MICROBES CAUSE THE AROMA IN BUTTER AND CREAM.

Results Obtained by Experiments with Bacteria-By a Process of Sterilization and Culture the Desired Aroma May be Given to Butter Uniformly-Practical Success.

Modern dairying within the past few years has been placed upon a scientific basi and many of the problems that formerly perplexed dairymen are now rendered explicable through the application of science to practice. Knowledge in dairying like all other technical industries has grown mainly out of experience. Modern dairying s attempting to build its more accurate knowledge upon a surer foundation and in doing this seeking to ascertain the cause of well-established processes.

To assist in such work bacteriology come as a potent ally and is thriving together with chemistry to broaden and strengthen the principles upon which advance in scientific dairying is made possible. Bac- | before the year 1694, the circulating medium | teriology is the youngest member of the sisterhood of those sciences that deal with species of straw, and which the natives life and its functions. For a long time it called libongos. Each libongo represents was merely a portege of medicine and even a value of five reis. The substitution of now the term bacteria is associated with copper coin for this curious straw money some dread contagious disease. But with came near bringing about a revolution, and further study the effect of bacteria in many | was the cause of the death of many. As practical and useful lines is being shown medium of trade among the aborigines of and the circle of its influence is steadily widening.

Bacteria are the lowest type of vegetable life and are composed of a single cell. The most common methods of bacteria growth enable the plant to increase with astonish. ing rapidity. Many species under most favorable conditions multiply with wonderful quickness. These bacteria or microbes as they are frequently called, abound in air, water, soil and in living plants and animals. Cold hinders their development and when heated long enough at the temperature of boiling water they are killed, but those spores, which correspond to seeds, will endure even this temperature for some length of time, though higher heat kills them speedily.

GROWTH OF BACTERIA.

contain a very large number.

from being injurious is of a positive advan- tally or check, was given to the person the two are as follows: tage to the buttermaker since modern ex- for whose service it was intended; the perimentation has proved that the ripening other half, called the counter tally, of cream is due practically exclusively to was laid up for safe keeping until its their action, and circumstances which corresponding tally should be brought hasten bacterial growth also aid the ripen- in by the person who has last given ing process. The variety of these germs value for it. Its intrinsic value was, o great and there is no apparent uniformity it was composed, but, by representation, in regard to species. Scarcely two spec - it denoted large sums. It was a current mens of cream in the same creamery are token of real money and served actually ripened by the same variety of bacteria. to distribute it from man to man by this The conditions affecting the growth of exchange. From this primitive tally was different species of bacteria are entirely derived the Exchequer bill, first introduced beyond the control of the buttermaker and in 1696 by Mr. Montague, the Chancellor it is impossible to obtain uniformity of re- of the Exchequer. The word "bill," too, sults by the ordinary process of ripening. | was no doubt derived from the old French This fact is doubtless the cause of the oc- bille, which means a staff. Bank post bills immature, owing to the relatively large currence of butter of inferior quality at and bills of exchange in our own day come certain seasons, and is one of the causes of from the same wooden base, and soldiers in difference between the butter of different | England are still said to be "billeted," creameries and dairies.

out three important points in the handling | whom they were quartered. In olden times of milk and cream : First, the importance officers of the army who were taken into of keeping milk so far as possible free from bacteria by the exercise of the greatest cleanliness. Second, the importance of cooling milk immediately after it is drawn from the cow, in order to prevent the souring as long as possible. Third, the advantage of keeping cream under circumstances favourable to the growth of bacteria that induce ripening.

BACTERIA THAT RIPEN CREAM.

The different species of bacteria which effects upon it during their growth, yet all assist in giving the peculiar flavor to the cream and the aroma to butter. The chief object in ripening cream is to produce this butter aroma, and the aroma, though very evanescent, controls the price of the saleable product. The buttermaker owes to bacteria the flavor given to his butter, for by their growth the materials rise to good, some to extra fine and others | words. to a very poor quality of flavor. A major-

the species in his cream, but has been to do terrible things to themselves if you obliged to use those brought to his cream- refuse alms. A very common form of ery in the milk furnished by his custom- mutilation which they practice is that of ers. Science here offers a helping hand, blinding themselves. Less common, but seasons of the year that the failure of one for the bacteriologist can isolate and ob- still common enough, is it to have the arms or two does not ruin them. In fact, they tain in pure cultures the species of bacteria cut off. The number of the halt and the which produce the best flavored butter. blind passes belief. One prosperous beggar He can supply them to the creameries to of the city is a man who, in addition to vegetable crops turning out either poorly use as starters in cream ripening. This being blind, has an iron skewer run through or in such abundance that there is little artificial ripening of cream promises much both cheeks. He is said to twist it about money in the sales. For instance, during for the near future and already has been to keep the flesh ragged and raw. He goes the past season cabbages and potatoes have successfully operated at several experiment about with a small gong, on which he beats both turned out very poorly as a rule, and stations. The use of a pure culture of a to attract attention. species from Uruguay improved the flavor of the butter of a creamery 20 per cent., according to expert estimates.

