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Madras
1st May, 1940

P. SRINIVASA RAO, G.M.V.C.
Editor
The Indian Veterinary Journal

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Devoted to the cause of the Veterinary Profession

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THE Indian Veterinary Journal

(The Journal of the All-India Veterinary Association.)

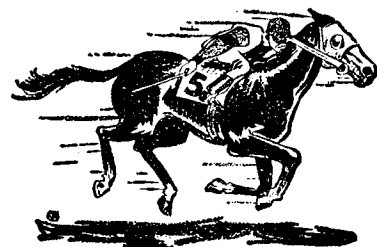
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THE Indian Veterinary Journal

Vol. XVI

MAY 1940

No. 6

General Articles

INSPECTION OF POULTRY FOR MARKETING AND SCIENTIFIC EGG-GRADING BEFORE MARKETING*

BY

MR. D. S. LAUD, G.B.V.C., F.R.H.S., F.Z.S. (LON.)

Superintendent of the Municipal Markets, Bombay Municipal Corporation, Bombay.

Poultry and poultry products form important articles of diet in man, and consequently their inspection is a very important factor from the point of marketing.

Characteristics of a healthy fowl.

A healthy fowl should possess the following characteristics:—

Feathers glossy, eyes bright, nostrils free from discharge, movements active, combs and wattles firm and bright in colour; as bird gets older its wattles and comb become darker.

Poultry meat.

The muscular tissues of fowls are fine, fibred, firm and without the intermixture with fat. The colour of the meat is preponderatingly pale; there are, however, also red muscles.

*Paper read at the meeting of the Provincial Veterinary Conference of the Bombay Veterinary Medical Association held in Poona at the Gokhale Hall, Sadashiv Peth, Poona City on the 30th and 31st December 1939.

In general the meat of chickens, capons and turkey is called white, while that of geese, ducks and pigeons is considered as dark. The consistence of meat is principally firm and the alkalinity subsists for a long time after slaughter. In accordance with the species and feeding, the odour and taste vary. The fat contents of the muscle proper are very small, the exception being in the case of the fattened fowl. The fat varies very much in consistence, colour and odour; however it is oily and soft.

Influence of feeding.

The poultry flesh acquires an oily flavour in birds fattened with oil seed, oil cake, colza (cabbage-seed) or hemp-seed; while it acquires a fishy odour and taste from feeding on fish. Turnips are considered to produce a bitter taste and pond mussels also cause a disagreeable flavour in the meat of ducks. It may, however, be mentioned that all these abnormalities of odour and taste, are as a rule, observed after the meat is heated.

Meat which possesses a high degree of repulsive odour or flavour is considered unfit for human food.

Examination of domestic poultry.

Domestic fowls should be examined in live state, and also when slaughtered, after the plucking of feathers, or in other words the examination should be both ante and post mortem, as is the case with the animals slaughtered for human food in our slaughter houses. The slaughter wound should be noted in fowls which are brought to the market for sale after being plucked of feathers; but in the majority of cases, the fowls are slaughtered immediately after they are purchased in our markets.

The skin should not be discoloured (bluish or bluish-gray faded or shrivelled and should possess no cadaver spots).

Light and poorly nourished geese are occasionally inflated.

With regard to the age, as a rule, a distinction is only made between young and old birds; that is, whether they are

under one year old or over. The following characteristics however are worthy of attention:—

In very young domestic fowl the back portion of the breast bone can be easily bent outward; in young fowls, it breaks easily and in old fowls, only when considerable force is applied. The keel of the breast bone in young birds bends sideways; in old ones it remains stable; the "ischium" and the "os pubis" can be pressed forward without breaking in young fowls, while in the old birds, the latter occurs with a cracking sound. An old cock has a spur over 1 c.m. in length, while it is correspondingly smaller in young birds. Occasionally hens have hard spurs and rough scales on the legs; while the lower half of the bill cannot be bent at all with the fingers as is the case with young hens.

In young Guinea fowls the feather flag of the outside quill feather is pointed; but it is more or less rounded in old birds. In Turkeys, age is determined by the spur and also by the appearance of the outside quill feather as described in case of the Guinea fowl. This is also decisive in Turkey hens, in which the rectum of old birds is surrounded by a red ring. In young domestic geese or ducks the trachea at the entrance of the thorax can be easily indented; in old birds it resists pressure. If a goose possesses a yellow down, it is then, at the most, just ten weeks old.

Common diseases of poultry.

I shall now only touch with the broad outline of the poultry diseases from the point of view of marketing and public health as to whether the meat is fit or unfit as food for human consumption, leaving the details of the various diseases as to their pathology, pathogenesis and clinics, to the pathologist, the bacteriologist and the clinician.

'A' External Diseases.

(1) Chicken-pox or avian variola (*Epithelioma contagiosum*) occurs in all feathered inmates of the domestic poultry yard, as well as in most other birds. According to Marx and

Sticker the disease is produced by an ultra microscopic filterable virus. Wart-like nodules, varying in size to that of a pea or slightly larger appear on those parts of the skin of the head, which are bereft of feathers or where few feathers are present, such as the nostrils, openings of the ears, the comb, wattles, corners of the bill and the eye-lids; the last named being one of the common sites. The nodules are encapsuled, firm of consistence, with a caseous centre and usually are discrete; but a number of them conglomerate to form a mulberry-like mass. In some cases the contents of the nodules resemble fatty tissue except for being more vascular; while in others they are watery and contain flakes of coagulated material resembling very much the small clots of milk. Lesions also affect the buccal mucous membrane, the affected parts of which are covered with thick whitish yellow exudates, which resemble in appearance the diphtheric false membrane, but differentiated from fowl-diphtheria by the presence of skin lesions and by the virulence of the blood from a virulent character of the blood in avian diphtheria. When the affection is limited to the skin, the disease is comparatively of benign character, but greater proportion of fatalities occur when the buccal mucous membranes are affected. Death appears to be due in most cases to inanition or asphyxia in accordance with the position and the extent of the lesions, rather than to any special activity of the virus.

From marketing and public health point of view, the carcass should be condemned as unfit for human food.

(2) The comb scab or chicken favus and (3) the leg scale which leads to the development of the so called lime feet (scaly feet) should also be considered.

'B' Internal Diseases.

As a rule the numerous animal parasites, which occur internally in fowls are of no importance to the veterinary inspector except in so far as they cause severe infestation and cachectic conditions, whereby changes are produced in the meat of domestic poultry.

'C' The specific infectious diseases of fowls.

The following diseases come under consideration:—

(1) Avian tuberculosis is a fairly common disease amongst poultry and may also be met with in pheasants, pigeons, turkeys, parrots and other birds. The disease spreads rapidly among fowls by contact and probably by means of the excreta of the affected fowl. In poultry the lesions are mostly confined to the digestive apparatus. The liver and spleen are generally affected. As long as the disease is confined to the spleen the birds are plump and in good condition; when however the liver gets involved, the bird is generally found in an emaciated condition.

(2) Chicken cholera, a septicæmic affection, which occurs in a malignant form, is a contagious disease of all species of birds, more notably the fowl, guinea fowl, pea-fowl, turkey, pheasant, partridge, grouse, goose, duck, ostrich, cage and other aviary birds. It is fatal to pigeons and rabbits. The period of incubation varies from 16 to 24 hours, and death generally takes place in 36 to 48 hours. The symptoms are high fever, dullness, difficulty in respiration, great thirst and livid colouring of the comb in chickens. The birds suffer from diarrhoea, the evacuations are fluid and of greenish colour. As a rule the birds pass into a sort of stupor and sit with feathers ruffled. The stupor gives way to convulsions, which terminate in death.

Judgment.—As there is no danger to human health from eating these fowls, the degree and the condition of the bird determine whether it should be considered as highly spoiled and accordingly condemned or whether, after previous boiling, it should be admitted for consumption. The latter precaution is necessary to prevent the spread of bacteria.

(3) Chicken pest is an acute contagious, infectious disease, which occurs almost exclusively in chickens, very rarely in pigeons and water-fowl. Terminates fatally within two or four days. The cause is an ultra microscopic filterable virus.

Now we come to the question of scientific egg-grading and candling of eggs before marketing.

Of late, Mr. Livingstone, the Agricultural Marketing Adviser to the Government of India, Imperial Council of Agricultural Research Department has introduced the grading of several agricultural produce and amongst them eggs have been graded and candled, before marketing, and rules and instructions have been framed by the Agricultural Marketing Adviser. He has issued general directions for grading eggs under the Agricultural Produce (Grading and Marketing) Act 1937. Only hen and duck eggs can be marked under the rules. The following is the procedure.

Since eggs are a perishable commodity, it is essential to market them as speedily as possible and that no time is wasted during grading. From experience it has been found that the work at the grading station could be divided into six convenient stages. They are as follows:—

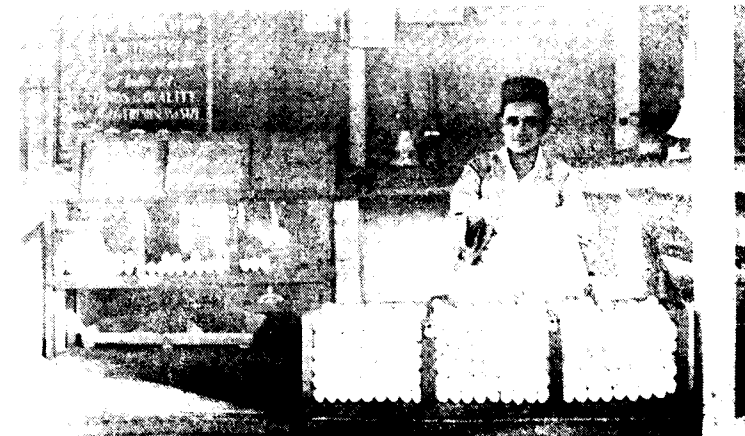
1st stage : Arrival of eggs from villages.—The only thing at this stage of grading for the Grader is to see the cleanliness of the eggs and to point out dirty eggs to either the collector or the producer and to advise them that dirty eggs are not wanted and that broken, chipped and unclean eggs are the result of carelessness and irregular collection from the laying nests. To serve this purpose a little propaganda is necessary.

2nd stage : Cleaning and sorting of eggs.—The Rules under the Act require that the egg shell must be “clean” free from stain, sound and of normal texture and shape.

If eggs continue to be found dirty they must be cleaned with a damp piece of felt, but care is to be taken in this because water is known to be detrimental to eggs. Broken and chipped eggs must not be graded. With practice it is observed that a helper can generally clean about 700 to 800 eggs per hour. Egg cleaning machines, however, are available abroad and few were tried in this country also. An efficient machine operated by hand costs about Rs. 140 and can clean and dry about 1500 eggs



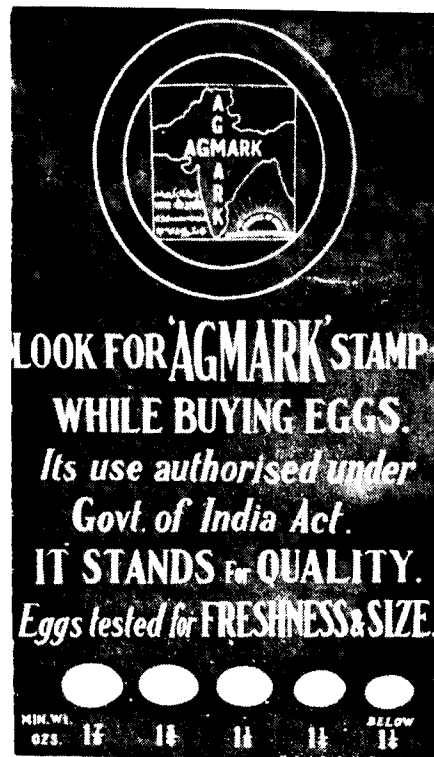
Egg grading on the grading machine.



Graded eggs with size weights and stamp — A. G. mark.



Egg grading on the machine. Note the eggs tilting into the pan 'C' class



"AGMARK" Egg labels



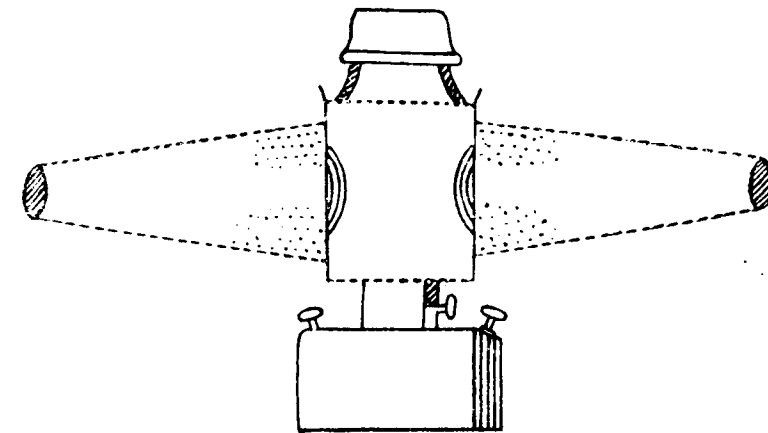
Egg Stamping



"AGMARK" Egg Stall No. 17 in the Crawford market, Bombay.

per hour. This machine is recommended for merchants who handle over 5000 eggs per day.

3rd stage: Candling of the eggs.—This is the most important factor as the freshness of eggs is determined in this stage. This method is known as 'candling' and is the best known method. It is done with the help of a strong light. An ordinary petromax lamp fixed with a metal hood would serve the purpose; vide the sketch below:—



This lamp should be placed in a dark room; if necessary a corner of the room may be darkened with a black curtain. The testing consists of holding the egg with the large end upward, between the thumb and the first two fingers at a distance of about one foot from the eye and as near as possible to the aperture of the lamp. Then give a quick twirl so that the contents of the egg rotate; also a reverse twirl may be given. According to the Act, "The contents of the egg must be free from blemish, the yolk central and freely mobile; the white must be translucent and clear and the air space must not exceed three-eighths of an inch in depth." When a normal fresh egg is candled the entire contents appear pinkish yellow but by looking closely one can see the air space at the larger end the diffused shadow of the yolk near centre.

Signs of bad eggs.—If the yolk moves quickly and shows blood, meat or black spots; or is discoloured or patchy or sticky to the sides; and if the white is indistinct, discoloured or cloudy

or there is large air space the egg is stale and should be put aside. If those grade specifications are well understood it is known that a trader or his helper can candle about 600 to 900 eggs per hour.

4th Stage: Grading.—After the candling of sound uncracked eggs for testing as to their freshness the eggs are ready for being sorted into different grades. According to the Act the grades and the minimum weights are prescribed as under :—

Hen eggs	Special,	A,	B,	and	C,
Weight	1 7/8	1 1/4	1 1/2	1 3/4	ozs.
Duck eggs	Special,	A,	B,	and	C.
Weights	2 1/2	2 1/4	2	and 1 3/4	ozs.

The grading is done with the help of a grading machine which is operated by hand. The machine costs from Rs. 400 to Rs. 1000 and about 2000 to 3000 eggs are graded per hour on this machine. The machine is suitable for big merchants, who handle over 10,000 eggs per day. For those merchants, who handle up to 3000 eggs per day, a smaller and simpler machine worth about Rs. 25 is available.

The grading of eggs on the machine is done on the basis of weight. Since size and weight are fairly closely related, it is possible to grade eggs by hand without any machine, according to size as determined by individual judgment. In such cases, the weight of eggs may be checked occasionally by a small egg weighing scale, which will cost about Rs. 3.

5th stage: Marking and stamping the graded eggs.—The Act requires that “the mark on each egg shall consist of the word “AGMARK” together with its grading designation (Special, A, B and C) placed centrally in circle of not less than 1/2 inch diameter and further “the grade designation mark shall be marked legibly on each egg in indelible ink on the shell by means of a rubber stamp.” A stamp for this purpose is supplied from the office of the Agricultural Marketing Adviser. The eggs are laid flat on a graded tray and then are marked gently with the stamp.

6th stage: Packing & fixing the AGMARK labels.—The Act provides that the “Containers shall be clean and suitable for the purpose. Packing material if used shall be clean, dry and sweet, free from any taint liable to impart any objectionable odour to the eggs. Hen and duck eggs shall be packed separately. Eggs of different grades shall be packed separately as far as possible. If more than one grade are packed in one container, a layer of clean paper or clean straw shall be placed between the different grades.”

The above rule is simple and when this has been complied with, the grade designation on label is afterwards attached by means of lead and bearing the word “AGMARK” to each package of eggs. The label must have written on it—

(1) Grade designation (Special, A, B and C), (2) number of eggs, (3) their weight, (4) the name of the grading station and (5) the date of the despatch. The colour of the labels has been determined already—white for special, red for ‘A’, blue for ‘B’ and yellow for ‘C’. These labels are the property of the Agricultural Marketing Adviser and can be had only from him by persons duly authorised to grade eggs.

An egg grading station has been established in one of new egg stalls near the mutton section of the Arthur Crawford market in Bombay. On this stall the grading work is carried on by the Candler appointed by the Government, who grades the eggs and candles them before they are marketed and sold. His work is supervised by the Provincial Marketing Officer to the Government, Bombay Presidency.

