

be made harmless by simpler measures, but in practice very few are really mosquito-proof.

For dealing with the mill-cistern problem, "oiling," which had proved so effective in the case of the ponds had to be ruled out for obvious reasons, and some efficient substitute had to be found. In some basin-experiments in the laboratory, the insect-powders with a pyrethrum base that are on the market under different trade names were found to be fairly effective. Of the three brands tried, viz., Katol, Imazu, and Keating's powder, all were distinctly less effective against anopheline than against *Culex* and *Stegomyia* larvæ, and under working conditions in a small cistern where fresh water is replaced as the old supply is used up, they were ineffective in preventing anopheline larvæ from coming to maturity. None of them had any effect on the eggs, and very little on the pupæ.

The next substance to which attention was directed was Paris green. The question of finding a suitable diluent to suit our conditions was considered to be of some importance. It is believed that Paris green is a specific poison for anopheline larvæ and acts most probably by ingestion. The anopheline larva being a surface feeder, means have to be devised to keep the particles of the drug floating on the surface. It was thought that the longer the poison could be kept floating, the more effective it would be, and under the conditions obtaining in the cistern under experiment, some diluent had to be used which would be least affected by the strong breeze blowing across the open tank, and further, would withstand the drowning action set up by the agitation of the surface water caused by a one-inch main pouring into it full-bore during refilling.

Different materials were thought of and tried out, first in basin experiments, and then under working conditions. Of these,

- (a) Cork powder was suitable but too expensive;
- (b) Sawdust had a tendency to sink after a short time and form a layer at the bottom which had to be cleaned often;
- (c) Fine road-dust sinks too quickly and does not withstand agitation or wind action;
- (d) Flue-dust—the very fine powder obtained after cleaning the boiler flues—was better in floating qualities, and worked quite satisfactorily in destroying larvæ.

But the best material for the purpose in view proved to be

- (e) French chalk. It forms a very thin even film on the surface, which lasts for about four days if the water is undisturbed as in the case of a closed tank, and almost refuses to be drowned by agitation.

[French chalk is finely powdered magnesium silicate, and in its crude form of steatite, is readily obtainable in the Indian bazaar as smooth

hard pieces under the name of *Sangjiru*; the pieces can be easily ground in a mortar into a fine powder which can be passed through muslin to ensure uniformity; it is cheaper than the imported powder.]

The cistern in which these experiments were carried out is 32' × 16' × 6' deep, and holds about 13,000 gallons of water. It is about 50' from the ground level, and has no roof or cover. It is known as a hydrant tank, and unlike the sprinkler tanks above referred to, the water is in daily use and is being constantly replenished. Larvæ of *Anopheles stephensi* were found again and again in it, though in the stagnant water of a sprinkler tank next door, none could be found.

According to the quantity of Paris green recommended for wells and cisterns by L. W. Hackett (from the Stazione Sperimentale per la Antimalarica, Roma) 40 grains of the drug were incorporated with 8 oz. of French chalk and sprinkled on the water (about 500 sq. ft. of surface). When seen after two hours, a strong breeze was blowing across the open mouth of the cistern, and the thin film of the powder could be seen to be repeatedly broken, but would as often re-form as soon as the force of the wind abated a little. We look upon this as a very important physical property of French chalk for our purpose. On examining the cistern the next day, no larvæ could be found: on the third day, a few very early larvæ again appeared, showing as is already known, that the eggs were not affected. On the other hand, in a closed cistern of similar construction which was treated with a similar quantity of the Paris green French chalk mixture, the powder formed a thin scum on the surface for five days, and no larvæ were detected for a week. The water of this latter cistern was stagnant, there was no disturbance of the surface, and *Anopheles* were breeding profusely before treatment.

We have also tried sublimed sulphur as a diluent of Paris green in basin experiments, and found it quite suitable for the purpose: but it has no special advantage over French chalk.

Conclusion.

For use on a small scale in cisterns and wells, French chalk is an ideal diluent for Paris green.

QUALITY OF MILK OF SOME SPECIAL BREEDS OF HIMALAYAN COWS.

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THE extraordinarily high percentage of fat in the milk of certain varieties of Darjeeling cows was first noticed in a sample of milk sent up for examination, in which no less than 7.5 per cent. of fat was determined. Subsequently, an attempt was made to collect some data from which the actual quality of milk obtained from certain breeds of cows might be arrived at.

