{ (-) 1' (±) 1' or (-) 1' (-) 1' (+) 3' (-) 1' (+) 5'
IV	Completely or almost completely Arakawa- negative case	(-) 5. (-) 5'	{ (±) 5' (-) 5'

3. Platelet count. I used Lampert's⁵⁾ method. The ear lobe was cleaned with ether, and a cut was made with Francke's needle. Blood was taken into the "Athrombit" and diluted with Tyrode's solution. After shaking the pipette for a few minutes, the 6th drop of the contents was examined for blood platelets. I waited over 5 minutes after the counting chamber was filled, and counted only then. Blood taking took place between 11 and 12 o'clock a.m., when mothers were in a fasting state.

I classified all the cases into 4 groups according to their platelet count: the group with "no increase" (or with the platelet count of 200-400 thousands), the group with "slight increase" (or with the platelet count of 400-500 thousands), the group with "moderate increase" (or with the platelet count of 500-600 thousands), and the group with "remarkable increase" (or with the platelet count of over 600 thousands).

Results of Investigation.

109 cases were examined and the results were as shown in Table 2. All of them had been taking a certain vitamin B preparation on their doctor's advice because of their Arakawa-negative milk (Cf. Table 2).

A) Classification according to the platelet count (Cf. Tables 2 and 3).

1. Cases with no increase: There were 31 cases out of 109 cases that showed no increase of the platelet count. 7 cases out of them belonged to Group I of Arakawa's reaction, 4 cases to Group II, 11 cases to Group III and 9 cases to Group IV.

2. Cases with a slight increase of the platelet count: In 61 cases out of 109 cases the count showed a slight increase. Out of them 1 case belonged to Group I of Arakawa's reaction, 5 cases to Group II, 26 cases to Group III and 29 cases to Group IV.

3. Cases with a moderate increase of the platelet count: In 13 cases out of 109 cases the count showed a moderate increase. There was no case belonging to Group I. 1 case belonged to Group II, 6 cases to Group III and 6 cases to Group IV.

4. Cases with a remarkable increase of the platelet count: Only 4 cases out of 109 cases showed a remarkable increase of the count.

5) H. Lampert, Verh. Dtsch. Ges. inn. Med., 1931, 43, 92.

TABLE 2.

Case No.	Name	Month of experiment	Age of mother (years)	Age of infant (months)	Blood platelet count (thousands) per cmm.	Arakawa's reaction		Increase of blood platelets
						Right	Left	
1	Y.S.	June	32	16	380	1(++)	1(++)	<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">No increase (31 cases)</div> <div style="margin-left: 10px;"> <div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Groups</div> <div style="display: flex; flex-direction: column; align-items: center;"> <div>I 7</div> <div>II 4</div> <div>III 11</div> <div>IV 9</div> </div> </div> </div> </div>
2	M.M.	July	25	4	300	1(+)	9(+)	
3	K.T.	Aug.	26	2	310	16(-)	16(-)	
4	S.H.	"	29	7	320	1(##)	1(##)	
5	T.M.	Feb.	28	3	320	3(±)	5(±)	
6	A.N.	"	28	2	320	16(-)	16(-)	
7	Y.M.	March	30	2	320	16(-)	16(-)	
8	T.T.	Oct.	30	13	330	3(++)	2(++)	
9	H.K.	June	28	10	330	2(+)	2(+)	
10	M.K.	Dec.	25	2	330	4(-)	16(-)	
11	Y.N.	Feb.	23	13	340	2(+)	15(±)	
12	K.O.	"	27	13	340	10(±)	10(±)	
13	A.T.	Aug.	26	9	340	1(±)	16(-)	
14	M.M.	May	25	2	340	2(±)	16(-)	
15	K.M.	Feb.	30	4	340	16(-)	16(-)	
16	S.T.	Dec.	26	3	350	1(##)	1(##)	
17	C.T.	Sep.	33	2	360	1(##)	1(##)	
18	K.S.	Jan.	27	6	360	16(-)	1(-)	
19	T.T.	Oct.	27	10	370	1(++)	3(++)	
20	T.A.	March	24	11	370	5(+)	1(+)	
21	K.Y.	Dec.	28	2	370	16(-)	16(-)	
22	G.S.	Oct.	25	11	380	1(++)	1(++)	
23	C.I.	April	33	8	390	4(-)	10(-)	
24	N.S.	June	31	1	390	16(-)	16(-)	
25	K.S.	Jan.	35	2	400	1(±)	1(±)	
26	Y.S.	June	32	16	400	14(±)	16(-)	
27	M.A.	Jan.	27	1.5	400	14(±)	12(-)	
28	T.A.	Feb.	28	8	400	2(-)	3(±)	
29	I.K.	"	26	5	400	15(-)	16(-)	
30	U.K.	June	26	1	400	16(-)	16(-)	
31	M.W.	"	24	1.5	400	16(-)	16(-)	
32	K.C.	Dec.	26	3	410	5(++)	11(+)	
33	T.K.	Nov.	29	2	410	10(±)	15(±)	
34	S.O.	"	21	9	410	3(-)	5(±)	
35	H.F.	Aug.	26	5	410	13(-)	13(-)	
36	J.T.	June	30	10	410	8(-)	12(-)	
37	R.F.	Oct.	35	14	420	3(++)	3(++)	
38	F.K.	June	36	10	420	1(+)	1(±)	
39	M.F.	Feb.	26	0.5	420	16(-)	14(±)	
40	J.O.	March	23	1	420	16(-)	14(±)	
41	T.A.	Jan.	27	8	420	7(-)	11(-)	
42	H.E.	March	38	1	420	15(-)	15(-)	
43	H.K.	Dec.	26	10	420	16(-)	16(-)	
44	K.O.	April	30	6	420	16(-)	16(-)	
45	H.O.	Jan.	28	4	420	16(-)	16(-)	
46	F.K.	June	31	1.5	430	1(++)	10(±)	
47	M.S.	March	24	5	430	14(±)	13(±)	
48	Y.C.	May	25	5	430	16(-)	6(-)	
49	K.S.	July	31	16	430	14(-)	5(±)	
50	S.F.	Jan.	30	4	430	3(±)	2(-)	

