THE DEVELOPMENT OF A PROGRAM OF HYGIENE
FOR THE NATIONAL TEACHERS COLLEGE FOR WOMEN, CHINA

by

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Part I. The Development of the Hygiene Program

A. Introduction

The law of survival for living has been proved a natural phenomenon among both animals and men. The animals depend completely upon their inherited physical supremacy and environmental advantages to conquer their enemies. Men, being endowed with the highest degree of intelligence in the animal kingdom, can control their inherited handicaps and combat their environmental disadvantages by scientific discoveries and modern inventions. In order to obtain supremacy among the nations, many countries have invented protective measures or devices of all types, destructive as well as constructive. Some have achieved, and many others have failed.

One of the most valuable achievements among the constructive works, and also the concern of this paper, is public health. All of the large countries, such as the United States, Great Britain, Germany, France, and some other countries, have shared in the great contribution toward the history of the development of the public health work of the world. However, the United States has the most efficient and advanced machinery for the promotion of public health.

The immediate aim of public health in the United States can be expressed in only two words, health and longevity. They are considered to be the birthright of every individual citizen.
In order to achieve these ends, various activities are organized. Winslow wrote: "Public health is the science and the art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will ensure to every individual a standard of living adequate for the maintenance of health; organizing these benefits in such a fashion as to enable every citizen to realize his birthright of health and longevity." In this definition of public health, the scope of public health is clearly presented.

In China longevity not only is the doctrine of Taoism, but also is considered by the common people as one of the two essential achievements of life. The other achievement is happiness. Happiness and longevity are two close companions. Their symbols are engraved on bronze, pottery, silk and many other articles. To celebrate a birthday there are many verses, such as, "May your life be as long as South Mountain and your happiness be as broad as East Sea," "Happiness and longevity are yours," and "Multiplication of years and prolongation of life." On a birthday noodle is served as the main course among many other courses and is called "Noodle of Longevity." The most appropriate gift for a birthday is a model of the "God of Longevity," made of either pottery or lacquer, or carved
from precious stones of various sizes. All these customs have been universally practiced by the Chinese people of all classes, educated and uneducated, rich and poor. They illustrate that longevity is a deeply rooted desire of the Chinese people. This desire may be analyzed psychologically as the compensation for the sadness of the frequent loss of the babies and the adult youths of many families. Whatever the cause may be, there has been, until recently, no community-wide scientific measure adopted to obtain this end.

The public health work in China has been prompted lately by the national consciousness of the inferior health of the nation, by the economic loss resulting from the high mortality and morbidity, and by the realization of the fact that health is the chief means of liberating the nation from the bondages which have prevented her from preserving her ancient culture and from keeping abreast of the modern nations. In other words, the promotion of public health has been motivated by awareness of the national necessity rather than the merely individual happiness. This idea coincides with the definition of health by J. F. Williams, "Health is to live the most and to serve the best."

Being prompted by the sense of responsibility of the individual citizen toward his country at the period of reconstruction, the writer is preparing this paper as a preliminary attempt to share a minute part of the reconstruction program of her country. Since she is not familiar with the condition of the newly established National Teachers College for Women
and is not closely informed of the current progress made in
the interior of China, she is obliged to rely upon her past
teaching experience in the Hopei Women's Normal College, which
is similar in nature to this new college, and to depend upon
information gathered from various people who have come from
China lately, as well as upon the literature on health brought
back by Professor Turner from China in 1936. It is hoped that
this paper will serve as the first experiment for the promotion
of health in the colleges in China by the three co-ordinated
phases of the hygiene program: health service, sanitation, and
hygiene instruction. It is also hoped that fellow students
will make a conscious effort to live by the principles learned,
within the limit of their control, for the sake of the mainte-
nance or the improvement of their own health rather than merely
to memorize the facts chiefly for fulfilling the requirements.
After all, the sole aim of this course is to impart scientific
knowledge for the purpose of changing the health behavior of
each individual student so that every one may be an asset to
the country instead of a liability.

B. The Study of Needs

1. The Mortality Rate in China

There are no statistical data to show the mortality rate
of the country as a whole. Dr. C. C. Chen was informed in 1931
from some authoritative source that the crude death rate in
China was about 25 to 30 per 1,000 population. This figure
was more than two times that of the mortality rate of either
England or the United States. The infant mortality rate was
200 per 1,000 live births. This is about three or four times as high as that of either England or the United States.\(^1\)

In 1935 the Central Vital Statistics Service of the Municipality of Nanking co-operated with Metropolitan Police Headquarters, and Nanking Municipal Government made an attempt to obtain the birth and the death rate of Nanking. The birth rate was 23.7 and the death rate 15.7 per 1,000 people. The age group 0-4 had the highest death rate, 78.4 per 1,000 people. The death rate of some of the diseases will be listed as follows:

The Death Rate of Some of the Diseases
In Nanking, 1935

<table>
<thead>
<tr>
<th>Causes of Death</th>
<th>Death Rate per 100,000 pop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Diseases (other than T.B.)</td>
<td>350.6</td>
</tr>
<tr>
<td>Other fevers and Exanthemata</td>
<td>184.2</td>
</tr>
<tr>
<td>Diarrhea and Enteritis</td>
<td>160.6</td>
</tr>
<tr>
<td>G.I. Diseases not otherwise specified</td>
<td>141.8</td>
</tr>
<tr>
<td>Tuberculosis of the lungs</td>
<td>131.7</td>
</tr>
<tr>
<td>Convulsions</td>
<td>111.5</td>
</tr>
<tr>
<td>Senility and Apoplexy</td>
<td>90.3</td>
</tr>
<tr>
<td>Measles</td>
<td>88.6</td>
</tr>
<tr>
<td>Purulent infection, Septicemia</td>
<td>66.5</td>
</tr>
<tr>
<td>Congenital Debility and Premature Birth</td>
<td>46.2</td>
</tr>
<tr>
<td>External Causes</td>
<td>35.8</td>
</tr>
<tr>
<td>Cardio-renal Diseases</td>
<td>31.3</td>
</tr>
<tr>
<td>Typhoid and Paratyphoid</td>
<td>19.7</td>
</tr>
<tr>
<td>Dysentery</td>
<td>8.4</td>
</tr>
<tr>
<td>Smallpox</td>
<td>6.0</td>
</tr>
<tr>
<td>Cerebro-spinal Meningitis</td>
<td>6.0</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>3.1</td>
</tr>
<tr>
<td>Typhus</td>
<td>0.1</td>
</tr>
<tr>
<td>Cholera</td>
<td>0</td>
</tr>
</tbody>
</table>

In studying the above table, there are at least two points to be remembered: First, Nanking was not the representative city of China. It was one of the very few cities which had applied modern sanitation and other preventive measures. Secondly, this was one of the first two cities which applied statistics to the study of the causes of death. The other city was Chuchung Hsien, Kiangsu. The birth rate was 28.9 and the death rate 17.9 per 1,000 population. The table of specific causes is given below:

<table>
<thead>
<tr>
<th>Causes of Death</th>
<th>Death Rate per 100,000 pop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Diseases</td>
<td>45.0</td>
</tr>
<tr>
<td>Other Fevers</td>
<td>122.4</td>
</tr>
<tr>
<td>Diarrhea and Enteritis</td>
<td></td>
</tr>
<tr>
<td>G.I. Diseases</td>
<td>151.0</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>158.5</td>
</tr>
<tr>
<td>Convulsions</td>
<td>183.1</td>
</tr>
<tr>
<td>Senility and Apoplexy</td>
<td>271.7</td>
</tr>
<tr>
<td>Measles</td>
<td></td>
</tr>
<tr>
<td>Purulent Infection</td>
<td>51.0</td>
</tr>
<tr>
<td>Congenital Debility and Premature Birth</td>
<td>103.2</td>
</tr>
<tr>
<td>External Causes</td>
<td>91.0</td>
</tr>
<tr>
<td>Cardio-renal</td>
<td>52.8</td>
</tr>
<tr>
<td>Typhoid and Paratyphoid</td>
<td>108.2</td>
</tr>
<tr>
<td>Dysentery</td>
<td>109.6</td>
</tr>
<tr>
<td>Smallpox</td>
<td>24.3</td>
</tr>
<tr>
<td>Cerebro-Meningitis</td>
<td></td>
</tr>
<tr>
<td>Diphtheria</td>
<td>17.1</td>
</tr>
</tbody>
</table>

One can imagine that the data in these tables is not very accurate because of the inaccuracy in diagnosis and in reporting.

Nevertheless, they give us a rough picture of the mortality rate. The death rates of tuberculosis, gastro-intestinal diseases and purulent infections are very close. They are probably endemic in China.

It would be interesting if there were a record of the mortality rate of the college students. It should be low, because college students belong to the privileged class and they are in the period unfavorable for the mortality rate.

2. The Morbidity Rate in China

Smallpox, tetanus, neonatal diseases, and tuberculosis of all forms are the main causes of death in China.¹

In the absence of the morbidity data, one has to rely upon various information and some unrelated or fractional data to determine the prevalent diseases in China. The geographical distribution of certain diseases, given in the annual report of the Central Field Health Station, published in 1935, may be of great help in the study under consideration. It is listed below:

<table>
<thead>
<tr>
<th>Geographical Distribution of Certain Diseases Prevalent in China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease                                      Distribution</td>
</tr>
<tr>
<td>Amobic Dysentery                               More prevalent in Central and South China</td>
</tr>
<tr>
<td>Ascariasis                                    Common throughout China</td>
</tr>
<tr>
<td>Bacillary Dysentery                            Endemic throughout China</td>
</tr>
<tr>
<td>Beriberi                                      More prevalent in coastal province</td>
</tr>
</tbody>
</table>

¹ C. C. Chen, An unpublished thesis on A School Health Program for China with Special Reference to Health Education (Massachusetts Institute of Technology, 1931).
<table>
<thead>
<tr>
<th>Disease</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cestodes</td>
<td>Moderately prevalent in North China</td>
</tr>
<tr>
<td>Cholera</td>
<td>Sometimes epidemic in coastal provinces and Yang Tze Valley (About 100,000</td>
</tr>
<tr>
<td></td>
<td>cases were reported in 1932. Only 7 sporadic cases were reported in</td>
</tr>
<tr>
<td></td>
<td>1933 and 6 in 1934.)</td>
</tr>
<tr>
<td>Clonorchiasis sinenses</td>
<td>Prevalent in Canton</td>
</tr>
<tr>
<td>Dengue Fever</td>
<td>Sporadic in South China</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>More common and more severe in North China</td>
</tr>
<tr>
<td>Elephantiasis</td>
<td>Comparatively common in Kiangsu and Fukien</td>
</tr>
<tr>
<td>Epidemic Meningitis</td>
<td>More prevalent in the Yang Tze Valley</td>
</tr>
<tr>
<td>Fasciolopsisis</td>
<td>Endemic in Chekiang, especially Shaohsing</td>
</tr>
<tr>
<td>Hookworm diseases</td>
<td>More common in Central China</td>
</tr>
<tr>
<td>Leishmaniasis Donavani (Kala-azar)</td>
<td>Prevalent north of Yang Tze River, especially in Shantung, North Kiangsu</td>
</tr>
<tr>
<td>Malaria</td>
<td>Endemic throughout China</td>
</tr>
<tr>
<td>Paragonimiasis Westermanii</td>
<td>Sporadic in coastal provinces</td>
</tr>
<tr>
<td>Plague</td>
<td>Sporadic in Fukien, reported in Shanai, Shensi, Suiyuan in 1928-29 and in</td>
</tr>
<tr>
<td></td>
<td>Shansi in 1931.</td>
</tr>
<tr>
<td>Relapsing Fever</td>
<td>More prevalent in North China</td>
</tr>
<tr>
<td>Scarlet Fever</td>
<td>More common and more severe in North China</td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td>Prevalent in lower Yang Tze region</td>
</tr>
<tr>
<td>Smallpox</td>
<td>More common in rural areas</td>
</tr>
<tr>
<td>Syphilis</td>
<td>Common in large cities</td>
</tr>
<tr>
<td>Trachoma</td>
<td>Common throughout China</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Common throughout China</td>
</tr>
<tr>
<td>Typhoid and Paratyphoid Fevers</td>
<td>Endemic throughout China</td>
</tr>
<tr>
<td>Typhus Fever</td>
<td>Sporadic in South China; endemic in North China</td>
</tr>
</tbody>
</table>

This table\(^1\) shows that bacillary dysentery and malaria are endemic throughout China. 

In 1932 a survey was made on malaria at four endemic areas in Nanking. Seventy-five percent of the inhabitants of these areas was reported to have malaria. *Plasmodium vivax* was the most common organism, *Pl. falciparum* the next, and *Pl. malariae* the least common species of sporozoa. Twice as many males were infected as females. The anopheles were *A. hyrcanus var. sinesis*. The breeding places were lotus ponds, rice fields, irrigation channels, marshes, and all temporary rain water collections except retaining utensils.\(^1\)

Malaria was also found prevalent in Kwei-chow, Kwang-si and Yunnan. It was called "changchi," known from ancient times as a mysterious, dreadful disease. In the blood of the "changchi" patient subtertian malaria parasites were invariably found.\(^2\)

Eleven years' experience in studying the physical examination records of three colleges in China—Ginling College, the National Central University, and Hopei Women's Normal College—showed that there were about 20 to 25 per cent of the students who had either weak hearts or weak lungs. These students were put in the restricted physical education classes. The students in the last mentioned college often complained of gastro-intestinal trouble.

According to the latest report by Kaing Wen Han, Student

Secretary of the National Committee of the Y.M.C.A. of China, the most common diseases among the college students in the interior are dysentery, malaria, colds, skin diseases, and "kissing paralysis." Malaria is the most common one. Fifty percent of the students at Szechuan University have malaria. Scarlet fever outbreaks are not unusual.  

3. Traditional Beliefs and Fads

Since China is an old country, through experience and prices paid, the people have formed some habits of living which conform to the hygienic principle, such as drinking boiled water, staying in the sunshine, and taking certain food. Every child is taught not to drink "raw water" at any time. That accounts for some of the Chinese students insisting upon drinking boiled water when they first come to this country because they do not know about the sanitary conditions here. They formed the habit when they were little. Such a habit has saved many lives in the nation.

There is a Chinese proverb about sunshine. It says, "When the sunshine reaches the bed, a physician is not needed in the bedroom." This proverb has ten words in Chinese. Five words are in each phrase, giving a good rhythm. According to the conventional way of arranging the room, the bed is at the back part of the room. The window is at the opposite side. This proverb implies the size and the direction, are important requirements of health. All the Chinese have the habit

of putting their bedding in the sun frequently. On Saturdays and Sundays the verandas of the dormitories of schools and colleges are often full of bedding. This habit was formed by their seeing the mothers doing this at home. The modern science that sunlight has destructive force on bacteria is very new to the Chinese.

The word for nutrition formerly was "repairing food." Anyone who does intensive mental work or who is not healthy is often advised to take extra "repairing foods," chicken soup, eggs, bird's nest, white fungus and ginseng beverages. These are not specifically for any kind of illness but for the general build-up. Nevertheless, the above listed foods are classified according to their action on the metabolic process under three groups: cool, warm and medium.

It is believed that individuals are also built constitutionally into these three types. The cool, warm and medium foods are good only to the individuals who are correspondingly built. Pork liver is good for the eyes because it takes the extreme warmth away, or "clearing off the fire," which is a common phrase applied to express the effect of cooling foods. Many fruits have the same effect on individuals.

To the Chinese, sore throat, mouth sores, and other mucous disturbances are due to "extra warmth," or "fire constitution." Fruits are good for these disturbances. In North China in the winter time, people must eat Tientsin green turnips to prevent colds and other winter diseases. The newcomer there is always advised to do as the Romans do. Tien-
Sin green turnips are noted for their crisp, sweet flavor, and their therapeutic and preventive effects on the "fire constitution," which people generally have in the winter season. Evidently the Chinese have by experience recognized that there is something in fruits and vegetables which is beneficial to health and to the prevention of diseases. They have also recognized the individual differences although most of them are unfamiliar with the knowledge of modern nutrition or physiology.

No doubt such experiences handed from generation to generation are valuable to health. Among the college students, naturally, no one believes diseases are due to demons. To most Chinese, food like shellfish is too cool for the system; therefore, after eating crabs or oysters, sometimes people have gastro-intestinal disturbances. It is not known even by many college students that shellfish is one of the causitive agents of alimentary diseases. Bacteria are known to some of the college students as theory. Just how they do damage on human beings is not exactly known. As mentioned early in this paper, they live by psychology; i.e., when their eyes do not see the germs, their minds are not bothered with them. This is the point of view of the general masses.

The writer is not familiar with the theory of warm and cool to which all of the foods belong. It seems to explain some phases of health to a certain extent. Many Chinese carry it too far. To avoid eating shellfish is a good practice, but to avoid eating good foods is a great mistake. Many people object to drinking milk because it is too warm.
Such practices are innumerable. To introduce hygiene to a group of people who have long formed prejudices is not a very easy task. It is apt to meet two extreme types of students in colleges: The type who take in whatever the teacher dictates and the other who has the attitude of "I do not believe." This latter represents the larger part of the population. In discussing health problems with people, one often receives a cold reaction. This is due to the fact that they do not know the morbidity rate and the mortality rate of the country. Their own survival seems to be the criterion of hygienic living for the nation.

The bacteria theory of sanitary science and personal hygiene is new to the Chinese. Bacteria explain the important role of the carrier in communicable diseases. This is unheard of to a majority of the Chinese. A few years ago a member of the writer's family was discovered by the school physician to be a diphtheria carrier and had to be isolated in the municipal isolation hospital. The bacilli she had were a virulent type as was proved by a virulent test. The parents realized the seriousness when they were informed that the guinea pigs had been killed by bacteria extracted from the child's throat. They consented to let the child stay in the isolation hospital as long as it was required.

Isolation of a person who shows no sign or symptom of diphtheria was unheard of to the child's maternal grandfather, an old scholar. He condemned the cruelty of modern science and the unreasonableness of the modern school system.
This is only to illustrate how hard it is to convince those people who have prejudices against modern medical science. However, they have a great admiration for the physical science in the progress of engineering in China. Physical science deals with mechanics. Biological science deals with living organisms, human beings and micro-organisms which are variable. This accounts for some of the unpredictable and uncontrollable biological reactions of the individual to the environment. This fact, combined with the difficulty of measuring the health status as influenced by hygienic living and by other preventive measures, has retarded the general recognition of preventive medicine, hygiene and sanitation.

In the modern school system hygiene is taught. The Chinese name for hygiene is wei shen, protection of life. A course bearing so significant a name is generally left to one who has no special training in it, especially in secondary schools. Secondary school teachers are often asked to teach it because both physical education and hygiene are related to health. No doubt, some of the physical education directors have some knowledge of hygiene, but many do not know more than the students although they may have an appreciation of hygienic living. For this reason hygiene has never been recognized by the students as a course of as high academic level as other courses. This deeply rooted impression of hygiene is carried with the students all through their lives. In college, upon hearing the name of hygiene, the students sneer. The content of the hygiene course in the secondary school is not more than
some very simple physiology and health rules, uninteresting and unrelated to life. To change the deep rooted impression of the students is not easy.

In view of the foregoing traditional beliefs and habits, one can visualize the problems confronted in introducing hygiene in the colleges of China. The problems also reveal the ample opportunity ahead. It was the same way with physical education in China twenty or thirty years ago. Those pioneers faced their hardships courageously and undauntedly in the promotion of physical education in the schools. Not long after, the government was convinced of its importance in the curriculum of schools and colleges. Besides twice a week of instruction in classes, all students were required to take an hour of extra curricular activities daily. National, provincial and local athletic meets were sponsored by the government. Huge stadia were erected in various big cities. There is not a single school or college which does not teach physical education. The skill of Chinese girls on the athletic field often startles foreign visitors. Physical health education is only one kind of health activity in schools and colleges.

Health education is another kind of activity for which physical education is not a substitute. The government has already directed its interest in primary and secondary school health. Health education has been started at a time more favorable than when physical education was first introduced into China. It is up to the present health promoters to explore their resourcefullness, to educate the students so that
they may gradually change their traditional beliefs and prejudices. Through them the whole nation will be guided on the bright road of health.

4. The Responsibility of the College Students

College students are the asset of the nation. Under their leadership the younger generation will be guided. Prior to the war the government invested on an average of $1,000, Chinese currency, in the institutions so that each student could obtain a higher education. The student himself received about $400 per year for food, books, etc., from home. Fourteen hundred in Chinese currency per year for each student is quite high when it is compared with the low cost of living before the war. The total cost for college education amounted to $55,461,200 per year. This is figured according to the enrollment of 46,758 for the year 1933-34 in the report of education in China.¹

These college students might have been well trained in their own professional fields, but a very small number of them knew hygiene. Some of them were so healthy that they did not feel the necessity, others were indifferent, and still others were anxious to know, but they did not know where to get sound information about hygiene. The last group generally belonged to the class of ill health. Most of the college graduates wished they knew more about hygiene, after they had served a few years in their own respective fields.

¹ Shih-Chih Wang, Education in China (Shanghai: China United Press, 1935), p. 4.
It is the responsibility of the college to offer such courses that the students will be equipped with a sound knowledge of the human mechanism and its function, and hygiene. The principle of extreme progressive education, waiting for the student to feel the need, is not applicable here. The students generally do not know their needs, when they are healthy. When they are sick, they do not know that illness is preventable to a great extent by hygienic practice; in China sanitary science is still in its embryonic stage, especially in the interior. Nevertheless, under the health status of the students at war time, they would naturally seek for preventive measures. The medicine is not only expensive but is hard to secure. This is the proper moment for introducing hygiene into the college. If hygiene is required in college and presented in a very interesting way, it will not only be welcomed by the students, but the health status of the students will also be improved. Fewer students will need to consult the college or private physicians who are scarcely available. In other words, the morbidity rate will surely be reduced. Equipped with their knowledge of hygiene, the students will be benefitted even after leaving college.

As mentioned above, the college students of China are the better privileged class, but their responsibility is much greater than that of the same class in other countries. Privilege goes hand in hand with responsibility. They are respected but at the same time, they are made aware of the duties of their position. Since ancient times people have been classified into
four main groups, according to their professions: They are scholars, farmers, laborers, and merchants. The scholars, the intellectuals, lead the rest. They are placed at the top of the list.

Events have changed the order of the other three classes, but the scholars still remain in the leading class. Even though some of the modern students are not any more, in the sense of the ancient scholar, brilliant and creative, they still enjoy the inherent honor of being scholars. They are no longer called scholars, but students, which in Chinese are two words, Hsien shen. Hsiu means learning and shen, living. The two words together mean learning to live.

The words hsiu shen, to the general population, mean the group of people who go to the modern schools and colleges to learn to read, to write, and to study modern books; and after graduation from normal schools and colleges, they will go into teaching or into the other earning classes. They are highly respected. To the very few classic scholars of ancient type the modern teachers are too superficial and do not know how to live. The Chinese words for teacher, hsien shen, mean leading to live. For this reason, the ancient Chinese respected their teachers as they did their parents. They did everything for the teachers as they would for their parents. "The teacher of a day is equivalent to the father of one hundred days." The principles, leading to live and respecting teachers, were well demonstrated by Confucius and his 70 disciples. The principles are old, but they are also modern, being elements
of the most progressive philosophy of modern education in the western countries. Although the real spirit of the Chinese words for teacher and student has been lost to a great extent, the teachers and students are still highly respected, for they are supposed to know how to live.

Hygiene is to inform the students in the sound knowledge of how to live. It has its birthright in the curriculum if colleges are recognized as the higher institutions whose function is to teach how to live. The responsibility of the students in college is not only to learn how to live hygienically as individuals but also to live hygienically as a group by helping to maintain the sanitary conditions of the college. According to the observation of the writer, it was not infrequent that the students in college nullified the sanitary efforts made by the authorities.

Although in the physical education classes efforts were made to make the students understand that, for the welfare of the individual as well as of the group, their co-operation was absolutely necessary, the result was still insufficient.

Physical education classes are the classes of student activities. When questions arise, the teacher can take the opportunity to remind students of certain hygiene principles. This is only a hit or miss style. If there were a hygiene class for the students, they would learn hygiene in a systematic way. As they would understand the principles of hygiene, naturally they would co-operate to maintain the sanitary conditions in the college.
5. Intelligent Support of the Health Education Program in the Primary School

The function of normal colleges in China is to train teachers to conduct primary and middle-school education. When any course is taught in these schools, the teacher should have a clear understanding of its principles. If he does not understand hygiene, how can he be expected to support the health education class in the primary school? To the untrained person the health habit of bringing a handkerchief to school is merely a simple rule, but to a trained person it is a very significant habit to form.

Since 1929, health education began to be promoted in primary schools. It has not gone so far as it might have. It is a new field; therefore, it needs support, not support merely from the assigned responsibility but the kind of support that is urged by the conviction of the importance of health education in the present educational system. The former lacks sustaining power, but the latter has living power.

Only those who understand the principles of hygiene can give the undaunted support, which is very essential in the promotion of health education in the primary schools. All the students in the normal colleges should have a course in hygiene so that they will be benefitted by it not only from the standpoint of personal health and maintenance of sanitation in college but also for the purpose of intelligent support of the education movement in the primary and secondary schools.

Shortly before the war National Central University began to require all education majors to minor in health education.
This indicates the direction of the movement of education in China. If other institutions have the personnel and facilities, they will do well to follow the trail of National Central University. To produce health education teachers are now the primary need, but that is not sufficient. To go parallel with this, the production of health education supporters is necessary.

6. The Promotion of Public Health Education by the Students

The public health movement in China is comparatively new. After Chiang Kai-Shek came into power, the government began to direct its interest to the development of public health in all of its phases. Popular health education is always a hard task of public health when the degree of result is taken into consideration. One of the best and more natural avenues of public health education is through the influence of the students in their homes. Contrary to the popular belief that the family members do not accept the suggestions of sons and daughters, brothers and sisters, the writer had wonderful experience at home in influencing the members of her family in the appreciation of modern sanitation and preventive medicine. It takes technique just as any field of education does, but it is the most efficient and lasting method of public health education. This is another reason that college hygiene should be required of the students. Students who understand the principles of hygiene will naturally practice at home and influence their families.

