incubated at 37° C. for different periods and the milk-clotting activities of the mixtures determined.[9] Typical results obtained with penicillin-papain system are presented in Table I.

TABLE I

Inhibition of the milk-clotting activity of papain by Penicillin

Penicillin in O.U. per c.c. (cup plate method)*	Time in seconds for clotting after incubating the mixture for		
	15 minutes	30 minutes	60 minutes
Nil	31	31	31
500	70	111	140
250	54	83	125
100	40	45	50
50	39	41	45
20	32	35	37
10	32	33	34

* The clotting times with the mixtures before incubation were found to be 31 seconds for all the mixtures studied.

Similar results were obtained for the Ficus enzyme-penicillin systems also.

Complete and instantaneous inactivation of the enzymes resulted on incubation with 0·2 mg./c.c. of allicin. When the concentration of the antibiotic was brought gradually to about 3·5 μg, results similar to those for penicillin were obtained. In the accompanying figure, results with allicin and Ficus enzyme are presented.

The above observations confirm the -SH nature of the enzymes studied. Attention has already been drawn to the inhibiting activity of allicin[10] on the starch-splitting activity of β-amylase, which has been shown to be another sulphydryl enzyme.[11] These observations are being extended to other enzyme systems known to play an important role in cell-metabolism.

It is clear that the enzyme-inhibiting activities of antibiotics like allicin even in very high dilutions provides a quick and accurate method for their micro-assay.

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R. RAGHUNANDANA RAO.
C. R. KRISHNA MURTI.

Dept. of Biochemistry,
Indian Institute of Science,
Bangalore,
December 4, 1947.

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UTILIZATION OF DESIZING WASHINGS FOR THE CULTURE OF INDUSTRIALLY IMPORTANT MICRO-ORGANISMS

FOR desizing textiles, the common practice is to impregnate the sized cloth with an active amylase solution. After standing overnight the cloth is washed in running water. The washings contain about 1 per cent. sugar besides dextrins and other soluble matter. Our studies in the preparation of bacterial amylase show that the washings could be utilised as a source of carbon for the cultivation of the industrially important micro-organisms.

Bacteria (*B. subtilis*, N.C.T.C., 2027 N), Yeast (*Torula utilis*, N.C.T.C., 3050) and actinomyces (*Actinomyces gresius*, Waksman's strain), which had been previously standardized for amylase formation,[1] food yeast manufacture,[2] and streptomycin production,[3] respectively were employed as test organisms for determining the efficiency of these waste liquids. The cultural conditions for the growth of these organisms were the same, except that the carbon supply in the culture medium was substituted by the equivalent amount of the desized washings on the basis of sugar present. The viscosimetric method* was followed for determining the amylase activity. Yeast growth was observed by Turbidity measurements. The cup assay method, using a susceptible strain of *B. subtilis*, was employed for the assay of streptomycin. The comparative data obtained with the experimental and control media are given in Table I.

TABLE I

B. subtitis		Yeast growth		*Actinomyces gresius*	
Amylase units per 10 ml.* of medium		Galvanometric deflection		Units γ/c.c. on 10th day	
Exptl.	*Contl.*	*Exptl.*	*Contl.*	*Exptl.*	*Contl.*
100·0	120·0	200·0	176·0	100 γ	80 γ

* One Amylase unit is that quantity of enzyme which, acting on a two per cent. starch solution at pH 7·0 and at 40° C., reduces the viscosity by 25 per cent. in 90 minutes.

The results show that the desized waste is a useful source of assimilable form of carbon for the micro-organisms. The difficulty of transporting large volumes of the waste could be considerably reduced either by slightly modifying the process of washing of the desized cloth or by using the washings on the spot.

My sincere thanks are due to Prof. V. Subrahmanyan for his kind encouragement, and guidance in these observations, and to the late Mr. Slicer, Chief Chemist to Bangalore Wool-

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Dept. of Biochemistry,
Indian Institute of Science,
Malleswaram P.O., B. S. LULLA.
Bangalore,
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CHANGE IN NITROGEN CONTENT OF MILK ON SOURING

IN this laboratory attempts were made to utilise the estimation of total nitrogen of curdled milk as a criterion of purity of the original milk samples by Kjeldahl Method as suggested by Hawley.[1] A preliminary analysis of about twenty samples on these lines showed that this method is unreliable, inasmuch as the nitrogen content of milk is subject to variation depending on the conditions under which the milk is allowed to curdle and on the initial bacterial flora of the sample.