Before inoculating a quantity of cream impart a high grade flavor to the butter, it leave Mrs. Goodsoul so soon? She is said small part of the market gardener's list. If is first necessary to kill all the germs present in the cream or the direct and individual effect of the inoculated species will be fruitless. Pasteurization or sterlization is the name asitic growths. The process consists given to the process of exterminating from milk or cream any foreign parastic growths. The process consists in heating the liquid to be sterilized to a temperature of 70 degrees centi-

grade and then suddenly cooling it to a comparatively low temperature. At the completion of the process, the inoculation takes place and the effect of one species of bacteria on the flavor of the final product, be it butter or cheese, can be studied. In addition to the necessity of cream undergoing this process preparatory to inoculation, it is also of practical advantage in

its preservation. will quadruple the consumption of cream in large cities and the dairy business will be considerably enlarged through this factor. Unsterilized cream is often thick and frequently thin. At times it keeps well and again it is sour as soon as delivered to patrons. In some localities, where the practice is in vogue of retailing sterilized cream, the product is annalyzed and more pasture than timothy acre per acre made of a certain per cent. of richness so that customers know each time the grade material they are purchasing. After cream has been pasteurized it can be preserved at least a week at this season of the

ODD FORMS OF MONEY.

Straw Mats, Shells and Other Primitive Mediums of Exchange.

In the Pertuguese possessions of Angola, consisted of small mats woven from a California, sea-ears or abalones (Haliotides) have been highly esteemed both for their beauty and importance when used as shell money, the shells in the latter case being cut into strips from one to two inches in shell, and about one-third as wide as long. These were strung on a string and used both as money and ornaments. The string bore the name of uhl-o aulone. As an From the reign of Henry 1. down to

the period of the establishment of the Bank of England, the legal tender money of England was fabricated out of wood, This instrument was called an exchange season, but only one of timothy. It may Bacteria grow with the greatest readiness | tally, and, by virtue of it, the holder was | not be quite correct to say that on average in milk and cream, exposed to the air, and entitled to receive from the Crown the by their development in these liquids cause value prescribed theron. It really conthem to sour and curdle. Vessels in which sisted of one-half of a four-sided rod or amount of clover produced would far exmilk and cream are kept, are a greatsource staff, on which, when in its entire state, of constamination by these parastic growths | the sum it purported to represent was hence cleanliness of the vessels in use about | carved in transverse notches, varying in | a dairy or creamery must be imperative. | width for thousands, hundreds, scores, | The longer a specimen of milk has been | pounds, shillings and pence. Those signs | exposed to the action of bacteria, other were for the unlearned. For the advantage apted to the growth of common red clover. things being equal, the greater will be the of those who could read the sum was number of bacteria present, and as a written in ink on two opposite sides of which are found growing in cream is very | course only that of the wood of which because formerly they tendered wooden Experimentation has, therefore, brought | "billes" or tallies to the victuallers upon the King's own pay were said to be put on the staff; that is, they were paid with Exchequer tallies, or wooden money.

### The Peddlers and the Beggars.

The peddlers and the beggars, the latter especially, are in every way worthy of notice. Pekin has more than is share of beggars, who are the most impudent, and on the ordinarily ripen cream produce varying whole, the most wretched-looking in the world, though some of them contrive to make a respectable living out of it. These are, of course, the more enterprising and clover, it is much more easily cured, and original—the men who have thought of, and it is pre-eminently the hay for horses. carried out with their own hands, some form of self-mutilation that is horrible to witness, and bound to attract the notice of | fed together. in the cream are decomposed and the com- strangers, upon whose charities they exist; pounds formed which produce the flavor for the ordinary Chinese do not give liberand odor of high grade butter. Different ally, and the spectacle is one with which species of bacteria vary much as to the they are more, familiar than the copy-book flavor they impart to butter, some giving | precepts from Confucius-their household

Beggar's Bridge, so called by the foreign ity of our common dairy species produce element, is a sight I shall not soon forget. good, but not the best, quality of butter. Numerous as they are everywhere about suffered probably as little as any other Up to the present time the manufacturer | the city, they crowd this place and sidle | class of farmers. The reason for this is not of butter has had no means of controlling along after you, whining and threatening so much that there is more profit in the

## A Stingy Woman.

Employment Agent-" Why did you to be a very nice woman.

begrudges the very air yeh breathe. " You amaze me.

ever twenty cents a gallon, is it ?"

