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Bulletin of The Central Leather Research Institute Madras

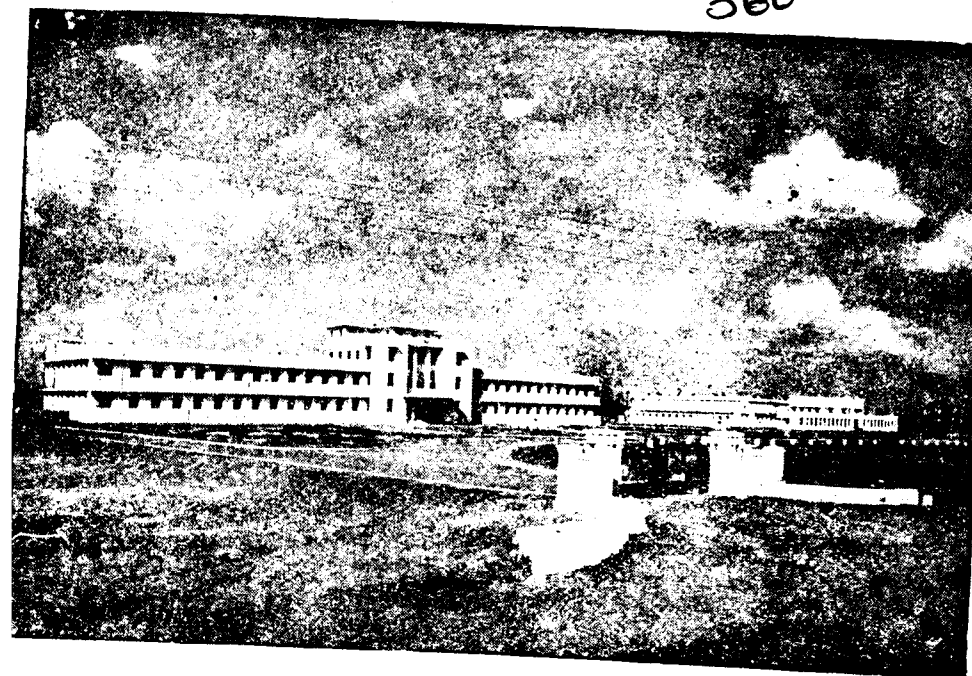


Vol. VIII

MARCH, 1962

No. 8

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COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH
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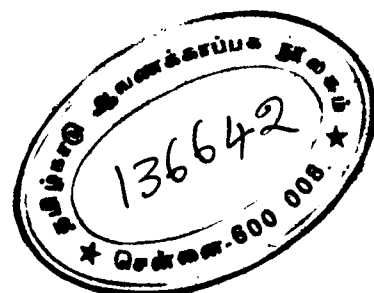
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Prof. D. M. Newitt, F.R.S., Professor of Chemical Engineering, Imperial College of Science and Technology, London, (extreme left), who visited the Institute on March 2, 1962.

EFFECT OF NEUTRAL SALTS ON ELECTRICAL CHARGE OF CHROME COMPLEXES*

BY

T. J. DEVASSY & Y. NAYUDAMMA,
Central Leather Research Institute, Madras

SUMMARY

Sodium chloride and sodium sulphate were added individually in varying proportions, to neutral salt free chrome liquor. The effect of addition of these salts on the relative proportions of the differently charged chrome complexes, especially of the differently charged fractions of cationic chrome, has been studied at various intervals using (1) electrophoresis and (2) spectrophotometry. The results obtained are discussed in terms of penetration of the anion into the complex, aggregation and the equilibrium between the various types of complexes.

Introduction

The great influence of the neutral salts—sodium chloride and sodium sulphate—normally present in chrome liquors, on the tanning characteristics of these liquors is well known.¹ It was thought worthwhile to study in detail the effect of addition of these salts to neutral salt free chrome liquors, on the chrome complexes present therein, in order to have a better understanding of their role in tanning. The changes in the relative proportions of the differently charged chrome complexes, especially of the differently charged fractions of cationic chrome have been investigated by electrophoresis and spectrophotometry; the results are reported in this paper.

Experimental

Neutral salt free 33% basic chrome liquor was prepared by reduction of chromic acid by sulphur dioxide followed by basification at the boil with the calculated amount of barium hydroxide slurry, the precipitated barium sulphate being filtered off; the

*Based on the Thesis of Dr. T. J. Devassy, which was awarded the Ph.D. Degree of the Madras University.

TABLE I

Changes in complexes and pH by addition of sodium sulphate

(Values as % of total chrome)

Time	C	N	A	C ₁	C ₂	C ₃	pH	
0.25 Mole								
0. hour	..	96.0	3.0	1.0	15.8(16.1)	37.2(38.7)	43.0(44.8)	2.70
1 hour	..	96.0	3.0	1.0	17.6(18.3)	41.7(43.5)	36.7(38.2)	2.83
1 day	..	95.5	3.5	1.0	11.9(12.5)	48.4(50.7)	35.2(36.8)	2.80
2 days	..	94.2	4.3	1.5	16.3(17.3)	42.0(44.6)	35.9(38.1)	2.80
3 "	..	93.5	4.9	1.6	17.1(18.3)	40.4(43.2)	36.0(38.5)	2.80
5 "	..	91.1	7.1	1.8	18.9(20.8)	36.4(40.0)	35.8(39.2)	2.80
10 "	..	90.0	8.2	1.8	21.8(24.2)	34.5(38.3)	33.7(37.5)	2.82
0.5 Mole								
1 hour	..	88.8	6.3	4.9	23.4(26.3)	35.5(40.0)	29.9(33.7)	2.90
1 day	..	93.5	2.5	4.0	19.4(20.9)	41.3(44.2)	32.8(34.9)	2.88
2 days	..	90.7	5.2	4.1	21.3(23.5)	37.2(41.0)	32.2(35.5)	2.86
3 "	..	88.2	7.5	4.3	23.6(26.7)	35.5(40.2)	29.1(33.1)	2.85
1.0 Mole								
5 "	..	85.0	10.7	4.3	23.4(27.5)	33.6(39.5)	28.0(33.0)	2.85
10 "	..	83.5	11.9	4.6	24.1(28.9)	32.6(39.0)	26.8(32.1)	2.92
1.0 Mole								
1 hour	..	84.0	8.1	7.9	24.3(28.9)	31.8(37.8)	27.9(33.3)	3.00
1 day	..	86.0	9.1	4.9	18.3(21.3)	35.2(40.9)	32.5(37.8)	2.95
2 days	..	84.5	10.3	5.2	20.9(24.7)	33.8(40.0)	29.8(35.3)	2.95
3 "	..	82.3	12.4	5.3	22.4(27.2)	32.6(39.6)	27.3(33.2)	2.95
5 "	..	80.7	13.8	5.5	23.1(28.5)	30.8(38.2)	26.8(33.3)	2.97
10 "	..	78.3	15.8	5.9	23.5(30.0)	29.4(37.5)	25.4(32.5)	3.00
3.0 Moles								
1 hour	..	82.0	9.2	8.8	28.7(35.0)	28.0(34.2)	25.3(30.8)	3.13
1 day	..	84.0	10.7	5.3	21.4(25.5)	33.7(40.1)	28.9(34.4)	3.08
2 days	..	81.5	13.0	5.5	23.8(29.2)	32.8(40.3)	24.9(30.5)	3.07
3 "	..	78.6	15.6	5.8	23.5(29.9)	30.1(38.3)	25.0(31.8)	3.05
5 "	..	75.3	18.7	6.0	23.2(30.8)	28.2(37.5)	23.9(31.7)	3.09
10 "	..	72.0	21.7	6.3	23.4(32.5)	26.5(36.8)	22.1(30.7)	3.15

C: Cationic complexes; A: Anionic complexes; N: Nonionic complexes;

C₁, C₂, and C₃: The three differently moving cationic complexes.

The figures in brackets are values as % of total cationic chrome.

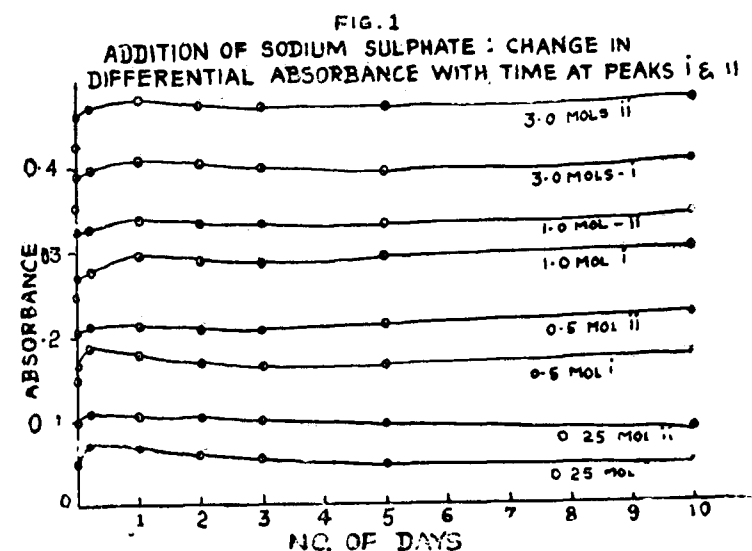
liquor was aged for more than six months to attain equilibrium at a 0.5 molar concentration of Cr. To equal proportions of this liquor (containing one mole of Cr) different amounts of sodium sulphate crystals corresponding to 0.25, 0.5, 1.0 and 3.0 moles were added. Using the electrophoretic technique described earlier,^{2,3} the amounts of the cationic, nonionic and anionic chrome complexes as well as of the three fractions C₁, C₂ and C₃ of the cationic type were determined at different intervals after addition of the salt, i.e., 1 hour, 24 hrs., 48 hrs., 72 hrs., 120 hrs., and 240 hrs. The spectrophotometric studies too were carried out with the same molar ratios and time intervals as mentioned above. In these cases, 1 ml. of the chrome liquor to be analysed was diluted 25 times and the absorbance in the visible range was read between 400 mμ and 600 mμ with the salt solution of the same concentration as blank. Necessary correction was made for the changes in the dilution in the liquor due to the addition of salt. The absorbance of the neutral salt free liquor also was noted to obtain differential readings. (In all cases, dilution was effected just prior to taking spectrophotometer readings. Beckmann spectrophotometer model DU was used in these experiments.) A similar series of experiments was carried out substituting sodium chloride for sodium sulphate.

Results and Discussion

Tables I and II bring out the changes in the relative proportions of the different fractions of the chrome complexes for different amounts of the added salt and at various intervals after addition. With sodium sulphate, at all the concentrations tried except the lowest, there is in the initial stage a decrease in the cationic Cr content; however, in the later stages the value rises only to fall again. With 0.25 mole of the salt per 1 mole of Cr (the lowest proportion used) there is a uniform decrease in cationic Cr, the decrease becoming perceptible after about 24 hours. The net or overall effect of addition of the salt would, therefore, be a decrease in the cationic Cr content. With sodium chloride, the decrease in cationic Cr is continuous but not so marked as with the sulphate.

The overall change in the case of the nonionic and anionic Cr contents is an increase. With 0.25 mole sodium sulphate, the increase in both the types is continuous. The discontinuity in the decrease of cationic Cr content observed with higher proportions of the salt is reflected by a discontinuity in the increase of both nonionic and anionic Cr contents with 0.5 mole of the salt and in

the increase of anionic only with 1.0 and 3.0 moles of sodium sulphate. With sodium chloride, the discontinuity is observed in the case of nonionic Cr content only and at concentrations of the salt greater than 0.25 mole, the changes in the other cases being proportional to the amounts of added salt and to the time interval.



As regards the changes in the relative proportions of the three individual fractions of cationic chrome, the following observations may be made:

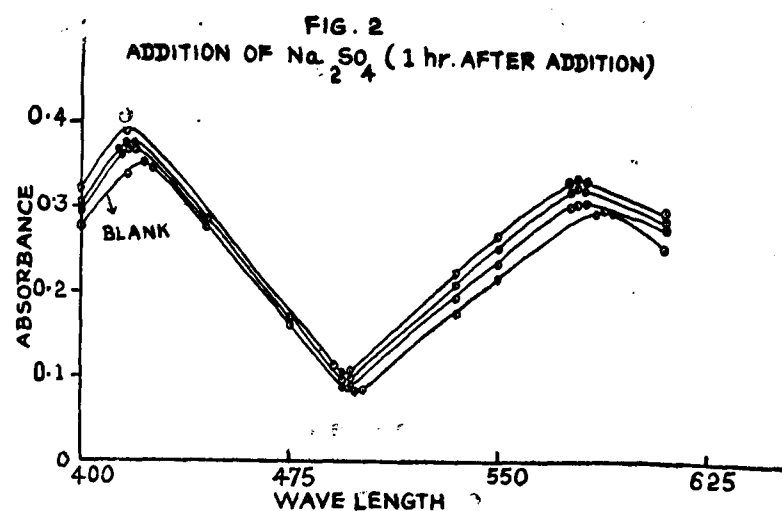
Addition of sodium sulphate leads to an increase in the amount of fraction C_1 ; the increase is perceptible in the initial stage itself and is proportional to the amount of salt added. A trend in the opposite direction is seen in the case of C_3 the fastest fraction. With C_2 , in the first one hour, there is an increase with the lower concentrations used and a decrease with the higher concentrations. Coming now to the change with time, the final change in the case of C_1 is an increase and in the case of C_3 a decrease. With C_2 , there is no specific trend except that the values pass through a maximum.

The position is slightly altered in the case of chloride. Here in the initial stages, C_1 as well as C_2 increase and C_3 decreases; however, there is no correlation between the amount of salt added and the change in the particular fraction. On keeping, the overall change in the case of C_2 is a decrease; the decrease in C_1 be-

comes appreciable with increased amount of the salt only. No distinct trend is seen in the case of C_3 .

It is thus seen that two effects are superimposed over each other; one due to the increasing concentration of the salt added and the other due to changes occurring on keeping. The overall change is the resultant of these two.