7. The Maternal Responsibility of the Students

The students of today will be the parents of tomorrow. It
is not uncommon that some of the college students are already married and that the pregnant women continue their college work as usual. One should stop a moment to ask what college education teaches the present mothers and the potential mothers with respect to their own health and the health of the coming infants and the future children. The answer will be very disappointing, i.e., college teaches no health subjects. According to some conservative estimates, the infant mortality rate in China in 1935 was 200 to 300 per thousand.¹

There are no statistical data available for the maternal death rate. One can imagine that it is very high because of the ignorance of maternal care and the untrained midwives. Though college students and graduates do not belong to the group of students who would seek help from untrained midwives, they have much to learn in regard to maternal health and child care. Most of the Chinese college girls get married after a few years service. There are often a few girls who are baptized by the so-called modern idea of independence, and they object to being taught maternal and child care. To them maternal and child care is an insult and is absolutely unnecessary. Experience has shown that these girls need more such training than the others. Student opinion in China does affect the smooth course of teaching to a certain extent, especially in a new field. How, ever, such obstacles can be overcome by the teacher's ingenuity.

¹ Marion Yang, "Birth Control in Peiping," Selected Papers by the Staff of the National Health Administration and Central Field Health Station (Nanking, China), p. 278.
8. The Social Responsibility of the Students

The students are now brought much closer to the common people. They cannot continue to isolate themselves on partial campuses as they did formerly. Most of them are quartered in temples, clan halls, and simple houses. They have to live in crowded quarters and eat simple food. The students are scattered and mixed with the common people and familiarize themselves with the problems in the rural community.

During vacations students go to the different rural areas to teach the illiterate people how to read and write, and they give them other phases of elementary education. If the students themselves know the sound principles of hygiene, the masses will have a chance to learn how to change some of their unhygienic habits of living.

To some well educated people of China, hygienic practice is only for the well-to-do class. They think that it is impractical to teach hygiene during war time. Their point is that people are too poor to provide themselves with sufficient food and clothing; therefore, how can they be expected to live hygienically. This is true, indeed. Poverty plays an important role in one's health. One must realize that there are also many undesirable habits which can be improved by intelligent understanding of hygienic principles which cost nothing, such as plenty of sunshine, fresh air, exercise, rest. One can add to that list the mental habits of concentration and facing reality, etc.

The high cost of living, which reduces one's purchasing
power, often makes one spend his money and energy more wisely and intelligently than he would otherwise spend them. If he also knows the principles of hygiene, he is apt to make worthy every penny that he spends on food. Take another example. To many Chinese a cold is not a disease. They are very care- less about spreading the disease. Likewise, they are unaware of how they may contract it easily. Some well educated Chinese overemphasize the psychological aspect of the disease and over- look the factual phase. This is due mainly to lack of train- ing in hygiene. Therefore, college hygiene should be promot- ed simultaneously with primary and secondary health education. College people are the ones who can penetrate the mass at the present time. Hygiene in normal colleges has its distinct functions, aside from that just mentioned. They are to support the promotion of primary and secondary health education and to be able to teach it whenever called upon.

C. The Hygiene Program in Colleges and Teacher-training Insti- tutions of the United States

1. College Hygiene

a. The Opinion Concerning the Importance of College Hygiene

Health has long been accepted as one of the aims in educa- tion in America, but its practical application in college de- pends more or less on the interest and enthusiasm of individual faculty members, especially college physicians, rather than upon the consideration of the college authorities of their responsi- bilities and obligations with regard to the health of the stu- dents. A survey made by the U.S. Office of Education in 1936, concerning the status of health instruction reported that only
one-third of the colleges and universities have required courses in hygiene. "It is difficult," states this report, "for those whose bodies are quite satisfactory servants of their souls, to conceive of the need of special concern over physical affairs, but when one's ambitions are hampered by faults in the machinery on which fulfillment of those ambitions depends, he becomes not only conscious of the value of health, but concerned for the physical welfare of others. Whether or not an educational institution requires a course in hygiene depends, in general, on whether those who have shaped its present policies have found their own physical foundations quite adequate for their purposes. There seems to be no other explanation for the absence of hygiene in the college curriculum."\(^1\)

It is the consensus of opinion of the members who met at the Second Conference on College Hygiene that it is the legal, social and educational responsibility of presidents and governing boards of colleges and universities to provide for the establishment and maintenance of a hygiene program.

According to Sundwall, the colleges and universities are paid for by society. Society insures itself or "takes out insurance" by providing for higher education. The contract between society and the college is that the college is to turn out people who are well equipped and capable of serving and leading.

society intelligently and effectively. The B.A. degree is the college's announcement that this contract has been fulfilled. The commencement exercise is to tell society that these young men and women are capable of rendering the fullest measure of intelligent and constructive service over a reasonably long period of time. A college cheats society when it gives the degree to a young man or woman who breaks down in health soon after the traffic of life is entered. The vital resources in the colleges and universities should be given the same consideration as the economics of material resources. The economics of the vital resources should be made of a comprehensive and constructive program in college hygiene.¹

Finally, Sundwall emphasized the need for the promotion of community health by college graduates. The college students should be trained so that they are eager to see that the members of their community understand the fundamentals of health promotion. Health is not the privilege of the very few but the right of every citizen. "The future belongs to that nation which produces the greatest number of healthy children and which maintains the highest order of health practices for its people... The highest degree of intelligence and education, of culture, of prosperity and of social well-being will be found in that country or society which pays the most attention to the health of its people."

¹ John Sundwall, "The Obligation of the College to Its Graduates and to Society," Proceedings of the Tenth Annual Meeting of the American Student Health Association, Bulletin No. 13, p. 11

² Ibid.
In planning its curriculum the college administration should take into consideration the social and economic needs for positive health and physical efficiency and see to it that these needs are met effectively.¹

b. The Problems of Hygiene Teaching

The important problems of hygiene teaching can generally be classified under two headings: (1) The hygiene teaching in college is insufficient to meet the social and economic needs. (2) The college students did not have adequate training in high school.

1). The hygiene in college is insufficient to meet the social and economic needs. The teaching of hygiene is, for the most part, superficial, prejudicial, confusing, unconvincing, and impotent, and does not command the respect afforded other subjects in the college curriculum. In many colleges and universities, hygiene teaching is linked with certain activities generally considered with health.² Physical education teachers and physicians are generally entrusted with hygiene teaching. The former do not have the proper background in the scientific aspects of health. The latter, though they have a knowledge of curative medicine, generally do not know the procedures in teaching. All they can do is to present some information on medicine. The preventive phase is usually given in a hit or miss fashion.

It was the opinion of the Second National Conference of

1. Ibid.
2. John Sundwall, "The Teaching of College Hygiene"

College Hygiene, 1926, sponsored by the President's Committee of Fifty on College Hygiene and the National Health Council, that the current classroom instruction in hygiene rates commonly with the poorest teaching in the educational institutions. Usually instruction in hygiene is given by inadequately prepared teachers to classes that are too large; moreover, the time allowed is too short. The contact with the student is insufficient. The library, laboratory, museum resources, and other teaching aids are inadequate.\(^1\)

It was also agreed that there is little planned effort to build up a teaching relationship between the physician on the health-service staff and the students who come to him for physical examination, conference, consultation, or other help.\(^2\)

\(^2\). The students did not have adequate training in high school. Many studies have been made in an attempt to find out to what extent the high school graduates know about hygiene and what should be the content of college hygiene. The study made by Pinckney in 1927 on "What University of Texas Freshmen Know About Hygiene" showed that students generally get their information from advertisements and home admonition. For example, the students were asked to check the direct cause for common colds by the multiple selection method. The causes listed were bacteria, dusts, drafts, chills, and lowered resistance to bacteria. It was found that the majority of

2. Ibid., p. 19.
the students checked "drafts." Another statement missed largely by the students is the most important factor in building strong teeth. The factors listed were lime water, absence of disease, wholesome food after birth, brushing the teeth before breakfast, and wholesome food before birth. "Brushing the teeth before breakfast" was the answer of the majority. This study reveals that hygiene teaching in high school has failed to make the scientific facts clear to the students.

The extensive study made by Rook, State University of Iowa, in 1935, on "The College Freshmen's Knowledge of and Interest in Personal Hygiene" gives the following conclusions:

a). Those engaged in the teaching of physical education and athletics are meeting the health objectives to a greater extent than some other departments in the high school.

b). About one-third of the freshmen studied indicated that they had not had a health course, nor had lectures been given on this subject by special speakers.

c). Only eighteen per cent of the group studied received a specific health course and talks by special speakers, while six per cent received only a specific health course.

d). Thirty-seven per cent of the entire group had received special talks on health. In these special talks, about two-thirds of the topics selected were in the field of personal hygiene, with the three units on sex education, care of the teeth, and cleanliness making up more than 60 per cent of the

topics presented.

e). Seventy-five per cent of the special speakers on health topics were either the physician, physical educator, or nurse.

f). No significant difference was found in health knowledge when comparison was made with the type of instruction given in high school.

g). There appears to have been little attempt to have an integrated sex education program in the schools of Iowa. Most of this instruction still is being given through the use of special speakers.

h). No significant difference in knowledge was found between those having had and those not having had sex education in high school.

i). Sixty-five per cent of the freshmen studied do not regularly read magazines containing health articles. Of those who do read in this field, approximately one-half read magazines which contain unscientific health articles and fallacious advertisements.

j). There is a serious lack of knowledge of the simple structure and normal functioning of the human body.

k). There is a serious lack of knowledge of hygienic facts and principles.

l). Due to the limited background in hygiene and physiology, the students are unable to discriminate between the genuine and false in advertisements pertaining to health and disease.
m). The high school has failed to remove many commonly held misbeliefs and fallacies in the field of health.

The University of Chicago made a study of its students and graduates and that of 33 institutions on hygiene teaching in public schools, private schools and colleges, in 1937. The results coincided greatly with those given in the foregoing paragraphs. Student opinion concerning hygiene is expressed as follows:

a). Fifty-eight per cent of the students thought the course in hygiene was too short in high school and 38 per cent thought the same of college hygiene.

b). Half of the students complained of the shortcomings in sex education.

c. The Program of Hygiene Considered Ideal in American Colleges

In English the words program of hygiene have two connotations: broad and narrow. The former includes the health service, sanitary and wholesome environment and health instruction; the latter, the curriculum of hygiene. In this paper the hygiene program will be considered in its broad sense. It is the opinion of all the authorities of hygiene that hygiene is not merely to inform the students of the facts of hygiene. Its ultimate function is to influence the habits of the students. The formation of hygienic habits is through daily contact with a hygienic environment and through constant practice of hygienic principles. The whole school program must express the principles of health so that the students may be educated through the health activities of the school.
The problems of hygiene teaching have been briefly presented. It must be remembered that hygiene is one of the hardest courses to teach in college. It is science in its application to the activities of daily life in one respect and education in its procedures in another respect. The activities of daily life are common to everybody. Any subject in connection with them is considered easy. One rarely realizes that hygiene, though it involves daily activities common to all, is the embodiment of the basic sciences: physics, chemistry, and biology. Many common phenomena of daily life have not been explained yet. Being a course of common subjects, coupled with the involvement of a broad field of science, has made hygiene the object of criticism. Many other courses, though not well taught, generally are not likely to be criticized as easily as is hygiene, because they are not so close to life, or their application to daily life has not been recognized by most people. Constructive criticism means opportunity for further improvement. The health authorities in America meet constantly to discuss the problems of health and to exchange ideas. The following paragraphs will discuss what the Second National Conference of College Hygiene considered the ideal program of hygiene.¹

¹. Hygiene instruction. Since hygiene teaching is comparatively more familiar than health service and seems to bear more significance to the mind of many lay people in China, it will be discussed first. There should be a series of objectives for the guidance of teachers of hygiene. The important

ones are as follows: (1) to make the subject as vital and real as possible, selecting learning experiences in response to the needs and interests of the student; (2) to assist the student to utilize that knowledge of the human mechanism and its environment which is round essential for both an appreciation of health and a development of healthful behavior; (3) to help the student develop a healthful and critical attitude with regard to the mass of health material presented for public consumption; (4) to lead the student to a realization that knowledge of hygiene must grow along with the advancement of the sciences on which it is based, and that he must be ready to accept new ideas advanced through reliable sources and to modify his conduct accordingly; (5) to develop the appreciation of the work of public agencies for the protection and improvement of health so that the student may not only co-operate with them but lend them his intelligent support.

a). Qualifications of teachers. Hygiene teaching must be recognized as one of the most difficult subjects to teach in college. Its purpose is to modify the behavior of the students. It calls for a wide acquaintance with a large number of special fields of human knowledge and a thorough training in some of them. Hygiene is not static. It changes rapidly with the discovery in other scientific fields. In view of all the difficulties, both the personality and the training of the teacher are very important in the success of teaching hygiene.

(1). Personality
(a). He should have good health.

(b). He should be sympathetic and understand the
problems of the students.

(c). He should be sufficiently dynamic to motivate
students effectively.

(d). He should be able to command the respect of
the students by his ability to convince them.

(2). Training

(a). He should have a liberal and cultural back-
ground.

(b). He should be familiar with the basic and
biological sciences; such as chemistry, including organic and
physiological chemistry, general physics, general biology, in-
cluding genetics, human anatomy (gross and microscopic), embry-
ology, human physiology and bacteriology.

(c). He should have training in general and edu-
cational psychology and the principles of education and be fami-
liliar with the modern development in these fields.

(d). He should be familiar with different branch-
es of hygiene; such as physiologic hygiene, nutritional hygiene,
mental hygiene, social and racial hygiene, community health,
including control or communicable diseases, sanitation and
health problems of homes, schools and recreation centers.

(e). He should know the work of the official and
nonofficial health agencies.

b). Curriculum. It was agreed that there should be
a required course in hygiene of not less than two semester hours
in all institutions. Credits should be given for such a course.
(i). General content

(a). Basic science

1. An elementary knowledge of the basic sciences -- physiology and anatomy -- should be presented to serve as a basis for the teaching of hygiene.

2. Sufficient facts should be presented to enable a promotion of a high level of nutrition. Basic anatomy and physiology related to nutrition, the fundamentals of food composition and values, the importance of food selection to promote growth and health.

(b). Personal hygiene

1. Emphasis should be placed on periodic physical examination and creation of intelligent understanding of disease.

2. The importance of the neuromuscular system and the effect of muscular activity should be made clear to the student.

3. The presentation of the health hazards which affect the respiratory system should include the structural obstruction to breathing, the ill effect of certain clothing, the common cold and other respiratory disturbances and the prevention and the control of these diseases.

4. The importance of regular and adequate removal of body wastes in relation to health through various organs should be emphasized.

5. Oral hygiene in relation to health and nutrition should be emphasized.
6. The relation of the endocrines to growth, to the metabolism, to the production of energy, to the reproductive processes, and to the nervous system should be taught.

7. The skin and its care is to be included, because the skin is an index of health.

8. The conservation of vision and hearing should be taught, so that the students may have the fundamental knowledge in taking care of their eyes and ears.

(c). Mental hygiene

1. The basic facts of normal personality function in terms of accepted psycho-biologic principles and their relation to the maintenance of individual adjustment should be given.

2. It should include mental health aspects of habit formation and habit forming agents, such as alcohol, tobacco and other narcotics.

(d). Social hygiene

Early in college life instruction in social hygiene should be given. This should include the physiology of sex, sex ethics with relation to marriage and the family, and the establishment and maintenance of a normal family life.

(2). Methods and material

(a). The material presented to the class in hygiene should meet the needs of its members. Avoid nonessential and details which may be interesting to the teacher.

(b). The subject matter should be developed with reference to the problems of the students.
(c). The experience selected should be progressively graded. Reliable measurements should be used to note the progress of each student.

(d). It should be remembered that the student is the center of the hygiene teaching.

(e). The home and college environment should be made a subject of study.

(f). Individual discussions and conferences should be made possible.

(g). Teaching aids should be used to the fullest extent. They are anatomic specimens and models, histological specimens, bacteriological cultures, microscopic preparations, biological products, motion pictures, charts, field trips, and community agencies.

(h). The entire instructional program should be integrated into the total life experience of the student.

2). Health service. "A college should furnish itself with a health service staff that scientifically, educationally, and professionally justifies the expectation that it will devise adaptations, discover opportunities, formulate procedures, and organize programs that will successfully assist the college to meet its health obligations and satisfy its educational purpose in the field of hygiene," stated in the Proceedings of the First National Conference on College Hygiene, 1931.

a) The scope of health service

(1). Health examination. College matriculation should include health examination and it should not be considered
complete until a health examination has been given by a physician and his recommendation for admission has been made. This should be given by a (full time) college physician or qualified physicians and dentists secured for the purpose. The family physician cannot take the place of a college health examination.

(a) It should be completed at the earliest possible date.

(b) It should constitute thorough investigation of the physical, mental, and social status of the candidate. The recommendation should be made as to the academic load and the outside employment of the student.

(c) Annual health examination for all students is recommended. There should be an annual health conference with each student.

(d) A health examination should be required of all students known or suspected to be cases or carriers of communicable diseases or those suspected as mental disease or social maladjustment.

(e) Careful health examination should be required of students for admission to participation in the following activities:

1. Membership in athletic squads
2. Admission to medical school
3. For teaching credentials
4. Irregular program
5. Students on scholastic probation

(f) Adequate arrangements should be made for volun-
tary consultations and required conferences. Follow-up work should be made after the consultations and conferences.

(2). Correction of defects. The health service should impress upon the student that to secure correction of any remediable conditions is important to health. If possible, a reasonable pressure should be brought to the students.

(3). Control of communicable disease. Communicable disease control should be administered according to the state health department.

(4). Immunization. All possible help should be extended by the health service to official public health agencies in immunizing, testing, and inspecting. Approved means should be utilized in the identification and the control of venereal disease. Vaccination against smallpox should be required for admission.

(5) Environmental responsibilities. The health service has a responsibility for the maintenance of a healthful environment. The special health of the college community are to be taken care of by the health service.

(a). Examination of the food handlers of the college, including complete physical inspection, Wasserman, and stool and throat cultures.

(b). The health service should cooperate with local health authorities in the supervision of off-campus student rooming and eating places, and should report to local health officers for action on any irregularities.

(6). Health instruction.
(a). The health service should further health instruction by influencing the college authorities to arrange for well-qualified speakers on health topics.

(b). Student organizations on the campus may be advised to introduce health talks and health publicity. The health service should see there is no exaggeration or misinterpretation of health facts.

(c). Radio talks over college stations are also recognized as having educational value.

(d). The health service should co-operate with the departments of physical education in their program of health activities.

(7). Clinical treatment

(a). All acute emergency surgery, such as fractures, burns, etc., whether or not sustained on the campus, should be cared for by the health service. Surgical operations and other strictly clinical treatment of an extensive nature, though not a primary function of the college, should be undertaken only because of conditions which may practically demand such activity of the college.

(b). Medical service to faculty members and employees is to be limited to first aid and emergency treatment and the control of communicable disease.

(c). The extent of actual medical treatment and infirmary care to be assumed should be carefully determined by each institution in relation to conditions on and immediately surrounding the campus. It should be plainly and specifically
stated.

b). Staff. In a small college it may be possible for a single appointee of exceptional competency to constitute the whole staff of the health service. In the large institutions it is necessary that a large carefully chosen staff be organized.

(1). Staff physicians. (a). The physicians on the staff should have a pleasing personality, be socially acceptable. (b). They should be graduates of Grade A medical schools with clinical experience of two or three years, at least, including some training in psychiatry. (c). They should hold membership in local and national medical societies. (d). They should cultivate friendly relationships with the local profession. (e). They should be scientifically interested in clinical, preventive, and research medicine, and in local, state, and national health problems. (f). They should have an educational point of view and an understanding of the problems of the youth. (g). The director of the staff should have administrative ability and leadership qualities. (h). He should be an example of healthful living.

(2). Staff nurses. (a). The nurse should have a pleasing personality, be socially acceptable in the environment of the institution. (b). She should be a registered nurse, a graduate from a recognized school of nursing, with experience in the hospital for one or two years after graduation. (c). Experience in laboratory technique is beneficial. She should hold a membership in a nurses' organization. (d). She should have interests outside of her own field and also an educational
point of view. (e) She should be understanding and have the ability to hold the students' respect while maintaining discipline.

(3) Secretary. A secretary should be chosen for efficiency, trustworthiness, and a pleasing personality. She should have ability to use tact and judgment in her contact with students.

(4) Dietitian. (a) A dietitian should have an institutional background. (b) She should have an educational viewpoint, and maintain close relationship with the health service. (c) She may give valuable educational service through individual instruction to students referred to her for their personal dietary problems.

c). Ratio of personnel to student body.

(1) Physician. It is recommended that ideally there should be one full time physician for each five hundred resident students. This places the responsibility on the physician that each interview should be an educational experience to the student.

(2) Psychiatrist. A resident psychiatrist should be available. The physician may act as a psychiatrist if she had the training in psychiatry.

(3) Nurse. There should be one nurse for each eight beds, and a minimum of one nurse for the physician's office. The nurse should work on the basis of eight hours a day. In a small institution it may be necessary to combine the functions of the nurse and the secretary, or nurse and tech-
nician.

d). Equipment. The following points should be taken into consideration:

(1). The health service quarter should be convenient to student traffic.

(2). The equipment should be in conformity with modern standards.

(3). Quiet and privacy should be provided for interviews and examination.

(4). There should be separate reception rooms for infectious and noninfectious cases.

(5). There should be laboratory facilities for urine, blood-chemistry, stool and sputum examinations, fluoroscopic and X-ray examinations, Wasserman and other blood examinations, and basal metabolic and other special apparatus.

2. Professional Education in Teacher-training Institutions

The result of the survey of studying the hygiene knowledge of college shows that 75 per cent of college students have had no health instruction since they were in the sixth grade and have had little practice in self-direction in hygienic living. It was agreed that a recommendation should be made to the College Entrance Board and to the regional accrediting agencies that health instruction be recognized as necessary for college entrance, conducted on a basis comparable to other instruction


in the secondary school.

The hygiene department of the teacher-training institution or of the university having a college of education, has a distinct service to render. Its professional courses in hygiene for teachers should make the future teacher health minded. Health is a fundamental factor in training and preparation for citizenship, since the health of the child determines endurance, disposition, and attitude, and these qualities vitally affect happiness and efficiency.

The health of the teacher has great influence on the health of the students. The example set by the teacher is an incentive of great importance to the furtherance of health education. It is recommended that a complete examination should be given to the prospective student along with his entrance examination. Whenever a student is found incompetent physically, he should be excluded from the teacher-training course. All the correctible and remedial defects should be corrected before the acceptance as candidates for teachers' diplomas or certificates.

In order to develop a scientific attitude toward life in general and health in particular, the student in the teacher-training institution should have some scientific background. It is recommended that certain basic sciences be included in the general subject matter required. The training should include a subject matter course in personal and community hygiene based on elementary physiology, anatomy, and bacteriology; a subject matter course in mental and social hygiene and healthful school living; a course in methods of health education, and an obser-
vation and practice-teaching course in a training school or public-school system.

Fully fifty per cent of the State teachers colleges and other teacher-training institutions offer a course in personal and community hygiene which is required of all students preparing to teach in elementary schools. Physiology is fundamental in teaching health; therefore, it should be required of the students. Preliminary to full appreciation of human physiology, instruction in general science, including biology, is desirable. This is not always required in high school. According to the National Survey of the Education of Teachers, about 95 per cent of 168 prospective teachers of elementary grades, graduating from teachers colleges had a course in general biology. Owing to the almost complete neglect of thoroughgoing instruction in physiology and hygiene in high schools, it is especially important that it should be well taught in teachers colleges.

Professor Turner wrote, "Health is one of the most difficult subjects to teach. One can teach subtraction without knowing higher mathematics, but one cannot answer correctly the questions of children in the field of health without a sound basic knowledge of physiology, hygiene, and sanitation. The grade teacher does not teach immunology, but she needs to know the nature of diphtheria immunization and the Schick Test if she is to participate intelligently in the school program of immunizing children. The child asks, 'Does milk give me red blood?" The answer is 'No', but behind the answer is a knowledge of nutrition on the part of the teacher that includes information
that iron is one essential element in which milk is deficient. We do not force upon the child information that he cannot understand or in which he is not interested, but our answers to him, although simple, must be correct, and therefore based upon adequate knowledge. The teacher who is to answer the questions of elementary school children correctly and within their understanding must be both informed and resourceful. Knowledge is needed in excess of the facts taught.  

It is the opinion of the health authorities that the improvement of elementary health education must start from the teacher-training institutions. The professional academic training, the attitude toward health, their own health and health habits are equally important to the child's health. Dr. A. J. McLaughlin of the United States Public Health Service wrote to J. F. Roger, the Consultant in Hygiene of the United States Office of Education, making the following remark, "Probably the greatest service that an official of the government could perform in the interest of public health would be to further this more efficient instruction in teachers colleges of embryo teachers in the fundamentals of child hygiene.... If the advice therein is heeded, no expenditure of energy in public health activity will pay greater dividends in the future." 

D. The Development of the Hygiene Program of the National Teacher's College for Women

2. United States Office of Education Pamphlet, No. 67
The National Teacher's College for Women is a newly founded college for the purpose of producing women principals and teachers for middle, normal and primary schools. There are seven departments: Chinese, history and geography, science, education, music, home economics, and physical education. In order to build a program of hygiene and health education for a college of such a nature, it is very important to base it upon the local needs and the experience of similar colleges in other countries. Since the writer is pursuing her study in the United States and since she is comparatively more familiar with the philosophies and practices in the field of education in this country, she will, from time to time, refer to some of the successful achievements in the organization of hygiene and health education program of this country.

1. The Objectives of the Program
   
   a. To promote health by the well supervised program of hygiene.
   
   b. To offer opportunity to improve the behavior of the students.
   
   c. To inform the students of the principles and the knowledge of hygiene.
   
   d. To protect the health of the students.
   
   e. To develop the sense of responsibility of the students in the support and the promotion of the various phases of public health.
   
   f. To teach the students the principles of maternal and child care.

2. The Organization

   In organizing the hygiene and health education program in the college under consideration, there are three phases to be
considered: hygiene teaching, health services, and wholesome living environment. Traditionally, hygiene teaching is under the administration of education; health service, under the administration of guidance, and sanitation, under the administration of business. They are separate units and have no correlations. Hygiene teaching may cover all kinds of hygiene principles, and the social environment may contradict what is taught in the classroom. Obviously, there is no educational value. In order to change the behavior of the students, there must be adequate provisions for hygiene practice. Furthermore, in order to convince the students that the college believes what it teaches, the health service, the environment, and college administration must interpret what is taught in the classroom. The hygiene program is not an isolated unit nor an outgrowth of the interest of a few individuals of the institution. It should be the result of the mobilized effort of the whole college, from the president to the cooks and labor comrades, formerly called servants.

