

## AGRICULTURAL NOTES

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### **Agronomy**

The Agronomy Department is giving special attention to the improvement of rice and to fertilizer experiments. The work in rice improvement began two years ago. It consists of variety tests, seed selection, fertilizer tests, and its botanical and agronomic study. Records are kept of all these experiments and will be published. In the first season of 1923, 31 Philippine, 8 American and 22 Chinese varieties were tried. In the second crop season of the same year, 22 Chinese, 52 Philippine, 9 American, 4 Java, and 1 Siam variety of rice were grown. All these are lowland types and a few are glutinous and beared. Many show striking differences in maturity and in botanical characteristics, especially the foreign varieties.

Commercial fertilizers are more and more being used in South China for crop production. Several large commercial fertilizer companies, both foreign and Chinese, are cooperating with the College for carrying on fertilizer tests. The Department of Agronomy, in cooperation with the American Cyanamid Co. of New York City, has just completed a test with ammo-phos fertilizer. Dodwell & Co. of Great Britain has given us Peruvian guano, fish guano and ammonium sulphate for testing. These have been tried on mulberry fields on a small scale, and the results will soon be reported. From the American Agricultural Chemical Company of New York we have received several packages of Bowker's lawn and garden dressing. Other companies have likewise furnished commercial fertilizers. Several experiments are now under way and plans are being made to greatly enlarge this important work.

The organization of a Fertilizer Testing Station is now being planned. The primary object of this Station will be to assist the Ling Naam Agricultural College in serving exporting and importing firms in the introduction and the farmers of South China in the use of commercial fertilizer. The prospectus of this Station will be sent to all firms interested in commercial fertilizers.

Of all leguminous crops tried out thus far, the most successful are the pigeon pea and the velvet bean, both of which are now grown on a comparatively large scale, the former by the Horticulture and the latter by Animal Husbandry Departments. The pigeon pea, also known as Porto Rican bean, is grown mainly as a forage crop for cows, and the velvet bean is used chiefly as a green manure crop.

### **Animal Husbandry**

During the summer of 1923 a silo was built by the Animal Husbandry Department. This is the first silo in South China outside of Hongkong and the second in China, one being located near Peking. The College silo is 13 feet in diameter and 24 feet high, inside measure-



ments, and should contain 50 tons of silage. The first filling of the College silo has been made with guinea grass, pigeon pea (*Cajanus cajan* or *C. indicus*), and native grasses. The grass was all cut and chopped by hand.

The Papec Machine Co. of Shortsville, New York, are contributing to the work of this department an ensilage cutter which will be available for filling the silo in 1924.

Recently a herd of 22 Indian dairy buffaloes of the "Murra" or "ram's horn" breed, originally from Delhi, India, was secured by the College.

Contributions of four Holstein heifers to the College herd have recently been made through Dr. H. J. Waters of the Kansas City Weekly Star by the following prominent breeders of Holsteins in America: Mr. H. C. Barker, The Ona Company, Chardon, Ohio; Governor Frank O. Lowden, Oregon, Illinois; and John R. Bell, Pittsburg, Penn. The stock is expected to arrive in January, 1924.

### Horticulture

The papaya introduced by the college from Hawaii some years ago is becoming well established on certain sections of Honam island and is rapidly spreading to other parts of the province. There is an increasing demand on local markets for the so-called "Lingnaam papaya."

The cape gooseberry, more recently introduced, is proving equally at home here and the College of Agriculture had an unusually large production last year which it used in the manufacture of jams and jellies. This and roselle, introduced some years ago, are valuable bush fruits of acid flavor which will be more and more appreciated by the Chinese in the years to come.

The citrus introduction station established several years ago in co-operation with the United States Department of Agriculture is still maintained at the college. The grove is in good condition and a reading on the trees, which heretofore have not been allowed to set their fruits, will be made during next year. One limequat tree, a citrus hybrid (48798 Limequat on *Citrus mitis*, 5-15-19) of the Office of Crop Physiology and Breeding Investigations has fruited most profusely this year and seems to be perfectly at home in this climate. The *Ch'iu chau sun kat* (潮州酸桔), which we brought to Canton from the Swatow region in 1918 is doing exceedingly well on our upland soil and may prove one of the best stocks for citrus culture on the hill lands of South China. Present studies indicate that this is possibly a form of *Citrus mitis* Blanco. The fact that it is very hardy makes it a promising stock for the colder regions of Kwantung. The Swatow orange growers apparently discovered this years ago and it is doubtless one of the secrets of their success with the famous so-called "Swatow" mandarin orange. Many other interesting forms of pummelo, orange, mandarin orange and citrus relatives will be found in the citrus introduction station and on the campus of the college. Southeastern China is the home of citrus fruits and this is doubtless one of the best places in the world for their study.



The Department of Horticulture in co-operation with the Business Division has recently issued a seed and nursery catalogue, listing most of the plants of the college campus under their Latin and Chinese names. The present publication does not attempt to describe the species and varieties but merely to list them as flowers, vegetables, fruits, potted ornamentals, trees, shrubs, and farm seeds. Following the lists of seeds and plants under this classification there is given a philogenetic classification according to the Engler and Prantl and Dalla Torre and Harms numbers as described in "*A Method of Indexing and Filing Chinese Plants*" in Vol. 1 No. 1, of the Lingnaam Agricultural Review. We are attempting to tag the plants of the Canton Christian College with these numbers, as also all plants and seeds going out from College. This will enable us to test the system under practical field conditions. It has already proven highly successful in the herbarium. This seed and nursery catalogue is Bulletin No. 8 of the Lingnaam Agricultural College series and will be sent by the Publication Office to those interested for 40 cents in stamps or currency.

