APPLIED SCIENCE AND PRODUCTION

That Hawaii Cannot Compete With Java And Cuba Without Protection

Shown In Interesting Publication Prepared By H. P. Agee For Commerce Department

A pamphlet dated October 1915 has been issued by the H. S. P. A. experiment station on "the relation of applied science to sugar production in Hawaii," which details the essential differences between the cost of producing sugar in Cuba, Java and Hawaii. This pamphlet was prepared for the information of the department of commerce, which recently sent special agent Frank J. Sheridan here to investigate the cost of producing sugar. It was prepared by director H. P. Agee with the cooperation of his assistants, Messrs. Burgess, Lyon, Norris, Potter and Swezey, and is the best and most concise resume of the subject that has ever been published.

Efficiency vs. Cheap Labor

Starting with the preamble that "the mainstay of sugar production in Cuba is the abundance of cheap lands" while in Java it is cheap labor, Dr. Agee proves conclusively that Hawaii, lacking both cheap lands and cheap labor, "has developed, and perforce must maintain, an efficiency which is well ahead of that of her foreign competitors."

He quotes Prinsen Geerligs, the great cane sugar authority, on the cost of production in both Cuba and Java, and proves that Hawaii is only able to compete with them through the application of a combination of thrift and science. Hawaii continues to grow and manufacture cane sugar only because of the modern business system that has been developed and science applied to every branch of the industry has been a very important part of this system.

Scientific Investigations

Outlining the work of the experiment station of which he is in charge Dr. Agee states that the following work is under way. Studies have been made of the life history of a number of insect enemies of cane, including the anomala, bud moth, borer, cut worm, leaf-hopper, leaf-roller and mealy bugs. Parasites have been brought here to prey on the leaf-hopper, horn fly, borer and anomala.

A systematic survey of the plantation cane insects is made periodically to forestall epidemics and collections are made for scientific purposes and for comparison. Under this system of "insect inspection," which is maintained in no other country in the world, enemy forms can be discovered and steps taken to combat them long before they become a menace.

In this connection it may be stated that Dr. L. O. Howard who recently visited Hawaii, pronounces the Hawaii an method of **prevention** of injury to crops the most advanced step in practical entomology ever adopted. Everywhere else than in Hawaii the epidemic comes first before the farmers seek the remedy.

Plant Diseases

The planters' experiment station is the only institution in Hawaii equipped to study and fight plant diseases. They have investigated the Fiji disease, ihau, leaf-spot, Pahala blight, root rot, yellow stripe and serch diseases of cane; the fungi parasitic on insects; and, the yeasts used in alcohol manufacture.

Chemical studies are made of soils, fertilizers and irrigation and drainage waters. The chemistry of manufacture is also well under control, weekly and yearly synopses being made which acquaint the factories with the latest developments in this subject. The problems connected with which sugar production are also studied.

Field Tests Too

Extensive field tests are being made and many purely agricultural experiments are under way. Experiments are under way with agricultural implements; methods of cultivation; the utilization of organic wastes; the use of green manures; the water requirements of cane; the duty of water in relation to sugar production; and, the liming of soils.

A field station of 135 acres is operated at Waiho and in addition almost all the plantations have experimental areas where tests are made under the supervision of the experiment station.

The utilization of by-products to feed cattle, or, as a source of potash, alcohol and paper-stock, are being investigated. In a word, the Hawaiian planters are doing on their own account and at their own expense work which in most other lands is done by the state, and they are doing it because it pays.