The tentative plan (accompanied with a diagram) of the hygiene program for the National Women's Normal College will be discussed in the following paragraphs. It must be borne in mind that this plan is based upon the administration of the former Hopei Woman's Normal College. It may serve as the basis for the development of a hygiene program in the National Women's Normal College.

a. The Outline of the Organization of the Program of Hygiene for the National Teacher's College for Women
of the National Teachers College for Women, China

The Administration of the Program of Hygiene

Music
History
Chinese
Home Economics
Education
Science
Health and Physical Education

Office of Dean

Office of Business

Office of Guidance

President
1). Hygiene instruction
   a). College hygiene required of all the sophomores
   b). Health education required of all the education majors

2). Health service
   a). Personnel
      (1). One part-time physician—six hours per week
      (2). One full-time nurse who, besides the academic training, must possess administrative ability

   b). Duty
      (1). Physician
         (a). Admission examination
         (b). Entrance examination
         (c). Annual examination
         (d). Control of communicable disease
         (e). Clinical work
         (f). Follow-up work
      (2). Nurse. Aside from her regular work in assisting the physician, control of communicable disease and taking care of the infirmary, she is to be responsible for the following work:
         (a). Kitchen and dining-room
         (b). The health of the cook
         (c). Toilet and privy

   c). Equipment
      (1). Clinic—two rooms, one is to be the reception room
(2) Infirmary—three rooms, four beds

3. Sanitation
   a. Personnel
      (1) Nurse
      (2) Business manager of the college
   b. Duty
      (1) Nurse—listed above
      (2) Business manager—purchase and construction

4. Administrative health committee
   a. Dean of Guidance
   b. Chairman of the science department
   c. Chairman of the education department
   d. Chairman of the home economics department
   e. Chairman of the physical education department
   f. Business manager
   g. Physician or nurse
   h. Health director

5. Student health committee—five members, elected by the student body

6. Public health education for the college community
   b. The Description of the Organization
      1) Health instruction. It includes college hygiene and the principles of health education.

a). College hygiene. All the students are required to take hygiene in the sophomore year two hours a week throughout the year. It will include the nature of the common diseases of the college students, and the community, their causes
and the prevention through personal hygiene, and community hygiene. For the intelligent understanding of these subjects, biology should be made the prerequisite. Therefore, it should be required in the freshman year of all the students. The previous practice in the colleges and universities was that biology was only required for physical education, and home economics majors, besides for some science majors. It would be exceedingly hard for the hygiene teacher to teach hygiene if these students had never had any biology in either middle school or college. Ordinarily people do not realize that hygiene is an applied biological science. It is usually considered as a course of common sense. It does include a certain amount of common sense, but based upon science. When hygiene is taught with science as a basis, the information is correct. If one depends upon only common sense, he is apt to make many mistakes. It is the same with general education. It involves a good deal of common sense, but its philosophy and procedure are based upon the science of human behavior, psychology and physiology. It is not uncommon that some of the so-called educators who do not have sufficient scientific background, adopt a certain philosophy or procedures blindly. They are harmful instead of helpful to the students. The other fundamental sciences should be required. Since this is the first experiment of developing a hygiene program in the said college, only the minimal requirement is suggested with the hope that as time goes on improvement will be made every year as far as the college condition permits.
b). The principles of health education. This includes the analysis of the health needs of the students in the schools; the relation of health education with general education; the application of educational principles in health education; the organization of health education program in schools; health education through co-operative activities; the routine procedures, gradation class instruction, and evaluation of results.

Both of these courses should be given by a special, trained person. The college authorities in China always consider a physician to be the most appropriate person to teach hygiene. The results have shown that they are the least satisfactory persons to teach the subject. A practicing physician has his own regular work and scarcely has time to prepare lessons. His interest is in the curative side rather than the preventive aspect. Moreover, he is unfamiliar with the educational principles. If a physician is interested in teaching and also has the training in educational psychology, he would be suitable for hygiene teaching. He should be the person who also heads the health service.

If a special trained health director is to teach hygiene, she should be under the administration of either the health and physical education department or the department of education. This can be decided according to the local condition.

2). Health service.

a). Personnel

(1). Physician. A part-time physician who comes
to the college three times a week, two hours each time, will be sufficient to take care of an enrollment of 200 students. This physician should be in good health and be interested in the educational aspect of health.

(2). Nurse. A full-time nurse is needed. She should have the personality to command the respect of the college students, besides her academic training. In China students often do not look up to the nurses. There are two reasons: First, the work of the nurse is similar to that of the servants, i.e., to wait on people. Secondly, formerly the students who did not have the mental capacity to pursue the regular middle school course, would go into the nursing profession. Lately, the standards have been raised, but there are all grades of nurses.

For the duty the nurse is to assume in the hygiene program of the National Women's Normal College, the administrative ability is more than desirable— it is imperative.

b). Duty

(1). Physician. Generally the physician thinks her duty begins at the annual examination of the students and ends at the prescription of medicine for the students. They are not supposed to have other work besides these two cardinal duties. The duties listed in the outline of the organization of the program of hygiene, admission of examination, entrance examination, annual examination, control of communicable diseases, clinical work, and follow-up work cannot express the spirit of the work demanded of the physician to accomplish the
objectives of the hygiene program at the National Teacher's College for Women. Her attitude and co-operation toward the hygiene and the new project of the hygiene program have great influence on the success of the co-operated effort of the development of the hygiene program.

Because the physician is not an academic staff member of the college, she is generally not so carefully selected. Her appointment is often made through the recommendation of some influential person inside or outside of the college. Once he comes in it is hard to make changes. It is hoped that the college authorities may see the importance of the strategic position of the college physician in the promotion of the hygiene program so that they will not secure any kind of support for the college at the expense of the student's health. This may not be so easy as one generally thinks. However, if the college authorities are intrinsically interested in the health of the students and see the importance of the relation of the quality of the physician to the hygiene program, they will choose to sacrifice the certain phase of the benefits of the college for the health of the students.

(2). Nurse. Besides the usual duties of a college nurse--assisting the physician, control of communicable diseases, clinical work, and follow-up work--the nurse is to be assigned to co-operate with the business manager to maintain a healthful environment. A full-time nurse in a college of two or three hundred students should have time to take care of the following environmental conditions:
(a). Kitchen and dining-room. Kitchen and dining-room in some colleges are left to the care of the cooks. The cooks may be experts in their special profession, but very few have scarcely heard anything about sanitation. The nurse should be assigned to supervise the cleanliness of the kitchen and dining-room. This includes washing dishes and chopsticks, proper storage of foods, proper cooking of food, and keeping food free from flies, rats, insects and mice.

(b). Cooks. The health of the cooks is seldom thought of by the college authorities. This is due to lack of the knowledge of how diseases are transmitted. The nurse should see to it that they are examined periodically and should report to the college physician any undesirable health conditions.

(c). Toilets and privies. In the interior of China there is no sewage system. The writer has no idea just what kind of sewage disposal is common in the colleges and universities. The scope of the duty of the nurse is to supervise the cleanliness of the toilets and privies and to see that they are free from flies.

The above mentioned places are not taken care of because they are not at the foreground of the college and, as a rule, are not used by the faculty members. During war time the conditions may be changed, and the faculty and students may have a common dining-room and privies. However, a special, trained person, rather than a business office staff member, should supervise the servants, requiring them to take good care of these
places and make reports of the existing conditions from time to time, so that the business office may be made to make improvements. These places are the hardest, but the most important places to keep clean. The nurse employed should have experience as well as administrative ability, and perseverance, besides her own professional training. To deal with the business office is one of the hardest jobs. It is not uncommon that a business manager is an old fashioned man in a small college. Even though he is a modern trained man, his staff member may not be trained in running business of a modern college. They often do not see the importance of the different phases of work and delay the work. It is up to the ability of the nurse to push the work without causing unnecessary conflicts with the business office.

c). Equipment

(1). Clinic. Generally in colleges there is a clinic with or without a reception room. It is much more desirable that a reception room be provided so that the physician may give diagnosis with privacy and without constant interruption.

(2). Infirmary. The infirmary and clinic should be close to each other. The purpose of the infirmary is not to take care of the sick students. There are two main purposes: (1) for doubtful cases and (2) for convalescent patients. For the protection of the health of the students as a whole, any doubtful cases should be separated from the rest of the group. Sometimes a student is recovered from certain
illness but is not ready to return to the routine college activities. There should be a room for such patients.

5). Sanitation. Sanitation has two aspects, business and supervision. Therefore, the nurse and the business manager are the key persons in this phase of health service. It would be ideal if the business manager had some knowledge or training in engineering. For the purpose of promoting health in college, sometimes it is necessary to make additions or changes in the construction of equipment, and in the arrangement of rooms, etc. Since the business manager and his staff are made to understand gradually the principles of sanitation and its relation to college buildings and equipment, he would be more efficient in directing engineering work from the aspect of health.

The nurse has so much contact with the business office and she is the important person to educate the business staff members as a school nurse to the parents of the children. This duty of hers is not outlined on paper in black and white, but it is expected to be the most important function of the nurse.

4). Administrative health committee. As the health program in college is a new movement in China, much support is needed from all departments. It is necessary to form a health committee as outlined. The function of the dean of guidance is to take care of the students' physical and mental health. The health program is not only so close to her work but is part of her work. The health program emphasizes
positive or preventive aspects of guidance by definitely planned activities. It teaches not only principles but offers opportunities to put these principles into practice. The health program is related to the guidance program. If the dean of guidance is a modern trained woman and has clear vision, she will give all her support to this newly introduced health program ahead of anyone else in the college.

Health is an applied biological science introduced and presented by educational procedures. It is both science and education. Much help is needed from both the science and the education departments from the point of view of teaching and administrating health activities. It is the function of the health director to make these two departments realize their unique opportunities in their contribution to the health program.

Health is one of the most important functions of the home economics department. It teaches nutrition, child care, and clothing from the standpoint of health. A well planned health program would be welcome by the home economics department for such a program exemplifies the health principles from various phases.

Health is the undeniable function of physical education, although some extreme leaders in the field of physical education try to emphasize health as the by-product of physical education and character training as the chief function. The word, by-product, implies the meaning, "coming along" without effort making. In no case physical education should not put emphasis
on health. If one does not seek to obtain health in physical education, ill health often becomes the by-product. This is not uncommon during the period of rapid growth of physical education in China. Health should be one of the undeniable objectives of physical education. There are two facts to be remembered: Health is the means not the end, and health is not the only objective.

Physical education seeks for health through proper physical activities, rest, and nutrition. It does not cover all the phases of health. It is quite common that many physical education directors think health education is in the field of physical education and vice versa. There are certain common phases of health of interest in both fields, but in each of them there are its own particular phases, which include special knowledge and technique that the other field does not cover. These two fields are like identical twins. They are alike in many respects and different in their own ways. One is ready to give assistance to the other. Dr. C.H. McCoy wrote that physical and health education are closely allied and are combined for the purpose of school administration, but they are not the same. All school subjects should contribute to health, and in doing so are a part of health education. Health is a major objective of all education while physical education is a way or method of educating and contributes most of all to health education. Certain special scientific phases of health edu-

cation not covered in other school subjects may need to receive special attention in a special class. That is the health education class in the schools.

The foregoing discussions have revealed that health is not an isolated field. It can draw its resources from all the allied fields. Therefore, the administrative health committee should consist of the chairmen of all the allied departments, besides the college physician (or nurse), business manager, and health director.

5). Student health committee. This committee should be elected by the student body. It has two main functions: first, to assist in promoting a health program in the college; and second, to make suggestions concerning the health program from the point of view of the students as a whole.

6). Public health education for the college community. Student health program cannot be developed satisfactorily without the promotion of the health of the faculty members, the staff members, and the labor comrades. Usually in college, rules and activities are only for the training of the students. The nature of health activities is different. Unless they are participated in by all the members of the college, the good result cannot be expected to be obtained. Some of the intellectual people do not know much about health nor appreciate its value. They are the hardest people to convince in a college community. They are either indifferent or sneer at the whole health program. Generally, the president of the college can influence these people. If the president sets the example,
many of them will follow. At the same time there should be lectures and exhibits arranged regularly for the whole college.

For the labor comrades there should be regular evening classes to teach them some simple rules of hygiene. In the first year, the nurse can conduct the class, for she knows just exactly what they should know. Later, the students can help.

The health program must be made a college affair. It is for everyone of the college community, so that he or she, whether, teacher, staff, labor comrade or student will participate in and contribute to the success of the health program.
Part II. **Hygiene Instruction**

A. **Introduction**

1. **Definition of Hygiene.** The term, "wei Sheng," in Chinese has a broad application. It includes all kinds of activities for the maintenance of health and the prevention of diseases. The National Health Administration is named as "Wei-sheng-shu," and the hygiene course in college and middle school is named "wei-sheng." The term,"wei-sheng," means protective measure for living. The meaning of the term allows such broad application with accuracy. It is a well selected modern term. It is hoped that by the time the course approaches its end the class will clearly understand the spirit of the term, "wei-sheng."

2. **Scope of hygiene.** There are two phases of hygiene: personal hygiene and community hygiene. Personal hygiene deals with individual behavior, and community hygiene essentially with the effect of the environment on the individual.

Personal hygiene is defined as the science and art of the conservation and promotion of personal health. It includes problems relating to nutrition and the satisfactory feeding of the individual, to his personal cleanliness, his sleep and rest, his work and fatigue, his mental joy and happiness and absence of worry, his physical exercise, the use of stimulants and narcotics, the clothing he wears, and the care of eyes, the ears, the teeth, the mouth, the bowels, the hair, and other organs. Certain practices, such as vaccination against smallpox, immunization against typhoid, or diphtheria
and the use of biological products either for preventive or curative treatment of disease and which are within the domain of preventive medicine may be considered part of personal hygiene, because they deal with the treatment of individuals rather than the control of the environment.\(^1\)

Community hygiene is the science and art of the conservation and promotion of the public health through the control of the environment. Its object is to promote the health, comfort, and convenience of communities. It deals with those health problems that are common to groups or communities, such as water supplies, sewage and drainage, refuse collection and disposal, food supplies, restaurant and storage sanitation, factory sanitation, housing, camp sanitation, sanitation of swimming pools, sanitary drinking facilities, street cleaning, parks, and playgrounds, and control of insects, rodents, odors, noises, obnoxious gasses, and other nuisances or menaces to health.\(^2\)

3. **Scope of College Hygiene.** College hygiene is only one part of one of the new developments of the National Teachers College for Women, hygiene program. The hygiene program has three phases: hygiene instruction, health service, and environmental sanitation. **Hygiene instruction** is concerned with the information of healthful living, health service with the revelation of the health status of the students, and the provision for the improvement of the health; and, finally, with environmental sanitation, with the establishment of the minimum sanitary conditions at all points for the college environment with respect to bedroom, dining-room, kitchen, toilet, etc. None

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2. Ibid.
of these phases of this program will be only nominal in the National Teachers College for Women. Special committees are appointed and professionally trained people are employed for each particular phase of the work.

These three phases are a well coordinated unit for the promotion of the health of the students in the college. It is hoped that every single member of this college community will co-operate with the college authority to make this project successful. This means constructive criticisms, perseverance, sympathy, patience, and appreciation of the efforts of the others. It is not a very easy task of the college authority to undertake such a project while the national resource is concentrated to the use of many phases of the reconstruction work at the period of national crisis. However, because of the realization of the fact of the promotion of the health of the students is the great potential force for the building up the new China, the college authority is trying to make this project at the minimum cost, but to reap the maximum results. It is the hope of the college that the fellow students of the college by their knowledge obtained in the college hygiene course will play the most important role in the contribution of the success of this program.

The college hygiene course is a year course. Two-thirds of its time will be devoted to the personal hygiene as discussed under the scope of personal hygiene, and one-third of the time to community hygiene.

There is no boundary line separating personal and community
hygiene. The individual is a part of the community. Communicable diseases involve problems of the hygiene of the individual and community hygiene the activities of the community, both the governmental and the social activities. Communicable diseases will be discussed under personal hygiene as how to avoid them by personal hygiene and also by the utilization of available facilities of the governmental and the social agencies. In community hygiene the discussion will be concentrated on the activities of the government in control of the communicable diseases from the standpoint of public health of the community, and that of the voluntary social agency in China and abroad in the assistance of the promotion of the public health work in China.

4. Objectives of College Hygiene. The objectives are generally of two types: remote and immediate. For the purpose of documentary form or publicity it is always necessary to list both types of objectives, but for the purpose of informing the students of the hygiene class what is expected of them in the hygiene instruction in relation to the health service and environmental sanitation, and for the purpose of measuring results at the end of the year, it is necessary to make these objectives as specific as possible. Therefore, only the immediate and specific objectives will be listed below. It is hoped that when these objectives are achieved,

they contribute in part to the success of the national health program.

a. To inform the students of the recent knowledge concerning personal hygiene.

b. To correct the unauthentic information and traditional beliefs concerning hygiene.

c. To teach the students to make the best use of their money in the selection of food.

d. To train the students to take care of their health by the intelligent understanding of the mechanism of their body.

e. To train the students to appreciate the existing preventive measures of public health and to make the best use of them.

f. To create the attitude among the students toward the importance of health in relation to efficiency.

g. To teach the students to make the proper use of the service of the physician.

h. To train the students to form the hygienic habit in the three phases of the hygiene program.

5. Approaches. A list of questions will be in the true and false form to test the general knowledge of the class before the lecture and activity start. Their answers will be corrected with the class after the short period of testing. The purpose of this test is twofold: to inform the teacher how much hygiene knowledge the students do possess, and to call attention to the students tactfully how much of their knowledge is incorrect.
The outline of the course will be distributed to the class. The teacher will go over the outline rapidly with the class. The students will be asked to hand in at the next recitation period some topics which they are interested in, and not outlined in the course.

6. **Material.** The topic is arranged in the order based upon the psychology of the Chinese students rather than the logical order. The students are more interested in preventing disease than in taking care of the sense organs, body mechanics, etc. They are more easily impressed by the ability and the background of the hygiene teacher in the presentation of topics which have close relation with medical science or diseases. Through the personal experience of the writer the first impressions made by the teacher are rather essential to the success of his teaching. However, the present order is subject to changes according to the available facilities.

This course attempts to arouse the interest of the students in the hygienic way of living by a careful selection of topics and interesting presentation, rather than writing an outline or a textbook. Professor C. E. Turner's **Personal and Community Health** and **Effective Living** cover all the important phases of personal hygiene and present the latest information of hygiene facts. Therefore, the material from these books is selected as the basic source material. Dr. Diehl's **Healthful Living** contains many interesting scientific evidences. Owing to the limitation of space in this paper, it is impossible to refer to all of them. Nevertheless, they will be used as references in
teaching. The other references are to be indicated in the footnotes of the respective pages.

The sound principles and practices of hygiene are given with great emphasis on the social and economic condition of the interior of China. Efforts have been made to stress the application of the practical knowledge to daily living, so that the students may find this course not only beneficial to themselves, but also to those with whom they are in constant contact.

The topics are developed in unequal length. Some are fully discussed and others are in more or less an outline form, because they are of different importance and also because some of the material refers only to "The Communicable Disease" as listed by the American Public Health Association. The papers distributed to the writer in her personal hygiene class, and the papers written by her in her epidemiology and sanitation classes are also referred to.

B. Personal Hygiene

1. Nutrition

To discuss nutrition seems very impractical and absurd to many Chinese at the present time because the blockade of Chinese seaports, combined with the rapid decline of Chinese currency, has greatly influenced the cost of living. Rice, the most common food in central and south China, is sold at a price ten to twenty times as high as that prior to the war. A pair of shoes costs $150. in Chinese currency. The salary of those who work in the educational field remains on the same level. A professor with the highest rate of income, about
$600. per month, cannot afford to feed his family of a moderate size, five or six members, with even adequate "common meals," which consists of two meats, two vegetables, a soup and rice.

Many students are short of money and are on government aid. They cannot afford to get enough bulky food to stop their hunger. They are urged to choose the food by one of the most fundamental instincts of man, stomach hunger, rather than by the conscious awareness of the nutritional values. Some of them cannot put into practice what they know because of lack of money. The writer is fully aware of the serious situation. It is the attempt of this paper to present some of the principles which may assist the students to make their limited amount of money go to the best advantage. For instance, wheat flour is cheaper than rice and has better nutritional value. It also supplies enough bulk. While money is so scarce, more wisdom is needed in selecting food. In order to be able to obtain this end, it is necessary to discuss the class of foods and their relation to health, the nutritional contents of the common foods, and the principles of selection.

Although preparing the menu of the college is not in the scope of the power of the students who live on the campus, intelligent suggestions concerning food, through the student health committee will be welcomed by the administrative health committee of the college. It is the intention of the college to make an effort to practice what she teaches the student within her limitation.

a. Questions

1). How foods are selected
2). State the function of each class of foods.

3). What comment would you give to our "common food" at an ordinary time?

4). What comment would you make on the food of the students in China at the present?

5). Which of the commonest and cheapest foods has comparatively high nutritional content?

6). What is the substitute of rice for the northerners in China? How does it compare with rice?

b. Subject Matter

1). Classes of foods and their functions. Food is the source material for body needs: (1) for energy and heat, (2) for growth and repair, (3) for control of metabolic process. From the foods the body secures its chemical elements, which are oxygen, carbon, hydrogen, calcium, phosphorus, potassium, chlorine, magnesium, sulphur, iron, copper, iodine, flourine, silicon, and manganese. The foods have the following classes:

a). Water

(1). Two-thirds of the body weight

(2). A liquid carrier system - lymph and blood supply nutrition and remove waste material

(3). Excreted from the lungs, skin and kidneys

(4). Obtained from drinking and foods

b). Proteins

(1). Amino acids are the chemical simpler products.

(2). Absorbed in the form of Amino acids in the digestive system

(3). Twenty-two known amino acids are present in
different combinations in proteins.

(4). Some of them are essential to the growth and maintenance of life.

(5). Milk, egg, meat, fish, and soybeans are considered the best source of proteins because all of them contain all of the essential amino acids. Proteins burn more rapidly in the body than other foods. Carbon and hydrogen are used as fuel; the excess or nitrogen is secreted.

c). Carbohydrates

(1). Fuel or energy-producing foods

(2). A small amount is needed for the metabolism of fats.

(3). Digestion reduces all sugar and starches into simple sugar dextrose. It is then absorbed in the alimentary canal.

(4). Furnishes a quick source of energy.

(b). Glycogen is the storage form in the liver. Muscle draws it from the liver for instant use.

d). Fat

(1). It contains also carbon, hydrogen and oxygen like sugar except oxygen is in less proportion. Therefore, it is more concentrated and requires more oxygen for combination. Fats produce 2.25 times as much heat as an equal weights of carbohydrates and proteins.

It requires the presence of sugar for complete combustion of it. Partial combustion of fat leaves an acid which results in the type of acidosis common in diabetes.
(2). Large amount stored in the adipose tissues.

(3). Interchangeable in the diet with sugars and starches, if the total amount of carbohydrates is not too greatly reduced.

(4). The unsaturated fatty acids, linoleic acid and linolenic acid are essential to the maintenance of health and cannot be synthesized from other foods. They are in iard, corn oil, cod liver oil and egg yolk.


   f). Calcium and phosphorus are not only important in forming bone and teeth but are essential in the formation of soft tissues.

   (2). Calcium is essential in the contractility of muscles, the irritability of nerves, and the coagulation of the blood, when the latter is exposed to air. It is rich in milk, fruits (oranges, figs, pears, strawberries and peaches), and vegetables (dandelion greens, cauliflowers, onions, and spinach). It is rich in the bones.

   (3). Phosphorus helps to regulate the neutrality of the blood and the rate of oxidation of carbohydrates. Many common foods contain considerable phosphorus. It is presumed that the requirements are automatically met. Liver, meat, fish, beans, peas and other vegetables contain it.

   (4). Iron is essential in forming hemoglobin of red blood corpuscles. Hemoglobin is concerned with bringing oxygen from lungs to tissue and carbon dioxide from tissue to lungs.
Iron is contained in liver, molasses, egg yolk, cereals, and green vegetables. Dandelion and spinach are rich in iron.

(5). Iodine is very important in the production of the internal secretion of the thyriod gland. This secretion controls the rate at which food is burned to give energy; it affects the storage of fat, and may even affect mentality. Ordinarily one obtains iodine from drinking water and foods. Water plants contain more water than land plants; garden vegetables, more than cereals and fruits. Seafoods are rich in iodine. Very little is needed in the body.

f). Vitamins

(1). Vitamin A. It is important for child growth, appetite, digestion, general well-being, and the health of the mucous membrane. It is called the anti-infection vitamin.

It is in leafy vegetables; yellow vegetables, as carrots, sweet potatoes, and yellow corn; in animal organs, such as liver, kidney, and sweet breads. Fish liver oils are an excellent source of it.

Carotine, the yellow pigment found in carrots and green vegetables, is changed into vitamin A in the body. Vitamin A oxidizes readily in the prolonged exposure to heat and air. Ordinary cooking does not reduce its potency.

The body stores it. One may eat liberal quantities of the foods which contain vitamin A. The surplus of it will be stored for later use.

(2). Vitamin B (thiamin, or Vitamin B₁). It is necessary for normal growth, motility of the organs of digestion (appetite). It prevents intoxication (by accumulation of
pyruvic acid from carbohydrate food). It is called anti-neuritic substance because it prevents certain nervous disorders.

It is found in roots, and tuber, in leafy vegetables, fruits, peas and beans, in whole cereals, in egg yolk, in such glandular organs as liver, kidneys, sweet breads. The richest food source is in the embryo of wheat, rice, and corn, and in yeast.

(3). Vitamin G, ascorbic acid. It prevents scurvy; therefore, it is called the anti-scurvy vitamin. It is required for the proper development and maintenance of bones and teeth. It is rich in citrous and other fruits, and vegetables that can be eaten raw, such as tomato, carrot, cabbage, onion. In the presence of heat and air, of an alkali such as soda, oxidation occurs. Commercially canned foods and vegetables are prepared in such a way that they contain nearly all of their original supply. It readily dissolves in water. The body is unable to store it. One must take it every day.