During the years 1924 and 1925, 277 samples of milk were examined from individual cows of all available strains, young and old alike, at different stages of lactation and yielding varying amounts of milk per day.

Four breeds of cows are found at Darjeeling—*Siri** (which are well suited to the high lands of the Himalayas—*Darjeeling District Gazetteer*), Nepali,* English, and cross-bred between any two of these three, or between a cross-bred and any one of the other.

The main factors on which the variation in the composition of milk depend are:—

(a) Time of milking—The morning milk was always selected for examination. In one sample of evening milk no less than 10·8 per cent. of fat was obtained. (In every case the cow was milked before me or my assistant who was specially deputed for the purpose.)

(b) Age and period of lactation—Milk from cows of different ages and at various stages of lactation was collected for examination.

(c) Climatic conditions and food—These

varieties are mostly found in the adjoining tea gardens at a somewhat lower elevation. As regards the food, green grass is used in all cases. This is supplemented by powdered maize boiled with water and mixed with salt in the case of poorer people who cannot afford to keep English cows; whilst the owners of the English cows employ, in addition to the green grass, rahar and rice, or gram and rice, or all three together, boiled with water and mixed with a little salt. Sometimes oil cakes are also used.

The striking feature of the *Siri* and Nepali cows is the extraordinarily high fat-content of the milk. The yield is much lower than that obtained from English cows—a well-fed *Siri* cow giving about six seers and a Nepali cow two seers of milk daily. These figures are quite good as compared with the other milch cattle existing in India, in which case according to Isa Tweed (*Cow Keeping in India*), a good average is 5 lbs. a day or 750 lbs. per lactation.

Percentage of fat in milk from the cows representing these four breeds in this area:—

Breed.	Number of samples examined.	Percentage of fat.			REMARKS.	
		Maximum (a)	Minimum (b)	Average.	The cow whose milk contained—	
					the maximum percentage of fat as shown in column (a) daily yielded:—	the minimum percentage of fat as shown in column (b) daily yielded:—
English ..	57	6·4	1·2	4·4	6 lbs. milk.	10 lbs. milk.
<i>Siri</i> ..	62	9·8	3·5	5·7	3 lbs. „	6 lbs. „
Nepali ...	86	8·8	3·3	5·7	8 lbs. „	8 lbs. „
Cross-bred ..	72	7·0	3·1	5·0	6 lbs. „	7 lbs. „

were not exactly identical in all cases. While the English cows and many of the cross-bred varieties are generally kept at the elevation of Darjeeling town, the “*Siri*” and “*Nepali*”

*The owners supplied the information so far as the breeds are concerned. The *Darjeeling District Gazetteer* mentions that most of the cattle in the district are *Siri-Kutch* (which are crosses between Nepali cows and *Siri* bulls) of sorts. “There are a few tame specimens of the *Methun*, also known as *Gayal* (which are really wild cattle in the Bhutan, Burmese and other jungles) to be found and some crosses between it and the *Siri* breed, but they are very few in number.” Mr. H. R. Edmunds, Superintendent of Agriculture, Darjeeling, says “Generally speaking, the pure bred Nepali and *Siri* cattle are, with very few exceptions, extinct around these hills. There are many cattle resembling these two breeds which have deteriorated from the original stock by intermixing. *Siris* are indigenous to Bhutan and the Nepali cows to Nepal.” It will thus appear that most of the cattle which still locally pass for *Siri* and Nepali cows are not pure bred.

In the case of *Siri* and Nepali cows, it is found that 42·6 per cent. of the samples examined contain above 6 per cent. of fat and 27·0 of the samples have fat values below 5 per cent.

It might be expected that if the animals are unquestionably pure-bred Nepali and *Siri* cows, and if they are kept under conditions more suitable for the individual species the percentage of fat would be still higher.

It will be noticed, however, that the other constituents of milk from the *Siri* and Nepali cows undergo very slight variations. Some typical examples are given below.

These figures show that the milk constituents are practically as high as those from the majority of buffaloes. It is very interesting to compare these results with those obtained in the case of the best cows (Indian and foreign), as supplied by the Imperial Agricultural Chemist, Pusa, Bihar.

