EVALUATION OF A RURAL SCHOOL HEALTH EDUCATION PROJECT

III. A STUDY OF PUPIL HEALTH PRACTICES

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THE health practices of a school child are determined by the many factors which influence the development of the child's total personality. It is difficult, if not impossible, to isolate any one of the many influences such as the home, school, and community, and adequately measure the extent of its effects on the child. Each has a part in his total growth and all are closely interrelated.

An attempt has been made recently in Cattaraugus County to study pupil health practices, and as far as possible to relate them to the influences of the school. The complexity of the problem as suggested above has been recognized. An experimental program of school health education has been in progress in the small rural schools of Cattaraugus County since the Fall of 1931. It was felt that studies which might define pupil health behavior more clearly and which might indicate the extent to which behavior had changed over a period of time would be of help in evaluating the effectiveness of this program and in pointing the direction it should take in the future.

The studies were conducted in the small one and two-teacher schools. Some were made in the Fall of 1932, near the beginning of the experimental program. The same studies were made again during the Fall of 1936 after the project had been developing for four years. Others were carried on in the Spring of 1937 and of 1938. Some of the studies also were made in a control group of schools

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in three supervisory districts of Steuben and Allegany counties. These schools were closely comparable to the Cattaraugus County schools[2] except that they have not received the benefits of an organized school health program such as has been developed in Cattaraugus County.

The study of pupil health practices was approached from several points of view, and employed the methods of pupil questionnaires, parent questionnaires, and observation. There was much difficulty experienced in obtaining objective evidence on health practices. Studies by trained observers of the daily living of large groups of children, both at school and at home, were impractical. Such studies were made to a limited extent in relation to classroom living, but it was necessary to depend largely upon reports of pupils and parents for information on health practices at home.

Lack of personnel also made it necessary for the teachers to administer the pupil questionnaires and the public health nurses the parent questionnaires. Although careful instructions were given in each case, uniformity was difficult to obtain.

Many types of records were unsatisfactory. Teachers' records on individual pupil health behavior could not be used. As valuable as these records may be for guiding work with individual pupils, such records usually are too subjective or complex for objective study. Records of health examination findings, defect corrections, absences, and communicable diseases are sometimes used as indices of the effectiveness of a school program but are unsuited as evidences of the effects of the program on pupil health behavior.

The methods that were employed are entirely exploratory. Some were modified from similar studies carried on elsewhere while others were originated for the purpose. The complete study has been designed to give composite pictures of pupil health practices,

[2] A comparison between the experimental and control groups will be found in—Strang, R. M.; Grout, R. E.; and Wiehl, D. G.: Evaluation of a Rural School Health Education Project. I. Evaluation of Teacher's Work in Health Education. Milbank Memorial Fund *Quarterly*, October, 1937, xv, No. 4, pp. 355-370.

and the influences of the school, rather than a detailed study of any individual children or school situations. Ideally, both types of studies are needed for a satisfactory understanding of the whole problem. The teacher's appraisal of an individual child's development is of greater aid to the teacher in making adjustments for the child and helping him to make his own, than a general study such as this. However, it was felt that objective studies which were developed from the standpoint of general County-wide problems also had their place in helping to determine administrative and supervisory policies and procedures.

PART I. A STUDY OF PUPIL HEALTH PRACTICES

A. *Based on Pupil Questionnaires.* During the Fall of 1932 a set of questions on daily health practices was given by the teachers in the rural schools of Cattaraugus County to all pupils from grades 1 to 8. The same questions, with one other added, were given again in the same schools in the Fall of 1936. This time they also were given to the pupils of the control group of schools in Steuben and Allegany Counties.

In 1932 returns were received from 145, or 60.7 per cent, of the schools, or from a total of 1,773 pupils. In 1936 there were 175, or 89.2 per cent, of the schools in Cattaraugus County which sent in answers from 2,028 pupils and 82, or 85.1 per cent, of the schools in the control group which returned answers from 719 pupils. The answers from four out of the five supervisory districts of Cattaraugus County will be analyzed in this section. These include answers from a total of 1,509 pupils in 1932 and 1,712 pupils in 1936. In the fifth supervisory district of the County the questions were given during the winter months instead of in the Fall. Since some of the habits vary with seasons of the year, and since the returns from the other four districts were sufficient in number and typical of the County, it seemed best to omit the fifth district from the summary.

Written instructions were given the teachers in order that the tests might be administered as uniformly as possible. No names were required, and the teacher or an older pupil, perhaps a brother or sister, helped the youngest pupils record their answers. The answers were tabulated by one person.