Case No.	Name	Month of experiment	Age of mother (years)	Age of infant (months)	Blood platelet count (thousands) per cmm.	Arakawa's reaction		Increase of blood platelets
						Right	Left	
51	U.K.	June	26	1.5	435	16(-)	15(-)	Slight increase (61 cases) I 1 case II 5 cases III 26 " IV 29 "
52	M.A.	Jan.	27	1.5	430	15(-)	16(-)	
53	K.M.	Feb.	35	15	430	14(-)	16(-)	
54	M.M.	July	25	4	430	16(-)	16(-)	
55	M.K.	April	23	12	430	16(-)	16(-)	
56	M.S.	Jan.	27	9	440	7(-)	12(-)	
57	Y.I.	Dec.	30	8	440	16(-)	16(-)	
58	T.N.	Feb.	26	10	440	16(-)	16(-)	
59	K.A.	June	23	1.5	450	14(-)	14(-)	
60	A.N.	Nov.	27	2	450	8(-)	16(-)	
61	H.I.	July	24	3	450	16(-)	12(-)	
62	Y.Y.	Jan.	24	1	450	12(-)	16(-)	
63	T.M.	"	33	5	450	16(-)	16(-)	
64	H.K.	March	24	1	450	16(-)	16(-)	
65	Y.S.	July	25	11	460	5(±)	6(-)	
66	J.T.	Sep.	25	4	460	15(-)	8(-)	
67	C.E.	April	32	8	470	9(+)	9(+)	
68	A.T.	Jan.	34	5	470	13(-)	7(±)	
69	M.F.	Feb.	26	0.5	470	15(-)	16(-)	
70	T.K.	June	25	5	470	16(-)	16(-)	
71	Y.H.	Nov.	24	9	470	16(-)	16(-)	
72	K.M.	Dec.	32	4	470	16(-)	16(-)	
73	I.K.	Jan.	26	5	470	16(-)	16(-)	
74	F.S.	March	25	1	480	1(+)	2(+)	
75	S.S.	Dec.	35	15	480	3(±)	5(±)	
76	S.A.	"	28	2	480	2(+)	16(-)	
77	T.F.	Oct.	27	12	480	8(±)	5(-)	
78	M.T.	Aug.	26	9	480	1(-)	1(-)	
79	Y.C.	May	25	5	480	16(-)	15(±)	
80	K.T.	Aug.	27	2	480	16(-)	16(-)	
81	M.K.	Nov.	27	9	490	11(±)	2(-)	
82	M.I.	Jan.	23	9	490	5(±)	2(-)	
83	M.M.	Dec.	24	9	490	8(-)	11(-)	
84	T.T.	Jan.	26	1	490	16(-)	11(-)	
85	H.T.	April	23	4	490	3(-)	3(-)	
86	T.A.	Nov.	21	3	490	15(-)	16(-)	
87	M.A.	Jan.	27	1.5	490	16(-)	16(-)	
88	Y.E.	"	25	3	500	16(-)	14(±)	
89	T.D.	Aug.	25	3	500	7(-)	14(±)	
90	K.S.	March	42	6	500	9(±)	14(±)	
91	K.I.	Nov.	29	3	500	16(-)	16(-)	
92	S.O.	Feb.	30	2	500	16(-)	16(-)	
93	M.W.	June	24	2	510	16(-)	16(-)	
94	T.S.	March	35	3	520	1(±)	4(±)	Moderate increase (13 cases) I no case II 1 case III 6 cases IV 6 "
95	M.I.	Jan.	23	9	520	7(±)	3(±)	
96	T.S.	Oct.	27	10	530	4(+)	5(±)	
97	T.F.	Sep.	26	12	530	1(+)	4(-)	
98	S.H.	March	26	2	540	9(±)	9(±)	
99	S.F.	Jan.	34	4	560	4(±)	3(±)	
100	H.S.	March	23	2	570	12(-)	11(±)	
101	M.S.	Jan.	28	9	570	16(-)	14(-)	
102	K.O.	March	24	1	590	16(-)	16(-)	
103	H.O.	Dec.	28	4	590	16(-)	16(-)	
104	Y.N.	"	26	3	590	16(-)	16(-)	
105	K.I.	Nov.	24	3	600	16(-)	16(-)	