The Department of Horticulture also wishes to announce the publication of Agricultural Bulletin No. 4, *A Garden Guide for South China* by Walter Leon Funkhouser. This deals with garden practices suitable for South China, garden pests and remedies. The vegetable and flower garden are also treated with cultural directions and calenders for this region. Some ornamental and forest trees are also considered. The bulletin is proving a very popular one to the home gardener. This publication is also available by addressing the Publication Office of the Lingnaam Agricultural College and sending 40 cents in stamps.

The department has prepared for the United States Consular Service a brief report on the 1923 fruit crop of the province. It is very difficult to secure accurate statistics of this nature and these are general observations of our staff. This year the *lychee* and *lungan* crops at time of flowering seemed exceedingly promising. At the opening of the typhoon season the crop was about 70% normal and a good year was expected. But the typhoons coming on just at the time of the ripening of the fruit reduced the income from the lychee crop to about half the normal. For a time prices were very low on local markets due to the difficulties of transporting the crops. The *Wai chi* (淮 枝) variety at one time this year sold as low as \$3 and \$4 local silver per picul, an unusually low price. The *lungan* crop which appears a few weeks after the later varieties of lychee was damaged by the many typhoons even more than the lychee. *Carambola* (*Averrhoa carambola* Linn.) blossomed and fruited very poorly for the first crop but the second crop was better, about 70% normal. The production of *custard apples* (*Anona squamosa* Linn.) is increasing in the province. This year the fruiting was normal but the typhoons did much damage. The citrus industry is not making much progress in spite of the unusually high prices received for citrus fruits during the past few years. This year *oranges*, *pummelo*, *mandarin oranges* and



*kumquats* all seemed especially promising in the early season. But as these fruits do not mature until the fall they were affected by the eight or ten typhoons which visited the province. The result is a 50 to 60% normal crop. An unusually poor year is reported for *Chinese Olives* (*Canarium album* (Lour.) Raeich and *Canarium pimela* Koen.) the so-called *white* and *black olives*. *Chinese apricots* (*Prunus mume* S. & Z.) fruit in the spring and the yield this year was unusually heavy. The average price per picul is about \$12 local silver, but this year they brought only \$4 or \$5. There has been an exceedingly good crop of *persimmons* of all varieties this year. The yield of *sand pears* has been medium. *Peaches* bloomed and fruited well but in March a drought developed which caused many of the fruits to dry on the branches and the harvest was only about 30% normal. The crop of *plums* was only 40 to 50% normal. Kwangtung does not produce large quantities of good *mangoes*. This year the trees bloomed exceedingly well but the cold weather reduced the crop to below normal. Plantings of *pineapple* are increasing in the province. This year the crop was 80 to 90% normal. Due to the recurrence of typhoons during the summer the damage to *banana* was very great. The crop was especially weak in *Heung Shan* (香山) district. Prices have been very high. The province had about a 50% normal crop of *Wongpei* (*Clausena lansium* (Lour.) Skeels). There are doubtless few places in the world that produce as large crops of this fruit as South China and during the past year the prices have been very high. *Papaya* is now produced in the province in increasing quantities but suffers exceedingly from typhoons. This year the unusually fine crop was greatly damaged and many trees were completely destroyed.

For a number of years work in the introduction of foreign vegetables for commercial production has been carried on. In this work we have established a number of facts never published. *Sweet corn*, *tomato*, and *celery* should be mentioned as especially successful. With irrigation *sweet corn* can usually be grown in Kwangtung throughout the year. *Early Mammoth* is best for spring planting, *Country Gentleman* for summer and *Stowell's Evergreen* for winter. The last crop is the best of the year. Chinese vegetable gardeners, in this region, plant a spring crop only. The tomato is quite at home in this territory. The *Stone* variety seems to do the best in the College gardens, and the people prefer it to other varieties because the fruit does not crack at the stem end. The *Golden Self-blanching* variety of celery is doing fairly well at the College, although it does not blanch completely. Trenching does not always prove successful due to a tendency to cause rot. Lima beans, beets, kohlrabi and parsley succeed quite well when planted during the fall months.

One of the great difficulties we have in growing early vegetables is the control of weather conditions. During the latter part of September and October the weather is very favorable for starting early vegetables. But cold weather often comes before we can mature the crop, or young seedlings may be killed outright. At other times continuous warm



weather stunts the growth of seedlings of those vegetables which prefer a cooler climate. Again, warm climate favors the work of insects. Facilities for temperature control is one of the present great difficulties of the Department of Horticulture and greenhouses are badly needed.

### **Sericulture**

The Department of Sericulture expects, early in the coming February, to begin the construction of a building to house a model filature for reeling cocoons. The building with its equipment is a gift from Mr. Eugene Atwood the former president of the Atwood Machine Co., Stonington, Conn., U.S.A. and will be called the Eugene Atwood Reeling Laboratory.

Besides a model filature of fifty basins where the most approved methods of unwinding cocoons will be investigated and demonstrated on a commercial bases, there will be rooms for the testing of raw silk, for the storage of cocoons and silk, class rooms, laboratories, offices and research rooms for advanced students.

