in the early part of the season, it was estimated, had cut short the crop of the season "40,000 to 60,000 lbs. for every 700 to 800 cows," equal to a deficit of 50 or 60 lbs. per cow. This loss in yield of cheese is followed by an estimated defect of one-third in the winter's keep, the price of which is very high, while stock is very low—hay $25 a ton at the barn, and good straight young cows $15 per head. The exports from the U. S. for the year are put by Mr. W. at 75,000,000 lbs., which is from 20 to 25 millions more than any previous year. If these estimates are correct, the deficit in home consumption must be large With this large and increasing exportation, with 500,000 cheese-eating emigrants added to our number annually, and with the rapid increase of our own population, the danger of over production was thought not to be imminent. To alleviate the misfortunes of drought and panic a reduction of farm wages to $1½ per month for each cent per pound cheese sells for—cheese at 12½ cents, wages per month should be $18; to guard more carefully against little wastes on the farm and in the family; to trust less to hired help; and weeding out unprofitable animals, to keep better stock, and care for it more kindly. Hon. Harris Lewis, of Frankfort, N. Y., spoke on "adaptation." He would have the young dairyman begin the work of adaptation, by selecting a companion suited to his vocation, a farm adapted to the business of dairying; stock suited to the special branch of the art he would pursue; the kind of food adapted to that branch, and the quantity of the herd, never pinching them an hour. He recommended *grass* as the proper food of cows in the summer, and *dried grass* for winter, especially so long as cows are in milk. He urged that for profit, for quality and quantity of milk, and health of stock, *grass* was better than *grain*. Hon. John Stanton Gould, of Hudson, delivered the annual address, subject—"cleanliness." Cleanliness had a wider signification than it was customary to give to that term. It excluded all substances found in milk not necessary to its composition. Milk is made up of certain materials in certain conditions and proportions, as water, butter, sugar, casein, and certain minerals—and all matter contained in milk foreign to these necessary constituents, no matter what it might be considered under other circumstances, must be regarded as filth when combined with milk. The otto of roses would be filth in a milk pail. It is not even necessary that something be added to make milk unclean. There is such a thing as native filth, that may grow into rank uncleanliness. The milk collected at the condensing factories is of the highest order of purity, yet, while in the vacuum pan undergoing the process of condensation, it gives off a mingled odor, a cow's breath, and her stable, that is most offensive. Filth may, therefore, be cultivated. It may also be absorbed, as well as added by contact with unclean vessels, or by unclean handling. The cause of the native filth is a ferment, which exists alike in the milk of the wild and domestic cow It is a fungus plant, only seen with the microscope. It grows like yeast, and in its growth gives off gases, and a strong smell, which dairymen call "animal odor." It is of the nature of rennet, and if milk is kept covered and warm it will soon thicken into curd without souring. It grows also by unnatural disturbances in the health of the cow, as by heating her blood.

The composition of butter, and the acids that form in it were minutely described, and also the peculiar changes that occur in cheese. The various modifications which occur in these highly complex bodies were attributed to the effect of cryptogamous plants, which, it was urged, was important for dairymen to study, as upon their peculiar development depends the perfection or destruction of all his goods. Though active in all his operations they are, as yet, little known to dairymen. They float by myriads in the scented air from the adjacent pen, the whey vat, the kitchen, and the cellar, and contaminate his butter, his cheese, his milk, but most of all his cream. The speaker also impressed the propriety of a better understanding of all the laws connected with the production and the management of milk, and suggested the formation of a scientific commission to develop and expound them.

Acids have become an important item in the dairyman's art, and it is of much consequence that he should know the exact state of their development as the work goes on. To show the possibility of doing this, Mr. G. introduced one of Twitchell's acidometers, and performed experiments in the presence of the audience, to show how easily and certainly slight degrees of acidity could be determined.

The subject announced for Prof. E. J. Wickson, of the *Utica Herald* was "Feeding at a mark." The professor explained the nature of the changes that are constantly occurring in matter, how inorganic assumes to be organic, and becomes vegetable, how vegetable matter is converted into the substance of vegetable eaters, and the vegetable eaters themselves into animal eaters—the matter in each transformation becoming more highly organized and complex. The burden of the discourse was to shew how feeding for a special purpose could be accomplished. He proceeded to show, by illustrations on canvass, how the supporters of respiration, and also albumenoids are changed from one to another of the many forms which each of these classes of substances are often assuming, how starch, and woody fibre are changed into sugar, by giving off a trifle of one of their elements, and how sugar is in the same way converted into fat. In a similar manner, by increasing or diminishing certain elements, the flesh-forming materials, albumen, fibre, casein, &c, are changed from one to the other. In feeding for a special purpose, that food which requires the least change to convert it into the desired product is to be preferred. If fat is the object, it may be derived from starch or sugar, or fatty matter itself. Sugar may be changed into fat by the loss of a little oxygen, while starch must first be changed into sugar before it can become fat. The sugar, therefore, will better contribute to the formation of fat than starch, because the latter requires two changes to be thus converted. But fatty matter which exists in the vegetable already formed, can be appropriated by the animal without any change, and is to be preferred to either. The tendency to accumulate fat is stimulated by the ease with which it can be done. The tendency to form bone, muscle, or milk, can be cultivated in a similar manner by providing the animal with food that will be converted into the desired material with the least change. Thus, in forming milk, casein is ready formed in peas and beans, sugar in fruit and beasts, and the fat in oily seeds, corn, &c. The lecturer proceeded at some length to point out the way in which chemistry can be made available in assisting the dairyman to make up rations for his cows that would enlarge and prolong their yield of milk. The discourse was listened to with a deep interest.