(4). Vitamin D. The metabolism of calcium and phosphorus depends upon vitamin D; therefore, it is necessary for the development of bones and teeth. It is rich in fish. Egg yolk, beef or pig liver are fairly good sources of it. Direct exposure to sunlight, especially in summer, forms vitamin D in the skin.

(5). Vitamin E. It is associated with reproduction, for normal birth. It is widely distributed in foods.

(6). Vitamin G (riboflavin, or Vitamin B₂). It is for the maintenance of the health of the skin. Most foods contain it but in different proportion.
(7). Vitamin PP (niacinic acid). It is the pel-lgara-preventing substance. It is found in yeast, wheat germ, lean meat, green peas, tomato juice, soybeans, spinach, mustard greens, milk, egg yolk and some vegetables.

2). Effect of deficient diet. The functions of differ-ent foods have just been discussed. For the purpose of a better understanding of the importance of foods in relation to health, a few minutes should be devoted to the effect of defi-cient diet. C. I. Wu stated: "Chinese are small in stature in comparison with Americans and English. They live shorter lives with higher mortality both among adults and infants. They pos-sess low vital resistance, as evidenced by the prevalence of such diseases as trachoma and tuberculosis. They are over-peaceful, non-persevering, non-progressive, non-enterprising, are easily contented with the enviornment in which they find themselves. Are these qualities inherited from the ancient Chinese who came to Eastern Asia thousands of years ago, or are they the result of malnutrition continued from generation to generation? There is considerable evidence that the latter is the case."¹

The following discussion will be devoted only to the foods which are commonly lacked.

a). Deficiency of protein. In India there is a characteristic protein deficiency among the lower classes because meat and fish are rare articles of diet. They posses

a lessened physical vitality and their statures are small. The addition of protein to the diet of these people has resulted in a striking improvement in physical efficiency. The proteins of animal origin are of higher nutritive value than those of plant origin. Eggs constitute a mixture of proteins and have a higher nutritive value than any other source of protein known. Milk is ranked the next in reference to high protein. This is nature's way of taking care of the embryo and the infant. After the infant stage one has to substitute other protein foods for growth and repair. In Western countries, especially in the United States, milk and its products are the common sources of protein. Cows are raised in the proportion of one cow to five persons. Milk is produced under sanitary conditions and sold at a very low cost. In China the mass of the people obtain their proteins chiefly from soybeans, from which a variety of foods are made; a feast of thirty or forty courses can be derived from the single source, soybeans. They contain all the essential amino acids for good health. Under biological analysis they show a low nutritive value, unless the temperature \( 140-150 \) degrees \( \text{C} \) is applied. This process will nearly double their value. Incidentally, in the Chinese cooking process, the temperature may be raised to such a favorable degree. Under present economic conditions, more people, especially children, should be encouraged to eat soybeans. Many people do not like some of the products made from soybeans, for the taste is not palatable. They can be flavored with almond or other like

things. For the better economic class, it is better to sub-
stitute for soybeans eggs, meat and milk, if possible.

d). Carbohydrates constitute the main portion of the
Chinese diet. They were comparatively cheap before the war.
There was no opportunity for such deficiency. As the price of
rice goes up every day, many people are lacking fuel to produce
a sufficient amount of energy to perform their daily tasks. If
this condition is not remedied soon the body will not be able
to function any longer.

c). The deficiency of minerals shows the following
defects:

(1). Calcium

(a). In young rat

1. Decreaseu rate or cessation of growth

2. Intestinal inflammation

3. Hyper-irritability

4. Resorption of bone salts and probably rickets

5. Premature death

(b). In adult rat

1. Sterility

2. Reduced lactation

(2). Iron

(a). Anemia. There are many kinds of anemia.
Two of them are due to lack of iron; one is the reduca-

tion of the number of red blood cells. An anemic person is likely to be pale and to tire easily. It often exists in young and growing girls. This condition may be improved by a vacation in a camp where wholesome food, adequate rest and sleep, outdoor air and exercise are provided.¹

Liver, kidney, beef muscle, eggs, wheat germ, rice polishings and tomatoes are very good food for anemia.

(3) Iodine² Deficient iodine causes endemic goiter. It is the enlaiement of the thyroid gland without hyperactivity. It must be remembered that not all the enlarged thyroid glands are due to deficiency in iodine. The toxic, or so-called exophthalmic goiter, which may or may not be enlarged, is an entirely different condition. Its cause is not clear. Its symptoms are typical of an excessive and abnormal thyroid secretion.

d). The defects in vitamin deficiency are as follows:

(1) Vitamin A.

(a) Impaired vision--night blindness

(b) Atrophy followed by keratinization of the epithelial tissues of the body, resulting in: (1) inflammation of the conjunctiva of the eye accompanied by dryness or even ulceration of the cornea (xerophthalmia); (2) injury to the linings of the cavities of the body, as respiratory passages

and sinuses, stomach and intestines, bladder and urinary passages, etc.; (3) dryness and scaliness of the skin.

(c). Lowered resistance to infections.

(2). Vitamin B\textsubscript{1} (thiamin)

(a). Injury to the nerve tissues (beri-beri, polyneuritis), heart (dilatation and slowing of rate), and tissues (edema) due to the accumulation of a toxic substance (pyruvic acid from carbohydrate food).

(b). Loss of appetite and even nausea, resulting in retarded growth or loss of weight, impaired digestion, and possible lowered resistance of infections.

(3). Vitamin C (ascorbic acid)

(a). Scurvy, characterized by swollen, bleeding and ulcerated gums, loosening and decay of teeth, fragility and necrosis of bone, fragility of the capillaries with hemorrhages throughout the body.

(b). Weakness, fatigue, anemia, loss of appetite and weight.

(4). Vitamin D.

(a). Rickets, characterized by failure to deposit calcium and phosphorus in growing bone (in adults characterized by a softening and an increased fragility of the bones).

(b). Increased tendency to dental caries, enlarged parathyroid glands, possibly lowered resistance to infection.

(5). Vitamin G. (Vitamin B\textsubscript{2} or riboflavin). Impaired vision, sore lips with fissuring at angles and greasy accumulations at angles of nose.
(6). Vitamin PP (nicotinic acid). Pellagra, characterized by digestive disturbances (diarrhea, skin eruptions, usually sensitive to sunlight and nervous disorders leading to insanity.

3) Dietary needs and selection of foods. After having discussed the requirements of foods for the body, the next question is how to select them to meet the individual needs. Proteins, minerals, and vitamins may be essential, but what shall we eat and how much of it? Nutritional requirements vary so much, even for persons of the same age and size. There are few principles to follow:

a). There are certain basic requirements for everybody, whether old or young, large or small, active or inactive. These are enough fuel food plans, vitamins, proteins, and inorganic salts besides water. Vitamins are essential, but the requirements cannot be yet determined in quantitative terms. Practically, fresh fruits, leafy vegetables, eggs, bean curd, and bean curd milk. The requirement for minerals - calcium, phosphorus, iron, copper, etc. - are supplied by eggs, meat, fresh fruits, and vegetables. In China it may be necessary to add some iodine. Proteins must be provided in sufficient quantities to supply the body a need for growth and repair.

(A chart of the common foods with their nutritional values and calories will be distributed to the students, copied from 1 Buice's Health Science and Health Education.

b). Variety of diet is necessary. A variety of proteins is good because all kinds of amino acids can be thus insured. Different fruits and vegetables contain different amounts of minerals and vitamins. A reasonable amount of hard foods is needed to exercise the jaw.

c). A certain amount of bulk is needed to serve as a stimulus for peristalsis in the intestines. Vegetables and fruits have high content of fibrous cellular substance. It cannot be digested, but it has mechanical value.

d). Growing children need more proteins, minerals, and vitamins than do adults.

e). Physically active persons need more energy and heat-producing foods than do those who live a sedentary life. The quantity of carbohydrates, fats, and proteins which is necessary as fuel for a normal person has been computed on the basis of the number of calories necessary for the individual. A large calorie is the amount of heat to raise a kilogram of water one degree centigrade. This unit may be used to measure the energy and heat output of the body. Physically active persons of average weight need 3,500 calories, and a person who leads a sedentary life, 2,500.

f). To maintain the alkalinity of the blood is absolutely necessary. Foods differ in respect to the acidity or alkalinity of the residue left in the body by the process of oxidation. Pure sugars, starches, and fats are neutral foods, oxidize completely and yield carbon dioxide which is eliminated through the lungs. The foods, which contain sulphur,
phosphorus, or chlorine and yield phosphoric sulphuric, or hydrochloric acid when burned, are acid foods, such as eggs, meats, and cereal foods. The foods which yield sodium carbonate and other alkalines are alkaline foods, such as most fruits and vegetables. Too much acid food tend to neutralize the alkaline reserve of the blood. This is an undesirable condition for normal metabolism.

It does not require too much technical knowledge to make out a well balanced diet. If one follows the above simple principles, the proper food will be selected. For the purpose of illustration the writer has asked Miss Marjorie Wang, formerly the dietitian of the Chinese patients of P.U.M.C., Peiping, China, to plan a day's meal for the college students in both peace and war times. The table of a day's meal planned by her with some supplementary notes will be given as follows:

Since the National Research Council, during the Washington Nutrition Conference, proposed only tentative allowances of the specific nutrients, on account of incomplete scientific studies, it seems best for our present purpose to follow a dietary pattern (conforming to China in her financial state during peace and war times as played in the lives of students, who are usually of the upper or middle classes) as interpreted by Lydia Roberts without specific calculations. The following dietary pattern is modified to conform to the recommended standards as mentioned above.

<table>
<thead>
<tr>
<th>Meal</th>
<th>Peace Time</th>
<th>War Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit</td>
<td>Tangerene</td>
<td>Persimmons</td>
</tr>
<tr>
<td>Protein food</td>
<td>Egg</td>
<td>Peanuts</td>
</tr>
<tr>
<td>Whole grain cereal</td>
<td>Cured liver</td>
<td>Salted vegetable</td>
</tr>
<tr>
<td></td>
<td>Millet chou (gruel)</td>
<td>Millet chou (gruel)</td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable soup</td>
<td>Chicken blood bean</td>
<td>&quot;Kai-t'sai liver soup</td>
</tr>
<tr>
<td>Protein dish</td>
<td>curd soup</td>
<td>pork, soya bean,</td>
</tr>
<tr>
<td></td>
<td>Braised fish</td>
<td>carrots and smoked bean curd</td>
</tr>
<tr>
<td>Meal</td>
<td>Peace Time</td>
<td>War Time</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Lunch</td>
<td>Vegetable-protein</td>
<td>Salted vegetable</td>
</tr>
<tr>
<td></td>
<td>Vegetable</td>
<td>Sautéed &quot;piao t'sai&quot;</td>
</tr>
<tr>
<td></td>
<td>Whole grain cereal</td>
<td>Whole wheat mantou (bread)</td>
</tr>
<tr>
<td></td>
<td>Fruit</td>
<td>Bean milk (instead of fruit)</td>
</tr>
<tr>
<td>Supper</td>
<td>Vegetable soup</td>
<td>&quot;fei-tsai&quot; bean curd soup</td>
</tr>
<tr>
<td></td>
<td>Protein</td>
<td>Beef with tomato, aifaifa</td>
</tr>
<tr>
<td></td>
<td>Vegetable-protein</td>
<td>Sautéed &quot;yu-t'sai&quot;</td>
</tr>
<tr>
<td></td>
<td>Vegetable</td>
<td>Mantou (bread)</td>
</tr>
<tr>
<td></td>
<td>Whole grain cereal</td>
<td>Millet, red bean, sweet potato chou (gruel)</td>
</tr>
<tr>
<td>Dessert</td>
<td>Walnut-honey-date tea</td>
<td></td>
</tr>
</tbody>
</table>

In every case, whole grain cereals and cereal products are used to insure the consumption of calcium and vitamin B. Any seasonal fresh fruit - not imported or canned - should be included in the meal, if possible. Since eggs and meat stuffs are so high during war time, the students will have to rely upon beans and bean products. The number of dishes although reduced during war time, will need to be doubled in quantities in the dishes served to meet calorie needs.

The names in the above table marked with quotation marks are the kinds of green vegetables not produced in this country.

c. Activities

1). Write to your friend and ask him or her to keep a careful account of the diet for a day. Criticize his or her diet from the standpoint of calories, building foods, vitamins, and minerals. How could it be improved?

2). Make a list of food fads and fancies which you know.

3). Collect some materials on nutrition.

4). If you were given six dollars a day for the menu of your family, what would you have for each meal? State the number of the family, the age, sex, and the occupation of each member.
2. **Disease**

   a. **Questions:**

      1). What are the causes of disease?
      2). What parasites do you know that are harmful?
      3). You have heard so much of the word germs. What harm do they do to people?
      4). Do germs like sunlight, dessication, high temperature, and cleanliness?
      5). What are the various methods to prevent disease?
      6). To what extent can you do for yourself to prevent disease?
      7). Why do some people seem to get certain diseases much more easily than others?
      8). What is immunity?
      9). Why is vaccination used to protect us against disease?
     10). What is athlete's foot?

   b. **Subject matter**

      1). **Theories of disease**

         a). Demonic theory of disease - still common among the uneducated people in the rural area.
         b). The theory of four humors - blood, phlegm, yellow bile, and black bile - discarded.
         c). The germ theory of certain diseases - present theory.

      2). **Types of disease**

         a). Deficiency disease. The diseases which are produced from insufficiency or lack of the essential food
elements as discussed under nutrition belong to this category.

b). Degenerative disease. The diseases caused from the constitutional degeneration as demonstrated in old aged people, such as organic heart disease, cancer, nephritis, etc.

c). Infectious disease. The diseases produced by parasitic infection are infectious diseases, such as diphtheria, scarlet fever, smallpox, typhoid, dysentery, tuberculosis, malaria, etc.

3). Three primary factors in infections - parasite mode of transmitting, and host.

1a). Parasites

(l). Disease-producing organisms

(a). Worms. There are several kinds of worm diseases. Some of them live in the intestines and others in the liver, blood, and muscles. There are several kinds of worms which prefer to live in the intestines. Some worms are microscopic in size and others several inches or several yards. These worms are mainly transmitted to man by the ingestion of uncooked or not well cooked meats or vegetables. Example: Life cycle of ascaris.

(b). Protozoa. Protozoa comprise one of the most important groups of causal agents of disease in man. The organisms which are responsible for malaria and certain forms of dysentery are protozoa.

Protozoa are simple, one-celled animal organisms. They have distinct nuclei. Not all of them are pathogenic. They

1. Ibid., p. 3.
live in fluids and water, at least while in active condition.

(c). Spirochaetes occupy a position midway between the plant group of bacteria and the animal group of protozoa. Some of their characters, such as the lack of a definite nucleus, are like bacteria; while others, the capacity for reflexing and contracting, are like protozoa. One species of spirochaetes is the causative agent of syphilis.

(d). Molds. Molds are multicellular plants. They have fine cottony, fiber-like bodies called mycelia. Their chief method of multiplication is by means of spores, which are at the end of mycelia. They are disseminated by the wind or fluids or other agents, and germinate when they come into contact with favorable conditions. The bread mold is not a disease-producing mold. The most common pathogenic mold is that causing "ring-worm." The very fine mycelia of this mold grow in the skin.

(e). Bacteria. They are one-celled plant organisms, and microscopic in size. There is no nucleus. This distinguishes bacteria from other groups of microorganism. Some have flagella, the apparatus for locomotion. They are classified in three groups according to shape: bacilli, spirilla, and cocci. They are divided by transverse division. Under favorable conditions of food, temperature, moisture, etc., some bacteria divide as often as once in thirty minutes or even more frequently. The different environmental factors are considered as follows.

Moisture. Water is essential for the metabolism of the
cell body of bacteria. Some of them can withstand dessication from a few hours to a few weeks by the self-resisting method, which will be discussed later.

Temperature. The range varies in different species. Most bacteria pathogenic for man thrive best at or near the temperature of the human body, 37.5 degrees centigrade. Many disease-producing organisms are able to resist temperatures below freezing for days, weeks, or even months.

Oxygen relations. Although most bacteria need oxygen of the air for the oxidation of food, some bacteria utilize the oxygen which is freed in the assimilation of their food substances. The former are aerobes and the latter anerobes.

Light. Sunlight is a powerful germicide for most bacteria. It destroys tubercle organisms in two hours. Diffuse sunlight is less germicidal than the direct sunlight. The violet, ultra-violet rays, x-rays, radium rays and cosmic rays are very powerful rays in the destruction of germs.

Spore formation. A few species of bacteria produce spores, such as lockjaw bacteria. Under unfavorable conditions of food or of temperature, or oxygen supply or of other factors, the protoplasm of the bacterium's body is concentrated in a spherical mass to protect itself. The mass is formed at either end or near the middle of the bacillar body according to species. It has a resistive wall to protect itself from all the unfavorable conditions, such as heat of boiling water for an hour or longer and may resist drying for weeks or months. In the case of anaerobic organism the spore will protect itself from oxygen. When favorable conditions again
return, the spore wall be dissolved by enzyme or chemical substance of the bacterium, and assumes its original shape and mode of life. It must be remembered only a very few bacilli form spores, and it is a means of protection, not multiplication, as in the case of the mold.

Toxins. Toxins are the poisonous substances produced by the bacteria. Most of them can easily be destroyed by heat. Boiling points for twenty minutes destroy the toxins.

(1). Exotoxins are extruded through the body surfaces—diphtheria bacillus.

(2). Endotoxins are not released and free to produce their poisonous effects until after the bacteria die and their bodies disintegrate, such as typhoid fever bacillus.

Anti-toxin. When an exotoxin is introduced into the body of an animal or into the human body, the exotoxin stimulates the body cells or tissues to produce an antitoxin. The ability of producing anti-toxin accounts for the fact that in some diseases there are no second occurrences.

(f). Filtrable virus. Ultramicroscopic organisms, much smaller than those can be seen with the assistance of the microscope. Their size can be estimated by filtration. They are parasitic, producing disease in man, the animals, and plants.

(2). The conditions of the organism

(a). Sufficient virulence. Virulence is the

power of a micro-organism to produce disease within the host that it attacks. It is variable in different hosts. Some time it is increased and other times decreased. It has two main components: (1) Toxicity, the power to produce chemical substances, which are poisonous to the hosts. (2) Invasiveness, the power to live, multiply, and penetrate into the fluids and tissues of its host. These two qualities may not be concurrent.

(b). Sufficient number.

(c). Selectivity of proper avenues for invasion.

b). Mode of transmission. Food, water, insects, contact with patients or other articles, and carrier.

(1). Carrier. A carrier is an individual who harbors and transmits pathogenic parasites without showing the usual evidences of infection. The absence of disease in carriers is due to the one of the three facts. ¹ (1) The carrier is in the stage of incubation (2) he has a general but not a local immunity or (3) he is too slightly infected to show symptoms.

(The material of the paper, which the writer wrote on cholera will be given to the class to illustrate how the five well known cholera pandemics were started from cholera carriers of India.)

(2). Other factors, water, food, etc. (The paper just mentioned will also show water as an important factor in transmitting disease.)

c). Host

¹. Ibid., p. 214.
(1). Resistance of the body.

(a). Skin. The thickness of the skin and the acid reaction (pH 7.1-7.4) of the stratum corneum of the skin protect itself from the invasion of micro-organisms. There are exceptions as in the cases of ring-worm and favus.

(b). Mucous membrane.

1). Ciliated epithelium.
2). Mucous secretions of nose.
3). Mucous secretion of mucin.
4). Tears (slight).
5). Gastric juice.
7). The acid reaction of urine and vaginal.

(c). Immunity. Immunity is the power or capacity of the body to resist the disease organism or its harmful products. It is due to the presence of certain substances (antibodies) present in the blood.

1). Natural immunity. Natural immunity is the immunity which the individuals of a race, species, or family possess by nature when born.

2). Acquired immunity - acquired during life.

a) Active acquired - The body participates in producing the substances which establish immunity in the body. It may be produced by (1) having the disease (2) following the injection of a virus or vaccine as in small pox vaccination (3) following the injection of killed bacteria (4) following the injection of
a mixture of the bacteria with the specific antibodies. b) passive acquired. The tissues of the body take no active part in establishing it. The protective substance is transmitted to the individual. (1) Congenital passive immunity is transmitted to the embryo in the placenta from the mother. Thus during the first six months of life the baby is immune to diphtheria, scarlet fever, mumps, poliomyelitis, etc. (2) The injection of certain horse antitoxin into those who have been exposed to the disease give them a passive immunity.

Different authors give different classification of immunity or use different terms for some of the types of immunity. Students of hygiene are often confused by them. It is to be born in mind that the student is to understand how immunity is established in the individual rather than mechanically remember the terms here, which may be different in various books.

(2). Factors influencing the resistance: Fatigue, exposure of wet and cold, alcohol, malnutrition, focal infection, and physical defects.

4). Immunization in specific diseases. As mentioned above active acquired immunity can be produced in various ways. Each specific disease is immunized not only with its specific material, but the material has also been treated differently according to the nature of the organism. For instance, an attenuated virus is introduced by vaccination against smallpox, rabies and anthrax. The virus of each of the diseases is attenuated differently. Small pox is so attenuated by transmitting the virus to the cow, rabies by transmitting
its virus to the rabbit and also by drying, and anthrax by heating its virus. Suspension of dead bacteria are injected in producing immunity against typhoid, paratyphoid bacillary dysentery, and Maita fever. Modified toxins are used for scarlet fever and diphtheria. All these processes are named as active immunization.

The serum containing anti-toxin produced in the horse may be injected to the patients in order to lessen the severity of the disease or to the people who are exposed to the disease for the purpose of prevention. This process is named as passive immunization in contrast to the above active immunization.

d. Activities:

1. Sketch molds and their spores from the material prepared by the teacher.

2. Sketch some living bacterial from hay fusion 24 to 48 hours.

3. Sketch spores in bacillus subtilus.

4. Demonstration of the effect of sunlight, heat, and dessication on organisms by the teacher.

5. Make a study of the percentage of the children at the neighborhood area who have not been vaccinated.

3. Mortality Rate.

a. Questions:

1). Have you any idea of the total mortality rate of China?

2). From your experience of living in a community as
such, what diseases do you think may have higher mortality rate than others? Why?

3). What does high mortality represent?

4). What share can the students take part in reducing the mortality rate?

5). What can the government do to reduce the mortality rate?

b. Subject Matter. The mortality rates vary widely in different countries. It is a great regret to say that in China there is no available record on such data. In other countries they have good systems for the registration of birth, death, and the causes of death. Such administration involves many problems, especially in the last mentioned item. Prior to the war in Nanking and some other cities the registration of the causes of death was started, and some of the data in Nanking will be used in discussing the present topic. Although Nanking is not a representative city, its data supplemented with other material will present to the class the tendency of the prevalence of certain diseases in China.

1). Comparison of the mortality rate of some significant diseases in the United States with the available mortality rate of similar diseases in China. The available data for the mortality rate of the specific diseases in the following table are that of Nanking and Chujung Hsien, Kiangsu, 1935. The mortality rate of the specific diseases of America is the data of 1937. All the death rates are calculated on the basis of per 100,000 population
<table>
<thead>
<tr>
<th>Specific Diseases</th>
<th>United States</th>
<th>Nanking</th>
<th>Chujung Hsien</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typhoid</td>
<td>2.1</td>
<td>19.7</td>
<td>52.8</td>
</tr>
<tr>
<td>Smallpox</td>
<td>less than .1</td>
<td>6.0</td>
<td>24.3</td>
</tr>
<tr>
<td>Measles</td>
<td>1.2</td>
<td>68.6</td>
<td>Not reported</td>
</tr>
<tr>
<td>Scarlet fever</td>
<td>1.4</td>
<td>Not reported</td>
<td>Not reported</td>
</tr>
<tr>
<td>Whooping cough</td>
<td>3.9</td>
<td>Not reported</td>
<td>Not reported</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>2.0</td>
<td>3.1</td>
<td>17.1</td>
</tr>
<tr>
<td>Cerebral meningitis</td>
<td>1.7</td>
<td>6.0</td>
<td>Not reported</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>49.0</td>
<td>131.7</td>
<td>158.5</td>
</tr>
<tr>
<td>Diarrhea and Enteritis</td>
<td>14.6</td>
<td>160.2</td>
<td>Not reported</td>
</tr>
</tbody>
</table>

The above table is far from complete, on account of the mortality rates of some of the diseases were not reported in Nanking and Chujung. Every single item shows that the mortality rates of both cities are much higher than that of the United States. The mortality rate of Chujung Hsien is expected to be higher than that of Nanking, because it is a Hsien, which had fewer sanitary facilities than Nanking, and the inhabitants there were less educated and probably belong to the lower economic class.

In the rural areas at the interior some of the diseases such as smallpox and the like have probably still higher death rates on account of ignorance, poverty, and lack of health service.

2). Comparison of the mortality rates of various countries. The following table will present to the class a clear picture of the birth rate, the death rate, and the death rate under one year in some countries:

The Birth Rate and the Crude Death Rate per 1,000 Population and the Death Rate under One Year, 1935

<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
<th>Living Birth Rate</th>
<th>Death Rate</th>
<th>Death Rate Under One Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>127,521,000</td>
<td>16.9</td>
<td>10.4</td>
<td>55.7</td>
</tr>
<tr>
<td>India</td>
<td>278,095,000</td>
<td>34.9</td>
<td>23.7</td>
<td>Not reported</td>
</tr>
<tr>
<td>England and Wales</td>
<td>40,645,000</td>
<td>14.7</td>
<td>11.7</td>
<td>56.0</td>
</tr>
<tr>
<td>France</td>
<td>41,940,000</td>
<td>15.3</td>
<td>15.0</td>
<td>68.9</td>
</tr>
<tr>
<td>Germany</td>
<td>66,863,000</td>
<td>18.9</td>
<td>11.8</td>
<td>68.6</td>
</tr>
<tr>
<td>Italy</td>
<td>43,009,000</td>
<td>23.2</td>
<td>13.8</td>
<td>101.2</td>
</tr>
<tr>
<td>Netherlands</td>
<td>8,433,000</td>
<td>20.2</td>
<td>8.7</td>
<td>Not reported</td>
</tr>
<tr>
<td>Japan</td>
<td>72,934,650</td>
<td>31.6</td>
<td>16.8</td>
<td>106.7</td>
</tr>
</tbody>
</table>

The estimated crude death rate for China is about 25-30 per 1,000 population as indicated in the early part of the paper. This figure was more than two times of the mortality rate of either the United States or England. The infant mortality rate was 200 per 1,000 live births. This is three to four times as high as that of either the United States or England. China stood at the top in both the crude mortality rate and probably the death rate under one year among all the countries. India had a lower death rate. Japan had a still lower rate in both cases. No doubt under the present war conditions these rates are going up. However, such a rise would occur in any country at war time. What does the high mortality rate indicate? It indicates poverty, ignorance, superstitions,

lack of correct knowledge concerning to personal hygiene, poor rural and municipal sanitation, and inadequate governmental health services. The government has realized this grave condition and has been making organized effort to improve the health of the nation. A country as vast as China with numerous problems, beside its program of war of defense, naturally cannot make very rapid progress. The improvement of health cannot totally depend upon the sanitary facilities of the government. It also depends upon the application of the knowledge of health to daily living on the part of the individual. It is a question of education. Here the word education means the awareness of the individual of the relation of personal hygienic habits to health and the formation of hygienic habits through persistent practice.