The following table shows the increase of nitrogen on curdling, in the case of raw buffalo milk kept in different beakers and allowed to curdle in open air at room temperature (average 32° C.).

Days of storage of milk	Acidity (lactic acid %)	Nitrogen (%)	Remarks
0	0·126	0·533	Raw milk before curdling
1	0·815	0·641	After curdling
3	1·56	0·630	,,
4	1·75	0·620	,,
7	2·08	0·614	,,

The main conclusions from experiments carried out under different conditions are :—

1. The nitrogen content of curdled milk is greater than that of the original milk.
2. The nitrogen percentage varies in the same sample of milk at different stages of souring ; it attains a maximum and thereafter tends to decrease.
3. The acidity developed appears to bear little correlation with the nitrogen content.
4. The nitrogen increase appears to be caused by the action of micro-organisms present in the milk.

Since samples of milk are not collected and despatched under aseptic conditions, Hawley's method of evaluating the N. content of curdled milk, as a criterion for its purity, cannot be adopted for routine testing.

A detailed paper will be published elsewhere.

Laboratory of the Public Analyst
to the Government, U.P., S. C. ROY.
Lucknow, D. P. BHATNAGAR.
December 19, 1947.

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GAMMEXANE (D. 025) AND CATTLE TICKS

A SMALL-SCALE trial with "Gammexane" powder D.025 has been tried on a group of fourteen cattle heavily infested with *Boophilus australis*, a common cattle tick in India. According to the manufacturers, "Gammexane" powder D.025 contains 5 per cent. of pure "Gammexane" (hexachlorocyclohexane) and 95 per cent. of inert diluent such as French chalk or talc. A dozen cattle showing gross infestation with ticks were hand-dressed with the powder. Two animals served as controls. Up to 12 hours after application there was no appreciable destruction of ticks. After nearly 24 hours tick mortality varied from 75-95 per cent. among the treated animals. After 48 hours all the treated animals were tick-free. The residual effect of the drug lasts from 5-9 days, depending on whether the treated animals are sent out for grazing or stall-fed. It is, therefore, necessary that the application should be repeated accordingly. In view of its efficient anti-tick and non-toxic properties and the simplicity of application, the powder could be safely used under Indian conditions.

Indian Veterinary Research Inst.,
Mukteswar-Kumaun, B. N. SONI.
December 1947.

OPTICALLY POSITIVE HYPERSTHENE FROM CHARNOCKITES OF GUNTUR DISTRICT

DURING the course of detailed optical work on the rocks and minerals of the charnockites of the Kondavidu Hills (Latitude 16° 15′ 30″; Longitude 80° 19′), one of the slides of the intermediate charnockites showed a hypersthene with abnormal optical characters. The scheme of pleochroism of this mineral as determined by the Federov's Stage is as follows :—

X : Golden yellowish green.
Y : Light greenish.
Z : Bluish or greyish green.

The only marked difference that this hypersthene shows with the normal type (the usual hypersthene met with in the area) is that the pleochroism along X axis is golden yellowish green here as against pale pink for the normal type.

In one of the hypersthene pieces the extinction is straight and 2 V = 74°, Z being the acute bisectrix. In the other the extinction angle (Z c) is 8° and 2 V = 69°, Z being the acute bisectrix. Thus both these pieces of hypersthene are optically positive. But the normal hypersthene shows the usual negative sign with 2 V ranging from 56° to 66°.

In the chemical analysis of the rock bearing this hypersthene, there is an excess of normative corundum. It is suggested, though it is not asserted, that this anomalous optical character of this hypersthene may be due to an aluminous variety of the mineral. Further work on the mineral is in progress, and a detailed paper will be published elsewhere.

Geology Department, C. MAHADEVAN.
Andhra University, A. NARASINGARAO.
Waltair,
December 23, 1947.