TABLE.

Units—c.g.s. E.M.

Specimen	Specific Magnetic anisotropy $\chi_{\parallel}l - \chi_{\perp}r$ $\times 10^8$	Mean susceptibility $\times -10^6$	Remarks
Hen's egg ..	1·2 (1·0 – 1·4)	0·35	The anisotropy in the plane of the shells was practically negligible.
Duck's egg ..	1·6 (1·4 – 1·9)	0·36	
Calcite ..	3·45	0·38	A clear specimen of Iceland spar.

due to the inclined orientation of the optic axes of the calcite prisms and the random orientation of these axes in azimuth relative to the shell surface. The latter also accounts for the absence of anisotropy in the plane of the shells. An interesting feature of the results is that the anisotropy of hen's egg is definitely lower than that of duck's egg. This would indicate that the calcite crystals in the latter have their optic axes more nearly normal to the shell surface than in the former.

My thanks are due to Prof. Sir C. V. Raman for suggesting this line of work.

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Dielectric Strength of Lacs of Known Origin.

SHELLAC varnishes are extensively employed for the insulation of electrical machinery but no systematic work on the dielectric strength of such varnishes prepared from different varieties of lac has so far been carried out. Verman[1] has drawn pointed attention to this in his paper on the dielectric properties of lac. Poole[2] measured the dielectric strength of films from alcoholic solution of shellac and solid castings, and obtained discordant results. Mackay,[3] and Flemming and Steel,[4] also measured the breakdown voltages of shellac castings and films but details are lacking regarding the percentage of the lac samples and conditions under which the tests were carried out. Similarly, it is stated that hard lac resin possesses enhanced electrical properties[5] but no experimental data are available.

We have carried out experiments with a view to ascertaining the electrical properties of lac from different hosts and those of the hard lac resins prepared from them by hot extraction with dilute soda and fractional precipitation from soda solution.[6] The results will be helpful in choosing the right type of lac to be used in the manufacture of insulating varnishes and indicate the best method of preparing hard lac resin possessing increased dielectric strength and moisture resistance.

The object of the electrical breakdown tests was not so much to determine the absolute value of the dielectric strength as to get comparative data on the different specimens of varnishes. From the data so obtained, the best type of lac for further investigation has been picked out.

The dielectric strength tests were carried out under the following three different conditions.

(1) On varnish films dried at 27° C. for 48 hours in an atmosphere of about 75 per cent. humidity.

(2) On varnish films prepared as in (1) and subsequently baked for half an hour in an oven at 90° C.

(3) On varnish films prepared as in (1) but subsequently exposed for 72 hours to an atmosphere of about 95 per cent. humidity at 27° C.

The films were prepared by dipping sheets of tissue paper twice in the varnish in a manner similar to that described in Appendix I of B. S. S., No. 119–1930. The brass test electrodes were each $1\frac{1}{2}''$ in diameter with rounded edges. The weight of the top electrode was approximately 1 lb. The bottom electrode was maintained at earth potential and the voltage between them was increased at a uniform rate until the film punctured. The maximum reading of a voltmeter, connected to the tertiary winding of the testing transformer, was noted at each breakdown. The primary of the transformer was supplied from a 25 cycle source of nearly sinusoidal wave form. Each film was punctured at six different points and the average value noted. The thickness of the film was measured close to the points of puncture by a micrometer and the average taken in reckoning the voltage per mil. The average thickness of the films tested was about 3 mils. The results have been tabulated as shown below.

Note.—All the lac samples were dissolved in 95 per cent. alcohol to give solutions of sp. gr. 0·884 at 27° C.

All the tests were carried out with the electrodes at room temperature.

The results indicate that Jalari lac has a higher dielectric strength than sagade lac. Another interesting point which emerges from this investigation is that seed lac on being dissolved in soda and precipitated acquires a higher value of breakdown voltage. It is surprising that tests after drying at 27° C. give a lower value for the hard lac resins than the original lac but the values increase enormously on heating the specimens at 90° C. for ½ hour. There are three possible reasons to explain such a behaviour.

(1) The films may be freed from water and/or some other conducting liquid locked up therein.

(2) Heating may induce an alteration in the physical state of the film.

TABLE I.