" No." "Well she 'most had a fit 'cause I started | them pay. to pour a few drops of it in th' kitchen

# THE FARM.

Clover or Timothy for Stock.

The discussion of this question calls for an examination of the following among other features of comparison: First the relative suitability of clover and timothy The practical success of pasteurization respectively in furnishing pasture; second, the question of relative productiveness; third, the question of relative suitability or feeding in the matured form; and fourth the various kinds of live stock to which these foods are adapted.

> Clover will undoubtedly provide much on nearly all kinds of soil. But the common red clover will provide more than any other variety. This arises from the greater power of clover to grow up again after it has been eaten off, and from its greater power to resist drought. Though clover should be eaten off in an average season, it will come right up again, and will thus continue to grow from spring until fall, Thereas timothy will not grow much after the natural season for harvesting the matured crop. Clover is a deep-rooted crop; when it is pastured the roots find moisture away down in the soil, hence the exposure does not seriously hinder the growth o the clover. But with timothy it is different. It is a shallow-rooted plant. Consej ceases to grow.

length, according to the curvature of the the growth of young animals than young timothy, as the proportion of the albumibut timothy pasture is more suitable for Mexico a horse has been traded for a single than clover. For this reason it may be profitably sown with alsike clover to provide pasture, as alsike clover is a perennial.

As to relative productiveness, clover will have the advantage on average soils, since two crops of clover may be obtained in one soils twice as much clover could be obtained in one season as of timothy, but the ceed that of the timothy. In dry seasons the difference in favor of the clover would be greater than in moist seasons. But it should be borne in mind that timothy will grow well on low-lying soils not well ad-

In the matured form, as in the form of grass, clover has the advantage as a flesh natural consequence cream will usually the staff, and finally, with a knife and producer, and is therefore better adapted mallet the staff itself was split in two, for young animals than simothy. Accord-The presence of these organisms so far longitudinally. One half, called the ing to Stewart the digestible nutrients in

> Albuminoids. Carbohydrates. Fat. Per cent. Per cent. Per cent. Clover ... 7.82 Timothy .. 3 67 41.25 1.03

From the comparison thus given it will be apparent that where growth is wanted it will be obtained in a much greater degree from clover, but where fat production and heat production are wanted, timothy is guests. A strong wind was blowing, and therefore a better food for horses than the fire spread rapidly. clover, when they are being worked.

Clover has been found adapted to feeding a greater variety of animals than timothy, and under a greater variety of conditions. As has been said, it is relatively better for all classes of young animals which are yet proportion of the albuminoids which it contains. But it is more relished also than timothy if well cured; but is much more difficult to cure, and in consequence is much less frequently found in a properly cured condition than timothy. Clover cut at a proper stage has been found a more suitable food than timothy for milch cows, for sheep, and for brood sows. Cows and ewes not only relish it better than timothy, but it will produce more milk, and brood sows may be made to consume a large quantity of clover hay if fed to them in the right way.

It is thus apparent that clover is a more valuable food for live stock than hay. And it is much better in sustaining the fertility of the land. Clover brings nitrogen from the air and from the subsoil, but timothy takes nitrogen out of the land. Yet we must not undervalue timothy. It is the most valuable of the grasses proper, yet discovered. It is more permanent than When sown with clover the total yield is increased per acre, the hay is more easily cured, and the two answer well for being

### The Market Gardeners.

During the present agricultural depression the market gardeners have had rather the best of the bargain, and they have business, but that the market gardener raise such a variety of farm produce at al calculate generally upon one or more while there is a modern profit in each the results are not by any means very flattering. Onions have not been extra, although better as a rule than either of the former.

But these three crops are after all only a onions, he is still making a good living. Lima beans, early peas, tomatoes, green

ning in the spring long before frost is out of the garden he starts early vegetables under glass, and by the time the general farmer is plowing his soil for seeding, the market gardener is harvesting his first crop. This early crop is almost independent of adverse weather and drouth, and if the market prices are good he realizes a fair part of his income very early. Later the regular field crops come, one following another in rapid succession. If one crop turns out poorly it is turned over for a later

Finally, the fall gardening is carried well up into winter. Spinach, late lettuce, radishes, turnips, squashes, and other late vegetables are all planted so that they will occupy the land as late as possible. From the three seasons, early spring, midsummer, the fall, the market gardener is sure to make money, and in this respect he is made more independent of bad seasons.