Breed.	Months in milk.	Yield of milk per day (in lbs.)	% Total solids.	% Fat.	% Non-fatty solids.	% Lactose.	% Mineral matter.	% Protein.
Nepali	6	10	16.03	6.4	9.63	4.4	.84	4.39
Do.	4	6	15.92	6.8	9.12	4.4	.79	3.93
Do.	5	5	16.90	7.1	9.80	4.9	.80	4.10
Do.	1	6	17.30	7.2	10.10	4.9	.74	4.46
Do.	4	4	16.80	7.3	9.50	4.8	.80	3.90
Do.	2	4	16.40	7.4	9.00	4.5	.70	3.80
Do.	3	8	16.80	7.4	9.40	4.6	.73	4.07
Do.	5	3	17.40	7.4	10.00	4.8	.80	4.40
Do.	4	3	16.80	8.2	8.60	4.7	.70	3.20
Do.	5	2	15.10	5.9	9.20	4.7	.76	3.74
Siri	5	2	15.40	6.2	9.20	4.9	.70	3.60
Do.	7	4	15.50	6.4	9.10	4.8	.69	3.61
Do.	7	6	15.70	6.6	9.10	4.7	.78	3.62
Do.	4	3	15.70	6.6	9.47	4.4	.78	4.29
Do.	4	6	16.17	6.7	8.90	4.5	.68	3.72
Do.	2	4	16.20	7.3	8.90	4.5	.68	3.72
Do.	1	4	17.10	7.6	9.50	5.3	.75	3.45
Do.	1	4	17.20	7.8	9.40	4.7	.73	3.97
Do.	2	8	17.20	7.8	9.40	4.7	.73	3.97
Do.	6	8	19.20	9.7	9.50	5.05	.75	3.70
Average of the above 18 samples .. .. .	..	..	16.55	7.2	9.35	4.7	.75	3.90

Breed.	% Total solids.	% Fat.	% Non-fatty solids.	Reference.
Britain—				
Jersey	14.65	5.43	9.22	Murray's <i>Chemistry of Dairying</i> .
Guernsey	14.46	5.16	9.30	"
Kerry	13.54	4.67	8.87	"
Ayrshire	13.46	4.24	9.22	"
Shorthorn	12.78	3.92	8.86	"
Holstein	12.12	3.51	8.61	Richmond's <i>Dairy Chemistry</i> .
Red polled	13.22	4.34	8.88	Richmond's <i>Dairy Chemistry</i> .

Breed.	% TOTAL SOLIDS.			% FAT.			% NON-FATTY SOLIDS.			Reference.
	Max.	Min.	Aver.	Max.	Min.	Aver.	Max.	Min.	Aver.	
Indian—										
Burmese (Mandalay) .. .. .	..	..	14.05	..	..	4.91	..	..	9.14	Warth.
Surati .. .. .	..	..	14.77	..	..	5.38	..	..	9.39	Dr. Joshi.
Kirkee (Poona)	15.19	14.2	..	5.80	5.30	..	..	..	..	Meggitt & Mann.
Saidapet— (Unknown— Nellore ?)	15.52	13.02	..	6.07	4.00	..	..	..	..	Dr. Leather.
Jaffrabadi .. .. .	..	..	15.82	..	..	6.10	..	..	9.72	Dr. Joshi.
Hariana (Lucknow)	15.15	11.69	..	6.29	2.94	..	9.43	8.44	..	McMahan.
Montgomery (Pusa) .. .. .	..	..	14.04	7.5	3.0	5.4	..	..	8.64	....
Sindi (Poona) .. .. .	..	..	..	8.4	2.9	..	..	..	9.43	Meggitt & Mann.
Cross-bred (Ayr x Mont, Pusa) .. .. .	..	..	12.62	8.6	2.8	4.2	..	..	8.42	....
Gir or Kathiwadi (Poona) .. .. .	..	..	..	9.0	3.1	..	..	..	8.93	Meggitt & Mann.
Foreign countries—										
British East Africa .. .. .	..	..	14.5	7.2	4.9	5.25	..	..	9.25	Kirkham & Barnes.
Illinois (U. S. A.)	15.1	10.9	..	5.6	2.7	..	10.1	7.5	..	Murray's <i>Chemistry of Dairying</i> .
England (Worker— Richmond) .. .. .	..	..	12.8	12.52	1.04	3.9	..	..	..
Germany— (Worker— Fleischmann) .. .. .	..	..	12.25	0.30	2.7	3.4	..	..	..
America (Worker— Snyder) .. .. .	..	..	12.5	6.50	3.45	3.6	..	..	..