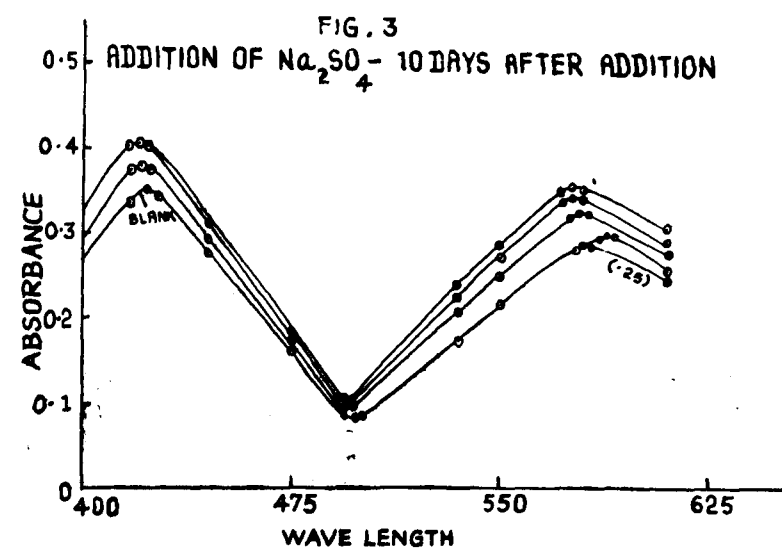
Fig. 1 shows the changes in intensity of absorption at both maxima (peak i round about 420 m μ and peak ii round about 588 m μ) on the addition of different amounts of sodium sulphate at different intervals in a differential manner compared to blank chrome liquor; fig. 2 shows the effect of concentration of sulphate on the intensity of absorption and on the shifts in maxima and minimum 1 hour after addition. Fig. 3 shows the same changes after 10 days. The corresponding changes after addition of chloride are shown by Figs. 4 and 5, the changes at 1 hour after addition of chloride being insignificant.



By the addition of sulphate a small hypsochromic shift (6-10 m μ) is observed at both the peaks within 1 hour itself at all concentrations, this being greater with more of salt and being not affected with time; in the case of chloride, no significant hypsochromic effect is seen at first peak whereas a hypsochromic shift of about 6-8 m μ at second peak which is not much affected by time and concentration of salt is observed. From the beginning itself, the intensity of absorption at both peaks increases with increase in concentration of sulphate. By the addition of small amounts of

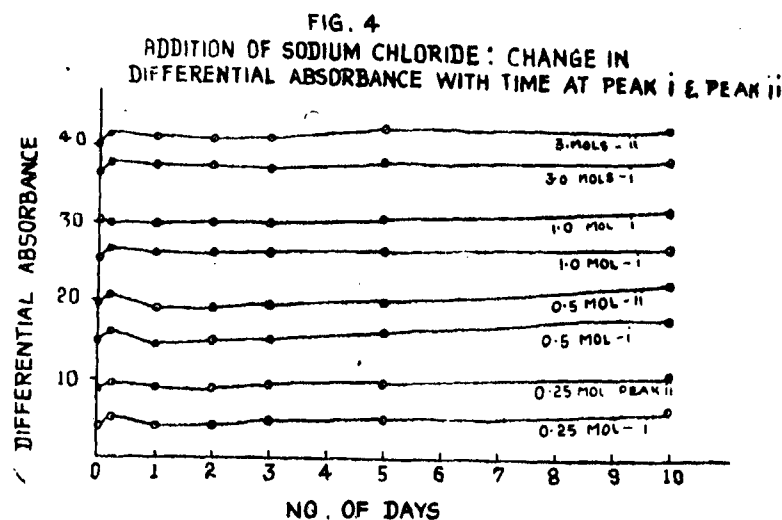
chloride, the intensity of absorption at the first peak is not changed; however, it increases with time. At the second peak, no significant variation in intensity of absorption is observed.

The decrease in cationic chrome in the presence of neutral salts like sulphate and chloride, has been attributed by Gustavson⁴ and Kawamura⁵ to the entry of the added anion into the chrome complexes, displacing co-ordinately held H_2O thereby reducing the positive charge. The present electrophoretic as well as spectrophotometric data confirm the above idea. The absorption of radiant energy in the visible range depends primarily on the number of electrons in the absorbing molecule and their arrangement. Variation of absorption characteristics of the molecule will be brought about by a change in the energy state of the electrons accompanying the substitution of one radical by another in the co-ordination sphere. In the case of chrome liquor, the change in intensity of absorption may be due to changes in (1) anion inside the chrome complex, (2) acid or basic radicals, (3) state of aggregation and (4) electrical charge.



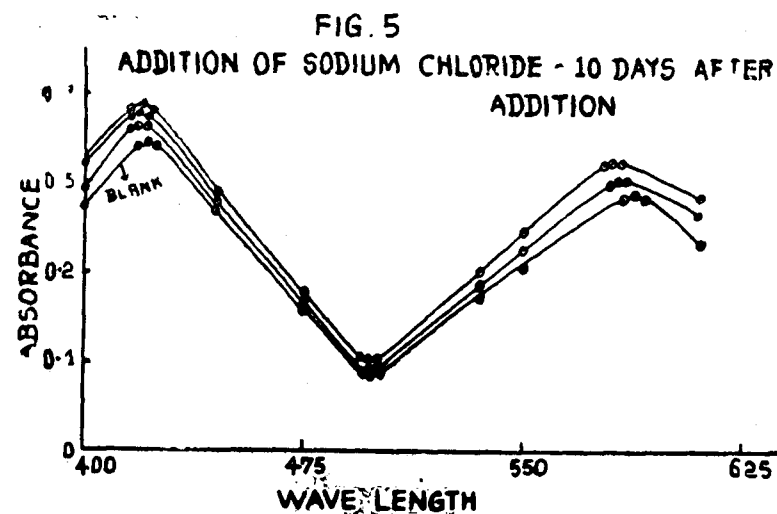
On addition of sulphate, penetration into the complex is noticeable even in the early stages as shown by the hypsochromic effect and the variation in intensity of absorption at both the peaks. Earlier workers^{6,7} suggested that these variations might be due to displacement of sulphato or aquo group from the complex, the displacement of $-OH$ possibly decreasing the intensity of absorption.

Replacement of aquo group may affect both the peaks and these effects are reversed by the entry of aquo group into the complex. In the case of chloride, the insignificant spectral changes at lower concentration of the salt prove its low penetrating power; also the slowness of reaction may be responsible for the very slight changes in the earlier stages. It is significant that the hypsochromic effect is noticed at the second peak. It may be indicative of the replacement of a particular type of sulphate, e.g., that portion which is not bridged. The increase in intensity of absorption and the shifts in maxima may be due to penetration of chloride into the complex. The slight decrease in intensity may be due to entry of aquo group into the complex as indicated by the electrophoresis studies.



As chloride is known to be a weaker penetrating agent than sulphate, its effect is felt only with higher concentration of salt and larger interval after addition. Since he could not find any change in spectrophotometric absorption, Shuttleworth⁸ suggested that the chloride ion would not penetrate into the complex in sulphate liquor. It is likely that the mode of preparation of the chrome liquor might be responsible for these observations quite contrary to the present ones. The observed increase in cationic chrome in the initial stages seems to be due to a reversal of equilibrium showing an increase in C_2 and C_3 also. Aggregate formation is considered to predominate in the initial stages; this could be between cationic chrome of higher charge and anionic chrome of lesser charge followed by entry of sulphate into com-

plex. This is supported by the observed decrease in anionic chrome. The higher proportion of nonionic chrome as compared to anionic obtained with the addition of sulphate was observed by Gustavson¹ also. Chloride is known to have no cross-linking capacity and in comparison to sulphate, it is likely that the rate of hydrolysis is greater in the chrome-chloride system leading to the formation of anionic complexes; Gustavson¹, however, has reported greater formation of nonionic complexes.



When sulphate is added to chrome liquor, it penetrates into the complexes, which are positively and differently charged, replacing the H_2O in each case by a co-ordinate covalent bond thereby reducing the charge and shifting the equilibrium consistently towards formation of lesser charged complexes like C_1 . The decrease in the C_2 and C_3 fractions with higher sulphate concentration is also attributable to the greater shift towards C_1 . Changes in intensity of absorption corresponding to these variations are observed in the spectrophotometric studies. The increase in C_2 with a corresponding decrease in C_1 in the earlier stages is probably due to aggregation of C_1 at all concentrations of sulphate which result in higher charge for aggregated complexes though individually the charge of chrome is not affected. This is indicated in spectrophotometric studies also as the decrease in intensity of absorption during the first 2 or 3 days is probably due to increase in aggregate formation; aggregate formation is known to decrease intensity of absorption in other cases.⁹ Along with aggregation, complexing also may be going on in a much less significant manner, as other-

wise, the combined value of C_1 and C_2 should be constant; this is further indicated by the increase in intensity of absorption in the final stages. The nonvariation of C_3 over longer periods of contact with salt could be explained as follows: the greater electropositive nature of this fraction leads to a greater attraction of the anion and thus to a quicker penetration of the anion, which is completed in the earlier stage itself. However, an increase in concentration of sodium sulphate brings about a lowering of this fraction.

When a high concentration of chloride is added, the great decrease in C_1 fraction of cationic chrome may be due to the continuous change in equilibrium towards nonionic and anionic chrome; for the stabilising forces necessary for the coexistence of the C_1 fraction without further reduction in charge, available in the case of sulphate are not present in this case. Also the aggregation of C_1 complexes is not feasible. Though chloride has no direct effect on aggregation, it may be affecting the ionically and complexely held sulphate, which may be instrumental in formation of aggregate with higher charge. It is also possible that a reversal of complex formation, i.e., complexly held sulphate being replaced by water by coordinate bonds occurs in the system. This is further supported by the observed decrease in the intensity of absorption in spectrophotometric studies. These two factors may explain the initial decrease in C_1 fraction at lower concentration of chloride. The increase in C_2 fraction may be due to any of the following reasons: when chloride penetrates into C_3 fraction, C_2 may be formed. As the pH goes down by the addition of chloride, Noerr and Classen¹⁰ have suggested that sulphate may be coming out of the system leading to the formation of certain coordinate bonds involving aquo groups. This will increase C_2 at the expense of C_1 . Further decrease in C_2 on longer intervals is brought about by the penetration of chloride into the complex, involving covalent linkage. The nondependence of C_2 on the concentration of chloride is probably associated with bridged $-SO_4-$ which is not replaced by chloride even at 3.0 moles as shown by Gustavson¹¹ in his studies on neutral salts. Though the penetrating power of chloride is low, it is possible that due to the great electropositive nature of C_3 and the electronegativity of chloride, some of it may enter into complex and reduce the charge as observed in the initial decrease of C_3 fraction. Subsequently, the reversal of equilibrium as stated earlier which resulted in more of C_2 may be responsible for the formation of more C_3 with larger concentration of salt and longer interval after addition.

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RESEARCH BEARS FRUIT

Improved Football Leather Manufacture

BY

T. S. K. MAHADEVAN, R. V. SOVANI & A. GANESAN

An improved method for the manufacture of football leathers was demonstrated at the Government Tanning Institute, Jullundur City, Punjab State in Oct./Nov. '61. The process is a modified form of bag tanning. The essential features of the process are a short liming followed by a high degree of vegetable tanning done in two stages, the first by bag tanning and the second by retanning in a pit in stronger vegetable tan liquor, dipping in a solution of basic aluminium sulphate and then fat liquoring. The hides are then set well and allowed to dry in the stretched condition on nailing boards. The detailed process is given below:

Raw material :

Wet salted local (Punjab) plump and tight textured cow hides having a weight range of 15-20 kg. (33-44 lb.) without serious grain defects are chosen.

Soaking :

The hides are given two changes of water and are left overnight in 400% water to which a small quantity of lime is added so as to make the bath alkaline. Next day, the hides are taken out, given a green fleshing to remove excess of flesh and taken to liming.

Liming :

Sodium sulphide (50% strength)	..	2% (on soaked weight)	
Ammonium sulphate	..	3/4%	-do-
Slaked lime powder	..	6%	-do-
Water	..	400%	-do-

First the sodium sulphide and ammonium sulphate are dissolved and mixed well and then the hides are handled well in this

solution for 15 minutes and then taken out. The required quantity of lime powder is added to the water, mixed well and the hides are put inside the bath. They are handled in this for two days.

On the third day, the hides are taken out, unhaired and fleshed. After noting the fleshed weight, they are given a good scudding, washed well and then taken for deliming.

Deliming :

The stock is delimed in a pit as follows:

Water	..	250% (on fleshed weight)	
Ammonium sulphate	..	0.5%	-do-

Ammonium sulphate is dissolved in the required quantity of water and the hides are trampled for about one hour and then left overnight in the pit. Next day, they are taken out, scudded and checked for deliming.

Pretreatment :

The delimed hides are dipped in a solution of 1/2% naphthalene sulphonic acid and 150% water on fleshed weight. Next, they are handled for 15 minutes and taken for bag tanning.

Bag tanning :

Total quantity of bark used in this is about 120% on the pelt weight. A mixture of 3 parts of babul bark (crushed) and one part of myrobalan nuts (crushed) is used. About 1/4 of the above mixture is used for preparing the "Malni" liquor and the remaining 3/4 is used for filling the bags.

About 1/4 of the tanning materials in the above proportion is soaked in 300% water on the previous day and kept overnight. Next day, the liquor is mixed well and the strength of the liquor adjusted to 6°Bk. The pretreated hides are kept in this liquor for 3 days taking care to handle the goods properly.

On the fourth day, the hides are taken out, wrung out to remove excess liquor, stitched in the form of bag and hung up with butt side down. The bags are filled with the remaining 3/4 of the bark and the tan liquor is poured into the bag. Then enough water is poured into the bag and the liquor is allowed to percolate through the bag. After 48 hours, a small cut piece from the butt is taken and checked for completion of tanning. Then the bags are

inverted with head side down after stitching. The stitches on the butt portion are cut open and the bag tanning continued for another 36 hours. A cut piece is taken and checked for completion of tanning.

After this, the bag is cut open at the seams and scoured on the grain side and the hides are taken to stronger vegetable tan liquors. The stronger liquors are prepared using a mixture of 3 parts of wattle extract liquor (80°Bk) and one part of myrob leach liquor of the same barkometer strength.

The bag tanned hides are first taken to a liquor of 20°Bk in the pits and kept handled for two days. Then the strength of the liquor is increased to 25°Bk and then to 30°Bk, each time keeping the stock handled for two days. Then the strength is increased to 40°Bk and the hides are handled for three days. Later the strength is increased to 50°Bk and the stock handled for four days. They are then taken out, kept in plain water overnight so as to remove loose tannins and other water solubles. Next day, the hides are washed, scudded well and then bleached as follows :

Perfectan O	..	½%	(on pelt weight)
Oxalic acid	..	¼%	-do-

These are dissolved in a small quantity of water and applied with brush on both sides of the hides and kept in pits for 20 minutes. Then the hides are washed well and allowed to drain. This is followed by a dip in a solution of basic aluminium sulphate in a tub prepared as below :

Basic aluminium sulphate liquor	..	5%	(on pelt weight)
Water	..	200%	-do-

The hides are kept in this liquor for 3 hours and handled well.

Note: The basic aluminium sulphate liquor is prepared from:

(Iron free) Aluminium sulphate	1 part
Sodium citrate	¼ part
Soda ash	¼ part
Water	8 parts

First the aluminium sulphate powder and sodium citrate are mixed well and heated upto about 60°C. Then about 4 parts of hot water at 60°C are added and mixed well. Next the soda ash is dissolved in the remaining 4 parts of water and slowly added

to the above, stirring well. The liquor thus prepared is kept overnight before use.

