ELECTION OF OFFICERS.

The election of officers for the ensuing year resulted in the unanimous election of the following:

President: HON. JAMES WILSON, Washington, D. C.
 Vice-President: HON. CHARLES WILLIS WARD, Queens, N. Y.
 Secretary: HON. W. M. HAYS, Washington, D. C.
 Treasurer: HON. N. H. GENTRY, Sedalia, Mo.
 Chairman Animal Section: DR. C. B. DAVENPORT, Cold Spring Harbor, N. Y.
 Chairman Plant Section: DR. H. J. WEBBER, Ithaca, N. Y.
 Secretary Plant Section: PROF. N. E. HANSEN, Brookings, S. Dak.
 Assistant Secretary: H. H. MOWRY, Washington, D. C.

The greater part of the time of each session was devoted to reading and discussion of the committee reports and papers, which follow:

METHOD OF EFFECTING BREED AND HERD IMPROVEMENTS AS USED BY THE HOLSTEIN-FRIESIAN ASSOCIATION.

By F. L. HOUGHTON, *Brattleboro, Vt.*

Primarily the method of effecting breed and herd improvement by the Holstein-Friesian Association of America is outlined in its by-laws and is summarized in the regulations and forms used for applications for registry and transfer.

This association, like all others, accepts without question the statements of breeders in regard to breeding data, provided that a comparison of such data with the office records shows no necessity for inquiry or correction of errors, failure to record transfer of ownership, etc. In short, the purity of the breeding is entirely a matter of honor, but the system of recording provides numerous safeguards which necessitate upon the part of the breeder a very careful keeping of his records.

The steps which a herd-book association may take to uplift the breed or the standard of breeding are apparently limited by practical considerations, and it remains largely with the individual breeder to so select, breed and develop his cattle as to secure the substantial improvement of the race.

The Holstein-Friesian Association devotes much attention to the distribution of literature relating to the breed, from which good comes, and from which is derived inspiration toward the better handling and development of herds.

The feature of the work of this association from which the improvement of the breed is looked for, and from which substantial improvement may come, is the system of advanced registry.

This system was inaugurated in 1885 and, under the rules then promulgated, was more or less used by breeders up to 1894, when, by the adoption of various features, the attempt to secure measurements of the animals entered practically ceased and reliance upon performance alone was made the requisite for admission.

The original system of advanced registry provided for exact descriptions and measurements of the animals admitted, and typical conformation was secured by the requirement that each animal should score 80 points of the adopted scale.

This system was originated by Mr. S. Hoxie, a man well qualified by practical knowledge, as well as by much study and observation, to outline and prescribe its rules.

In the preface of the second volume of this interesting record, issued March 1, 1889, Mr. Hoxie said:

The objects of this register are to increase public interest in Holstein-Friesian cattle; to aid breeders in the work of improving them, and to collect and preserve observations upon them from which principles relating to their selection and breeding may be deduced.

The common system of pedigree registry originated upwards of eighty years ago. Since then it has been the most efficient means of awakening and sustaining public interest in the different breeds of pure-bred cattle. For several years sagacious observers have seen that the time was approaching when a step in advance of that system must be taken. The Holstein-Friesian Association leads off in this movement. Since the issue of its first volume, steps have been taken for the establishment of similar registers for three other breeds. Whatever vicissitudes this movement may encounter, a strong assurance is felt that it is a necessity, and that it must eventually mark an era in the advancement and improvement of all breeds of pure-bred cattle.

Writing at an earlier period, Mr. Hoxie said:

The information gathered in this work in regard to the structure and style of our noted cows must be of value to all who are interested in improving the breed. The means are here afforded of determining models, and of intelligently seeking such combinations of breeding as will produce our ideals in form and structure. The measurements have been taken with much care, and the descriptions have been made as correctly as fallible judgment and condensed language have permitted. Years will add especial value to this part of the work. The time is coming when it will be regarded quite as important to trace peculiarities of structure and peculiarities of qualities in the lines of ancestry as to trace pedigrees. This work is also a slight offering to science. There is yet to be a science of cattle selection and cattle breeding. But such a science can never be established without a multitude of observations such as this work affords.

