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DIVISION OF FORESTRY.

FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale; the price per 100 varying from $1.00 to $2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

RALPH S. HOSMER,
Superintendent of Forestry.

DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief we like and sometimes it is indispensable for us to see the insect suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box specimens may be mailed at 3rd class rates. When specimens are not accompanied by letter *always* write your name and address in the upper left-hand corner of the package. Address all communications SUPERINTENDENT DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

EDW. M. EHRHORN,
Superintendent.

THE HAWAIIAN

FORESTER AND AGRICULTURIST

VOL. VIII. OCTOBER, 1911. No. 10.

Mr. W. M. Giffard has been selected by the Board of Agriculture and Forestry to conduct the campaign for the eradication of the Mediterranean fruit fly. As one of Hawaii's leading amateurs in horticulture and arboriculture, long a keen student in entomology, having also had many years of experience in large business affairs, Mr. Giffard is one man in a thousand for the task. The Board is to be congratulated on his acceptance, also upon his prompt taking hold of the work, he having begun to plan a course of action immediately on his return from a visit to the island of Kauai.

Manufactures in Hawaii, of which the latest census report, covering the year 1909, appears in this number, of course mainly consist of the product of the sugar plantation factories. From about the year mentioned fruit and fruit juice preserving works, also factories preparing coffee and fiber for market, begin to add substantially to Hawaiian manufactures, and cotton may be made soon to increase the tale, providing its new pioneers in these islands do not allow themselves to be beaten by pests that have been subdued in other countries. Agriculture is as closely related to manufactures in Hawaii as mother to child, and this is true to a further extent than in the preparation, wholly or partly, of agricultural products for the consumers. Honolulu has iron-works that owe their development more to the sugar industry than anything else, which for some time have had no superior competitors anywhere in furnishing sugar factories to other countries.

From C. M. Winslow, Brandon, Vermont, secretary Ayrshire Breeders' Association, has been received Ayrshire official Records No. 6, September, 1911. The publication is a small card folio. It contains a summary of each average annual yield of 362 cows and heifers, grouped as two year olds (54), three year olds (31), four year olds (15), mature (76) and cows and heifers (186), in twenty-nine separate reports. The purpose of giving each average is stated as being to show the uniformity of averages, the short introduction reading thus: "We have always claimed that the value of a dairy breed should be judged by the general average of dairy product for that breed and not

by phenomenal records of individual cows. We have also claimed that the value of a single cow should be determined by what she will yield for a year rather than for a week or a month, since she must be cared for and fed for the whole year, and only on that basis can her profit be determined."

The animals admitted to advanced registry are five in the two year old form, four in the three year old form, two in the four year old form and fifteen mature, and their averages respectively are as follows:

	Lbs. milk	Lbs. fat	Lbs. butter	% fat
Two year old class.....	7,454	296.60	346	4.11
Three year old class.....	9,663	386.62	451	4.07
Four year old class.....	8,613	356.57	416	4.27
Mature cow class.....	10,186	377.60	440	3.77
Whole, cows and heifers..	8,979	354.35	413	4.05

Mr. S. T. Starrett, the market superintendent appointed under the legislation of 1911 to promote the prosperity of homesteaders, is diligently pursuing his duties. He is visiting one district after another throughout the islands, taking note of the products most adaptable to profitable raising in every locality visited. Thus far his general advice has been communicated for the most part informally through the newspaper press, but he gives instruction personally, meanwhile, to the homestead cultivators as he passes through the country. When he has thoroughly covered his field work, Mr. Starrett will no doubt sum up his findings with recommendations in form to serve as a foundation for scientific development of diversified agriculture in this Territory. Heretofore this great cause has been advanced in a practical way wholly upon a basis of any man for himself. With a trained expert now at the directing helm, let us hope for coöperative effort and system, both in cultivating and marketing such products of the soil as are in constant need here and for which a demand can easily be created, where not already existing, in all the accessible markets outside. The trade returns show many natural products imported, at an aggregate cost of millions of dollars annually, which might certainly be raised in these islands. There are equally as many articles, peculiarly Hawaii's to produce, for which an unfailing demand obtains abroad. Let us buy less and sell more of what our climate and soil can abundantly yield. That is the way to bring about a more general diffusion of prosperity among the population of the Territory, as well as to gain and keep more population among which to have the prosperity diffused.

MANUFACTURES IN HAWAII.

(*Correspondence of The Forester.*)

Washington, D. C., October 17, 1911.—A preliminary statement of the general results of the Thirteenth United States Census of manufactures was issued today by Census Director Durand. It contains a statement of the statistics for 1909 for the noncontiguous territory, Alaska, Hawaii, and Porto Rico, prepared under the direction of William M. Steuart, chief statistician for manufactures, Bureau of the Census. The figures are subject to such revision as may be necessary after a further examination of the original reports. Following are the statistics for Hawaii:

Number of establishments	500
Capital	$23,875,000
Cost of materials used	$25,629,000
Salaries and wages, total	$ 2,795,000
Salaries	$ 686,000
Wages	$ 2,109,000
Miscellaneous expenses	$ 3,329,000
Value of products	$47,404,000
Value added by manufacture (products less cost of materials)	$21,775,000
Employees:	
Number of salaried officials and clerks	594
Average number of wage earners employed during the year	5,904
Primary horsepower	41,930

These figures exclude the hand and the building trades and the neighborhood industries, and take account only of establishments conducted under the factory system. Statistics for this census were not collected for factories having products for the census year of a value less than $500, except that reports were taken for establishments idle during a portion of the year 1909, or which began operations in that year, and whose products, therefore, were less than $500.

It is better to be a busy little body in this world than a little busybody.

"A word to the wise is sufficient," but a multitude of words are in vain to the foolish.

Do not put all your slicking-up on the front yard. There's a back yard, too.

Hard words are hardly ever necessary.

Stubbornness is misdirected persistence.

Straw hats show which way the wind blows.

Into the well which supplies thee with water cast no stones.—Talmud.

Meet every stranger like a gentleman, even if he be an agent selling wooden nutmegs.

In these days of muck-raking, the farmer who is able to rake up a good compost heap stands to win.

"They say his wife makes $5,000 a year with her pen." "I didn't know she was a writer." "She isn't. She has a pig farm in Iowa."—Chicago Record-Herald.

One of the things that gives the greatest pleasure where fleas abound, says Practical Farmer, is knowing how to rid the premises of these pests. Simply sprinkle the floor of the house and barn with oil of penny-royal; also put a little on your clothing.

It isn't much fun to have the seat of one's trousers shingled with a big piece of fly-paper. Won't the women folks please not lay any of these papers in the chairs? Put 'em up somewhere, good and high. Flies will find 'em just as well and it may save the men folks a lot of embarrassment.

A SYLLABUS FOR A COURSE IN GENERAL BOTANY.