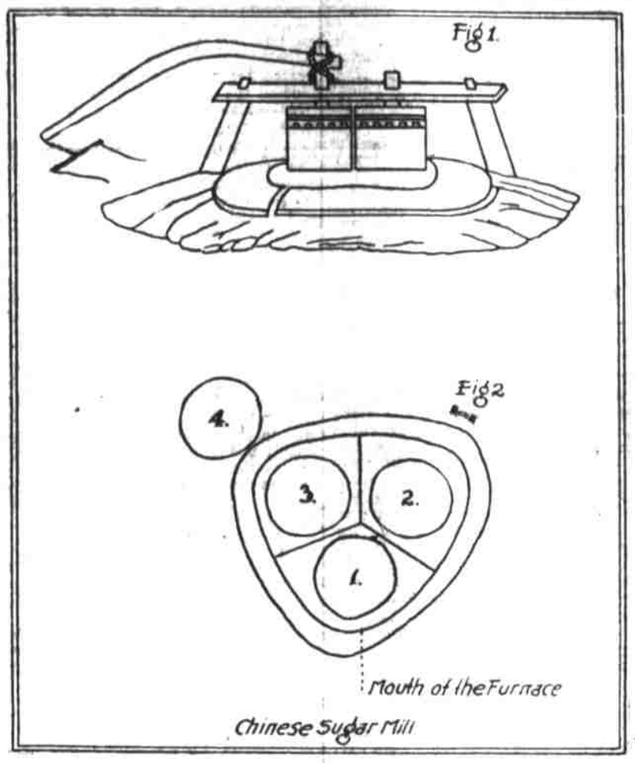
Science and System

"Applied Science" has placed agricultural production on a higher plane in Hawaii than in any other commonwealth in the United States, and it is only through the application of modern business system and science that Hawaii can continue to compete with other cane countries where land and labor can be had "for a song."

This pamphlet comprises so much that is concise and exact that it should be in the hands of everyone who is interested in sugar. It is hoped that if it has not been placed on sale a price will be fixed on this little volume so that it can be within the reach of all.

OLD KAUAI SUGAR MILL OF EIGHTY YEARS AGO

A Kauai sugar mill with the capacity of 300 pounds per day. Above, figure 1, a side view of the first sugar mill showing the granite rollers imported from China, and the mill setting. Below, figure 2, the clarifiers and evaporators, being the precursor of the modern boiling house.



Description And Drawings of First Mill And Boiling House

Arthur C. Alexander has kindly loaned The Advertiser a copy of the "Hawaiian Spectator, published in 1839 by an Association of Gentlemen," which contains the following description by "H.," an author whose identity has not been determined, of a sugar mill which was in operation at Waimea, Kauai, in 1837, or 1838. The accompanying drawings of the mill and boiling house, which are copied from the Spectator, give an excellent idea of the advances made by the Hawaiian sugar industry in the last seventy-eight years. The article follows:

"Mr. Editor:—while on a visit to Waimea, Kauai, a year or two since, I happened in at a sugar mill then in operation under the management of three Chinamen; it being the first establishment of the kind I had ever seen in operation, I was induced to spend nearly an hour in noticing the mode which the Chinese adopt in producing sugar from the cane; and, with a view of amusing some of your more distant readers, I herewith send you an outline of the mill as it then stood, and a partial description of their method of setting sugar pans.

Machinery and Live Stock

"Some ten or a dozen upright posts supported a straw roof which protected from the sun the mill, boilers, three or four jaded horses, and a score of hogs, which at times seemed to claim a part of the juice which flowed from the mill. In the center of the building a heap of earth was thrown up in which were implanted two upright posts of rough granite, their upper ends being hewn off to something resembling a tenon; a plank extended from one post to the other having in it two mortices to receive the tenons; also, two circular holes to receive the necks of the two rollers.

"These rollers were of granite, about two and a half feet in diameter and two feet high, and were morticed near the top at proper distances to receive wooden cogs which, apparently, were made with no other tool than a broad axe.

Imported Machinery

"The bed of the mill was a granite slab imbedded in the earth and had in it two round holes to receive the lower necks of the rollers; also, a channel extending from four to five inches round the rollers, the outlet to which (when the lump of mud was removed) allowed the juice to flow through a gutter under the horse-walk to a small tub.