L. B. Arnold, of the CANADA FARMER, occupied the stage after Prof. Wickson. Subject, "The influence of heat as used in cheese-making." All the changes in milk, that occur in the process of cheese-making, are induced by the agency of some variety of the cryptogamous plants, which have been referred to by Mr. Gould. The effect of heat, up to a certain degree, hastens the growth of these plants, and hurries up the changes their growth produces. The higher the degree of heat, compatible with their growth, the more rapid will be the coagulation of the milk, the separation of the whey, and the conversion of the curd into ripened cheese. But, in the manufacture of cheese, it is more important to carry on the changes *evenly* than *rapidly*. In the present mode of working, we often fall short of uniformity. The curd on the top of the vat, or vessel, in which the milk is coagulated, is apt to get cooler than that at the bottom and sides, which are protected from contact with the air. The curd thus cooled does not ripen as rapidly as that which is kept warmer. It never catches up with the warmer curd; and when the latter has become ripened to the proper degree to go to press, the former will be too soft, and the contents of the cheese will not be uniform. It will contain hard and soft spots. In a recent journey that extended over a considerable portion of the State, frequent cases of this kind were met with, especially outside of the Mohawk valley. The rennet is usually applied to milk at 80 to 84 degrees, and by standing, falls from 4 to 6 degrees lower. The scalding is generally at 98, the whole mass being raised about 20 degrees. As heat is applied at the bottom and sides of the vat, it cannot be evenly applied while the curd is in one mass, so it is divided by cutting into pieces more or less minute. The larger the pieces the more unevenly will they heat. As the temperature rises, the outside of the lumps heat first, and the inside is all the time a little behind. This difference in "cooking," between the inside and outside of the lumps, affects the quality of the cheese unfavorably, and is a serious obstacle in the way of successful manufacture, especially on the plan known as "coarse curds." The finer the curd is divided, and the more thoroughly it is stirred to keep it fine, the more evenly will it heat, and the better will be the cheese, but the greater will be the waste. It is a very difficult matter, and one that can only be accomplished with long experience, and close observation, to regulate the fineness of cutting, and the method of stirring, so as to secure an even heating of the curd, and at the same time avoid loss.

To obviate these difficulties, it is suggested that vats be so constructed as to maintain their contents at a uniform temperature, that the rennet be applied to the milk at such a temperature as careful observation shall decide as best, and then let the ripening of the curd, without cutting, go on at one uniform degree till it is ready to grind and salt. This would greatly simplify the process of cheese manufacture, and bring it more within the range of prescribed rules, and make it less dependent on skill and experience.

This process was not presented as a perfect plan to which no objections could be made, but as a suggestion to be considered. The plan has been a favorite one with the speaker for several years, and some experiments have been made looking toward its adoption. It has occurred to others as well as the speaker, and cheese has been made to a limited extent on this plan that has proved to be good, and to yield at least 10 per cent. more product than the ordinary method. Under these circumstances, it was deemed appropriate, at a meeting composed chiefly of the most intelligent experts, to throw out the suggestion for criticism, and food for thought.

Hon. Josiah Shull, of Ilion, discussed upon cross-breeding for the improvement of dairy stock. The common stock of the country, Mr. S. considered, were made up, not of any particular breed, but of a mixture of many breeds. They are generally called natives, but they are not natives. The only native cow is the buffalo. There is often good veins in the blood of common cattle that can be made useful by crossing with some good animal. The object of the dairymen is milk, and in crossing with other stock this must not be lost sight of, but other things should not be ignored. Beef is also an object with the dairyman, and to a certain extent, beef is not incompatible with milk. We should cross to increase size. The cow is a machine, and large machines work more economically than small ones, especially in our severe climate. Crossing with milking strains of the Short horns was recommended. It had proved successful in his experience. Mr. S. went into a minute calculation to show the difference in profit between common, and large milkers. The profit, however, was all with the large milkers. Constitution was a grand point to be regarded. Size, nor milking qualities were valuable without it. Large consumption is necessary to large results in milk or