For use in the Secondary Schools of Hawaii.

The topics in the following outline are those of chief importance in a course in general botany. The subject-matter for each of these topics will be found in such standard texts as those of Bergen, Coulter, Bailey, or Hunter. "The Essentials of Biology," by G. W. Hunter with laboratory manual by Sharpe (published by American Book Co.) is especially recommended for this course, because these books include excellent sections dealing with the fields of zoology and physiology. By the use of these books a term's work may be done on each of the three large divisions of biology—botany, zoology, physiology.

A sufficient number of topics is given to occupy a full school year, with five hours per week. If less time than this is available, selection can be made. The most important of the topics are starred.

An essential and absolutely necessary part of the course is field and laboratory work. This is very simple, demanding neither ex-

pensive apparatus nor exhaustive preparation. The student should examine an abundance of living material, which can be secured at all times.

I. STUDIES OF THE PLANT AS A WHOLE.

* 1. The plant a living organism.
2. Protoplasm and the structure of the cell.
3. Relations to environment—light, moisture, heat, food, etc.
4. Plant associations—hydrophytes. xerophytes, mesophytes, halophytes; arctic. tropic and temperate conditions.
* 5. The flora of Hawaii, and of the Pacific islands.
* 6. Man's control of the plant world—cultivated plants; forests; seaweeds; bacteria, etc.

II. STUDIES OF SEEDS AND SEEDLINGS.

1. Form of seeds; coats; explanation of markings on seed.
* 2. Internal structure of seed—cotyledons, plumule, hypocotyl. Cotyledons as foliage leaves.
* 3. Position of stored food; tests for food material; enzymes.
4. Early stages of seedling to show changes in parts of embryo. Method of breaking through the soil.
5. Later stages of seedlings.
* 6. Work of government nurseries; Arbor Day.
7. Comparisons of structures and development of monocot., dicot., and polycot. seeds.
8. Germination and growth of seedlings as affected by moisture, temperature, air. Gases given off by seeds.
9. Uses of seeds.
*10. Seed testing; selective planting.

III. STUDIES OF ROOTS.

1. Kinds of roots—fibrous, fleshy, tap, etc.
* 2. Internal structure—central cylinder, cortex, epidermis, root-hairs; functions of each part. The root-cap.
3. Origin of secondary roots; adventitious roots.
* 4. Functions of roots—food, water, anchorage. Prop-roots, holdfasts.
5. Storage of food in roots. Parasitic roots.
6. Region of rapid growth; osmosis; relation to gravity.
* 7. The soil solution; irrigation and drainage; fertilizers.
8. Nitrogen in the soil; relation to bacteria.
9. Plants as rock-disintegrators and soil-makers.
*10. Roots of economic importance.

IV. STUDIES OF STEMS AND BUDS.

* 1. External characteristics of stems—bark; leaf-scars; nodes and internodes; lenticels; other markings.
* 2. Internal structure—location, description and function of pith, wood, medullary rays, cambium, bast, cortex, epidermis.

* 3. Pruning; grafting; cuttings.
4. The monocot. stem—rind, pith, bundles.
5. Course of sap through the stem.
* 6. Specialized stem-types—rhizome, bulb, tuber, tendril, thorn, trunk, etc.
7. Adaptations of stem to environment—relation to sunlight, etc.
8. Relations of buds to branches, to leaves, to general form of plant.
* 9. Structure of bud—leaf-buds, flower-buds, etc.
10. Protection of bud—from cold, from drying.
11. Time of bud-formation; of bud-opening.
12. Storage of food in bud.
*13. Forestry—on mainland; in Hawaii.
14. Economic value of trees—as timber; as water-sheds.
15. "Conservation" and its significance.

V. STUDIES OF LEAVES.

* 1. General structure and parts—blade, petiole, stipules; venation; simple and compound forms.
* 2. Functions—photosynthesis, respiration, transpiration, assimilation. *The work of chlorophyll.*
3. Epidermis and stofata; air-chambers; mesophyll; bundles.
* 4. Arrangements of leaves. The light relation.
5. Modifications and special adaptations of leaves.
6. Response of leaves to special stimuli—touch.
7. The sun the final source of energy.
* 8. Ornamental value of trees, bushes, vines, lawn.
9. Grass and herbivorous animals.

VI. STUDIES OF FLOWERS AND FRUITS.

* 1. Structures and functions of parts of flower—ex. hibiscus.
* 2. Pistil and ovules—location, structure.
* 3. Stamens and pollen—location, structure.
* 4. Protection of pollen; cross-pollination—wind, water, insects.
5. Germination of pollen; fertilization; development of ovule into seed.
6. Types of inflorescence.
* 7. Identification of common flowering plants.
8. Flower gardens; cut-flowers; leis.
* 9. Origin of fruit from flower.
10. Functions of fruit; distinctions between seeds and fruits.
*11. Types of fruits—external and internal structures; dry and fresh fruits; pomes; citrus fruits.
12. Adaptations for seed dispersal.
*13. Struggle for existence.
14. Plant breeding.
15. Economic value of fruits.

VII. STUDIES OF ALGAE AND FUNGI.

1. Spirogyra—habitat, structure, life-history.
* 2. Yeast—cultivation, structure, reproduction, economic importance.
* 3. Bread-mold—development, life-cycle, structure.
4. Bacteria—of air, water, milk; pathogenic forms; forms of industrial value.
* 5. Marine algae—location, kinds, gross structure, colors, uses.
* 6. Toadstool or mushroom—habitat, structure, life-cycle, uses.
7. Lichen—habitat, structure, life-history, symbiosis.

VIII. STUDIES OF MOSSES AND FERNS.

1. Peat and sphagnum bogs; formation of coal; fossil plants.
* 2. A moss plant—general structure, reproduction, life cycle.
* 3. A fern plant—general structure, reproduction; life cycle.
* 4. Tree fern forests of Hawaii.
5. Fern-houses; care of ferns.

IX. STUDIES OF FLOWERING PLANTS.

1. Classification of flowering plants.
2. The monkey-pod tree or the hala tree—crown, leaves, flowers, fruit.
* 3. Taro plant—corm, leaves, bud, flowers, life cycle.
* 4. Coconut palm—trunk, leaves, flower, fruit; compare with other palms.
5. Carnation, lily, or geranium—cultivation, flowers, varieties, diseases.
* 6. Sugar-cane—cultivation, stem, sap, flowers, varieties, insect enemies and diseases; relations to soil and moisture.
7. Important plants of Hawaii—indigenous; brought in by ancient Hawaiians; brought in since 1778.

Individual work with the compound microscope is not recommended; although the laboratory should have one or two good instruments for demonstration work. Emphasis should be upon gross structure, with special reference to function.

"Experiments with Plants," by Osterhaut (Macmillan Co.), is highly recommended as an aid in this course.