"The necks of these rollers were all of wood, about six inches in diameter and their bearings protected by an iron band. On one of these was secured the arm or lever to which the power was applied; this arm was merely the branch of a tree (imported with the rollers). Some pains must have been taken to select one whose natural crook should answer the purpose; it was secured to the neck by a rope; a single horse attached to its end, with a plentiful application of the lash, gave motion to the rollers.

Engineer Was On the Job

"He, whose business it was to feed the rollers with cane, seated himself before them, and generally kept three or four sticks of cane between the rollers, allowing it at first to be gently squeezed, the second time more so, and on passing it between the rollers the third time it was also drawn through a stout iron funnel which effectually took all the remaining juice. (Fig. 1.)

"The evaporating pans contained about twenty gallons each and were set triangularly, thus: (Fig. 2.) The furnace was built of sun burnt bricks, eighteen inches long nine wide and thick. Those bricks (if they can be so called) are made of common earth, hens' feathers goats' hair, hogs' bristles, and water, and laid up with the same compound.

"The mouth of the furnace was about two feet high by one foot wide, and directly over it was a small hole to allow the smoke to pass off. The capacity of the pans was increased two fold by extending the brick work which was protected from the action of the syrup (at least for a time), by being covered with mats, tapas, banana leaves, lime, brick dust, etc.

Primitive Clarification

"Pan No. 1 (Fig. 2.) seemed to be used for a clarifier only, and was separated from the other two by two boards projecting from the brick work to a common center. Pans 2 and 3 served for evaporators and when the ebulition was great, flowed into each other; this was prevented by, occasionally, throwing in a small quantity of an offensive, greasy preparation, the principal ingredient of which is the lees of groundnut oil.

"The syrup was concentrated in pan 3, thence removed to cooler 4. To ascertain when the syrup had arrived at the chrystalizing point, a small coarse grained stone, made for the purpose, was placed in the bottom of a saucer of cold water, on which a portion of the syrup was dropped; the boiler rubbing his thumb over it soon determined whether it was sufficiently boiled.

Record Work

"From the cooler it was removed to conical clay pots, holding about 20 lbs. each; these pots were not filled, till after three successive boilings. I noticed the Chinese did not clay their sugar, but used rice straw well saturated with water; this placed on top of the sugar containers to the depth of 3 or 4 inches, the water from which passing through the sugar removed all the molasses.

"This sugar was crushed, and exposed to the sun, before sending to market. The mill, indeed the whole apparatus, was exceedingly rude, but it appeared to answer a good purpose. I was told that they had made 300 lbs. of sugar per day with it.

"It is to be regretted that some plan could not have been devised, which would have rendered it for the interest of all concerned to keep the mill in operation.

EARLY COLDS.

Be careful of the colds you take at this time of the year. They are particularly dangerous. A neglected cold may mean a winter long cold. Take Chamberlain's Cough Remedy at once. For sale by all dealers. Benson, Smith & Co., Ltd., agents for Hawaii.

GLANDERS VACCINE NOT SUCCESSFUL

As a result of cooperative tests made by the New York City board of health and the United States department of agriculture, it is stated that the vaccination method previously recommended for the prevention of glanders does not give horses immunity against this disease.

A recent bureau of animal industry bulletin on this subject states that "the control of glanders must therefore remain dependent upon the concentration of efforts to eliminate infected horses and the adoption of precautions against the introduction of infected animals into stables free from the disease."

As in the case of practical control of bovine tuberculosis among dairy cattle, Hawaii has progressed farther towards the complete elimination of glanders than any of the mainland states. This result has been due entirely to the extremely efficient inspection service maintained by the Hawaiian board of agriculture and forestry.

SUGAR CARGO AND PRICES

There were two sales of raw sugar on the New York market yesterday, one at 4.64 and one at 4.77. This makes the average price at close, affecting Hawaiian values, 4.705. However as there are practically no Hawaiian sugars offering the actual influence of higher prices is only speculative.