In the basement will be a cold storage plant of two tons capacity for keeping silk worm eggs over the warm winters of South China at an even, temperature. This cold storage plant has been given by Mr. Edward E. Bradley, Vice-President of the Atwood Machine Co.

It is intended that this plant shall be a model not only as to methods of work which it will demonstrate but also as to construction and mechanical equipment which can be copied by those now owning filatures or those who may be planning to erect new filatures, in Kwangtung.

A general survey of the Sericulture of South China is at present being made by the Sericulture Department of the College. The Survey was made possible by Governor Liao Chung Hoi, who furnished the funds needed and has helped in every other possible way to make the Survey a success. For about a month eight men concentrated on an intensive survey of the silk industry of San Tak District which is the heart of South China's silk region. Then, for the next four months, several men made extensive trips into the outlying districts. In every district they met with hearty cooperation on the part of the magistrates, the postal officers and the farmers. The survey is now nearing completion and the complete report will be published at an early date.

The Civil Governor of Kwangtung Province has authorised the organisation of a provincial bureau for assisting the people in the province in improving their sericultural industry. This bureau is to be known as the Kwangtung Provincial Bureau for the Improvement of Sericulture. The main offices are located on the campus of the Ling Naam Agricultural College, with the Head of the Department of Sericulture of that College as the Director of the Bureau. This close affiliation of the Bureau and the College will, it is thought, give a greater impetus to the work of sericulture improvement in as much as the Department of Sericulture of the College has been working on this problem for the past 5 years and has created a demand on the part of the farmers for the work



The Bureau has the power to supervise all the work of certified egg production in the province, even to the point of licensing all egg merchants, as well as to employ every effort for the improvement of mulberry production and filature practice. The Bureau is supported by appropriations from the Provincial Government and has as advisors a Board composed of representatives from the Government, the Ling Naam Agricultural College, and from several organisations of business men who are vitally interested in the silk industry.

### **Hookworm Investigations**

The work in the study of hookworm disease reported in the last issue of the Review has continued. Dr. Frank Oldt of the United Brethren Mission and Canton Hospital is initiating this work and a Committee on Hookworm Investigation has been established within the Canton Christian College in order to encourage and facilitate the project. Last year's investigations revealed that a large percentage of farm laborers coming in from the districts to work on the college farm are infected with hookworm and other intestinal parasites. All farm hands have been treated by Dr. Oldt and Dr. Cadury. And the Hookworm Committee is encouraging further research. Tests are being made by the Agronomy Department to determine the effect of storing and mixing with earth, on the fertilizing value of night soil and of the effect on hookworm eggs and larva in night soil thus treated.

Dr. Ernest Carroll Faust of the Peking Union Medical College spent two weeks at the College last May and gave to students and Canton physicians a very helpful course in parasitology. He has also instructed the staff in methods of differentiation of hookworm larvae from free living nematodes and also concerning other animal parasites and their intermediate hosts. Dr. Faust has written a brief report of his findings which we publish in this issue of the Review.

Last summer a project for the investigation of hookworm disease in China was launched under the joint auspices of the Department of Pathology of the Peking Union Medical College and the International Health Board of the Rockefeller Foundation. Dr. W. W. Cort and Dr. J. B. Grant are co-operating in the direction of this work. Dr. Grant has already visited the College and we expect to have Dr. Cort with us early in 1924. The College of Agriculture is especially interested in this problem as the investigations center about the relation of methods employed in fertilizing the soil with reference to the spread of hookworm disease. The laboratory phase of our work is an attempt to follow the life of the hookworm eggs and larvae in night soil, stored under various conditions with the object of devising methods to prevent the spread of hookworm disease by the use of this material in fertilizing crops. It is also planned to extend the work by carrying studies into the country districts and working with the villages close at hand. More detailed reports of this work will be published in forthcoming issues of the Review.



**Agricultural Manufacturing**

This department started the canning of fruits and vegetables in 1920. Due to local climatic conditions, to differences in cultural methods in the production and handling of the raw materials, to the limited varieties of fruits and vegetables canned by local canneries and to the fact that a high percentage of their products spoil, the first and most urgent problem for the department is to experiment with the proper time of processing the different kinds of fruits and vegetables used locally. So far it can be generally stated that vegetables and fruits canned during the spring months need much longer processing than the same products canned in the winter months (vegetables are abundant during the winter but not as cheap as in spring months), and in summer months the raw products must not be very mature or much more time is necessary in processing and the quality will not be first class.

**CANNED INTRODUCED FRUITS AND VEGETABLES:** Introduced vegetables such as beets, celery, tomatoes, sweet corn, green peas, okra, string beans, lima beans, and fruits such as cape-gooseberry (native variety too small and not tasteful enough to be of economic importance) and strawberries are not canned by the local canneries, but the department finds that they can be easily canned and are of good quality.

**COLOR EXPERIMENTS:** Native raspberries, red plums and introduced strawberries canned in tins lose their red color after a time, and if their color is to be preserved they must be canned in glass jars. Tinned beets, locally grown, keep their red color for more than one year.

**CANNED ORANGES:** Canned oranges (in 190° F) become bitter in taste after three months, but on the other hand, tinned mandarin oranges retain their fresh fruit flavor for more than one year.

**CANNING OTHER FRUITS AND VEGETABLES:** The department has also experimented in canning other native fruits and vegetables such as lychee, lungan, carambola, pineapple, bamboo shoots, water chestnuts, bitter squash, etc. and they are found to be easily sterilized. Peach, pakchoy, wild rice, cabbage, chestnut, guava, because of their nature and perhaps due to certain technical difficulties in the handling of them, are not put up by local canneries. The department is gradually solving the difficulties in canning these products.