Whenever feasible *the plants should be studied out of doors, under natural conditions.* Field trips to gardens, nurseries, etc., are of great value, if well planned. The teacher will need to make out special outlines, to meet local conditions.

Thorough drill should be given in the correct oral and written presentation of important subject-matter. The field and laboratory work should include the making of simple drawings of important structures. All field and laboratory work should be carefully recorded, and all drawings should be carefully labeled.

A herbarium is not necessary. Use liberal quantities of fresh material. Pressed plants are not suitable for elementary work.

Demand scientific accuracy and precision in all work. Cultivate the investigative spirit. Teach, whenever possible, out of doors.

VAUGHAN MACCAUGHEY,
The College of Hawaii.

FARMERS' INSTITUTES FOR YOUNG PEOPLE.

(Extracts from Circular 99, office of Experiment Stations, U. S. Department of Agriculture.)

Out of every 500 young people in the country districts in the United States only one ever enters an agricultural college. Of every 100 rural and urban children only five ever reach the high schools, and only six ever go beyond the elementary schools. Ninety-four out of every 100 children therefore finish their education with the district school.

In order to reach the 499 out of every 500 rural boys and girls who can not go to an agricultural college, and yet in whom some attachment for and interest in rural life should be inculcated, there has developed quite generally a demand for the introduction into the rural schools of subjects that will educate in the direction of appreciation of rural life and its opportunities instead of confining the teaching as hitherto to studies that ignore the country and direct the scholar's attention to the occupations of the towns and cities.

The first effort to meet this demand was made by the town and city schools through the introduction of topics which later were all embraced under the term "nature study." The rural school began its work of agricultural instruction by directing the scholars' attention to some of the simplest and most common natural objects in the neighborhood of the school itself. Gradually this was extended to critical observation of various phenomena in the growth and development of plants and animals. Later, elementary text-books on these and other subjects connected with rural life were introduced and studied.

Among the country schools, however, only the most favorably situated have been able to conduct even elementary work along this line. There are several reasons for this. The subject is new in school work with children, and the majority of public school teachers are not prepared to give instruction in agriculture because until recently there was no demand for such instruction and consequently no provision had been made either for qualifying a teaching force for imparting it or for equipping the schools with suitable apparatus.

As a part of the course in education for children of public school age, a system of "clubs" has been organized in many sections by rural teachers and county superintendents of schools, intended to interest the pupils in country life and at the same time be of ser-

vice in preparing them for their future work, whether that work be on a farm or in some other occupation or profession. The club activities are mainly in the form of contests in judging grains and animals, with some field work, such as growing corn, potatoes, or similar crops. The field operations are restricted to quite small areas, and to comparatively few varieties of products.

In order that opportunity to become acquainted with agricultural operations may be given to those who have left the public school and from whose ranks the future farmers and their wives must be supplied, the farmers' institutes in several States have organized and are now conducting what are known as "institutes for young people."

Because of the fundamental difficulty in securing teachers capable of giving vocational instruction in agriculture in the rural schools, and from the fact that after the scholars leave school no provision has been made for giving them opportunity to receive such instruction, the farmers' institute has undertaken the training in agriculture of rural children after leaving school. In doing this it has found it necessary to drop from its system of instruction the purely educational feature and devote itself strictly to giving vocational instruction. Such studies and practice, therefore, as the institute utilizes, have in view the perfecting of the individual in his vocation. The institute system, therefore, partakes more nearly than any other of the trade-school method, and is intended for youth above 14 years of age. It differs from the work carried on by other agencies employed in training country youth in that its primary object is to build up a better agriculture by teaching young people methods for increasing crops, improving animals, restoring worn-out soils, and disposing in a profitable way of the products of farms. It is undertaking to teach youth *how to make money in agriculture.*

The fact that there can be no physical compulsion exerted in bringing those who are to be reached to attend upon any course of teaching makes it necessary to employ other methods for securing their attendance and attention. There are at least two characteristics in the rural youth that can be depended upon to respond to proper appeal—ambition and love of gain. With respect to the first, young people are naturally interested in a subject or exercise when presented in the form of a contest. Their plays for the most part are of this nature. When properly planned and conducted such exercises not only interest young people, but they possess in addition features of great practical and educational value. They stimulate the creative faculties of the contestants, teach the relation between cause and effect, develop power and desire to do things, show how to apply previous knowledge derived from books or school to solving the problems of life, and by keeping the mind occupied with useful purposes they stimulate to further and more determined effort. The contest method, therefore, has wisely been adopted by the institute for awakening interest and creating enthusiasm among young people in agricultural operations.

The subjects that can be successfully studied in institutes for young people cover a wide range and may ultimately include the entire field of rural life. Since the institute is dealing with boys and girls who for the most part are without much experience, and while the subjects studied must be treated in a way to be intelligible to them, yet it by no means follows that because the pupils are not of full age the teaching and the truths taught must be correspondingly elementary.

While the farm presents problems most complex and difficult to be thoroughly understood, on the other hand many of its operations are apparently so simple that they seem to require no particular thought or skill for their performance, and consequently come to be regarded as of minor importance. Many of the manual processes are of this character. They are largely matters of practice, or operations repeated until a degree of dexterity is acquired in their performance. The general lack, however, of both knowledge and skill on the part of many of those who engage in these everyday operations is very marked when their performance by an ordinary worker is compared with the rapidity and perfection of their execution by an accomplished expert. With a view to improvement in this direction the institute for young people should offer prizes for superior skill and proficiency in manual processes, and should hold competitive exhibitions at which dexterity and skill would be recognized and rewarded.

In order to increase interest and at the same time to instruct young people, the gathering of collections provides a valuable means and should be encouraged. Specimens of rocks, soils, grasses, grains, weeds and weed seeds, vegetables, flowers, fruits, insects, etc., furnish material for such collections.

The list of contests also could be extended to the preparation of papers and the holding of oral examinations upon subjects requiring wider culture, knowledge, and experience than those just mentioned. Such a list might embrace farm management, orchard management, landscape gardening, vegetable gardening, flower gardening, practical housekeeping, the preparation of balanced rations, also papers upon local history, on the local fauna and flora, local geology and geography, local laws, local markets, sanitation, etc.

In addition to the subjects discussed in the meetings, the institutes for young people should outline courses for home reading, taking up definite groups of subjects or lines of work, and should assist the readers in obtaining bulletins and other publications from their state experiment stations and the United States Department of Agriculture. The institutes might also include a brief systematic course in the generally neglected but most important subjects of farm bookkeeping, local laws, local history, farm management, etc., and they might discuss the advantages and operations of coöperative associations organized for the purpose of buying and selling and for securing the more economical transportation and distribution of farm products.

In contest work a necessary preliminary is a carefully prepared plan, giving full directions for carrying out the various operations which the contest embraces, the method of judging, and the nature of the awards.

