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Twelfth annual report of the agricultural experiment stations of the Louisiana State University and A. & M. College.

Louisiana State University and Agricultural & Mechanical College

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TWELFTH ANNUAL REPORT

—OF THE—

Agricultural Experiment Stations

—OF THE—

LOUISIANA STATE UNIVERSITY

—AND—

A. & M. COLLEGE,

—FOR 1899—

TO THE GOVERNOR.

BATON ROUGE,
PRINTED AT THE TRUTH BOOK AND JOB OFFICE.
1900.
REPORT.

Louisiana State University and A. and M. College,
Office of State Experiment Station,
Baton Rouge, La., January 15, 1900.

To His Excellency, Murphy J. Foster, Governor of Louisiana:

Sir—In accordance with the provisions of Section 2, of the Act of Congress to establish Agricultural Experiment Stations in connection with the colleges established in the several States, under the provisions of an Act approved July 2, 1862, and the Acts supplementary thereto, I beg leave to submit a report of the operations of the three stations, including a statement of the receipts and disbursements from July 1, 1898, to July 1, 1899:

STATION NO. 1.

Sugar Experiment Station, Audubon Park, New Orleans, La.

Experiments in the field, sugar house and laboratory have been continued during the past year, looking to the amelioration of the sugar industry of this State. The experiments in the field suffered seriously by the extreme temperature of 60° Fahr., which prevailed from February 13th to 16th, 1899. Such cold has never been experienced here before by our oldest inhabitant. It destroyed a greater part of the stubbles (rattoons) and much of the seed cane, either planted or in windrow, reducing by over one-half the annual output of sugar in this State.

Taking advantage of this disaster, important studies have been made of the injured cane and stubbles, and valuable information of a physiological character obtained. Microphotographs of sections of injured and uninjured canes were made and will be utilized to illustrate a future bulletin on sugar cane.

The experiments in fertilizers, to determine the form and
quantity of each valuable ingredient best required by the growing cane plant, have been continued for ten years upon the same soil, and the results of this period are now being prepared for publication in bulletin form.

The same bulletin will contain the results of four years of different kinds of cultivation, showing most conclusively that cane is no exception to the general rule which prescribes “thorough preparation of soil, generous fertilization, and shallow and frequent cultivations.” Of the large number of “seedlings” tested, one variety, No. 74, a dirty-greenish cane, has maintained its good qualities of the last five years. Both in sucrose content, and tonnage, it excels, giving this year over 38 tons per acre, which yielded, without saturation, upon our nine-roller mill 81 per cent. of juice on the weight of the cane. This juice had 16 per cent. of sucrose.

Another large quantity of this seedling was distributed to over two hundred of our sugar planters, and if it proves with them its superior merits, will be a valuable addition to our cane fields. Nos. 95 and 69 were also distributed in limited quantities, their superior merits suggesting more extensive trials.

The duration of the sugar house experiments was this year considerably shortened by the limited supply of cane. However, the opportunity was seized of completing and confirming several of the experiments of the previous year. There is now in preparation a bulletin on the “Chemistry of the Sugar House,” which will embody the results of the elaborate work performed in the sugar house and laboratory for the last five years. Prof. W. R. Dodson has again spent the season in continuing his studies of the ferments of the sugar house, and special processes by which sterilization of juices, syrups, and molasses can be obtained.

The acreage in sugar cane was this year largely reduced. The tonnage, even where fair stands were secured, was rather below the average, but the sucrose content was good, and a most favorable season prevailed in this section of the State for perfect work during the harvest. The cold in early fall, which injured severely most of the standing cane in the upper sugar belt, did no damage in this immediate section. The
first visitation of destructive cold was on January 1st and 3rd, 1900.