Previous experience with the use of these or similar questions has shown the trustworthiness of the pupils' answers. The American Child Health Association which used the questions in its HEALTH SURVEY OF 86 CITIES gives evidence that the questions were answered accurately by the pupils. Shuttleworth in an unpublished report on the use of these and similar questions among village children in Cattaraugus and Steuben Counties showed that the answers were trustworthy.[3] Although no studies were made in this case to test the accuracy of the answers, the teachers who often knew the families of their communities quite well felt that truthful answers were given. The fact that the conditions reported are so far from the ideal might be considered another indication of the accuracy of the answers, or at least that the answers do not reveal conditions better than they are.

The questions asked are given below.[4]

3 Shuttleworth, F. K.: Educational Results of the Cattaraugus Demonstration. Paper prepared at Yale University, 1931.

4 These questions are adapted from those used by the American Child Health Association in its HEALTH SURVEY OF 86 CITIES, which was published in New York City in 1935.

"What You Usually Do"

1. What time did you go to bed last night?
2. What time did you get up this morning?
3. Name each thing you ate for breakfast this morning.
4. What did you eat for lunch this noon? (not given in 1932)
5. What did you eat for supper or dinner last night?
6. How many cups of coffee did you drink yesterday?
7. How many glasses of milk did you drink yesterday?
8. Did you have an all-over bath last week?
9. Did you brush your teeth yesterday?
10. Have you been to a dentist in the last year? (since January last—1932)
11. How many days were you out of school last week because you were sick?
12. Do you sleep in a room all by yourself?
13. Do you usually eat what is put before you at the table?
14. What does your mother usually give you to eat when you come home in the afternoon after school?

(Continued on page 386)

Both in Cattaraugus County and the control group there was a wide variation in the percentage of pupils who reported good health habits of different types. For each item the differences in the proportions shown in the Cattaraugus County figures for 1932 and 1936 and the control group figures for 1936 are small. (See Tables 1 and 2). Seventy-five per cent or more of the pupils in all three groups reported milk drinking, an all-over bath, sleeping with windows open and eating what is put before them, while only from 25 to 35 per cent of the pupils reported visits to the dentist and sleeping alone. The diet rating which was based on an optimum rating of ten was close to five in each case.[5]

Only two items show statistically significant improvement in 1936 over 1932, although the slight changes for other items in this period are all in the direction of improvement in health habits. The significant changes are with reference to "going to the dentist" and the average amount of milk drunk. The percentage of children who reported that they had drunk some milk "yesterday" increased only from 78 to 80, but the average number of glasses drunk increased from 1.9 to 2.5.

The greatest improvement was shown in connection with visits to the dentist. Thirty-four per cent reported visits in 1936 as against 25 per cent in 1932. The rewording of the question in 1936 might account for some of this difference, but not for all. The questions were given during the latter part of the year in 1932, and usually the greatest number of dental corrections are made in the summer. Since farm incomes had not increased appreciably during this time

15. What do you usually do after school in the afternoon until your evening meal? Write down one or more of the following: play outdoors, do outdoor chores, help mother in house, play indoors.
16. Do you sleep with a window open?

5 This diet rating is an arbitrary rating developed by the Milbank Memorial Fund to aid in the study of the day's diets of school children. According to the rating three or more glasses of milk count 3, two glasses 2, and one glass 1, potatoes count 1, cereal 1, egg or meat 1, and fruit and vegetables 4. Greater values are given to tomatoes and citrus fruits, leafy or green colored vegetables and yellow colored vegetables than to other vegetables and fruits.

and no special funds were available for dental corrections, it is not too much to assume that education played an important part. There is no knowledge of the comparative influence of the nurse working in the homes and the teachers in their classrooms or with parents, but observations would indicate that each had a share.

There are a number of factors which might account for the slight change in most items. In most instances the home is involved in the performance of the habit, and any change would involve a new routine for the home. These changes take place slowly, especially in homes of lower social and economic levels. In an analysis of the coffee drinkers in 1932 it was found that 45 per cent of the drinkers were concentrated in thirty schools which included only 20 per cent of the total number of children who answered the question. The public health nurses were questioned as to possible causes for the large number of coffee drinkers. Typical answers were: "One large family lacks money for milk and has no cow"; "Consists mostly of Polish children"; "Cannot afford milk. Parents very uncooperative and are antagonistic to nurse in her home visits"; "Reason may be traced to lack of early health teaching." In every area there are families such as these among whom improvements in health do not come rapidly, if at all.