The contest feature of the young people's institute should be graded so as to be as far as possible a complete and progressive course. When completed a certificate should be given stating the work performed by the contestant during the period in which he was a member of the institute.

The course should begin with a simple exercise like the growing of some common crop and end with the more difficult, as a daily record for twelve months of the operations of a farm, with comments on these operations, and a set of books showing the loss or gain of the enterprise for the year.

By the method of pursuing a systematic course for four or five years the practical work of the young people's institute would be preparatory to their undertaking the larger operations of a farm or home, and instead of the contest exercises being disconnected and incomplete, as now, they would be systematized into a course that would cover the principal operations of a farm and be of real service in the future life of the contestant.

It has been found by experience that young people are greatly attracted and influenced by rewards, and that they value these rewards far above their worth in cash. Money for prizes can usually be secured without difficulty by applying to public-spirited citizens in the community for contributions, many of whom are glad of the opportunity to assist worthy young people in any effort that they may make to better their condition and become more useful citizens of the State.

In a few States the farmers' institute and the college of agriculture, by conducting what are called boys' encampments, have interested in agricultural subjects many boys who would not join the ordinary club contest. The camping-out idea appeals to them as a pleasant and enjoyable diversion, and the lectures, demonstrations, and judging contests which form a part of their daily life for the week or two during which the camp is held are pursued with pleasure as well as profit. Their interest is aroused by the scientific features of subjects which they have never before understood and which are here exhibited in their relation to the practical. Many boys who otherwise would never have been reached are thus started in search of further useful information. These boys' encampments are, strictly speaking, young people's institutes. The members live and study together during the entire meeting; prizes are awarded for winners in stock, grain, and similar judging contests, and for proficiency in other agricultural subjects as determined by a final examination of the work pursued at the encampment.

For a while at least institutes for boys and girls should be union meetings, with special sessions for each sex as occasion may re-

quire. The membership should be restricted to persons over 14 years of age and should not as a rule include those over 18 or 19 years.

While attendance upon the institutes is of necessity voluntary, yet it is important to effect, as early as practicable, an organization in each locality composed of a membership that can be depended upon to attend the meetings and to assist in carrying on the work. To accomplish this it will be necessary to secure pledges from as many as possible to a form of constitution that embodies these obligations.

Interest in institutes for young people should not be limited to farmers. The support of business, professional, and public-spirited men generally is necessary to make the movement a success, and this support is more likely to be given if the institutes are planned to include town as well as country boys and girls. Merchants, lawyers, doctors, mechanics, and tradesmen should be invited to assist.

Every young people's institute organization should be provided with a library of reference consisting, along with books of general reading, of bulletins, pamphlets, and other books by recognized authorities upon agriculture and domestic science. This library should be in charge of the county institute and be available for use by all young people belonging to the institute organization of that county.

The farmers' institute can materially assist in inaugurating the movement for the introduction of agriculture into the public schools by giving information to teachers, county superintendents and parents respecting this kind of work, and may go to the extent of organizing and conducting clubs as samples of what the schools should do in this direction. As soon as the institute has organized such a club and has succeeded in interesting a group of children of school age and their teachers in contest work, it should turn it over to the school authorities for further attention and control. Children, therefore, of school age (10 to 14 years) should be committed to the school authorities for agricultural club work during the period of their connection with the school. After leaving school, the farmers' institute for young people can take charge and give them the special vocational training that they need to become proficient in the practical operations of the farm.

Hitherto the farmers' institute has devoted its energies almost exclusively to interesting adults in agriculture and household art. It has selected its subjects for discussion and chosen its instruction with this in view. A new field of activity has suddenly opened up, one that is altogether unoccupied and for which no adequate provision has yet been made—the vocational training in agriculture of country youth between 14 and 18 or 19 years of age.

After 14 the public school does not and, as at present constituted, can not reach the majority of rural youth with agricultural instruction. What the secondary schools may ultimately

accomplish in this direction has not yet been revealed. In the meantime these youths are growing up, many of them with no proper appreciation of country life or of its advantages and opportunities in a business way over those of the towns and cities. The farmers' institute can change all this by modifying its present methods to suit the ages, needs and degrees of advancement of these youth. It should avail itself of the opportunity now presented and occupy this field. By doing so it will not only be following out the purpose of its organization, but will also perform valuable service in the present effort for the development of agricultural education and become an important factor in shaping the future of the world-wide movement for agricultural extension now under way.

BOARD OF AGRICULTURE AND FORESTRY.

Minutes of a special meeting of the Board of Commissioners of Agriculture and Forestry, held in the Land Office, Capitol building, October 5, 1911, at 3:30 p. m.

Present: Mr. C. S. Judd, President and Executive Officer; Messrs. J. M. Dowsett and H. M. von Holt, members.

Report of Advisory Committee.

Mr. Judd stated that the meeting had been called for the purpose of reporting on ways and means of combating the Mediterranean fruit fly; that he had taken up the matter with the Governor and after careful consideration it had been decided that by shifting around the conservation fund the amount of $8750 could be raised, it being the idea that the $6500 allotted to the Kohala Reserve for tree planting could be reduced by $3000, and that $2500 could be taken from the Inter-Island inspection fund and the balance from the unused balance of the conservation fund.

Mr. Dowsett stated that it was his understanding, and also that of Mr. von Holt, with whom he had discussed the matter, that it would require $17,500, approximately, to carry on the work until the next session of the Legislature in 1913; that of this amount it was believed California would be willing to contribute one-half if it were shown that Hawaii would contribute the other half, and was in earnest in the proposed campaign; that it seemed to be a matter of as much importance to California as to Hawaii, and that it could only be carried on successfully with the coöperation of California. After outlining a possible routine for conducting the work, Mr. Dowsett stated that Mr. Carnes had suggested that California might be willing to send a man down to act in conjunction with Hawaii's Board, and Mr. Dowsett believed it would be best to take the man under the Board's jurisdiction and do all possible to aid and assist him. It was generally discussed as to whether it would be advisable

to communicate officially with California in regard to the contribution of one-half of the $17,500 and the probable action to be taken in the campaign, and Mr. Judd stated that Mr. Carnes thought such official communication advisable.

Mr. von Holt stated that it seemed that the matter was at present in too indefinite a state for the Board to take this action, and he believed it best to put the whole matter in the hands of a committee, and therefore made the following motion:

Special Committee to Communicate With California.

Moved by Mr. von Holt that further action be referred to a Committee consisting of Mr. Judd and Mr. Dowsett, in regard to communicating with California officials in reference to the Mediterranean fly situation; that said committee take the matter up with the Advisory Committee and, upon being able to report, that Mr. Judd be authorized to communicate the results of the conference to the proper officials in California. Seconded by Mr. Judd and unanimously carried.