The extremely low temperature of February, 1899, which so seriously damaged the sugar cane, completely destroyed every orange, olive, and fig tree. In the severe weather of 1896, when the thermometer went down to 15 degrees F., all of the orange trees budded on the sweet, bitter-sweet and sour orange; the rough lemon and pomelo stocks were completely killed. Even the sweet (Aurantium dulcis) varieties, budded on the citrus trifoliata stock, succumbed, leaving only the Satsuma and Kumquats on the citrus trifoliata stock alive. It was inferred from this experience that the latter combinations were proof against any cold that this section would ever experience. Accordingly many trees of these combinations were planted with a confidence of their survival. It was therefore with both amazement and regret that we saw the trees which survived the winter of 1896 completely effaced by the cold of 1899. It may now be confidently asserted that no combination of stock and scion of the present known varieties can withstand a cold of such severity as that which occurred last winter. The Division of Pomology, of the Department of Agriculture at Washington, has been conducting a series of experiments looking to the securing of a frost-proof orange. Crossing, by hybridization, the hardier sweet varieties on the deciduous, non-edible Japanese trifoliata, it has secured a number of plants, which the Department is now distributing throughout the Southern States. Secretary Wilson has generously proffered us two trees of each of the sixty-two varieties thus produced. They are daily expected, and when received will be carefully transplanted and results awaited with considerable interest.

For the first time in the history of this station, the fig trees were killed, many not even sprouting from the roots. This destruction has temporarily suspended a profitable and growing industry of this section (canning and preserving figs).

Ramie, jute, and several varieties of hemp were grown last year with a view of testing the various machines designed
to decorticate them; but the quarantine established during the fall in this section prevented a public trial.

Forage crops, grasses, clovers and alfalfa, were grown with the usual success. Considerable interest has been manifested in the growing of alfalfa all over the State, created by the great success achieved on this station, and every assistance possible in the dissemination of information has been rendered, looking to a general culture of this valuable plant.

The Egyptian varieties of cotton are still grown, with a view of ultimate acclimation. The dry season has been very favorable for both growth and fruit.

India varieties are also grown, though promising but little for the future.

Sea Island cotton could, by careful selection and proper cultivation, be grown successfully, if not profitably, all along the Gulf coast. The present prices (15 to 50 cents per pound) would justify extensive trials.

Work has been carried on during the year in crossing varieties of cotton to secure a variety or varieties better adapted to our wants, and some progress made.

A large number of varieties of cotton have been grown, and all ginned upon the roller gin. Simultaneously, the same varieties have been grown at Baton Rouge and ginned upon a saw gin. Samples of lint from both stations, of each variety, have been sent to Mr. Edward Atkinson, Boston, Mass., who will have them microscopically examined, and the tensile strength of each carefully determined, with a view of ascertaining the injury done by the saw gin.

**FERTILIZER AND PARIS GREEN CONTROL.**

Beside the usual work incident to the station, the chemical laboratory has been largely engaged in the analyses of fertilizers and paris green, under Acts 126 of 1898 and 131 of 1890. So great is the demand for this work, that last year nearly one thousand samples of commercial fertilizers and thirty-eight of paris green, were analyzed (see Bulletin No. 58). The present system of inspection and analyses created confidence in the buyer, and care and caution in the seller, to the mutual benefit of both. Ample protection is thus afforded
the intelligent buyer, that he will get the full guarantee of the seller.

TEA CULTURE.

The Department of Agriculture at Washington has recently sent to this station 650 very vigorous tea plants of two varieties. These have been successfully transplanted and efforts will be made, in conjunction with the National Department of Agriculture, to grow tea commercially in Louisiana.

STATION NO. 2.

STATE EXPERIMENT STATION, BATON ROUGE, LA.,

Continues its work with the same efficient staff. On the farm the usual experiments in corn, cotton, forage crops, grasses and clovers, have been continued, results of which appear from time to time in the bulletins.

Beside these regular experiments, others with tobacco have been tried. An attempt has been made to grow the purest Sumatra and Havana wrappers.

Mr. Woodward, of Florida, who has had an extensive experience in the growing, curing and fermenting of the best Florida tobaccos, was employed. The best seed of many varieties were obtained and planted. The Sumatra and Havana varieties were grown in the shade (under canvas), in the half shade (laths) and in the open. All of the tobacco was well cured in the barn. It was brought to the fermenting room on the grounds of the University and there carefully fermented under the joint supervision of Mr. Woodward, the tobacconist; Prof. Dodson, the bacteriologist; and Mr. Glenk, the chemist. Each followed the tobacco through the pile, and valuable data obtained, which will later be published.