Generally people do not realize how much the individual can do for himself, nor do they realize the health service of the government in the role of reducing the mortality rate of the nation. If a physician saves the life of a patient at his dying bed, people would marvel at the wonderful work of the physician, making the dead alive, as the Chinese express it. The saving of life can take place in a non-spectacular form by personal and community hygiene. In the United States and some other countries the mortality rates of different diseases have been actually lowered by public health, personal hygiene, and medical service in the prevention of diseases.

c. Activities.

1). Write to the Central Field Health Station for the
mortality rate of Chungking.

2). Write also for the diseases which have higher mortality rate.

3). Visiting the division of Vital Statistics of the Central Field Health Station.

4. The Physiology of the Alimentary Canal, Its Common Diseases and Preventions.

a. Questions:

1). What is digestion?

2). Through what agent can foods be changed into simple forms for absorption?

3). What is an enzyme?

4). What are those enzymes in the digestive system?

5). What is indigestion?

6). What are the causes of constipation?

7). What are the common gastro-intestinal diseases?

8). What is epidemics?

9). Why are cholera epidemics so common in China?

10). Why do many people have diarrhea, especially in summer?

11). Americans do not drink boiled water as we do, but when they come to China, they do as we do. Why?

12). What are those intestinal diseases, which are more common in children than that of America?

b. Subject Matter.

1). Physiology. In the alimentary canal the solids and chemically complex substances of foods are changed into
chemically simple, and soluble substances.

a). Mouth and esophagus.

(1). Mastication.

(2). Ptyalin. Ptyalin digests starches and dextrins.

b). Stomach.

(1). hydrochloric acid ends the starch digestion.

(2). Rennin curds milk.

(3). Pepsin acts upon protein on an acid medium and changes them into peptones.

(4). When the solid food is pressed against the pylorus by a contraction wave, it closes more tightly. When the food at the pyloric end has been thoroughly liquified and acidified, a jet of food passes through the pylorus to the small intestine.

(5). There is no absorption in the stomach except for alcohol and some poison.

c). Small intestine, liver, and pancreas.

(1). Pancreas.

(a). Diastase or amylase converts starches into simple sugars.

(b). Lipase or steapsin converts fats into fatty acids and glycerin.

(c). Trypsinogen, an inactive enzyme, is changed into powerful proteolitic enzyme when entering the intestinal tract.

(2). Intestine.

(a). Enterokinase in the secretion of intestinal
glands, which is located between the villi in the intestinal wall. This enzyme activates trypsinogen into trypsin, which acts upon proteins.

(b). Erepsin completes the digestion of proteins.
(c). Invertase, lactase and maltase complete the digestion of sugars.
(d). The major part of absorption takes place in the intestine.

(3). Liver.
(a). Storage of glycogen.
(b). Elaboration of urea from the nitrogenous waste of the blood.
(c). Decomposition and excretion of the pigments set free by the disintegration of red blood corpuscles.
(d). Production of bile, which enters into the duodenum through the bile duct. It contains alkali and acts together with alkali of the pancreatic and intestinal juices to saponify the insoluble fatty acids so that they may be absorbed through the membranes of the lymphatic tubes.
(e). Bile salts facilitate the action of lipase in fat digestion and the absorption of the resulting soaps. It may promote intestinal peristalsis.
(f). The surplus bile is temporarily stored in the gallbladder, which is a muscular sac. Its duct joins the bile duct to form a common duct to pour bile into the intestine.

c). Large intestine.

The consistency of the content when it enters into the large intestine is like pea soup. It contains water, residue
of plant fiber, the bodies of bacteria (50 to 50 per cent of the bulk) and some of the bile residue. The right half of the large intestine absorbs a great part of the water.

3). Absorption of food substances.

(1). Fat in the form of soaps and glycerina passes into the lymphatic tubes of the villi and enters into the lymphatics of the mesentery as a milky fluid called "chyle." It is then carried into the thoracic duct, which flows into the left subclavian vein.

(2). The simple protein and carbohydrate substances are absorbed by the capillaries of the villi and carried to the portal vein which runs to the liver and divides into capillary channels. The end product of carbohydrate, dextrose, is given to the cells of the liver, which transform it into glycogen. It is also stored in the muscle cells for the production of energy (only 1 per cent of the weight of the muscle).

(3). The storage and utilization of sugar is controlled by insulin, which is produced in the pancreas and picked up by the blood stream and by way of the portal veins it is taken to the liver. Diabetes is a result of the failure of production of insulin.

(4). The amino acids, the final products of protein digestion, are taken from the blood by the body cells where they are needed for growth and repair. These amino acids are built into protoplasmic structure in excess of actual needs. Liver, spleen, and skeletal muscles are the chief storage of the proteins.
f). Digestion and emotion.
g). Digestion and exercise.
h). Regularity in eating.
i). Water with meal.
j). Indigestion. Indigestion is not a scientific or medical term, but a popular term applied to conditions associated with abdominal pain, vomiting, belching of gas and a bad taste in the mouth. The causes of indigestion are as follows:

(1). Hurried eating, combined with swallowing of an excessive amount of air and imperfect mastication prolongs the process of digestion.

(2). Over eating distends the digestive organs, producing discomfort.

(3). Eating between meals mixes the already partially digested food with undigested food in the stomach delays the discharge of the properly digested foods of the stomach.

(4). Pickles, or highly seasoned foods may be irritating and cause discomfort.

(5). Fried foods digest slowly. There is no ground for the common belief that all fried foods are indigestible.

(6). Wrong emotional state and fatigue inhibit digestion.

(7). Too much sugar irritates the stomach.

(8). Excess of alcohol, or its continued use,
causes irritation to the stomach, with over production of mucous and hydrochloric acid.

(9). Worry, excitement, overwork, or excessive use of alcohol, tobacco, coffee and tea sometimes may cause highly acid gastric secretion. This gives a burning sensation named as "heart burn."

k). Constipation.

(1). Causes.

(a). Failure to form a habit.

(b). Lack of roughage in the diet.

(c). Lack of exercise.

(d). Ptosis, sagging of the intestine and stomach, due to weak abdominal exercise. This condition reduces the abdominal pressure.

(e). Excessive use of bran may cause irritation and the contraction of the muscles of the intestines. This kind of constipation is named as spastic constipation, which is in contrast to the common atonic type.

(2). Symptoms. The symptoms are headache, lassitude, depression, irritability, and difficulty in accomplishing mental work. They are produced by the distention of the rectum rather than bacterial toxins.

(3). Prevention by:

(a). Foods. (1) provide bulk (2) produce gas (3) are mildly acid.

(b). Exercise.

(4). Laxatives. Less desirable. Some of them
cause irritation and are habit-forming.

2). The common diseases of the alimentary canal.

a). Food allergy. Certain persons are sensitive to particular foods, such as eggs, mushrooms, fishes, or some other foods. This poisoning effect is not due to infection, but due to an idiosyncrasy which makes the individual sensitive to certain substances in the food.

b). Appendicitis. Appendicitis is an inflammation of the vermiform appendix.

(1). Its cause is not well understood. The neglected constipation, intestinal poisoning, and habitual overeating are thought to be the contributory causes.

(2). Symptoms. The pain is usually at the right side of the lower abdomen. It may also appear as general cramps at the upper part of the abdomen. The pain is generally accompanied by vomiting.

(3). People often mistake it for so-called indigestion. The use of cathartics is very dangerous. It is estimated that more than 12,000 deaths every year in the United States are due to taking laxatives for abdominal pain in the case of appendicitis. The excess of activity caused by laxatives may cause the appendix to rupture. This leads to peritonitis. It is often fatal. Many lives would have been saved if the rule of not taking cathartics for abdominal pain were followed. Early medical diagnosis and treatment will reduce the mortality rate.

c). Cholera.
(1). The nature of the disease. It will be discussed under the headings of symptoms, etiological agent, and source of infection as given in "The Control of Communicable Diseases" by the American Public Health Association. Hereafter this same booklet will be referred to as source material in discussing the disease.

(2). The transmission of the disease. (The above mentioned material will be referred to).

(3). The prevention of the disease. It is a public health problem. It is related to sanitation, such as water and food supply, sewage and garbage disposal. In the countries they have modern system of sanitation, the mortality rate of cholera is nearly zero. Though in China there is no available data, one can judge the mortality rate must be high by the unofficially reported cases in the community during the summer. In the summer one tends to eat raw and cold foods and to drink unboiled water or drinks made from the water of unknown source. Foods and drinks like such may be contaminated and polluted, therefore, both the mortality and the morbidity rate are high in summer.

The preventive measure in China has to lean more upon personal hygiene, not only because of the lack of sanitary facilities but also because it is probably the efficient means among the educated class to achieve results. One should not be disappointed by the fact that to develop a satisfactory system of sanitation in China involves problems in finance, science and technical personnel. Educational measures should
should be used to the fullest extent. They are very much emphasized even in the United States which has a very good system of sanitation. In China, education has been recognized for a long time as a strong force in combating poverty, illiteracy, and ignorance among the masses. Schools, colleges, and universities have been established at a much higher rate than that of any other developments. After the outbreak of the war, education has become socialized and expanded to the heart of the rural area. While the students in college, they should not only familiarize themselves with the preventive measure upon which they have control, such as personal hygiene, but they should also be convinced of the fact that the possible death rate can be reduced by their conscious effort in practicing the simple hygienic rules and their influence of teaching others to do the same. In the college hygiene class, students often objected to being told the simple rules, such as drinking boiled water or eating cooked food. They consider such rules are only for grade students. As a matter of fact, they do not practice what they know. The reason is that they do not realize that simple rules may have profound scientific basis and public health significance. Our ancestors in China handed down these rules by having paid the great price of the toll of life. The Westerners established these rules through scientific research. The students should be taught to appreciate the existing preventive measures which have the elements of both simplicity and efficiency. Some research workers, who spend their lives in their laboratories to search
for this end and have not succeeded yet. It is absurd that many people have been informed of such rules free through the great price paid by others but regard them as simple and unworthy to learn. If there is any unworthiness, it is the fact that one knows some simple things which have public health or national significance but has no inclination to put them into practice. The value of any object is always determined by its contribution to people and the demand for it. Do the rules of drinking boiled water and eating cooked food fulfill this twofold requirement under present conditions in China? It is hoped that the class will give more serious thought to this question.

The other preventive or control measures (the material in "The Control of Communicable Disease will be used).

d). Ascarisis. According to the study made by the Central Field Health Station in 64 primary schools in Nanking, 1
50.5 per cent of the students examined were found to harbor helminth ova. 6,203 students were examined. The highest incidence of the ova was ascaris. It constitutes 46.1 per cent of the total number. It was also found that the farmer class outside the city have a higher percentage of helminthes infestation than the townspeople. Ascaris was also founded to have a higher rate.

(1). The nature of the diseases.

(2). The transmission of the disease.

(3). The prevention.

c). Summary. All the infectious alimentary diseases, such as typhoid, paratyphoid, dysenteries, and some of the worm diseases are transmitted in the same manner as those diseases just discussed. Their preventive measures are also alike, therefore they will not be discussed here any more.

2). Activities.

1). List what kind of gastro-intestinal troubles you have had.

2). Keep a record of five girls in the college for a month to see how many of them have good habits for evacuation. Give the names of the girls. There should be no duplication of records.

3). Demonstration of the effect of saliva on starch.

4). Demonstration of pepsin on albumin, if it is possible to obtain such facility.

5). Keep a record for three days how much time you have given for all your meals; use tabular form.

6). Demonstration of cholera vibrio with prepared slides.

7). Demonstration of some other bacteria, which cause intestinal diseases.

5. The Physiology and the Diseases of the Respiratory System.

a. Questions:

1). What are the breathing organs?

2). Is common cold a disease?

3). How to prevent colds?

4). Why should one avoid colds?

5). What is tonsilitis?
6). Under what conditions should tonsils be removed?
7). What is hay fever? How to avoid it?
8). Why tuberculosis is a very important disease?
9). How to prevent tuberculosis?
10). Is it inherited?
11). Why are more Chinese vaccinated against smallpox than any other diseases?
12). How do you explain immunity in smallpox vaccination?
13). Why must children be immunized against diphtheria?
14). Why is diphtheria an important disease?

b. Subject Matter.

1). Physiology.

Is one "poisoned" by the air in poorly ventilated rooms? What is the relation between breathing and health? Before these questions are answered, some fundamental facts on respiration should be discussed.

There are two kinds of respiration, external and internal. The external respiration is familiar to the class. It is to bring air into contact with the blood stream in the moist tissue of the lungs, where the exchange of gasses involved in oxidation can take place. The internal respiration is the exchange of gasses between the body cells and the surrounding fluid. The oxygen is brought from the lungs to the cells, and the carbon dioxide is taken away from the cells by the blood. Oxygen unites with hemoglobin (Hb) in an unstable compound, oxyhemoglobin (HbO), from which oxygen detaches itself in the
capillary field of the body tissue. Both oxygen and carbon
dioxide are present in the blood. The proportions vary in
arterial and venous blood.

The air one inhales is a mixture of 79 per cent of nitrogen,
and nearly 21 per cent of oxygen, together with .04 per cent
of carbon dioxide and traces of certain other gasses. The
nitrogen content of the air is unchanged in the lungs, the oxygen
content may reduce to 16 per cent and carbon dioxide may rise
to 5 per cent. The following table will give the oxygen and car-
bon dioxide contents of different kinds of air.

<table>
<thead>
<tr>
<th>Items</th>
<th>O₂</th>
<th>CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition of pure air</td>
<td>21%</td>
<td>0.04%</td>
</tr>
<tr>
<td>Air in the lungs</td>
<td>16%</td>
<td>5.00%</td>
</tr>
<tr>
<td>The air in the worst ventilated rooms</td>
<td>19%</td>
<td>0.40%</td>
</tr>
<tr>
<td>Composition of air which chemically produces physiologic injury</td>
<td>14%</td>
<td>3.00%</td>
</tr>
</tbody>
</table>

Formerly it was believed that the lack of oxygen and the
accumulation of CO₂ produced injury effects. The above table shows when O₂ drops to 13% and CO₂ rises to 3%, the air may
produce injuring effects. Such proportions never occur under
ordinary conditions.

a). The mechanics of breathing.
   (1). Muscles - diaphragm and intercostals.
   (2). Respiratory center in the medulla oblongata -
carbon dioxide content of the blood stimulates it.

b). Breathing and health. Proper breathing (1)
carries air to all portions of the lungs (2) provides adequate oxygen to meet the full needs of the body cells and (3) provides movement for digestion. Breathing muscles and other muscles are toned up.

c) Hygiene of the voice. The organs of breathing and the vocal cords are the agencies of speech. A pleasing voice is one of the most important assets socially and professionally. The proper use of the voice is related to the health of vocal organs.

The tone is determined not by the amount of air which passes the vocal cord but by the following factors: (1) their state of contraction and (2) the shape and resonance of the air passages of the mouth and nose. Before speaking, the lungs should be well filled. The air movement starts at the diaphragm with the throat relaxed and with the upper part of the respiratory tract free and vibratory. The voice is then clear with carrying power. Speak on the full breath and take breath between phrases.

d) Mechanical obstruction of breathing. The mechanical obstructions of breathing are (1) cold, (2) dust and smoke, (3) deviation of the nasal septum from injury or uneven growth before birth, (4) small bodies of soft tissues may be hanging in the nasal passage by small stems or stalks, (5) adenoids, and (6) enlarged tonsils.

e) The effects of mouth breathing. The effects of mouth breathing are (1) nasal voice, (2) sinus and middle ear infections, (3) susceptibility to colds. In children the lower
jaw drops, the cheeks press inward, the palate becomes high and narrow, the voice becomes nasal, the expression becomes dull, and the facial contour is changed. The failure of the body to secure enough air may cause mental retardation and imperfect nutrition.

2). The common diseases of the respiratory system.

a). Sinusitis is an inflammation of one or more of the sinuses. It is due to the spread of infection from the nasal passages. The bacteria are usually those which invade the upper respiratory tract following a fresh cold. The acute type produces pain and headache. A chronic infection is likely to develop in the sinus where the opening is very narrow. The inflammation may exist for a long time without being recognized because the local symptoms are not always present. Sinus infections may be either of the catarrhal or the suppurrative type.

Most of the cases of sinusitis could be avoided by (1) taking prompt care of colds, (2) avoiding snuffing solutions up the nose, and (3) blowing the nose gently.

f). Mastoid abscess. An infection may be spread to the middle ear through the Eustachian tube. It may be catarrhal or suppurrative in nature. The latter type may cause bursting of the eardrum and a "running ear." The infection may spread to the mastoid process; in some cases the result is a mastoid abscess, which if not attended by surgical treatment may extend to the brain area.

c). Bronchitis. Bronchitis is an inflammation of
the bronchi, extended from the nose and throat.

d). Tonsilitis. Tonsilitis is the infection of the tonsils. They tend to shrink after childhood; they are not necessarily injurious. When they obstruct breathing or predispose the person to throat infections, it is advised to have them removed. Acute tonsilitis sometimes may set up a secondary infection in the joints or on the valves of the heart to cause rhumatism or endocarditis, respectively.

e). Pleurisy is an inflammation of the surrounding membranes of the lungs. Usually it is caused by bacterial infection. The membranes become dry and are injured as they rub against each other in breathing. When the pus is formed, the condition is known as empyema.

f). Hay fever. The term hay fever may not be familiar to the class, but such a disease is common although the causes are not known to most of the Chinese. The symptoms are itching, burning, weeping, and sneezing. The nose runs, and breathing is difficult. It is not caused by bacterial infection, but by certain proteins in the pollen in only certain sensitive individuals. Different individuals are sensitive to the particular protein in certain pollen.

In China, allergy is not generally known by people as it is in this country, though there are such diseases. The recognized control measures are neither known nor practiced. In the early part of the school year a lecture will be given to the college community on allergy, and the class will be required to attend it. Therefore, the control measure will not be
discussed here. The material is from the paper the writer wrote in the class of "The Content of health Education," at the summer school of the University of California, 1939. It was written for the purpose of presenting to the high school students what allergy is and how it can be controlled.

g). Common cold. The common cold, although contagious, to many Chinese is not a disease, nor has it been considered as having any serious significance in health. People make very little effort in preventing its spread. This is due to ignorance of the nature of the disease and its mode of transmission.

The common cold is an acute infection of the nose or the throat or both. As to its cause there is no uniform agreement. Some authorities believe virus is the only cause, and others believe that the infection of the upper respiratory tract, which have the same appearance of the common cold are sometimes produced by some other microorganisms. They may act as secondary invaders and prolong the infection.

The cold is spread by the spray of the saliva or the secretion of the nose of the infected individual, especially during the first twenty-four hours. It appears not to be infectious after three or four days. The incubation period is usually thirty-six hours.

The immunity is very temporary. One may have a second cold after a very short interval, probably as short as two or three months. The inhabitants in the city are apt to be infected. The isolated individual or community may be free from such infection until it is brought in outside contact. Apparently
the viability of the virus is very low.

In the tropics the cold lasts only a week because it is uncomplicated. In the temperate climate it is complicated by the secondary invaders, such as the influenza bacillus, the pneumococcus, certain staphylococci or streptococci. Some of these organisms exist in the throat or the nose all the time, and they multiply more rapidly when one is infected with the cold. Chilling and unusual fatigue may prolong the cold or bring on pneumonia. Probably the latter is due to the extension of the pneumococcus infection from the upper respiratory tract to the lungs.

Some people have natural resistance to cold, and others are very susceptible to it. In the western countries cold vaccines are used to combat the secondary invaders. They are beneficial to some and relatively ineffective to others. There is evidence to prove that the deficiency in vitamin A is likely to produce the continued infection by secondary invaders.

To avoid draft, excessive fatigue, and to have the proper diet, such as fruits, vegetables, milk, and meat are personal hygiene measures in preventing colds.

When one is infected with a cold he should stay in bed to keep himself warm and rested for the purpose of preventing secondary infection. Moreover this prevents others from being infected. Orange juice and a mild laxative are helpful. Sodium bicarbonate counteracts the acidosis which is generally accompanied by the cold.
h. Tuberculosis.

(1). Prevalence. In the United States the mortality rate has declined from 1904 to 1934 from 200 to 50 per 100,000 population. Now in the United States this disease is concentrated in certain groups of people, such as Negroes, young industrial males and young mothers. In girls active cases and deaths are one and one-half times as numerous in ages from 10 to 14 as compared with other age groups. In boys it is three times as numerous in ages from 15 to 19, as compared with other age groups. According to the reports made on "Tuberculosis in Foreign Students" in the University of Michigan, Chinese students had the highest rate of tuberculosis cases. The mortality rate for the Chinese was 104 per 1,000 students. These Chinese students came from the privileged homes in China. For the students from the lower economic level the rate would be considerably higher.

The following data obtained from the National Tuberculosis Association will show the prevalence of tuberculosis among the Chinese people in this country.

| Per cent of all deaths in the United States due to tuberculosis from 1934 to 1938 |
|-----------------------------|------------------|-----------------|----------------|----------------|
| Total                      | White | Negro | American | Chinese | Japanese |
| 4.9                        | 4.1   | 9.6   | 17.6     | 17.8    | 18.0     |

The Chinese population has a much higher mortality rate than any of the populations in this country, except the American Indians.

The National Tuberculosis Association has estimated that the annual loss caused by tuberculosis amounts to one billion dollars. This includes wages, treatment, and the loss of future earning power by death.

(2). The difficulties in controlling tuberculosis.

(a). The disease does not give notable signs until it reaches an advanced stage.

(b). There is no sure way to produce artificial immunity by the use of vaccine or serum treatment. The reaction of the body to tuberculosis is not antitoxic but cellular. The tubercle bacilli are surrounded by the white blood cells and encapsulated by the cells or connective tissues.

(c). It is impossible that bodily vigor may be attained universally to resist the disease. It is very simple to say that fresh air, sufficient sleep, and proper diet may prevent or cure in the early stage. As a matter of fact, many people cannot secure that.

(d). Prevention cannot be secured chiefly by sanitation as in the case of typhoid.
(a). Transmission

(a). Two strains of organisms - human and bovine.

(b). Many types of the disease. Pulmonary tuberculosis is the most common. The bones, the meninges, and the glands are often attacked by the organisms.

(c). Children are infected at the trachial lymph nodes of the chest. The disease in this stage is benign. There is an excellent chance for recovery, if it is recognized early enough. (The bovine type organism causes the glandular tuberculosis.)

(d). Adults are commonly infected at the apices of the lungs. The organisms are spread from the lymph nodes.

(e). The chief source of infection in man is the sputum. Men are infected through ingestion as well as through droplets. Formerly the importance of infection by inhalation was overestimated. The organism may make its way from the throat and tonsils to the glands of the neck and from the intestines to the abdominal glands to other parts of the body, including the lungs.

It is necessary to prevent the access of infectious material to the mouth. Man can resist a certain number of the organisms. In fact, the majority of the persons who have lived to the age of twenty-five or thirty years will show tuberculosis lesions at autopsy although they may never have had any symptoms of the disease. Most of the people have received the organisms. It depends upon the dosage and the resistance of the individual to determine whether one will have the disease or not.

Tuberculosis is not inherited, but it is possible that
some predispositions may be inherited. A child can be infected from a tuberculosis mother. Children of tuberculosis parents have generally a high rate of tuberculosis.

(4). Prevention and control. Under the present economic condition most methods used for prevention and control in this country are prohibitive to the majority of the people in China. However, this should not prevent the class from knowing all the possible methods.

(a). Education. People should be made to know that tuberculosis is curable if it is discovered early. They should know that it is transmissible and that it is avoidable by personal prophylaxis, such as good ventilation, using private drinking cups, and not associating with persons who have tuberculosis.

(b). Early diagnosis. Early diagnosis during childhood and youth should be sought because tuberculosis is a disease of young people. The tuberculin test is used as a screening test for the children in the school. The positive reaction indicates the hypersusceptibility to tuberculosis due to some previous invasion of the organism.

X-rays are used with those who show a positive reaction to the tuberculin test. It is found a period of about three years between the diagnosis by means of x-ray and the first appearance of clinical symptoms. Sputum examination is not as good an early diagnosis as the x-ray, although the tubercle bacilli appear in the sputum before the appearance of clinical symptoms. Probably most cases of advanced tuberculosis could be prevented
if between the age of ten to twenty an annual x-ray were given.

(c). Hospitalization and preventive treatment. Patients should be separated from others for their own good as well as for the good of their family members. The cost either in the hospital or in the preventorium is very high. Probably there is not much provision in the interior to take care of such patients. Home treatment will have to substitute hospital or preventorium treatment.

(d). Home treatment. The treatment of tuberculosis is rest, fresh air, and nourishing food. If the case is not too far advanced, the patient can improve his condition by conscious effort to follow the instruction.

1). Smallpox. Smallpox is an old disease. Formerly millions of people died annually from it in China. At Sung Dynasty the old method of vaccination, nose inoculation, was first recognized as a measure of prevention. It was to introduce the scab of the smallpox patient to the nose of a well person. Many people died from contracting the disease by nose inoculation. Not until the tenth year of Chia Ching or Tsing Dynasty, the end of the eighteenth century, the modern method of vaccination was introduced to China by an English merchant indirectly through Malina and Meou. Once a Chinese poet wrote that if this method were introduced to all the provinces, the lives of the children would have been prolonged. This disease is still very prevalent in the rural areas of China.