**CANNED FISH:** Local canneries prepare their fish and other game by first thoroughly frying them and then putting into cans. They sometimes become lignified and very hard. The general belief is that these products cannot be prepared in the same manner as that of preparing sardines and salmon. The department began to experiment on this problem last year and finds that it can be done with some modifications. Oysters and clams are not successfully canned by some local canneries and the department finds that the difficulty is due to the fact that insufficient pressure is used in processing for in using high pressure they can be safely kept for a long time.



**TONIC FOODS:** Foods designated to have special tonic and stimulating value to the different parts of the body are eagerly consumed by many older people and especially the oversea Chinese. They are prepared by cooking, for a long time, meats such as chicken, beef, game, etc., with certain drugs. The department has made some of these tonic foods in tins and expects to try out their real value.

**CONDENSED MILK:** Local condensed milk made from buffalo cow's milk has an oily taste. The department experimented with buffalo milk and made fairly good condensed milk with some butter fat removed. The comparatively small percent of milk sugar in the buffalo cows milk necessitates the use of a little more sugar. If sweet condensed milk is required, the danger of gritty milk is some-what less because of its low milk sugar content.

**JAMS AND JELLIES:** Jams and jellies from all the native fruits were made and tried out. Guava, kumquat, orange, lime, plum, Chinese apricot and grapes can be made into good jellies. Rose apple, carambola, if carefully made, and blended with sour fruits have good flavors. Rose apple can be made into delicious rose-flavored syrups. Introduced roselle and cape gooseberry can be made into excellent jams, jellies and fruit syrups.

**JUICES:** Fruit juices are not commonly made in Kwangtung on a commercial scale. Juices squeezed out from limes, which are to be used for preseving, are used as a mordant for drying and for cooking of hard candies. But lime juices properly made are very delicious. The juices of native raspberry and mulberry make good beverages.

**CANDIED FRUITS AND VEGETABLES:** Mrs. Cotta (formerly Miss Elizabeth H. Groff) has done a great deal of experimental and investigational work on candied fruits and vegetables. The department finds that most vegetables and fruits can be preserved by the native method except in the case of soft fruits which must be handled somewhat differently.

**DRIED FRUITS AND VEGETABLES.** The fruit season is also the rainy season, which makes it difficult to dry fruit other than in season of light rainfall. The drying of lychee and lungan is well worked out and there is no urgent need of experiments with these fruits. Dried pineapple and banana can appear be successfully produced, but peaches are difficult to be make into fine appearing and delicious dry products.

**OTHER PRODUCTS:** The department will take up pickling and other microbiological industries if opportunity permits. Courses in general agricultural manufacturing are being offered.

### **Division of Education**

The Department of Sericulture is planning to offer a number of new courses which are not given in any institution in this part of China and which will form a nucleus of a sericulture school. These courses are: Anatomy of Silk Worm; Diseases of Silk Worm; Breeding of Silk



Worm; Study of Raw Silk; Filature Methods; Mulberry Culture; Sericulture Economics; and Problems of Sericulture. The department will be equipped to offer the first two courses next year. In addition, a course in general silk worm culture will be given. Quite a large number of students are deeply interested in the various phases of sericulture. The department is also conducting a short course in sericulture in connection with the one year course in Agriculture. This will take the place of the six months course formerly given.

The Animal Husbandry Department is offering for the first time courses in Dairy Bacteriology and Dairy Seminar. A veterinarian is expected for the second semester, when courses in Anatomy and Physiology will be given. Fifty per cent of the students in the College of Agriculture are specializing in this department.

The College of Agriculture has thus far turned out a small number of graduate students. Nevertheless, all these men with the exception of one are following the lines of work for which they have been trained. They are as follows:

Kwok Lam Shong, '21, B. A. Manager of Wing On Co., Hongkong.

Koo Kwai Fan, '22, B. S. Now a graduate student in America.

Hoh Leung, '22, B. S. Manager of a large farm near Hongkong.

Wong Chaak Po, '22, B. S. Assistant in Sericulture with the College.

To Shue Tsoi, '23, B. S. Instructor in Animal Husbandry with the College.

### **Hainan Explorations**

The spring issue of the Hainan News Letter, a publication of the American Presbyterian Mission, Island of Hainan, Kwangtung reports:

"Visitors to Hainan are becoming more frequent. Evidently some people have learned that she is on the map and some few have come to find out just what sort of place Hainan is. Some are interested in her mountains, others in her people and still others in her fauna and flora. At present Mr. Pope, who is with the Roy Champan Andrews Mongolian Expedition, is at Nodda collecting animals. Mr. Pope is a recent graduate of New York City College. He has spent several months in Nodda and vicinity and his specimens now number in the thousand. One of the rare animals brought in is the flying fox. Mr. Andrews has written him commending him on his success. One of the interesting stunts staged by Mr. Pope was a battle royal between a mongoose and a cobra. The battle ended as expected."

"Dr. and Mrs. Malcolm Smith of Siam spent the month of January and part of February exploring the interior of Hainan. From Hoihow they proceeded to Kachek and thence to the Miau country and made the Five-Finger Mountains their objective. They did not reach the summit of the Five Fingers but camped at the height of 6000 ft. This is twice within a year that our Finger Mountains have been scaled by venturing white men".