Some of the tobacco was excellent, so pronounced by the large manufacturers of New Orleans, especially that grown in half shade. Several boxes of cigars have been made from the best of the tobacco, and they are rated with good imported Havana stock.

These experiments were quite exhaustive and indicate that experience and great care and intelligence are required to make a first-class wrapper.
There is quite an inquiry for tobacco seed and literature, which are freely supplied by the station.

TEXAS FEVER.

The experiments previously made and reported looking to the "immunization" of imported cattle to that dreaded disease "Texas fever," have been continued and results have been decidedly successful. Last year two registered Herefords and twelve grade Shorthorns were imported and successfully carried through the fever, artificially created by inoculation with the defibrinated blood of an immune animal. This pronounced success induced the station to proffer its services to those contemplating importing valuable stock. This offer has been accepted by many citizens of Louisiana, and the veterinary infirmary is now filled to its full capacity with pure registered cattle of the various beef breeds, undergoing treatment.

Some have been discharged, successfully immunized; others have passed the critical period of the fever, and none up to date have died.

For particulars as to the disease and treatment, see Bulletin No. 57, which will be sent free upon application to any address.

By such treatment the great danger of importing Northern cattle to the South is decidedly minimized, if not entirely removed. It gives promise, also, of the rapid development of beef raising throughout the South, where highly nitrogenous foods, abundance of water, and mild winters produce conditions for beef raising perhaps unexcelled on the entire continent. Only the beef animals are wanting to obtain success, and these can now be imported with little or no danger from Texas fever, if properly and promptly treated.

CHARBON.

This dreaded disease prevailed to an alarming extent throughout Southern Louisiana last summer. During its prevalence Dr. Dalrymple and Prof. Dodson were sent to the field for the purpose of studying the disease and aiding in every way in checking its ravages. They visited numerous plantations in many parishes and obtained much information.
for guidance in future work, and also for publication in an early bulletin. Laboratory studies of the germ of this disease have been begun and will be continued until its true life history is determined.

TICKS.

Prof. Morgan has been experimenting with various ticks, studying their life histories and testing their power of producing Texas fever. It has been shown that only the cattle tick (Boophilus bovis) is capable of transmitting the Texas fever. His results have been published in Bulletin No. 56.

RICE.

During our sojourn in Southwest Louisiana last summer, holding Farmers' Institutes, it was found that the rice fields were becoming impregnated with red rice and other noxious weeds, whose seeds, mixing with rice in threshing, greatly injured the value of the latter. Prof. Dodson began at once a botanical investigation of the character of these noxious weeds and the best methods of eradicating them, and has since continued his work. At an early day his results will be given as part of a bulletin which will treat of rice, in extenso, from soil to market.

STATION NO. 3.

NORTH LOUISIANA EXPERIMENT STATION, CALHOUN, LA.,
Continues its popularity among the small farmers of North Louisiana. Besides the usual crops experimented with, great stress has this year been laid upon those forage crops which contribute to stock raising. The corn crop was harvested with the self-binding harvester, and when cured, it was passed through a husker and shredder which shucked the corn and delivered by carrier into a wagon, shredded the stalk, fodder and shuck, and passed them by a carrier to the loft of the barn. By grinding the corn with cob and feeding with the shredded stover, every particle of the corn crop is utilized. By thus saving the corn stalks, an immense amount of cattle food is obtained, which if properly combined with cotton seed or cotton seed meal, will feed a goodly number of stock through
the winter. If the practice could become general over Louisiana, then its million and a quarter of acres now devoted to corn, would furnish at least one and a quarter millions of tons of stover, which would maintain over one million of cattle through the winter, and if additioned by cotton seed or its meal, would fatten ready for the shambles at least half of this number. At present scarcely anyone saves the stalks, and but few the fodder.