The effect of the depression cannot be overlooked as another possible factor toward slow change. A large proportion of the rural children come from farm homes and the years 1932-1936 were especially difficult ones for farm families. Farm incomes reached bottom in 1933, and although they later increased slightly, they still were lower in 1936 than in 1930.[6]

Still another factor which should be taken into consideration is the manner in which the school program developed during the period from 1932-1936. Special attention was given to bettering the school environment and health teaching methods, since it was felt that they were among the fundamentals in improving pupil

[6] Reports from the office of the Cattaraugus County Farm Bureau.

health behavior. Although teachers were helped to study the individual pupils and their problems, and teachers' committees worked on a better organization of the health instruction program, there was no intensive county-wide emphasis during this time on specific health behavior problems such as those included in the questionnaire.

The slight superiority for the Cattaraugus County group in 1936 over the control group for a few items is not great enough to be considered significant. The comparative figures are also given in Table 1. The number of children having some dental care, and the use of milk and coffee are the practices which show the more significant

Table 1. Summary of answers to "What You Usually Do"[1] received from pupils in Cattaraugus County and in a countrol group.

Item	Per Cent of Pupils		
	Cattaraugus County		Control Group
	1932	1936	1936
Eleven Hours or More of Sleep	48.7	52.4	49.2
Less Than Eight Hours of Sleep	2.8	2.2	1.3
Sleep Alone	27.8	28.1	29.1
Sleep With Windows Open	76.4	81.3	81.7
Had Coffee Yesterday	28.0	25.6	26.0
Two or More Cups of Coffee	9.8	8.3	18.8
Drank Milk Yesterday	78.4	80.5	76.7
Eat What is Put Before You at the Table	86.7	90.9	88.2
Brushed Teeth Yesterday	72.6	71.5	74.4
Visited Dentist in Last Year	25.2	34.0	27.6
All Over Bath Last Week	84.1	86.6	85.4
Absent Last Week Because of Sickness	7.5	9.5	7.7
What Do You Do After School?			
Play Outdoors	40.9	44.4	36.9
Do Outdoor Chores	29.2	27.4	32.2
Help in House	25.4	22.5	25.4
Play Indoors	4.5	5.7	5.5
Average Diet Ratings			
Two Meals	4.2	4.4	—
Three Meals	—	5.0	4.5
Average Glasses of Milk Drunk	1.9	2.5	2.1

[1] Total number of pupils, Cattaraugus County in 1936: 1,712
Total number of pupils, Cattaraugus County in 1932: 1,509
Total number of pupils, Control Group in 1936: 719

superiority in Cattaraugus as compared with the control group.

A study of foods eaten and selected health habits according to grade groups, shows some interesting differences in the changes in practices during the four-year period at various grade levels. Table 2 gives the results of a tabulation of selected items for all pupils whose grades were reported. Consistent tendencies for diet and practice to vary with age are shown for the Cattaraugus pupils in 1932 and 1936 and for the control group in 1936. For example, there is a steady increase in the percentage of pupils who drank coffee and in the average cups of coffee drunk from lower to upper grades. The percentage taking baths and brushing teeth also increased. Of special interest, however, is the comparison of pupils at specific grade levels in the two periods. For pupils in grades 5-6 and grades 7-8, some improvement in health practice between 1932 and 1936 is indicated for every item shown in Table 2. On the other hand, differences for the younger children in these two years are extremely slight and not consistently more favorable.

The changes in dietary habits reported by the older children suggest an increasing responsibility and interest on the part of some toward their food. Only one-half as many children in grades 7 and 8 reported eating pancakes for breakfast in 1936 as in 1932, and the per cent reporting cereal for breakfast increased from 52 to 68. The use of coffee was reported by 5 per cent fewer children in 1936, and the per cent who drank two or more glasses of milk increased 4 per cent.

When the Cattaraugus County groups by grades are compared with the control groups in 1936, the slightly more favorable results for some items in Cattaraugus County are found to apply chiefly to the older children.

Comparison of the answers of Cattaraugus County children in grades 5 and 6 in 1936 with answers to the same questions of fifth grade pupils in eighty-six cities in 1924 is given in Table 3.[7] Since

[7] *op. cit.* Footnote 3.