The Ling Naam Agricultural College is extremely interested in the Island of Hainan as the Rev. B. C. Henry, one of the founders of the Canton Christian College and father of Mr. J. M. Henry, Vice-President, was one of the first missionaries to that island and he recorded some of the earliest scientific data reported from there. Moreover, the island belongs to the province of Kwangtung which our College serves. We believe it imperative to establish an agricultural sub-station in Hainan at an early date. As a preliminary step in that direction Mr. McClure was sent to the island by the College and his findings are being published in full in the Review.

The Herbarium Committee is now offering for sale Mr. F. A. McClure's collection of Hainan plants. Prior to Mr. McClure's explorations in Hainan only about 350 species of plants were recorded from that island. His collections have increased this number to about 1200 species of which we have about 1150. There are approximately 90 species new to science in Mr. McClure's collections. Mr. Merrill reports that Mr. McClure's No. 9387 is doubtless a new genus which probably can be best placed in the family *Pentaphylaceae* which at present contains a single genus with two known species segregated a few years ago from the family *Theaceae*. This is the second new genus that has been found in Kwangtung within the last few years, the other one having been collected by Prof. Chung Koon Kong in southern Kwangtung and which Mr. Merrill has named *Tsoongia*. In connection with the sale of the Hainan material the Herbarium Committee is issuing special identification labels with each plant. These not only give a brief description of the plant but include very interesting economic data regarding the local uses of the plants. Separates of "An Enumeration of the McClure Collection of Hainan Plants" are available. Address: Herbarium Committee, Canton Christian College, Canton, China.

### **Agricultural Library**

The College of Agriculture is establishing one of the strongest agricultural libraries in South China. This is in connection with general college library where a complete card index is kept of all agricultural material. We are now receiving bulletins and reports from all parts of the world, many of which are in exchange for our own publications. We are very eager to strengthen the Chinese division and will be glad to receive Chinese books and publications dealing with agriculture.

In this connection it will be of interest to know that there is a very rare collection of Kwangtung gazetteers to be found on file in the Herbarium. All Chinese plant names from these publications have been indexed and the Herbarium Committee is seeking to locate specimens of these plants so as to have them identified by Mr. E. D. Merrill.



### **Colleges of Agriculture in China**

An increased interest is taking place throughout China in agricultural education. In spite of political uncertainty and lack of funds for education there has been marked progress during recent years. Dr. Kenyon L. Butterfield of the China Educational Commission (1921-1922) handed over to both the national and Christian forces at work in China a comprehensive program for agricultural education. The most advantageous lines of procedure are clear but it is not always easy to bring about the co-ordination of interests that will assure the presentation to the nation of a unified system. Nanking should prove the center for such co-ordination as we find there leaders of thought and action in both national and missionary agricultural education.

Last June a six-year review (1917-1923) was issued in English by the College of Agriculture, National Southeastern University, Nanking, China. There has recently been a report current in news items that Southeastern has suffered serious loss through fire. Our sympathy is theirs and we are sure they will go forward with renewed effort in spite of such reverse. The scope of this college includes teaching, research and extension. Their underlying aim is to promote the agricultural welfare of the farming population of the southeastern provinces. They have a personnel of about twenty-six professors and more than twice as many assistants. For the fiscal year 1920-1921 the total funds available for operating expenses amounted to \$98,070 of which \$78,304 were apportioned to budgeted expenditures and \$19,766 for extraordinary expenditures. This college has been especially fortunate in the support it is receiving from business interests in China, including the Shanghai Flour Mill Association, the Chinese Cotton Mill Owners' Association, the International Committee for the Improvement of Sericulture in China, Tung-Tai Reclamation Company and bankers. It is also liberally supported by the Kiangsu provincial government. At the time of the report the college valued its equipment at approximately \$30,000 not including books and general museum material. This college has now been designated by the provincial government to act as the central agency for the control and promotion of agriculture in Kiangsu Province, and an annual grant of \$50,000 has been made for this important project. The college is organized into seven departments: Biology, Agronomy, Horticulture, Animal Husbandry, Sericulture, Plant Pathology, Entomology and Utilization of Farm Products. At present the college has one Central Experiment Station and at least nine Sub-stations, totalling about 3,800 mow (approximately 750 English acres) of land. The central station is located at Tashengkwan, about 15 miles west of Nanking City and has a total area of 1,800 mows of fertile land on the Yangtze river. Professor C. C. Yuen, formerly of the Kwangtung Experiment Station, is Director of this station. He has five assistants under his supervision. The sub-stations are designated for different experiments. The first is for animal husbandry and floriculture, the second for wheat, the third for fruit and vegetables, and the rest of the stations are all devoted to the growing of cotton.