There being no further business, the meeting then adjourned, it being stated that the next meeting would be the regular business meeting on Monday, October 9, at 2 p. m., at the same place.

DIVISION OF ENTOMOLOGY.

Honolulu, October 1, 1911.

Honorable Board of Commissioners of Agriculture and Forestry.

Gentlemen:—I herewith respectfully submit my report of the work of the Division of Entomology for the months of August and September.

During my absence on the Coast, Mr. D. B. Kuhns, the inspector of the division, performed the duties required with great satisfaction, and I am pleased to report that during the month of August 32 vessels were boarded and fruit, vegetables and plants were found on 17 of them.

After careful inspection of the various shipments, the following results were obtained:

Disposal with principal causes.	*Lots.*	*Parcels.*
Passed as free from pests	776	12,283
Burned	17	17
Fumigated	3	3
Total inspected	796	12,304

Of rice, 21,067 bags arrived during the month, and were found free from pests.

Pests Intercepted.

A large consignment of corn from Japan was found infested with the grain weevil *Calandria linearis* and a *Lepidopterous larva,* and after a long fumigation and reinspection was released, all insects being dead.

Some ferns from California were infested with scale *Hemichionasis aspidistral,* and were fumigated. Sandpears from Japan and oranges from Fiji were likewise infested with scale insects, but fruit being prohibited from those sections, the fruit was destroyed.

Brother M. Newell, inspector at Hilo, reports the arrival of nine vessels, three of which carried vegetable matter. He found 107 lots, consisting of 1230 parcels, all of which was passed as free from pests.

During the month I forwarded a lot of *Staphilinid beetles* from the Coast with instructions to liberate where maggot-infested fruit or vegetables could be found. These beetles are of great value to the vegetable growers of the Coast, feeding on cutworms and radish, onion and cabbage maggots.

Six packages of Japanese beetle fungus were distributed to applicants.

During the month of September 32 vessels were boarded and fruit, vegetables and plants were found on 21 of them with the following results:

Disposal with principal causes.	*Lots.*	*Parcels.*
Passed as free from pests	1053	21,201
Burned	19	20
Fumigated	7	9
Total inspected	1079	21,230

Of rice, 22,497 bags arrived and were passed as free from pests.

Pests Intercepted.

One hundred and twenty bags of Japanese beans were found infested with a moth larva *Gelechiid sp.,* and after a thorough fumigation with carbon bisulphid they were released. A box of artichoke flowers was found infested with ants, the common black ant *Formica nigra,* and after fumigation was passed. One box of raspberry plants, badly infested with fungus (orange rust, (*Coeoma luminatum*), was burned.

Beneficial Insects.

Returning from the Coast, I brought back another colony of *Staphilinid beetles,* and I am endeavoring to rear further colonies from these.

One colony of black scale parasites, *Scutellista cyanea,* was liberated and two lots of Japanese beetle fungus delivered to applicants.

Brother M. Newell, inspector at Hilo, reports having boarded 9 vessels, 3 of which carried vegetable matter, consisting of 187 lots and 2570 parcels, all of which were passed except one lot of oranges badly infested with the purple scale, *Lepidosaphes beckii,* which was burned.

Arrangements on the Coast.

While in San Francisco, I made it my business to visit all the shippers and commission merchants, who send fruit and vegetables to Honolulu, and I explained fully our requirements regarding all shipments. I also furnished them with blocks of inspectors' lists, which are to be filled out whenever any shipments are made. This last matter needed attention, for, although we have written to those who overlooked sending the lists, we did not get any satisfaction from them. My personal visit seems to have given results, for, since my return, our lists have almost doubled in number. I also took particular pains in looking over the shipments of pineapples and bananas which arrived during my visit, finding there is good room for improvement. Careless packing and poor fruit, either infested with scale or showing decay spots, should receive the attention of the shipper at this end, otherwise the California inspectors will surely stop all future shipments. It seems to me that, if we are to continue pineapple and banana shipments to the Coast, the leading shippers could get together and either advise or supervise the less informed shipper so as to obviate the loss of future delivery.

Respectfully yours,

EDW. M. EHRHORN,
Superintendent of Entomology.

DIVISION OF FORESTRY.

Report for August.

Honolulu, September 5, 1911.

Board of Commissioners of Agriculture and Forestry.

Gentlemen:—I have the honor to submit, as follows, the routine of the Division of Forestry for the month of August, 1911.

Trip to Hawaii by Superintendent of Forestry.

During the greater part of the month, from August 8 to 26, my own time was occupied with an inspection trip to the Island of Hawaii. Going first to Waimea, I inspected the forest planting on the Kohala Mountain above Waimea village, now being done under contract for the government by the Parker Ranch.

The work is progressing in a very satisfactory manner. Between 15 and 20 acres have been planted, over 20,000 trees, mainly *Eucalyptus robusta,* having been set out, with very few failures. A large number of seedlings of this species are being got ready for planting in the ranch nursery at Puu o pelo. The contract calls for the planting of 50 acres; it is expected that this area will all be covered during the next three months. The planting will then be continued by the ranch on its adjoining fee simple land of Waikoloa.

Next I went over to Puuwaawaa to look over a portion of the land of Puuanahulu, for which an application to lease for grazing has been filed by Mr. Robert Hind and the Parker Ranch. During the administration of Governor Dole, this land was temporarily set apart by the then land commissioner as a forest reserve. It now appears desirable that a portion of the area be leased for grazing. I am now preparing a brief report, with recommendations from a forest standpoint, upon this subject.

Experimental Tree Planting on Mauna Kea.

I then spent several days at Waikii, making an inspection of the plots on the slope of Mauna Kea where experimental planting of exotic trees is being carried on with the aid of federal funds. So far the results on Mauna Kea have mostly been negative. In the 7000-foot plot, however, a good proportion, about half, of the four species planted have been established, while in other of the plots some of the tree seed sown a year ago was found to have sprouted and to be growing. In each of the four plots I planted a box of *Eucalyptus robusta,* 54 trees, and sowed some additional lots of seed.

In connection with the Parker Ranch corn farm at Waikii, which now covers 1400 acres, there are to be planted extensive windbreaks and shelter belts of eucalyptus trees. There are now in the nursery at Waikii, ready for planting during the coming winter months, over 35,000 trees. Now that this nursery has been so well established it will be possible to start here, as well, trees for use in the experimental plots. In this way I am confident that in the future much faster progress can be made than has been possible up to this time.

Before leaving the Parker Ranch I spent one day inspecting the tree planting now being done along the Paauhau gulch on the government land of Nienie and in looking over the work of the weed destroying gang, who are using arsenical spray on thimbleberry and German ivy. This treatment is proving a very effective means of combating these pests, besides being very much less expensive than methods previously used. The tree planting along the Paauhau gulch is going forward in a highly satisfactory way. Over 25,000 trees have been set out, the work is well systematized, and the nursery full of young trees.