TOBACCO.

Further experiments with this crop have been continued, though the dry weather of last spring and summer prevented a realization of the accustomed yield.

LIVE STOCK.

Arrangements of pastures, coupled with the growing of forage crops, have been made looking to experiments in raising beef cattle. Already a pair of Herefords and about a dozen grade Shorthorns have been secured as a basis for beginning the work.

The dairy on the station continues its good work, and its influence in educating the farmers to a knowledge of how to make first-class butter is apparent on many farms throughout North Louisiana.

Extensive planting of grasses, clovers and forage crops have been made and are at this date looking well. The alfalfa plat continues to yield its quota of nutritious hay.

ORCHARD.

The old orchard was so badly wrecked by the severe cold of last winter that it was deemed best to plant a new one and upon a more suitable location. Accordingly this fall, after thorough preparation, several acres were planted with two trees of each variety of pear, apple, peach, etc., which experience had suggested would probably thrive in this climate. If possible, the station will find what varieties are best adapted to that section.

ROAD MAKING.

During last September the Office of Road Inquiry, of the Department of Agriculture, at Washington, kindly sent Mr.
Harrison, one of its road experts, to construct a model road out of the public road, which runs for three-fourths of a mile through this station. The road could not be satisfactorily completed at that time, on account of the severe drouth then prevailing, which rendered the clay hills too hard for economical work. It has since, however, been satisfactorily finished by Maj. Lee, and an excellent model road is now being used by the public both for travel and for guidance in future road building.

Mr. Harrison arranged his work so as to coincide with the Seventh Annual Fair and Camp Meeting held on the closing days of September. One day of this meeting was devoted to the discussion of good roads and their benefits to Louisiana, in which Your Excellency took an active part. To this meeting every police jury in the State was invited to send a representative. Many complied with the request, and it is believed that the occasion served as a powerful stimulus to future building of good roads. In the afternoon of the second day, a practical lesson in road making was given by Mr. Harrison.

This fair and camp meeting was like all former ones, a great success, both in the number and enthusiasm of its visitors, and the quality and quantity of the exhibits. The premium list was large and the prizes eagerly sought by the exhibitors.

**LOSS OF BUILDINGS.**

On October 5th, during a prolonged drouth, while running the farm engine, a spark from the boiler lodged in the shredded fodder and hay of the barn loft. In a few minutes the barn was consumed with all of its contents. The fire caught the adjoining buildings and consumed the tool shed, carriage house and horse stable. It was only by co-operative work and quick dispatch that the rest of the buildings on the station were saved. The losses were partially covered by insurance.

Since the fire, a large barn and a combined stable and tool house, both 40x60 feet, two stories high, covered with galvanized iron, have been erected and are now being used.
GEOLOGICAL SURVEY.

Mention was made in my last report of the employment of Prof. Gilbert D. Harris, of Cornell University, to conduct the field work of the survey. He gives three months of his services to actual field work. He is ably assisted by Mr. A. C. Veatch, who devotes his entire time to the survey. Conjointly they have recently prepared a report of the first year's work, which is now in print and will be issued to the public in a few weeks. The following is an outline of the report:

GEOLOGICAL SURVEY OF LOUISIANA.

Report for 1899.

Letter of transmission—Dr. Wm. C. Stubbs.
Introduction—G. D. Harris.

PART I.

Final report on reconnaissance work in Louisiana; being a resume of what is known regarding the geology of the State—Harris and Veatch.

History of Geological Investigations in Louisiana:
First period, early explorations to 1867.
Second period, reconnaissance:
Prior to Experiment Station work, from 1867 to 1892.
Experiment Station work, 1892 to 1898.

Geology of the State by formations:
Cretaceous
Eocene
Neocene
Quaternary
Illustrated by a geological map of the State, a general map of the geology of the Mississippi embayment, and numerous engravings.

Resume of our present knowledge of the fossil remains of the State:
Invertebrata.
Vertebrata.
Plantae.