Volume six, number twelve of the University of Nanking bulletins is a report of the College of Agriculture and Forestry and Experiment Station for 1922-1923. Nanking has also recently issued numbers one and two of agricultural and forestry notes. It is stated in the introduction of the report: "By means of institutes, exhibits, plays and demonstrations we have gotten out into and next to the rural communities much more than ever before. We are more surely and in more ways becoming linked up with general missionary interests in rural affairs." The opportunities before the University of Nanking in agricultural work are very real ones. They receive liberal grants from missions and recently they have had allocated to them a fund of \$700,000 gold for famine prevention work by the American Committee for the China Famine Fund. In their sericulture work they are receiving support from the Silk Association of America. Cornell University has recently decided to develop missionary work in China in co-operation with Nanking and this should be of great assistance to them. The time is right for the agricultural colleges of western countries to place men and money in the agricultural missionary field in China. Nanking has also instituted a One-Year Short Course in Agriculture and they are now inaugurating a special training course for rural teachers which will begin February 15. Their faculty has been greatly augmented during recent months and they are accomplishing much more research work than ever before. Nanking's College of Agriculture and Forestry has organized the following departments: Agricultural Economics and Farm Management, Agronomy, Bacteriology, Botany, Cotton Improvement, Forestry and Sericulture. This college, like most Colleges of Agriculture in China, is in need of more land. They have approximately seventy English acres under cultivation in the city of Nanking. Outside the city on their Tai Ping Men farm they own about thirty-five English acres, and in addition they rent three other tracts totalling about seventy English acres. The inventory of the College of Agriculture and Forestry totals \$38,507.61. The government co-operation which Nanking is receiving is in the form of scholarships: from Shansi Province, fourteen students, from Anhwei, eight, and from Shantung, three. The college lists a personnel of faculty and officers totalling thirty-eight of which twenty-seven are doing full time work in agriculture. They have recently had several additions to their staff including two men from the West, Mr. R. H. Porter from the Iowa State College of Agriculture and Mr. M. Leslie Hancock of the Ontario Agricultural College. Mr. Porter will carry work in plant pathology and Mr. Hancock work in horticulture.

These notes on the Colleges of Agriculture in China deal primarily with details of progress of the two colleges at Nanking. Peking is rapidly following in the footsteps of Nanking and Canton and within the next five or ten years we should find within the northern city efficient agricultural organization. About one year ago government agricultural college education was reorganized in Peking. Dean P. W. Tsou of the College of Agriculture of National Southeastern University helped with this reorganization. This College is known as the Peking National Agricultural College (國立北京農業大學) and started with a staff of about 40 men, ten or twelve of



whom were graduates of Western agricultural colleges. Mr. S. H. Taam was released by the Lingnaam Agricultural College, for a time, to help in the organization of the animal husbandry work and the Kwangtung College of Agriculture sent Mr. T. T. Chang and Mr. P. F. Shen. National Southeastern University also sent some of its men to Peking to assist in the developments there. We understand that this college has now been closed due to general unfavorable political conditions and lack of funds. But land has been secured and a yearly budget of about \$100,000 has been drawn up. There will be one main station and two sub-stations with a total area of land of about 5,000 mow (about 1,000 English acres).

At Peking the mission forces are also projecting a College of Agriculture in connection with Peking University. A professor of animal husbandry has been on the field for several years. With the help now received from the American Committee's China Famine Fund rapid progress should be made.

Canton is a third center in China where agricultural education, research and extension is projected and being developed. It is significant to note that the past missionary movement in Canton records: "in 1893 the Conference (Missionary) created a committee on the Farmers' Association to stimulate agricultural interests in China along Western lines. The engaging of an European professor of agricultural science to teach in mission institutions was advocated." Kwangtung was also one of the first provinces in China to establish a government agricultural experiment station which has continued under more or less adverse political conditions to the present time. This institution is known as the Kwangtung Agricultural College and Forestry Experiment Station (廣東地方農林試驗場). The men of this station, many of them graduates of Western and Japanese colleges, have striven nobly at great odds to maintain the experimental work established some years ago. Recently, however, most of the work has been discontinued, much of the land having been sold and the buildings occupied by soldiers. In connection with the Station, there has been established an agricultural school known as the Kwangtung Agricultural College (廣東公立農業專門學校) which has never attempted work of college grade, leading to a science degree in agriculture, but has admitted students from district schools. This institution offers courses in general agriculture and forestry. The instruction has always been entirely in Chinese. The Station had an annual budget of about \$50,000 and the College about \$20,000 local silver. Since the work of the Station has been discontinued, plans are being drawn to enlarge the College budget so as to include the Station. Steps are also being taken to raise the Agricultural College to strictly college grade. Formerly there were agricultural high schools at various places, but these have been discontinued.

The present situation in agriculture at Canton is somewhat different from that at Nanking and Peking. The College of Agriculture of the Canton Christian College, known as the Lingnaam Agricultural College (嶺南農科大學), is very largely an indigenous undertaking. It has



been fostered and developed by the Cantonese and is not directly under western control. However, its affiliation with the Canton Christian College makes possible efficient co-operation with western business and missionary interests. We hope this unusual situation will make it unnecessary to develop in Canton two institutions of learning working in the field of agriculture but it is too early to fortell the future. We publish in this issue the photographs of the Board of Managers of the Lingnaam Agricultural College. The object of this Board, is with the sanction of the Trustees of the Canton Christian College, to organize a full College of Agriculture which shall maintain the highest standard of agricultural reseach and efficiency. This Board supervises the work of the College of Agriculture and plans for its necessary extension. It is responsible for its adequate maintenance and decides the annual budget. The Board of Managers of the Lingnaam Agricultural College has land holdings adjacent to the Canton Christian College upon which it is developing its college, through agreements which it has entered into with the Trustees of the Canton Christian College, in line with plans for a university federation at Canton. It also holds all land and property of sub-stations of the College of Agriculture which may be established on areas far removed from Honglok, the present site of the college.