Items	Grades 1–2	Grades 3–4	Grades 5–6	Grades 7–8
Per Cent Having Fruit for Breakfast				
Cattaraugus County, 1932	10.7	10.2	11.4	18.5
Cattaraugus County, 1936	9.7	10.7	17.9	19.7
Control Group, 1936	—	—	—	—
Per Cent Having Pancakes for Breakfast				
Cattaraugus County, 1932	21.1	20.2	22.1	31.4
Cattaraugus County, 1936	19.4	19.0	15.8	16.3
Control Group, 1936	—	—	—	—
Per Cent Having Cereal for Breakfast				
Cattaraugus County, 1932	54.9	51.2	55.8	52.2
Cattaraugus County, 1936	58.7	58.7	67.0	68.0
Control Group, 1936	—	—	—	—
Per Cent Who Drank Coffee				
Cattaraugus County, 1932	21.4	24.0	28.6	39.3
Cattaraugus County, 1936	23.2	21.2	24.3	34.3
Control Group, 1936	19.7	24.5	23.6	34.8
Average Cups of Coffee Drunk				
Cattaraugus County, 1932	0.28	0.35	0.44	0.70
Cattaraugus County, 1936	0.37	0.39	0.41	0.58
Control Group, 1936	0.27	0.33	0.31	0.55
Per Cent Who Drank Milk				
Cattaraugus County, 1932	82.8	80.6	79.3	78.2
Cattaraugus County, 1936	82.7	76.9	83.3	78.7
Control Group, 1936	81.8	75.5	77.5	71.0
Average Glasses of Milk Drunk				
Cattaraugus County, 1932	2.1	2.3	2.3	2.3
Cattaraugus County, 1936	2.3	2.5	2.7	2.6
Control Group, 1936	1.9	2.2	2.4	2.2
Per Cent Having Two or More Glasses of Milk				
Cattaraugus County, 1932	61.7	68.7	60.9	61.1
Cattaraugus County, 1936	65.4	61.2	68.3	65.3
Control Group, 1936	—	—	—	—
Per Cent Having Bath Last Week				
Cattaraugus County, 1932	82.5	82.5	85.8	88.5
Cattaraugus County, 1936	81.5	87.2	87.6	90.7
Control Group, 1936	80.3	84.0	88.5	84.5
Per Cent Brushing Teeth Yesterday				
Cattaraugus County, 1932	65.3	76.0	74.7	72.9
Cattaraugus County, 1936	70.4	70.5	75.7	80.0
Control Group, 1936	64.4	77.0	76.9	71.0
Per Cent Eating What is Put Before Them				
Cattaraugus County, 1932	88.3	86.4	86.5	86.8
Cattaraugus County, 1936	79.5	88.4	91.1	91.7
Control Group, 1936	—	—	—	—
Average Hours of Sleep (Hours and Minutes)				
Cattaraugus County, 1932	11-2	10-36	9-57	9-54
Cattaraugus County, 1936	11-5	10-35	10-10	9-51
Control Group, 1936	10-59	10-33	10-9	9-53
Number of Pupils in Group				
Cattaraugus County, 1932	308	412	430	303
Cattaraugus County, 1936	341	438	436	300
Control Group, 1936	132	200	182	155

Table 2. Variations in selected health practices by grade groups. Experimental and control groups.

the conditions under which the questions were given for the American Child Health Association's study were different, the results are not exactly comparable with those in Cattaraugus County, but some interesting differences between the groups are apparent. More of these rural children drank milk and fewer drank coffee, and a much higher percentage had a cereal for breakfast. On the other hand, a larger proportion of the urban children had an all-over bath.

Table 3. Comparison of answers to "What You Usually Do" received from pupils in grade five in two different studies.

	86 Cities American Child Health Association[1]	Cattaraugus County, 1936 Rural Schools[2]
	Per Cent	Per Cent
Milk Drinking		
No Milk	22	16.8
Two or More Glasses	58	63.2
Coffee Drinking	39	24.3
All Over Bath Last Week	92	83.8
Brushed Teeth Yesterday	68	75.7
Fruit for Breakfast	15	17.9
Cereal for Breakfast	35	67.0
Average Hours of Sleep	10hrs. 11min.	10hrs. 10min.

[1] 35,000 pupils, fifth grade, January–June 1924.
[2] 436 pupils, fifth and sixth grades, September-November 1936.

B. *Based on Classroom Observations.* In the Fall of 1936 observations were made of the health behavior of children in school situations. Forty schools were visited, 20 in Cattaraugus County and 20 in the control group. The schools were selected at random from lists of teachers who were in their schools for the second year or longer. The teachers had been rated by their district superintendents for their general teaching ability, and a proportionate number was selected from each of the three classifications used. The observations in each school were made by one person and at the same time of day. The hours from 9 to 1 were chosen because they gave a good sampling of the school day and also showed the lunch hour habits of the children. The observer alternated her weeks of observation between the experimental group and the control group of schools to avoid the influence of seasonal changes on either group.