Economic products of the State:
Salt.
Sulphur.
Clays.
Marl.
Building Stone.
Limestone.
Lignite.
Iron Ore.
Lead.
Artesian Waters.

PART II.

Detailed work of the geological survey.
Special papers by various authors.

Reports on certain important areas throughout the State:
- Shreveport Area With Map and Sections—By A. C. Veatch.
- "Many" Area With Map—By A. C. Veatch.
- Sabine River Area With Sections—Veatch and Harris.
- Winnfield Area—Marble Quarry, Coochie Brake, With Maps and Sections—Harris and Veatch.
- Natchitoches Area With Maps and Sections—G. D. Harris.
- The Five Islands, With Maps, Model, Sections and Engravings—A. C. Veatch.
- Magnetic Declination and the Establishment of Meridional Lines—G. D. Harris.
- Paleontology:
  - Cretaceous—Midway and Lignitic Eocene—By G. D. Harris. All species figured.
  - Eocene Paleobotany—Description and illustration of the fossil plants collected by the survey during 1899—By Arthur Hollick, Columbia University.
- Report on the Clays of Louisiana Collected by the Survey, 1899—Dr. Heinrich Reis.
- Road Improvement—G. D. Harris.
  - What is Being Done by Other States for the Improvement of Highways.
  - How to Commence the Work of Improving the Roads of Louisiana.
- Index.

They are both now in the field and are diligently prosecuting their work. Particular attention is given to the study of the underlying water-bearing strata with a view of determining the artesian possibilities in every section of the State. Later, a map of the State showing such possibilities will be given the public.

SOIL SURVEY.

Through the liberality of Prof. Milton Whitney, Chief of Division of Soils, approved by Secretary James Wilson, of the Department of Agriculture, arrangements have been made for studying and mapping the soils of Louisiana. The Division of Soils will furnish the necessary field assistants for three or four months of each year to perform the work in Louisiana, mapping the soils and collecting samples, and will make the necessary mechanical analyses, prepare the manuscript maps of the soil areas, and suitable descriptive matter to accompany each map. The Experiment Station will
FARMERS' INSTITUTES

Were held in many of the parishes of this State, under the direction of Gen. Leon Jastremski, Commissioner of Agriculture and Immigration. Nearly every member of the staff of the stations took an active part in these institutes, and the great good accomplished will more than compensate for the absence from official duties.

The following constitute the present staff of the stations:

SUGAR EXPERIMENT STATION NO. 1.


William C. Stubbs, A. M., Ph. D., Director.
R. E. Blouin, M. S., Assistant Director and Chemist.
J. F. Harp, B. S., Assistant Chemist.
H. E. Wright, B. S., Assistant Chemist.
Simon Baum, B. S., Assistant Chemist.
George Chiquelin, Sugar Maker.
W. D. Clayton, M. S., Farm Manager.
Arthur C. Veatch, Geologist.
James H. McHugh, Secretary and Stenographer.

STATE EXPERIMENT STATION NO. 2.

Post Office, Baton Rouge, La.

William C. Stubbs, A. M., Ph. D., Director.
—, Assistant Director.
Charles E. Coates, Jr., Ph. D., Chemist.
R. Glenk, B. S., Assistant Chemist.
W. R. Dodson, A. B., S. B., Botanist.
H. A. Morgan, B. S. A., Entomologist.
F. H. Burnette, Horticulturist.
James Clayton, Farm Manager.

NORTH LOUISIANA EXPERIMENT STATION NO. 3.

Post Office, Calhoun, La.

William C. Stubbs, A. M., Ph. D., Director.
J. G. Lee, B. S., Assistant Director.
make the chemical analyses. The Department will furnish the station with copy of the manuscript maps, with mechanical analyses, and descriptive matter, with permission for publication. The Division of Soils pays the salaries of the above assistants, and the station pays their expenses while engaged in the work.