The Lingnaam Agricultural College has outlined a definite agricultural program calling for desirable expenditures over a ten year period which it has presented to its Board of Managers. Several years ago the Kwangtung Government promised \$100,000 annually for current expenses and \$300,000 for land, buildings and equipment. After several payments the province was torn by political disorder and this source of income was cut off for the time being. It is a most encouraging fact, however, that the Board of Managers have provided the funds whereby it has been possible for the College of Agriculture to continue with a budget of approximately \$100,000 local silver for 1922-23 and \$87,000 for 1923-24.

The present purely agricultural staff consists of nine western graduates, two Lingnaam graduates in agriculture and two men trained at the Kwangtung Experiment Station. Much of the general science instruction is carried on by the staff of the College of Arts and Sciences. The college has more than one hundred acres of land under cultivation not including the general campus of the Canton Christian College upon which it is assembling a representative collection of plants. More than one hundred men are employed on the farm or in business undertakings connected with the college. For administrative purposes the college has been organized into four divisions: (1) Education, (2) Research, (3) Extension and (4) Business. Five departments have been organized to date: (1) Animal Husbandry, (2) Agronomy, (3) Horticulture, (4) Agricultural Manufacturing and (5) Sericulture. The activities of these departments and divisions appear elsewhere in these notes or in the articles of the Review. The college is receiving liberal support from both Chinese and Western interests.



The institutions above mentioned are not the only ones at work in China in the field of agriculture but are those which are most strategically located for the initial steps in a constructive all-China program. Ultimately each province will establish some agricultural work and advances have been made in this direction. In Shantung we know of the Shantung Pongee Silk Experiment Station (山東野蠶絲試驗場) at Cheefoo and the Shantung Agricultural School (山東農業學校) in Tsinanfu. Kansu province has three agricultural high schools closely affiliated with South-eastern University and Anhui has two. There is an agricultural technical school in Honan as also in a few other provinces.

West China offers tremendous possibilities in agriculture and in any comprehensive national program must not be forgotten. Chengtu is certainly in line with Nanking, Peking and Canton as an important center for agricultural education. Recent correspondence with Mr. F. Dickinson of the West China Christian University at Chengtu, Szechwan indicates that this University is also thinking and working with those rural interests so important to the very life of China. The report of the China Educational Commission of 1921-22 points out: "The province of Szechwan is in itself an empire, the bulk of its population are farmers, and it would seem inevitable that this dominant interest of the people should be recognized; but it might be wise to build a first-class middle school of agriculture before attempting work of college grade." Apparently climatic and general conditions in West China are not unlike those of Kwangtung. West China is producing crops very similar to those of South China and under methods not unlike those we find in the southern provinces. For example Szechwan is growing citrus fruits and even, to a limited extent, the lychee, a fruit whose range is very limited. This great country is lying in wait on the western frontier of China as we are bidding our time on the southern. With wide expanse of undeveloped land, fertile soil and climate that permit cultivation throughout the entire year both West and South China should be developed as rapidly as Central and North China.

### **China Famine Prevention Funds**

Through the publications of the University of Nanking details with regard to funds allocated by the American Committee for China Famine Fund (New York City) for permanent famine relief in China are now available. After all relief commitments had been paid on account of the China famine of 1920-21 there remained in the hands of this committee an unexpended sum of \$900,000 gold. General opinion concerning the use of this fund was unanimous that it should be devoted to permanent famine prevention measures. In view of the preponderant part the churches of America played in raising these funds, as also the assistance christian missions gave to the relief projects in the field, the American Committee apparently accepted the recommendations laid before it in January, 1922 by the Trustees of the University of Nanking and Peking University, supported by the North American Conference of Foreign Missions through its Committee of Reference and Council. In



accord with these recommendations there has been given to a Trustee in trust for Nanking University \$675,000, and in trust for Peking University \$225,000, "to be used for the study and investigation of famine causes, prevention and (or) relief, and as a means thereto for the education of the Chinese in agriculture, forestry and such other activities as may relate to famine." There is reserved from these two grants in trust for five years an emergency fund of \$100,000 for use as a nucleus to start a national campaign in the United States for famine relief in China should such a campaign be necessary. At the end of ten years the Committee, created by the trust, may direct the trustee finally to surrender control of the funds to the two universities.

The American Committee has provided for a China Famine Fund Committee which shall administer the principal of these funds and shall approve or revise the budgets for expenditures out of the income. The following American citizens residing in China have been appointed to this committee: Mr. C. R. Bennett, General Manager Peking Branch, International Banking Corporation with Mr. Robert Coltman, Standard Oil Company, Peking as alternate; Mr. J. Harold Dollar, Vice-President and General Manager of Robert Dollar Company and President of the American Chamber of Commerce, Shanghai, with Major Arthur Basset of the British American Tobacco Company, Shanghai, as alternate; Rev. Charles E. Patton, Shanghai, secretary of the (Presbyterian) China Council with Rev. J. E. Shoemaker of Yu-yao, Chekiang, as alternate; and Bishop T. F. Keeney, Foochow, with Rev. Frank Rawlinson, Editor of the Chinese Recorder, Shanghai, as alternate; and Mr. Dwight H. Edwards of the Y. M. C. A., Peking, with Mr. J. B. Powell, Editor of the China Weekly Review, Shanghai, as alternate. This committee has held its first meeting and has approved the budgets of Peking and Nanking. The program to be carried out by the College of Agriculture and Forestry of the University of Nanking includes projects in forestry instruction, extension and research, improvement of farm crops, agricultural extension, co-operative extension projects, economic and farm management surveys, plant and animal disease control, agricultural education, etc.