Care was taken to make the observations as inconspicuously as possible. The observer so controlled her visit to each school that neither teacher nor pupils was aware of the true purpose of the

Activities	Cattaraugus County 195 Pupils		Control Group 254 Pupils	
	Number of Children Observed	Per Cent Doing It	Number of Children Observed	Per Cent Doing It
Outside Clothing Is Not Worn in School	185	92.5	238	90.4
Rubbers and Rubber Boots Are Not Worn in School	166	99.4	241	89.3
Hands Are Washed Before Eating	143	88.1	167	35.3
Hands Are Washed After Toilet	51	70.5	79	8.8
Hands Are Washed After Play	178	16.2	229	3.9
Hands Are Washed Under Running Water	141	58.7	142	18.3
Mid-morning Lunch, When Eaten, Consists of Milk or Fruit	57	21.0	64	28.1
Nothing Is Eaten Between Meals	135	92.5	220	72.2
Lunch Is Eaten in a Leisurely Fashion	134	64.1	157	57.3
Standing Posture Good—				
Feet Flat on Floor[1]	62	79.0	38	76.3
Head Up, Chest Out, Abdomen and Chin In[1]	62	74.1	56	44.6
Books Are Held at an Angle for Easier Reading[1]	141	28.3	124	43.5
Material Is Held at a Distance of About 12 Inches from Eyes[1]	150	94.0	196	89.2
Fingers, Pencils, Crayons, etc. Are Kept Out of Mouth[1]				
Early A. M.	135	87.4	221	80.9
Late A. M.	145	64.1	228	77.1
Total	1,885	70.0	2,400	59.8
Average of Result for 15 Items		68.7		54.3

[1] These figures were obtained through timed observations, that is, the number of pupils observed within a three-minute period.

Table 4. Classroom observations made on children's health practices in Cattaraugus County and in a control group.

visit. In the Cattaraugus County schools she dropped in to each school unexpectedly and asked for the privilege of visiting for the morning. In the control group she did likewise, but carried a letter of introduction from the district superintendent. Classroom work proceeded in routine fashion, and many times when penciled checks were necessary they were done symbolically, such as by means of a group of lines to form a design.

The points to be observed were divided into four parts. They covered the teacher and her program, the mental attitudes of the children, the school environment, and the children and their health behavior. The discussion of this section will be limited to observations of pupil health behavior.

Despite the care given to the preparation of the observation sheet it was found that the items on pupil health behavior were often stated in such a way as to make objective observations difficult. A selection has been made of the items in which there was the least opportunity for error.

The summary of the observations on these items is found in Table 4. Other items which have a bearing on pupil health behavior are found in Table 5. It will be seen in Table 4 that fifteen items gave an average score of 70.0 per cent for Cattaraugus County and 59.8 per cent for the control group. Cattaraugus County showed considerable superiority over the control group in handwashing procedures, and eating lunch in a leisurely fashion. Quiet games or rest followed lunch in nine schools in Cattaraugus County and five schools in the control group (not shown in table). The mid-morning lunch appears to be somewhat better in the control group as does also the practice of holding books at an angle for easier reading.

PART II. INFLUENCES OF THE SCHOOL ON HEALTH PRACTICES OF CHILDREN

A. *Evidences Revealed Through School Studies.* Many phases of the school program have a part in influencing pupil health practices. Two phases, the teacher's work in health education and the school environment, already have been discussed at length in previous articles. These same two influences were also studied during 1936 through classroom observations in twenty schools in Cattaraugus County and twenty schools in the control group. The manner in which these observations were made is described in some detail in Part I. The observations are summarized in Table 5. Only those items which appear to be significant and for which complete and accurate observations were made have been used in this general summary.

There is a striking failure on the part of the teachers in both groups to provide rest periods for the younger children. Two out

of twenty teachers in Cattaraugus County and none in the control

Table 5. Classroom observations on teacher and program, mental attitudes and school environment, Cattaraugus County and Control Group.

Items	Cattaraugus County 20 Schools	Control Group 20 Schools
Teacher and Program		
Allows Time for Children to Wash Hands at Noon	16	7
Provides One or More Rest Periods for Lower Grades	2	0
Takes Time to Correct Poor Posture[1]	10	6
Takes Time to Correct Position in which Books Are Held[2]	9	7
Supervises Play Activities at Least Once During the Morning or Noon Recess	7	4
Has Desks Arranged for the Best Light	7	6
Has Seats and Desks Adjusted to Size	9	7
Helps Pupils to Watch the Temperature of the Room Carefully[1]	6	1
Allows Free, Necessary Movement About the Room[1]	17	18
Allows Pupils to Leave the Room when Necessary Without Permission[3]	16	16
Mental Attitudes		
Children Are Free to Use the Materials Around the Room and Do So[2]	17	17
Children Are Courteous	17	15
Children Get Over Grievances and Disappointments Quickly	10	11
Children Appear Happy and Contented as They Work and Play About the Room	20	20
Children Seem to Show No Undue Fear of Teacher	20	16
Teacher Gives Pupils Material They Can Use	19	20
Teacher Gives Pupils Tasks They Can Do	19	20
School Environment		
All Outside Doors That Are Used Are Screened	3	7
The Water Is Kept in a Covered Container	12	13
There Are Paper Cups	16	12
There Are Fountains	4	2
The Children Are Allowed a Fresh Cup Each Time They Drink	6	3
There Are Paper Towels	20	16
The Lunch Boxes Are Kept in a Covered Place	7	0
The Wraps Are Hung Neatly	16	16
Walls Are Painted a Light Shade	14	17
Walls Are Papered a Light Shade	5	2
There Are Double Mounted Shades	16	3
There Are Single Shades	4	17
There Are Inside Toilets	19	9