Three Magellan cargoes totaling 20,000 tons are still afloat. The Kentucky-ian with 7600 tons, sailed from Balboa October 6 and is due to arrive at Atlantic ports next Monday. When this cargo left Hawaii sugar was selling at 4.40. Hence whether the planters lose or gain by the delay at Panama will depend on the course of the market during the next seven days.

The same applies to the Georgian and Texan which are due to arrive at New York, provided they maintain schedule time, about November 25 and December 10. Sugar was selling at 3.84 when the Georgian's cargo left, and at 3.75 when the Texan sailed.

WEATHER GOOD EVERYWHERE

Weather conditions have been good on Kauai and Maui during the week. On Oahu the whole of Honolulu plantation has had a heavy soaking. The Oahu Sugar Company lands adjoining got good rains, and Ewa some light showers, Waianae had .40 of an inch Monday night.

At Waialua there has been a little precipitation on the fields. Heavy rains in the Waialua mountains have filled reservoirs and ditches fairly full. Kahuku has had very little rain.

On Hawaii there have been very heavy rains all through Hilo, Honomakua and Kohala, in the Hilo district accompanied by high winds which however did practically no damage to the cane. The rain extended through Olaa to Kau without the winds and conditions here are reported at their best.

VARIETIES ARE CHANGING

The sugar planters experiment station has grown 15,700 seedling cane varieties in the ten years since this work was started, in 1906. Previous to that time there were only four varieties of cane, Lahaina, rose bamboo, Whitney, and yellow caledonia, grown commercially. At this time rose bamboo has been practically given up. In 1913, 145 different varieties were being grown, forty-two of them on a field scale.

In point of acreage yellow caledonia is now the most important variety of cane with Lahaina second, D 1135 third, and striped tip fourth. Over 700 acres of seedling canes of Hawaiian origin were included in the 1915 crop just harvested.

NIULII ENDS CROP

Niulii Mill & Plantation finished grinding its 1915 crop November 4, making a total of 3139 tons. This is 139 tons more than was harvested last year, and is 639 tons more than the manager's January estimate.

Niulii, although one of the smallest plantations, has in previous established an enviable reputation in producing sugar at a minimum cost, due in large measure to the extremely efficient system of cultivation employed. Considerable interest has been expressed by the other managers of some of the larger properties to know what the Niulii cost of production has been during the season that has just ended.

SEREH IN JAVA

The "Zeefvaten" disease of sugar cane in Java is described by F. B. Fellinga in a recent number of Archief voor Suikerindustrie. This disease is the "type four" of sereh, described by Wakker and Went.

Bad soil and weather conditions tend to cause the disease to spread. Also the susceptibility of cane tends to increase every year especially where diseased seed is used. Fellinga believes this form of serch can be controlled by selection of healthy cuttings and especially by growing seed cane in the mountain districts instead of replanting the lowland fields with lowland cane.

FLUORINE MAY BE FERTILIZER FOR CANE

Fluorine is a constant constituent in the bodies of the higher animals. It occurs in the skin, hair, nails and tooth enamel in combination with phosphorous in almost exactly the same definite proportions as in the mineral "apatite." It also occurs in all tissues where life is intense, especially in glands and nerves, but here is associated with phosphorous in the somewhat definite proportion of about one to four hundred.

The constancy of the presence of fluorine in animal and vegetable tissues possessing intense life shows that it must play a very important part in the life of all organisms.

The possibility that fluorine may therefore have some fertilizing value has led the French agriculturist, Arthand Gauthier, to undertake field tests and pot experiments to determine this point. The results of several years' work by Gauthier and his assistant, P. Clausmann, were published in February, 1915.