The problem of famine prevention in China is a large one and permanent measures to be effective must not be restricted in scope or in regional activity. China possesses the oldest agriculture in the world with many highly developed products and practices worthy of western study before those changes take place which result from the introduction of western ideas. China's present famine conditions are not due to the inability of the Chinese farmer nor to over-population of the country, taken as a whole. They are due primarily to unorganized government, inadequate irrigation and drainage projects, lack of transportation, police protection, rural organization and rural finance. The colonization of unoccupied areas is one of the largest factors to be considered in permanent relief. In this connection we would call the attention of the China Famine Committee to South and West China as regions offering relief from



the more unfavorable agricultural region of North China. In years past thousands of Chinese families in Central, and North China have emigrated to these parts, establishing some of the most successful family lines of the southern Chinese people. Their success was due in large part to the favorable soil and climatic conditions in the south. The efficiency of the South China farmer is widely recognized, and the areas still open for expansion are evident to any student of the country.

One of the first agricultural bulletins published under missionary auspices in China was Bulletin No. 5 of the Canton Christian College series, "Agricultural Reciprocity between America and China—A Contribution toward Economic Development and Permanent Famine Relief" in which the very lines now accepted by the China Famine Fund Committee as best for permanent famine prevention were fully discussed. For many years President C. K. Edmunds of this college has been interested in the famine problem and he has written some very comprehensive articles on "Permanent Relief from Famine in China" in the *Trans-Pacific Magazine*, June to October, 1921. The Lingnaam Agricultural College will watch the work of the China Famine Relief Committee and the Universities of Peking and Nanking with keen interest. We shall always hold ourselves in readiness to co-operate in any studies or program they may wish to develop in South China.

### **Visitors**

Mr. L. K. Elmhurst from Santiniketan, Bengal, visited the College in May and spoke on village work in India. Mr. Elmhurst is a graduate of Cornell University.

In March the College was favored with a visit from members of the American Silk Association who were in the Orient at that time studying the silk industry from the production side. The delegation included:

Mr. and Mrs. James A. Goldsmith, President, Hess, Goldsmith & Co., Inc., New York City.

Mr. and Mrs. D. E. Douty, Vice-President and General Manager, United States Testing Co., Inc., New York City.

Mr. Ray I. Swartz, United States Conditioning Co., Inc., New York City.

Mr. and Mrs. Austin Cheney, Mgr., Weaving Dept. Cheney Bros., South Manchester, Conn.

Mr. and Mrs. Eugene Atwood, Atwood Machine Co., Stonington, Conn.

Mr. and Mrs. Edward E. Bradley, Vice-Pres., Atwood Machine Co.

Mr. and Mrs. Carl Schoen., Pres., Carl Scheon Silk Corp., New York City.

Mr. Edward Bayer, Jr., Julins Kayser & Co., New York City.

November 8 to 15 Mr. Douty again visited the College with Mr. Chas. J. Huber who is the representative of the U. S. Testing Co. of China and Japan. Their visit was for the purpose of planning the model filature and reeling building given by Mr. Eugene Atwood (See Sericulture Notes).



Miss Anna E. Bayha, Associate Professor in Home Economics, Miss Elida Yakaley, Registrar and Dr. and Mrs. Ryder, all from the Michigan Agricultural College, visited the Canton Christian College on October 15, 1923.

### **Staff Items**

Mr. F. A. McClure spent the past year in the United States where he has been associated with the Office of Foreign Seed and Plant Introduction of the United States Department of Agriculture in preparation for plant exploration work in South China. Mr. McClure spent much of his time in the plant propagating houses at Bell, Maryland and made one trip to southern Florida to study conditions there. He also spent several months in special botanical studies at Ohio State University. We expect Mr. and Mrs. McClure to return to Canton for the opening of the second semester.

During the past year Mr. P. S. Chung has traveled widely in the interests of the college. Last spring he went to Hawaii and from thence to Australia. After returning to the college in the early fall he and Mrs. Chung sailed for Indo-China. Mr. Chung has been very successful in interesting the Chinese living abroad in the work of our college and he carries back to us information very helpful in our work for South China.

Mr. K. P. Buswell, who devoted the past six months to the sericulture survey, sailed from Hongkong in December for home via India, the near East and Europe. Mr. Buswell will visit sericulture stations in these parts of the world and will send information to the Department of Sericulture.

Mr. Harvey House who was at work upon the soap manufacturing project in connection with our Department of Agricultural Manufacturing returned to the States for special medical treatment. The soap project has been discontinued until his return. Mr. House is much interested in industrial missions and is making a thorough study of the problems connected with them. He has secured special gifts for soap equipment which will be installed upon his return to the college.

Mr. W. L. Funkhouser, now on a farm in Ohio, was married in September. He has spent some time at the Pennsylvania State College in special campaign work for the Penn State Mission to China. It was our hope that the Penn State Mission could return Mr. Funkhouser to China but they have been unable to do so this year. We trust that next year they will find it possible.

Mr. G. W. Groff attended a meeting of the Committee on Rural Problems and the Country Church of the National Christian Council held in Shanghai in September. Mr. Groff is a member of this committee which is concerned with the task of the rural Church, and which is collecting information and outlining plans for improving the economic, social and religious condition of the peasants of China. Rev. K. T. Chung of the secretarial staff of the Council spent last summer in Kwangtung and has made some very interesting observations on the rural Church of this province.





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