[1] In Cattaraugus County one school was not observed on this point.
[2] In Cattaraugus County three schools were not observed on this point.
[3] In the control group one school was not observed on this point.

group made such a provision. The teachers in both groups were also slack in supervising play activities at least once during the morning or noon recess. Only seven in Cattaraugus County and four in the control group did this.

The teachers in both groups, with the exception of two in each group, "allowed free, necessary movement about the room." On the whole the children in both groups "appeared happy and contented as they worked and played about the room." Most of them were courteous and showed no undue fear of the teacher.

All of the schools in Cattaraugus County had paper towels while only four lacked them in the control group. In nearly every school of both groups the walls were painted or papered a light shade. There were very few schools with screens in both groups, but four more in the control group than in the other.

There were a number of items on which Cattaraugus County showed some superiority over the control group. These include allowing time for children to wash hands at noon, and the presence of double mounted shades and inside toilets. There were no items in which the control group showed a similar superiority.

B. *Evidences Revealed Through Health Knowledge Tests.* Another approach to the influences of the school is through the use of health knowledge tests. In the Spring of 1937 the Gates-Strang Health Knowledge Tests were given to 131 pupils of grades 3 to 8 in fifteen schools of Cattaraugus County and to 133 pupils of the same grades in fifteen schools of the control group (Steuben and Allegany counties). The schools were selected from among those used in the classroom observation studies during the previous Fall. These tests are of the multiple choice type and consist of three parts. Each part compares closely with the other two. There are sixty questions in each and the questions are very similar. A revised edition of the original test was used in its experimental form and so had not been standardized.

One person administered the tests in all of the schools. In each

Grade	Mean Score		Number of Pupils	
	Cattaraugus County	Control Group	Cattaraugus County	Control Group
3	62	68	17	24
4	90	77	31	30
5	110	100	24	20
6	123	118	26	27
7	135	118	24	23
8	138	127	9	9
Total	108	98	131	133

[1] The highest possible score is 180.

Table 6. Mean total scores on Gates-Strang Health Knowledge Tests[1] given in grades 3 to 8 in Cattaraugus County and in a control group.

case the teacher was informed in advance that the person was to visit her school on a certain day to give some special tests. There was no further information given out as to the nature of the tests or the children that would be tested.

The highest possible score for the complete test was 180. Table 6 gives the mean total scores by grades and district. Once more, with the exception of grade 3, Cattaraugus County showed a slight superiority over the control group. Although the mean score for Cattaraugus County pupils was only 10 higher than that for the control group, the odds against such a difference occurring from chance are 140 to 1.[8]

The questions were classified according to subject matter fields and the per cent of correct answers from pupils of grades 5 to 8 was found for each group of questions. The results of this study are shown in Figure 1. It will be noticed that there is a similarity in the curves of the experimental and control groups, but in nearly every

		Mean	*Standard Error*
[8] Health knowledge score, Cattaraugus County		108	± 2.72
Health knowledge score, Control		97.9	± 2.58
	Difference	9.9	± 3.57