Graded and tested eggs are sold on the egg stall No. 17 of the Crawford Market as stated above, the average prices ranging as below :—

Graded and tested eggs.					
Grade	Weight.	per 100		per doz.	
		Rs. A. P.		Rs. A. P.	
D	below 1 1/4 oz.	2	8	0	0 5 0
C Minimum	1 1/4 oz.	3	0	0	0 6 0

Grade	Weight.	per 100			per doz.		
		Rs.	A.	P.	Rs.	A.	P.
B „	1½ oz.	3	8	0	0	7	0
A Min.	1 7/8 oz.	4	0	0	0	8	0
Special „		5	0	0	0	10	0
Extra special		6	0	0	0	12	0

The special and extra special are supplied wherever available.

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SOME DEVELOPMENTS IN THE ANIMAL DISEASE FIELD*

BY

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Veterinary Medical Association, Editor of Bio-Chemic Review
Received for publication on 19-2-'40.*

If there is one dominant, redeeming feature about veterinary medicine, it is, that it never grows monotonous.

As science unfolds its secrets, new diseases gradually make their appearance; with the ebb and ascendancy of the virus cycles, diseases and deaths multiply; parasites, either alone or in their role as vectors, carry with them their transmissive pathogens as they migrate to new areas.

Exemplary of this is the country-wide sweep of encephalomyelitis; the almost nation-wide occurrence of spotted fever

* Paper read at a recent meeting of the Wyoming State Veterinary Medical Association.

cases; the appearance of African anaplasmosis in Kansas cattle and Filariasis or heartworm disease in our Southern dogs. Swine erysipelas, Undulant Fever and Tularemia are to-day national problems. Who knows what to-morrow may hold in store.

It is my wish to consider with you to-day a few of the more recent developments in the animal disease field—to come here not as an authority but, let us say, as a sort of “information broker” with data gleaned mostly from current literature.

The Subjects

If time permits, let us then consider the following disease entities; namely, Black Disease or Infectious Necrotic Hepatitis of Sheep and Goats; secondly, a brain disease or encephalitis of sheep, cattle and other animals called Listerellosis; third, a potentially dangerous plague—the disease of Aujeszky or pseudo-rabies.

Black Disease

For sixty years or more sheep growers of Australia, Tasmania and New Zealand have suffered heavy losses from a quickly fatal plague known locally as Black Disease a term based on the blue-black discoloration of the bellies of pelted victims. In New South Wales alone the losses from Black Disease are said to approximate four millions of dollars annually.

It remained for Hadleigh Marsh and his co-workers of the Montana Station to first identify and describe this disease in American sheep⁽¹⁾. Later his findings were confirmed by Shaw, Muth and Seghetti of the Oregon Station⁽²⁾ who state that five counties in that state have suffered heavy losses while the disease also occurs in other countries where liver flukes are a problem.

We are, however, indebted to Turner and his associates of Australia⁽³⁾ for their masterly research in ascertaining the true story of Black Disease which they define as: “A toxemia induced by a specific bacterium—*B. oedematiens* in hepatic lesions resulting from the migration of young liver flukes *Fasciola hepatica*.”

Characteristics.—As before stated, the spore-forming, anaerobic bacillus of Black Disease is associated with infestations of larval liver flukes. It is thought, however, by some that it may cause death following intestinal or liver trauma from other endo-parasites, coccidia, tapeworms, oesophagostomes, etc.

Likewise, being one of the gas-gangrene group, it may occur as a fatal wound contaminant—a reason to be careful in posting animals dead of the disease.

Black Disease is of seasonal occurrence, its appearance and losses rather coinciding with the cycle of its symbiot, the liver fluke. Thus losses are most common in late summer and autumn, although Marsh⁽⁴⁾ describes cases occurring throughout the winter months.

Essentially this is a disease of ewes, lambs under seven months old being rarely if ever affected.

The most predominant symptom—if there are symptoms—is sudden death, for victims are usually found dead in natural bedding position; perhaps with a little foam from the mouth, more gas distention than normal and quicker spoilage. The mortality is in direct ratio to the extent of infection for recoveries from Black Disease are almost unknown.

The sudden nature of the deaths and the not infrequent presence of petechiation, especially on the endocardium, have sometimes resulted in confusing the diagnosis with hemorrhagic septicæmia or anthrax.

The following clinical picture as described by Turner of Australia is very typical:—

“A pregnant cross-bred ewe was seen standing apart from the rest. It lay down, subsequently got up and moved away a few staggering steps on being approached, but soon lay down again. Obviously very ill, weak and depressed. The respiration was hurried (120) and shallow, the pulse being 80 but irregular, alternating from ‘bounding’ to ‘thready’ and the temperature 105. The animal became semi-comatose, and a frothy material accumulated at the mouth and nostrils. Urine was voided in

repeated small quantities and faeces were passed. The conjunctiva was rather pale, the skin distinctly dark. The animal was quite apathetic to the presence of observer or dogs, and showed little or no response to cutaneous stimuli. It frequently moved the head from side to side, opening the mouth as if fighting for air. The tongue and buccal membranes became cyanotic just before death, which occurred quietly just ten minutes after the ewe was first noticed to be ill.”

Necropsy:—Upon autopsy the first lesion noted in a typical case is the blackish, hemorrhagic discoloration of the under surface of the pelt. Upon incising the abdomen one may detect the characteristic Blackleg-like odor.

The pericardial sac is invariably distended with fluid and, upon incision, shows the typical “chicken-blood” type of clot or fibrin.

The auricles may show petechiation, the endocardium more commonly so. The lungs are little changed though they may show slight cyanosis. The trachea is filled with foamy froth while the pylorus quite constantly shows some inflammatory change and oedema.

Examination of the liver shows a distended gall bladder, bright green in color. The parietal face of the liver reveals, usually, the scars of fluke invasion or the light-yellow, or red-ringed areas of necrosis....the seed bed of *B. oedematiens*....from which the fatal toxin is generated.

Proper necropsis requires that the livers be sectioned closely. The kidneys may show little change other than tiny necrotic foci, the bladders are contracted and there is some increase in quantity of peritoneal fluid, usually clear but again a light pinkish color.

Control:—Theoretically, it should be possible to eliminate Black Disease by an anti-fluke campaign copper-sulphating pastures and water holes, treating sheep with carbon tetrachloride and so forth.

However, in practice, and especially under range conditions, fluke elimination is very rarely possible or practical.

Hence in Australia, use of Black Disease Toxoid is almost universal. A single dose is given a few weeks before the outbreak season and this carries the flocks through the danger period.

We are indebted to Marsh and Tuncliff⁽⁵⁾ of Montana for their fine research on Black Disease and especially for their development of an effective, efficient and practical Alum-precipitated toxoid. They conclude that a 5 c.c. dose of this toxoid will serve as an efficient prophylactic against losses from the American strain of *B. oedematiens*. Their research is so thorough that it is not open to question.

Listerellosis.

For many years veterinarians in the midwest have encountered confusing outbreaks of trouble involving feeder lambs and cattle, more rarely home raised flocks and herds, a disturbance characterised by involvement of the central nervous system yet atypical of the usual conditions of this type. Change of feed, laboratory examination of viscera, use of mixed bacterins and change of feedlots had been ineffective.

Within the past two years, Beister and Schwarte of Iowa⁽⁶⁾ Graham of Illinois⁽⁷⁾ and Jungherr of Connecticut⁽⁸⁾ have proved conclusively that some outbreaks of encephalitis in sheep and cattle are due to a genus of rod-shaped microorganisms called *Listerella*.....a term first given the bacillus by Pirie⁽⁹⁾ of South Africa who isolated it from a wild rodent. It is probably identical with the organism isolated from a rabbit by Murray of Iowa in 1926 and called by him *Bacterium monocytogenes*.

To date the following species have proved susceptible to infection, either naturally, artificially or both. They are: Sheep, cattle, goats, swine, rabbits, guinea pigs, foxes, garbilles, chicken and man.

Symptoms:—Listerellosis, as it has been noted in mid-west field outbreaks, is not a sweeping, quickly-contagious trouble, as is anthrax for example.

The affected victims come down more or less sporadically or in small groups, but the end results are severe because, as in the Black Disease, practically all of the visibly sick animals perish.

Thus, one of the outbreaks cited by Beister and Schwarts⁽¹⁰⁾ which involved 2,200 western feeder lambs in South Iowa resulted in 255 deaths and only 3 recoveries. In an Illinois outbreak cited by Graham⁽¹¹⁾ a death loss of 30 western feeder lambs occurred in lot of 250.

Just as in other diseases involving the central nervous system the symptoms may be variable and non-specific. Temperatures are ordinarily high—105 to 106 degrees, the onset sudden and the incubation about 3 to 11 days.

Refusal of feed, dullness, trembling, leaning in fixed position, incoordination, erratic head movements, fast respiration and, to an extent quite characteristic, circling movements either to right or left. There is a moribund state of variable duration during which the prostrate victim makes running motions.

However, there are two more or less constant symptoms which often give the key to a differential diagnosis.

All investigators to date have noticed that quite a percentage of animals affected with *Listerella* show some pathology of the eyes such as "smokey" corneas, keratitis or conjunctivitis. Secondly, the ropy, tenacious mucus hanging from the nose—an excretion from the mucous glands of the turbinates—is also suspicious, especially as it occurs without involvement of the lungs.

Lesions:—Unfortunately, the gross autopsy lesions are as non-specific as are the symptoms. There may be mild oedema of the brain, slight meningeal extravasations, an increase in the spinal fluid and, not constantly, oedema of the cervical lymphatics. The microscopic pathology, on the other hand, is quite constant and resembled closely some of the tissue changes noted in pathology due to filtrable viruses.

According to Graham, this disease has been confused with mad itch, rabies, hæmorrhagic septicæmia, forage poisoning, acetonemia, chemical poisoning and so forth. This is understandable for any or all of these troubles may result in primary or secondary involvement of the central nervous system.

The most important points to emphasize about *Listerella* infection are:—that every possible angle of herd history should be studied closely when an encephalitic trouble appears in sheep or cattle; that special attention should be given to the presence or absence of eye lesion: that laboratory confirmation is absolutely essential and that the technician must be furnished the entire brain in good condition.

Control:—As to prevention and treatment I can give you no help. Heavy doses of foreign proteins have given fair results in some bacterial involvements of the brain. One might attempt protection with heavy doses of an autogenous bacterin.

Beister observed a marked rise in the antibody titre of an experimental pig and, if the disease becomes more prevalent, attempts should be made to produce a hyperimmune serum.

Before leaving this subject we might add that *Listerella* organisms have been isolated as the cause of death in chickens. In this species the pathology is not cerebral but is characterized by a necrotic myocarditis. It has also been found in a few cases of human encephalitis and otitis media. Graham suggests that veterinarians take aseptic precautions in removing the brains from suspected cases.

Pseudo Rabies

There is another brain disease, a plague very prevalent in some parts of the world, that may, at some time, become widespread in this country. This is the virus disease of Ajeszky also known as infectious bulbar paralysis or pseudo rabies.

Twenty years or more ago in Iowa we thought that this condition was the nervous or cerebral form of hæmorrhagic

septicæmia and based our treatment accordingly. Naturally, the results left very much to be desired.

Infectivity:—Almost all warm blooded animals are susceptible to this virus though from an economic angle it is most important in cattle in this country. Dogs readily succumb after infection and may contract the disease if permitted to eat carcasses of dead cattle. Cats are also said to be quite susceptible.

Shope ⁽¹²⁾ of the Rockefeller Institute proved that pseudo rabies is not uncommon in American swine while Ray ⁽¹³⁾ has described the disease in hogs as a fulminating trouble of comparatively low mortality, unaccompanied by the morbid itching which is typical of the disease in dogs and cattle. He mentions, however, that some swine may manifest distinct nervous symptoms. Many recovered animals probably remain carriers.

To date my acquaintance with outbreaks of this trouble have been in cattle. The febrile onset is sudden, the incubation period very short—probably from one to four days; there is irritability, involuntary spasms of the panniculus muscles, excitement, hypersensitivity of the skin, frequent defecation, and a brief moribund period of prostration before death. The diagnostic characteristic symptom is the malignant pruritis—so severe at times that cattle may rub off an entire horn, blind one or both eyes and denude themselves of large areas of skin.

In my own experience and through my contacts with mid-west veterinarians for many years, we have noted that mad itch outbreaks almost always—if not always—occur where hogs have access to munched up or discarded green corn or corn stalks fed to cattle. It seems evident that swine serve as virus carriers, disseminating the virus in their nasal secretions or saliva. The swine, in turn, very probably pick up infection from diseased rats—a species that often is extensively infected with the virus. It is also known that the blood and lymph of affected cattle carry the virus during an attack of the disease and, also, that other cattle in the herd will lick off the blood smears where diseased cattle have rubbed.

Treatment:—So far the curative treatment of mad itch in cattle has, in my experience, been exactly 100% non-effective.

In one experimental herd vaccination with a heavy dose of carbolised brain emulsion from a fatal case seemed to possess some preventive value. According to some European investigators, a potent hyperimmune serum is possible of production and is supplied there but, so far as I know, it is not available in this country.

In view of Shope's findings that hog blood often carries a comparatively high titre of specific immune bodies, it would seem logical to employ large doses of Anti-Hog Cholera Serum as a curative and possible passive preventive. The reason is that in hyperimmunizing swine with a mass dose of pooled virus such "hypers" are also at least partially hyperimmunized against pseudo rabies virus. At least, in lieu of no other effective remedy it is worth a trial.

In the main, we feel that the first step in blocking an outbreak is to immediately separate hogs from cattle and discontinue the feeding of corn stalks or green fodder. All sick animals should be immediately isolated and healthy cattle scattered by turning to a large pasture although, when this is done, they must be watched closely.

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"MILK—ITS VALUE AS DIET AND IN ECONOMIC UPLIFT OF THE COUNTRY."*

BY

PULIN BEHARI CHAUDHURI, P.G. (BANGALORE), I.D.I. (ASSOCIATE),
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"Most city dwellers are Cogs in the machine, some few are master mechanics with power to regulate the levers that direct the course of city life. But every city dweller, whatever his post in the metropolitan affairs, must remember that to attain the highest business efficiency and personal satisfaction of every day life, it is necessary to-day, as never before, to cultivate soundness of body and mind."

William James, the phsycologist, realised this fact. Regarding physical vigour he said: "Even if the day ever dawns in which it will not be needed for fighting the old heavy battle against nature, it will still always be needed to furnish the back grounds of sanity, serenity and cheerfulness in life, to give elasticity to our disposition; to round off the weary age of our fruitfulness and to make us good humoured and easy of approach."

How best may we attain this vigour hedged in as we are by the restriction of city life?

The answer is simple, we must so regulate our life that we get plenty of rest, plenty of exercise and free air, even walking is extremely beneficial and plenty of wholesome food.

Let us consider to-day the part played by wholesome food, for unless our nutrition is adequate to our need, rest and exercise can accomplish little for us. In order to be nourishing, our diet must contain a variety of substances, all necessary to the efficient functioning of the body machine.

Proteins must be included in the daily menu. Proteins are valuable substances in certain foods which furnish the body with

* The article that won the Jagadish Das Gupta Memorial Medal, for the year 1938-39.

means to rebuild its worn out tissues, which occurs as the inevitable result of living at all. The rebuilding of tissue is part of a marvellous process called metabolism by which the body maintains its vigour throughout life. Without sufficient supply of protein food this process would be impossible.

All food stuffs contain protein but the amount they contain varies widely. Animal foods such as milk, eggs, fish, meat are rich in protein, cereals such as rice, wheat, millet, barley etc., have a fair proportion of protein but leafy root, vegetable, and fruits do not contain much of protein.

It is important to remember that growing children require per unit of body weight, more protein, than adults. The new tissues are largely built of elements drawn from protein. For this same reason, the need of protein for women during pregnancy and lactation are greater than at other times. The best source of animal protein for growing children is milk from cow or other species. It must be emphasised that skim-milk is as rich in food protein as whole-milk.

The list of protein requirement as found out by Dr. W. R. Aykroyd M. D., Director, Nutrition Research Laboratories, Coonoor (South India) is given below:—

Sex.	Age.	Co-efficient.	Grammes per day.
Man	18-60 Years	1.00	65
Woman	18-60 "	0.85	55
Boy	10-17 "	1.20	80
Girl	10-17 "	1.10	70
Child	6-9 "	0.90	60
Child	2-6 "	(0.60) - (0.80)	40-50

The daily menu must also contain fuel food—the carbohydrates that is to say sugar, starch and fat. This food makes the muscular activities possible. The muscular activities again result from the released energy incidental to the body's consumption of fuel. If the fuel were not provided in the form of food such energy would be sadly lacking. Most of the Indian diet are low in fat. Diet low in animal fat is often deficient in certain important vitamins. Animal fat such as butter or ghee contain

vitamin 'A' while most of the vegetables fat and oil lack in this factor.