Case No.	Name	Month of experiment	Age of mother (years)	Age of infant (months)	Blood platelet count (thousands) per emm.	Arakawa's reaction		Increase of blood platelets
						Right	Left	
106	T.T.	Sep.	28	2	620	15(-)	15(-)	Remarkable increase (4 cases) no case " 1 case " 3 cases Groups I II III IV
107	I.H.	Jan.	34	15	630	10(-)	7(+)	
108	T.F.	Oct.	27	12	640	14(-)	13(-)	
109	T.A.	Jan.	28	8	640	13(-)	16(-)	

TABLE 3.

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.

TABLE 4.

Relation between Arakawa's reaction and blood platelet count of mothers taking vitamin B.

Platelets (thou- sands) Group	200—400 No increase	400—500 Slight increase	500—600 Moderate increase	600— Remarkable increase	Average count of blood platelets (thousands) per cmm.
I 8 cases in all	88% (7 cases)	12% (1 case)	0	0	351
10 II " " "	40 " (4 ")	50 " (5 cases)	10% (1 case)	0	408
44 III " " "	25 " (11. ")	59 " (26 ")	14 " (6 cases)	2% (1 case)	450
47 IV " " "	19 " (9 ")	62 " (29 ")	13 " (6 ")	6 " (3 cases)	462
109 cases	28 " (31 ")	56 " (61 ")	12 " (13 ")	4 " (4 ")	

No case belonged to Group I or to Group II. 1 case belonged to group III and 3 cases to Group IV.

B) Classification according to Arakawa's reaction (Cf. Table 4).

1. Group I (Group of normal Arakawa's reaction): There were 8 cases out of 109 cases belonging to Group I. The platelet count showed no increase in 7 cases (88%), and a slight increase in the remaining 1 case (12%). There was no case of the count over 500 thousands. The platelet count of the cases belonging to Group I was 351 thousands on an average.

2. Group II (Group of better intermediate Arakawa's reaction): There were 10 cases out of 109 cases belonging to Group II. The count showed no increase in 4 cases (40%), a slight increase in 5 cases (50%), and a moderate increase in the remaining 1 case (10%). There was no case of the count over 600 thousands. The platelet count of the 10 cases was 408 thousands on an average.

3. Group III (Group of worse intermediate Arakawa's reaction): There were 44 cases out of 109 cases belonging to Group III. The count showed no increase in 11 cases (25%), a slight increase in 26 cases (59%), a moderate increase in 6 cases (14%), and a remarkable increase in 1 case (2%). The average count was in these 44 cases 450 thousands.