The hides are sammed after the above treatment and then taken for oiling. A mixture of the following is prepared.

Sulphated fish oil	..	1 part	} Quantity used is about 5 to 7% on sammed weight depending on the stock
Sulphated pungam oil	..	1 part	
Raw fish oil (or castor oil)	..	2 parts	

The above mixture is emulsified with a small quantity of hot water and then the emulsion is applied by hand on both sides liberally. Then the hides are hung up for samming. When the hides are properly sammed, the offals are cut off and afterwards the butt portion is taken for thorough setting. The butts are set twice with hand on both sides in the sammed stage and then nailed on boards stretching well. After nailing, the butts are oiled off on the grain side with ½% gingelly oil on sammed weight. The butts are allowed to dry completely in the nailed state itself. The offals are also allowed to dry after setting well. After complete drying, the grain side is smoothened well with glass slicker and then the yield is noted. The butts are utilised for the manufacture of high quality foot-bolls and offals are used for various other purposes.

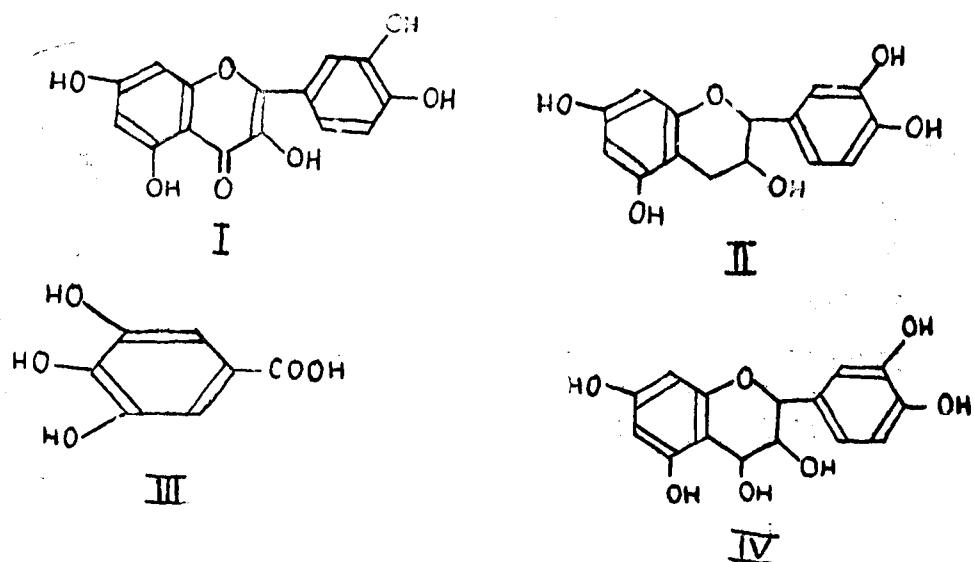
Leather yield .. 45% (on fleshed weight)

Note : The above process is particularly designed to meet the needs of small tanners who cannot afford costly mechanical equipment.

LETTER TO THE EDITOR

Studies on Biosynthesis of Tannins in Indigenous Plants. Part VII: Isolation of Quercetin, Catechin, and Gallic Acid from the Heartwood of babul.

In an earlier communication¹, work on the polyphenols of leaves of babul (*Acacia arabica*) was reported. Studies were extended to heartwood region also. The present communication reports the occurrence of quercetin (I), catechin (II), gallic acid (III) and leucocyanidin (IV) herein.



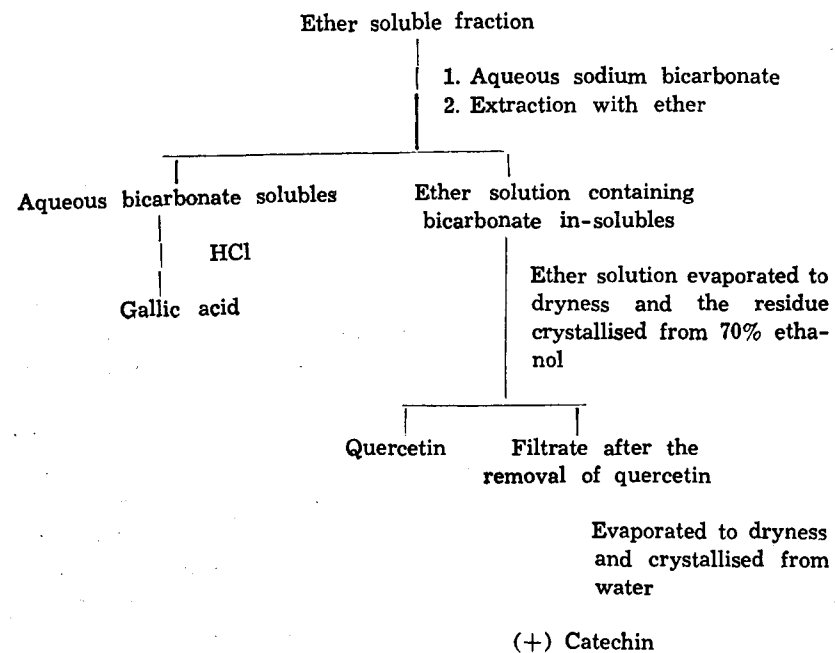
Experimental

Well powdered heartwood portion of babul was repeatedly extracted with acetone. The acetone solution was then concentrated to dryness *in vacuo* (N_2 atmosphere). The residue thus obtained was then moistened with water and repeatedly extracted with ether and the ethereal solution dried over anhydrous Na_2SO_4 . After removal of ether, the solid residue obtained was put to paper chromatographic studies using the solvent system: 6% acetic acid in the first way followed by *sec.*-butanol: acetic acid:

water (14:1:5) in the second way². Spraying was done with ferric chloride—ferricyanide reagent and vanilin—HCl reagent. Five clear spots were obtained. The R_f values were:

No. 1—0.47, 0.77 (corresponding to both catechin and gallic acid); No. 2—0.46, 0.89 (unknown); No. 3—0.26, 0.79 (unknown); No. 4—0.08, 0.79 (quercetin) and No. 5—0.44, 0.57 (leucocyanidin).

The actual isolation of quercetin, catechin and gallic acid was effected as follows:



The ether insoluble fraction of the acetone extract contains most of the tannins and work on the nature of this fraction is in progress.

March 12, 1962,
C.L.R.I., Madras-20.

K. U. BHANU,
S. RAJADURAI,
K. N. S. SASTRY,
Y. NAYUDAMMA.

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TECHNICAL SEMINARS

Studies on oil tannages: Sulphonyl chloride tannage*

BY

S. R. SRINIVASAN

The fixation of sulphonyl chloride on collagen has been studied with a view to find out the optimum conditions for producing good tanning effect. The results indicated that the maximum fixation occurred at a concentration of 50% sulphonyl chloride and 5% sodium carbonate on the weight of the hide powder. Further it was found that sulphonyl chloride was fixed on collagen in the form of sulphonamide links which were vulnerable to acid and alkaline hydrolyses, thereby causing increased stripping of fixed sulphur at alkaline pH.

The fixation of sulphonyl chloride at different pH values showed that the maximum fixation above the isoelectric point of collagen was due to participation of uncharged amino groups. The fixation on the acid side of isoelectric point of collagen has brought to light the possible hydrolysis of sulphonyl chloride and its fixation to charged amino groups as sulphonic acid. A study on the modified collagen and combination tannages showed that the amino groups were involved to a greater extent apart from the non-ionic groups of collagen. This finding was also substantiated from the data obtained from the isoelectric point studies.

The tanning studies with the aromatic sulphonyl chlorides have revealed that not only aliphatic sulphonyl chlorides, but also the aromatic sulphonyl chlorides possess tanning potency, the degree depending on the number of aromatic rings present. The preparation of and tannages with different aliphatic sulphonyl chlorides with varying hydrocarbon chain length, degree of unsaturation and substituent groups were studied and it was found that the formation as well as fixation was hindered by the presence of unsaturation and branching of hydrocarbon chains. It was also found that substituent groups like -OH and -COOH enhanced the fixation of sulphonyl chloride.

* Summary of the talk given on January 19, 1962.

The physical properties of leathers tanned with different aliphatic sulphochlorinated oils were studied with a view to find out the effect of chain length of the sulphonyl chloride on the physical properties and the suitability of the same as a tanning agent in place of Immergan. It was found that in general all the sulphonyl chloride tanned leathers possessed high tensile strength, bursting strength, stitch tear strength, water absorption etc. and that there was no appreciable change in physical properties due to difference in chain length. The hydrophilic character of sulphonyl chloride tanned leather was to be attributed to the sulphonamide links formed and the presence of alkyl sulphonates resulting from hydrolysis during turpentine were found to be the most suitable substitutes for Immergan.

Based on the above results, a process has been worked out for hair-on tannage.

Studies on some uncommon inorganic tannages: Cerium tannage*

BY

A. TULSI RAM

Using potentiometry, spectrophotometry and electrophoresis, the chemistry of trivalent cerium salts, i.e., masking ability, basicity, olation and charge, has been studied with a view to utilise them for tanning. The unmasked cerous salt solutions showed very low basicity and hydrolytic action; the tanning ability was poor due to the low basicity and absence of aggregation.

In the presence of equimolar amount of phthalate, a stable olated complex of about 24% basicity was formed. This was the maximum basicity that could be reached with phthalate masked liquor, as shown by potentiometric titrations; the precipitation of cerous hydroxide took place at pH 7.0 in the case of sulphate and at pH 6.6 in the case of the commercial mixed rare earths chloride.

The stability of the phthalate masked cerium (III) liquor was measured by adding different basifying agents like sodium carbonate, borax and sodium hydroxide. Carbonate basification was found to lead to precipitation, hence borax or hydroxide alone could be used for basification.

With the phthalate masked cerium liquors, a fixation of 6.69% Ce_2O_3 per 100 gm. of hide substance and a shrinkage temperature of 80°C was observed at an optimum pH of 7.0 and with a concentration of 10% Ce_2O_3 on the dry weight of the hide powder. With the rare earths chloride, the maximum fixation was only 4.61 gm. Ce_2O_3 per 100 gm. of hide substance and the shrinkage temperature was only 72°C . In this tannage, formic acid was found to be satisfactory for pickling and sodium hydroxide for basification. With the rare earths chloride, borax basification was found to produce white leathers. Taking all these factors into consideration, a process for basic phthalate masked cerous sulphate and commercial chloride tanned leathers has been worked out. Physical properties of the cerous sulphate and mixed rare earths chloride

tanned leathers were compared with those of the chrome and aluminium tanned leathers and it was found that cerium tanned leathers were not only comparable to chrome tanned ones but in addition, possessed special properties of heat resistance and high bursting strength also. Based on the white colour obtained and other physical properties, uses were suggested for these types of leathers in industry.

Study of the mechanism of cerous sulphate tannage revealed that the collagen carboxyl groups were mainly responsible for the fixation of cerium and high thermal stability of cerium tanned leathers (T_s 92°C). The possibility of nonionic sites of the protein also taking part in the tannage at a high pH of 7.0 was suggested.



The Executive Council of the Central Leather Research Institute, which met on March 1, 1962. Dr. A. L. Mudaliar, Chairman, is seen in the centre.

* Summary of the talk given on January 19, 1962.

TANNERS' CORNER

The Central Leather Research Institute has been since its inception rendering technical aid to the leather industry through answering technical enquiries on specific problems. The number of such enquiries has been increasing year by year. In order that the formation contained in the replies to the technical enquiries may be available to all those who have similar problems, this new feature "Tanners' Corner" has been inaugurated. Typical questions will be reproduced herein with the relevant answers. It is hoped that the industry will fully utilise this new feature and bring more and more of its problems for solution by this Institute.

Q. XIII. It is learnt that the C.L.R.I. has prepared a leather adhesive from indigenous materials and that the joints obtained with this adhesive are proof to moisture. The following further details are required: (i) How long does the joint stay effective? (ii) What is the colour of the latex cements A & B? (iii) Are the cements transparent? (iv) Does the cement latex evaporate very rapidly? (v) Is a thinner supplied in case the cements become thick due to exposure?

Answer: (i) The joint will be effective for a long time; the presence of moisture may slightly affect the strength of the joint but not materially.

(ii) The colour of the latex cements A & B is rosy.

(iii) The latex cements are not transparent. The film obtained will be translucent.

(iv) When applied as an adhesive coating on leather, it will take about 3-10 minutes to evaporate depending on the nature and type of the leather.

(v) Water can be used as a thinner if thinning is needed.

CLASSIFIED ABSTRACTS

RAW MATERIALS

Raceway brine curing.

William T. Roddy, *Leather & Shoes*, 142, No. 19, 36B (1961). Green hides are first washed with cold water. The equipment used for this purpose is of rotary type, 30' high and is capable of accommodating 75-100 hides per hour. The washed hides are then demanured or fleshed prior to brining in the raceway.

The raceway used for brining is an oval shaped vat. It has capacity for 500 to 600 hides at a 4:1 or 5:1 float of brine. The hides are continuously moved about by two paddles (one at each side of the vat) in order to obtain a mill-race effect. The brine (of 95°-99° salometer strength range) is circulated through a lixator for each vat. Air may be blown through brine. Lightening mixtures run continuously in the top quarter of the lixator. After a minimum of 14 to 17 hours brining, the hides are pulled out at the rate of 250 to 300 hides per hour, horsed up to drain for 48 hours, trimmed, graded and bundled for shipment.

Corrugated condition of the hair side of the goods "brine" cured by the raceway method is known as "Brine Draw" and cannot be eliminated in tannery practice. This becomes even more pronounced in sole leather when they are compressed by rolling. Bacterial damage is another risk. This can be reduced considerably by the use of bactericides. The so-called chicken wire effect is the third defect observed on the grain side. This can be avoided by proper handling of the hides for amply sufficient length of time in the raceway. As against these disadvantages, the raceway brine curing possesses the following advantages, viz. (i) minimum handling of hides, (ii) short time and (iii) minimum floor space.

VEGETABLE TANNING

Eugenol lignin: its chemical properties and significance.

D. E. Bland (Division of Forest Products, C.S.I.R.O., Melbourne, Australia) *Biochem. J.* 81, 23 (1961). Artificial lignin

has been produced on oat-coleoptile segments and potato parenchyma from purified eugenol in buffered aqueous solution containing hydrogen peroxide. The colour reaction of the eugenol lignin with phloroglucinol, its behaviour in the 72% (w/w) sulphuric acid lignin determination and its ultimate composition were all similar to these characteristics of gymnosperm lignin. Its ultraviolet- and infrared-absorption spectra were similar to those of gymnosperm lignin. Unlike natural lignin, the eugenol lignin has no *p*-hydroxybenzyl alcohol or other arylcarbinol groups that can be ethylated. On oxidation with nitrobenzene the eugenol lignin gave only a low yield of vanillin (5%). The yield of dehydrodivanillin was about the same as from lignin. It is concluded that eugenol lignin is a lignin-like substance, but that it differs from lignin in important respects. Conclusions about natural lignin and lignification drawn from experiments with eugenol lignin must therefore be made with the utmost caution.