To a certain extent the grower exclusively of wheat, corn, or cotton might learn a lesson from these truck gardeners. It is not well to put all the eggs in one basket in farming, as we are learning very emphatically every few years. By diversifying our crops we not only make more certainty of profit, but we tend to prolong the grow-

### Light for the Stable.

Intelligent dairy farmers know that it is possible to have a stable light and well ventilated, and at the same time so warm of the surface of the land by pasturing is that water will not freeze in it during the coldest weather. Plenty of windows are needed, and it is well to whitewash the whole interior at least once a year. To quently when the plants are cropped closely accomplish this at the least expense o the sun and winds quickly lift much mois- time, make a whole barrel of whitewash ture out of the land, hence the timothy and apply it very thick with a broom. Begin by sweeping the sides, partitions and Young clover is much more suitable to ceiling. Where the surface is uneven, a force pump with a spray nozzle is excellent for applying the whitewash. The whitewash must first be rubbed through a sieve noids to the carbohydrates is much higher, | to remove the lumps, or they will clog the valve of the pump. Keep the windows from being splashed by tacking old bags or illustration of the purchasing power of an working horses than clover. And timothy blankets over them. Lime is purifying and abalone, it may be stated that in New has the advantage of greater permanency deodorizing, and makes it easier to keep the stable clean and in order. Another reason for providing abundant light is to promote the health and vitality of animals. A cow in a winter dairy is like a person engaged in a sedentary employment. She cannot receive the stimulus to her vitality that a horse, for instance, gets from labor in the sunshine. A cow cannot do her best | Steele. unless she is made comfortable in a light and cheerful stable.

### A BRAVE GIRL.

The Bravest Beed We Ever He ard of Per formed by a Girl of Sixteen.

It does not require either mature years or an exalted position in life to develop the qualities that make a hero or heroine. One of the bravest and most resolute deeds that we have ever read of was performed, only recently, by a girl of sixteen who was serving as a dining-room girl in a hotel at Harper, Kansas.

At four o'clock on the morning of the 16th of November, a fire broke out at this hotel. In its rooms slept thirty seven

"In one of the rooms two dining-room girls were asleep. One of them, whose name is Maud Schermerhern, woke halfsuffocated by smoke. Her companion was insensible; and Maud though herself halfsuffocated, helped the other out of the window, and herself leaped out, cutting her flesh badly on the glass as she did so. where she would be safe.

been alarmed.

self. Breaking through a fastened lower window, and again cutting herself severely. she crept back into the hotel, the halls of which were thick with choking smoke. She could not walk upright against the smoke; but getting down on her hands and knees, her face to the floor, she crept through the corridors, from room to room, alarming all in the house.

Everywhere she left a trail of blood behind her from her bleeding flesh. When the last guest had opened the door of his room in response to her calls, he found her lying helpless in a pool of her own blood.

Though he was himself half-smothered, this guest picked up the girl, and groping his way, reached the street with her in is said that several people would undoubtedly have perished but for this heroic girl's efforts.

### Women and Paradise.

God has promised to believers, men and women, gardens beneath which rivers flow to dwell therein forever, and goodly places in saving an army when in dire distress. in the Garden of Eden.

Verily, men resigned and women resigned, and believing men and believing women, and devout men and devout women, and truthful men and truthful women, and patient men and patient women, and humble men and humble women, and almsgiving men and fasting women \* \* \* and men who remember God much and women who remember Him-God has prepared for such forgiveness and a mighty hire. Enter ye into Paradise, ye and your wives, happy. - The Koran.

# An Invitation to Dinner.

In his private capacity, the Hindu is frequently very hospitably inclined. The Domestic-"Nice! She's that stingy ahe and nothing on potatoes, cabbage and prevent him offering an invitation to dinner awarm temperament and a particularly clear "Judge fer y'rself. Kerosene isn't worth corn, cucumbers, and all other vegetables and paying for dinner, while he awaits its decrease. It would hardly be right to make combined go to make up his list, and he is consumption in another part of the house. a statement that red hair is disappearing pretty sure to make some if not most of It takes one some little time to get used to unless a special investigating committee. Another feature of market gardening is one sees the propriety of accepting the a full report. The disappearance of hair of that the season is made very long. Begin- | kindness in the spirit which prompts it.

PEARLS TRUTH.