Kukaiau Ranch Planting.

Under the terms of its lease of government lands, the Kukaiau Ranch is doing extensive tree planting in establishing groves of eucalyptus, mainly blue gum, between the elevations of 3000 and 4500 feet. In order to be in touch with the progress of this work I spent a couple of days with Mr. Robert Horner, going over the areas planted. The planting is progressing at a satisfactory rate, so that the total number of trees required to be set out should be in the ground some time prior to the time limit fixed in the leases.

The greater part of the trees planted during the last three years are making excellent growth and in the few places where there were setbacks while the seedlings were small—in some cases requiring replanting—the little trees have now taken hold and are doing well. Taken altogether the government has good reason to be pleased with the progress of this piece of work.

Examination of Muliwai.

The last part of my stay on Hawaii was devoted to a trip into Muliwai, the government land on the bluff between Waipio and Waimanu valleys, as a part of which I went down into and up the latter valley to its head.

Muliwai and Waimanu are inaccessible localities. Because of the steepness of the trails leading into them, which in wet weather are almost impassable, to visit these places requires special preparations. The present trip was made possible through the courtesy of Mr. August Ahrens, manager of the Kukuihaele plantation, who, at the request of Mr. J. W. Waldron, one of the directors of the company, had had a trail cut up the ridge of Muliwai, through the woods from the government trail. Mr. Ahrens provided a pack train; we camped out two nights in the woods.

In former years Muliwai was subject to cattle grazing, which resulted in the opening up of the forest, the letting in of Hilo grass and the death of the larger trees.

Three years ago the government ordered the removal of all the cattle from Muliwai. This was done, and since then the area has been policed by the Pacific Sugar Mill, so that there has been no further damage. Looking across at Muliwai from Kukuihaele there appears to be a large area of dead forest, but when one follows up the ridge, although there are considerable areas where the large trees are dead, there is found to be much young growth. In my judgment most of the damage to the forest on Muliwai is the result of grazing in past years. With conditions as they now exist, I see no reason to be apprehensive about the ultimate return of the forest on the upper parts of the slope. Shortly I expect to submit to the Board a brief report on this section, discussing certain points about it more in detail.

Proposed Planting at Honokaa.

Just prior to returning to Honolulu I visited the Honokaa plantation and arranged with the manager, Mr. A. Morrison, to supply him with seedlings for extensive shelter-belt planting along the sea bluff makai of the cane fields. Thirty thousand seedlings will be set out during the next few months.

During the remainder of the month I was in my office in Honolulu.

Tree Distribution.

The furnishing of trees from the Government Nursery and the substations at Hilo and at Homestead, Kauai, goes on steadily. I submit herewith Mr. Haughs' report for August, which gives the details of this work at Honolulu. Brother Matthias Newell reports from Hilo that the total distribution from January to June, 1911, inclusive, amounted to 3235 trees.

Botanical Survey.

During a good part of July, Mr. Rock was in the field on Hawaii, collecting in the proposed National Park near the Volcano. He returned to Honolulu early in August, and was at work in the herbarium the greater part of that month.

Owing to limited amounts available for carrying on the work of the Board, it has been considered advisable to transfer the botanical investigations, that for the past three years have formed a part of the activities of the Board, to the College of Hawaii. On September 1, Mr. Rock becomes a member of the college staff, while the herbarium is loaned to the college for an indefinite period. Until the new home of the college is ready, Mr. Rock will continue to occupy his present quarters at the Government Nursery.

Forest Fire Notes.

I am informed by the district fire warden at Wahiawa that the Korean arrested for setting a grass fire near the Wahiawa dam on August 2, 1911, pleaded guilty when arraigned before the district magistrate at Waialua, receiving a suspended sentence for thirteen months. "This," says the district fire warden, "I regard as a victory for the law, that will meet the requirements quite as well as the imposition of a fine, which the man could probably not afford to pay."

In this connection I would report that while I was at Kukuihaele a Japanese laborer employed on the plantation shot three Hawaiian geese, nene, on which by Act 68 of the Session Laws of 1909, there is a four-year tabu. I made complaint to the

deputy sheriff, with the result that the man was arrested and fined $10. It is the belief of the plantation authorities that this example will have considerable weight locally in causing this law to be respected in the future.

Very respectfully,

RALPH S. HOSMER,
Superintendent of Forestry.

REPORT OF THE FOREST NURSERYMAN.

Honolulu, August 31, 1911.

Advice and Assistance.

At the request of the officers of the 5th Cavalry, Schofield Barracks, the writer visited the barracks on August 10 for the purpose of giving advice in the planting and care of trees, etc. A few days previous to my visit 1150 trees, consisting of about a dozen different species, were sent to the barracks. It is the desire of the officers to plant large numbers of trees around the quarters and parade grounds and fast growing trees are in demand. Different species of the eucalyptus are recommended owing to their fast growth and their adaptability to withstand the prevailing winds. Other trees and plants more ornamental might be recommended later for certain sheltered places but what is wanted at present is fast growing hardy trees.

Distribution of Plants.

	In seed boxes	In boxes transplanted	Pot grown	Total
Gratis	5,000	825	3101	8,926
Sold	10,000	254	730	10,984
	15,000	1079	3831	19,910

Collections for August amounted to $72.75, $43.00 of which was on account of cordwood from Tantalus forest and $29.75 on account of plants sold.

Experimental Garden, Makiki.

The two men employed at the garden have been transplanting seedlings and doing other routine work.

U. S. Experimental Planting in Nuuanu Valley.

One man has been employed during the month, his work being planting and hoeing. One day each week all the available men

from Makiki and Nursery, including the two seed men and two prisoners, have been taken to Nuuanu to assist in the planting. Altogether 17 plots containing as many different species have been partly planted. Eight are completed and the balance will be finished just as soon as trees can be got ready. The trees are being propagated at Makiki.

Very respectfully,

DAVID HAUGHS,
Forest Nurseryman.

REPORT FOR SEPTEMBER.

Honolulu, October 5, 1911.

Board of Commissioners of Agriculture and Forestry.

GENTLEMEN:—I have the honor to submit, as follows, the regular report of the Division of Forestry for the month of September, 1911:

During the first half of this month my own time, with the exception of two days in the field, was given to work in the office, especially the preparation of letters and reports in connection with my trip to Hawaii in August.

Visit to Waianae.

On September 6 and 7, I visited Waianae, to inspect the forest planting being carried on by the Waianae Plantation Company within the boundaries of the Waianae forest reserve, and to look into other forest matters in that locality. Since 1906, the Waianae Company has, under the general direction of this division, but at its own expense, planted in that forest reserve about 30,000 trees. This little forest is growing excellently and in a short time now will make a marked difference in the appearance of the valley. Being the first case of a private corporation voluntarily to engage in forest planting in a government forest reserve, the work of the Waianae Company deserves special commendation. The trees planted are eucalyptus, silk oak and Monterey cypress. In this connection, too, note is to be made of the rapid spread of the algaroba in the upper part of Waianae valley during the last five years, since the creation of the forest reserve.