Grain foods and root vegetables are largely composed of carbohydrates and when they are present in excessive proportion the diet is ill-balanced.

Certain minerals are also needed if we are to possess the full vigour of adequate nutrition. The chief among those minerals are calcium and phosphorus. They ensure the nourishment of bone and teeth.

Calcium is found abundantly in milk including skim-milk, butter-milk. As in the case of protein children require relatively more calcium and other minerals than the adult. If a diet contains sufficient calcium, it may be taken for granted that it has satisfactory phosphorus content.

Diet should contain 0.68—1.0 grammes of calcium daily. Iron also cannot be forgotten in the menu. Because the red pigment of blood—as most important physiological substance which transports oxygen from the lungs to the tissues contains iron as an essential constituent of its molecule. Iron is needed by the body for its blood formation. So well balanced diet should contain near about 20 mgs. of iron.

Then comes the vitamins of various classes as A, B, C, and D.

Vitamin 'A' is found in animal fats, whole-milk curds, butter, pure ghee, egg-yolk, liver and fish. It has been observed that milk obtained from cows fed on succulent green grass rich in carotene, contains more vitamin 'A' than cows stall-fed on more of dry matter.

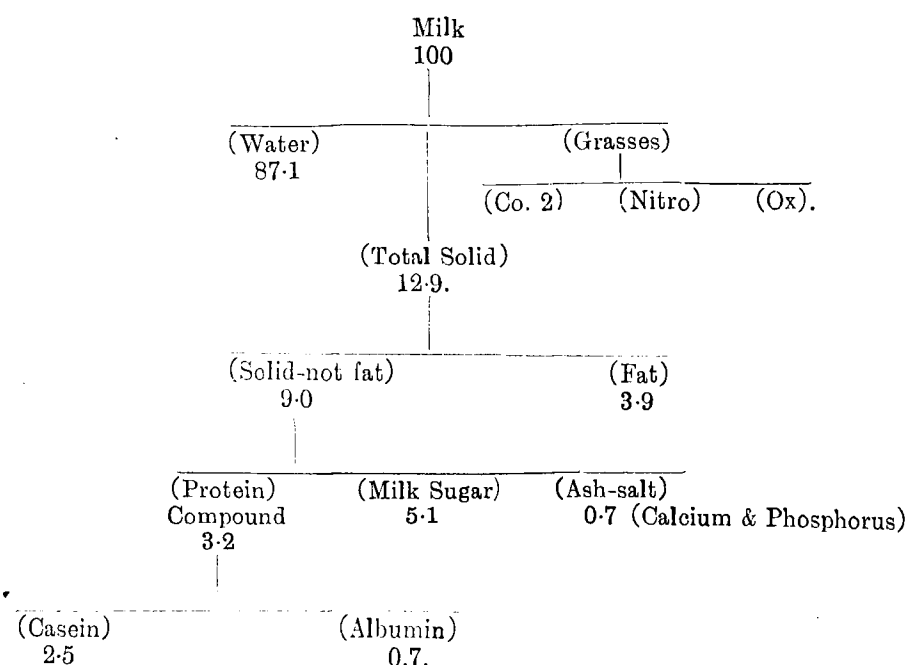
Vitamin 'B' is plentiful in milk and milk products.

Vitamin 'C' is destroyed by high temperature of the boiling milk.

Vitamin 'D' which prevent rickets, is found in liver oils, egg-yolk and milk-fat (ghee) obtained from animals fed on green pastures exposed to sunlight. Vitamin 'D' helps the development of strong regular teeth.

To find those necessary food substances we need not seek far. Some of the most commonest and inexpensive foods contain them and of these foods one of the most important, is *Milk*.

The chart below gives composition of milk for ready references. (As per study of the writer under Mr. Jal. R. Kothawala, Imperial Dairy Expert, Bangalore S.I.).



Milk merits its description as the most nearly perfect food. It is at once a fuel food and building food. It is evident from the analysis of the milk given above that it contains sugar and fat to maintain the body fuel for muscular activity. Likewise in milk, are found those complex marvellous substances called proteins by means of which body rebuilds its worn out tissues. Milk is again an excellent source of mineral salts—Calcium and phosphorus—which are bone and teeth builders and at the same time give the sturdiness to the body frame.

Many of us are now-a-days unfortunately familiar with disastrous consequences of unsound teeth and it has been admitted on facts by eminent doctors that when teeth lack

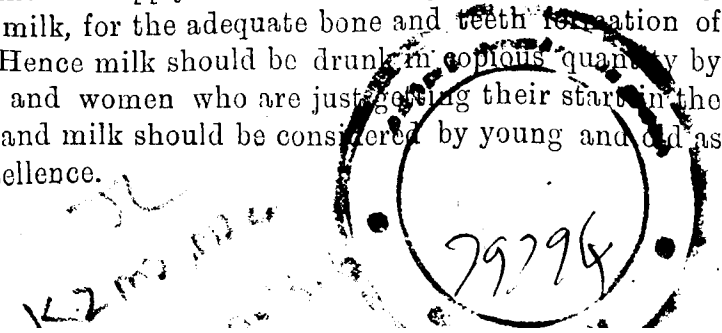
adequate supply of calcium and phosphorus they are particularly open to the attack of bacteria and decay.

Milk of course is low in iron but we can very well make good of this deficiency from other foods. But inspite of this slight inadequacy, curable by other accompaniment of foods, it is reasonable to appreciate the vast contribution which milk can make to our nutrition.

Further, the most important vitamins such as A, B₂, C & D are found in milk and milk products in most assimilable form. A factor in milk's favour is its easy digestibility. This is specially important to the sedentary workers of the city. "The body not being in vigorous muscular effort, is slow in using up its food supply. Waste tends to collect and the digestive processes are retarded in their activity, while the city dweller does his best to make up for this deficiency by some exercise whenever he has a chance, an easily assimilable food helps him to carry on effectively". Milk is such a food. "The digestibility of milk may be appreciated by the fact that warm milk drunk at bed time is usually an efficient sleep producer. Many a victim of insomnia has found a cure in this use of milk. A glass of milk warmed to blood heat, draws, the blood from head to stomach quickly inducing the mental relaxation, without which deep and restful sleep cannot be obtained. If milk were not so easy to digest, this bed-time beverage would have failed to produce the desired effect".

Young people from infancy need an abundance of milk. It has been estimated that the growing child whose bones and teeth are still forming needs five times as much calcium and phosphorus as does the adult.

Further more, during the period of gestation and as well as in the period of lactation every expectant mother should receive a sufficient supply of calcium and phosphorus, so easily available in milk, for the adequate bone and teeth formation of the child. Hence milk should be drunk in copious quantity by young men and women who are just getting their start in the adult world and milk should be considered by young and old as food par excellence.



The majority of the young scholars are overworked first in colleges and then in business world. "Combination of long hour in study and business with poor food, results in fifty per cent physical debility with tuberculosis lurking just around the corner". Wholesome food and moderate exercise are needed to parry the danger. Here also the milk should occupy the place of importance.

As for the tired businessman and woman of mature year and house-wife borne down with cares and anxieties of a family may derive enormous benefits from drinking really pure milk. In a busy day it is the most efficacious quick lunch.

To stand the strain of existence our bodies need the finest nourishment they can have and pure milk from healthy cows provides such nourishment.

It has been found that animals, such as a calf when given a judiciously liberal daily allowance of milk, always grow quickly and attain large in size with bright eyes and fine coat and give every evidence of excellent health. (Experiment conducted at the Imperial Agricultural Research Institute Dairy by Mr. W. Sayer) "States of mal-nutrition which fall short of serious disease are wide spread. A well balanced diet is essential if growth and development are to take place normally". "A badly fed child is often small for its age and then its weight for weight will fall below average. The frequency of minor ailments in school children can be reduced by judicious feeding—the state of skin is a very sensitive index of faulty feeding, a round dry skin covered with a popular eruption suggests faulty feeding and particular vitamin 'A' deficiency. Sour mouth and tongue and erosions at angles of the mouth are found in ill-fed children. Such lesions occurring most commonly in milled rice-eaters may be due to vitamin B₂ deficiency, they can often be rapidly rectified by increasing milk intake". (Finding of Doctor W. R. Akyroid, M. D., of Nutrition Research Laboratories, Coonoor).

We all start our life on milk. It is the infant's one perfect food, and for the developing child milk provides the essential

growth factors. Nature planned milk as a well balanced diet to provide all the primary nutritional essentials—mother's milk for the infant, and for later period, cow's milk with certain modification. Experience and observation have taught man-kind the world over the peculiar value of milk.

His Excellency Lord Linlithgow, in a speech at Simla, made the following observation regarding milk. "It is a scientific fact beyond dispute that a liberal supply of milk is an essential constituent of diet for growing children, nor can there be the slightest doubt but that good nourishment in the early years of life is essential to the building up of a strong constitution in after life. Let me give you quite shortly the result of very carefully conducted experiment showed that the addition of a pint of milk to the ordinary diet of growing boys, converted an average annual gain in weight of 3.85 pounds per boy to one of no less than 6.98 pounds, and increased the average gain in height of 1.84 inches to one of 2.63 inches."

McCollum of America observes that "the diet of Indian being so largely of meatless nature, providing of satisfactory protein quality and quantity is a matter of real urgency. There is no general source of non-flesh protein so satisfactory as good cows, cows milk. Milk protein is superior to meat protein. We could entirely dispense with meats without suffering any ill effects whatever, but if we permit the use of milk even in the diet of adults to fall below the doleful minimum, its effects will soon become apparent in our national efficiency."

Dr. H. C. Menkel, M. D., said that 'average annual consumption of milk in America is 55.3 gallon per head. Compare this with India where the annual average is only 6.5 gallons or less than three ounces daily per head. I have seen the diet sheet of an orphanage in India where growing and developing children are provided only with three table spoon of milk—this indispensable fluid life."

It must always be remembered that all this high value of milk applies only to clean fresh milk as obtained from well-fed healthy cows. The supply of pure milk does not seem to be

easily secured in India in general and Assam in particular, the fact is more felt than described. The danger of impure supply of milk cannot be neglected, because milk though an important item in our dietary, is nevertheless a sure medium of carrying the dreadful diseases like Dysentery, Diarrhoea, Cholera, Typhoid, Infantile liver, and Tuberculosis. The rise in the infant mortality in India is grealy due to the bad and insufficient supply of milk both in cities and villages.

The statement below will speak for itself about the infant mortality alone in Assam in comparison with other countries.

Country	Death below one year per 100 live birth.	
Assam	15.6	Public Health Report Assam (1932-33).
Germany	8.9	(1928)
Denmark	8.5	(1926)
England	7.4	(1929)
Switzerland	5.4	(1928)

To remove the contamination in milk with all germicides, due mostly to the production of milk under unhygienic condition and by people of unclean habits, boiling and pasteurising are necessary. Boiling and pasteurising of course alter the original composition of milk by reducing its vitamin contents and altering the minerals and thus make it necessary the addition of raw fruits and green vegetables to compensate the losses in the milk thus treated.

It is more or less a habit with most of us to sweeten the milk with sugar or sugar products which naturally lessens the qualitative value of milk, because sugar is very apt to produce fermentation and stomach wind. If any sweet is to be added at all to make the palatable milk more palatable, honey is the best substitute.

Another drawback with most of us is that we drink milk all at once in one long sip, this naturally gives rise to the formation of large and hard curd in the stomach. From the composition chart of milk given in previous chapters, it appears that milk contains as much as 12.9% of total solid which needs

chewing for mixing it with saliva before swallowing. Therefore it is beneficial to drink milk in small sips to avoid curdling in the stomach.

The vegetarian dietary which is largely followed in India is incomplete, and this in most instances can be rectified by liberal addition of milk and milk products in the daily menu.

There is nothing really new or recent about all this, except perhaps the modern effort not only to popularise milk but also to make it available by means of effective and scientific production and distribution. More milk campaign has its good effect in the economic uplift of the country in various ways, namely,

(a) Healthful habits of drinking milk builds up a nation with sturdiness of body, frame and soundness of mind.

(b) It will help the country in the attempt of producing plenty of milk and thus cheapening the price as an economy.

(c) It will help in the improvement of the bovine population of the country as means of maintaining the fertility of the soil where general farming is the main stay of living.

Conclusion: (a) This has been dealt with in previous chapters.

(b) The people in general are desirous of consuming more milk but slow in paying premium for assured milk, because the general income per head in India is very small and if the price of milk remains as high as it is in Bengal and Assam in the absence of any economic improvement in the present method of production and distribution, the Dairy Industry will never make any head way. Production of milk by co-operation is the main link in the improvement of milk Industry in the country. No country has ever succeeded in improving the Dairy Industry by individual work. Because the supply of milk by individual cow owner is small, so attempt is always made to make more profit out of small turn over. Therefore the improvement in the supply of more milk depends mostly in industrialising the Dairying on Co-operative basis to free the small holder from incidental expenses which is proportionally

very high for the smallness of the quantity of milk each cultivator produces. Secondly the producers must be trained in the technique of dairying and the educated youngmen, trained in the dairy technique will not be a misfit to go in as middlemen to co-operate with the villagers in finding and selling their products by quick transport and even distribution. At the same time legislative control is also necessary to protect the producers of genuine and wholesome products against unfair competition.

Thirdly, the sterilisation, chilling and transporation of milk and milk products from the places of production, needs the helping hand of the capitalist in industrialising the dairying in India.

(c) The improvement of cattle in a country of agriculturists is more a necessity than a luxury. In the language of Sir Laury Hammond, the then Governor of Assam, "Cow is considered as a devine sanction of God." It is beyond dispute that any attempt in the improvement of cattle wealth, will not only be appreciated by the people of India but will feel grateful when such improvement will be effected. India is mainly an Agricultural country and to advance its real prosperity not only must the wealth earning capacity of the Cultivator be increased, but the productive capacity of the soil must be enlarged." The problem of national development in this country is hinged with the improvement of the draught power of the cattle. The bullock power in its turn is co-related with the cattle breeding policy of the country. No improvement in the problem of cattle breeding is, at present as never before, possible unless some economic measures are taken. (Observation by Imperial Dairy Expert).

(d) The cattle must always be bred in the cultivated land and not in the forest and breeding of cattle must be based on economically sound principle. The cultivator must breed and rear cattle to make this a payable proposition.

The income of the breeder must be assured from the milk and milk products from his cows and male progenies which will

become the draught animal of the future. To meet these two ends, breeding of dual purpose animals will be the key note of success of the Indian cultivators who are the real cattle breeders of the country.

A good milch cow will drop 50% male, 50% female calves. Female stock will bring in cash money for the keeper by way of selling milk and the male stock will help the breeder in cultivating his lands and the combined effort of the herd will bring in prosperity to the cultivator.

Writer most faithfully acknowledges the guidance and help he had received from Mr. Zal. R. Kothavala, B.Sc., B.Ag., N.D.D. (Scott) Imperial Dairy Expert, Bangalore S.I., in connection with the study of "Dairy technology" in India.

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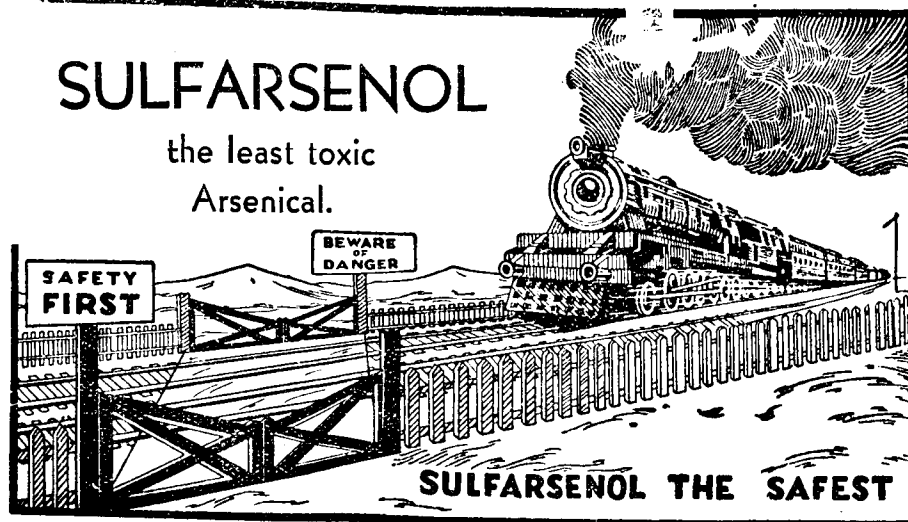
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retiring Deputy Director of Veterinary Services, Government of Bombay.
He is seen sitting at the centre.

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Editorial

CIVIL VETERINARY DEPARTMENT, MADRAS

We draw the attention of the Government of Madras to a peculiar and strange feature existing in the constitution of its Civil Veterinary Department. We understand that nearly fifty per cent. of the Veterinary Assistant Surgeons in that Department are recruited and kept up on a temporary basis, as a result of which these men are liable to be discharged at any time and their services do not count for pension. We also understand that these men cannot easily go on leave earned by them because, if they do, the dates of their future increments will be postponed by a corresponding period. This is an extraordinary state of affairs in the constitution of a Development Department and it calls for immediate and prompt remedy.