4. Group IV (Group of completely or almost completely negative Arakawa's reaction): There were 47 cases out of 109 cases belonging to Group IV. The count showed no increase in 9 cases (19%), a slight increase in 29 cases (62%), a moderate increase in 6 cases (13%), and a remarkable increase in the remaining 3 cases (6%). The count in these 47 cases was on an average 462 thousands.

Comment.

Those 109 lactating mothers in the present paper had been taking a vitamin B preparation on their doctor's advice, though they were "not suffering from beriberi".

From the reports published by Ido⁶⁾ Kubo,⁷⁾ Nakamura⁸⁾ and Iijima⁹⁾ it is ascertained that an increase of the blood platelet count is a symptom of beriberi or B-avitaminosis. From J. Kimura's²⁻⁴⁾ papers and from my own preceding paper¹⁾ we knew that there was an increase of the platelet count in the case of mothers with milk negative to Arakawa's reaction. That paper of mine showed further that there was a certain parallelism between the blood platelet count of lactating mothers and the intensity of Arakawa's reaction,—a higher count and weaker reaction, or a lower count and stronger reaction. Now it will be interesting to know what is the relationship between Arakawa's reaction and the platelet count of those who had been taking a vitamin B preparation for a more or less long time.

As will be seen from Table 3, the average count of blood platelets was 351 thousands in Group I of Arakawa's reaction, 408 thousands in Group II, 450 thousands in Group III, and 462 thousands in Group IV. Mothers showing an increase of the count were 12% in Group I, 60% in Group II, 75% in Group III, and 81% in Group IV.

Now, I will compare the present result with the result published in my preceding paper¹⁾. The comparison is shown in Table 5 which is more simplified in Table 6 (Cf. Tables 5 and 6).

Let us look at Table 6 first. This will show that, if cases with both "no increase" and "slight increase" are combined together, then it is of the same influence upon blood platelet count whether mothers have been taking vitamin B or not (see later). But mothers with

6) Y. Ido, Fukuoka Ikwaigaku Zasshi. 1912, 6, 217.

7) T. Kubo, Tokyo Iji Sinsi, 1921, 1417.

8) M. Nakamura, Nippon Naikwagakkwai Zasshi, 1925, 13, 317.

9) R. Iijima, Rinsho Byorigaku Ketsuekigakkwai Zasshi, 1935, 4, 531.

TABLE 5.

*Comparison of the platelet count between Arakawa-negative mothers taking no vitamin B and ones taking the vitamin.
The percentage shows that of the cases.*

Groups of Arakawa's reaction	No increase		Slight increase		Moderate increase		Remarkable increase	
	No B ₁	Taking B ₁	No B ₁	Taking B ₁	No B ₁	Taking B ₁	No B ₁	Taking B ₁
I	84%	88%	15%	12%	0%	0%	0%	0%
II*	43 "	40 "	28 "	50 "	24 "	10 "	5 "	0 "
III**	25 "	25 "	34 "	59 "	24 "	14 "	13 "	2 "
IV***	16 "	19 "	36 "	62 "	32 "	13 "	16 "	6 "
	31 "	28 "	32 "	56 "	26 "	12 "	11 "	4 "

* This Group was shown as Groups II and III in my preceding paper.

** " " " " " " IV and V " " " " "

*** " " " " " " VI and VII " " " " "

TABLE 6.

*Simplified comparison of the platelet count between Arakawa-negative mothers with and without B-vitamin intake.
The percentage shows that of the cases.*

Groups of Arakawa's reaction	No increase and slight increase		Moderate increase and remarkable increase		Average count of blood platelets	
	No vitamin	Taken	No vitamin	Taken		
I	100%	100%	0%	0%	340	351
II*	71 "	90 "	29 "	10 "	431	408
III**	59 "	84 "	37 "	16 "	487	450
IV***	52 "	81 "	37 "	19 "	504	462

*, **, *** Cf. Foot note to Table 5.

milk negative to Arakawa's reaction are, as Table 6 shows, of a smaller platelet count, if they have been taking the vitamin; or better, there is a smaller percentage of Arakawa-negative mothers taking the vitamin that are of a high platelet count than of those with no vitamin intake.