Its Fertilizing Value

These authorities now state that in most cases the addition of fluorine to soils promotes rapid growth and seems in particular to promote flower and seed production. In a few cases fluorine was poisonous to crops, and it had less effect on the grass crops, grains and cereals than on garden vegetables. Gauthier is inclined to believe that fluorine is a constant constituent of growing plants as of animals, but that being always associated with phosphorus and in such minute proportions its presence has been ignored by chemical analysis.

The fertilizer experiments with fluorine are only preliminary and no general rules can be laid down for its use, as this line of investigation is a new one. Fluorine experiments are now being made with cane at the sugar planters' experiment station at Waipio.

PLANTERS ANNUAL MEETING

The annual meeting of the Hawaiian sugar planters association will probably be held during the week of December 14, about ten days later than usual. Several factors connected with the internal business of the association are responsible for the postponement, not the least being the withdrawal of many mail and passenger steamers from the trans-Pacific trade. A number of the directors and quite a few plantation managers are now on the mainland and as they are not due to return until the next Matsonia, one month hence, the date of the meeting has been tentatively set as stated above.

THE DAVIES PLANTATIONS

Theo. H. Davies & Company stated yesterday that the outlook for 1916 for all of their plantations except Waiakea is just as good as it was for this year. Waiakea is excepted, they said, not because the cane is not in excellent condition but because if this property beats its 1915 record in 1916 it will soon be in the H. C. & S. class.

TENTATIVE ESTIMATES

The following tentative estimates of 1916 crop have been announced by C. Brewer & Company, Wailuku Sugar Co., 18,000 tons; Onomea Sugar Co., 18,000 tons; Pepeekeo Sugar Co., 10,000 tons; Hawaiian Agricultural Co., 14,000 tons; Honomu Sugar Co., 8500 tons.

SUGAR IN SWEET POTATOES

New crop sweet potatoes consist almost wholly of starch. Immediately after harvesting there begins a rapid transformation of the starch into cane sugar and reducing sugars. Hence the sweetness depends to a considerable extent on the degree of maturity of the potato when dug.

NO CONTRACT YET

A. M. Nowell, manager of the Sugar Factors' Company, stated yesterday that no contract for the sale of Hawaiian raws has as yet been entered into, and that irrespective of street rumors to the contrary the final conclusion is still in abeyance.

HANAWI TRESTLE DOWN

The recent storm at Hilo blew down the high flume trestle across Hanawi gulch at Onomea. This structure which is 160 feet high was blown down in 1906, nine years ago and had been demolished by high winds several times previously.

OLAA ALMOST FINISHED

Olaa Sugar Company will finish grinding its 1915 crop about November 20, Bishop & Company stated yesterday that the crop will amount to about 31,500 tons which was the manager's April estimate. The 1914 crop was 25,736 tons.

THE 1916 CROP

Ewa and Waialua plantations will begin grinding their 1916 cane the first or second week in December, Castle & Cooke announced yesterday.

MAN WITH BROKEN HIP NEGLECTED BY POLICE

Another instance of the slipshod methods in vogue at the police station came to light yesterday, when it became known that Charles Silva, arrested for drunkenness on Saturday night, had been found on Monday night to be suffering from a broken hip.

It is believed that Silva received his injury before being locked up on Saturday.

For two days and nights the injured man was allowed to suffer in his cell, and not until forty-eight hours after he had been arrested was it discovered that he had a broken hip.

Silva was removed to Queen's Hospital.

GENERAL WUDAN PUT IN ARREST

Firebrand of Revolutionary China May Be Deported As An Anarchist

Col.-Gen. D. J. Wudan, firebrand of revolutionary China, was arrested yesterday afternoon on a charge of being an anarchist and therefore liable to deportation, and was released on $1000 bail, given by his friends.

An investigation of Colonel General Wudan will be made here and the information gathered by an immigration inspector will be sent to the department of labor at Washington for decision as to whether he shall be deported.