Officers are recruited and kept up on a temporary basis when a Department had reached its required normal strength with a view to meet some emergencies. It is also done when the nature of the work to be carried out is only of a temporary nature and is expected to last only for a short time. It is never done to carry out the day-to-day duties and functions of a Department. It is admitted on all hands that the Civil Veterinary Department in Madras Presidency is still in its infancy and that the existing staff have not been enough even to touch the fringe of the various Veterinary problems in the country. Contagious diseases still continue to levy a very heavy toll.

Non-contagious diseases sap up the vitality of the livestock and diminish their working capacity while problems of Animal Husbandry are just being formulated. Many a scene of outbreak of contagious diseases is being visited by the Veterinary Officers long after the epidemic had broken out, mainly because their jurisdiction is far too extensive. Many a village continues to remain unvisited by any itinerating Veterinary Officer because the extent of the charge under a Veterinary Officer is far too big. The recommendation of the Royal Commission on Agriculture that there should be at least one Veterinary Assistant Surgeon for every 25,000 head of cattle and that each and every taluk headquarters should have a Veterinary Dispensary to solve the problem of Veterinary aid to rural tracts, is still a far off ideal. We are mentioning all these to make our point clear that the Department has not yet got a staff of adequate strength even to meet the normal requirements of a Province. As such, it passes our comprehension why the Government should keep nearly half the strength of the Department on a temporary basis. It may be that this expediency was adopted as a temporary measure of retrenchment, though no other department of government was similarly penalised; but it is unwise to continue it any longer. The demand on the services of the Department has been rapidly growing during recent years and, with the transfer of the livestock section to this Department, the activities have expanded still more. As such it is the better part of wisdom to study the requirements of the present and future and increase the strength of the cadre.

The effects of keeping a number of Government servants — nearly half the existing staff in a Department—for a number of years on a temporary basis are far reaching. The insecurity of service and its non-pensionable nature will tell upon the contentment and efficiency of the services sooner or later. And the harshness of the leave rules will only add to the discontent. It definitely leads to a deterioration of the *morale* of the rank and file. With a Democles sword of 'discharge at any time' and "service not pensionable" hanging on their heads, is it reasonable to expect the

Veterinary Assistant Surgeons to put forth their best into the work? Is it fair and honest to expect a sustained and keen interest in their study of the various problems confronting them under such psychological conditions? No, it is not. After all, these Veterinary Assistant Surgeons also are only human-beings and they will be more than human if they feel otherwise.

Apart from its demoralising effect on the staff, there would certainly be a great deal of embarrassment experienced in the administration of a Department with such a large temporary staff. We understand that the sanctioned leave Reserves for a Department is usually one-eighth the sanctioned permanent strength. But, in the case of temporary staff, the leave reserve is only one-sixteenth. With this great handicap, applications for leave would have often to be turned down; and if not actually turned down, then the billets have to be kept vacant or tacked on to the adjacent ones, for want of necessary leave reserves. Such an arrangement is not conducive either to smoothness of administration or to efficiency of service.

We, therefore, appeal to the Government of Madras to look into the matter immediately and order the absorption of the temporary staff into the permanent cadre thereby ensuring for contentment and efficiency in that Department. It is highly undesirable to keep a large staff for a number of years on a temporary basis for carrying on the day-to-day duties of a Department.

THE LIVESTOCK BILL

We extracted in the last issue of this *Journal* the text of a Bill which the Madras Government propose to enact for the improvement of the livestock of the Presidency. The bill is intended to carry out one of the recommendations of the Royal Commission on Agriculture that castration of all unfit male animals after a certain age should be undertaken to prevent indiscriminate breeding. One of the many factors which have contributed to the deterioration of the livestock in this country

has been the absence of stud bulls of the approved type. Any and every male animal had been used for breeding purposes with disastrous consequences on the quality of the breed. To check this deterioration and to improve the breeding of livestock on approved lines, the Madras Government propose to take powers to license approved bulls in a locality and to compulsarily castrate animals which do not come up to the requisite standard in that locality. They, however, propose to proceed cautiously in this matter. The provisions of the bill will not automatically come into operation in the whole of the province the moment it is passed but will be applied only to "areas where a sufficient number of stud bulls which are free from any disease or defect are available for breeding purposes within easy reach of cattle owners." The castration of all male animals unfit for breeding purposes will be done free of charge. Provision has also been made to prevent mixing up of breed by refusing license to bulls which are not suited to a particular locality, so that the different breeds in the Province may not get mixed up. Further, to ensure that only approved bulls are used for breeding purposes, periodical inspection of the bulls by a competent Veterinary staff will be undertaken.

The bill is, therefore, a step and only a step in the tackling of the livestock problem. More important than the castration of worthless stock is the immunisation against disease and the fodder famine. As we have observed often in these pages, the numerical strength of cattle had increased considerably at the expense of their quality because the ryot thought that it was the only way to protect himself from the ravages of epidemic and scarcity of fodder. Therefore, given a sufficient security against these, the co-operation of the ryot can be secured for the improvement of the livestock. Successful breeding by better quality of cattle is dependent mainly upon the availability of adequate supply of fodder and therefore the Government of Madras must follow up the Livestock bill with arrangements for improving the problem of fodder supply.

MEMORIAL TO SIR ARNOLD THEILER,* K.C.M.G.,

DR. MED, VET., D.V.SC., Hon. Associate, R.C.V.S.

Sir Arnold Theiler, founder and first director of the Veterinary Research Institute at Onderstepoort, near Pretoria, South Africa, died in London on July 25th, 1936. His great services to Veterinary Science were fully recognised during his lifetime and many rewards and honours were bestowed on him. He received no less than seven honorary doctorates. Of other great distinctions may be mentioned his election to the French Academy of Sciences, the award of the Laveran Gold Medal, of the Budapest Gold Medal, and the Gold Medal of the Royal Agricultural Society of England. He was an honorary or corresponding member of some twenty scientific societies.

On Wednesday, November 15th, 1940 before a large and distinguished gathering, including the members of the Diplomatic Corps, Cabinet Ministers, Heads of Government Departments, scientists and other prominent citizens, General the Rt. Hon. J. C. Smuts, Prime Minister of the Union of South Africa and a personal friend of Sir Arnold Theiler, unveiled the statue. "To-day," said General Smuts, "is not a day of mourning, it is one of rejoicing. We have come to honour the memory of one of the foremost men in the history of science in South Africa. We are filled with the spirit of rejoicing and appreciation.

"There are some special features about the occasion. Firstly, this is the only occasion on which a monument has been erected to a great man in the Union of the South African Government. Hitherto, we have always left it to friends and admirers to collect funds for a memorial, but Sir Arnold seemed to this Government and the previous Government to be an outstanding case where an exception should be made. He had done such great service that we felt we were justified in erecting a memorial on behalf of the entire nation instead of merely of a group."

* Reprinted from Veterinary Record, March 16th, 1940.

Secondly, said General Smuts, South Africans had been prone to honour men who had held high public posts in their country — statesmen, soldiers and outstanding public men. Sir Arnold, however, had not been in the public eye, he had not occupied a high position. He had been a scientist pure and simple, and had belonged to a branch of science which had no high honour attached to it — veterinary science. "But," continued General Smuts, "this veterinary doctor made himself, this institute, this country famous all over the world. More than any other man he has put South Africa on the science map of the world."

General Smuts touched on the history of Theiler. He mentioned how General Botha had encouraged the young Swiss veterinarian and how, realising the vast importance of scientific work, he had sponsored the grant for the erection of the institute at Onderstepoort.

"There are many young men to-day who must have a vivid recollection of Sir Arnold Theiler's great personality. He was sincere, straight, powerful, enthusiastic, devoted to his work. Many books have been written on his scientific discoveries. There is not an animal disease of any importance to us which he did not tackle. Every time he found out the cause, the source and nearly always the cure. He worked on such scourges as East Coast Fever, red-water fever, horse-sickness and bluetongue. And when we realise how seriously these diseases have retarded our progress in the past, we understand what a benefactor he was.

"It was not hard work alone which took Sir Arnold to the heights; he possessed that added something possessed by so few, 'the genius of insight.' And yet, in spite of his greatness he was a simple soul; he lived and worked for his profession; money and fame meant nothing to him.

"We should be proud of this institute of Onderstepoort which he built up," said the Prime Minister. "The men here merely do their jobs. They are not politicians and I hope they

never will be. They are here to carry on the scientific tradition of devotion to duty which he began."

The statue, made in granite quarried near Pretoria, was sculptured by Mr. Coert Steynberg. It stands on a grass plot in front of the main building—the first permanent laboratory building erected at Onderstepoort.

V. N. KULKARNI, G.B.V.C.

*Deputy Director of Veterinary Services (Retired), Government of
Bombay, Poona.*

*An appreciation
(Contributed)*

Born in March 1885, in Gadag (Dharwar District) in the Vatandar (Hereditary) Kulkarni (Karnam = Village Accountant) family of that place, Mr. Kulkarni underwent his primary and middle school education in Gadag itself and joined the Government High School in Dharwar wherefrom he matriculated in the year 1902. He studied for his Intermediate in the Ferguson College, Poona in 1903, but, realising his weakness in the compulsory subject of mathematics he wanted to join some professional course. Just then a scholarship was available for a youth from Dharwar District for admission into the Bombay Veterinary College. He applied for it to the Collector of Dharwar and joined the Bombay Veterinary College in 1904. He had a bright scholastic career passing first in all the Examinations and graduated in December 1906.

Soon after graduation he was taken into the Veterinary Department, Bombay, as a Veterinary Assistant Surgeon, in which capacity he served for twelve years. The efficiency and skill with which he worked during that period was well appreciated by the higher authorities and he was appointed as a Veterinary Inspector in which capacity he worked for eighteen years. He was a kind hearted Inspector and also a very useful guide to his subordinates. "To err is human, to forgive is divine" was his motto during his official career. Even as

an Inspector he was very social. Appreciating the ability with which he worked, Government deputed him to the Imperial Veterinary Research Institute at Mukteswar to undergo a post graduate training. After his return from Mukteswar he was appointed as Deputy Director of Veterinary Services. After serving as such for three years, he retired in February 1940.

Everybody realises how difficult it is to secure the appointment of the Deputy Director for an individual starting his career from the lowest rung of the ladder. The very fact that Mr. Kulkarni rose to the post of the Deputy Director from the lowest rung, will convince every body of his ability. As a Deputy Director and in all the posts he held, Mr. Kulkarni treated all those concerned equally never creating what is called the superiority complex. He was a trusted servant of the Government.

A brilliant student, a trusted servant, a very social and kind officer, Mr. Kulkarni is now laying down his office. The profession wishes him a long happy life to enjoy his well-earned rest.

[We join in wishing Mr. Kulkarni, long life and prosperity to enjoy his well merited pension. The popularity with which he was held in the department is shown by the chorus of tributes given to him by the profession, at the Farewell Party given to him on 31st December 1939, by the various speakers which are extracted elsewhere in this issue. We do hope he will give his best to the profession also, by becoming an active member of the All-India Veterinary Association and an ardent contributor to its organ, the *Indian Veterinary Journal* Ed. I.V.J.]

Clinical Articles

A CASE OF ROARING

BY

A. G. KAKA, G.B.V.C.,
Veterinary Assistant Surgeon, Jacobabad, Sind.

A Special Police Force (Gelding John) was sent to the dispensary for treatment on the evening of the 4th November 1937, by the District Superintendent of Police, Upper Sind Frontier, Jacobabad. The animal had been used as a polo pony, and on the evening of 4th November, after the game, he was found to be breathing very hard and was on the point of falling down. Roaring was present and it could be heard from a distance of 100 yards. After that the animal was found to develop roaring even after trotting a distance of 50 yards. Therapeutic treatment in cases of roaring is generally unsuccessful but I tried Potassium Iodide and it appeared to give good results.

Two drams of Potash Iodide were given in drinking water morning and evening. After a fortnight's treatment there was a little improvement in the breathing and after two months' treatment, the animal recovered. The horse has been under observation since then, but has had no recurrence of the roaring.

CHRONIC TYMPANITIS IN RUMINANTS.

BY

JATINDAR NATH NAGAR, L.V.P.,

Veterinary Assistant Surgeon, Civil Veterinary Hospital, Amritsar.

Tympanitis is only a symptom which may be present in a variety of diseases of alimentary tract. EBER wants the term Chronic tympanitis reserved for those morbid conditions where the function of the stomach is not disturbed at all or shows a very minor degree of disturbance in spite of bloating of a high degree. In Vol. XV, No. 2 (October 1938, page 205) of the *Indian Veterinary Journal*, Mr. S. S. Iyengar, G.M.V.C., Mayavaram, Madras, suggested a line of treatment which has been found by me to be very effective.

Subject:—B. Cow; B. Cow; Bullock; Cow; Cow.

The history of these cases were more or less same. At first bloating occurred at irregular intervals, and later on regularly after each feed; in other cases, it remained as a permanent condition. Rumination was more or less suspended in every case.

Treatment:—Many cases have been treated by me successfully. In a set of five cases treated in November 1938 and February 1939, three intravenous injections of 40 c. c. of a solution containing a dram each of Sod. Cit. and Sod. Chlor. were given at an interval of three days.

All the above cases made uneventful recoveries. Four cases were seen after a month and found totally cured.

My best thanks are due to Mr. B. N. Handa, B. Sc., M.R.C.V.S., Superintendent, Civil Veterinary Department, Lahore and Jullunder Divisions, Ferozepore, who has very kindly gone through this article and made necessary corrections.

A CASE OF PIROPLASMOSIS IN A MILCH BUFFALO

BY

G. V. NARUSU, G.M.V.C.,

*Veterinary Surgeon, S. P. C. A. Veterinary Dispensary, Osmanganj,
Hyderabad-Dn.*

History:—A milch buffalo was brought to this dispensary with the history that she was passing blood instead of urine and that she was off her feed and dull.

On examination, the coat was staring and dry and the mucous membranes were very much congested. The temperature was 105.8° F. and the pulse was frequent. The urine passed was black in colour. Blood smears were taken for microscopical examination and a sample of urine was collected in a test tube for analysis.

Diagnosis:—The microscopical examination of the blood smears revealed Babesia Bigemina. Haemoglobin and albumen were present in the urine examined.

Treatment:—*First day.*—The animal was given the following mixture with instructions to the owner to attend to its comfort and diet:—

R,

Pot. acetat	3 II
Pot. Citrat	3 IV
Liquor ammon acetat	3 I
Spt. Aeth Nit.	3 IV
Aqua	ad. OI

Second day:—Temperature 105.6° F, pulse frequent. Off feed. Injected 60 c.c. of 1 per cent. solution of Trypanblue intravenously (allowing 5 minutes time for the solution to gravitate into the vein).

Third day:—Temperature 105.8° F, pulse frequent. Haemoglobin and urea present in the urine. The animal

refused feed still, but took water. Repeated the mixture of the first day.

Fourth day:—Temperature 105.4° F, heart weak, Hæmoglobin and urea still present in urine. Injected Bayers 'Acaprin' 5 c.c. of 5 per cent. solution intramuscularly in the gluteus muscles.

Fifth day:—Temperature and pulse normal; the animal began eating well. No hæmoglobin or urea in the urine and the animal made an uneventful recovery; and no medical treatment was given afterwards.

Conclusion:—I would like to say that in all clinical cases of this nature Bayers 'Acaprin' may be tried as a specific treatment rather than the usual Trypanblue and Trypaflavin. Moreover, it is very easy to administer this drug as it is done by the intramuscular route and very often a single injection brings about a complete cure.

NOTES ON MANGE AS OBSERVED IN THE PUNJAB

BY

JATINDAR NATH NAGAR, L.V.P.,

Veterinary Assistant Surgeon, Veterinary Hospital, Amritsar.

Mange is a contagious skin disease in domestic animals caused by small mites which live in or on the skin. Each class of animal has its own particular variety of itch mites. They are grouped under Sarcoptidæ and Demodecidæ families.

Horses, asses and mules are liable to be affected with Sarcoptes, Psoroptes and Chorioptes and rarely with Follicular mange mites. Sarcoptic mange is first noticed on the head, withers and back and sometimes on the quarters, whereas the inner side of the ear is the normal habitat of the psoroptes.

Cattle are liable to be affected with sarcoptes, psoroptes, chorioptes and rarely with follicular. Chorioptic mange is commonly seen and psoroptic occasionally. Sarcoptic mange is

highly contagious and is transferable to man, and is seen first round the root of the tail. In chorioptic mange, the legs are first involved, while in psoroptes the legs are last involved.

In camels sarcoptic mange is common and the mites responsible are transferable to man. It is first seen on the parts which come in contact with the ground when the animal sits.

In sheep sarcoptic mange is rare, psoroptic is most common and is known as sheep scab.

In goats sarcoptic mange is most common and psoroptic is also met with. Sarcoptic mange first begins on the head and ears of goats while psoroptic mange is usually confined to the inner side of the ear.