PROCESSES AFTER TANNING

Finishing of glove and garment leathers.

Robert Shaw, *Leather Manufacturer*, 78, No. 5, 18-24 (1961). The finish on glove and garment leathers must be able to withstand a very high degree of stretching. For this, the plasticizer used along with the film forming material should not be of an easily evaporating type; it should not also migrate into the leather. The sulfonated oils used in the protein finishes are not satisfactory in this respect, as they have a marked tendency to be absorbed by the leathers. Also, since the formaldehyde spray given to the protein finish in order to insolubilise it makes it brittle, protein finishes are not suited for glove and garment leather finishing.

The second type of finish that is applicable to these soft leathers is the so-called 'Lacquer finishing'. Here the film forming material is nitrocellulose. It has, however, two drawbacks, viz., brittleness and inflammability. The solvent plasticizers formerly used to soften the film were not satisfactory as these too like the sulfonated oils referred to above are absorbed by the leathers. However, the difficulty came to be obviated later on by the use of synthetic resinous plasticizers. The inflammability of nitrocellulose led to the evolution of lacquers in the form of emulsions. The two important advantages of lacquer emulsion finishes are (1) their ability to form thinner films thus imparting real leathery feel and appearance to the goods and (2) good adhesion proper-

ties (to the base coat). The greatest drawback of lacquer emulsions, however, is that in the pigmented condition they lack in hiding powder.

Still another novel method of finishing these leathers is by making use of synthetic resins. Acrylic resins are the best suited for this purpose as films formed therefrom are quite stretchy and flexible. Flexibility is inherently present in the polymeric molecules themselves and therefore, they do not require any separate plasticizers. Formerly, the resin was used to form a base coat for lacquer finishes. Since in the water dispersed form, these are found to bind large amounts of pigments, leathers are, nowadays, finished with this resin independently also. Filling and covering properties of this type of finish are of a very high order. And therefore, for white and pastel shades also, this finish can be used.

TESTING

Measurement of moisture penetration of leather footwear under field test conditions.

James C. Perkins (Quartermaster Research and Engineering Field Evaluation Agency, U.S. Army, Fort Lee, Virginia) *J. Am. Leather Chemists' Assoc.* 56, 502 (1961). A study was made to develop a more refined, objective, and reliable method for determining, on a continuing basis, the instant and location of leakage and the amount of moisture penetration and absorption in leather footwear under dynamic conditions. A portable, 8-circuit, moisture detector, incorporating an audible indicator signal, and a harness-type sensing element were developed. The construction of this detector and sensing element was based on the principle of electrical resistance and resultant changes in resistance activated by water penetration. The device was subjected to a series of dynamic test trials to determine its efficiency and applicability to field testing conditions, including wear by soldiers to evaluate the comparative water resistance qualities of Army leather combat boots with standard and direct molded outsole construction. Based on these dynamic test trials, the instrument proved satisfactory and completely met the test objectives.

Factors influencing water solubles determination.

Lester M. Whitmore and George V. Downing (Leas & McVitty, Inc., Salem, Va) *J. Am. Leather Chemists' Assoc.* 56, 518

(1961). In 1942 the ALCA Committee on Water Solubles in Leather, with L. M. Whitmore as chairman, published a summary of the work done by the committee, but the actual data upon which the report was made have never been published. Believing that this committee work should be published, the authors present here the detailed report of the work which led to the adoption of present methods B1 and B8.

The action of heat and moisture on leather. Part I. The storage of a variety of commercial leathers at 40°C and 100% R.H.

J. H. Bowes and A. S. Raistrick (British Leather Manufacturers' Research Association, Milton Park, Egham, Surrey, England) *J. Am. Leather Chemists' Assoc.* 56, 606 (1961). Studies of the deterioration of leather under warm moist conditions have mainly been concerned with heavy upper leathers of high grease content. In the present work, a survey of the behaviour of a selection of commercial leathers of various types has been made in order to form a general background to a programme of research on the mechanism of the deterioration of leather.

The leathers were stored over water at 40°C. for six months, and losses in strength and changes in crackiness, shrinkage temperature, and pH of water extract were determined.

Chrome leathers were the most resistant to the action of heat and moisture and, with the exception of the one sole leather tested, lost little or no strength. Some of the vegetable-tanned leathers also lost relatively little strength but darkened in colour and tended to become rather cracky. The resistance of the majority of the semi-chrome and chrome retan leathers was poor, and losses of strength of 80% occurred in some cases. The shrinkage temperature of most of these leathers fell by 10° or more during storage.

The possible causes of the low resistance of these leathers are considered, and their bearing on the behaviour of these leathers in wear are discussed.

Limited tests on the same leathers stored over water at 20°C or in air at 40°C indicate that little deterioration occurs under these conditions, emphasizing that it is the combined action of heat and moisture which is deleterious.

The action of heat and moisture on leather. Part II. The storage of vegetable, chrome, semichrome, and chrome retan leathers at 40°C and 60°C and 100% R.H. for varying periods of time.

A. S. Raistrick (British Leather Manufacturers' Research Association, Milton Park, Egham, Surrey, England) *J. Am. Leather Chemists' Assoc.* 56, 616 (1961). In Part I of this series the effect of storage at 40°C. over water on a wide range of commercial leathers was reported. To examine the effect of variations in the conditions and time of storage, and the chemical changes occurring, four leathers, chrome-tanned, vegetable-tanned, semichrome, and chrome retan, were stored in closed jars over water for periods of upto 72 weeks at 40°C, or 15 weeks at 60°C. and tested at intervals for buckle tear load, shrinkage temperature, pH of water extract, and solubilization of protein.

All the leathers lost about 50% of their strength after 5 weeks at 60°C. over water. The three leathers containing vegetable tan lost their fibre structure after 10 to 15 weeks and were very dark in colour. The chrome leather, although weak, had changed little in appearance. At 40°C. the chrome and vegetable-tanned leathers were relatively unaffected, but the combination-tanned leathers lost over 80% of their strength in 72 weeks.

Mold growth caused considerable losses in strength in the chrome-tanned leather, but the other three leathers were not adversely affected.

The shrinkage temperature of the chrome- and vegetable-tanned leathers increased with extended time of storage, but that of the combination-tanned leathers decreased. Changes in the pH of water extract of the leathers were small until the leathers lost their fibre structure, when increases from about pH 3 or 4 to pH 5 or 6 were observed in some cases.

Only small increases in nitrogen soluble in 0.1N sodium bicarbonate were found. The nitrogen soluble in 5M acetic acid increased slowly as the leathers lost strength and then more rapidly when the fibre structure began to be lost. Although the chrome-tanned leather became very weak in some instances, its soluble nitrogen was always low. In the grossly deteriorated leathers containing vegetable tan, the volatile nitrogen in the extracts was very high, indicating that deamination of the amino acids of the collagen had occurred.

The extractability of the chrome tan was reduced by storage, suggesting that considerable changes had occurred in the chrome complex.

The mechanism of deterioration is discussed.

The action of heat and moisture on leather. Part III. The effect of pH on the deterioration of vegetable, chrome, semichrome and chrome retan leathers.

J. H. Bowes and A. S. Raistrick (British Leather Manufacturers' Research Association, Milton Park, Egham, Surrey, England) *J. Am. Leather Chemists' Assoc.* **56**, 632 (1961). Vegetable, chrome, semichrome, and chrome retan leathers were adjusted to various pH values in the range 2 to 9 and stored at 40°C over water for 15 weeks.

The strength of the leathers as measured by buckle tear load was little affected by the adjustment of pH except when this was reduced below 3.0. Losses in strength during storage varied with the type of leather and with its pH. In general, in the range 4 to 8 pH had little effect on the losses of strength of chrome, vegetable, and semichrome leathers, but with the retan leathers losses increased progressively with fall in pH. In this range the chrome leathers lost no strength, the vegetable-tanned leather about 30%, the semi-chrome about 50%, and the chrome retan leather 10% at pH 8.0, increasing to 25% at pH 4.0. At lower pH values the losses in strength of the chrome and retan leathers increased sharply but those of the semichrome only slightly, while with the vegetable-tanned leather, losses were only increased at the lowest pH value (2.0). At this pH, however, the vegetable-tanned leather was extensively damaged after only two weeks' storage.

The leathers containing vegetable tan became progressively darker in colour with increasing pH and tended to become cracky, but the chrome-tanned leather was relatively unaffected both in appearance and feel.

It is concluded that for resistance to storage the pH of the leather should be above 3.5, and even higher with chrome leather and retan leather. High pH values, however, lead to darkening of leathers containing vegetable tannins and to detannage of chrome leather, so that a limit must be set. In wear, the absorp-

tion of perspiration increases the pH of the leather, and this must also be borne in mind.

THEORIES

Amino-acids of the cyclohexane series. Part I.

L. Munday (Science Department, Birkenhead Technical College, Borough Road, Birkenhead, Cheshire) *J. Chem. Soc.* **43** 72 (1961). Several alkyl-1-aminocyclohexanecarboxylic acids have been synthesised by the Bucherer hydantoin and the Strecker synthesis. While the latter synthesis leads to one geometrical isomer in each case, the former gives both possible isomers, the opposite geometric isomer greatly prepondering. Evidence is presented for the configurations assigned, which are based on the resistance to hydrolysis of the 1-amino-4-*t*-butyl- and -4-isopropyl-cyclohexanenitrile hydrochlorides, on infrared spectra, and on the dissociation constants of the amino-acids.

The chemistry of connective tissues. 7. Dissociation of the chondroitin sulphate-protein complex of cartilage with alkali.

S. M. Partridge and D. F. Elsdon (Low Temperature Research Station, Downing Street, Cambridge) *Biochem. J.* **79**, 26 (1961). The dissociation of the chondroitin sulphate-protein complex of hyaline cartilage in alkaline solution was studied by zone electrophoresis in a column stabilized by a density gradient. The complex was stable in a sodium hydroxide-sucrose solution of pH 10.8 but was irreversibly dissociated by treatment with 0.5*N*-sodium hydroxide for 24 hr. at 25°. It was concluded that linkage between chondroitin sulphate and protein is most probably covalent. The protein fraction released by alkaline treatment was examined by chromatography with a carboxylic acid ion-exchange resin (IRC-50). The protein was heterogeneous and appeared as a close group of poorly resolved peaks. Head and tail fractions were analysed separately and found to have the same qualitative composition, but the head fraction contained 9.6% of carbohydrate and the tail fraction 5.4%. It was concluded that the fractions were derived from a single carbohydrate, containing protein which had been degraded by the action of alkali. The carbohydrate moiety of the protein was rich in glucosamine and galactose, but neutral sugars other than galactose were present in trace amount only. The core protein may thus contain keratosulphate.

The pectic enzymes of *Aspergillus niger*. 1. The production of active mixtures of pectic enzymes.

R. Tuttobello and P. J. Mill (International Centre for Chemical Microbiology, Istituto Superiore di Sanita, Rome, Italy) *Biochem. J.* **79**, 51 (1961). A method is described for the preparation of a mixture of pectic enzymes with cultures of *Aspergillus niger*. The cultures were produced in stirred fermenters with a medium consisting of 0.05% of Na_2SO_4 , 0.2% of NH_4NO_3 , 2% of sucrose and 2% of pectin in a boiled extract of groundnut flour. Fermentation was continued for 5-6 days at 30°. The pH of the culture remained between 3 and 4. The preparations induced virtually complete hydrolysis of pectin. Enzymic preparations obtained from the culture fluid by precipitation with ethanol were more active, on a weight for weight basis, than commercially available materials.

The pectic enzymes of *Aspergillus niger*. 2. Endopolygalacturonase.

P. J. Mill and R. Tuttobello (International Centre for Chemical Microbiology, Istituto Superiore di Sanita, Rome, Italy) *Biochem. J.* **79**, 57 (1961). Endopolygalacturonase has been separated from the culture fluid of *Aspergillus niger* with a purification factor of 400-fold and a recovery of 34%. The preparation obtained was homogeneous on paper electrophoresis at pH 7.2 and pH 8.0, and of moderate stability with an optimum for stability of about pH 6. The enzyme rapidly lowered the viscosity of a solution of pectic acid and released reducing groups from it according to a random pattern of hydrolysis, but the digestion was not complete. Pectin underwent only a very slight degradation, sufficient to show a fall in viscosity but with little release of reducing groups. Tetragalacturonic acid was rapidly split to tri- and monogalacturonic acid, and trigalacturonic acid was slowly split to di- and mono-galacturonic acid, but the digalacturonic acid was not attacked.

Cellular components of *Bacillus megaterium* and their role in protein biosynthesis.

G. N. Godson, G. D. Hunter & J. A. V. Butler (Chester Beatty Research Institute, Institute of Cancer Research: Royal Cancer Hospital, Fulham Road, London, S.W.3) *Biochem. J.* **81**, 59 (1961). The membrane complex obtained by lysing protoplasts of *Bacillus megaterium* in buffers of physiological strength is disrupted by exposure to buffers of low ionic strength. Under these conditions, the following fractions are obtained and separated cleanly from

each other: (1) a mucoprotein fraction; (2) a phospholipoprotein fraction, seen in the electron microscope as very small spherical vesicles free from ribosomes; (3) ribonucleoprotein particles (ribosomes of 30s and 45s); (4) ribonucleic acid of low molecular weight, together with solubilized protein that includes all the amino acid-activation enzymes of the complex. When the whole membrane complex or protoplasts are incubated with labelled amino acids, labelled protein appears first in the ribosomal and phospholipoprotein fractions. The greater part of this labelled protein is found in the phospholipoprotein fraction, and there is no evidence that this is derived from the ribosomes.

Optical rotation of soluble feather keratin.

N. E. Dweltz (Department of Physics, University of Madras, Madras-25) & V. Mahadevan (Department of Physical Chemistry, University of Madras, Madras-25) *Biochem. J.* **81**, 134 (1961). The optical rotation of soluble feather keratin has been studied, and the specific rotation of the protein in solution at 25°, $[\alpha]_D^{25}$ has been found to be -430°. This value is very close to that observed for soluble collagen and the triple helical polypeptides, and very different from that observed for α -proteins. It thus supports the triple helical structure put forward for feather keratin from X-ray data by Ramachandran and Dweltz (1961).

The absorption of cationic surfactants by cellulosic materials. II. The effects of esterification of the carboxyl groups in the cellulosic substrates.