The exact details of this system would probably be of little interest at this time, but in a general way an excellent idea is conveyed by a quotation from the pamphlet issued by the Holstein-Friesian Association of America, entitled, "Holstein-Friesian Cattle," as follows:

This Advanced Registry system is designed to advance the interests of every breeder. It affords the means of bringing the merits of every man's herd to the attention of his fellow-breeders. It also serves to check false claims to merit: It demands full proof of all records received.

Two opposite tendencies are manifest in the handling of every improved breed of cattle, one toward degeneration, the other toward further improvement; the former is brought about by illiberal feeding and unskillful selection and breeding; the latter by wiser management and better methods. This system is designed to especially encourage the work of improvement. It gathers the records of the great cows of the breed and proposes to gather descriptions and measurements of its most valuable bulls as well as cows. The value of these records must increase with time and the increasing popularity of the breed. The great breeders of England have always based their herd-books on selection. The same is true of the Holland breeders. No animal is received into their herd-books unless personally examined and measured by an expert and declared to be of especial merit. This examination takes place after a cow is in milk, or a bull has produced offspring.

Furthermore, public interest in a breed can only be maintained by constant selection, either by breeders personally or through the methods of an association of breeders.

The selection of bulls for Holstein-Friesian advanced register is made in two ways. The first is through breeding and structure. This requires that a bull to be eligible shall be the offspring of an advanced registry cow, of the full brother of two such cows, or the half brother of four such cows. His superiority as a stock-getter must be shown by at least three of his get, and he must be able to scale in the judgment of the examiner at least 80 points of the scale of points of the association, and be capable of weighing at five years old, in good flesh, at least 1,800 pounds.

The other way is through the official records of daughters. The superintendent of this system is required to enter all bulls, living or dead, four or more daughters of which have made official records. This he must do whether application for entry is made or not. Such bulls are regarded as especially valuable, and a proposition has been made to name them 'standard bulls.'

The selection of cows for this registry is largely based on records of milk and butter production. The rules fix minimum requirements for every day of age from two to five years. To accommodate different classes they provide two milk records, either of which will admit to entry, one for a continued period of ten months; the other for two short periods of ten days each, one of which must be made after eight months' milking. The rules also provide two other records, either of which will also admit to entry, one of butter fat, the other of butter made by the churn.

"If calving at two years old or under two years, the requirement of a cow is not less than 6,500 pounds of milk in ten months; or 354 pounds and 118 pounds in periods of ten days each, the latter eight months from calving; of butter fat, 7.2 pounds in a week; of butter by the churn, 8 pounds in a week. If calving at just three years old the requirement is not less than 7,900 pounds for the long milk record; or 432 pounds and 144 pounds for the short records; for the butter fat record, 8.8 pounds; for the butter record by the churn, 11 pounds. If calving at just four years old the requirement is not less than 9,300 pounds for the long milk record, or 511 pounds and 170 pounds for the short records; for the butter fat record, 10.4 pounds; for the butter record by the churn, 13 pounds. If calving at just five years old the requirement is not less than 10,700 pounds for the long milk record, or 589 pounds and 197 pounds for the short records; for the butter fat record, 12 pounds; and for the butter record by the churn, 15 pounds. Every day of age from two years to three, from three years to four, and from four years to five increases the requirements as follows: That of the long milk record, 3.83 pounds; of the short milk records, the first, .21 of a pound, the second, .07 of a pound; of the butter fat record, .00439 of a pound; and of the butter record by the churn, .00548 of a pound.

"Every such record must be attested under oath by all persons who are associated in making it. If description and measurements of the cow are entered with it, the inspector is required to certify, in case the record is not official, that, in his judgment, she is capable of its production. If a private record, and it reaches 18 pounds of butter fat, or 22½ pounds of butter, the Superin-

tendent of this registry is required to proceed to further investigate it by a re-test of twenty-four hours."