This will also be seen from the average platelet count (Cf. Table 5), which is always smaller in the case of Arakawa-negative mothers (Groups II, III and IV) with vitamin intake than in the case of those with no vitamin intake (408, 450 and 462 thousands as compared with 431, 487 and 504 thousands respectively).

In this regard, it is interesting to note that in Group I, the average platelet count is slightly larger in the case of mothers with the vitamin intake. The difference, however, is small, so that we may attribute the cause to a too small number of Arakawa-positive cases taking the vitamin (8 cases in all). But the following reason is very probably not to be excluded. The mothers treated of in the present paper began to take vitamin B on their doctor's advice, as stated above, so that these mothers, no Arakawa-positive, must have been Arakawa-negative. Then it is not improbable that their platelet count must have been coming nearer and nearer the normal. At this time of writing, for instance, they may have shown a smaller count. At any rate, the average count is almost equal in Arakawa-positive mothers with or without vitamin intake.

If now we look at Table 5, then there is no remarkable difference between mothers with or without vitamin intake as to the distribution of cases according to the platelet count. The overwhelming majority of Group I belonged to "no increase". But as to the other Groups (II, III and IV), there is a much larger percentage of the cases with vitamin intake belonging to "slight increase" than those without it, while almost an equal percentage of both kinds of cases belonged to "no increase" (Cf. Table 5).

From the above, it will be clear that in Arakawa-negative mothers, blood platelet count is smaller in cases taking vitamin B, while in Arakawa-positive cases there is no remarkable difference whether they have been taking vitamin B or not, probably because the platelet count is or has come mostly within normal limits.

Remarks.

To prevent misunderstanding, I may briefly add that an intake of vitamin B may sometimes increase the blood platelet count. Suppose in a mother of whom we do not know anything of her Arakawa's reaction, we made a count and obtained the figures 250 thousands, and then 330 thousands,—say, after a week of vitamin B intake. It is of course not to be concluded that vitamin B will increase the count

generally. The mother may have been in a far advanced stage of avitaminosis B, and in such a case vitamin B intake will increase the count and then only much later begin to decrease it, if the intake is continued longer.

Summary.

In the present paper I examined the blood platelet count of 109 apparently healthy lactating mothers with different Arakawa's reaction who had for a more or less long time been taking a vitamin B preparation.

The platelet count of 8 Arakawa-positive mothers (Group I) was within the normal limits in 88% of the cases, and only 12% showed a slight increase of the count. The count of Group II (the group having better intermediate Arakawa's reaction) showed a normal count in 40% of all 10 cases, a slight increase in 50%, a moderate increase in 10%. The count of Group III (the group of the worse intermediate Arakawa's reaction) showed a normal count in only 25% of all 44 cases, a slight increase in 59%, a moderate increase in 14%, and a remarkable increase in 2%. The count of Group IV (completely or almost completely negative Arakawa's reaction) showed a normal count in only 19% of all 47 cases, a slight increase in 62%, a moderate increase in 13%, and a remarkable increase in 6%. The average count was 351 thousands in Group I of Arakawa's reaction, 408 thousands in Group II, 450 thousands in Group III, and 462 thousands in Group IV.

As I stated in my preceding paper,¹⁾ there is a certain parallelism between the blood platelet count of lactating mothers and the intensity of their Arakawa's reaction: Higher count and weaker reaction, or lower count and stronger reaction.

It is interesting to note the following about the average count in each group. In the groups (Groups II, III and IV) of cases with negative Arakawa's reaction, the average count is always smaller in the cases with vitamin B intake than in those without it. But in the group of cases with positive Arakawa's reaction or in the group of cases with "good" or normal milk—the average count is about the same in the cases without vitamin B intake as in the cases with it.

Conclusions.

In the present paper the relationship between the blood platelet count and Arakawa-negative mothers taking a vitamin B preparation is shown.

1. There is a certain parallelism between the blood platelet count of lactating mothers and the intensity of their Arakawa's reaction,—the weaker the Arakawa's reaction, the higher the blood platelet count is.

2. In the groups of cases with negative Arakawa's reaction, the average count is always smaller in the cases with vitamin B intake than in those without it. But in the group of cases with positive Arakawa's reaction the average count is about the same in the cases without vitamin B intake as in the cases with it.