Besides Demodex, dogs and cats are also affected with sarcoptic mange, which is most common and is highly contagious. The first part usually invaded is the head. Follicular mange is the most obstinate of skin diseases of dogs though not very contagious.

Scaly legs in fowls are often met with and is caused by *Cnemidocoptes mutans*.

Treatment:—

1. Segregation of the affected.
2. Strict disinfection of the stables, all gear and blankets before being used again.
3. Burning of the beddings.
4. Examination of the incontact.
5. If there are a number of animals in a stable, put separate attendant to those isolated.
6. If weather permits, clothing should be withdrawn from the diseased.
7. The application of dressing over the affected part must be preceded by clipping and washing with soap and water.
8. No irritant dressing should be used.

9. Liberal diet throughout the treatment is essential. The following recipes have given good results:—

1. R_x

Lime	12 lbs.
Sulphur	30 „
Water	100 gallons.

Boil till a yellow colour is produced.

Sig.—Dip the affected animal two or three times a week and repeat according to the extent of disease. Used for both Sarcoptic and Proroptic mange.

2. R_x

Sulphur	2 parts
Tar oil	1 „
Pot. bi carb	1 „
Phenyle pure	1 „
Sweet oil	12 „

M. ft. Lin.

Sig:—To be rubbed thoroughly two or three times a week and continued until hairs begin to grow.

3. In Sheep Scab the same dip may be used as in equines i.e., of sulphur and lime.

(a) Another Scab Dip in sheep.

R_x

Soap	1 lb.
Carbolic Acid	1 pint
Water	50 gallons.

Dissolve soap in one gallon boiling water, add acid. To be used as dip.

(b) R_x

Fresh skimmed milk	1 gallon
Kerosene oil	2 gallons.

Churn together until emulsified. Use one gallon of emulsion to each 10 gallons of water. To be used as dip.

4. For dogs with follicular mange:—Odyline application and injection of Aricyl 1 c.c. subcutaneously are useful. At the most 6 injections would do. To be given on every third day.

5. In Scaly legs of fowls:—Sulphur ointment dressing is useful.

6. Sarcoptic mange in camels is treated by Taramera Oil to be used as follows:—

(a) Clip, wash with hard soap and water, and dry

(b) Apply Taramera oil and rub it well on the affected part leaving the neighbourhood of eyes due to its irritant action.

(c) Apply on the second day mud on the affected part in a thick layer and let it remain for a week.

(d) Remove the mud and apply again Taramera oil as before, and mud also as before and let it remain for a week.

(e) Give bath with soap and water.

(f) Apply some emolient to remove the irritant action of the Taramera Oil.

(g) If there is still any sign of scabies, repeat once again the same treatment.

7. The following mange dressing has been found useful in practice:—

Sulphur	1 part
Alum	1 „
Borax	1 „
Sugar (Qoosa Misri)	1 „
Vineger	qs. to form paste.

M. ft. ung.

Sig:—To be rubbed in on the affected part. Repeat every day for a week.

I would recommend to every one prescription Nos. 2, 3 (b) and 7 to give a trial especially to No. 7 in all species of animals.

Hotch Potches

Common Cattle Troubles.—Veterinarians are very often called upon to suggest a practical treatment for cows that have obstructions at or near the end of the teats, or they have such a strong sphincter muscle at the opening of the teat that it is almost impossible to milk them. Many Veterinarians have prescribed the use of a teat plug for the purpose of dilating the opening, and others have advocated the use of a teat tube to draw the milk. Both of these are rather unsatisfactory and sooner or later infection of the teat canal develops and mastitis occurs in the udder with the usual trouble caused by such infection.

There has been reported recently a new method of treating these hard milkers, consisting of the use of silver nitrate sticks which are nothing more or less than small six inch sticks on the end of which are fused a bead consisting of 75 per cent-silver nitrate and 25 per cent. potassium nitrate. These tips are moistened and inserted into the end of the teat where the obstruction is found and this caustic substance cauterizes the tissues, with the result that in a few days time the destroyed tissues slough out, leaving a much larger opening through the teat and in many cases greatly improves the hard milker. It may require the use of several of these sticks in treating each hard milking teat, but they are very inexpensive and of course are used only once.

In treating cows in this manner it is necessary to control them, and this can be done in most cases by the use of a bull leader. Only a veterinarian should use this treatment.

Retained Afterbirth.—Experienced cattle owners and veterinarians in general practice realise that the old method of removing the retained afterbirth from the cow by detaching the membranes from the cotyledons by hand was a very unsatisfactory method. Injuries to the delicate membranes were sure to result from the detachment of the retained afterbirth.

There was usually a very severe inflammation following the infection and a general septic poisoning (blood poisoning) of the animal. Most of these animals recovered very slowly, lost a lot of flesh, had a hump-up appearance, and had a discharge for many weeks or months.

A much better method of handling these retained afterbirths consists of the introduction of an antiseptic solution or an antiseptic powder deep into the uterus at regular intervals until the afterbirth comes away naturally. The purpose of the uterine capsules or the solution is to keep the infection to a minimum and to reduce the inflammation and swelling and to bring about a return to normal of the uterine membranes.

Veterinarians and cattle owners who have followed this practice for many years find that their cows recover very rapidly and there are no bad after-effects from the use of this method. The cows do not lose flesh, they milk normally, and usually breed in a few weeks.

With the old method many of the cows could not be bred successfully for several months. GEORGE H. CONN, D.V.M.

Hoard's Dairyman, Feb. 10, 1940.

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Clinical Picture of Foot and Mouth Disease in the Goat.—The general condition of the animal remains unaltered, and a very careful search has to be made in order to find vesicles on the tongue or feet. The average incubation period is two to seven days. The hair appears harsh and staring, giving the head a swollen appearance; the animal may be dull but the appetite is often not affected. The characteristic smacking of the lips is seen and a catarrhal rhinitis may appear. Symptoms of colic are sometimes shown and diarrhoea may supervene. Pinhead-sized vesicles appear on the tongue, udder and feet; the epithelium is very thin and easily ruptured, and a small erosion is left on the epithelial surface. Healing of these ulcers is not so rapid as it is in cattle.

The condition in the feet does not always produce lameness; secondary infection is not common in goats. The milk secretion

is reduced, and the milk becomes thicker and of an unpleasant taste. Abortion of dead kids is a common feature.

A differential diagnosis is established between foot-and-mouth disease and catarrhal stomatitis (plant and phosphorous poisoning), papular stomatitis of cattles, herpes and goat pox.

Vet. Rec. April 30, 1938.

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Bacillary White Diarrhoea in Turkeys in Italy.—Age of Turkeys five to ten days old affected. Lesions: Catarrhal enteritis, myocarditis, enlargement of the spleen and the presence of greyish yellow nodules in the liver. A Gram negative organism was isolated in pure culture from the liver, bone marrow and heart blood, which on cultural and biological examination showed itself to be *Salmonella pullorum*. Feeding 2 c.c. of culture to young turkeys and chickens produced typical symptoms of bacillary white diarrhoea. It is suggested that the disease is chiefly transmitted through the egg and that one of the most important steps to take in its eradication, is to eliminate adult turkeys carrying the infection.

Vet. Rec. Sept. 24, 1938.

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Bionomics of Strongyloid Larvae in Pastures.—Infective eggs of *Ascaris* remain alive in the cold rooms of the laboratory after two years. A few larvae of *Trichostrongylus axei* were found to be active after having been kept in the cold room of a laboratory at temperature 30°F. and 40°F. for two years and two months. Enigk (1934) found strongyloid larvae still alive after having been kept on a slide in a dry state for over four years. Ranson (1916) found that a field kept vacant for seven months still contained infective larvae. Exposure to cold 52.5°F to—15°F in winter months in Moscow killed and rendered inactive most larvae. In pastures *T. Larvae* can retain their infectivity *en masse* throughout the winter months on arable ground in Great Britain in sufficient numbers to cause disease in the spring, even if the sheep are penned on the ground in such a way as to prevent auto-infestation from taking place through the addition to the larvae already there. The larvae climb to the top of the

blade of grass and exposure kills them. The longest lived larvae are those which remain in the moistest microclimate on the lowest parts of the herbage nearest to the soil, and that some of them may remain for a time actually in the soil and migrate on to the herbage plants at some later time.

1. The larvae ascend the herbage rapidly and efficiently.
2. The rate of mortality among larvae which have just climbed on to the herbage is very high during the first few weeks, but decreases as time goes on.
3. Some of the infective larvae die during the first 42 hours on the herbage.
4. 50 per cent. of the larvae die during the first week.
5. The shortest-lived larvae are those which climb high on to the exposed leaves, and the longest-lived larvae are found on lower leaves and particularly on the leaf sheathes near to the ground.
6. Dead larvae disappear from the herbage, either falling off or being washed off by rain. This also applies to living larvae.
7. These observations suggest that considerable benefit may result from resting a pasture even for a few weeks during which time a considerable reduction in the number of larvae may have occurred.

Vet. Rec. Oct. 1, 1938.

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Lactation Tetany.—Syn:—Atypical milk fever, staggers. Symptoms.—Marked hyperaesthesia which became intensified on approach, rapid palpating heart beat, temperature normal laboured respirations, staring eyes, muscular twitching of the muscles of the head and neck and eye lids.

Blood analysis showed the same alteration in serum calcium and serum magnesium as reported by other observers. Lactation tetany does not occur until there is both a low serum calcium and serum magnesium and that the onset of attack is accompanied by a sudden drop in the serum calcium which

returns to the normal on the recovery of the patient. Causes.—dietetic. Exciting causes which seem to be intimately connected with calcium metabolism also play a part in the aetiology of the disease. Treatment.—Mag. sulph per os and intravenous calcium therapy.

Vet. J. Oct. 1938.

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The Technique of Nerve-Blocking for Dehorning Cattle.—The source of nerve supply to the head is a branch of the 5th cranial and ascends from the back of the orbit to the horn, resting on the temporal muscle, almost immediately behind the lateral ridge of the frontal bone. It becomes more superficial as it ascends until at the last inch or more of its course below the horn it is almost subcutaneous being covered here only by skin and a thin layer of panniculus. In blocking this nerve the sight at which the local anaesthetic should be injected is about 1 inch below the root of the horn immediately behind the lateral ridge of the frontal bone. This ridge of the frontal bone can be easily made out ascending from the orbit to the base of the horn. It is important to make the injection subcutaneous, because if the needle be allowed to perforate the underlying aponeurosis which here covers the temporal muscle the anaesthetic will be injected into this muscle and will fail to block the nerve. If the injection be made $\frac{3}{4}$ of an inch deep at a point midway between the horn and the orbit as recommended by some authors failure will result in many cases. The operator usually uses Parsetic and injects about 5 c.c. over each nerve. This requires 10 to 15 minutes to act and continues for half an hour or more. In the case of large animals with large horns make a second smaller injection about $\frac{1}{2}$ inch behind the main site in order to block any branches of the nerve. The horn is removed with the saw.

Vet. Rec. Oct. 8, 1938

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Benzoic Acid Therapy in Veterinary Medicine.—Use of Sodium Benzoate intravenously, was tried in the affections of the respiratory tract in the horse, cow and dog. Indications

laryngo-tracheo-bronchitis, bronchopneumonia, pneumonia, traumatic and gangrenous pneumonia, parasitic pneumonia in cattle, and whether by accident or design tuberculous pneumonia is also included.

In catarrhal affections of the respiratory tract in the horse and cow, 20-25 grammes of sodium benzoate are dissolved in 200 to 250 c.c. of distilled water per day. For pneumonia 30-40 grammes in 200 to 250 c.c. aqua dist is given, whilst for purulent and gangrenous lung conditions 50 to 100 grammes in 1000 c.c. aqua dist is administered per day in 3 equal parts. The average dose for the day is 5 grammes in 20 c.c. aqua dist. administered subcutaneously or intravenously in two equal parts. In bad cases treatment had to be repeated daily for 3 to 10 days. In 2 to 6 minutes some reactions are seen e.g. excitement, snorting, coughing, exaggerated respiratory movements and urination.

Vet. Rec. Oct. 15, 1938.

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Treatment of Fowl Paralysis by Wheat Germ Oil.—Rapid recovery from paralysis following subcutaneous injections of cold pressed wheat germ oil in clinical cases of fowl paralysis. The use of wheat germ oil is also said to prevent the occurrence of further cases in an already affected flock.

Cold pressed wheat germ oil containing 40 Pacini-Linn units of vitamin E per gramme as used by Butler and Warren, was used on a flock.

Dose.—First week, 0.25 c.c.; second week, 0.5 c.c.; third week, 0.75 c.c.; and fourth week, 0.75 c.c.

Lesions.—Enlarged nerves, lymphocytic infiltration of various organs and nephritic tumours.

Vet. Rec. Nov. 19, 1938.

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"Trichlorsol" as a New Treatment for Canker.—Trichloroacetic Acid has been reported to be effective for treatment of Canker of the foot of horses. Treatment repeated at seven day intervals.

Vet. Rec. Dec. 17, 1938.

Alum-Toxoid as a Vaccine for the Prevention of Tetanus in Animals.—Was tried in Australia. Later when toxin-free and spores were injected the vaccinated animals were found unaffected.

Vet. Bull. Feb., 1939.

Diagnosis of Leishmaniasis and Piroplasmosis in Dogs by Sternal Puncture.—Puncture at the anterior sternum (1 sternum) with a trocar and canula. Material is withdrawn by means of a syringe, and spread carefully on slides. These films are rapidly air dried and stained by May-Grunewald and Giemsa. Leishmaniasis in the dog is a generalised condition, and sternal puncture affords a simple method of examination, as also in suspected canine piroplasmosis. The study of variations in the medullary cells in leucaemia and anaemias can also be easily performed by this method and should prove a valuable aid to diagnosis.

Vet. Bull. Feb., 1939.

The use of noncooked, nonsterilised coconut milk as an additional nutrient substance in culture media.—Sterile coconut milk is easily obtained by aseptically aspirating ripe fresh coconuts. The addition of this noncooked, nonsterilised nutrient agent merely doubled the cultural qualities of ordinary nutrient broth and agar in the cases of all organisms tested, and was found to be superior to the usual medium used in the case of *Staphylococcus aureus*, *B. fecalis alcaligenes*, and *B. Welchii*. In the case of the meningococcus, it was found to be equally as good as the medium usually used. In the cases of the *Streptococcus viridans*, pneumococcus, gonococcus, and tubercle bacilli, it was found to be inferior to the preferred selected media.

J. Lab. & Clin. Med. Jan., 1939.

Tetrachlorethylene in the Treatment of Hookworm disease with Special reference to Toxicity.—The anthelmintic activity of tetrachlorethylene has been studied in 111 patients, ranging in age from 2 years to 7 years. The drug was found effective

against hookworm, a dose of 8 c.c. being the most effective one. It had a slight action against round worms. The toxicity of tetrachlorethylene has been studied with special reference to liver damage. No appreciable toxic action has been found even after 8 c.c. doses on the cardiovascular, respiratory, hepatic, and renal organs. In a few cases, doses of 6 c.c. and more have produced symptoms of giddiness, faintness, and weakness, and in one case that of narcosis. The effects were only temporary. Doses of 4 c.c. to 5 c.c. may be safely given in adult patients, and two such treatments at intervals of ten days may be expected to cure even severe cases of anchylostomiasis. Children may be given tetrachlorethylene in doses of four to five times the age in minims. Tetrachlorethylene, in view of its low toxicity and efficacy, is a very valuable drug in the mass treatment of anchylostomiasis.

Ind. Jl. of Med. Res. Jan., 1939.

College News

MADRAS VETERINARY COLLEGE

B. V. Sc. Degree (Final) Examination Results.

The following is the list of successful candidates at the B. V. Sc. Degree (Final) Examination held in January 1940:—

- | | |
|---------------------------|----------------------------|
| 1. Chandrasekharan, V. P. | 5. Ramanujachari, G. |
| 2. Ganapati, M. S. | 6. Sambamurti, B. |
| 3. Hariprasada Sarma, B. | 7. Sankaranarayanan, M. V. |
| 4. Mg. Ko Gyi. | |

Final Diploma Examination Results.

Names of candidates who have passed the final diploma examination held in March, 1940.

- | | |
|------------------------|------------------------|
| I. Aiyavaru Sastri, G. | III. Maung Thoung Tan. |
| II. Srinivasan, P. | |

- | | |
|-----------------------|---------------------------|
| IV. Maung Tin Swe. | XI. { Nargunam, V.P. |
| V. Sukumaran, K. | Sanjiva, B. |
| VI. Nagappa Pai, K. | XII. { Narasimhamurti, G. |
| VII. Muhammad | Navaratnam Samuel, Z. |
| Azizuddin, I. | |
| VIII. Pandurangam, G. | XIII. { Mantramurti, I.D. |
| IX. Kunhikamaran | Ramachandra Reddi, |
| Nambiar, K.T. | B. V. |
| X. Ramabrahmia, T. | XIV. Venka Reddi, K. |
| | XV. Kariyappa K.K. |

Madras Veterinary College, } M. R. V. PANIKKAR, B.Sc., M.R.C.V.S.,
 Vepery, } Principal,
 Madras, 2nd April 1940. } Madras Veterinary College.