The conditions of this class of official records are: (1) They must be made under the *personal, critical and official supervision of representatives of State Experiment Stations*; (2) they must be made by using the scales and the Babcock test, or other method approved by the Association of Agricultural Colleges and Experiment Stations; (3) they must invariably be for periods of not less than seven consecutive days; and (4) such a record must be confirmed by the affidavits of the owner of the cow, the milker of the cow and official supervisor of the test, vouched for by the officer of the State Experiment station under whose direction the test was made and the record produced.

Their value lies in the facts that (1) they are unquestionably reliable; (2) they discover valuable strains of blood hitherto unknown; and (3) they lead to the employment of the richest and most productive strains to improve the dairy cattle of our country.

Retests are sometimes made to confirm such records. The Superintendent of Advanced Registry is authorized to order such retests and to reject records that, in his judgment, fail of full confirmation. He may require the services of two representatives of the station in making a retest, in order that the cow may be kept constantly in view of one or the other of them for at least twenty-four hours or more during the retest.

Jessie Maida.

The Association is annually appropriating large sums of money to encourage the making of these records. At the present time it is offering a series of cash prizes, ranging from \$10 to \$40. They are for cows classified according to ages, as follows: (1) Cows five years old or over; (2) cows four and a half years old and under five; (3) cows four years old and under four and a half; (4) cows three and a half years old and under four; (5) cows three years old and under three and a half; (6) cows two and a half years old and under three; (7) cows under two and a half years old. There are 138 such prizes—48 for thirty-day records and 90 for seven-day records; only three in each division can be awarded to a single breeder; hence there is a wide distribution of prizes among the contestants,

Condensed reports of official records are sent monthly to a large number of agricultural journals and to breeders who request them. These reports give the names of the cows, their herd-book numbers, days for calving to commencement of records, number of pounds of milk, number of pounds of butter fat and the equivalent pounds of butter at 85.7 per cent. of a pound of fat as found in the milk for a pound of butter.

Under the operation of the system as originally adopted, entries of about 25 bulls and 300 cows were made, thus securing a considerable amount of data of much value. No attempt has been made by the association, however, to digest this mass of the measurements and records. Individuals have occasionally made interesting studies thereof. Mr. Geo. W. Knorr, writing in the *Holstein-Friesian Register* of December, 1898, offers a demonstration of the value of keeping the measurements of cattle in the advanced register.

De Kol Creamelle.

At the annual meeting of June, 1907, modifications of the system were made which largely confine it to a record of performance only, and in fact which it has been since 1894.

These records of performance are of the greatest possible interest and value to breeders and students. Of records of this class there have been entered up to May 15, 1907, 6,646 cows.

From the last report of the Superintendent of Advanced Registry the following quotation will convey an idea of the extent of the work and a general average of performance. The Superintendent reports:

The total amount of official work passing through this office amounted for the year, to 2,321 weeks, covering over 56,000 milkings, each of which was separately watched over by a supervisor, who weighed the milk and determined the amount of butter fat contained therein. It is only through such details that the immense amount of official testing being done by Holstein-Friesian breeders can be realized. The 1,725 cows and heifers of all ages competing for prizes in the 7-day division produced in a period of seven consecutive days 596,670 pounds of milk containing 22,522.385 pounds of butter fat, thus showing an average of over 3.41 per cent. fat, as against 3.39 shown last year. The average for each animal was 376.6 pounds of milk containing 13.156 pounds of butter fat equivalent to 15.25 pounds of the best commercial butter.

The work of individual cows during the year has in many instances been phenomenal; and the official record has been broken in classes 1st, 3d, 4th and 7th, of both the 7-day and 30-day divisions. During the year, the names of Colantha 4th's Johanna, Grace Fayne 2d's Homestead, Covia Hengerveld 3d, Bessie De Kol Rue 2d, and Mary Walker Pietertje—the cows setting the new marks for Holstein-Friesian breeders to strive to excel—have become well known to thousands of Holstein-Friesian men, and to hundreds of thousands of dairy farmers between the Atlantic and Pacific. * * * I have not space here to make a full comparison, but find that in four years and with an average of three times the number of animals competing, you have raised the average yield of fat for Class 1 nearly one pound, and for Class 7 nearly three-quarters of a pound; while the average for all cows and heifers competing in all the classes has been raised .645 of a pound of fat.