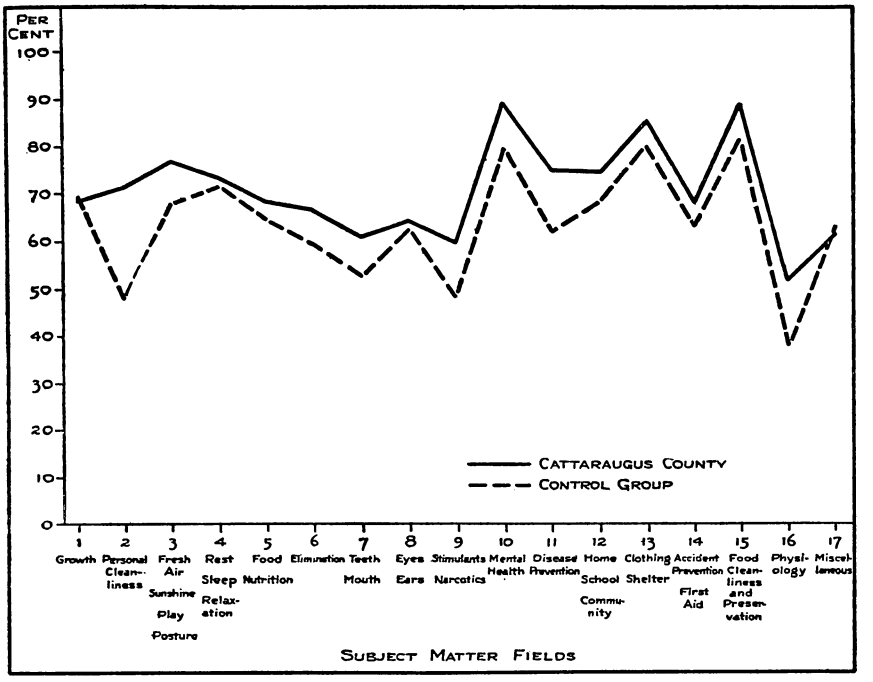

Fig. 1. Summary of Gates-Strang Health Knowledge Tests. Per cent of questions answered correctly in various subject matter fields for grades 5 to 8 in Cattaraugus County and in the control group.

instance the experimental group shows slight superiority over the control group. In Cattaraugus County the largest per cent of questions answered correctly was on the subjects of mental hygiene, clothing and shelter, and food cleanliness and preservation, while the smallest per cent of questions answered correctly was on teeth and mouth, eyes and ears, stimulants and narcotics, and physiology. There was a similar distribution for the control group except that it showed a considerable drop in relation to questions on cleanliness.

C. *Evidences Revealed Through Parent Questionnaires.* In the Spring of 1938 it was decided to turn to the parents of these rural school children for their opinion of the school's program in relation to the promotion of good health practices at home. It was thought that in the final analysis a really effective program would extend its

influences into the home life of the child, and that the parents were the logical ones to whom to turn for information on this point.

A questionnaire form was prepared for the public health nurses to use with parents on their regular visits to homes where there were children attending the one or two-teacher schools. Each nurse was asked to select ten children representative of the community she served. Children studied were of both sexes and from varying age levels, varying economic and social levels, and from different nationality groups. There were never more than two children studied from a family and ordinarily only one was used.

Space was provided in the questionnaire for general information on the child, including age, number of children in family, age range of children, and size of household. No names were required. Part I of the questionnaire included questions similar to those given the pupils on "What You Usually Do" (see Part I of this article) with some additional questions on immunization and defect corrections. These were given in order to direct the parent's thinking toward specific health practices.

Part II contained six habits, namely: number of hours of sleep, milk drinking, vegetable eating, cleaning teeth, washing hands before meals, and washing hands after toilet. The parent questioned was asked to state for each practice whether or not improvement was needed at the beginning of the school year, whether or not it was shown during the school year, and whether or not the school had helped to bring the improvement. Opportunity was given to state possible other causes for improvement, also. The parent was then asked the question "In what ways do you believe the health work at school has helped your child in his home habits? Please explain."

Altogether there were 104 children studied by thirteen nurses. They were scattered over twenty-eight townships and were taught by sixty-two different teachers with varying abilities. Ages ranged from six to fifteen with the average age of 9.9. The number of chil-

dren in the family varied from one to thirteen and averaged five.

In Table 7 one finds for each of the various practices the number of children whom the parents felt in need of improvement, the number who showed improvement, and the percentage distribution of influences responsible for the improvement. According to the parents, improvement was shown in 76.9 per cent of the cases and in 90.5 per cent of these the school helped to bring about the change. The fewest number of children needed improvement in hours of sleep, while the greatest number needed it in cleaning teeth. The greatest improvements were shown, however, in hand-washing and teeth cleaning, and the school played a prominent part in each case. The least improvement was shown in milk drinking and vegetable eating, and in these the school's influence was felt the least. In an analysis of the reasons why improvements were not shown in milk drinking it was found that only two children were reported as definitely not liking milk. In a large majority of the cases where definite reasons were given by the parent or nurse the failure of the parents to appreciate the need for milk, or the feeling of inability to pay for it predominated.

Table 7. A study of pupil health practices needing improvement as reported by parents[1] in Cattaraugus County.