In accordance with this agreement, Profs. Dorsey and Smith, of the Division of Soils, reported for duty on the 1st of December, 1899, and were assigned to work in the Florida parishes, beginning at the northwestern corner of West Feliciana and proceeding directly eastward to the Pearl river. They have finished the Florida parishes and have now divided, Prof. Dorsey going along the line of the Southern Pacific, platting a township at each of the following places: Gretna, Lafourche Crossing, Schriever, Franklin, Adeline, Iberia, Lafayette, Crowley, Jennings, and Lake Charles. At Lake Charles he will proceed northward along the line of the Pittsburg and Gulf, selecting a township at De Quincy, Leesburg, Many and Mansfield.

Prof. Smith starts at Vicksburg and proceeds along the line of the Vicksburg, Shreveport and Pacific Railroad, mapping a township at Delta, Tallulah, Delhi, Girard, Monroe, Calhoun, Arcadia, Minden, Red River bottoms in Bossier, and Shreveport. At Shreveport he will start south on the Pittsburg and Gulf, and take typical townships in the vicinity of Gloster, Mansfield and Natchitoches.

The work this year will cover the typical soil areas of the State, and will aid us greatly in our already extended study of the soils of the State.

It is hoped, if finances will permit, to continue this survey until every parish in the State will be thoroughly mapped and every type of soil thoroughly studied.

The work in the laboratories keeps pace with the progress in the field. Over five hundred mechanical and two hundred chemical analyses of the soils of the State have already been made, and it is the aim and design of the station to accompany the soil maps with complete analyses of the soils, and full description of the best modes of treatment when devoted to different crops.
At the end of this report will be found a correct exhibit of the receipts and expenditures arising from the Hatch Bill for the fiscal year ending June 30, 1899. It shows expenditures have equalled receipts. There were other receipts besides those from the Hatch fund.

In closing this, my last official report to you as Governor of the State, permit me to return my high appreciation of, and sincere thanks for, the generous interest and cordial support which you have, for the past eight years, manifested in the stations and the agricultural welfare of Louisiana.

Respectfully submitted,

WM. C. STUBBS,
Director.

Statement of receipts and expenditures of the Louisiana Agricultural Experiment Stations, in account with the United States appropriation:

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<tr>
<th>Item</th>
<th>Cr.</th>
<th>Dr.</th>
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<tr>
<td>The receipts from the Treasurer of the United States for the year ending July 1, 1899</td>
<td>$15,000 00</td>
<td></td>
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<tr>
<td>By salaries</td>
<td>$7,911 77</td>
<td></td>
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<tr>
<td>labor</td>
<td>2,869 63</td>
<td></td>
</tr>
<tr>
<td>publications</td>
<td>737 15</td>
<td></td>
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<tr>
<td>postage and stationery</td>
<td>332 30</td>
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<td>freight and express</td>
<td>335 43</td>
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<tr>
<td>heat, light and water</td>
<td>143 25</td>
<td></td>
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<tr>
<td>chemical supplies</td>
<td>351 85</td>
<td></td>
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<tr>
<td>seeds, plants and sundry supplies</td>
<td>555 25</td>
<td></td>
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<td>fertilizers</td>
<td>120 76</td>
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<td>feeding stuffs</td>
<td>260 16</td>
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<td>library</td>
<td>141 52</td>
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<tr>
<td>tools, implements and machinery</td>
<td>110 47</td>
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<tr>
<td>scientific apparatus</td>
<td>119 84</td>
<td></td>
</tr>
<tr>
<td>live stock</td>
<td>1,011 62</td>
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</tr>
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</table>

$15,000 00 $15,000 00
We, the undersigned members of the Board of Agriculture and Immigration, to whom is entrusted the disbursement of the above funds, do certify that we have examined the accounts of the Experiment Station of the Louisiana State University and Agricultural and Mechanical College, for the fiscal year ending June 30, 1899, and have found the above classification to be correct, and the receipts for the time named are shown to be $15,000 and the corresponding disbursements are $15,000, for all of which the proper vouchers are on file, and have been examined by us and found correct.

Leon Jastremski,
Commissioner of Agriculture and Immigration.

Wm. Garig,
Vice President of Supervisors and ex-officio Member of Board of Agriculture.