It will be seen from the table that a maximum of 12.52 per cent. of fat has been obtained by Richmond in England, but the minimum is also very low, namely, 1.04 per cent. A maximum of 9.8 per cent. of fat (and 10.8 per cent. of fat in a sample of evening milk) is found possible in the milk from *Siri* cows, and this, with rare exceptions, is the highest amount of fat, as far as records are available, which can be contained in cow's milk.

I must gratefully acknowledge my indebtedness to Dr. D. A. Farquharson, M.B., C.M., F.R.F.P. & S., D.P.H., Medical Officer of Health, Darjeeling Municipality, for giving me every facility in carrying out the work.

AN ANALYSIS OF 337 CASES OF ORIENTAL SORE TREATED BY VARIOUS METHODS.

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ORIENTAL sore tends to run a prolonged course, and is a source of anxiety to the patient and of worry to the doctor. Any measure therefore which can shorten the course of this disease and be practicable in the mofussil, will be welcomed by the profession. With this object in view these few notes are written.

Summary of cases treated.

Number of cases.	Treatment.	Period of cure (average).
300	Intravenous injection of tartar emetic; starting with 5 c.c. of 1 per cent. solution every 3rd day; increasing up to 10 c.c. Three injections in all.	18 days.
20	Operation. Excision or scraping.	25 days.
5	Ionisation. (Zinc and antimony salts.)	?
5	X-rays. Subintensive, once a fortnight.	6 weeks.
5	Berberine sulphate, weekly injections.	2 weeks.
2	Locally with potassium permanganate and antimony ointment.	?

Out of 300 cases treated with intravenous antimony one case proved fatal. The patient got ill after the third injection and died within 72 hours of injection. It may be pointed out that these cases were treated in a general hospital and all precautions were taken prior to intravenous injections of tartar emetic. It will thus be seen that tartar emetic, although very useful, is not without risk—the question of technique and skill apart.

Twenty cases treated by scraping were done under general anaesthesia, as the object was to remove even the doubtful areas and obtain a comparatively safe area. The simple sores

thereby produced took 25 days to heal on the average.

Ionisation was only a partial success. Two of the cases had to be scraped. The other three took nearly three months to heal.

X-rays were very successful. Although this is a painless remedy, it is not easily procurable, is expensive, and the period required to cure is as long as six weeks.

The results obtained with potassium permanganate and tartar emetic ointments were not encouraging, since the sores took 8 to 10 weeks to heal; the patients got tired and each was given one intravenous injection of tartar emetic.

Berberine sulphate, although a new drug for oriental sores, promises well. It is a bright yellow coloured salt of berberine ($C_{20}H_{17}NO_4$) which is contained in *Hydrastis* and *Calumba*, but it is obtained principally from the bark of *Berberis vulgaris* and other species of berberry. It can be obtained from any well known chemist. The technique is simple, the treatment easy of administration, and results very encouraging. The number of cases treated is small no doubt, but the results obtained are so brilliant in comparison with previous cases, that I may be pardoned if I assert that "in berberine sulphate we have a remedy which must be universally tried."

The technique is simple: $\frac{1}{4}$ grain of this yellow salt is dissolved in $1\frac{1}{2}$ c.c. of aqua distillata, sterilized and injected subcutaneously. The needle is inserted $\frac{1}{2}$ in. away from the margin of the sore, and passed for some distance, till it reaches the edge, where about $\frac{1}{2}$ c.c. of solution is emptied; then $\frac{1}{2}$ c.c. of the remaining solution is injected a little above and $\frac{1}{2}$ c.c. below the first point. A second injection is given a week later on the opposite side of the sore in the same way. It has been my experience that injection at one spot affects 3 to 4 sores within an area of 3 square inches. Local reaction is nil in some cases. These only have intense itching. Within a week early sores dry up, whereas the big open sores develop healthy granulations. I did not find more than 2 injections necessary when a dressing of hypertonic saline solution was used in conjunction with the berberine injections. It is my belief that hypertonic saline solution fomentations are specially valuable when the sore is discharging offensive pus, and may lower the vitality of the leishmania. When the sore clears up normal saline solution dressings are resorted to. This treatment is free from risks and the period of cure compares favourably with that by intravenous tartar emetic.

DEEP INFILTRATION ANÆSTHESIA IN OPHTHALMIC OPERATIONS.

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PAINLESS surgery has always been the aim of all surgeons. Ever since the introduction of