No.	Material	Solid content in 100 c.c. alcoholic solution	Acid value	Breakdown voltage in volts per mil. After drying at 27° C. for 48 hours	After baking at 90° C. for ½ hour	After exposure to 95% humidity for 72 hrs.
1	Sagade seed lac (*Schleichera Trijuga*)	24·36	79·0	1420	1200	600
2	Whole lac dissolved in soda, filtered and precipitated ..	27·26	85·5	1200	1640	570
3	Hard lac resin by fractional dissolution in soda	25·66	83·9	1000	1450	390
4	Hard lac resin by fractional precipitation	23·44	66·5	1190	1750	455
5	Soft lac resin from (4) ..	25·26	84·2	1100	1850	410
1	Jalari seed lac (*Shorea Talura*)—					
	Sample (1) Old	23·80	87·2	1320	1320	580
	,, (2) Fresh	23·90	81·5	1410	1840	620
*2	Whole lac dissolved in soda, filtered and precipitated ..	24·82	88·8	1450	2000	460
*3	Hard lac resin by fractional dissolution in soda	24·36	68·6	1160	1940	400
*4	Hard lac resin by fractional precipitation	23·54	58·6	1120	1910	400

* Prepared from Sample 2 of Jalari lac.

(3) Intramolecular change through polymerisation and condensation of the lac may take place.

We wish to thank Professors K. Aston and K. Sreenivasan for their keen interest and encouragement.

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Choline Esterase in Cobra Venom.

THE venom of the Indian Cobra (*Naia Naia Vel tripudians*) is a substance of very complicated composition and possesses a remarkable pharmacological activity. A large amount of literature has collected on the subject and many investigators have attempted to explain the cause or the causes which are responsible for the peculiar toxic manifestations produced by the venom. Most of the investigations reported in the literature are centred around the question of the identification and separation of the various constituents, to each of which can be attributed a particular toxic property. Earlier workers like Calmitte[1] believed that the protein fraction (toxalbuminoids) was the active constituent in the venom but later experiments tended to show that certain principles of a non-protein nature might also be involved. Faust[2] reported the isolation of a non-nitrogenous, non-glucosidal principle from the cobra venom (ophiotoxin) which was very closely related in its physical, chemical and pharmacological characters to the saponins. This principle produced all the effects of whole snake venom, except agglutination. That the enzymes present in the venom might have some part to play in bringing about the toxic manifestations of venom poisoning was first brought out by Mathews[3] who showed that the destruction of fibrinogen by the protease present in the *crotalus* (*crotalus adamenteus*) venom was the chief cause of the failure of the blood to clot in *crotalus* poisoning. This finding was later confirmed by Billing.[4] These observations naturally drew the attention of a number of workers (Ganguly,[5] Ghosh *et al*[6]) to the study of the nature and physical and biochemical characteristics of the various enzymes or enzyme complexes present in the cobra venom. Recently, Iyengar, Sehra and Mukerji[7] investigated in detail the nature of the protease in the cobra venom and attempted to explain the biochemical significance of the presence of this enzyme with special reference to the use of the venom in therapeutics. Roy and Chopra[8] studied the comparative biochemical characteristics of the cobra and Russell's viper venom with a view to identify, if possible, the constituents of the venom primarily responsible for the poisoning symptoms associated with snake bites.

The action of the cobra venom in experimental animals was investigated by Chopra and Iswariah.[9] It was shown that the main action of this venom in lethal and sub-lethal doses is on the respiratory system, the effect being one of initial stimulation and final paralysis. The respiratory centre is probably primarily involved but the motor end-plates in the diaphragm and other respiratory muscles are also affected almost simultaneously. There is considerable divergence of opinion with regard to the exact mechanism involved in bringing about the respiratory paralysis. Chopra and Iswariah (*loc. cit.*) produced evidence to indicate that the paralysis is chiefly central in origin. Cushny and Yagi,[10] Houssay[11] and Kellaway and Holden,[12] on the other hand, thought that the seat of motor paralysis was peripheral resembling very closely 'curare' action. Of late, evidence has been advanced that most, if not all, motor nerves on stimulation liberate acetylcholine at their ends and that this substance (and not the nerve itself) carries the impulse across the synapse to the end-organs. It has also been shown that this liberated acetylcholine is quickly destroyed in the blood due to the presence of a specific choline esterase in the plasma. Therefore, if acetylcholine is prevented from reaching the receptor end-organs by its destruction through choline esterase, apparently no