The nature of the disease and its mode of transmission

1. Central Field Health Station, Pamphlet on "Smallpox."
and prevention will be discussed as given in the booklet named "The Control of the Communicable Diseases."

j). Diphtheria. Diphtheria is highly contagious. It is distinctly a children's disease from the standpoint of incidence and mortality. Since the discovery of diphtheria antitoxin, great progress has been made in the control of this disease. Prior to the war the toxoid was produced at the Central Epidemiology Laboratory at Peiping.

The nature, the transmission, and the control of the disease will be discussed as in the "Control of the Communicable Disease."

c. Activities.

1). Keep a record of the colds of five individuals in tabular form for the current year. Avoid the duplication of records.

2). Try to recall how many persons whom you know died from tuberculosis.

3). How many persons do you know who have hay fever?

4). Demonstration of tuberculin test made on the teacher to the class.

5). Arrange to have the students who have never had diphtheria take Schick test.

6). Investigation of the neighborhood by the students to find out how many people have had vaccination by the old method. How many have been vaccinated by the new method? How many have never been vaccinated by either method?


a. Questions.

1). What do you know about heart disease? How can one
prevent it and take care of it?

2). What is anemia?

3). What is the cause of anemia?

4). How can one prevent and cure anemia?

5). We have heard so much about "chang-chi." What is it according to the explanation of the modern medical science?

6). What significant public health problem does it bear?

7). Why is blood fluke disease more prevalent in the oriental countries?

b. Subject Matter

1). Physiology

2). Common Diseases

a). Heart disease. Heart disease has the highest death rate among all the other diseases. It is not a single entity but a combination of many factors etiologically and pathologically. It may be the result of rheumatic infection, syphilis, arterio-sclerosis, kidney disease, scarlet fever, or some minor causes, such as neglected infections in tonsilitis, sinuses, or the roots of the teeth, or a combination of some of these conditions. The infection is carried by the blood stream to various structures of the heart.¹

Sometimes the heart itself has no organic defect, is affected by impaired nerve stimulation, endocrine disorders, or from certain drugs.

b). Athletic heart. The name "athletic heart" was

formerly given to the enlarged, or hypertrophied heart, which was thought to be caused by the heavy demand made upon the heart muscle from participation in competitive athletics. The enlargement of the heart by exercise is normal and desirable, not a pathological condition. The term "athletic heart," therefore, should be discarded. In China it is not known to people except among a few physical education leaders.

Athletics may be injurious to the person with an infected heart or a normal person with acute infection such as tonsilitis. A person whose heart is normal should feel free to take exercise.

c). Defects in the blood vessels

(1). High blood pressure or hypertension is a constant constriction of the blood vessel walls.

(2). Arteriosclerosis or hardening of the blood vessels is the increased amount of fibrous tissue and of calcareous deposit developed from high blood pressure.

(3). Varicose veins are developed when the venous blood is interfered by the constriction or pressure, which tends to dilate and lengthen the veins. Varicose veins in the leg may be developed by the habit of wearing tight garters and of crossing one knee over the other. They may be developed in the veins of the spermatic cord or in the veins of the ligaments in which the ovaries are suspended.

(4). Hemorrhoids or piles are the enlarged veins developed in the anus by undue pressure. This condition may be improved by correcting constipation. In severe cases surg-
ical treatment may be necessary.

d). Defects of the blood. Anemia is one of the most common defects in the blood. It is a condition of deficiency in hemoglobin, which may be due (1) to the reduction in red blood corpuscles, (2) to the reduction of hemoglobin contained in them, (3) to the hemorrhage, (4) to destruction of the red cells by parasites, such as those of hookworm or malaria, (5) to bacteria found in acute or chronic infections, or (6) to poor habits of living.

Hygienic habits play a large part in the prevention or cure of anemia. A diet rich in green vegetables, and other foods containing iron compounds, is important. Exercise stimulates the production of red corpuscles through the increased demand for oxygen. Sunlight also contributes to the formation of hemoglobin.

The red marrow is able to produce red blood cells only in the presence of an "anti-anemia substance," the chemical nature of which is unknown. It is produced by some element in food combined with the action of enzyme in the stomach. The reduction of red blood corpuscles is caused by the lack of this enzyme. The excess of this anti-anemia substance is stored in the liver. The disease can be cured either by feeding liver or liver extract or by giving the essential enzyme obtained from the tissues of the pig's stomach.

e). Malaria. Of all human diseases in both ancient and modern history there is none of more importance than malaria, although the full knowledge of its cause, the mode of transmission, and means of prevention is available. It has
been estimated to be the direct or indirect cause of about half of the deaths of the human race. It has been suggested that this disease is the main cause of the downfall of the Greek Empire.¹ From an unauthoritative source, the retreat of the Chinese army at Hankow in 1938 was said to be due to the malaria epidemic in the army.

Malaria is found in certain localities in warm countries, particularly in cities situated in swampy areas. The name "bad air" used for malaria in western countries, chang-chi in the southwest China reflect the common belief that the humid swamp air produces the disease. Laveran, the French scientist, first found in the blood of malaria patients plasmodium, the protozoa which causes the disease. Ross (1895) first found that it was transmitted by the mosquito. In order to test the mosquito theory, Sambon and Low of the London School of Tropical Medicine went to Italy to live in the "bad air" area. They protected themselves by retiring to the screened hut at sundown until sunrise. Later the mosquitoes that had fed on the malaria patients in Italy were brought to London to bite two volunteer health individuals (Dr. Manson and Mr. Warren). They both contracted the disease. It was then confirmed that malaria is transmitted by Anopheles mosquitoes, and certain stages of life history of plasmodium is in the female mosquito only. The male mosquito does not such blood but fruits and vegetable juices. The female must feed upon blood in order to become developed.

to the stage where reproduction is possible.

The nature and the control of the disease will be discussed as the manner in "The Control of Communicable Diseases."

f). Blood fluke disease (schistosomiasis) Blood fluke disease should be ranked as the most dangerous disease along with malaria. According to the conservative estimate, 10 per cent of 100,000,000 people in the endemic areas of China suffer from it.

The worms live in the pelvic or mesenteric veins and feed upon blood corpuscles. The female makes excursion in the smallest vessels and usually deposits her eggs in the walls of the rectum or bladder. These eggs work their way through the vessels into the walls of the intestine or bladder. The eggs generally escape with the feces and urine. Accidentally they are carried to the liver or the lungs or other organs to set up inflamations. The miracidia escape from the eggs in 16 hours after the feces or urine is diluted in the water. These miracidia attach themselves to the snails, which serve as intermediate hosts. In the snail they go through certain changes and escape as cercariae into the water again. They can penetrate the skin or the mucous membrane of the mouth and be carried to the blood system, and via the heart to the lungs. The life cycle of the blood fluke given here is to illustrate how the worm diseases are transmitted. The class is not expected to memorize it.

Some of the material in "The Control of the Communicable

l. Ibid., p. 252.
Disease" will be discussed with the class.

c. Activities

1). Trace the circulation of the blood through the whole body, from the heart and back to it.

2). Find out from the college physician about your own blood pressure. What does it signify?

3) Microscope demonstration of the red blood cells by smear.

4). Microscope demonstration of the while blood cells by slides.

5). List the reasons which you can think of for adjusting the activities to the special limitation of the individual.

6). Use the college as the center making a map showing the breeding places of the anopheles within the distance of a mile radius. Assign each member of the class to go to the different places to do the survey work. A captain is to be elected. Each member is required to write a full report of the survey.

7. Physiology of the Uninary System, Kidney Disease and Its Prevention

a. Questions:

1). How can one be benefitted by drinking six or eight glasses of water?

2). Why is it desirable to drink more water than usual when one has an infectious disease?

3). Why is it not desirable to take too much protein?

4). What is the basic means of preventing kidney diseases?
5). Why is urine increased when it is cold?

b. Subject Matter

1). Physiology. Nitrogenous wastes are changed into urea by the liver and to some extent by all body cells. This urea is taken to the kidney from which it is secreted and finally discharged from the body with water and inorganic salts.

For the purpose of a better understanding of the function of the kidney, it is necessary to review its important parts. The kidney has an outer portion, cortex. It is made up of 4, 500,000 units. Each has a knot of capillaries, glomerulus, surrounded by a two-walled capsule which leads through the conducting tubule to the pelvis of the kidney.

The exact physico-chemical nature of the kidney function is not well understood. The fluid from the blood stream, except proteins and phosphatids, passes through the walls of the capillaries and makes its way through the inner wall of the capsule. It then flows along the conducting tubule. The cells in the wall of tubules are supplied richly with capillaries, which absorb some substances and secrete others. They change the composition of the fluid into urine.

The urine is increased in cold temperature. This is due to the blood of the skin which is sent to the internal organs. Nervous excitement and chemical substances, such as tea, coffee, alcohol, and certain drugs, increase the secretion of urine. Following intense anxiety or excessive exercise, albumin and sugar are likely to be present in the urine.

The continued presence of albumin means abnormality of
the kidney. The presence of sugar often indicates diabetes.

2). Nephritis, a common disease. Nephritis ranks as the third or fourth cause of death in the United States. It is an inflammation set up by any interference with the kidney function. There are acute and chronic nephritis. In childhood, acute nephritis may follow infectious diseases such as scarlet fever and the like. In the adult it may follow undue strain or exposure. Rest, proper medical care, and avoidance of protein foods, tobacco, mercury poisoning, and stimulants will help the person. Chronic nephritis occurs in older persons, especially those who live under a nervous strain without adequate exercise, and those who indulge in too much food, and those who accumulate more protein waste than the kidney can eliminate. It may follow a persistent local infection, such as tonsillitis, gallbladder, rheumatism or appendicitis.

3). Personal hygiene. Under any condition hygienic living and medical advice should be sought first. Plenty of water intake, no extreme excess of protein, normal exercise, and a well balanced diet are the rules for the normal function of the kidney. Hollow back posture should be avoided, for it may interfere with the kidney function and produce albumin in the urine. Excessive use of foods which contain much spices may cause frequent urination and burning of the urethra. A well acid-alkaline balance of the diet prevents acid urate or alkaline phosphate crystals in the urine.

c. Activities

1). List the hygienic rules of the kidneys.

2). Scan the advertisements in the newspaper for the
medicines of kidney disease for a month and record the names of medicines and the claims.

3). Record for three days the amount of water you drink every day.

8. Mental Hygiene
   a. Questions:
      1). Why do people worry?
      2). Where does fear have its origin?
      3). How can one train himself not to worry?
      4). What attitude should one have toward some peculiar type of persons?
      5). What role do the parents play in bringing up the children, i.e., with regard to mental health?
      6). What role do the teachers in school play in the provision of opportunity for mental health?

   b. Subject Matter

Mental hygiene concerns itself with the human mind and with methods of preserving its integrity, and preventing its impairment. From the community point of view it deals with problems of (1) the hospital care of all degrees of mental disorder and defects. (2) the group of delinquency, alcoholism, drug addiction, prostitution, illegitimacy, and dependency. From the individual standpoint, mental hygiene concerns itself with the ways and means of obtaining personal enrichment and developing to the greatest extent the capacity and potentialities of the family.

The art and science of medicine, psychiatry, psychology, mental testing, sociology and social work, economics and educa-
tion, play important roles in mental hygiene.

Mental hygiene deals with the control of environmental and personal factors. The present trend of mental hygiene is to give consideration to positive and constructive aspects instead of stressing abnormal aspects. Education is the hope of the field of mental hygiene.

1) Feeble-mindedness. Feeble-mindedness is not a disease but a condition characterized by a lack of normal development of the intelligence. It may be due to structural damage to the brain by disease or injury before birth, at birth, or during the first six years of life, or from imperfect development of the brain structure.

Feeble-mindedness may be due to a variety of causes. Not infrequently the cause is unknown. A feeble-minded child may be born to perfectly healthy parents. Weakness, illness of the mother during pregnancy or of the father at the time of conception may cause feeble-mindedness to the infant. Not all injuries at infancy cause feeble-mindedness. Mental defects may be sometimes the sequel of measles, whooping cough, pneumonia, cholera infantum, and so forth, occurring during the first six months. Syphilis of the parents, imperfect action of the thyroid gland or other glands, may be the cause. There is also a hereditary form of feeble-mindedness.

The defective child needs more attention. It he is properly trained and protected during the formative years, he generally becomes a useful person.

2) Mental disorder. Fear in some form produces most
of the cases of mild mental disorder. There are three sources of fear: from environment as environmental strains, from the body as pains, and from the mind as worry. Work alone or pain alone seldom produces mental disorder, but when joined with worry, they may result at times in mild disorder. Learning to understand our troubles, cutting out the worries, and trusting to the higher power to take care of everything may help.

The commonest symptoms of approaching mental breakdown are depression and feelings of inadequacy. They often arise with fatigue and after or during illness. Statistics show that acute recoverable disorder is more likely to have the feeling of depression than severe non-recoverable cases.

There are two excellent rules to help people to watch out for fatigue: (1) When one keeps on working after he is tired, he becomes less tired and needs less sleep. The sense of fatigue is inhibited. He needs a vacation. (2) When one begins to feel that nobody can do his work but himself, he should be careful. This is the warning for the need of a vacation.

There are different degrees of mental disorder, from mild to serious. They involve fatigue, fear of all kinds, uncontrolled emotion, sensitivity, organic disorder, and mental symptoms.

3) Mental difficulties of peculiar persons. In our broad contact with people, the eccentric personalities of certain individuals have been observed. Their ego is dominant and they go ahead to do things without consideration of the opinion of their group. They often head reform movements, but they live a thorn in the flesh of their associates. Among
these people will be found sympathizers with the enemy in time of war, conscientious objectors, and those people habitually form themselves into anti-societies. Mental hygiene does not change these individuals, but it helps others to tolerate and understand them, for most of them are useful and important members of the societies.

4). Mental health for normal children.

a). Children should be given opportunities for proper reaction to their instincts and impulses—to play to work, to assert themselves, and to help others.

b). Children should be trained to control their emotions by the indirect method. Direct their interest from the undesirable to the desirable.

c). Concentration should be trained. Short periods and complete attention should be the rule. The children should be taught to look upon each morning as a new day in which to improve, but not to carry over their troubles from yesterday.

d). Orderly association should be developed. Work should be simple and definite, instruction clear and concrete, and final actions straightforward and wholehearted.

e). An active attitude toward difficulties should be developed. The trying situations, the occasion of worry, of fear and of rage represent the opportunity for the most important training. Training the child to do the best in a difficult situation is a good practice for mental health.

f). Normal social relations should be trained. The child should play, work, and eat with other children, not merely with adults. To participate, to share, to lead, to follow
to serve, on occasion to resent, or to fight, represent healthful attitudes and healthful forms of activity. To deceive, to act cruelly, to be suspicious, and to hold a grudge represent unhealthful mental attitudes.

g). To develop a normal sense of dependence is very important.

5). A few suggestions for the development of a healthful personality. A healthful personality should have four important qualities: balance, sincerity, friendliness and a sense of humor. Balance implies poise, the avoidance of extremes, and the ability to see things from all angles. Sincerity means honesty, fairness and absence of pretense. A sense of humor keeps a person from taking things too seriously. It also keeps one from developing a feeling of great superiority or of inferiority. The friendly and considerate individual is always welcome.

One can develop these qualities to a considerable degree. The lives of successful people have shown that it is not impossible. The following suggestions are very helpful. It would be nice if the members of the class could copy these points in their diaries and follow them strictly. Healthful personality cannot only make an individual happy and successful, but also can make others happy and avoid many unnecessary conflicts which have been existing.

a). Take good care of your physical health. Play while at play. Work while at work.

b). Have faith in the future, in yourself, and in the Superior Power. Life will treat you well if you do your
part.

c). Don't worry. If you have no control over the object of your worry, think of something else. If you have control over it, make a plan dealing with the situation and carry it out.

d). Do not expect too much of life. Be a realist. Enjoy your work. See it as a service to others.

e). Count fifty before exploding a temper or other form of emotions.

f). Analyze your prejudices. Try to see the basis of the prejudices. Question them.

g). Be courteous. Real courtesy and consideration can be developed to the advantage of one's health and happiness.

h). Play and relax a little each day. An interesting hobby helps to maintain good mental health.

i). Seek aid when it is needed. Go to a good friend and talk over your trouble. If you have doubts, fears, or the like, a family doctor or a psychiatrist should be consulted. In China, to talk over one's trouble with a friend would be more practical, for there is no expert psychiatrist.

c. Activities

1). Recall some of the activities which are desirable or undesirable for your mental health at home and in school.

2). Through your own experience, what should be done at home and in school to improve the mental health of the children? What difficulties would be involved?

9. The Hygiene of Reproduction
a. Questions:

1). Menstruation is the natural phenomenon of the life of a woman. Should she be restricted from taking the routine activity during the menstrual period?

2). Why is feeble-mindedness of the parents transmissible from one generation to the other?

3). What is the substance in the germ cell responsible for heredity?

4). Can infection be transmitted from the mother to the embryo? If so, how?

5). Infants in the first six months of life are innured against several childhood diseases. Can you explain how?

6). How is gonorrhea contracted?

7). How is syphilis contracted?

b. Subject Matter

1). Sex function. Sex function follows adolescence. During early childhood the sex glands secrete into the blood system certain hormones, which develop the sex characteristics of the male and the female.

a). Male. Spermatozoa are formed continually in the tubes of the testes when puberty begins (between twelve and seventeen years of age). They pass to the coiled tubes, epididymis, and are stored there until ejaculation takes place. They die or are absorbed when this process fails.

The ejaculation of spermatic fluid takes place when there the secretion of the seminal vesicles are accumulated with seminal secretion. Night emissions occurring at an interval of five to six weeks is normal. When one has sufficient physical
activity and wholesome mental occupation, the intervals are much longer. Erotic thoughts or situations and local congestion or irritation increase the frequency of emission. Drinking liquid before retiring, constipation, or lying on the back during sleep may cause irritation and congestion.

If night emissions occur as frequently as several times a week, a physician should be consulted. Night emissions ordinarily cease after marriage because the seminal fluid is discharged during normal sexual intercourse.

b). Female. Puberty brings about bodily changes and the maturing and discharging of ova. When the individual is born, there are 30,000 to 40,000 immature ova in the ovaries. The discharging of ova is called ovulation. It occurs at the interval of twenty-eight days between puberty and menopause. If fertilization does not take place, ovulation is followed by menstruation.

The menstrual cycle has four periods, as follows: (1) Pregravid period of about four days—the mucous membrane of the uterus becomes congested with blood. (2). The period of discharge, five days, when the mucous membrane is discharged with blood and mucous. (3). The period of restoration and repair about seven days. (4). The period of rest about five days. Ovulation occurs about two weeks after the beginning of the last menstruation. The individual varies in time relation. The material given by Prof. C. E. Turner in a tabulated table to his personal hygiene class on the reproductive cycle in the human female, and the research work by the writer on "Vinegar and Menstruation" will be discussed with the class.
The length of the cycle also varies in different individuals. Menstruation is a normal function and should not be associated with pain and need not restrict the activities of the individual except in exercise of a vigorous and jarring nature, such as basket ball and some events in field and track. Chilling the body should be avoided because prolonged exposure tends to produce congestion in the organs of the pelvic region. Daily bathing is desirable, if without chilling. Prolonged swimming and swimming in cold water should be avoided.

2). Development of the embryo. The ovum is fertilized at the oviduct. The sperm can travel at a rate of one-eighth of an inch per minute through the uterus to the oviduct. It penetrates the outer membrane of the ovum and unites with it. This is called fertilization or conception.

The fertilized egg comes down into the uterus and becomes implanted in the highly vascular mucous membrane. The newly united cell then begins to divide. The process of division goes very rapidly. When the new embryo develops, a surrounding membrane, amniotic membrane sac develops with it. The embryo is suspended from part of the wall of the sac and floats in the fluid of the sac. The mucous membrane of the uterus at the area where the sac attaches, develops some soft projecting growths to form an attachment between the embryo and the uterus. The attachment is highly vascular and is called placenta. It is to be remembered that the blood does not enter the embryo, but the embryo produces its own blood supply, because these two systems are separated. They do exchange substances in the pla-
centa by permeation. The highly vascular placenta is connected with the embryo by the two arteries and a vein, which pass through the attached portion of the amniotic sac to the embryo. These blood vessels together with the attached portion of the amniotic sac form the umbilical cord. In nine months the embryo is mature, the amniotic sac ruptures and its fluid escapes, and the baby is born to its mother.

3) Sex education. Sex instruction has been much advocated in this country. In China mothers are of different educational levels. Some are highly educated, some not educated at all, and others are between these two extremes with different degrees of education. Among the educated classes, opinions are rather varied concerning this subject. Some mothers may be highly educated in physics or chemistry but ignorant of the biological science. Some may be well trained in biological science but have no knowledge of its application to sex education. Besides the knowledge of sex education, it takes ingenuity to give the child just the proper instruction about sex.

The teachers of different grade levels may not possess the educational background or be progressive enough to think that sex education is a necessary part of one's education. Though theoretically they believe education is not merely to impart knowledge to the pupils, but to develop the individual physically, morally, mentally, and emotionally a well-being. As a matter of fact, they do not practice what they believe. To the mind of the uninformed Chinese, if there is anything to be taught to the pupils, sex should be the last. The pupils are
from homes of different social standards, some very conservative and others modern. In the school it would be a very hard place for such instruction.

Traditionally anything concerning sex is not supposed to be talked about in China. This may have some significance. Under the present rapid social changes, the youth are brought up in a society of divergence of opinions and standards. These uninhomed youth are at a great loss. Their behavior may be approved by one social group and disapproved by the other. They may have been condemned for their radical behavior at one time and respected later as the pioneers in bringing about social changes. Just what, when, how, and who to teach anything concerning sex or marriage constitute the serious problem. The college students generally do not know much about marriage nor do they discuss it openly. They are left to whatever kind of married life by chance. The writer hesitates to discuss this topic with the students in the class. However, the teacher of hygiene should have in mind the idea of helping the students when condition demands for individual or group discussion, if she has the confidence to handle the situation.

4). Heredity and health. There is a high correlation between the mentality of parents and children, and between brothers and sisters. Dr. F. A. Woods has demonstrated that the first thirty persons selected for the Hall of Fame had, on an average, one near relative of distinction. One of every four persons listed in "Who's Who" had also a near relative of distinction. The bad strain of human stock can be inherited in
a similar manner.

Heredity is an important factor in determining the physical, moral, and mental quality of the nation. Nevertheless, an individual can improve the health of the next generation by the proper selection of a mate.

5). The diseases of the reproductive system.

a). Gonorrhea. The material of "The Control of Communicable Diseases" will be used. Special emphasis is to be placed on the mode of transmission. Unnecessary fear of contracting the disease is very common among the college students in China because of lack of knowledge of the mode of transmission.

b). Syphilis. Syphilis is hard to control because in its early stage it does not show conspicuous symptoms. In the United States about one person in ten acquires syphilis at some time. It is estimated that 15 per cent of the insanity and 10 per cent of the blindness are due to syphilis. Thousands of heart cases are also due to this disease.

The organism of the disease is relatively frail. It does not resist dryness and will not grow after an hour it has been dried. It will live on a wet towel for twelve hours. Accidental infections contracted outside of venery are more common than is supposed.

The disease will be discussed according to the material given in "The Control of the Communicable Diseases."

c. Activities

1). Showing to the class the photographs on the vaginal smears of the rats at the different stages of the oestrous cy-
These photographs are from the research work, "Vinegar and Menstruation," done by the writer in Mills College.

2). List separately all the characteristics in which you resemble your father and mother.

10. Health in the Family
   a. Questions:
      1). What qualifications would you look for in choosing a family physician?
      2). Why should the expectant mother be under the supervision of the physician?
      3). What health measures should be taken in caring for the infant? Why?
      4). In America the preschool age is called the neglected age. Can you tell the reason for it?
      5). For the health of the family do you think that the physical and psychological conditions of the parents should be understood by the sons and the daughters? State the reasons.
   b. Subject Matter
      1). Medical care. Here the term medical care means the physician's constant supervision of one's health. Formerly, medical service was applied to the cure of the sick. The physician's advice was sought only when the illness had become serious. This has given way to the modern practice of using medical science for disease prevention and health promotion, as well as for curing the sick.

Very few Chinese apply medical science in such a broad sense. The medical profession in China is new. There is a limited number of competent physicians who can serve people in
such capacity. People generally are unable economically to have the proper medical care. Education of the individual, alone, cannot solve the problem, unless there are a large number of physicians produced every year for the next ten or twenty years. There physicians must be trained with the idea of serving humanity, rather than earning a good income.

It is often true that in the large cities where the competent physicians are available many people who can afford to secure the proper medical care do not know the standard for choosing a good physician. It is absurd to overestimate a physician who has been abroad. Some of the physicians who have been abroad are competent and excellent, but there are also quacks among foreign trained physicians. Medical science progresses rapidly. One has to keep abreast of the latest developments. Foreign training does not always guarantee competency.

The physician should be a graduate of a recognized medical school and should have had experience in a first class hospital. He should keep up with the discoveries in scientific and surgical practice. He should be a member of the national medical association and of the local association.

2). Maternal care. There are no available data of maternal death in China. Even in America it is very high. Annually fifteen thousand women lose their lives from child bearing. In China one can imagine it must be extremely high. The expectant mother should place herself under medical care early in pregnancy. The problem of diet, the elimination of
waste, and the size of birth canal are to be under the supervision of the physician. Medical supervision also teaches the mother how to prepare for childbirth.

3). Infant health. The infant is the child under a year of age. No other period of life, except extreme old age, has such a high death rate as this period. Proper feeding, rest, cleanliness and the formation of habits are important. Breast feeding is preferable to bottle feeding. The mother's diet is closely related to the quality of the milk.

In the United States the death rate of bottle fed babies is four times as high as breast fed babies. Cow's milk is often the medium for infection and digestive disturbance. Cow's milk has less protein, less fat, less sugar, but more mineral matter. Cow's milk must be modified for feeding the infant. Unsweetened evaporated milk is often used instead of fresh milk. It is important to supplement cow's milk or mother's milk with orange juice, codliver oil, egg yolk, and cereals. Vitamin containing foods can prevent rickets or scurvy.

For the welfare of the infant, undisturbed rest, fresh air, sunshine, and a minimum of handling are important.

At birth the baby's eyes should be treated with two drops of one per cent silver nitrate solution to prevent ophthalmia neonatorum, which may eventually cause blindness.