Richard L. Halsey, inspector in charge of immigration, said that he made application for the warrant, and that he based it upon utterances of the Chinese soldier since he came to Honolulu. Mr. Halsey cited one as given in the Chinese Liberty News of June 7:

Basis of Official Charge

"Heading of article 'Report of speech of D. J. Wudan, delivered May 31, 1915.

"'Reference to the guilt of Yuan Shih-kai, he is to be decapitated and those editors who favor him cannot easily be set free.'"

There were others of the same nature, Mr. Halsey said.

How long it will require to assemble evidence is uncertain, Mr. Halsey said. The hearing has not been set. Washington will pass upon the data forwarded from Honolulu.

Yesterday's arrest was the climax of a series of interesting happenings which have centered about the colonel-general. He came here April 5, fresh from China, and immediately was the leader of the Chinese revolutionists of Honolulu, who hate Yuan as bitterly as they love Doctor Sun well. He was truly in the public eye.

The soldier decided he wished to go to San Francisco, and he applied to Consul Woohuan for a passport, required of Chinese who enter the States from Honolulu, but the consul refused to issue one, because of the applicant's revolutionary creed, and Wudan did not sail June 5. He did not sail at all, for his protest to Washington was turned down, and he cannot get to San Francisco.

May Be Returned To China

If he is found to be an anarchist he will be deported to the port from which he came. He was granted a passport by the American consul-general at Shanghai before he came to Honolulu, and, if he should be returned to that port, he probably would be able to escape the government police as he could remain within one of the foreign settlements.

Warrant for the arrest of Wudan by the immigration authorities was received yesterday in a cablegram from Washington. It was based upon information laid by Mr. Halsey. Inspector Harry Brown of the immigration service made the arrest.

MACHINERY REPAIRS

Repairs and replacements are under way at all of the Brewer plantations, getting the mills ready to handle the big 1916 crop. Some of the new machinery which had been ordered was caught east of Panama when the slides closed the canal but all this is expected to arrive in plenty of time to install it before the grinding is well under way.

LITTLE SUFFERER FROM ECZEMA

Grew Worse in Spite of Six Months of Ablest Treatment—Sleep Terribly Broken—Face, Head and Hands Masses of Dreadful Humor.

A SINGLE SET OF CUTICURA CURED HIM

"I feel it my duty to let you know with what success I have used the Cuticura Remedies. When our baby was seven weeks old he broke out with what we thought was heat but which gradually grew worse. We called in a doctor. He said it was eczema and from that time we doctored six months with three of the best doctors in Atchison but he only got worse. His face, head and hands were a solid sore. There was no end to the suffering for him. We had to tie his little hands to keep him from scratching. He never knew what it was to sleep well from the time he took the disease until he was cured. He kept us awake all hours in the night and his health wasn't what you would call good. We tried everything but the right thing. Finally I got a set of the Cuticura Remedies and am pleased to say we did not use all of them until he was cured. We have waited a year and a half to see if it would return but it never has and to-day his skin is clear and fair as it possibly could be. I hope Cuticura may save some one else's little one's suffering and also their pocket-books. John Lease, n, 1403 Atchison St., Atchison, Kan., Oct. 19, 1909."

Cuticura comfort for all who suffer from facial eruptions such as acne (pimples and blackheads), acne rosacea, facial eczema, ringworm, tetter, redness, roughness and oily perspiration is found in gentle anointings with Cuticura Ointment followed by warm baths with Cuticura Soap. For preserving, purifying and beautifying the skin, scalp, hair and hands of infants, children and adults, Cuticura Soap and Ointment are priceless.

Cuticura Soap (25c.), Cuticura Ointment (50c.) and Cuticura Resinol (50c.), for ill the form of Chocolate Coated Pills, 25c. per vial of 60. Sold throughout the world. Potter Drug & Chem. Corp., Sole Props., 135 Columbus Ave., Boston, Mass.

☞ 32-page Cuticura Book, mailed free, giving description, treatment and cure of diseases of the skin.