Yehezkiel Gotshal, Ludwig Rebenfeld, and Howard, J. White, Jr. (Textile Res. Inst., Princeton, New Jersey), *J. Colloid Sci.* **14**, 619 (1959). Viscose rayon and oxycellulose containing a high concentration of carboxyl groups have been esterified at the carboxyl group using ethylene oxide. This reagent was chosen to minimize changes in accessibility caused by the esterification reaction. Measurements were made of the carboxyl contents, of the capacities of the samples to absorb water, and of their capacities to absorb the cation and anion from solutions of cetyltrimethylammonium bromide. These last measurements were made to test the hypothesis advanced by Sexsmith and White (1) that absorption of ion pairs from the surfactant solution was a clustering process dependent on the presence of exchanged cations which served as nuclei. The marked decrease in ion-pair absorption found after esterification was in agreement with this hypothesis. Some other properties of the esterified oxycellulose samples are also discussed.

The absorption of cationic surfactants by cellulosic materials. III.

A theoretical model for the absorption process and a discussion of maxima in absorption isotherms for surfactants.

Frederick H. Sexsmith and Howard J. White Jr., *J. Colloid Sci.* 14, 630 (1959). A theoretical model is proposed to account for the results observed when cationic surfactants are absorbed by cellulosic substrates. The model consists of the absorption of cations by an exchange process followed by a clustering of ion pairs on the exchanged cations. When this model is combined with a mass-action treatment of the surfactant solution, absorption isotherms, similar to those found experimentally, are obtained. In particular, there are maxima in the absorption isotherms. A discussion of the factors which lead to maxima is given, and a model to account for the maxima observed with anionic surfactants is proposed.

GENERAL

Radioisotopes and their applications

J. A. Moss, *J. Soc. Leather Trades' Chemists*, 45, 321 (1961). Radioactivity is the attempt by an unstable nucleus to settle down to a stable state. This results in the emission of radiation, characteristic of the atomic species concerned, which can be detected and measured with a high degree of sensitivity and accuracy. The radiation also produces ions and free radicals in the surrounding medium. The uses to which radioisotopes are put can be divided roughly into three categories. First, there are those applications in which the effect of the radiation on the medium is of importance and which involve large radiation sources. Examples are the sterilisation of medical products and the vulcanising of rubber. In the second class, sources of lower intensity are used in measuring instruments such as liquid level indicators and thickness gauges. Lastly, there are those applications which are probably of major interest to the chemist, including the tracer technique. This technique allows the elucidation of chemical reaction mechanisms in systems difficult to study by other means. No great use has yet been made of radioisotopes in the leather field but interest is increasing and it is to be hoped that work useful to the industry will result. Among the possible uses to which radioisotopes could be put are studies of chrome complexes and the stability of leather, investigations into the penetration of substances into pelt and the irradiation sterilisation of hides and skins.

NOTES & NEWS

46th INDIAN SCIENCE CONGRESS

The 46th Science Congress was held on 3 & 4 Jan. 1962 at Ravenshaw College campus of the Utkal University. Prime Minister Jawaharlal Nehru inaugurated the Congress. He exhorted the senior scientists to give all facilities to junior research workers so that they could contribute their best. He also appealed to them to make a bid to concentrate on the applied field so that the results could reach the common man.

The sessions of the chemistry section were well attended; the presidential lecture of Prof. R. P. Mitra was on electro-chemical aspects of polymer solutions which included protein solutions also. There were special lectures by Prof. R. S. Mulliken, N. L. on forces of interaction between molecules and by Prof. Havemann of Germany, on the photochemical reaction of dyes. Two symposia were arranged. The first one was on the physiochemical methods for evaluation of structure; papers on the use of N.M.R., Raman spectra and spectroscopic methods of structural investigation were presented. The second symposium was on coordination complexes wherein the spectrophotometric method of determination of stability constants of complexes of metal ions like Zr, Al etc. with certain dyes figured prominently. More than 50 papers on analytical chemistry, organic chemistry, inorganic chemistry, nuclear chemistry and industrial chemistry were presented; the contribution from C.L.R.I. was on the determination of basicity of chrome complexes containing organic acids by solvent extraction technique, by D. Ramaswamy, S. C. Sumathi and Y. Nayudamma. The special and popular lectures by foreign delegates arranged on the occasion were on "Magnetic properties of rocks and continental drifts" by Prof. P. M. S. Blackett, "X-ray crystallography and thermal vibration in crystals" by Madame Kathleen Lonsdale, F.R.S. and "Tranquilizers" by Prof. Zuckler.

The entire Congress was held in an exuberant atmosphere in fine weather and provided an occasion for the participants to make scientific contacts and to know the fields in which other fellow scientists were interested.

D.R.

Trade trends in goatskins

A Review of Conditions in First Half of 1961

The amount of raw goatskins entering international trade in the second quarter of 1961 and in the January-June period was lower than in the corresponding months of 1960. Exports from India during January-April were lower than in the previous year following a decline in purchases by the U.S.S.R.; however, trade in semi-tanned skins was above the 1960 level. Shipments from Kenya, Uganda and Tanganyika in the January-June period showed some increase but those from South Africa were greatly reduced.

United Kingdom imports in April-June were much heavier than in the same period of last year; so trade from the beginning of the year was slightly higher than in 1960. Both Italy and Western Germany increased their purchases of goatskins in the second quarter of 1961, imports into both countries in January-June showing a sharp rise on those of a year earlier. On the other hand, the decline in United States receipts continued during April-May, purchases in the first five months of 1961 being 44 per cent, lower than those recorded in the comparable period of last year. It appears that imports into the U.S.S.R. and other East European countries were also reduced in the first half of 1961.

Distribution of Exports from India

Exports of goat and kidskins from India during April and May were 22 per cent lower than in the corresponding months of 1960 and shipments from the beginning of the year fell by 9 per cent. The decline was largely due to the reduced level of trade with the U.S.S.R., shipments from the beginning of the year being 27 per cent less than in January-May 1960. On the other hand, the recovery in exports to the United States continued in April-May and sales during January-May showed a rise of 23 per cent. Exports to Western Germany in 1961 were running at twice the level of last year, while some increases were also recorded in those to Italy and Czechoslovakia.

Imports to the United Kingdom

The marked rise in goatskin receipts during the second quarter of 1961 over the same period of the previous year, entirely offset the loss recorded in January-March period. Receipts from India

Exports of raw goat and kidskins from India
(tons)

Country	1959 Year	1960		1961			
		Jan.- March	April- June	July Dec.	Year	Jan.- March	April- May
Australia	221	17	28	107	152	17	29
United Kingdom	254	28	34	224	286	69	70
France	24	6	—	8	14	7	—
Italy	692	63	109	208	380	75	74
Netherlands	49	11	—	4	15	25	4
Western Germany	507	95	103	240	438	208	135
Bulgaria	74	—	36	—	36	—	—
Czechoslovakia	522	126	198	271	595	194	166
Eastern Germany	89	36	42	7	85	1	8
Hungary	28	30	58	3	91	—	7
Poland	64	99	27	18	144	239	—
Rumania	160	77	130	—	207	—	—
United States	3454	443	834	1507	2784	649	673
U.S.S.R.	6048	2056	925	3021	6002	1592	468
Yugoslavia	6	3	45	13	61	21	19
Other countries	85	6	7	2	15	—	—
Total	12276	3096	2576	5633	11305	3097	1654
Of which:							
dry-salted	10041	2264	2310	3379	7953	2432	1226
wet-salted	2155	810	224	2228	3262	623	412

Imports of goatskins into the United Kingdom

(tons)

Country	1959 Year	1960			1961		
		Jan.- March	April- June	July- Dec.	Jan.- March	April- June	Jan.- June
Aden	66	18	9	8	2	—	2
India	362	14	41	220	74	83	157
Kenya, Uganda and Tanganyika	1020	157	87	147	122	166	288
New Zealand	31	18	—	29	1	—	1
Nigeria	1337	215	233	424	221	293	514
Pakistan	821	267	168	339	187	142	329
Other Commonwealth	34	8	2	11	4	6	10
South Africa	130	11	11	19	12	8	19
Other foreign	212	26	13	14	6	2	9
Total	4013	734	564	1211	629	700	1329

Imports of goat and kidskins into the United States

(tons)

Country	1959 Year	1960			1961		
		Jan.- March	April- June	July- Dec.	Jan.- March	April- May	
India	4206	496	785	1725	725	569	
British East Africa	1012	191	404	167	3	23	
Nigeria	1475	169	513	935	314	259	
Pakistan	1920	564	649	1318	643	388	
Other Commonwealth	198	218	85	81	25	15	
Argentina	641	111	162	100	32	6	
Brazil	1973	455	386	273	257	209	
Chile	110	31	47	29	15	12	
Congo Republic	123	18	12	26	—	—	
Ethiopia	1674	271	223	55	98	73	
Indonesia	155	31	58	64	24	10	
Iran	675	95	388	242	174	99	
Iraq	86	38	—	—	—	—	
Peru	756	195	207	396	136	56	
Somalia	558	116	148	—	—	31	
Sudan	51	11	18	14	7	5	
Other countries	872	221	244	255	60	99	
Total	16485	3231	4329	5680	2513	1854	

showed a marked recovery in each of the first two quarters of the year while those from Kenya, Uganda and Tanganyika rose sharply in the April-June period making good the decline in the preceding three months. Imports from Nigeria in January-June showed a moderate rise but purchases from Pakistan were reduced.

Imports into the United States

With a continued decline in demand by tanneries in the United States, goatskin imports during April and May were 35 per cent, lower than in 1960 and purchases from the beginning of 1961 showed a decline of two-fifths on the corresponding figure for last year. As the rise in imports from Commonwealth countries during January-March was followed by a decline in April and May, the cumulative figure showed little change; however, receipts in the January-May period accounted for 68 per cent of the total as compared with 47 per cent in 1960. Purchases from Brazil, the second largest source of supply in 1958 and 1959, have continued to decline while trade with Ethiopia and Iran has also been reduced.

Imports of goat kidskins into the European Economic Community during the first half of 1961 exceeded the 7,200 tons recorded in the previous January-June as the fall in French receipts was outweighed by the heavier amounts entering Italy and Western Germany. Trade with Commonwealth countries showed a more than proportionate increase and accounted for 30 per cent of the total compared with 21 per cent a year earlier.

Tanner: November & December, 1961.

Indian Goatskin exports during October, 1961

Robert Mills & Co. (London) Ltd., advise, that during October, 1961 approximately 823,000 pieces of Indian goatskins were exported from Calcutta (compared with about 717,000 for the same period last year).

Drysalted: about 683,000 pieces of which about 42,000 were for the U.K., 604,000 were for the Continent, 37,000 were for the U.S.A.

Wetsalted: about 140,000 pieces; about 20,000 to the U.K., about 98,000 to the Continent, about 22,000 to the U.S.A.

Kidskins: Nil.

Of the overall total about 588,000 were for Eastern European countries.

Leather Trades Review: December 6, 1961.

Australia is now pioneering brand new uses for Kangaroo skins

Kangaroo and smaller cousin wallaby skins are gaining wider popularity as Australians pioneer new uses, transforming them into shoes, wallets, cases, masonic regalia, rugs, belts, toy bears, bagpipes and—the most surprising success of all—fur coats. Exports of skins have increased in volume over the last five years by 64 per cent to 1,212,695 lb. recorded for 1960-61. Kangaroo has been a big hit on the American market which takes 87 cent of all skins exported. Firms in U.K. have shown an increasing interest recently.

The c.i.f. main U.K. port price for a top grade skin of 7-8 sq. ft. is about 17s, while a third grade skin of 5-6 sq. ft. would be about 8s. less. Exported skins are pickled and packed in wooden casks or in metal open top drums with plastic liners.

Figures for skins processed in Australia show 142,411 tanned there in 1957-58 and 240,678 in 1959-60; while kangaroo leather dressed increased over this period from 702,000 sq. ft. to 1,174,000.

Mr. Bernhard Hammerman, Sydney furrier, first began experimenting with kangaroo skin coats in 1941. He found a grade of skin which, when softened and bleached, made an acceptable substitute for white beaver with the added virtue of surprising economy. Mr. Hammerman finds the best skins for his purpose are those from the female blue. These skins are smaller—eight being used for each full-length coat—and not so touch. Now the kangaroo is steadily supplanting opossum as the best ambassador for Australian furs. American students go for the kangaroo as a campus coat: a more elegant model was presented recently to Princess Alexandra during her visit to Australia.

Another Australian pioneer of the uses of these skins is Mr. William Corner, of Brisbane, Queensland, who prefers them to sheepskins for making bagpipes. Mr. Corner says that in humid tropical climates kangaroo skin bags will last for up to 25 years whereas sheepskin lasts only about three months. In addition, he finds kangaroo skins are softer, more flexible and, after treatment, less porous.

Leather Trades Review: December 13, 1961.

Export of raw goat skins

The Government of India has decided to continue for the year 1962 (Jan.-Dec.) the current policy for export of raw goat skins the effect of which will be as follows:

(a) Established shippers will be allowed quotas upto 6½% of their best years exports during any of the five calendar years 1954 to 1958.

(b) Applications from shippers who exported raw goat skins during the year 1959, but have no exports to their credit in the present basic period will be considered on merits.

(c) Established shippers whose basic exports are less than 1,50,000 pieces will be allowed to export upto 100% of their basic exports while those whose best years exports are more than 1,50,000 pieces but which would be reduced under the present orders below the said figures will be allowed a minimum of 1,50,000 pieces.

(d) All quota holders whose entitlements work out to 1,50,000 pieces or less during the year will be allowed to combine if they so desire with other quota holders to enable them to utilise their quotas in a profitable manner.

Economic Times: January 3, 1962.

Research units

Establishment by Industries

The Council of Scientific and Industrial Research is now vigorously pursuing its policy of encouraging research work in industries as well as taking to the industries the results of research conducted in the National Laboratories.

A committee has been appointed with Dr. M. S. Thacker, Director-General of the C.S.I.R., as the Chairman to evolve ways and means of getting industries interested in the establishment of research units. It will be the task of the committee to build up in the country a team of expert consultants. Industrialists are also represented adequately on the committee.

Dr. Thacker told Pressmen that he was now in a position to say with confidence that the C.S.I.R. was playing a significant role not only in building up the National Laboratories which numbered 27 but also in promoting science and scientific research in the country. He was hopeful that in another decade India would be able to produce scientists of real repute. The C.S.I.R. itself had expanded four-fold in the last six years.

Stressing the value of co-operative research, Dr. Thacker said that this idea had been gaining ground slowly, and satisfactory

progress had been made during the last three years. He himself had discussions with several industrialists. There was going to be a textile research institute and the automobile industry had decided to form a research association. Rubber research had also been undertaken. Those industries which had research units could get incentives in the form of tax exemptions. Other incentives might also be considered if the industries started their own departments of research.