Before the infant is one year old, vaccination against smallpox should be given. At the age of six months, or soon after that, he should be immunized against diphtheria. Schick test should be given six months after the immunization to see whether the immunity has been established.
Measles and whooping cough are very fatal in infancy. Children should be protected from exposure of these diseases. Whooping cough can be prevented by vaccination. Measles can be prevented, or reduced in severity by inoculation after exposure of the convalescent serum or the extract of placenta if available. Babies should be kept away from any respiratory infection, from cold to tuberculosis.

4). The health of the preschool child. The preschool child should be under the supervision of the physician. Periodical examination should be given to insure proper development. Any kind of defect should be followed up by correction.

The deciduous teeth should be well taken care of, for they are related to the development of the normal jaw and the proper position of the permanent teeth. To visit the dentist every six months is desirable. In China there are very few dentists which are qualified for such care. There are more quacks in dentistry than in medicine. There is only one dentistry school in China, of which the writer knows. There are many dentists, who have never attended the dentistry school. Those very few who have had training in the foreign countries always charge very high and the middle class people generally cannot afford to pay so much. In fact the technique of some of the dentists is not equal to the demand, which is made upon them. Lack of qualified dentists is one of the greatest health problems.

5). The health in the school years. At the age of five or six the physical health is much like that of the pre-
ceeding period. Special training should be given to the development of mental health and the preparation for adult life. The school and home should cooperate in building up both the physical and mental health.

The personality of both the teacher and the family members play very important role in the influence of the mental health of the child. Cheerfulness, kindly consideration, and cleanliness, friendly interest in the child questions both in school and home play very important role in the development of personality. Moodiness, indifference, depression, and resentment are not healthful. The timidity of the mother, the arrogance of a father, the selfconsciousness of a sister, the egotism of an older brother are likewise detrimental to the health of the child. Much of the mental health of a child has been discussed under mental hygiene; therefore, it is not to be repeated here.

6). Health problem of later life. A family consists of people of different age levels. The experience and the points of view of life of the parents are different from the sons and daughters. The father may work under pressure and anxiety, and the mother may go through a period of physical change and adjustment. These conditions should be understood by the sons and daughters. Mutual understanding and consideration are very important to the happiness and the health of the family.

c. Activities.

1). List the pros and cons of having a family physician
under the present economic condition and medical service in China.

2). Record the quack methods of treatment from the newspaper.

3). Visit a maternal health clinic, if possible.

4). Record what percentage of infants whom you know are under the supervision of the physician.

5). List the advantages and disadvantages of living together in a home like the Chinese family. What suggestions would you give to improve the condition?

11. Exercise and Health.


Both "exercise and health" and "body mechanics" are also in the field of physical education. For hoping to have a further study of the various phases of physical education in the near future, the discussion of these two topics are omitted here.

13. The Hygiene of Mouth, Ear, and Eye.

a. Questions.

1). How is the metabolism of the body related to that of the tooth?

2). From what germinal cells are teeth developed?

3). What is the basic cause of caries?

4). Why is root abscess considered important to health?

5). Is tooth paste or powder indispensible to the health of the tooth?

6). How would you choose your dentist?
7). What is the common disease of the ear?

8). Name some of the eye defects and give their causes.

9). What is the most common eye disease in the oriental countries? Why?

b. Subject Matter.

1). Oral hygiene.

a). Development and structure of tooth. Teeth are not a part of the bony system but are formed within the soft tissue. The enamel is secreted by an enamel organ made up of ectoderm. The cells from the ectoderm grow into the underneath soft tissue in the shape of a thimble and produce an enamel substance, calcium phosphate and carbonate, on the inner surface. It extends over the crown of the tooth.

At the same time from the mesoderm the dentin organ, a finger-shaped mass of dentin-forming cells (odontoblasts) pushes into the thimble area and lays down the dentin phosphate and carbonate of calcium and considerable organic matter in the form of tubules. The dentin-forming cells also form the lining of the pulp cavity of the tooth. From these cells living protoplasm extends into the canal of the dentin tubules. Thus the dentin of the erupted tooth is in closer contact with the body liquids than the enamel. It is, therefore, more susceptible to deficiencies in the diet.

In the pulp there are blood vessels, lymphatics, and nerves entering and leaving through a foramen at the apex of the root. The root is covered by a hard substance called "cementum." This substance is attached to the bone by its
surrounding peridental membrane. It holds the tooth pulp in place but also serves as a means of preventing jar. The gum attaches the tooth at the junction of the cementum with the enamel which covers the crown.

b). Quality of the teeth. The hardness of the teeth is different in different persons and in the same person at different ages. The tooth decays more rapidly in some individuals than in others. During pregnancy and adolescence decay is apt to develop because much calcium is used for the formation of new bone tissue. Between the age of seven and twenty the incidence of caries is higher.

During the period of tooth formation a deficiency of vitamin A results in the imperfect formation of dentin and a deficiency of vitamin C interferes with the production and the maintenance of the hard substance of the dentin by the odontoblasts. These odontoblasts withdraw from the formed dentin and stop to deposit any more of it. The foods producing alkaline ash such as vegetables and fruits contribute to good teeth and an excessive acid producing food like cereals is decalcifying. Vitamin D is important in the formation of strong teeth. Calcium and phosphorus are very important for the development of the teeth.

c). Structural abnormalities in the mouth. (1) The movement of the jaw is limited; therefore the development of the lower jaw is retarded. (2) The upper jaw becomes high and narrow. This is due to the obstruction of the posterior part of the nose by the adenoids. The persistence of thumb sucking habit also results in the narrowing of the jaw. (3) The irregularities in the spacing and position of the teeth caused by the premature loss of either the temporary or the
permanent tooth.

a). Caries. Caries is ranked as the second most common disease. However, in some parts of the world tooth decay is unknown because the diet is rich in vitamins and minerals.

In the beginning of the decay the enamel becomes decalcified and appears chalky white; a small cavity starts from the enamel to the dentin. Bacteria make their way from the cavity to the dentin tubules. They form acid and dissolve away the structure.

Evidences have proved that poor diet produces the pre-disposing condition for caries. Bacteria cannot invade the tooth if the diet is proper. It is to be remembered that physiologic and pathologic conditions of the individual also play a very important role in caries. That accounts for one person may be free from caries and the other develops caries although they both may have the same diet.

e). Root abscess. The nerves and blood vessels are disintegrated when the caries reaches the pulp cavity. This results in an abscess at the tip of the tooth and the swelling of the gum. The bacteria may be carried by the blood stream to cause rheumatism, heart disease, neuritis, or other diseases.

f). Diseases of gum. (1) Trench mouth or Vincent's disease is characterized by ulcers within the mouth, often at the margin of the gum and tonsils. This is more common among the people with poor nutrition. (2) Pyorrhea is an infection of the gums. It is usually, not always, associated with inade-
quate cleanliness.

g). Proper care of the mouth and teeth. (1) Proper nutrition, (2) habitual use of foods requiring sufficient masticatory effort to provide the vigorous exercise to stimulate circulation, such as hard breads, raw vegetables, and certain fruits, (3) cleanliness of the mouth and teeth.

h). Table salts or baking powder is very effective in cleaning of the teeth. The commercial tooth paste or powder is not a necessity. Since tooth paste or powder is very expensive now, table salt is highly recommended.

i). The dentist. It may seem very impractical to recommend the students to visit the dentist twice a year. Such knowledge one should know, if he can afford to do so.

j). The hygiene of ear.

a). The defects of the ear. Otologists believe the hearing defects are mainly due to colds and contagious diseases in which the hearing has been neglected. Any infection of the nose or ear can affect the middle ear through the Eustachian tube. During or after the cold, or other diseases such as scarlet fever, diphtheria, and measles the ears should be taken care of. Too vigorous blowing of the nose may force the infection from the nose passage into the middle ear through the Eustachian tube.

Purulent otitis media (middle ear infection) is usually accompanied by pain, congestion, bulging of the eardrum, and pus formation. The rupture of the eardrum often follows and the pus drains through. The pain is often thus relieved. It
is uncommon that a qualified specialist may have to puncture the eardrum to facilitate drainage. Sometimes the drainage through the Eustachian tube may occur and the infection is not recognized. Such a chronic condition may cause the stiffening of the joints of the ossicles, and eventually produce permanent deafness.

The catarrhal form of otitis media may result from cold, chronic nasal trouble, enlarged tonsils, or adenoids. The mucous membrane of the middle ear and the Eustachian tube are inflamed. The tube may become closed and a partial vacuum in the middle ear may be created. A watery exudate is produced by the membrane to relieve the negative pressure and the eardrum is drawn in rather than bulged. Pain, head noises, and diminished hearing are often accompanied. Although these conditions may be diminished, they should not be overlooked, because they may persist for months and cause a thickening and retraction of the eardrum and adhesion and displacement of the ossicles. Chronic catarrhal otitis media is the most common ear disease and the chief cause of progressive deafness.

The excessive secretion of wax may impair hearing. Painful boils in the canal may be produced from trying to remove the wax or the eardrum may be pierced from careless manipulations.

b). The hygiene of the ear. The advice of the physician should be sought after infectious diseases of the upper respiratory system. The far more important thing is to avoid cold and other infectious diseases.

In swimming, ear plugs should be used when the ear drum
is damaged, so that the water may not enter the middle ear.
Different forms of fungus may get into the ear and cause in-
fection in the ear canal. This may occur from swimming.

Foreign objects should never be introduced into the ear,
for it may bring infection to the canal or injury to the eardrum.

3). The hygiene of the eye.

a). Deviations from normal vision.

(1). Myopia (nearsightedness). Myopia is caused
by the abnormally long eyeball. The rays of light focus in
front of the retina. When the object is held near the eye,
the focus falls on the retina and the vision becomes possible.
This defect can be corrected by the concave lenses.

Children are born farsighted as a rule. The requirement
of excessive use of the eye under improper conditions has
increased the percentage of nearsightedness from grade to grade.
In the adult nearsightedness is developed by the constant use
of the eyes upon close work.

The myopia may be caused by a combination of inherited
tendency and strain due to excessive use of the eyes, especially
when inflamed. Ordinarily the eyeball is under the pressure
of its own fluids. The pressure is increased under the action
of external muscles and the ciliary muscle during near vision.
The coats of the eye are weak from either poor health or poor
nutrition, and they may tend to elongate under increased pressure
caused by overwork.

(2). Hyperopia (farsightedness). The eyeball is
too short and the focus falls behind the retina. The ciliary
muscle constantly adjusts to round the lens and bring the image on to the retina. This causes eye strain. A properly fitted convex lens may correct the condition.

(3). Astigmatism. Astigmatism is caused by the irregular curvature of the lens and the cornea. The image formed on the retina is blurred or distorted. This defect is usually congenital, although an injury and inflammation may cause it. It is often accompanied by eyestrain, and a large percentage of functional headaches are caused by it. Dizziness, convulsions, rapid heart beat, indigestion, constipation and pains of various parts of the body are often the symptoms of astigmatism. Children often develop lateral curvature of the spine from adjusting the posture to secure a clear image. It can be corrected by fitted glasses. It is better to secure the corrective measure before the child is six.

(4). Muscle imbalance (cross-eye or squint). The causes of cross-eye are (1) farsightedness and (2) defects in the external eye muscles. Unequal vision is in most of the cases. If it is not treated, the vision becomes impaired. The person does not only suffer from disfigurement but must also go through life with monocular rather than binocular vision.

Most cases of cross-eye may be treated either by the glasses, exercise, or operation. It is better to have treatment before the child reaches six years of age.

(5). Anisokonia ("unequal images"). Anisokonia is a defect in the formation of images in the fusion center
of the brain. Normally in binocular vision the images of both eyes are equal and overlaid on each other at the fusion center of the brain. In aniseikonia the images are not equal. They produce an image at the fusion center of the brain a distorted picture. Now there is a new testing instrument to measure the exact difference in the size of the pictures. Special lenses can correct this condition.

b). Diseases of the eye.

(1). Blepharitis. Blepharitis is an inflammatory condition of the eyelids. They are covered with dried, hardened secretions which appear as white and gray scales. This condition generally occurs in the poorly nourished children, particularly where there is an eye strain already. In severe cases the eyelid may retract and the eye lashes rub against the eyeball. A special treatment is required.

(2). Stye. A style is an infection of the small oil glands. These glands are at the margin of the eyelid. It is commonly associated with uncorrected eyestrain. Treatment and prevention of multiple infections are necessary.

(3). Conjunctivitis. Conjunctivitis is an inflammation of the conjunctiva, the mucous tissue in front cover of the eyeball and the lining of the eyelid. It often accompanies colds. Conjunctivitis and the above discussed conditions are more likely to occur if the health is poor and the eyes are understrain.

(4). Trachoma. Trachoma creates a serious public health problem in China. The writer was interested in this problem and therefore wrote a paper on it in her epidemiology class. The material of this paper will be used for discussion of this topic with the hygiene class.
(5). Ophthalmia neonatorum. Ophthalmia neonatorum is the inflammation of the conjunctiva during the first two weeks of infancy. The majority of the cases are due to gonorrheal infection during birth or through contact with contaminated fingers later. If the infection is neglected, blindness is resulted. In the United States two to eight per cent of all blindness is caused by ophthalmia. The use of one drop of one-per cent silver nitrate for the eyes of the baby immediately after birth can prevent the infection. In some states this treatment is required by law. Since the adoption of this law there has been a decline of sixty-five per cent of the blindness attributed to this cause.

c). Hygiene of the eye.

(1). Reading while sitting.

(a). Twelve to eighteen inches between the book and the eyes.

(b). The book should be held at an angle from forty-five to seventy degrees (measured from the desk).

(2). Reading while lying. Reading while lying is not a desirable position. If one feels that he must do so, every precaution should be taken to create as favorable conditions as possible.

(a). The body should be placed in a semi-sitting position.

(b). The book should be propped up on a level with the eyes.

(c). The light should be arranged so that it
comes from the head of the bed.

(3). Avoiding reading while traveling in a moving car. The motion of the car which produces constant variations of distance between the eye and the book and the intensity of the light. These variations tend to produce an enormous strain upon the muscles of accommodation in the eye.

(4). Avoiding direct sunlight from a printed page is important. Light should fall from over the shoulder on one's work.

(5). Nutrition and the condition of the general health are the important factors of the eye. Exercise increases the metabolism of the whole body. The metabolism of the eye is also improved. Certain diseases of the eye is related to the diet, notably vitamin A. The deficiency of vitamin A causes xerophthalmia and nightblindness.

(6). Frequent examination of the eye by a qualified specialist is very important.

c. Activities.

1). List some of the hygiene rules for teeth.

2). What diet would you suggest for the health of the tooth?

3). Find out how many people in college are hard of hearing.

4). Watch closely and record the reading habits of the college students as to distances between the eye and the book, posture, the intensity and direction of the light.

14. The Hygiene of the Skin.

a. Questions.
1). Describe the structure of the skin.
2). What are the functions of the skin?
3). Why is silk padded garments warm?
4). What effects has sunlight on health?
5). Are cosmetics related to hygiene? If so, how?
6). Does cold cream have more cleansing effect than soap and hot water?

7). What is the cause of Hong-Kong foot?

b. Subject Matter.

1). Clothing. Clothing serves as an artificial means in regulating body temperature. It retards heat loss because air is in the mesh of the woven fibers. Air is the poor conductor of heat. The garment padded with Chinese raw silk fiber serves a very good illustration. Only six ounces of silk fiber will make a very warm and light garment. Every other year the specialist is employed to loose up the silk puff. This is to allow it to have more air spaces in it to retard the loss of heat as when it was new. In most of the Chinese homes there is no heat system. One has to keep his body warm instead of the house warm. The majority of the people use cotton fibers to pad their coats. They are not as warm as the coats padded with silk because they do not retain much air.

American clothing for winter consists of more woolen material. Many Chinese also prefer woolen outfits in winter. Some of them use woolen fibers to pad the garment. Woolen fibers retain air more readily than silk fibers because they
are rough, scaly, and round. Silk fibers are round but not rough. Both the linen and cotton fibers are flat.

The way how the fabrics is woven makes a considerable difference in the degree of warmth. The cotton and silk may be woven in such a way to produce a fabric which is fairly useful in the retention of body heat and woolen fibers so woven as to reduce their warmth.

Woolen underwear is not desirable for persons working indoor for the air spaces will be filled with perspiration and becomes a good conductor of heat. Light underwear compensated with heavy outer garments is desirable.

Rubber garments prevent the normal evaporation of moisture, therefore they should not be worn more than for short intervals.

The body can make adjustments to slight changes of temperatures; much clothing reduces this special ability of the heat regulating apparatus. Insufficient clothing is not desirable, because too much heat is lost. Those who wear little clothing need a high calorie diet.

2). Bathing.

a). Cleansing bath. The temperature of the water should be 96° to 100°F. It is both cleansing and relaxing. Some people find the warm bath stimulating and cannot take it before bed time.

When the water is at 100°F., it tends to decrease metabolism by heating the surface of the body artificially. There are considerable differences in the reaction of persons to different temperatures of baths. Hot baths are weakening.
A physician sometimes prescribes a hot bath before going to bed to the person who has a cold, for it helps to bring the blood to the skin and relieve congestion in the head or chest. One should avoid chilling before going to bed.

b) Baths for stimulating the muscles and nerves in the skin. The temperature should be determined by the individual, so that he will obtain the desirable reaction, a warm glow, a deep breathing, and a general feeling of well being. After the temperature is determined, the bath at this temperature should not be more than one minute. And it should be taken in a warm room, when the skin is warm. It should be followed by a vigorous rub with a cold towel. The suitable time is on rising in the morning. Within one hour after eating neither a hot nor a cold bath should be taken.

c) Sun bath. Light is the visible portion of the spectrum. It has wave lengths varying from 3,900 to 7,700 Angstrom units (one tenmillionth of a millimeter). Infra-red are longer waves and untra-violet radiations are shorter waves. Both of them are not visible. The wave lengths of the solar spectrum are from 2,200 to 40,000 Angstrom units. Some of the radiations useful to man are not produced by sunlight but from other sources.

When the skin is exposed to the bright sunlight, it becomes reddened. This is due to the accumulation of a great quantity of blood in the exposed area. A brownish pigment, melanin, leaves the capillaries and goes into the skin and are left behind after the blood returns. The skin is thus tanned.
Freckles are the irregular deposit of the similar pigment. The exact function of tanning is not known. It is believed that it protects the deeper tissues from damage by actinic rays.

Sunlight plays a very important role in the production of vitamin D in the skin by acting upon ergosterol in the living tissues. As mentioned before, to some Chinese health is an expensive practice. Yes, it is, in some cases, but many phases of it do not cost anything, if one is only willing to submit himself to the practice. Sunlight is free to all. How many people have made the full use of it?

Ultraviolet radiation reduces the prevalence of rickets and stimulates the production of red blood corpuscles. It also aids in curing certain infectious diseases, such as tuberculosis.

The sunlight in the country is more healthful than that of the city because the dust and the smoke of the city screen out the ultraviolet rays. Window glass also has the same effect on sunlight. Sunlight is more effective in the summer than in the winter.

Infra-red or heat rays are very useful in medical treatment to relieve pain, to relax muscles, to dilate the surface blood vessels, and to relieve internal congestion. Dark colors absorb these rays while light colors refract them.

3). The care of the face, hands and hair. Comparatively the college students are more familiar with this topic; therefore, it will not be presented in lecture form. However,

it will be introduced through asking certain questions to the class and through arousing the curiosity of the class so that they may be interested to know more of it. To dislike to be taught what one thinks he knows, in fact he does not know, is the common human nature. It is necessary to present this topic in different form.

4). Cosmetics. Cosmetics are not interesting to a certain group of students but command great interest from the students who use them extensively. This involves only a small percentage of students. The poison contained and the claims made will be discussed. There are quite a few people in China who think that the imported cosmetics are of better quality than those made locally. Such research has not been made. The monograph on cosmetics of the paper written by one of the class members of "The Content of Health Education" in the summer session of the University of California in 1939 will be read to the class. It gives a good account of the researches on different cosmetics made in this country.

5). Abnormalities.

a). Corns and warts. Corns and warts are localized overgrowth of the outer horny layer of the skin. They may be removed by suitable preparations.¹

b). Mole. A mole is a protrusion and an undue growth of the deep pigment layer. Generally these are unlikely to cause trouble. Irritation and accident may start an abnormal
growth the characteristics of a cancer. A physician should be consulted for the removal.

c). Acne. Acne occurs most commonly at adolescence. It is a greasy skin, blackheads, pimples and often postules. Chinese call them chia tse, wine thorn. Prevention is easier than cure. A diet which consists of citrous and other fruits, vegetable, and whole cereals will be helpful. The bowels should be moved regularly. Drinking plenty of water and keeping the skin scrupulously clean are also essential. Improve the circulation by the alternation of hot and cold applications.

d). Boils. Boils are usually produced by an infection of the hair follicle with bacteria. Heat applied to it would soften it and bring it to a head. It should then be opened and dressed with a surgical precautions.

e). Cold sores or fever blisters. Cold sores are caused by viral virus. They generally accompany a cold, a severe sunburn or other ailment, but they may develop independently. They should not be broken. A touch of them with spirits of camphor and then with powdered alum may be helpful.

f). Ringworm. Ringworm is caused by certain fungus on the skin. Gymnasium costumes if not allowed to get dried thoroughly may be favorable for the growth of the mold, which may be transferred to the skin of the wearer.

The so-called athletes foot, corresponding to the Chinese name, Hongkong foot, is also caused by fungus. The moist condition of the foot favors its growth. Every precaution should be taken to prevent its spread.

g). Scabies. Scabies is caused by an insect, the
itch mite, which cannot be seen by the naked eye. Cleanliness is a rather important preventive measure.

c. Activities.

1). Record for a month the claims made on various cosmetics; indicate both the locally made and the imported.

2). Make an investigation of the cosmetics used daily by five college girls--tabulated form indicating the individual girl by A, B, C, D, E, F, and the name of the article under the items: soap, powder, rouge, vanishing cream, cold cream, etc.

15. **Endocrines**

a. Questions:

1). What is metabolism?

2). What is the basic cause of diabetes?

3). You have seen dwarfs or gaints. What is the basic cause of either case? How can that be prevented?

4). Why do some athletes give a better show when there are a large number of spectators?

5). What glands play an important role in the mental ability of a growing child?

b. Subject Matter

The endocrine glands, also called internal secretion glands, play a very important role in the metabolism of the body. They secrete certain substances to affect the cellular activities.

1). Metabolism. Metabolism is known to the Chinese as "sing chen tai sia," which means the alternation of new and old, corresponding to anabolism and catabolism. It is the process of all of the chemical changes in life, in growth, and in carry-
ing all of the functions. There is a great difference of metabolism in different individuals and in the same individual at different times.

Basal metabolism involves just those chemical changes required to maintain the living state. These changes take place in all the visceral organs, nervous system, and secreting glands. Basal metabolism test is given when a person is fasting and at rest. The rate of oxidation is determined by either putting the subject in the calorimeter and measuring the heat yield, or using a respiratory apparatus to measure the oxygen consumed and the carbon dioxide given off. The metabolism is lowered when one is asleep and increased when food is ingested, especially protein food. It is increased 10 per cent for each degree centigrade.

Functional metabolism involves the increased chemical changes in the performance of muscular contraction, glandular activity, and the functioning of nerves and sense organs. Growth metabolism is the chemical changes for the production of new structures and protoplasm. The secretion of the endocrine glands, named hormones, determine the metabolic rate.

2). Endocrine glands. The hormones and the functions of the endocrine glands will be discussed according to the table given by Prof. C. E. Turner on endocrine glands. It is in a very concise form and suitable for the class.

c. Activities.

1). Draw a diagram to show where those endocrine glands are located.
2). Record those people whom you know have given attention to the improper secretion of any endocrine gland.

16. **Narcotics, Stimulants, and Self-medication**

a. Questions:

1). Why do people drink alcohol?

2). What is your opinion about flavoring some of the dishes with wine in cooking?

3). What is the effect of alcohol on the nervous system?

4). You have heard much of the good effect of tobacco. What explanation can you give for its claim?

5). Do you advocate drinking tea to excess? Why?

6). What do you think of patent medicine? Have you ever used it through the advertisements?

b. Subject Matter

1). Alcohol

a). Alcohol and health. Alcohol is a narcotic, not a stimulant. After a mild dose of alcohol one has the feeling of exhilaration. This is due to the paralyzing of the higher nerve centers, which have to do with self-control and judgment.

One-fifth of the alcohol taken is absorbed from the wall of the stomach and the rest from the small intestine. No digestive process takes place in alcohol. When it is carried into the blood stream, it passes rapidly into other tissues and organs. About two per cent of the alcohol taken is eliminated through the lungs and kidneys. That accounts for the alcohol smell in those who drink a great amount of alcohol. The rest is oxidized into carbon dioxide and water in the tissues and
organs. The amount of time needed to get rid of the alcohol depends upon the amount taken.

(1) Alcohol acts as a narcotic on the central nervous system. This depends upon the amount of alcohol which reaches the brain and spinal cord. The higher centers of the brain that deal with memory, attention, thought, judgment, and self-control are the first ones affected, and the motor and sensory centers, the next.

(2) Alcohol produces changes in the circulation on account of the dilation of the blood vessels at the surface of the body. This gives the feeling of warmth in the skin and leads to excessive loss of heat. There is no increase of heat production in the tissues; therefore, his deep body temperature is lowered. If the person is not active and well protected from cold, no harm may result. Exposure will have a serious effect.

(3) The narcotic effect of alcohol on nerve tissues in the special sense organs. The accuracy in interpreting sensation and speed in responding become lessened by alcohol. The sense organs may be affected for hours even after a moderate drink of alcohol, because it is eliminated very slowly.

(4) The effect of alcohol on respiration. It does not have an appreciable change in respiration, after a moderate amount of alcohol. A large amount may paralyze the breathing center and cause death.

(5) Alcohol on digestion. A small amount of alcohol has little effect on digestion. A large quantity of
it irritates the stomach and slows up the digestive process.

(6). Alcohol and athlete. Alcohol reduces one's endurance. Athletes should warn against drinking alcohol. Even moderate drinking decreases accuracy and skill.

(7). Alcohol and personal conduct. The drunk or partly drunk person becomes less and less responsible for his personal conduct; this is especially true in the field of sex conduct. Alcohol is an important factor in the spread of venereal diseases. There is no damage to the reproductive glands after the use of alcohol.