We are members great body, planted by nature in a love, and fitted for a social life. -Se

Oh! how much more doth beauty beauteous seem by that sweet ornament which

truth doth give. - Shakespeare. A gentleman that loves to hear himself talk, will speak more in a minute than he

will stand to in a month. - Shakespeare. Hearts are like flowers; they remain open to the softly falling dew, but shut up in the violent downpour of rain. -Rich-

Who dares to think that these few thousand years have exhausted this majestic and mysterious being that we call man ?-Phillips Brooks.

The lights of a picture are created by shades; the highest pleasure which nature has indulged to sensitive perception is that of rest after fatigue. - Johnson. Critics must excuse me if I compare them

to certain animals called asses, who, by gnawing vines, originally taught the great advantage of pruning them .- Shenstone. I am very sure that any man of common

understanding may, by culture, care, attention and labor, make himself whatever he pleases, except a great poet. - Chester-Men of great parts are often unfortunate in the management of public business, be-

cause they are apt to go out of the common road by the quickness of their imagination. -Swift. Ballads and popular songs are both the cause and effect of general morals; they are first formed and then react. In both points

of view they are an index of public morals. -H. Martineau. Such a starved bank of moss, till, that May morn, blue ran the flash across; viole/ts were born. Sky-what a scowl of cloud, till, near and far, ray on ray split the

shroud : splendid, a star !- Browning, Bashfulness is a great hindrance to a man both in uttering his sentiments and in understanding what is proposed to him; it is therefore good to press forward with discretion, both in discourse and company of the better sort .- Bacon.

It is a secret known to but few, yet of no small use in the conduct of life, that when you fall into a man's conversation, the first thing you should consider, is, whether he has a greater inclination to hear you, or that you should hear him. -

Attention makes the genius; all learning, fancy, science, and skill depend upon it. It builds bridges, opens new worlds, heals diseases, carries on the business of the world. Without it taste is useless, and the beauties of literature unobserved .-Willmott.

When we live habitually with the wicked, we become necessarily their victims or their disciples; on the contrary, when we associate with the virtuous, we form ourselves in imitation of their virtues, or at least lose, every day, something of our faults. - Agapet.

### The Latest Scandal.

One of the latest scandals unearthed in France reads like a burlesque. A man was arrested for defrauding a wine merchant by representing that certain shares of the Nice Navigation Company, which he gave in payment for goods, were worth much more than their market value. This led to an investigation of the company, which advertised a daily service between Nice and Corsica. It turned out that the persons forming the company never had any capital; that they had hired an old steamer on credit, had changed its name two or three times to conceal its identity and used the different names to make up their fleet. As the steamer was not seaworthy, it regularly left Nice She dragged her companion to a place with great display, and as soon as it was out of sight made for a safe place on the Then she saw that the fire was envelop- coast, never trying to go to Corsica, and ing the house, and that the guests had not after a while returned to Nice. The Captain and crew were never paid. The deviser of The task of doing this she took upon her- this ingenious scheme is a naval engineer and a Chevalier of the Legion of Honor.

### Chinese Kites.

Great ingenuity is displayed by the Chinese in the manufacture of kites. Kites of the angular shape common among ourselves are never seen, the designers representing at their own sweet will flowers, birds, fish -and in fact anything that may be found on the earth or in the waters under the earth. Many of them are extremely beautiful and do infinite credit to the artistic tastes of the people. Human figures, representing historical or mythical events, safety. No life was lost in the fire; but it | are very commonly used, while emblems. such as the double fish, and characters of felicitous import, such, for example, as shou (longevity) and chi (good fortune) are favorite subjects.

On some of them musical strings are so arranged that they emit sounds of melody as they fly aloft. The first ones so constructed are said to have been instrumental The General commanding this unfortunate force, being hemmed in by the enemy, resorted to the stratagem of flying in the dead of night a number of kites with musical strings so arranged as to emit sounds resembling the words, "Beware of Han." Like the Syrians, at the noise of the chariot wheels, the contending host took flight at men and almsgiving women, and fasting the sound, and were destroyed-horse, foot, and dragons.

### Red Hair Disappearing.

A correspondent in the London Lancet asks if red hair is disappearing, and then adds his own testimory that red heads will soon be a memory and no longer a reality. Statistics, which sometimes tell the truth, aver that blondes are disappearing, and fact that his caste prejudices preclude him | that brunettes are annually increasing in from eating with Europeans does not always proportion. Red hair is supposed to denote violent temper, great quickness of intellect. -his idea of English hospitality. This complexion. If red hair is disappearing, consists in his driving his guests to a hotel then tempers and intellects must be on the this mode of procedure, but after a while | which is just now the fashion, should make any color is to be deplored.