BIHAR VETERINARY COLLEGE

Final Diploma Examination Results.

The following students are declared to have passed the final Diploma Examination for the Session 1939-40 held in March 1940:—

- | | |
|---------------------|----------------------|
| 1. M. Swarup, | 10. R. K. Shaw, |
| 2. Ghufuranuddin, | 11. M. Murtaza Khan, |
| 3. S. A. H. Zaidi, | 12. N. K. Sharma, |
| 4. Raj Kumar, | 13. P. N. Sinha, |
| 5. A. D. N. Sinha, | 14. S. M. Prasad, |
| 6. M. Sulaiman, | 15. R. B. Prasad, |
| 7. R. Y. Pandey, | 16. R. R. Sinha, |
| 8. Basudeo Narayan, | 17. G. Bishwal. |
| 9. S. N. Sharma. | |

Patna, } P. G. MALKANI, B.A., B.Sc. (Lond. Vet-),
 12th April 1940. } M.R.C.V.S.,
 Principal,
 Bihar Veterinary College.

BOMBAY VETERINARY COLLEGE

List of successful Students in the final Diploma examination held in February 1940.

- | | |
|--------------------|---------------------|
| 1 Kotbagi V. M. | 14 Tilak M. B. |
| 2 Patil K. R. | 15 Bendigeri D. H. |
| 3 Luktuke S. N. | 16 Vaishnav V. N. |
| 4 Kulkarni A. E. | 17 Salvi M. S. |
| 5 Jadgouda G. B. | 18 Nikumbh V. E. |
| 6 Kathuria B. K. | 19 Patravli P. P. |
| 7 Patil K. L. | 20 More S. V. |
| 8 Gulrajani T. S. | 21 Thakar J. G. |
| 9 Solanki J. H. | 22 Bhagwat A. G. |
| 10 Palnitkar G. G. | 23 Memon A. K. |
| 11 Ursani A. F. | 24 Aralikatti S. R. |
| 12 Mataney C. F. | 25 De'Costa L. S. |
| 13 Patil R. M. | |

M. MOHEY DEEN M.R.C.V.S., J.P.
 Principal.

BENGAL VETERINARY COLLEGE

List of students that have passed in order of merit the Diploma examination of the Bengal Veterinary College for the Session 1939-40.

- | | |
|---------------------|----------------------|
| 1 S. Anwar | 22 { S. S. Sastri |
| 2 I. Gupta | E. H. David |
| 3 S. R. Biswas | 23 A. C. Chakravarty |
| 4 S. C. Ghosh | 24 N. Guntia |
| 5 R. C. Dikshit | 25 N. P. Naithani |
| 6 M. Sarwar | 26 S. A. Hassan |
| 7 L. F. Gibson | 27 M. A. A. Miah |
| 8 C. P. Pillai | 28 S. N. Mukherjee |
| 9 M. Pu | 29 S. N. Das |
| 10 B. D. Kapri | 30 { C. Venkataswamy |
| 11 { G. S. Mahanath | R. K. Roy |
| H. K. Mukherjee | 31 S. N. Biswas |
| 12 M. Nasim | 32 M. Ishaquddin |
| 13 L. C. Hua | 33 B. Singh |

14 D. N. Hazarika	34 Md. K. Rahman
15 M. A. Wadud	35 R. K. Sen
16 Md. F. Rahman	36 A. N. Guha
17 K. Singh	37 { P. M. Chakravarty
18 K. R. Saxena	{ S. C. Giri
19 S. Singh	38 R. N. Bhattacharjee
20 N. K. Ghosh	39 Ch. G. Mustafa
21 { C. P. Tatt	
{ P. C. Charles Ratnatunga	

A. D. MACGREGOR F.R.C.V.S., F.Z.S., I.V.S.,
Principal.

BIHAR VETERINARY COLLEGE

PATNA

NOTICE.

The next session of the Bihar Veterinary College will commence from the 1st July, 1940.

1. Candidates desiring admission should submit their applications on the prescribed forms together with the following certificates, so as to reach the Principal on or before the 1st June, 1940. The certificates will not be returned.

(a) Age and moral character certificate from the Headmaster of the School or Principal of the College which he last attended (true copy).

(b) University certificate or a certificate from the School of University authorities to show that he has passed the Matriculation Examination (true copy).

(c) Medical certificate of fitness from an Assistant Surgeon.

(d) Certificate from a gazetted officer to the effect that he is a Bihari or domiciled in Bihar (applies to candidates claiming Bihar domicile).

(e) Letter of identification from some well known person stating that the candidate is known to him and the statements made in the application form are correct (in original).

(f) Letter from his guardian stating that all expenses incurred by his ward during the latter's period of study at the college will be paid (in original).

2. An applicant must be a Matriculate of a recognised University. Preference will be given to a candidate who has passed the I.A. or I.Sc. Examination. A good knowledge of English is essential. Height should not be under 5'—4" and chest unexpanded, not less than 30 inches. A candidate must not be below 16 and over 25 years of age on 1st July, 1940.

3. A non-stipendiary candidate will have to appear before the Governing Body of the College when called for interview.

4. Fees must be paid in advance according to the scale under rule 8 of the College rules, the initial payment due at the time of admission being Rs. 35/8/- only.

5. A candidate on admission may be required to reside in the college hostel.

6. Admission forms may be had free on application to the Principal. Prospectus will be supplied on receipt of -/4/- by money order, for each copy required. Stamps sent in lieu of money will not be accepted.

7. *For candidates from the Province of Bihar only.*—A candidate for a District Board stipend to assist him while under training at the college should apply in the first instance to the Chairman of his home district board, with necessary certificates as soon as possible so that when selected he may be interviewed and approved by the Director of Veterinary Services, Bihar, before he is recommended for admission. Such a candidate should in addition to the certificates required in para 1, produce at the time of admission a letter from the Director of Veterinary Services, Bihar or the Chairman, District Board concerned regarding his selection as a stipendiary.

8. *For candidates from Provinces other than Bihar and from Indian States.*—A candidate from other provinces and Indian States should apply to the head of Veterinary Department of his province or state for reservation of a seat for him, on payment of an annual contribution by the Government of

his province or State. Applications received direct from such candidates will not be considered.

9. The scale of pay of the Bihar Veterinary Service is as follows:—

Provincial Rs. 200-40/2-560-40-3 640.

Subordinate.—(a) Veterinary Inspectors—1st Grade.

Rs. 170/-

do. —2nd Grade.

Rs. 135/-

do. —3rd Grade.

Rs. 100/-

(b) Veterinary Assistant Surgeon.

Rs. 50 to 100/-

(fixed travelling allowance. Free house or house allowance in lieu thereof).

Note.—Revision of the above scale of pay is under the consideration of Government.

10. Stamped & addressed envelopes must be enclosed for replies to queries etc.

PATNA,
The 21st March. 1940 }
B.N./-21-3-40.

P. G. MALKANI,
Principal,
Bihar Veterinary College.

Association News

FAREWELL PARTY TO MR. V. N. KULKARNI

By the Bombay Veterinary Medical Association.

Speeches delivered at the Farewell-Party given on 31st December 1939, in honour of Mr. V. N. Kulkarni, Deputy Director of Veterinary Services, Province of Bombay, Poona, on the eve of his retirement from service.

Speech by Mr. N. B. Kotbagi, Veterinary Assistant Surgeon, Poona City:—

Rao Bahadur Phadke, Mr. Popatlal Shah, President, Poona City Municipality and Friends,

You all know the occasion, for which we have assembled here. Mr. Kulkarni, our Deputy Director is passing into retirement, after 33 years successful service in the Veterinary Department. It will not be amiss, if I give you a short life sketch of Mr. Kulkarni which perhaps many of you might not know.

Mr. Kulkarni was born in Gadag of a respectable family. In the School Mr. Kulkarni characterised himself as a scholar. Besides, he was also a sport. He Matriculated himself in 1902 and joined the Fergusson College for his Collegiate Education. After getting a duck in his F. Y. examination he joined the Veterinary College in 1904 and passed the G.B.V.C. examination with distinction in 1906.

Soon after his graduation he was taken into the Veterinary Department of our province, as a Veterinary Assistant Surgeon. He served as a Veterinary Assistant Surgeon for 7 or 8 years in various places. The efficiency and skill with which he acted during the first 7 or 8 years was well appreciated by his higher authorities and as a recognition of it, he was appointed as a Veterinary Inspector. As an Inspector he worked for nearly 20 years. He was a very kind hearted Inspector, and also a very useful guide to his subordinates. It does not mean that the mistakes were not observed by him, but after noticing the mistakes he used to get them corrected just on the spot and never desired either to expose the officer concerned, or to make any metal out of that. Even as an Inspector he was very social, and noting the ability with which he worked, Government deputed him to the Veterinary Research Institution at Muktesar to undergo the Post Graduate Training.

At Muktesar also Mr. Kulkarni showed himself off to an advantage. (There he characterised himself as Research Scholar). After his return from Muktesar he was appointed as

a Deputy Director of Veterinary Services, where he worked for 3 years and is now retiring.

You all know how difficult it is to secure the appointment of the Deputy Director for an individual who starts in the cadre of the Veterinary Assistant Surgeons. The very fact that Mr. Kulkarni rose to the post of the Deputy Director from the lowest rung, would convince you all, the ability he possesses. As a Deputy Director and in all the posts he filled in, Mr. Kulkarni treated all those concerned quite equally, never creating what is called the Superiority Complex. He was also a trusted servant of the Government. His reports on any matter administrative or otherwise, were very much valued and appreciated by his higher officers. A brilliant student, a trusted servant, and a very social and kind officer, as we can describe Mr. Kulkarni is now laying down his office. I am sure I will be voicing the opinion of you all when I say that May God give Mr. Kulkarni a long happy life to enjoy his well earned rest.

With these words I take my seat.

Speech by Rao Bahadur V. R. Phadke:—

Brother graduates and friends,

This is the second occasion for me to preside at a farewell function arranged in honour of our friend Mr. V. N. Kulkarni, Deputy Director of Veterinary Services, who would be shortly going on leave prior to retirement and I do regret that we should be compelled to have to close the chapter of our association and friendship with him in his official capacity in view of his retirement.

I have known Mr. Kulkarni ever since he joined the College in the year 1904 while I was Assistant Veterinary Officer at the College prior to my leaving for Mukteshwar as Veterinary Inspector. I have been watching his career right through with interest. He has risen from the lowest rung of the ladder to his present position by virtue of his merits. I assure you he is like a gem that did not get an opportunity to shine in a small ornament from no fault of his or could be compared to a huge fragrant flower not finding its way to be set in a tiny Boquet.

Almost all of you, I suppose, had the fortune of working under him while he was a Veterinary Inspector and knowing him too as Deputy Director.

I have listened with profound interest and joy all that has been said by many of you about his many good qualities of heart and congenial temperament and having come with him in personal and prolonged contact I would like to fully associate myself in endorsing every word of what has been said without being accused of repetition.

I may tell you that he has been a great asset to me as a Personal Assistant while I was acting as a Director of Veterinary Services and on my return from Karachi last year he has been more or less my constant companion.

Although he is 55 he has plenty of reserve forces that could be capably utilised.

Although you would be losing in him an official guide he would always be available as such in his private capacity. To be brief you will all join me in wishing him long life and health to enjoy his well earned pension and rest and that God may shower blessings on him and his family.

Speech by Mr. B. B. Joshi:—

Rao Bahadur Phadke and Brother Delegates,

With due apologies and respects to you, Sir, I wish to speak a few words on this occasion, with a request that you will all hear me patiently. I do not wish to add anything more to the life history of Mr. V. N. Kulkarni already related to you by my friend Mr. Kotbagi in his speech but I would refer to a few more important things which I remember on this occasion. When I entered the threshold of the College, Mr. Kulkarni left the College as a graduate. His higher education at the time he joined the College requires to be mentioned here as very few then had this kind of College education. I am not a great astrologer or a palmist but I do find in his right eye signs of FIRE *Agni* and in his left eye, signs of *Vayu* meaning great activeness; his temper though sweet, he is known to be very

wild with anger on occasions in his life, body well built and robust, he ought to have joined the bar or the revenue department and I am sure he would have risen to a high responsible position. What made him to join this College I do not know; he may perhaps give us an idea as to why he did so. Anyhow I am glad to see that our friend, by his merits and good work, has risen equally to a responsible post, *viz.*, the Deputy Director of Veterinary Services. Gentlemen, allow me to relate to you an instructive fable which I am always very fond of relating to others and which I feel sure, fits in very well on this occasion. The fable runs thus:—

When God Almighty created this Universe, He created—man, horse, bullock, dog and monkey and gave them each 20 years longevity and dispersed them all to live on the Universe. Man died in his very youth, while others found this period of 20 years rather tedious. They therefore conjointly approached the God Almighty and requested him to do the needful. God said—Gentlemen—man will have 100 years but he will have these in the order as follows:—

First 20 years are his own; next 20 years will be that of the horse; next 20 of the bullock, next 20 of the dog and the remaining 20 that of the monkey were given satisfactory periods of longevity and they all were dispersed. The fable has its own instruction which you all should follow in your life and see its Mith as applied to Mr. Kulkarni. The instruction is as follows:—Let the man be a pauper or a king, you know that he is quite happy during the first 20 years of his own; the next twenty *viz.*, from 20 to 40 he has to work like a horse. Horse is very well known for its energy and rashness thus has its energy to work but he is found to be rash and thus requires a guide during this period. Man in the midst of his life is always in danger. This proverb holds good in every man's case. Mr. Kulkarni worked like a horse during this period of his life and was also in danger. I know of one and that is the terrible sickness he has had for years then. Thank God he pulled through but the effects are still there. As regards his service career I need not add anything. More to all good

words already spoken by my friends, but refer to only one thing and that is.—we were all very fortunate in having Mr. Kulkarni as an Inspector and Deputy at an age which according to the fable was between 20 and 40—a well matured experienced, kind at heart as Mr. Kulkarni has been to us all. It is a pity that we are going to lose such an officer like Mr. Kulkarni. But it is said that even Lord Krishna had to retire: You cannot expect him to work and serve throughout.—He is due to retire and he does deserve rest. Let us therefore wish him according to this fable a full life of 100 years and hope he continues the same sympathy and kindness towards us and the profession he belongs to; let us pray to God to give him a long happy and prosperous life and to bless him with every honour and magnanimity that a man does aspire for.

Reply by Mr. V. N. Kulkarni:—

Rao Bahadur Phadke, Colleagues and Friends,

I am aware that you expect me to say a few words on this occasion in response to your felicitations. Unfortunately I am not much used to speechifying. I will, therefore, with your kind indulgence, be as brief as possible in expressing to you my thanks for all the nice things you have said of me and for the kind appreciation of my work in the Department. I know I do not deserve them. All I can say of myself is that I tried to do my duty by the Department and my best for my colleagues. I take no credit for anything. If my official life has been happy, peaceful and successful it is to you, to your friendship and your co-operation that I owe it all. I am deeply grateful to you all, not only for the kind things which have been said about me today but for all the good things you have done to me in the past.

As Mr. Kotbagi has just told you I have completed my 33 years' service. During this long period I had many occasions to visit many of you that have gathered here to-day and to receive your kind hospitality. My Service life as Veterinary Inspector for about twenty years was of great pleasure to me as

I could often meet you in different scenes and sceneries. Whenever I came to you I felt quite at home. I felt so happy amidst your family and children that they looked upon me as one of their members. It has just been said of me by one of you that I never made you feel of any sense of inferiority complex when you happened to be in my company. Here I must confess that I was really unfit to be an effective or efficient Inspecting Officer, being made of rather soft metal and as such I may have failed to maintain the rigour of office. I am not however sorry for it. I have always tried to treat even the fresh graduates as my colleagues, friends or brother graduates and not as my subordinates.

- Conditions of service are fast changing and I should like to suggest to you to be straight forward in your dealings, sincere and obliging in your work and obliging and polite in your manners to your clientele, majority of whom are poor and illiterate agriculturists of whose livestock you are the care-takers. Never mind if your work is not immediately appreciated. Reward for good work does come sooner or later according to luck. At least there is your conscience to tell you that you have done your duty and that is the greatest satisfaction in life. Your work is such that it serves you two great purposes in life viz. Swartha and Paramartha according to ethical code. Swartha, in that you get your remuneration in the shape of pay and allowance and Paramartha, in the sense that you relieve the pain of the dumb animals. You have thus fulfilled the mission of your life. What more would you desire!

I wish you to be careful of your subordinate staff. I tell you most of the allegations made against the Veterinary Assistant Surgeons are done through the mischief of these men. Be kind to them, grant them small concessions that do not interfere with the working or discipline of the dispensary but do not trust them implicitly and make them *de-facto* Veterinary Assistant Surgeons as they try to take undue advantage of our weakness and even try to blackmail you. I as Veterinary Assistant Surgeon, was a victim myself of such intrigues in this very

hospital and suffered much more than any of the Veterinary Assistant Surgeon in the Department. Even though I suffered for the time being which I attributed to the influence of bad stars the reward for my sincere work in the past came to my rescue and I was promoted as Veterinary Inspector immediately after, to my great surprise and relief, I would therefore advise you to do your work sincerely and to the best of your ability and you are safe.