Trip to Maui.

From September 15 to September 30 I was away from Honolulu on a trip to the islands of Maui and Kahoolawe. I went first to Huelo and spent several days in working out on the ground the details of a forest planting plan which is to be put into effect

by the Maui Agricultural Company and the Hawaiian Commercial & Sugar Company on land belonging to the government in the Koolau forest reserve, bordering the irrigation ditches maintained by those corporations.

I next made an inspection of certain of the forest planting of the Maui Agricultural Company at Kailiili and Opana, Maui, and then met Governor Frear and his party at Lahaina and accompanied them on a three days' trip to the island of Kahoolawe. The object of this trip was to look into the question of the most feasible method of starting reclamation of the denuded portions of that island.

Mr. W. F. Martin, federal hydrographer, who was one of the party, set up four rain gauges on Kahoolawe which will yield data that later will be of value in connection with whatever planting is carried on.

Returning to Maui, I visited the Cornwell Ranch in Kula to secure information on the ground on which to base recommendations for a planting plan for a portion of the government lands of Waiohuli-Keokea and Waiakoa-Alae, there being requirements in the new leases of those lands that become operative on November 1, 1911, that the ranch shall plant groves of trees.

The last few days of my stay on Maui were given to an inspection of certain of the plots on the upper slopes of Mt. Haleakala where experimental forest planting is in progress under federal auspices. In Plot I, near Puu Nianiau, elevation 6000 feet, there was a very encouraging showing, both of the seedlings set out and of seed sown in seed spots. In Plot II, further toward Kula, elevation 7000 feet, the showing was not so good, many of the seedlings planted out last spring having died. This is probably accounted for in part by the fact that on the mountain the past summer has been unusually hot and dry. Additional lots of forest tree seed were sown in both plots. I returned to Honolulu on the morning of October 1.

Botanical Bulletin.

On September 2 there was issued, as Botanical Bulletin No. 1, an illustrated 16-page pamphlet entitled "New and Noteworthy Hawaiian Plants," in which Mr. J. F. Rock of this Division describes a new genus, Hibiscadelphus, consisting of three new species, and a new Sapindus, and Dr. L. Radlkoffer of Munich, a new Alectryon. A portion of the cost of publishing this bulletin was borne by private subscription. An edition of 750 copies was struck off. The bulletin has been sent to those of our exchanges interested in botanical research.

Yearbooks.

During the early part of September, the usual annual distribution of the Hawaiian quota of the Yearbook of the U. S. Depart-

ment of Agriculture has taken place. The books are forwarded to this office by the Delegate to Congress, Hon. J. K. Kalanianaole, and sent out by us to a carefully selected list of names. The 1910 Yearbook is a particularly interesting volume. A few copies still remain, which may be had, while they last, upon application.

The Nursery.

Mr. Haughs' report for September shows that increasing interest is being taken in tree planting by sugar plantation companies, a number of large orders for seedlings having recently been placed.

Very unfortunately, through inexcusable carelessness on the part of the road gang at work on the new Tantalus road, severe damage was done at the experimental garden in Makiki valley early in September by rocks thrown into the nursery during blasting. Providentially none of the laborers were hit, but both buildings and plants suffered. The houses have been repaired by the Superintendent of Public Works, but it will be impossible to make good the damage to the plants, many of those destroyed being rare specimens raised from seed sent from abroad by Mr. G. P. Wilder.

Very respectfully,

RALPH S. HOSMER,
Superintendent of Forestry.

REPORT OF THE FOREST NURSERYMAN.

Honolulu, Sept. 30, 1911.

Mr. R. S. Hosmer, Superintendent of Forestry.

DEAR SIR:—The following report gives the principal work done during the month of September:

Distribution of Plants.

	In seed boxes	In boxes transplanted	Pot grown	Total
Gratis	....	750	602	1,352
Sold	26,850	4700	487	32,037
	26,850	5450	1089	33,389

Collections on account of plants sold amounted to $15.85.

For the next three or four months, our principal work will be the raising and sending out of trees. We have at present on file orders for 210,000 forest trees to be delivered within the next few months. This amount added to our regular distribution, which consists of smaller orders from homesteaders and others

who are not required to notify us in advance, will keep us busy. The majority of the trees ordered is for seedlings in seed boxes. A few thousands, however, are wanted transplanted and ready to set out.

Experiment Garden, Makiki.

The quarters and a large quantity of the nursery stock suffered severely through the discharge of a heavy blast of powder which scattered rocks all over the quarters and plants. The blast was the work of the men laboring on the new Tantalus road which passes immediately above the quarters.

Large rocks, some of which must have weighed over a ton, were sent flying all around the quarters. The cottage, which is generally occupied by a man and family, but at this time luckily happened to be empty, was left after the blast in a very shattered condition. The end facing the new road was practically battered in, the floor and roof smashed in many places. The stable also suffered, the front part being practically wrecked. The storeroom and potting shed had several pieces of roofing and rafters destroyed. The nursery stock that suffered most was the new plants introduced by Mr. Gerrit P. Wilder, about 1000 of which were totally destroyed. The loss of so many rare plants is much regretted. The Superintendent of Public Works has had the government carpenters repair the wrecked buildings.

U. S. Experimental Planting in Nuuanu Valley.

One man has been employed during the month, his principal work being hoeing and planting.

Very respectfully,

DAVID HAUGHS,
Forest Nurseryman.

RABBIT PEST HERE.

Honolulu, Sept. 15, 1911.

Board of Commissioners of Agriculture and Forestry.

GENTLEMEN:—There has recently come to my attention from wholly reliable sources the fact that in two localities on this island rabbits have escaped from their owners and are now at large in increasing numbers. The localities where they have been seen are on the land of Kalauao, Ewa district, near Honolulu plantation, and at Mokuleia in the Waialua district.

Those at Mokuleia are supposed to have got away from Chinese banana growers. They have been seen at large there during the last three or four months. The band is a small one, perhaps not more than a dozen, but there are said to be two generations. Two rabbits have recently been caught.

The band at Kalauao appears to be larger and has probably been at liberty longer. It is said not to be uncommon to see rabbits at the point where the government road makes a sharp turn, where there is an artesian well in the angle. It seems likely that these rabbits may have got away from Orientals living in that vicinity.

In view of the very serious damage to agricultural crops and other vegetation which rabbits can do when in large numbers the questions of getting rid of these two bands seems to me one that should receive the attention of the Board. I understand that some years ago this Territory suffered severe loss from depredations of rabbits, at which time was enacted the special legislation in regard to these animals now on the statute books (Game Law: Rabbits: Chap. 37, Revised Laws; Sections 465-468). In this connection, too, members of this Board do not need to be reminded of the extensive damage which rabbits have caused in California and in the Australian states.