The Superintendent of Advance Registry of the Holstein-Friesian Association of America in the preface to Vol. 18 of the Advanced Register states:

Among these entries, 47 cows produced in excess of 20 pounds of butter fat in a period of seven consecutive days; while 29 heifers under two and one-half years of age produced over 13 pounds of fat in the same period of time.

During the official year (ending May 15, 1907), 1,725 cows and heifers of all ages were officially tested for a period of at least seven consecutive days; producing for that time 659,840.6 pounds of milk containing 22,629.929 pounds of butter fat, and thus showing an average of over 3.41 per cent. fat. The average production for each animal was 382.5 pounds milk containing 13.119 pounds butter fat; equivalent to nearly 27 quarts of milk per day, and 15.25 pounds of the best commercial butter per week.

During the year (ending May 15, 1907), 131 animals of all ages were officially tested for a period of 30 consecutive days; producing in that time 257,253.3 pounds of milk containing 8,876.896 pounds of butter fat, and showing an average of 3.45 per cent. fat. The average for each animal was 1,963.8 pounds of milk, containing 67.762 pounds of butter fat, equivalent to more than 79 pounds of the best commercial butter. This average exceeds that of the preceding year by 104 pounds of milk and nearly 6 pounds of butter fat.

¶ The great work that Holstein-Friesian cows are doing is shown by the fact that, to the close of this volume of the advanced register, 54 animals have made seven-day records in excess of 21 pounds butter fat. These 54 cows average 578.7 pounds milk containing 22.662 pounds of butter fat, thus showing an average of 3.92 per cent. fat; and every well-informed person knows that this amount of fat is equivalent to 26 1-3 pounds of the best commercial butter. Up to the same time, 53 Holstein-Friesian cows have officially produced in excess of 80 pounds of butter fat within a period 30 consecutive days; the average production for each animal being 2,479.8 pounds of milk containing 87.973 pounds of butter fat, and showing an average of 3.55 per cent. fat. This average production is equivalent to 37 8-gallon cans of milk, or 102 2-3 pounds of best commercial butter.

Doubtless the first effort that a breeder or dairyman should make in attempting to improve his herd should be to ascertain the exact yield of his cows. No greater incentive could be offered than the system of prizes now in vogue, while the public distinction which is given to the owner of such tested cows is a valuable commercial asset, resulting in a largely increased price obtainable for such cows, and their progeny.

A very convenient and valuable compilation of these Advanced Registry records has each year been made and published in the Holstein-Friesian Year Book, giving a list of the cows tested and their yields and a list of the sires of such tested cows, a list of the daughters and their yields appearing beneath the name of each sire. A further list gives the name of each cow that has produced two advanced registry daughters, and the name, age, and record of each daughter.

Colantha 4th's Johanna.

The Year Book thus condenses for ready reference the entire contents of the advanced register, enabling the observer to readily distinguish the large record cows and their sires and dams and make such application of the data as may be desired in endeavoring to improve his herd.

Caspar L. Redfield, whose work of analysis of the pedigrees of trotting-bred horses appears to demonstrate that those horses of greatest speed are the results of breeding together of mature animals of demonstrated ability, has applied his theory to the Holstein cow,

and in a series of articles printed in the Holstein-Friesian Register (April to June, 1907), using the records of the advanced register as a basis and adopting as a standard for his investigation cows whose yields were one-third above the standards of the advanced register, deduces certainly very interesting and, I believe, wholly conclusive results.

Mr. Redfield takes 137 cows in whose pedigrees the ages could be obtained for 951 dams, granddams, and great-granddams, and by a slight relaxation of his arbitrary standard of performance, this list was increased to 144 cows, in whose pedigrees were the ages of just 1,000 cows. All of these cows were born since 1901 and they are the largest milk yielders for their respective ages that have been tested up to February 15, 1907.

Mr. Redfield by way of preface says:

One of the problems which has bothered biologists for many years, and one which, if rightly answered, is of vast importance to breeders, is the determination of whether a continuous development arising from a function continuously performed is or is not inherited by offspring produced by the animals so developed.