Pilot Projects

Regarding the application of new processes and methods evolved in the National Laboratories to industries, Dr. Thacker said previously these were allowed to be put into commercial use directly. Now it had been found to be useful for the C.S.I.R. to start a pilot plant where the new processes could be tried out. For instance, some experiments had been done on the manufacture of steel on a small-scale by the use of non-metallurgical coal in a low shaft furnace. If any industry was willing to set up pilot plants to try out any particular process, the C.S.I.R. was prepared to work in collaboration on a fifty-fifty basis.

Aid to Research Workers

Dr. Thacker rebutted the criticism that the Council was discriminating between fundamental science and applied science and was more in favour of the latter. In many cases, they could not take up applied research without carrying out fundamental research to start with. They allowed full scope, flexibility and freedom for research workers. But he would underline the fact that it was the universities which should get excellent scientists. So, apart from what the universities had to offer by way of encouragement to science, the C.S.I.R. encouraged those scientists from universities with fellowships. Any scientist who had a scheme could come to them and seek help. In fact they had a scheme for helping retired scientists. If a scientist or Professor, retired from a university or college, wanted to do research work, they could help him to do so by providing facilities like assistance, contingency expenses for buying equipment and personal honorarium. If he could not work in the same institution from which he had retired, they could help him to join an institute where he could work. At present 30 such retired scientists were being helped. The C.S.I.R. had more than 480 research schemes and 760 fellowships.

Dr. Thacker said that he was anxious that the layman should get an idea of the progress and work done in the National Laboratories. Recently, he invited Mr. Ritchie Calder, the well-known science writer and his son Mr. N. Calder, Editor of "New Scientist" and had discussions with them. The C.S.I.R. would bring out a directory called "The Wealth of India" several parts of which had now been completed.

The Hindu: January 11, 1962.

Leather goods industry

Model Centre at Lucknow to be expanded

The carcass utilisation-cum-training centre at Bakshi-Ka-Talab near Lucknow will be further expanded in the coming month when it receives another instalment of machinery being imported from Holland.

The special project—costing Rs. 22.50 lakhs—has been sponsored by the India Government in collaboration with the Food and Agricultural Organisation of the U.N.

Addressing the annual convocation of the centre, the Deputy Home Minister of Uttar Pradesh, Mr. Nawal Kishore, said that the project was of considerable importance to U.P. as carcasses worth Rs. 2.60 crores went waste here every year. He described the centre as a unique example of international cooperation and coordination. He expressed the hope that in future it would attract trainees not only from all parts of India, but also from abroad.

The F.A.O. expert, Mr. F. H. Hoek, said that the centre had now developed into a full-fledged model training-cum-production centre. With the installation of new machinery, it would go a long way towards giving fillip to the shoe-making industry of this country which was already exporting footwear to the USSR and quite a few Eastern European countries.

The Principal of the centre, Mr. K. A. Raza, revealed that till January, 1960—since its inception in 1952—as many as 381 artisans and instructors had received training in improved methods of flaying, curing and carcass utilisation. During the year 1960, 16 candidates were trained in tanning and 15 in footwear leather utilisation. Of them, one candidate came from North Nigeria and eight from other parts of the Indian Union. There were at present three FAO instructors at the centre.

The Director of Animal Husbandry, Mr. M. R. Mahajan, said that small machines required for the leather industry were already being manufactured in this country. And it was the policy of the State Government to provide engineers and industrialists with every encouragement in this sphere.

The Hindu: January 13, 1962.

Exotic cattle breeding

Farm to be started near Bangalore

The Government of India have decided to start an exotic cattle breeding farm at Hesaraghatta, about 12 miles from Bangalore.

The Union Deputy Minister for Agriculture, Mr. M. V. Krishnappa, told pressmen that 100 bulls and calves of Jersey breed imported from America under the Heifer project would be stationed at the farm. He said that 50 cattle had arrived in Delhi and a second batch of 50 cattle was expected to arrive next month.

Mr. Krishnappa said that it had been decided to locate the farm in Bangalore because of its ideal climatic conditions. The Union Government would acquire about 300 acres of land in Hesaraghatta for the farm which would be handed over to the Mysore Government after being developed.

The Hindu: January 18, 1962.

Leather goods exports

During 1960-61, the total value of leather goods exported to other countries was Rs. 2,805.11 lakhs, as against the target of Rs. 2,788.50 lakhs, according to a communication received from the Leather Export Promotion Council.

While the value of tanned goatskin and sheepskin recorded an excess of Rs. 141.89 and Rs. 87.77 lakhs over their respective targets, the value of cow hides fell short of the target by Rs. 89.77 lakhs.

The communication mentions that foreign exchange earnings, during 1960-61, of the leather trade and tanning industry was Rs. 28.05 crores.

The Hindu: January 19, 1962.

Conference on parasites and parasitic diseases

For the first time in the history of India, Veterinary Parasitologists met at a conference held at Madras from 19th September, 1961 to 22nd September, 1961. Some of the expert parasitologists engaged in research on human parasites were also present. The conference was held under the aegis of the Indian Council of Agricultural Research and was inaugurated by Shri M. Bhaktavatsalam, Minister for Agriculture and Animal Husbandry, Madras State. Shri L. Sahai, Animal Husbandry Commissioner with the Government of India, presided over the deliberations.

In his inaugural address, Shri Bhaktavatsalam said that one of the foremost problems facing livestock in a tropical country like India was that of keeping the livestock healthy. Animals affected with parasitic diseases of one kind or another were a drain on the resources of the individual who owned them; further human beings who live in close association with animals and consume their products, were also susceptible to such parasites which were communicable from animals to man and *vice versa*.

Shri Sahai, in his presidential address, said that until about three or four decades ago, the attention was concentrated, in the fitness of things, on the bacterial and viral diseases. Since then methods of control had been developed with the result that they were fairly in a comfortable position now so far those diseases were concerned. While much headway has been made in studying the life history of parasites they had not been able to do much by way of controlling the parasitic diseases. It required not only a huge organisation but enormous financial resources.

Indian Veterinary Journal: February, 1962.

Woollen Industry

Plan for Research Institute with Soviet Assistance

As part of an overall national sheep and wool development programme, the Commerce and Industry Ministry, has now sponsored a plan for setting up a national research institute for the woollen industry. The institute, which is likely to be set up in Rajasthan, will get Soviet assistance. The industry has already agreed to raise Rs. 20 lakhs in the setting up of the institute, which is expected to cost about Rs. 1 crore. In the meantime, it is understood the Chief Minister of Rajasthan has offered land and buildings for the institute.

Apart from this, a sheep and wool development programme in a big way is also to be initiated in the wool producing States soon. Currently, there is a plan for setting up a Central Sheep and Wool Technology Institute at Malpura in Rajasthan and two sub-stations for the Himalayan and the Deccan plateau sheep breeds are to be located at Chamba in Himachal Pradesh and Kodaikanal in Madras State, respectively.

Extension Centres

The Malpura institute, it is stated, will undertake research in production of sheep and wool in relation to land utilisation study, wollen technology and production of improved mutton producing breeds. It will carry out acclimatisation studies of imported sheep breeds and educate research and extension workers in the field of sheep and wool production.

It has also been reported that a statutory wool board will be set up in Rajasthan. The Board will supervise and finance about 600 wool extension centres covering a total sheep population of 84 lakhs.

Economic Times: February 22, 1962.

U.N. Science Conference

A United Nations Conference for the application of science and technology to aid the less developed regions of the world will be held in Geneva at the end of February and beginning of March, 1962.

The conference will be presided over by Prof. M. S. Thacker of India, with Prof. Carlos Chagos of Brazil as Secretary-general.

A Soviet expert, Mr. M. Solodnikov, will be deputy director for plans and programmes and Mr. A. G. Katzin, a U.N. under-secretary, will be executive secretary.

Economic Times: February 23, 1962.

Russia to buy more goods from India

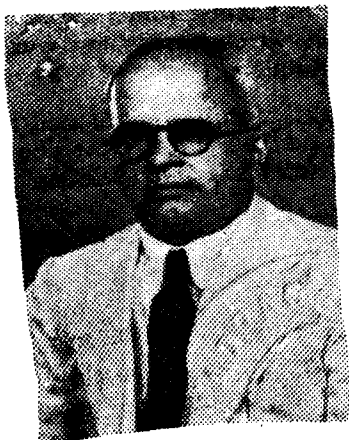
Mr. G. P. Valiky, trade representative of the U.S.S.R. in India and Commercial Consul of the Soviet Embassy at Delhi, said that two-way trade between Russia and India was progressing satisfactorily and steps were being taken to increase the volume of trade between the two countries on the principle of reciprocity and mutual benefit.

Mr. Veliky said that Soviet Russia intended to buy more goods from India particularly spices, pepper, cardamom, leather, textiles, vegetable oil, cashew-nut, tea and tobacco.

He added that Indian cashew-nut was becoming more and more popular with Russians. He hoped that Russia would also purchase more handloom goods from Madras.

Economic Times: February 25, 1962.

OBITUARY



We deeply regret to record the sad demise of Sri G. S. Sreenivasa Iyer, Founder and Senior Partner of Messrs. Sreenivas & Co., Madras and a former member of the Executive Council of the Central Leather Research Institute, on 25th February, 1962. Sri Sreenivasa Iyer was ailing for some time past. He is survived by his wife, five sons and three daughters.

Sri Sreenivasa Iyer was born on 25th February, 1899 in Gopala-samudram, Tinnevely District. After his high school career there, he had his University education at Madura and Kumbakonam. Messrs. Sreenivas & Co. was started by him in 1927. Sri Sreenivasa Iyer who entered trade as an exporter of Senna leaves, cotton waste and colour waste, began his business in E.I. tanned hides and skins in 1930 to become soon one of the leading exporters of E.I. tanned skins. At the time of his demise, he was the Secretary, Southern India Skins & Hides Merchants' Association, and the Executive Committee Member of the Leather Export Promotion Council and of the Indian Hides & Skins Improvement Society.

The C.L.R.I. had close relations with the late Sreenivasa Iyer, whose tannery was always available for tanning experimental lots. He also took a keen interest in the Tamil Publications of this Institute and was a member of the Editorial Board for the first Process Bulletin in Tamil.

சென்ட்ரல் லெதர் ரிசர்ச் இன்ஸ்டிடியூட் புல்லட்டின்

இணைப்பு ஏடு, மார்ச், 1962.

“பை” முறையில் பதனிடுதல்

பை முறையில் பதனிட்டுக் கபிலைத் (கலை)

தோல் தயாரித்தல்

(முறை மேம்பாடு செய்யப்பட்டது)

எஸ். பி. கோஷ், ஏ. கணேசன்

கச்சாப் பொருள் :

ஒவ்வொன்றும் 10-15 ராத்தல் (4.54-6.50 கி. கிராம். எடையுள்ள பசு வறைத்தோல்கள் உபயோகிக்கப்பட்டன)

நனைவு :

(கீழே கொடுக்கப்பட்ட அளவுகள் 100 கி. கிராம் வறைத் தோலுக்குக் கணக்கிடப்பட்டன)

1-ம் நாள் :—ஒரு குழியில் தோல்களின் வறை எடையைப் போல் 8 முதல் 10 பங்கு தண்ணீர் நிரப்பப்படுகிறது. அதில் 1.0-1.5 கி. கிராம் தாளித்த சுண்ணாம்பும், 1.0-1.5 கி. கிராம் சலவை சோடாவும் கலக்கப்படுகின்றன. தோல்கள் இதில் நன்றாக அழுக்கப்பட்டு குழியிலேயே இரவு முழுதும் விட்டு வைக்கப்படுகின்றன.

2-ம் நாள் :—நனைவுக் குழியிலிருந்து தோல்கள் வெளியே எடுக்கப்பட்டு மேலாக ஒரு தடவை சல்லா சீவப்படுகின்றன. பின்னர் இந்த நனைவுத் தண்ணீரிலேயே மேலும் 1 மணி நேரம் விட்டு வைக்கப்பட்டு அவ்வப்போது அரக்கப்படுகின்றன. இதனால் தோல்கள் மிருதுவாகின்றன. இதன் பிறகு இவை சுத்தமான தண்ணீரில் ஒரு தடவை கழுவுப்பட்டு, மரக்குதிரைகளின் மேல் போடப்பட்டு, வடிய வைக்கப்

படுகின்றன. பிறகு இவை நிறுக்கப்பட்டு, நனைவு எடை குறித்துக் கொள்ளப்படுகிறது.

பூச்சின் மூலம் முடி நீக்குதல் :

(கீழே கொடுக்கப்பட்டுள்ள அளவுகள் 100 கி. கிராம் நனைவுத் தோல்களுக்குக் கணக்கிடப்பட்டது.)

பின்வரும் அளவில் கீழ்க்கண்டவாறு முடி நீக்கும் மருந்துப் பூச்சுத் தயாரிக்கப்படுகிறது. முதலில் 15 கி. கிராம் தண்ணீர் எடுத்துக் கொள்ளப்படுகிறது. இதில் கொஞ்சம் ஒரு மண் பாணியில் எடுத்துக் கொள்ளப்பட்டுக் கொதிக்க வைக்கப்படுகிறது. இதில் 1.5 கி. கிராம் சோடியம் சல்பைடு (Sodium Sulphide) தூள் கரைக்கப்படுகிறது. பின்னர் இத்துடன் 5 கி. கிராம் தாளித்த சுண்ணாம்பு கலக்கப்பட்டு, மீதி இருக்கும் தண்ணீரும் உடன் சேர்க்கப்பட்டு, முடி நீக்கும் மருந்துப் பூச்சுத் தயாரிக்கப்படுகிறது.

தோல்கள் பட்டறையாக விடப்பட்டு, அவற்றின் மேனிப்பக்கமும் சவ்வுப் பக்கமும் இப்பூச்சுத் தடவப்படுகிறது. பூச்சுத் தடவப்பட்ட தோல்கள் மடிக்கப்பட்டு பட்டறையாக விடப்பட்டு, இரவு முழுதும் விட்டு வைக்கப்படுகின்றன. பட்டறை கோணியால் நன்கு மூடி வைக்கப்படுகிறது.

3-ம் நாள் :—தோல்கள் வழக்கம் போல் முடி தள்ளப்படுகின்றன. பின்னர் கீழ்க்கண்டவாறு மறு சுண்ணாம்பிடப்படுகின்றன.

ஒரு குழியில் நனைவு எடையைப் போல் 4 பங்கு தண்ணீர் நிரப்பப்படுகிறது. இதில் 5 கி. கிராம் தாளித்த சுண்ணாம்பு கலக்கப்பட்டு, தண்ணீர் நன்றாகக் கலக்கி விடப்படுகிறது. தோல்கள் இச்சுண்ணாம்புத் தண்ணீரில் போடப்பட்டு, குழி திருப்பப்பட்டு இரவு முழுதும் இக்குழியிலேயே விட்டு வைக்கப்படுகின்றன.