I am not sure how far the Board of Agriculture has power or authority to act in this matter, but it is evident that the time to check a pest like rabbits is when the bands are still few in number. The expenditure of a comparatively small sum now, in the employment of men to exterminate all the rabbits at large, would be money well spent. If the Board may not itself take up this matter I recommend that steps be taken to bring it forcibly to the attention of those who are in a position to act.

Very respectfully,

RALPH S. HOSMER,
Superintendent of Forestry.

HAWAII IRRIGATION COMMITTEE.

(Forester Special Correspondence.)

CHICAGO, Illinois, August 31.—Governor Frear writes in a recent letter to the headquarters of the National Irrigation Congress that he has appointed an advisory committee with which the officers of the Irrigation Congress can coöperate in making its coming meeting here, December 5 to 9, of the greatest benefit to Hawaii.

Members of the advisory committee appointed by the Governor are Ralph S. Hosmer, William O. Smith, Alonzo Gartley, Walter F. Dillingham, and Jared G. Smith.

"Save the forests, store the floods, reclaim the deserts, make homes on the land," is the motto of the National Irrigation Congress, and clearly sets forth its objects. Of particular interest is the consideration the congress will give at this session to reclamation by drainage. This year its sessions are held simul-

taneously with the United States Land and Irrigation Exposition and the International Live Stock Show. These three big events offer unusual opportunities for communities to make known their advantages to hundreds of thousands of prospective farmers and settlers, and that interested States might make the most of these opportunities the suggestion was made that their governors appoint advisory committees.

CONCRETE MATERIALS FOR FARM IMPROVEMENT.

(Forester Correspondence.)

WASHINGTON, D. C., October 2.—The early settlers, colonists and pioneers encountered a trackless forest extending from the Atlantic to the prairies, the removal of which was necessary before they could create farming land. As the country began to be settled demand upon the forests was made for building material. A hundred years ago almost all agricultural structures, and buildings of all kinds in farming communities, were constructed from lumber procured from nearby forests. Even a few years ago the farmer used nothing but lumber for farm buildings. The timber was cut from his own land and sawed at nearby mills, so that his own trees were converted into his troughs, dairy houses, walks, fences, and even his house and barn; hence the high price of lumber, consequent upon the rapid decrease in the country's timber supply, was felt last by the farmer—though now the demand for a new building material is nowhere more keenly felt than on the farm.

Such a material has been found in concrete, which in some instances has proved superior to lumber, brick, or building stone, and is being used for all kinds of farm structures from silos to sidewalks, and stables to dwellings. This material, too, like his lumber, can generally be largely produced from his own or nearby land, as nothing but the cement and metal bars for reinforcement need be purchased from afar, and much of the work can be done by the farmer and with ordinary farm labor under the direction of a skilled concrete worker.

Frequently concrete users have made costly mistakes by not informing themselves properly, before starting their work, concerning the correct methods of making good concrete. As a guide in the selection of the proper materials, especially the sand and gravel which form six-sevenths of the solids used in the concrete, the United States Department of Agriculture issued Farmers' Bulletin No. 461, containing suggestions which should be observed.

Concrete is manufactured stone formed by mixing cement, sand, and stone or gravel (i. e., pebbles) together with water. The cement is but a small part of the mixture, and is the product of skilled workmen under the supervision of the manufacturer

who must compete with all other makers of like material; but the sand and gravel constituting one-third or one-half of the final product must be selected and prepared by the farmer, and this is where most failures originate. Various amounts of each are used, according to the use to which the finished product is to be put. The mixture in which all the spaces or voids between the stones or gravel are filled with sand and all the spaces between the grains of sand are filled with cement is the ideal mixture. The ideal is seldom attained, but the bulletin gives detailed instructions and instructive illustrations, which should go far toward enabling the farmer to closely approach it.

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David Haughs, *Forest Nurseryman.*
Joseph F. Rock, *Consulting Botanist.*
Bro. Matthias Newell, *in charge of Sub-Nursery at Hilo, Hawaii.*
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J. C. Fitzgerald, *Deputy Territorial Veterinarian for Maui.*
A. R. Glaisyer, *Deputy Territorial Veterinarian for Kauai.*
..... *Deputy Territorial Veterinary for Kohala and Hamakua, Hawaii.*

CLERICAL STAFF

Mrs. C. L. Seybolt, *Clerk and Stenographer.*
Miss Ella K. Dayton, *Librarian.*
Daniel Logan, *Editor of the "Forester."*

PUBLICATIONS FOR DISTRIBUTION.

Any one or all of the publications listed below (except those marked *) will be sent to residents of this Territory, free, upon application to Mailing Clerk, P. O. Box 207, Honolulu.

BOARD.

Report of the Commissioner of Agriculture and Forestry for 1900; 66 pp.
Report of the Commissioner of Agriculture and Forestry for 1902; 88 pp.
* First Report of the Board of Commissioners of Agriculture and Forestry, from July 1, 1903, to December 31, 1904; 170 pp.
Second Report of the Board of Commissioners of Agriculture and Forestry, for the year ending December 31, 1905; 240 pp.; 8 plates; 10 text figures.
Third Report of the Board of Commissioners of Agriculture and Forestry, for the year ending December 31, 1906; 212 pp.; 3 plates; 4 maps; 7 text figures.
Fourth Report of the Board of Commissioners of Agriculture and Forestry, for the calendar year ending December 31, 1907; 202 pp.; 7 plates.
Fifth Report of the Board of Commissioners of Agriculture and Forestry, for the calendar year ending December 31, 1908; 218 pp.; 34 plates.
Report of the Board of Commissioners of Agriculture and Forestry, for the biennial period ending December 31, 1910; 240 pp.; 45 plates.
"Notice to Importers," by H. E. Cooper; 4 pp.; 1903.
"Digest of the Statutes Relating to Importation, Soils, Plants, Fruits, Vegetables, etc., into the Territory of Hawaii." General Circular No. 1; 6 pp.

"Important Notice to Ship Owners, Fruit Importers and Others. Rules and Regulations Prohibiting the Introduction of Certain Pests and Animals into the Territory of Hawaii." General Circular No. 2; 3 pp.; 1904.
"Law and Regulations, Importation and Inspection of Honey Bees and Honey." General Circular No. 3; 7 pp.; 1908.

"The Hawaiian Forester and Agriculturist," a monthly magazine. Vols. I to VII; 1904-1910. To be obtained from the Hawaiian Gazette Co., Honolulu. Price $1 a year.

DIVISION OF FORESTRY.

* "Forest and Ornamental Tree Seed for Sale at Government Nursery." Press Bulletin No. 1; 3 pp.; 1905.
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