It will be obvious that, if the development in milk-yielding capacity which a cow acquires as a result of being regularly bred and milked is transmitted in greater or less measure to her offspring, then the road to progress in milk production is through the preservation for stock purposes of the calves from mature and comparatively old cows rather than through the calves of young or immature cows. The cows, therefore, which we are to investigate are those which yield very large quantities of milk, and our object is to discover whether these cows come from old dams, from young dams, or from dams whose ages average the same as in those in ordinary breeding operations. As a basis for any intelligent comparison it is necessary to make a standard which will tell us at what average age Holstein-Friesian cows come fresh under the breeding conditions that have existed in this country during the past few years. An elaborate tabulation shows this standard to be four years, three months, 21 days, or an average total age for seven dams in a pedigree like that given, of thirty years, one month, twenty-seven days. The majority of selected cases should show an average above this standard, and none should fall below it. The combinations which have produced cows capable of yielding very large quantities of milk are those combinations in which the dams, granddams and great-granddams each average one year, four months, twenty-seven days older than do the dams, granddams and great-granddams of the average-bred cow. This may not be considered a great difference, but five years, eight months, eighteen days is nearly 33 per cent. greater than four years, three months, twenty-one days. The final results of the selective operation in the few years in which these cattle have been bred in this country has succeeded in raising the average age of dams of females only one year above the average for the breed, but has raised the average age of dams of males two years above the average for the breed. It means that when breeders select those blood lines which they think are the best, and are successful in their selection, they are selecting, unbeknown to themselves, lines which came from old and well-matured cows.

Of the 144 cows selected because of their great capacity for the production of milk, not a single case shows itself to be an exception to the general principle that the road toward still greater production is through animals which have been well developed before they produce the progeny intended for further breeding.

Mr. Redfield's deductions seem to be of the greatest possible value to stock breeders, and it is obvious that the system of advanced registry has thus furnished the data for the application of Mr. Redfield's theory. In the foregoing summary of Mr. Redfield's work it must be understood that I have omitted the various details of tables, deductions, and arguments.

METHODS USED BY THE AYRSHIRE BREEDERS' ASSOCIATION IN PERFECTING THE BREED.

By C. M. WINSLOW, *Secretary of the Ayrshire Breeders' Association, Brandon, Vt.*

ORIGIN AND INTRODUCTION OF THE BREED.

The mention of the name of Scotland always suggests to the mind a country of rugged exterior, of fierce winds, and terrific storms; the name of Scotchman sterling grit and hardy constitution. So when we mention the Ayrshire cow, the suggestion is of an animal fitted for a life of daily battle for sustenance, against all the opposing elements of nature.

The County of Ayr in which the Ayrshire breed of cattle originated is situated in the southwest of Scotland, backed by mountains on the east and washed by the ocean on the west, having the form of a crescent, and embracing the Firth of Clyde in its circle. The face of the country is hilly, and rises from the level of the sea some 2,000 feet to the top of the mountains on the east. The soil is strong, and somewhat heavy, being a clay and clay-loam, but thinner on the tops of the hills and mountains, the whole being originally covered with a dense growth of timber. The climate is moist, with a temperature ranging from about 25° to 65° F., with a mean temperature of about 47° regulated by its proximity to the sea, and with frequent rains, which are favorable to growth of grass, and giving luxuriant pasturage, though sometimes it is swept by fierce coast storms.

The Ayrshire is probably the youngest of the thoroughbred dairy breeds, and though her origin is veiled in some obscurity, there are many things that confirm the theory that the native wild cattle of the country are the foundation of the Ayrshire of modern times. The original native wild cattle of the country were said to be white with red ears and black noses, high white horns with black tips, with an animal now and then having more of the brown, black, or red; very wild and the bulls fierce, but when calves were taken young, they would grow up to be quiet and tame. This theory seems the more reasonable when we consider how easily the Ayrshire color reverts to the white, then too there is frequently an Ayrshire that has a strong tendency to that wild alert bearing that characterized the foundation stock.