4, 5, 6-ம் } —தோல்கள் சுண்ணாம்புத் தண்ணீரில் குழி நாட்கள் : } திருப்பப்படுகின்றன.

7-ம் நாள் :—தோல்கள் வெளியே எடுக்கப்பட்டு, சல்லா சீவப்பட்டுக் கார் வாங்கப்படுகின்றன. சல்லா எடை எடுக்கப்பட்டுக் குறித்துக் கொள்ளப்படுகிறது. பின்னர் இவை சுத்தமான தண்ணீரில் இரண்டு தடவைகள் கழுவப்பட்டு, மற்றொரு தடவை கார் வாங்கப்பட்டு, மறுபடி 10 நிமிடங்களுக்குக் கழுவப்படுகின்றன.

சுண்ணாம்பு நீக்கம் : (இளங்காரம்)

(கீழே கொடுக்கப்பட்ட அளவுகள் 100 கி. கிராம் சல்லாத் தோல் எடைக்குக் கணக்கிடப் பட்டவையாகும்.)

ஒரு குழியில் சல்லா எடையைப் போல் 1½ பங்கு தண்ணீர் நிரப்பப்பட்டு, அதில் 1 கி. கிராம் அமோனியம் சல்பேட் (Ammonium Sulphate) கரைக்கப்படுகிறது. தோல்கள் இக்குழியில் போடப்பட்டு, ½ மணி நேரத்திற்குப் புரட்டி விடப்படுகின்றன. இதன் பிறகு இவை இரவு முழுதும் இக்குழியிலேயே விட்டு வைக்கப்படுகின்றன.

முதல் பட்டைத் தண்ணீர் தயாரித்தல் :

மறுநாள் உபயோகத்துக்காக இன்றே முதல் பட்டைத் தண்ணீர் தயாரிக்கப்படுகிறது. கருவேலம் பட்டைத் தூளும், தூள் கடுக்காயும் 3 : 1 என்ற விகிதத்தில் கலக்கப்படுகின்றன. இக்கலவை 100 கி. கிராம் எடுத்துக் கொள்ளப்படுகிறது. இதில் ½ பாகம் தண்ணீரில் ஊற வைக்கப்படுகிறது. மீதி ½ பாகம் பதனிடுவதற்காகச் சேமித்து வைக்கப்படுகிறது.

8-ம் நாள் :—சுண்ணாம்பு நீக்கம் (இளங்காரம்) குழியில் தோல்கள் ½ மணி நேரம் புரட்டி விடப்படுகின்றன. கனமான தோலின் கனமான பாகத் திலிருந்து ஒரு சிறு துண்டு வெட்டி எடுத்து, பிளாஸ்தீன் அல்லது மஞ்சள் உபயோகித்துச் சுண்ணாம்பு நீக்கத்தைப் பரிசோதிக்க வேண்டும். முழு அளவு சுண்ணாம்பு நீக்கம் நடைபெற்றிருக்க வேண்டும். பின்னர் இவை கார் வாங்கப்பட்டு, ஒரு குழியில் 10 நிமிடங்களுக்குக் கழுவப்படுகின்றன.

நெழுப்டுதல் : [(மாஸ்னி) முதல் பட்டை]

10°-12° வீர்யமுள்ள முதல் பட்டைத் தண்ணீர் ஒரு குழியில் நிரப்பப்பட்டு, இதில் சுண்ணாம்பு நீக்கப்பட்ட (இளங்காரம்) தோல்கள் 2 மணி நேரத்திற்குப் புரட்டி விடப்படுகின்றன. கருவேலம் பட்டை-கடுக்காய் இவற்றின் சக்கை குழியின் மேல் தூவப்பட்டு, தோல்கள் இரவு முழுதும் இக்குழியிலேயே விட்டு வைக்கப்படுகின்றன.

9-ம் நாள் :—தோல்கள் இன்றும் 2 மணி நேரத்திற்குப் புரட்டப்பட்டு, இரவு முழுதும் இக்குழியிலேயே விட்டு வைக்கப்படுகின்றன.

10-ம் நாள் :—தோல்கள் இன்றும் 2 மணி நேரத்திற்குப் புரட்டப்பட்டு, இரவு முழுதும் இக்குழியிலேயே விட்டு வைக்கப்படுகின்றன.

பதனிடு திரவம் தயாரித்தல் :

கருவேலம் பட்டைத் தூள்—தூள் கடுக்காய்க் கலவையில் மீதமுள்ள 3 பாகம் தண்ணீரில் ஊற வைக்கப்படுகிறது. இதிலிருந்து கிடைக்கும் பதனிடு திரவம் மறுநாள் பை முறையில் பதனிடுவதற்குப் பயன்படுத்தப்படுகிறது. பதனிடு திரவம் தயாரிக்கும் குழி (ஸீச்சிங் பீட்) இல்லாவிட்டால் கருவேலம் பட்டைத் தூள்—தூள் கடுக்காய் இவற்றின் கலவையைப் பைகளில் நிரப்பி, முன்பே ஒரு தடவை உபயோகிக்கப்பட்ட பட்டைத் தண்ணீரைப் பையில் ஊற்றியும் பதனிடு வேலையைச் செய்யலாம். பதனிடு வேலை முடிவடைந்ததும், பையில் நிரப்பப்பட்ட கருவேலம் பட்டை—கடுக்காய் இவற்றின் சக்கையை முதல் பட்டைத் தண்ணீர் தயாரிக்கப் பயன்படுத்தலாம். இதனால் இவற்றிலுள்ள பதனிடு சத்து வீணாகப் போவது தடுக்கப்படுகிறது.

11-ம் நாள் :—காலையில் முதல் பட்டைத் தண்ணீரிலிருந்து தோல்கள் வெளியே எடுக்கப்பட்டு, பையாகத் தைக்கப்பட்டு, குழிக்கு மேலாகத் தொங்க விடப்படுகின்றன. முந்தைய தினம் தண்ணீரில் ஊற வைக்கப்பட்ட கருவேலம் பட்டைத் தூள்—தூள் கடுக்காய் இவற்றின் கலவையிலிருந்து கிடைக்கும் பதனிடு திரவம், அவற்றின் சக்கையுடன் பைகளில் நிரப்பப்படுகிறது. கீழே உள்ள குழியில் பைகளிலிருந்து வடியும் பதனிடு திரவம் அவ்வப்போது பைகளில் நிரப்பப்படுகிறது. பைகளில் உள்ள திரவத்தின் வீர்யம் 10°-12° ஆகும்.

12-ம் நாள் :—காலையில் பைகள் தலைகீழாகத் தொங்கவிடப்படுகின்றன. பைகளின் நடுபாகம் கயிற்றால் கட்டப்படுகிறது. இதனால் தோல்களின் மைய பாகம் நன்கு பதனிடப்படுகிறது. மாலையில் கயிறு அவிழ்க்கப்படுகிறது. பதனிடு திரவம் கீழ் பாகத்திற்கு வந்து விடுகிறது. குழியிலிருந்து பதனிடு திரவம் அவ்வப்போது பைகளில் நிரப்பப்படுகிறது.

13-ம் நாள் :—மாலையில் பைகள் பிரிக்கப்படுகின்றன. தோல்கள் இக்குழியிலேயே இரவு முழுதும் விட்டு வைக்கப்படுகின்றன.

14-ம் நாள் :—தோல்கள் நன்கு தேய்த்துக் கழுவப்பட்டு, பட்டறையாக விடப்படுகின்றன. தண்ணீர் வடிந்ததும் பின்வரும் எண்ணெய்க் கலவை தோல்களின் மேனிப்பக்கத்திலும், சவ்வுப் பக்கத்திலும் தடவப்படுகிறது. பின்னர் இவை பட்டறையாக விடப்படுகின்றன.

கடலை எண்ணெய்	2	கி. கிராம்
மண்ணெண்ணெய் (கிரோசின்)	0.5	„
சல்பேடெட் புங்க எண்ணெய்	1	„

மாலையில் தோல்கள் தொங்கவிட்டுக் காய வைக்கப்படுகின்றன.

15-ம் நாள் :—தோல்கள் கொஞ்சம் ஈரப்பசையுள்ளதாக இருக்கும் போதே கையால் சுருக்கம் (தாண) தள்ளப்படுகிறது. தேவையானால் தோல்களின் மேல் கொஞ்சம் தண்ணீர் தெளித்து, பதப்படுத்திக் கொண்டு, பின்னர் சுருக்கம் (தாண) தள்ளலாம்.

இம்முறையில் சல்லா எடையில் 43-45% ஒப்பனைத் தோல் கிடைத்தது. 1 ராத்தல் ஒப்பனைத் தோலுக்கு 2½ ராத்தல் பதனிடு பொருள்கள் உபயோகிக்கப்பட்டன.

1 ராத்தல் தோலுக்கு 33-35 நயா பைசா விலையுள்ள ரசாயனப் பொருள்கள் உபயோகிக்கப்பட்டன.

செய்திக் கதிர்

இந்திய மாட்டுத் தோல் உற்பத்தி, ஏற்றுமதி,
வருமானம் ஆகியவை பற்றிய விவரங்கள்
(1958, 1959, 1960-ம் ஆண்டுகளுக்கானது)

பதனிடப்பட்ட தோல்களின் உற்பத்தி அதிகரித்தது.
வருமானம் குறைந்தது.

குரோம் பதனிட்ட மாட்டுத் தோல் :

இந்தியாவில் குரோம் பதனிடப்பட்ட மாட்டுத் தோல்
களின் எண்ணிக்கை 1959-ல் 6.50 லட்சமாக இருந்தது.
1960-ல் 7.94 லட்சமாக உயர்ந்தது. அதாவது 1959-ம்
ஆண்டை விட 1960-ல் 22.1% அதிகரித்தது.

தாவரப்பதனிட்ட மாட்டுத் தோல் :

தாவரப் பதனிட்ட மாட்டுத் தோல்களின் எண்
ணிக்கை 1958-ல் 20.67 லட்சமாக இருந்தது. இது 1959-ல்
24.66 லட்சமாகவும், 1960-ல் 26.78 லட்சமாகவும் அதிக
ரித்தது.

காலணிகள் உற்பத்தி :

ஆண்டு	மேற்காட்டுப்பாணி	உள்நாட்டுப்பாணி
1958	42.72 (லட்சம்)	32.86 (லட்சம்)
1959	41.40 "	41.02 "
1960	64.18 "	37.77 "

மேற் காணும் அட்டவணியிலிருந்து மேல் நாட்டுப்
பாணியில் தயாரிக்கப்பட்ட காலணிகளின் எண்ணிக்கை
1960-ல், 1958-ம் ஆண்டைவிட 50 சதவீதமும், 1959-ம்
ஆண்டைவிட 50.2 சதவீதமும் அதிகரித்ததைக் காண
லாம்.

உள்நாட்டுப்பாணியில் தயாரிக்கப்பட்ட காலணிகளின்
எண்ணிக்கை 1960-ம் ஆண்டில் 1958-ஐ விட 14.9 சதவீதம்
அதிகரித்ததும், 1959-ம் ஆண்டை விட 8.9 சதவீதம்
குறைந்ததும் தெரியவரும்.

தோல் ஏற்றுமதி மூலம் கிடைத்த வருமானத்தில் குறைவு

தோல் ஏற்றுமதி மூலம் 1958-ல் 20.17 கோடி ரூபாயும்,
1959-ல் 31.38 கோடியும், 1960-ல் 28.58 கோடியும்
வருமானம் கிடைத்தது. அதாவது 1960-ம் ஆண்டில் 1958-ம்
ஆண்டை விட 41.6 சதவீதம் வருமானத்தில் அதிகமும்,
1959-ஐ விட 8.9 சதவீதம் வருமானத்தில் குறைவும்
ஏற்பட்டது.

தோல்—தோல் சாமான்களின் ஏற்றுமதி மதிப்பில்
1960-ம் ஆண்டு 89.9 சதவீதம் தோல் மட்டும் ஏற்றுமதி
செய்யப்பட்டது. 1958-ல் இது 90.2 சதவீதமாகவும்,
1959-ல் 90.7 சதவீதமாகவும் இருந்தது.

தோல் ஏற்றுமதிக்கான அளவுகள் வருமாறு

ஆண்டு	ஏற்றுமதி (கி. கிராமில்)	மதிப்பு (ரூபாயில்)
1958	14.4 மிலியன்	18.20 கோடி
1959	21.2 "	28.47 "
1960	20.2 "	25.70 "

மேற்காணும் அட்டவணியிலிருந்து ஏற்றுமதி செய்யப்
பட்ட தோல்களின் மதிப்பு 1960-ம் ஆண்டில் 1959-ம்
ஆண்டைவிட 9.7 சதவீதம் குறைந்ததையும், 1958-ம்
ஆண்டைவிட 41.2 சதவீதம் அதிகமானதையும் அறிய
லாம்.

கடந்த மூன்று ஆண்டுகளில் இந்தியாவிலிருந்து
அதிகமான தோல்களை வாங்கிய நாடுகளில் இங்கிலாந்து
முதலிடமும், மேற்கு ஜெர்மனி 2-ம் இடமும், அமெரிக்கா
3-ம் இடமும் வகிக்கின்றன. அந்நாடுகளுக்கான ஏற்றுமதி
விவரங்கள் வருமாறு :

நாடுகள்	ஆண்டு	ஏற்றுமதி (கி. கிராமில்)	மதிப்பு (ரூபாயில்)
இங்கிலாந்து	1958	12.8 மிலியன்	12.26 கோடி
	1959	17.9 "	18.88 "
	1960	14.7 "	16.12 "
மேற்கு ஜெர்மனி	1958	1.1 "	1.82 "
	1959	1.9 "	3.42 "
	1960	1.6 "	3.20 "
அமெரிக்கா	1958	1.0 "	0.59 "
	1959	1.7 "	1.58 "
	1960	1.2 "	1.34 "

மேற்கூறிய விவரங்களிலிருந்து இங்கிலாந்துக்கான ஏற்றுமதி 1960-ம் ஆண்டில் 1959-ஐ விட 21.8 சதவீதம் குறைந்ததும், 1958-ஐ விட 14.8 சதவீதம் அதிகரித்ததும் தெரியவரும். மேற்கு ஜெர்மனி, அமெரிக்காவுக்கான ஏற்றுமதியிலும் ஏறத்தாழ இதே நிலை காணப்பட்டதும் தெரியவரும்.

ஆதாரம்: 'டேனர்' நவம்பர் '61.