One more thing I have noticed is that some of you do not give due respect to the members of your Dispensary Committee because you think that some of them are not sufficiently educated or are not fit in some other way to deserve your consideration. That is a great blunder. Be courteous to every one that visits your dispensary, be he an officer, a member or a cultivator.

I would also like to advise you that you should develop a habit for reading. Do subscribe to a good daily paper, read it regularly and be in touch with world news. Spend a few rupees of your small earning in buying good books both professional and of general knowledge and try to be abreast of times in all directions.

It is a great pleasure to me to see so many of you to have gathered here to-day to do me honour on the eve of my retirement. Though I am retiring from service I am not willing to sever my personal relationship with you and hope to meet you often as friends.

I assure you that I can never forget you and remember that wherever I may be you are always welcome to me. Nothing could hurt me more than the thought that any of you should have come nearer my place and failed to visit me.

Once again I thank you all from the bottom of my heart for all your good wishes and in return you will accept my own.

May you prosper and be happy, shall be my prayer to Almighty God. I can say no more.

COPY OF THE LETTER

August 10, 1939.

No. 1978.

Communication.

(The Editor does not hold himself responsible for the views expressed by the correspondents).

To

THE EDITOR,
Indian Veterinary Journal.

Dear Sir,

I request you to be good enough to publish the following letter in the earliest issue of your journal. This letter is an objection drafted at the request of a former student of this Institute, to a recent ordinance passed by the municipality in which he is operating one of his large creameries. Since this particular ordinance came to my attention, I noticed from press reports that one of our largest cities has passed a very similar law regarding skim milk powder. I have attempted to set forth my views and opinions on such legislation as clearly as is possible in this letter. Since submitting it to the concerned Municipality I sent a copy of this letter to Gandhiji, who personally replied suggesting that I submit it to you which I do at this time. He added he is also dealing with the matters in his own way.

Sincerely Yours,

JAMES N. WARNER, M.SC.

*Professor of Dairying
Allahabad Agricultural Institute
Allahabad Christian College.*

.....
The Municipal Board,
.....U. P.

Gentlemen,

It has come to my attention through Mr..... Manager of the..... Dairy Co. of your city, that a recent ordinance requires that skimmed milk offered for sale within the municipal limits should be coloured red. Mr..... informs me that you have given him thirty days in which to outline his protestations. I write at this time, therefore, to give my views on this matter and to confirm them by the statements and findings of nutritionists who are far better able to speak on these matters than myself, as I am less familiar with the dietary requirements of the human subject and the value of certain foods in meeting these requirements than they. In the first place it would seem that the fundamental purpose of this law is to prevent the use of skimmed milk in adulterating whole milk that might be offered for sale within the municipality. I see no other reason for it in which there may be the slightest suggestion of justification, and ever in this case there is considerable question, as I shall attempt to point out.

The use of artificial colouring materials for the purpose of identifying particular products is generally known. In the United States the Federal Food and Drug Administration requires that all oleomargarine (artificial butter) be sold in its natural colour to identify it from butter which is usually artificially coloured. They also require their inspectors to add green colour to cream they condemn in creameries so that it will not be made into butter. In India the colouring of the vegetable ghee is required by some municipalities to identify it from pure ghee (milk fat).

In the case of the coloured vegetable ghee the product is not, thereby, unfit for human consumption, but it is unquestionably identified as vegetable ghee; so coloured it may not be used as an adulterant of pure ghee because of the added colour; its use for this purpose could and would be easily detected. Both its nutritional value and economic value are less than those of pure ghee and the added colour makes it easily identified as a separate product which cannot be mixed with and/or sold as pure ghee.

The nutritional value of skimmed milk is only slightly less than that of whole milk. This fact hardly justifies the practice of colouring, unless the material used for the purpose—colouring material—does not make the skimmed milk unfit for human consumption and the public is educated to realize that they are quite as safe in using coloured as uncoloured skimmed milk.

I question very much the possibility of completely destroying the prejudices in the minds of the consumers against the consumption of coloured skimmed milk, through the most extensive, and therefore expensive, educational programme. I question further the comparative costs to the municipality of such an educational programme and of strict enforcement of laws regarding the adulteration of milk with either water or skimmed milk. I feel the latter is the better from the stand point of cost.

Laws governing the adulteration of milk are made fundamentally to prevent the addition of water. The addition of skimmed milk is a practice which many of the world's largest milk plants carry on. This is acceptable in some cases since the food value, except for a slight change in the fat content of the milk, does not become any less. Furthermore, the fat content of milk or cream can be adjusted in this way without altering the S. N. F. content appreciably. It is true, however, that the practice, as it is generally carried on by the Indian gowala, is made to increase the volume of milk in the same way and for the same illegal purpose, as the addition of water. The latter is by far the worst offense, as I shall explain below.

The colouring of skimmed milk to prevent its use as an adulterant of whole milk gives the practice of using water considerable encouragement. The man who adulterates will continue to devise means of so doing. If he cannot use skimmed milk, he will use water. There is no question of that. Therefore, this means of preventing adulteration, *i.e.*, by requiring that the skimmed milk be coloured to identify it, actually encourages the more undesirable practice of using water. Enforcement of laws directly concerned with adulteration is a far more practical solution.

If a man adulterates with coloured skimmed milk he may readily be caught. The far greater offense is, however, to use water, and one who does that is not touched at all by this ordinance; the material he uses is not such as will identify him or his practice so readily. The fact is, the use of water is encouraged by such a law and this is fundamentally the practice toward which we wish legislation to be directed—Against this practice, certainly not for it! I feel very firmly, therefore, as I stated above, that we are working against ourselves instead of for ourselves in this case. It does not offer any solution, therefore, to our difficulties, rather it aggravates them.

Let us assume that it is desired to dilute 100 lbs. of whole cow's milk with 25 lbs. of water. We then have 125 lbs. The composition of whole cow's milk (refer to the table below) shows us the Chemical Composition of cow's and Buffaloe's whole milk; cow's skimmed milk and water. We have in that milk approximately 9 lbs. of milk solids-not-fat (S.N.F.) plus 3.8 lbs. of fat or 12.8 lbs. solids. (%=lbs. per hundred). By adding 25 lbs. of water we then have 12.8 lbs. of solids in 125 lbs. or 10.2% ($12.8 \div 125 \times 100$), *i.e.*, 3.04% fat and 6.16% S.N.F. If, on the other hand we used skimmed milk in place of water (Note: Adulteration means: to falsify by admixture of baser ingredients (Oxford Dict.) or corrupt, debase, or make impure by admixture of a foreign or a baser substance (Webster's Dict.) and "tone" or "Standardise", as used in respect to milk and its products, means to correct the composition with respect to a particular ingredient, usually fat. In the case of a random

addition of skimmed milk to whole milk for the purpose of increasing its volume we do not have a practice that can literally be called toning, but it is not adulteration as defined above). We get results somewhat as follows: 100 lbs. of milk plus 25 lbs. of skimmed milk equals 125 lbs. in which we have 3.8 lbs. of fat and 9.0 lbs. S.N.F. (contained in the 100 lbs. of whole milk) plus 9.23% of 25 lbs. or 2.30 lbs. of S.N.F. (contained in the added skim). We have, therefore, 3.8 lbs. of fat and 9.0 lbs. plus 2.30 lbs. of S.N.F. in the 125 lbs. or 3.04% fat and 9.04% S.N.F. ($9.0 + 2.25 \div 125 \times 100$). In other words the food value of the product has been reduced by 0.76% fat, exactly the same reduction as when water was added. This assumes no fat in the skimmed milk which is actually not true. In skimmed milk from the most efficient mechanical separator there is around 0.05% butter fat, and it may run much higher if the separator is not functioning properly. It can be seen, therefore, that the reduction of the fat % will likely not be so great when skimmed milk is added as when water is added.

		(1)	(1)		
		Buffalo	Cow	Skimmed*	water
Water	...	83.00	87.38	90.77	100.00
Fat	...	7.51	3.73	nil	none
Milk solids-not-fat..	9.49	8.89	9.23	none	

The more significant difference is, however, in the S.N.F. content of the final product. In the case in which water was added we saw that the S.N.F. content fell from 9.0% to 6.16% a difference of 2.84% or 2.84 lbs. in 100 lbs. of such an adulterated product. On the other hand, in the case in which skimmed milk was used the percentage of S.N.F. actually increased from 9.0% to 9.04%. It is true that this is a small increase, but the fact remains that the difference between the S.N.F. percentage of the two products is $2.84 + 0.04$ or 2.88%, which is 2.88 lbs. S.N.F. in 100 lbs.

All of this assumes a knowledge of the constituency of that portion of the milk termed S.N.F. and of the nutritional value

* Calculated.

of the constituents included. This we shall not do at this time, rather we will consider what materials make up this portion of milk and the value of these materials as a human food.

Dr. Davies states that the 8.93% of whole cow's milk, that is included under the term S.N.F., consists of protein, lactose and ash to the extent of 3.42%, 4.78% and 0.73% respectively of the whole milk ($3.42 + 4.78 + 0.73 = 8.93$). The fact that these materials are used by the human body for muscular development, heat, energy and bone and tooth development respectively, is generally known. What may not be so widely realized is that the percentage of each of these materials actually assimilated by the human subject is greater in the case of milk than almost any other food. Eckles, Combs and Macy⁵ tell us that the percentage of digestibility of milk proteins is as much as 98%. The figure for fat and carbohydrates (sugar, *i.e.*, lactose) in this case is 99%.

What significance, one might ask, has this to the new ordinance. It is simply this: No one denies the value of milk as a food. The food value of milk is dependent entirely on the solid contents of that milk, *i.e.*, the amount of fat plus S.N.F. contained in it. Without an extensive programme of education to destroy the prejudices of the people of your city against the use of coloured skimmed milk there will be many who refuse it as a food. It is almost, if not entirely, impossible to use it for the making of sweets. The immediate effect and in all probability the ultimate effect as well, since such prejudices will likely never be entirely removed, is to reduce, from psychological causes, the availability of a greatly needed food product, one which is at present readily available to the consumer because of its low price, if for no other reason. If the policing or execution of laws regarding adulteration of milk was undeniably strict, the very cause of such an ordinance would not exist, hence such a law would not have been suggested.

Allow me to confirm the statement regarding the food value of milk, and more particularly skimmed milk by the statements of better qualified men than myself.

Dr. W. L. Davies, Director of Dairy Research, Government of India,¹ says: "the addition of whole milk and separated milk, to the diets of school-children attending day-schools in some Scottish towns promoted satisfactory growth, and separated milk proved as beneficial as whole milk" "Mann compared milk with several other supplements — The diet was considered adequate (before the addition of milk).—It was found that increase in growth, as measured by both height and weight, was promoted by the addition of one pint of whole milk per day.— The missing growth-factors in the original diet were undoubtedly associated with fatsoluble vitamins, the calcium salts, and the good quality of the protein of the milk added as a supplement." Also, "Luck gives the (energy) value as 68·3 calories per 100 grams. or 310 calories per lb. The fat accounts for roughly 50%, the proteins for 21% and the lactose 29% of the total calorific value. "Its (milk) value as one of the fundamental constituents of a well chosen diet cannot be overemphasized."

Dr. Norman C. Wright of the Hannah Dairy Research Institute, Ayreshire, Scotland,⁴ says: "I should unhesitatingly recommend that separated milk should be—for local consumption."

Steenbock and Hart⁶ say, "whether it is used in the form of whole milk, skimmed milk, buttermilk, or even whey, or as cheese, milk furnishes a protein which seems to be just what the body needs."

"Grains and potatoes are notoriously poor in their content of chlorine, calcium, and sodium, but milk makes up this deficiency in an excellent manner."

From Johns Hopkins University, Mr. E. V. McCollum⁷ says: "The greatest factor of safety in the human diet is the regular use of milk."

J. B. Orr, Chairman of Research Com., Scottish Milk and Health Ass'n. ⁸ says, "Height and weight increase in children getting milk over seven months experimental period was 20% greater than control children."

"Separated milk is of great value for promoting growth. Its nutritive value for children would appear to be underestimated."

Leighton, Gerald and Clark, Mabel⁹ report an experiment with school children somewhat as follows:

"Whole milk average 3·85% fat and skim 0·33% fat was used in feeding 1425 children from 6 to 14 years of age."

"Average increase in height was of 23·5% and in wt. 45·37% for milk fed over non-milk-fed. Greatest increase in height was the milk fed 6 year old group. Greatest increase in weight was in the 13 year old separated milk group."

These authors further state that "Dr. G. W. Simpson observed 'The difference in nutrition between groups receiving milk and not receiving milk was plainly evident. No great difference was noticed between the whole milk and separated milk groups.'"

Lastly, Mrs. Wiser¹⁰, in studying our village dietaries as compared with the standard dietaries for men of 70 kg. (145 lbs.) doing light, medium or hard work, concludes that: "Our village diets are high in carbohydrates, while protein, and especially fat, are low. This is what we might expect when cereals are used so extensively, and when proteins come from vegetable rather than animal sources."

What I wish to point out here is that the people of..... need every ounce of the food contained in skimmed milk and that they should, therefore, not be deprived of it. Colouring the skimmed milk red would do this, as I have indicated. It would seem, therefore, more just to allow free sale of such a food product by not requiring that it be coloured and strengthen the execution of existing ordinances regarding adulteration so that neither water nor skimmed milk could be used for this. Water has its place in the human diet, but not in the milk. Skimmed milk has a place in the diet, but cannot be used to fulfill this place as a food if the present ordinance is enforced.

I do not plead for the use of skimmed milk as an adulterant. I know quite well what harm the Indian dairyman does

to himself by such a practice. My plea is that such milk shall be available to the people of your city, and to the people of every city and village in India; further, that such ordinances as exist, as I presume they most certainly do, be enforced so that the greatest offender be punished more than the lesser offender rather than the lesser offender being punished the most and the greater offender not only punished less, but encouraged.

I hope my position is clear. I desire to make it so if it is not. Do not, therefore, accept this note on any basis except that it presents facts not of my making, but of people who have carefully, humanly and conscientiously considered this very matter. Any of them will confirm what I have said. I am sure.

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Sincerely yours,
JAMES N. WARNER, M.Sc.,
Professor of Dairying.

Extract

A NOTE ON THE IMPROVEMENT OF GOATS IN THE UNITED PROVINCES*

BY

A. E. SLATER, B.S.A., AND SARDAR SINGH BHATIA,
I.D.D. (HONS.)

Introduction.—Goats have been kept in India for very many years in large numbers but, nevertheless, very little, if any, scientific work has been done in regard to them. There is here a virgin field of the greatest importance, for Europe, England and America have long realised the value of the goat, giving to it the term the "poor man's cow." An adequate milk supply is of the greatest importance to the villager, who is often too poor to keep a buffalo or a cow, and who is even unable to purchase milk.

We would point out that whereas both the Government of India, and Provincial Governments have spent time and very large sums on the improvement of all other kinds of live-stock, not forgetting poultry, that almost nothing has yet been done to improve the "poor man's cow". The goat provides, on small quantities of feed, a nutritious and plentiful supply of milk for the cottager and humble peasant. It has clearly been demonstrated in Europe that from 5 to 7 goats can be kept as cheaply as one cow.

A word in regard to the value of goat's milk. The T. B. Bacillus has very rarely been found in goat's milk. This fact is one of great importance, more so as this dreadful disease is on the increase in India. Further, the digestibility of goat's milk is much greater than that of cow's milk or buffalo's milk. Its value for dyspeptic is shown by the fact that in New York, Chicago, and other large cities in the U.S.A., goat's milk retails for twice the price of the best cow's milk, being in much demand for hospitals and sanatoriums.

Coming now to a comparison of goat's milk with cow's milk, certain interesting facts stand out at once. Indians do not, we believe, like goat's milk. Why? Perhaps because of its odour and taste. This is entirely a matter of management. We have produced goat's milk absolutely without odour and when offered to friends to drink, it could not be distinguished from cow's milk. The peculiar taste often associated with goat's milk is probably due to the goats having been fed on Neem leaves, which are extremely bitter and also to the presence of the male with the milking herd. In many ways goat's milk is certainly superior to cow's milk. An important difference between cow's milk and goat's milk is this. Goat's milk is alkaline, cow's milk acid in reaction; a difference which may mean life and death to any one

* Allahabad Farmer, November, 1939.

with a very weak stomach. Further, cow's milk requires two hours for digestion, goat's milk 30 minutes; a saving of $\frac{2}{3}$ of the work for the stomach; another life and death difference in many cases of weak digestive organs. If one studies the mineral-salt contents of three milks, *i.e.*, cow, goat, and human, it is interesting to note that there are twelve different mineral-salts found in the three kinds of milk, but not all of them in any one milk. All but three of the twelve are to be found in goat's milk, only six in cow's milk, and but five in human milk; a difference of no mean importance. Further, cow's milk is almost without iron, whereas goat's milk has from 7 to 10 times as much of that very important element, in the blood of all warm-blooded creatures. High medical authorities have said that "If cow's milk contained a little more iron it would be the 100 per cent. perfect food." It is also well known that the phosphates are bone-forming elements; of 7 phosphate salts the milk of the cow carries 0.508 parts, the milk of the goat, which is a much smaller animal, 0.319; and human milk the disproportionately small total of 0.093. When we come to the salts containing Potassium, we find the order reversed, and the small goat showing 4.483 parts to the cow 0.282; a truly remarkable thing, when we consult Wobster and find him telling us that "Potassium has the most powerful affinity for Oxygen of any known substance, and takes it from every other compound." Add to this the iron content in goat's milk, and we have an Oxygen-absorbing power in goat's milk uncomparable with any other milk.