Items	Number of Pupils Needing Improvement in September, 1937	Number of Pupils Showing Improvement in July, 1938	Percentage Distribution of Influences Responsible for Improvement			
			School	Other Cause	School and Other Cause	No Cause Stated
Number of Hours of Sleep	14	12	58.3	8.3	16.7	16.7
Milk Drinking	43	16	81.3	12.5	0.0	6.2
Vegetable Eating	29	20	60.0	10.0	15.0	15.0
Cleaning Teeth	72	62	77.5	3.2	16.1	3.2
Washing Hands Before Meals	46	41	75.6	0.0	19.5	4.9
Washing Hands After Toilet	43	39	87.2	0.0	10.2	2.6
Total	247	190	76.3	3.7	14.2	5.8

[1] Total number of pupils studied: 104.

Typical comments from the mothers reflect their attitudes better than figures. In an encouragingly large number of cases the mothers point to the fact that the children, as a result of the school program, have a better appreciation of the importance of good health habits and a better knowledge of why they should be practiced. This comment is characteristic of many. "Child knows reasons for health practices now. Health practices have improved a great deal. Helps younger children with health habits."

In some cases the mothers have a very definite conception of the ways in which the school has helped, such as the mother who commented through the nurse that, "The regular monthly weighing has stimulated child's interest in growth. The planning and preparation of the school lunch made the child interested in food. Mother also feels that the handwashing has improved since the teacher made it more interesting with sample cakes of soap." Or again a nurse states that the mother of a beginner feels that "Since school began the child has been very anxious to carry out health practices—has been very careful about washing hands, brushing teeth, etc., before going to school. Has better appreciation of diet and health habits."

In other cases there is just a general feeling that some good has been done such as the case of the mother who "can't think of any specific examples of the way the school has helped, but in general feels that it helps to make a more lasting impression."

In a few instances the mothers felt that the school had done little or nothing, and in one case the mother stated that personal hygiene had been over-emphasized in the school, almost to the point of "nagging," and that the net result had been the arousing of the children's antagonism.

GENERAL SUMMARY

These studies represent an attempt to develop objective methods for studying health practices and for evaluating the effectiveness of

a health educational program on a county-wide basis. Regardless of their limitations in this respect, they have proved of real local value. Teachers, through applying the studies in their individual schools, have benefited from the information they have gained. New emphases have been stressed in the supervisory program as a result of the findings of the studies.

The studies have been described at some length in this article. In Part I an attempt has been made to define more clearly the health practices of elementary children in the small rural schools. An analysis of answers to pupil questionnaires was made. This showed little change in behavior between 1932 and 1936, and between the schools of Cattaraugus County and the control group of schools in Steuben and Allegany Counties in 1936.

Classroom observations of pupil health practices in 1936 showed some superiority of the Cattaraugus County group over the control group, however. This might be expected in view of the stress that has been placed in the Cattaraugus County program on improved school environment and healthful school living.

The studies in Part II have approached the question of the influences of the school on health practices of the pupils. Since these studies were made in 1936 or later no comparison could be drawn with an earlier period. Classroom observations of teachers and the school program, mental attitudes, and the school environment in the experimental schools of Cattaraugus County and in the control group of schools show some points in which both groups excelled, others in which they were weak and still others in which the Cattaraugus County group showed some superiority over the control group. There was none in which the control group showed similar superiority.

The difference in the results of health knowledge tests given to both groups was small but moderately significant statistically. The Cattaraugus County group made slightly better scores than did the control group for nearly every field of subject matter.

The parents of Cattaraugus County in 1938 believe that the school has an important influence in improving pupil health practices at home. When parents feel that over three-quarters of the pupils who needed improvement in six different home practices showed improvement during the year, and that the school had a part in bringing about the improvement in 90 per cent of the cases, there are values to the program that evidently were not apparent in the results of the statistical studies described in this paper. Unmeasurable also, in these studies is the improvement in attitudes and understandings, which in the long run help to determine behavior. A large number of parents, however, discern in their children, as a result of the school's program, a better appreciation and understanding of the reasons for good health practices.

It is to be expected that a program which has developed as this one has would show results slowly. Many teachers have been poorly equipped for carrying on a health education program. Time has been needed to arouse the interest and cooperation of all concerned, including the many new teachers continually coming into the schools. The home is an important factor, and only a beginning has been made in bringing home and school into a closer working relationship.

There are a number of hopeful indications of improvement, however. The fact that 28 per cent more teachers returned the pupil questionnaires in 1936 than in 1932 is at least one evidence of increased interest on their part. The older pupils, under the influence of the school for a longer period, show greater changes in certain habits over the four-year period than the younger pupils who are closer to the influences of the home. Although changes have been slight there is a consistent tendency toward better practices revealed throughout the studies. If the program can go on it is reasonable to expect that the improvements will continue slowly but with a cumulative effect.