TRAFFIC SQUAD TO USE NEW PLAN OF SIGNALLING

Beginning Monday Mainland, Or Semaphore System, Will Be Followed

WHISTLES TO BE BLOWN FOR MAKING OF TURNS

Outstretched Arms Will Open Street One Way And Close It The Other

Starting next Monday the traffic squad will have a new set of signals, the semaphore system in use in many mainland cities having been adopted. Assistant City Attorney Carden, instructor in the police school, yesterday instructed the traffic officers in the use of the new signals. He reports satisfactory progress.

The system of signalling in use at present is known as the "free lunch sweep." The motions, which are overhand and downward are said to puzzle rather than aid autoists.

Officers To Use Whistles

Under the semaphore system officers will be equipped with whistles. By the system an officer stands with outstretched arms pointing in the direction in which he wishes traffic to proceed. This signal also stops traffic proceeding in other directions. For instance, if the officer's arms be extended east and west, the street is open to traffic coming and going that way. At the same time the street is blocked to traffic going north and south.

A whistle will be used when a person desires to turn to the left. On one blast all traffic will come to a stop. The officer will then point one hand at the person going to turn and the other toward the street he desires to turn into, whereupon the person makes the turn. At the same time a person desiring to make a right hand turn within the turn being made by the other person, may turn also. On the completion of the turn the officer will sound two blasts on his whistle, releasing traffic in the direction his outstretched arms indicate.

Sheriff Refuses Raincoats

The matter of providing the men of the traffic squad with rain coats was mentioned to Sheriff Rose yesterday.

"If they want rain coats let 'em buy 'em themselves," the sheriff said.

"The Advertiser's suggestion that traffic officers be provided with rain coats is a good one," said a leading citizen yesterday. "It is true we don't have a great many wet days in Honolulu, but even if there were only half a dozen wet days every year the men at the crossings should be protected. A chill resulting from a wetting might easily deprive the city of a valuable officer."

ALL SHIPS SOON TO COMPLY WITH LAW

Inter-Island Superintendent Hopes To Have Able Seamen Minimum Next Week

When the Inter-Island steamer W. G. Hall sails for Kauai at five o'clock tomorrow evening she probably will have a crew forty per cent of which are able seamen under the Seamen's law requirements. The Mauna Kea, sailing Saturday afternoon, also is expected to be within the law. J. E. Sheedy, superintendent of the Inter-Island, said that within ten days he hopes to have forty per cent of all crews certificated able seamen.

The road for certification of Inter-Island men was made easy when Mr. Sheedy received a cablegram from Supervising Inspector General Uhler of the steamboat inspection service, saying that men who had been at sea three years or more were not required to pass professional examinations. Mr. Sheedy had cabled Mr. Uhler Monday night asking a ruling on this point.

Physicians Will Be Busy

Probably not more than thirty-five or forty Inter-Island men will have to undergo the professional examinations, so that the work of Capt. James H. Brown of the cutter Thetis is lightened greatly; but the public health service will be busy for a long time conducting physical examinations.

Mr. Sheedy hopes to have all his men certificated within a month. The Inter-Island will not be content with having the minimum of forty per cent on each ship, but will have as many as can qualify. And all men will be sent up for lifeboat certificates. Mr. Sheedy said that he understood the law to mean that a certificate of ability as an able seaman did not include lifeboat efficiency, so that he will seek certificates for every man on every ship, sailors, stewards and engine crew. He expects this to be consummated within a month.

This means that more than 400 men, including all in port, will be examined by the public health service and for ability in handling lifeboats. Several can be tried out in each boat at once, so this work will not approach that of the physicians in magnitude.

Only One Man Turned Down

Only one Inter-Island seaman has been turned down by the physicians for physical disability, and he will be given another place by the company. Three or four were found yesterday who had not had three years' service, and so will have to take the professional examination.