(8). Chronic alcoholism. It is developed with the gradual use of alcohol as a beverage. It makes a person shrink from facing reality and responsibility. There is a gradual change not only in personality and intelligence but also in the physical condition of the organs of digestion, the liver, and other soft tissues of the body, so that disease may develop in these organs. Both acute and chronic alcoholism are accompanied by lowered resistance to respiratory and to septic infections.

(9). Alcohol and longevity. There is evidence that those who drink alcohol constantly even in moderate amount have short life.

b). Alcohol and society. In China wine is served at all feasts and at most dinner parties. There are all grades of wine. "White dry" and "yellow wine" are common. The former is made of millet (and has a high concentration of alcohol), and the latter is made of rice. It is generally served in
tiny cups during the entire feast time. A Chinese feast consists of twenty to forty courses. At the beginning of each course the host himself stands up to honor the guests by filling their cups, especially at those main dishes such as shark's fin, bird's nest, etc. During the dinner time, the host as well as the guests urge each other to drink until the "cups are dry." The cups of those who are well known for a big capacity for wine are always filled and refilled. The food served is generally left aside. It is considered good sport if one can be urged to drink many cups without getting drunk. Sometimes the wine game is played between two persons at the table. The game is always played by extending certain fingers on the right hands of the two opponents. Each of them is to guess the total number of his own and of his opponent's extended fingers by shouting the number in a simply formed rhyme. If neither is correct or if both are correct, they are even. If one is correct and the other is wrong, the latter is to pay the penalty by drinking a cup of wine. After a few rounds the others may take turns. Generally the rest of the members watch the game with enthusiasm. The name for a Chinese feast has the word wine as a prefix. Wine dominates the food. The feast is generally ended with four substantial courses and rice. Wine is to be discontinued before these courses are served. Those who do not drink can just pretend to sip whenever they are urged to drink.

It is rather hard to change such customs. People, indeed, have a very good time in attending a feast like this. But it
is uncommon that people do get drunk before the feast is over.

2). Narcotic drugs. Certain drugs in medicine used to dull pain and to soothe the senses have a tendency to create a craving for repeated use of larger doses. These drugs are cocaine, an extract from the leaf of the cocoa plant, and opium, the juice of a certain poppy. Morphine, codeine, heroin, and others are all the products of opium.

The body has the ability to develop a "tolerance" of these drug poisons with repeated doses. Under such conditions the desired effect is only produced when a larger dose is used. In China during the last two decades people began to use patent medicine through the wide advertisement of the imported and local made medicines. It is not so common as it is in this country. As a rule the Chinese do not pay much attention to the minor disorders of health; therefore, they do not seek medicine to cure them. Many people let nature take care of itself. It seems rather primitive. However, much danger has been avoided by such practice. It is so common to see the students in this country carry headache tablets around. Such a thing does not happen among the Chinese students in college, but is more common among some of them who have had so-called western education. Along with their education in the western countries, they have also picked up those habits which are not desirable. Further discussion of this topic will be presented under self-medication.

3). Tobacco. Tobacco is not widely used among the women students in China as it is in this country. It is com-
monly used by male students. Nicotine is the chief constituent of tobacco and one of the most violent poisons. The not only quantity of nicotine in tobacco varies with the kind of tobacco but also with the form in which it is burned.

It is not infrequent that one hears the tobacco smoker claiming the good effect of tobacco. Much research has been done on this subject. Tobacco increases temporarily the concentration of the blood sugar and the rate of sugar combustion because of the action of nicotine on the adrenal glands. The excess of sugar in the blood helps to relieve fatigue and irritability. In one-half or three-quarters of an hour the blood sugar drops to, or slightly below, its normal level. Tobacco also interferes with appetite.

4). Tea. Tea is richer in caffeine than coffee. Roasted coffee contains 0.75 to 2.7 per cent of caffeine. Generally the amount present in a cup of tea is less than in a cup of coffee, because tea is not made with too many tea leaves.

Both tea and coffee are stimulants, not narcotic. Whether they are entirely harmless depends mainly upon the different individuals. Growing children should not use them because they interfere with normal nutrition and overstimulate the sensitive nervous system of the children.

Some nervous adults tend to use a good deal of either coffee or tea. The beverage makes the condition only worse.

5). Self-medication. Self-medication is one of the most common practices. This is due to one or more of the following reasons. First, it appears simple and convenient.
Secondly, people are ignorant of the fact that any apparent pain is a warning of some disorder of some part of the body and that one should consult a physician to find out the cause and cure of it. To take some narcotic drug to stop the pain does not remove the cause. Thirdly, economic pressure prevents people from practicing what they know they should practice. Many people, therefore, seek advice from relatives and friends, who do not have medical knowledge, depend upon traditional beliefs and experiences. Most of the people who practice self-medication belong to either the first or the second group.

In the United States, $715,000,000 is spent annually for drugs, of which 75 per cent is for self medication ($525,000,000). About $360,000,000 goes to patent medicine. In China there is no available data for any of these data. Judging from the newspaper advertisements, one is sure that a great portion of the money goes to patent medicine. Under present economic conditions probably there are many people who have saved money from food for patent medicine. If these people only knew that self-medication is not only a waste of money but may also do harm instead of good, they might save money from patent medicine for protecting food. Money is very scarce and every single penny should be deliberately spent for useful things.

c. Activities.

1). Find out what percentage of the students in college have never taken alcohol.

2). Find out also what percentage of the students in

college have never used tobacco.

3). Find out the percentage of students who take tea regularly and those who take if for sitting up late before examinations.

4). Find out the percentage of students who have never used patent medicine.

C. Community Hygiene

The class has been informed of the scope of community hygiene in the early part of this paper. Its function may not appear to the class to have any relation to personal hygiene, though they are closely related. For a better understanding of the importance of personal hygiene under the present undeveloped sanitary conditions of China, for an appreciation of the activities of the governmental and private agencies, for the realization of the fact that the health of the nation can be secured only through the co-operation of the individual effort with the governmental activities, it is necessary to present to the class the main functions of community hygiene.

This paper does not attempt to present the details of community health. The students often lose their interest on those details which could not be either controlled by themselves or put into practice under the present economic conditions of their generation. New materials on this subject will be added from time to time as the occasion requires.

Owing to the fact that community hygiene in China is far from a satisfactory standard, sometimes the health activities of the United States will be cited for a better understanding
of the scope of public health.

   a. Questions:
      1). What health significance does the water have?
      2). Aside from aesthetics, why is the proper disposal
         of sewage and garbage important?
      3). What danger does the fly represent?
      4). How can the privy be protected from flies?
   b. Subject Matter

      1). Water Supply. In the discussion of the diseases
         of the alimentary canal, attention was already called to the
         fact that water creates a great public health problem. This
         is especially true in the countries where there is no water
         supply system. There are three sources of water supply in
         China, rain water, surface water and ground water. River and
         lake waters are surface waters. Well water is ground water.
         Chinese prefer rain water to river water for making tea. Since
         it is very scarce, river water is substituted. The rain water
         is not clean because it has collected the dirt from the roof,
         and sometimes the container itself may not be clean. Water
         analysis has shown that there are bacteria in the rain water
         collected. Both the river water and the well water are usually
         polluted.

         To many Chinese, water is not a serious problem in China,
         because the water is always boiled before drinking. They ne-
         glected the fact that these polluted waters are used also for
         sprinkling or washing fruits, berries, and vegetables which may
not be well cooked or may not be cooked at all before being served. It is not uncommon to see many coolies drinking raw water. It is also not uncommon that the outbreak of various intestinal diseases occurs here and there, now and then. When the intestinal disorder is mild, many Chinese just overlook it. It is very important for the class to know that the intestinal disease may lower the resistance and cause some secondary diseases. According to Hazen Allen's investigation that every death from typhoid fever saved from purification of water, there were three or four deaths saved from non-intestinal causes. 1

Because water constitutes a serious health problem and impure water has resulted in many epidemics of cholera, typhoid and dysentery in the United States, the public health department gives much attention to the purification of water.

There are three methods of purification: (1) Storage, (2) Filtration, (3) Chlorination.

Storage is the natural way to purify water. It is done by settlement of bacteria and other impurities in the quiet water, such as lake water. The majority of people in China consider that flowing water is purer than quiet water because they see the advantage of the dilution in the flowing water but neglect the fact that many impurities and bacteria may be carried from the region of the upper river to the region of the lower river, and the fact that quiet water renders the best chance for settlement.

Purification by slow sand filtration is to apply the natural process of purifying surface water to ground water with porous materials, such as fine sand at the top, coarse sand at the next layer, and gravels at the bottom. One acre of area can purify three to five million gallons of water per day.

Purification by rapid sand filtration is to use chemicals, lime or alum to precipitate the bacteria and the dirt suspended in the water, besides filtration as mentioned above, except a much smaller area of sand in used. This method can purify the water at a rate of 125 million gallons of water per acre per day. Both slow and rapid sand filtration can reduce 99 percent of the bacteria content.

Chlorine may be added in different forms to kill the non-spore bearing bacteria. The amount of chlorine used depends upon the amount of organic matter.

There are times when one is travelling in the country that there are no facilities for boiling water. In ordinary times there were chlorine tablets on the market for use in disinfecting small quantities of water at a reasonable price even in China. Two drops of the tincture of iodine to a quart of water may have the same effect. It must be well mixed and allowed to stand for thirty minutes before using.

The household filter is not regarded as safe and reliable means for removing infectious organisms. After a time bacteria may pass through either charcoal or porcelain filters.

2). Sewage disposal. It has been noted that the germs of the diseases of the alimentary canal can be transmitted
through water, sewage, insects, etc. The proper disposal of sewage plays a significant role in public health. There are various methods of disposing of sewage. The best is the water carriage system, which has been widely used in the western countries, and the large cities in China. In different parts of China different methods are used. None of them known to the writer is sanitary.

Whatever method may be used, there are two important principles: (1) Flies, other insects, and animals must be kept away from the excreta and (2) there should be no chance for the contamination of the water supply.

For the rural areas there are some recommended privies: pit privy, recepticle privy, and bored-hole privy. The first two are familiar to the Chinese. The bored-hole latrine is a hole of twenty feet deep and about sixteen inches in diameter. A suitable privy house is built over it. The privy house should be fly-tight.

In the western countries there are various ways of treating the sewage so that it may be purified. This depends upon the bacteriologic action. Prior to the war the central field station in Nanking started to purify water and sewage by various scientific methods on a small scale, with success. Under present conditions, though, it is not possible to continue this undertaking; each individual or each small community should make an effort to dispose of excreta in such a way that it will not contaminate well water or serve as a place for the breeding of flies. This means the mass of the people must be educated to be
awareness of the danger of the improper disposal of excreta.

3). Garbage disposal. There is no need to emphasize the importance of keeping garbage from flies or rats, after one has understood (through the previous discussion of various diseases), what menace these creatures may cause. Keeping one's bedroom or living-room clean is not all the work of house cleaning, but keeping the kitchen and toilet clean and free from flies and rats has more health significance. The garbage, though disposed of outside of the house, should also be kept free from these creatures. One must consider his community if he desires to be healthy himself. Health is not merely a matter of the individual but also a matter of the consideration of the health of the community.

Activities.

1). What is the source of water at your home?

2). What methods do you use to dispose of the excreta and garbage? What do you think of these methods? What improvement can be made without much cost?

3). What can the students do to share the responsibility of keeping flies and rats from carrying diseases to the college community as well as to the neighborhood?

2. Food

a. Questions:

1). What kind of adulteration have you heard of? Have you ever been cheated by the high sounding label of a certain food? If so, describe your experience.

2). What possible diseases can be transmitted by meat?

3). What role does a carrier play in the restaurant?
b. Subject Matter

Food has been discussed from the standpoint of diet. Here it is concerned with two problems: adulteration and sanitation. Probably many of the class members have never thought that adulteration is a public health problem. Although in our country the government has not done much in the control of adulteration, a brief discussion of what the government of the United States has done may add to the knowledge of the class about the scope of community hygiene.

1) Adulteration. Prior to the war the Central Field Health Station began to examine drugs and foods on the market for the purposes of health and economy of the people. In the United States there are food laws to prohibit adulteration. The Federal Food, Drug, and Cosmetic Act will be translated and distributed to the class so that the members will know what the government can do for her people. Besides Federal laws there are state laws. The class is to bear in mind that the United States is a democratic country and that each state has its own power to legislate and to enforce its law insofar as it does not conflict with the federal law. In some cities an ordinance is set up against milk adulteration.

2) Sanitation. Meat and prepared foods are included. In the United States milk is the main food. An average person there consumes more than 880 pounds of milk and milk products yearly. The public health department has done a tremendous piece of work in controlling the milk supply. Milk is a very good medium for the growth of bacteria and for the transmission of diseases, such as typhoid, dysenteries, scarlet fever, septic
sore throat, diphtheria, tuberculosis and undulant fever. The health department sees to it that the milk is produced under hygienic conditions, that the cows are free from disease, that the milk is properly pasteurized, and, finally, that it is properly delivered. Since milk is not a common food in China -- only very few people take it -- and since it is usually boiled before it is taken, it is not necessary to go into a detailed discussion on milk production. Anyone who has been in America always appreciates how convenient and safe it is to pour a glass of milk to drink, right after it is delivered to the home. The students who have come from Shanghai, Tientsin, Peiping, etc., to the interior may appreciate the convenience and safety of the pasteurized milk, but the milk is sold at a high price there. In the United States a quart is sold at a price of 11 or 12 cents. It has the highest food value, but it is also one of the cheapest foods. The government also has control over its price.

a). Meat. The animal is examined before it is killed to see that it is free from tuberculosis, anthrax, trichinosis, actinomycosis, tape worm, and blood poisoning. The process of slaughter is also supervised. Later inspections are made to make sure that it is free from decomposition.

b). Shellfish. So many diseases are transmitted through shellfish. People who live near the coast are fond of shellfish. Great precaution has to be taken in preparing them. In the United States several notable epidemics have broken out from shellfish. The government now requires the
chlorination of shellfish. Chinese are fond of crabs. Frequently people get dysentery or other intestinal disorders from eating crabs or seafoods. Since there is no public health requirement in regard to the sanitary condition of shellfish, each individual has to be very careful how it is made.

c). Prepared food. Here the prepared food means the food in the restaurant or hotel or other places for selling it. The restaurants are inspected and the food handlers are examined periodically. They are taught the proper way of storing and handling the food, and the washing of dishes by the inspectors. With all the effort of the health department, there are still many food handlers ignorant of the principles of hygiene. There is still much room for improvement.

c. Activities.

1). Observe how the food is handled in the restaurants and food stores.

2). Observe the water which the fruit men use for their fruits.

3). What is the comment on the location of the privies in the schools and colleges of which you know?

4). Make a constructive comment on the conditions of the kitchen, the dining-room. Specify your suggestions, keeping in mind the possible difficulties and their solutions.

3. Environmental Hygiene

a. Questions:

1). What can you do to help to control fly, mosquito, rat, and bedbug?
2). What are the difficulties in controlling the above creatures?

3). Is housing in the scope of public health? Why?

4). What is a nuisance? Should it be controlled by city regulations?

b. Subject Matter

The environmental unsanitary conditions in the interior of China have created a serious public health problem. People who have migrated to the interior from the coastal cities find that though personal hygiene cannot control the conditions, it lessens their effect on the individual. Life would have been much more pleasant and much easier if the unsanitary conditions were all controlled by the activities of the public health department of the government. It must be remembered that it is not a simple process. Many problems are involved, even if the government had appropriated a generous sum of money for developing public health. The ignorance, the poverty, the superstition, the traditions and the age-old habit of living have always retarded the rapid progress of public health. The class will notice how many problems are involved in each phase of public health in the following discussion.

1). The control of the fly. The fly carries all kinds of micro-organisms on its legs mechanically. The students are generally aware of its danger; therefore, a full discussion is not needed here. A fly prefers filthy places, and the female fly lays its eggs in human excreta, animal manure, garbage, and other decomposed organic matter in clusters of 120 to 150 eggs.
It lays over 1,000 in its lifetime.

The life cycle of the fly consists of four stages: egg, larval, pupa, and adult fly. It takes about ten to twelve days to complete its cycle if the temperature is favorable.

The proper disposal of excreta and garbage, the fly-proof privy, and screening are the control measures. In a country like China some of these measures are not practical in the rural area.

2). The control of the misquito. The material of the paper on the control of malaria, prepared by the writer in her sanitation class, will be used for the discussion.

The dispersion of an overpopulated city like Chungking, Kungming, etc., to the rural cities by the government has created a serious problem in the control of malaria. Malaria is very prevalent in the interior, especially in the rural cities where the government has not been able to extend its public health work in the short period. However, the Central Field Health Station is making a great effort to eradicate the misquitoes in these areas. The education of the population also plays a very important role in the co-operation with the government in this special phase of health work.

3). The control of the bedbug. Although the bedbug is not known definitely as an important vector for carrying disease, its constant disturbance of a sound sleep, upon which one's health depends, justifies its eradication.

People who come from the interior of China have reported that the old houses in the interior are densely populated with
bedbugs. For the purpose of supplementing the present study, the writer chose to write a paper on the eradication of bedbugs in her sanitation class. It will be discussed with the class.

4) The control of rats. The writer also wrote a paper on the control of rats in her sanitation class. This paper and the one just mentioned were written especially for homes and college communities in the interior of China.

5) Housing. Housing conditions have so much to do with health. If the house is not planned and constructed in terms of sanitation, it will be very hard to control misquitoes, flies, bedbugs and rats, and to follow the hygienic principles in daily living at home. In the United States the students who major in city planning are required to take courses in sanitation. Some cities there require the kind of buildings which may be built in each part of the community. Prior to the war the municipal government of Nanking had regulations in regard to building houses. Now in Chungking and Kung-ming, there are also requirements for the new buildings. The housing problems illustrate that community hygiene is related to engineering, bacteriology, etc.

6) Nuisance. Any condition that is injurious to health, comfort or welfare is considered to be a nuisance. Fly-breeding, unnecessary noise, smoke, faulty drainage, removal of dead animal, dirty tards, spitting on the sidewalk, glaring automobile lights, and disagreeable odors are all nuisances.

7) City recreation. Recreation is the positive activity of promoting health. Every city needs play space for
children and adults. There should be facilities for all kinds of recreation activities.

c. Activities.

1). List the requirements for building new residences in Chungking.

2). Find out how many playgrounds and parks are provided in the city. Do you think the size and number are adequate for the population?

3). What suggestions would you give for reducing the flies in the college community?

4). Under what department are recreation grounds administered in your city?

4. The Organization of Public Health Work in China and Its New Development

a. Questions:

1). Why should a student of hygiene know the organization of public health work?

2). Does your home town have a public health department?

3). Did you have health education when you were in primary school?

4). Do you know under what organization vaccines or immunizing material are manufactured?

b. Subject Matter

In order to understand intelligently the public health work in China, it is necessary to know its general organization.

1). National Organization

1. Presidential address by H.E.J. Heng Liu, Director of the National Health Administration, Selected Papers by the Staff of the National Health Administration and Central Health Field Station, 1934, p. 1.
a) National Health Administration, Weishengshu, of the Ministry of the Interior. Weishengshu is to take care of all of the administrative responsibility of public health work.

b) Central Field Health Station. Central Field Health Station is under the National Economic Council. It has nine technical departments: Vital statistics, communicable disease control, maternal and child hygiene, sanitation, laboratory, public health education, hospitalization, research, and public health nursing.

Under these departments there are National Quarantine Service, Central Hygienic Laboratory, Central Midwifery School, First Midwifery School (Peiping), Central School of Nursing, The National Epidemic Prevention Bureau, and Manchurian Plague Prevention Service.

Particular stress has been placed on the following phases:

(1) Maternal and infant welfare

   (a) Midwifery schools. Various courses are offered to train different grades of midwives for the purpose of solving the maternal and infant problems both fundamentally and immediately.

   (b) Child Health Stations. Courses are offered for mothers on home economics, home hygiene, and care of the infant and preschool child. There are also consultations for the preschool child.

(2) School Health. Many people as well as the school authorities generally do not know the scope of school health. School health is not merely a hygiene course lectur-
ed to the pupils in a hit or miss fashion as many people think. School health consists of a program of activities for protection, correction and promotion.

(a) Health protection.

1. Sanitation of the school plant. This includes the location of the building and the sanitary conditions in the building.

2. Examinations. Physical, dental, and psychological examinations.

3. Communicable disease control. There are routine procedures and procedure in epidemics. The former includes inspections, exclusions, readmissions, educational measures, and immunization; the latter, recognition of epidemic, treatment of contacts, measures to prevent infection.

(b) Correction of defects.

1. Special classes are arranged for the children who have defects of the eye, the ear, or the speech, etc.

2. Clinics for nutrition; ear nose and throat; dental habit; cardiac; lung; posture; habit.

3. Follow-up service

(c) Health promotion

1. Hygienic arrangement and administration of the school program for the health of both the teachers and the pupils, including the length of the school day, the length of the recitation period, the sequence of subject, the recess, the amount of homework, the number of pupils per room, the nature and conduct of examinations, discipline and punishment, extra-curricular activities, the selection of proper textbooks and
source material, the maintenance of teacher and pupil relationship.

For the teachers there should be provision for relaxation and recreation, satisfactory opportunity for obtaining lunch, limitation of extracurricular requirements, provision for undisturbed workplace after school, and sick leave.

2. There should be a directed play period or physical education class.

3. Health instruction. Health teaching in the primary school is generally given by the schoolroom teachers. In China many schoolroom teachers have never had any training in health education.

Prior to the war the government began to put great emphasis on health education. The National Central University since 1931 has offered a major course in health education, and later all the education majors were required to minor in health education.

(3). The control of communicable disease. Special attention was given to the control of the most common diseases in the particular areas of the country. These diseases were cholera, smallpox, diphtheria, malaria, dysentery, meningitis, etc.

The National Epidemic Prevention Bureau in Peiping manufactured all the vaccines and sera needed in China, all up to international standards.

The National Quarantine Service with its branches in all the important ports, helped to prevent the importation of com-
municable diseases from the outside. It also renders service in the fumigation and deratization of steamers.

(4). Public health education. It has been discussed above that health cannot depend completely on either community hygiene or personal hygiene. The government develops community hygiene on the one hand and educates the masses on the other hand. The Division of Health Education prepares health posters, pamphlets, lantern slides and models. From 1932 to 1934, 900 wax models, 200,000 posters, and 1,500,000 pamphlets were distributed.

(5). Rural health. Over 85 per cent of the Chinese population is rural. The protection of the people in the rural area constitutes the major problem of the public health work in China. Rural Health Service was organized in 1932. At Tanshan there was experimentation with rural health work. A hsien-wide program on both curative and preventive activities was proposed and passed in the Second Conference of civil officials in 1932.

2). Provincial and local organizations. There are also provincial and local organizations of public health work with various levels of development. In some provinces and special municipalities, the health work is growing very rapidly, and in others very slowly. They are assisted by the National Health Administration and the Central Field Health Station to develop certain particular phases of public health work.

3). Private Agency. In China there is no private agency doing organized public health work except the rural health as a part of James Yen's rural experimental work. Both Y.M.C.A.
and Y.W.C.A. at different localities initiated some phases of public health with some good results. However, the work was not maintained long enough nor was it well planned for a long period.

In the United States there are many kinds of private organizations which have definite funds, plans, projects, publications, etc. Nevertheless, as soon as the importance of public health is recognized by the influential people or social organizations in China, they will take the initiative to co-operate with the government to do certain phases of public health work on a long period plan.

4). Foreign agency

a). League Of Nations. The League of Nations furnishes public health personnel in assisting to promote public health work or in controlling certain disease prevalent in a particular locality.

b). Rockefeller Foundation. The Rockefeller Foundation (1) founded Peiking Union College, (2) grants fellowships, (3) assisted James Yen's rural health program, (4) grants funds to personnel training station.

c). Milbank Foundation. Milbank Foundation granted subsidization to James Yen's rural health program.

c. Activities.

1). Find out from the National Health Administration how many provinces in China have well organized public health work.

2). How is the local health department organized in
Pei-sha where the college is situated?

3) What is the provision for maternal and infant welfare in Pei-sha?

4) Write to the health department of Szechuan province, Chentu, about the project on health education in Szechuan province.
Part III. **Measurement of Results**

The purpose of the hygiene program is to impart the modern knowledge of hygiene, and to offer the opportunity to develop the proper attitude and to form good habit in the hygienic living. Whether these ends have been achieved should be the question for the college authorities to ask themselves after this new project of hygiene program has been put into effect for a year. The immediate question following the first one would be how to measure the results. To measure the knowledge one can give tests as in any other course. But how can one measure the attitude and the habits objectively?

The answer is that in the light of the present knowledge there is no satisfactory method of measuring attitude and habits, and one will have to rely upon the subjective judgment of those who are in close contact with the students, such as the college nurse, the matron, and the roommate. To measure the effect of the hygiene program is broader than academic examination. The latter is interested to find out how much each student knows and where he stands academically. The former is interested to know also how the program affects the students collectively in respect to knowledge, attitudes, and habits. The following methods may be used with a considerable degree of success to measure these qualities.

A. Knowledge tests can be given frequently.

B. Certain questionnaires or exercises should be given to the students to check their own attitudes and habits on various phases of health. Their names should not be required to be
written on the questionnaire paper. This is to insure that the truth may be told.

C. Reports on illness after a definite period of time may reveal the condition of the health of the students.

D. Medical examinations may be used to check the health of the students.

E. The observation of the health director, the college nurse, and the matron of the college will serve as a very good means to check the habits and attitudes of the students.

A period of three years study will give enough evidence to tell to what extent the program of hygiene has affected the health of the students both individually and collectively.
Part IV. Conclusion

Although this paper has reached its end, it marks only the beginning of a long-planned project of a hygiene program of the National Teachers' College for Women. As time goes on there will be new information concerning health and socio-economic changes in China. It is the hope of the writer that the new health facts in this country and the constant new development will be followed closely in China, so that the present study will be adjusted from time to time to the new situations. As soon as she returns to her homeland she expects to familiarize herself with the public health work in the interior of China and the available facilities for her hygiene program. It is also the hope of the writer to keep in close touch with the Director of Health Education in China and with her professors of public health for advice and information so that her present project will be steered successfully and share the contributions of the national project toward the reconstruction of a new China.
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