உலக வெள்ளாட்டுத் தோல் வியாபார நிலை
(1961-ம் ஆண்டின் முதல் பாதிக்கான மதிப்பீடு)

1961-ம் ஆண்டு ஜனவரி முதல் ஜூன் வரையிலான 6 மாதங்களில் உலகில் ஏற்றுமதிக்காகக் கிடைத்த வெள்ளாட்டுத் தோல்கள் சென்ற ஆண்டில் இதே மாதங்களில் கிடைத்ததைவிடக் குறைவாகும். ரஷ்யாவின் இறக்குமதி குறைந்தால், இந்தியாவின் ஏற்றுமதி ஜனவரி-ஏப்ரல் மாதங்களில், சென்ற ஆண்டு இதே மாதங்களில் இருந்ததை விடக் குறைந்தது. எனினும் பதனிடப்பட்ட தோல்களின் ஏற்றுமதி 1960-ம் ஆண்டைவிட அதிகமாகவே இருந்தது. கென்யா, உகண்டா, தங்கனிகா முதலிய நாடுகளின் ஏற்றுமதி அதிக அளவில் குறைந்தது.

இங்கிலாந்து நாட்டில் மேற்கூறிய மாதங்களுக்கான இறக்குமதி, சென்ற ஆண்டு இதே மாதங்களுக்கான இறக்குமதியைவிட மிக அதிகமாகவே இருந்தது. எனவே அந்நாட்டில் 1961-ம் ஆண்டு துவக்கத்திலிருந்தே இவ் வியாபாரம் முந்தைய ஆண்டைவிட அதிகமாகவே இருந்தது. இத்தாலியும், மேற்கு ஜெர்மனியும் 1961-ம் ஆண்டு ஏப்ரல்-ஜூன் மாதங்களில் தங்கள் இறக்குமதியை அதிகரித்தன. அமெரிக்காவின் இறக்குமதி 1961-ம் ஆண்டு மேற்கூறிய மாதங்களில், சென்ற ஆண்டு இதே மாதங்களில் இருந்ததில் 44 சதவீதம் குறைந்தது. ரஷ்யா, கிழக்கு ஐரோப்பிய நாடுகளின் இறக்குமதியும் மேற்கூறிய மாதங்களில் குறைந்ததாகவே தெரிகிறது. இதன் முழு விவரங்களை அட்டவணை 1-ல் காணலாம்.

இந்திய ஆட்டுத் தோல் ஏற்றுமதி

1961-ம் ஆண்டு ஏப்ரல்-மே மாதங்களில் ஏற்றுமதியான ஆட்டுத் தோல்களின் அளவு, சென்ற ஆண்டு இதே மாதங்களில் ஏற்றுமதி செய்யப்பட்டதைவிட 22 சதவீதம் குறைவாகும். ஆட்டுத் தோல் ஏற்றுமதி 1961-ம் ஆண்டு

துவக்கத்திலிருந்தே 9 சதவீதம் குறைந்தது. இதற்குக் காரணம் ரஷ்யா நம் நாட்டிலிருந்து இறக்குமதி செய்யும் அளவைக் குறைத்ததேயாகும். ரஷ்யாவுக்கான ஏற்றுமதி 1960-ம் ஆண்டில் ஜனவரி-மே மாதங்களில் இருந்ததை விட 1961-ல் இதே மாதங்களில் 22 சதவீதம் குறைந்தது. அமெரிக்காவுக்கான ஏற்றுமதியில் இதே மாதங்களில் அபிவிருத்தி காணப்பட்டது. ஜனவரி-மே மாதங்களுக்கான ஏற்றுமதி சென்ற ஆண்டைவிட 23 சதவீதம் அதிகரித்தது. மேற்கு ஜெர்மனிக்கு ஏற்றுமதி 1961-ல் சென்ற ஆண்டைவிட இரண்டு மடங்கு அதிகமாயிற்று. இத்தாலி, செக் கோஸ்லாவாகிய ஆசிய நாடுகளுக்கான ஏற்றுமதியும் கொஞ்சம் அதிகரித்தது. இதன் முழு விவரங்களை அட்டவணை 2-ல் காணலாம்.

ஆதாரம்: 'டேனர்' நவம்பர் '61

மக்களிடையே விஞ்ஞான அறிவைப் பரப்பி
அதன் செல்வாக்கை உயர்த்துதல்
பள்ளிதோறும் விஞ்ஞான சங்கம் அமைத்தல்

இந்திய விஞ்ஞானக் காங்கிரசின் (Indian Science Congress) 46-வது கூட்டம் சென்ற ஜனவரி மாதம் 3-4 ம் தேதிகளில் உத்கல் பல்கலைக் கழகத்தைச் சேர்ந்த 'ரேவன்ஷா' கல்லூரியில் நடைபெற்றது. பாரதத்தின் பிரதம மந்திரி ஸ்ரீ ஜவஹர்லால் நேரு அவர்கள் இக்கூட்டத்தைத் துவக்கி வைத்தார்.

இக்கூட்டத்தின் ஆதரவில் இந்திய விஞ்ஞான சங்கத்தினர் (Science Club of India) பள்ளிகளில் விஞ்ஞான சங்கங்கள் (Science Club) அமைப்பதன் மூலம் விஞ்ஞான அறிவைப் பெருக்கி மாணவர்களிடையே அதன் செல்வாக்கைப் பரப்பச் செய்வது பற்றிய கருத்தரங்கம் (Seminar) ஒன்றை ஏற்பாடு செய்திருந்தனர்.

இக்கூட்டத்தில், நாட்டில் உள்ள ஒவ்வொரு செகன்டரி பள்ளியிலும், விஞ்ஞான சங்கம் அமைப்பதற்கு வேண்டிய வசதிகளையும் பண உதவியையும், மாவட்ட அரசாங்கங்களும், பல்கலைக் கழகங்களும் செய்து தர வேண்டுமென்றும், இச்சங்கங்களைப் பொருப்பேற்று நடத்தித் தரும் ஆசிரியர்களுக்கு வேலைக்கேற்ற ஊதியம் கிட்டுமாறு செய்வதற்கு வேண்டிய நடவடிக்கைகள் எடுக்கப்பட வேண்டும் என்றும் ஒரு தீர்மானம் எடுத்துக் கூறியது.

அட்டவணை - 1

ஏற்றுமதி, இறக்குமதி அளவுகள் (டன்களில்)

நாடுகள்	1959		1960		1961	
	ஜனவரி- டிசம்பர்	ஜனவரி- மார்ச்	ஏப்ரல்- ஜூன்	ஜூலை- டிசம்பர்	மொத்தம்	ஏப்ரல்- ஜூன்
ஏடன்	1,088	243	176	324	743	141*
இந்தியா	12,276	3,096	2,576	5,633	11,305	1,654
கென்யா						
உகண்டா	2,153	674	392	1,081	2,147	639
தங்கனிகா						
ஹைஜிரியா	2,652	605	694	1,262	2,561	—
தென் ஆபிரிக்கா	2,160	516	438	927	1,881	306
சிரியா	733	208	56	402	666	1*
துருக்கி	1,622	611	318	1,438	2,367	470*
இறக்குமதி						
ஏடன்	844	188	158	301	647	129*
இந்தியா	694	169	312	323	804	90*
இங்கிலாந்து	4,013	734	564	1,211	2,509	700
பிரான்ஸ்	2,250	617	648	981	2,248	465
இத்தாலி	6,712	2,282	1,639	3,543	7,464	1,784
மேற்கு ஜெர்மனி	4,243	1,064	945	2,039	4,048	1,349
ஸ்விடன்	2,202	658	401	940	1,999	507
அமெரிக்கா	16,485	3,231	4,329	5,680	13,240	1,854*

மதிப்பளவு *ஏப்ரல், மே மாதங்களுக்கு மட்டும் ** ஜனவரி, பிப்ரவரி மாதங்களுக்கு மட்டும்

அட்டவணை - 2

ஆஸ்திரேலியா	1959		1960		1961	
	ஜனவரி- டிசம்பர்	ஜனவரி- மார்ச்	ஏப்ரல்- ஜூன்	ஜூலை- டிசம்பர்	மொத்தம்	ஏப்ரல்- ஜூன்
ஆஸ்திரேலியா	221	17	28	107	152	20
இங்கிலாந்து	254	28	34	224	286	79
பிரான்ஸ்	24	6	—	8	14	—
இத்தாலி	692	63	109	208	380	74
ஹாலந்து, பெல்ஜியம்	49	11	—	4	15	4
மேற்கு ஜெர்மனி	507	95	103	240	438	135
பல்கேரியா	74	—	36	—	36	—
செக்கோஸ்லாவாகியா	522	126	198	271	595	166
கிழக்கு ஜெர்மனி	89	36	42	7	85	—
ஹங்கேரி	28	30	58	3	91	8
போலந்து	64	99	27	18	144	7
ருமேனியா	160	77	130	—	207	—
அமெரிக்கா	3,454	443	834	1,507	2,784	673
ரஷ்யா	6,048	2,056	925	3,021	6,002	468
யூகோஸ்லாவியா	6	3	45	13	61	19
மற்ற நாடுகள்	85	6	7	2	15	—

மொத்தம் 12,276 3,096 2,576 5,633 11,305 3,097 1,654

இதில்: உப்பு வரைத்

தோல்கள் 10,041 2,264 2,310 3,379 7,953 2,432 1,226

உப்புத் தோல்கள் 2,155 810 224 2,228 3,262 623 412

நாட்டைப் படிப்படியாகத் தொழில் மயமாக்குவதற்கு முதற்படியாக மக்கள் விஞ்ஞான எண்ணம் கொண்டவர்களாக ஆக்கப்படுதல் மிகவும் இன்றியமையாதது. இதற்கென நாட்டுக்குப் பொதுவாக பாரத விஞ்ஞானப் பொருட் காட்சி சாலை (National Science Museum) ஒன்றும், ஒவ்வொரு மாவட்டத்திற்கும் ஒரு பொருட் காட்சிசாலையும் நிறுவப்பட வேண்டும். இப்பொருட் காட்சிசாலைகளில் விஞ்ஞான ஆராய்ச்சி முடிவுகளை உள்ளங்கை நெல்லிக் கணிபோல் விளக்குவதற்கு ஏற்ற மாதிரி உருவங்கள் வைக்கப்பட வேண்டும். இதன் மூலம் நாடு முழுதும் மக்களிடையே விஞ்ஞான ஆர்வத்தை ஊட்டி வளர்ப்பதும், விஞ்ஞான ஆராய்ச்சி முடிவுகளைப் பரப்புவதும் எளிதாகும் என்றும் மற்றொரு தீர்மானத்தில் எடுத்துக் கூறப்பட்டது.

ஆதாரம் : ஹிண்டு, ஜனவரி 7, 1962

நிலையச் செய்திகள்

இந்தியத் தொழில் நுட்பக் கல்லூரிகளின் தலைவர்கள் சங்கக் கூட்டத்தில் இந்நிலைய டைரக்டர் டாக்டர் ஓய். நாயுடம்மா அவர்கள் பிப்ரவரி 9 ம் தேதி கலந்து கொண்டார்கள்.

இந்நிலையத்தின் நிர்வாகக் குழுவின் விஞ்ஞான உப கமிட்டி பிப்ரவரி மாதம் 28 ம் தேதி நடைபெற்றது.

நீத்தார் நினைவு

இந்நிலையத்தின் நிர்வாகக் கமிட்டியின் முன்னாள் அங்கத்தினரும், சீனிவாஸ் அண்டு கம்பெனியின் ஸ்தாபகரும் முக்கிய பங்காளியுமான ஸ்ரீ ஜி. எஸ். சீனிவாச அய்யர் அவர்கள் சென்ற பிப்ரவரி மாதம் 25-ம் தேதி காலமானார் என்பதை ஆழ்ந்த வருத்தத்துடன் தெரிவித்துக் கொள்கிறோம்.

ஸ்ரீ சீனிவாச அய்யர் அவர்கள் திருநெல்வேலி மாவட்டத்தில் கோபால சமுத்திரம் என்ற ஊரில் 1899-ம் ஆண்டு பிப்ரவரித் திங்கள் 25-ம் தேதி பிறந்தார். அவ்வூரிலேயே அவர் தம் உயர்நிலைப்பள்ளிக் கல்வியைப் பெற்றார். அன்றாடம் கல்லூரிப் படிப்பு கும்பகோணத்திலும், மதுரையிலும் நடைபெற்றது.

1927-ம் ஆண்டு சீனிவாஸ் அண்டு கம்பெனியைத் துவக்கினார். இக்கம்பெனி துவக்கத்தில் சென்னா இலைகள், நூற்பதற்குப் பயன்படாத பருத்தி முதலியவைகளை ஏற்றுமதி செய்து வந்தது. 1930-ம் ஆண்டில் கிழக்கிந்திய முறைப்படி பதனிட்ட தோல்களை ஏற்றுமதி செய்யத் தொடங்கினார். வெகு விரைவில் கிழக்கிந்திய முறைப்படி பதனிட்ட தோல் ஏற்றுமதியாளர்களில் சிறந்தவருள் ஒருவராக விளங்கினார்.

அன்னார் காலமாகும் தருணத்தில் தென் இந்திய தோல் வியாபாரிகள் சங்கத்தின் (Southern India Skins & Hides Merchant's Association) காரியதரிசியாகவும், தோல் ஏற்றுமதி அபிவிருத்திக் கழகம் (Leather Export Promotion Council), இந்தியத் தோல் அபிவிருத்திக் கழகம் (Indian Hides & Skins Improvement Society) ஆகியவற்றின் நிர்வாகக் கழக உறுப்பினராகவும் பணிபுரிந்து வந்தார்.

இந்நிலையத்திற்கும் அன்னாருக்கும் மிக நெருங்கிய தொடர்பு எப்போதும் இருந்து வந்துள்ளது. இந்நிலையத்தின் முறைகளைப் பெரிய அளவில் செய்து பார்ப்பதற்கு எப்போதும் அன்னாருது பதனிடு நிலையம் கிடைத்து வந்தது.

பதனிடு முறைகளைத் தமிழில் வெளியிடுவதில் அன்னார் மிகவும் அக்கரை காட்டினார். முதன் முதலாக இந்நிலையத் திலிருந்து தமிழில் வெளிவந்தமுறை விளக்க நூலின் ஆலோசனைக் குழுவில் ஒருவராக அவர் செய்த பணி போற்றத் தக்கதாகும்.

இத்தகைய அரிய பெரியோரை இழந்தது தோல் தொழிலின் ஈடுசெய்ய முடியாத நஷ்டமாகும். அன்றரைப் பிரிந்து துயருற்றிருக்கும் அவரது மனைவி, மக்களுக்கு ஆழ்ந்த அனுதாபத்தைத் தெரிவித்துக் கொள்ளுகிறோம். ிர் ஆவி சாந்தி பெற இறைவனை இறைஞ்சுகிறோம்.



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தவணைத்தாள்.

கே. என் :

ப. எண் :

[illegible]

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