Thus has Chemistry clearly shown us, why the "poor man's cow" is so strong and vigorous, and so readily adaptable to all climates and why her milk is so super-superior as a food and also a therapeutic agent, both of which are being continually demonstrated in many thousands of cases all over the world.

It is these factors that make goat's milk an ideal feed for infants and children. In India this is of the utmost importance.

Breeds.

The following are the famous breeds of goats:—

I. *Jumna Pari*:—They are mostly found in the Etawah District in the United Provinces, in the tract of hilly land lying between the Jumna and the Chambal rivers and bordering on the State of Gwalior. They are dual-purpose goats combining milk and meat qualities. They are supposed to be the best Indian Goats. Being of Nubian origin their butter fat percentage is very high testing on an average of 5.2 per cent. One of our goats has tested as much as 7.8 per cent. They are not bred to any standard colour or markings. They have long pendulous ears. In practice they are bred once in a year, and generally give birth to one kid. They are very hardy and are not stall-fed. They are kept by villagers mostly for meat and ghee. The average weight at birth of a Jumna Pari male is 8.5 lbs. and female 7.3 lbs. The average adult male weighs from 150 to 250 lbs., and female 100 to 140 lbs. The height of a Jumna Pari adult male varies from 36" to 40" and length from 50" to 54", whereas in the female, the height varies from 30" to 34", and length from 46" to 50". There is a good demand for the castrated males of this breed in big cities. Villagers castrate the males within three months of age. The average milk yield during the lactation is 540.0 lbs. and the

average lactation is 210 days. The average milk yield per day during the lactation is about 2.8 lbs. The average maximum yield a day is 4.8 lbs. The highest milk yield during a day for one of our Jumna Pari goats No. 45 is 8.4 lbs. and yield during the lactation is 1237.4 lbs.

II. *Bar-Bari*:—The Encyclopædia Britannica defines Bar-Bari as "The dwarf goat of Guinea goat, of Central and West Africa". It resembles small English Goat in appearance. These goats are also found on the banks of the Nile and in Mauritius, Madagascar and Bourbon.

In India these goats are found mostly in districts of Etawah, Agra, Delhi, Gurgaon and Karnal. They are of small size and are generally spotted. They are mostly stall fed and are of dairy type like Jersey cows. They are not so valuable for open grazing conditions. In practice they kid twice in 15 to 18 months. They are not so suitable for meat because of their small size. The average weight at birth of a Bar-Bari male is 4.5 lbs. and female 4.2 lbs. The weight of an average male being 80 to 100 lbs. and female from 60 to 80 lbs. The height of a Bar-Bari male varies from 26" to 30" and the length from 38" to 42", whereas in Bar-Bari females the height varies from 24" to 28" and length 38" to 44". They are valuable goats for cities. The average milk yield during the lactation is 480 lbs. The average lactation is of 200 days. The average milk yield per day during the lactation is 2.4 lbs. and the average maximum yield a day is 3.12 lbs. The maximum yield a day for one of our best Bar-Bari goat No. 52 is 6.0 lbs. and the maximum yield during the lactation of our best Bar-Bari goat No. 211 is 781.0 lbs.

III. "*Beetal*" goats.—These goats are found in the Punjab, specially in the districts of Sialkot, Gujranwala, Gujrat, Jhelum, and Gurdaspur. They resemble Jumna Pari of the United Provinces. They have the typical wedge-shape. The forehead is wide and the frontal bone is convex. The horns curve downwards, backwards, and slightly outwards. Generally, the male goats possess a well-defined beard, while the females are beardless. They have patches of brown tan colour on their body. They are smaller in size than Jumna Pari.

IV. "*Surti*" goats.—These goats are found in Western India and they resemble very much the Bar-Bari goats of the United Provinces. They are of pure white colour and of short size.

V. "*Kashmere*" goats.—These goats are found in the hilly tracts of Kashmere and Tibbet. Their body is covered with a long fine silky hair, about 4 to 5 inches in length, beneath which is the "under-wool" of such exceeding fineness that it compares with that of the Merino sheep. The under wool grows from October to February and falls off in the Spring. The goats are combed for 8 or 10 days and the wool collected, leaving long silky hair on the animal. The average outturn of wool is from 3 or 4 oz. from each goat. These goats are very hardy and can stand very severe cold. They do not thrive in a damp climate, or in the plains.

VI. *Desi* goats.—These goats are found in the villages of the country. They have no standard type. They are mostly of black colour and are smaller than the Jumna Pari in size. They are very suitable for crossing with the Jumna Pari. The average weight of a female being 80 to 100 lbs., and the maximum yield during the lactation 400.0 lbs.

Breeding and Management

The presence of the buck with the females is very objectionable. The odour which it emits is readily absorbed by the milk and is one of the sources of bad-flavour in milk. It should be kept in a separate place altogether.

For best results it has been found that the doe should be bred when about 18 months of age. Early breeding will check the growth of the doe and the progeny will be of small size. A mature buck should breed as many as 50 to 60 does in a breeding season. He should not be used on more than 75 does during a year. The main breeding season of goats is during June and July and kidding season November and December. Goats come in heat every 21 days or so, and remain in heat for perhaps two to three days.

The average gestation period of a goat is 148 days.

Constant changes of diet suit the nature of the goat. Clean, fresh water, changed daily, and rock salt or salt lick should be available at all times. For the housing of goats, good ventilation dryness and cleanliness are very necessary. The floor should be raised a few inches from the ground level and should have a slight slope to the rear. Hay racks should be used for feeding roughages. These should be placed high enough to prevent them pulling the fodder out at the top, in which case it is wasted. The grain can be fed in a bowl. The following grain mixture is recommended:—Crushed gram (Chana) 2 parts and Wheat bran (Chokar) 1 part. No grain is required during the dry period. When in milk goats should get 1 lb. of grain for every 3 lbs. of milk. Bucks during the breeding season should be given about 2 lbs. of grain mixture.

Plenty of exercise is an important item, specially for the young kids which do not go out on the range for grazing. An old box or barrel for the kids to jump on and off, is useful. Their hoofs should be frequently examined and the outer shell cut back to the level of the pad. If the hoofs are neglected lameness and even foot-rot may result. Proper grooming daily is essential for maintaining sound health of the animal. With long-haired goats it is well to clip away the hair round the flank and hind legs, so far as is necessary to aid cleanliness and prevent interference with milking.

Diseases

Fortunately the goat is, perhaps, of all domestic animals the least liable to disease, being, in fact, immune to some of the worst that attack other animals. However, a few of which they are liable to get are the following:—

1. *Pneumonia in Kids*:—This disease generally starts about the end of November. On the first day of an attack the kid stops taking milk, and running from the nose and eyes starts with slight fever. On the second day the fever rises and the kids start breathing fast. Sometimes abdominal breathing starts with some snoring. The temperature goes up to 105 to 106. The disease generally occurs during November, December and January. In the acute stage they stand with their heads dropping and shoulders raised. Faeces are normal. Dams are perfectly healthy. The disease lasts about 4 to 8 days. A few of the affected cases have lingered on for about a month. Sudden changes of temperature may be the predisposing cause of the disease.

Careful nursing, sufficient warmth and fresh air are helpful. Stimulants, i.e. Spirits of Nitrosi Ether and Aromatic Spirit of Ammonia, given internally, are good.

2. "*Bisi*."—The cause of this disease is due to *parasitic infection* of the stomach, intestine, and liver. The animals pick up the infection by grazing on grass growing in low spots and stagnant places during the rainy season. The animal loses weight, becomes unthrifty, eats much less, membranes of the eyes and mouth become pale and there is a characteristic swelling under the lower jaw, has slight fever; in advanced stage diarrhoea appears. The course of the disease is from 10 to 15 days. The disease usually appears in the winter month. The following treatment is recommended:—

Powdered Copper Sulphate	... 2 oz.
Mustard Meal	... 2 oz.
Water	... 3 gallons.

This is well mixed together until the copper sulphate is dissolved. The dosage for full-grown goats is 2 oz. of mixture. Shake well before administering and starve the goats for 12 hours before dosing. The treatment should be carried out once a month until confident that parasites have been overcome.

3. *Mammitis or Garget*.—This disease is caused most frequently by does lying about on cold and damp ground. It starts either just before or after kidding. The symptoms are as follows:

Inflammation in the udder, rough coat, dull eyes, loss of appetite, suspended rumination, and possibly constipation. The animal stands in an awkward straddling position, and moves about or lies down with reluctance and difficulty, owing to the soreness of the udder, which will usually be found to be hot and tense, very hard, and tender. The fever, though sometimes local, is more liable to be general. A dropsical condition under the skin of the abdomen is sometimes observed.

The secretion of milk is partly or entirely suspended. The milk itself is lumpy or stringy, or its consistency may be altered to that of a serous fluid containing yellowish clots, caused by the coagulation and separation of the casein. The secretion becomes purulent and offensive. Severe inflammation of the udder probably brings about a rupturing of some of the capillaries, which makes the milk bloody.

Hot fomentations should be given and the udder should be well massaged with camphor ointment and all the milk or curd should be extracted by means of a milk siphon, which should be thoroughly sterilised before using each time. The treatment should be repeated in two hours.

4. *Goat Pox*.—This disease of goats is extremely contagious. Animals get slight fever. Blisters break out on teats, udder, under tail and under hind legs. These blisters turn to scabs in about 10 days. Sometimes the disease breaks out in a very virulent form, blisters appearing over the whole of the body. The affected animals should be strictly isolated. Blisters should be bathed with a 3 per cent. solution of Granular Hypo-Sulphate of Soda. The pustules should be dressed with Zinc ointment. The affected goat should be milked last and the hands of the milker must be thoroughly disinfected after the process.

5. *Foot and Mouth*.—The symptoms are very similar to those noticed in cows, except that in goats the mouth is frequently not affected. The disease in adults is not serious, so that in many herds, its presence is totally ignored. The disease, however, may prove fatal to new-born kids. During the outbreak the entire flock should pass twice daily through a "Foot Dip" bath containing "Phenyle or Copper Sulphate" disinfectant. The mouths of affected animals should be washed with alum lotion at least once a day.

Economic Value of Goats.

We may point out here that the Board of Economic Enquiry, Punjab Rural Publication No. 8, states in the "Economic Value of Goats": "From a food-consuming point of view the goat is the most economic of all milk-producing animals. It is very prolific and cheaply reared. It eats a class of fodder on which other animals starve to death. The goat is, therefore, the cheapest of all milk-producers.....In the plains it is only bred by the poorer classes, mostly menials, owning little or no land and depending entirely on common grazing grounds or what can be picked up by the way."

Goats are also kept in this country by the villagers in big herds for supplying milk to cities. Breeders derive a good livelihood and make a good profit by supplying the milk to towns.

But the defect is that they do not breed them from any pedigreed stock. They breed them at a very young age, and do not castrate the males of poor milkers. They have very little grazing areas of their own, and hardly give them any grain to eat. They have been kept in India for many years, in large numbers, but nevertheless, with the exception of only a few Government Goat Breeding Farms started recently by the Imperial Council of Agricultural Research. Goat Husbandry in India is almost entirely in the hands of illiterate, ignorant and careless people. On the other hand, if all these Desi males could be castrated and good pedigreed Jumna Pari males could be supplied instead, this would result in much improvement, as regards meat and milk-production. The practice has been started in the surroundings of Districts Etah, Fategarh, Mainpuri and Etawah.

In the end we may point out that the Royal Commission on Agriculture in India has stated, "There are obvious directions in which the goat might be improved both as a milking and a hair-producing animal. In many parts of this, as of other countries, the goat is the poor man's cow; and there can be little doubt that like the cow, its milk yield could be raised with little difficulty by selection. Since many breeds, or types of goat have been recognised in different parts of the country, there is reason to suppose that in the case of this animal resort to crossing might also result in considerable improvement in the milk yield. Very little attention has been given to the subject, and in view of the hardy character of the animal, and the great need for increasing the milk supply, the possibilities of the improvement of milking strains should be explored".

CHHARODI CATTLE FARM

(Ahmedabad District Bombay Presidency).

Bombay, April 8, 1940.

The Administration of the Cattle Farm at Chharodi was taken over from the Government of Bombay formally on Saturday last by Sirdar Vallabhbhai Patel, Chairman and other members of the Governing Body of the Institute of Agriculture, Anand.

The Chharodi Cattle Farm, till recently belonging to the Government of Bombay, contains the best type of cows and has also some well-known stud bulls which have won All-India prizes at Delhi. The Institute of Agriculture will now be in charge of the Farm and has acquired from Government 3,000 acres of land for implementing the objects of the Institute. In the budget of the current year, provision has been made for the expansion of the Chharodi Farm by increasing the annual budget from Rs. 30,000 to Rs. 40,000.

The Government of Bombay accepted in June 1939, the offer of the Trustees of the Seth Manusukhlal Chhaganlal Trust and Seth Munglal Goenka Trust of Rs. 900,000 and Rs. 600,000 respectively for the starting of two institutions, namely, The Mansukhlal Chhaganlal Institute for Animal Husbandry, Dairying and Agriculture and the Munglal Goenka Institute of Animal Genetics and Nutrition. For this purpose, the Government agreed to hand over to the Governing Body of the above institutions, the Chharodi Cattle Farm in Ahmedabad District and a portion of the Agricultural Farm at Surat. The Government further agreed to pay to the Governing Body annually a grant up to Rs. 60,000 besides the interest on the trust money of Rs. 15 lakhs.

Sardar Vallabhbhai Patel is the Chairman and Mr. K. M. Munshi is the Vice-Chairman of the Governing Body. The main objects of the two institutions are to impart education and training in Animal Husbandry, Dairying, Animal Genetics and Nutrition and the science of agriculture, and to develop and maintain pedigree kind of best milchcows and draft cattle, to popularise improved methods of agriculture and animal husbandry and to undertake such items of work as the Government may specify, consistent with these objects.

Hindu, April 11, 1940.

Review

The Disease of the General Organs of Domestic Animals.—By W. L. Williams, Professor Emeritus, Cornell University. Second Edition 1939. Cloth bound. 617 pages; 199 illustrations, 3 in colour. Published by the author, 209 White Park Road, Ithaca, N.Y., (U.S.A.) Price \$ 9.

This book has been published at a most opportune moment, when various agencies are turning their attention towards the improvement of the livestock

The author has spared no pains to present the latest ideas on the results of breeding experiments from time to time, by experts.

In Section I. The basic causes of interferences with reproduction, the teratology and pathology of the reproductive cells, hereditary and congenital defects are dealt with.

Section II:—Estrum, Coitus and Pregnancy.

Section III:—Tumours of the Reproductive system.

Section IV:—Systematic and organic infections of the genital system.

Section V:—Contagious Abortion and Sterility. Here the Bacterial, Protozoan (Trichomonad included) infections are exhaustively explained.

Section VI:—Diseases of the various Genital Organs.

Section VII:—Defects and Diseases of the Newborn.

The book says "The ovulation in Dairy Cows is unstable during the first 60 days or more after the termination of a pregnancy especially when associated with abortion, abbreviated gestation, retained afterbirth or other pathological phenomenon

"In cases of prolonged gestation the foal is born mortally ill from sepsis—the so-called sleepers."

The normal and pathological appearance of the Spermatozoa their ratio of healthy per 1000, necessary for fertilisation, staining etc., are described with illustrations.

The dislodgement of corpus luteum to regulate the estrus to treat cases of Pyometra due to Trichomonad and other affections and also to induce estrus in cases where a single sire has demands to mate several cows in heat and thereby rejecting some cows to be served later as per arranged estrus—are explained with the necessary operative technic.

The chapter on Artificial Insemination has been elaborately described and various methods are compared.

The examination and proper assessment of the value of the Spermatozoa in health and disease and the several pathologic forms as double heads, heads without tail etc., are explained with illustrations to enable one to judge the reproductive value of the sire.

The book contains 585 pages of text, is profusely illustrated and contains several coloured plates which explain fully the various points mentioned in the text.

We have great pleasure to recommend this book to all Veterinary and Agricultural Colleges and students, Horse and Cattle Farms and all those connected with the breeding experiments.

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