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ROOF SLABS IN LOW COST HOUSES

Part 2.—Vault Roofs with Uniform and Varying Arch Thickness

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The construction, deflection testing, movement due to diurnal variations and ultimate strength of plain concrete vault roofs have been described. The roofs with varying and uniform arch thickness were laid on two separate rooms measuring $10 \times 10'$ each and tested under a uniformly varying superimposed load of sand bags. The results indicate the suitability of these types for larger spans in shell roof constructions.

INVESTIGATION OF THE TEMPERATURE DEPENDENCE OF DIELECTRIC CONSTANT AND ITS FIRST DERIVATIVE FOR LIQUIDS AND SOLUTIONS

Part I.—Some Preliminary Measurements on Benzene

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As an extension of previous investigations of the first temperature derivatives of viscosity, density, and refractive index of various liquids and solutions, some preliminary measurements are reported here for the first derivative of dielectric constant, ϵ , of benzene from 28°C. to 41°C. The measurements are made by filling benzene in a coaxial cylindrical capacitance cell, constructed specially for the purpose, and the quantity $\frac{1}{\epsilon} \Delta\epsilon/\Delta T$ is obtained for intervals ΔT of 2°C. The results show an approximately sinusoidal variation, having a period of about 6°C., and an amplitude of about ± 30 percent about the mean value. Other liquids are being studied.

CHLORINATION OF PETROLEUM HYDROCARBONS

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Different low boiling petroleum cuts both indigenous as well as imported have been chlorinated under varying conditions of gas-rates, sunlight or ultraviolet radiations and temperature, and in the presence of hypochlorite solutions. Low gas-rates namely 0.133 L/min./Litre at initial stages of chlorination favour smooth absorption. In the presence of direct sunlight the gas-rates increase from 0.0033 to 0.1805 L/min./100 ml. at 10 mm. Hg, while higher rates namely 0.0033-0.216 L/min./ 100 ml. result in sparking and blackening of the product. Ultraviolet radiations effects the second-stage where otherwise the gas-absorption is low. Chlorination in the presence of caustic-soda varying in concentration from 0.5 to 4 percent, does neither promote smooth absorption nor helps in reducing the overall period of chlorination. The addition of the final chlorinated product in 5 to 25 percent concentration, promotes the smooth absorption of chlorine. Of all the methods used, chlorination in the presence of poly-chlorinated hydrocarbons has proved beneficial in promoting smooth absorption of chlorine. Less so is the chlorination in the presence of direct sunlight. A combination of the two gives satisfactory results

REACTIONS OF METALS WITH CELLULOSE

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Reactions of cellulose with heavy metals in the form of their soluble complexes and sodium salts of *amphoteric* metals have been studied and it has been found that metals such as Cu, Pb, Cd, Sb, Sn, Fe and Cr get firmly attached to the cellulose chain by replacing the hydrogen atoms in the two secondary hydroxyls. For these reactions with cellulose, the metals in the form of their soluble complexes, must essentially be present in such a potential but masked form that their corresponding hydroxides are readily available when cellulose comes in contact with these solutions.

PRODUCTION OF GROG FIRECLAY BRICKS

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(Received May 7, 1964)

An attempt has been made to produce standard grog fireclay bricks, chiefly from abundantly available Pakistani raw materials. Bricks of 18 compositions were formed and their essential characteristics, such as thermal conductivity, permeability thermal expansion, thermal shock resistance, bulk density, shrinkage, porosity, crushing strength and re-heating shrinkage were determined and the results discussed.

SYNERGISTIC ACTION OF ISOCHAKSINE AND SERPAJMALINE

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The pharmacological properties and toxicity of isochaksine have been investigated. Isochaksine produced marked hypotension following intravenous injection in dogs. The mechanism of this hypotension was both central as well as peripheral. Isochaksine had an inhibitory action on the cardiac musculature. It also showed ganglion blocking activity. Isochaksine showed a synergistic action with serpajmaline in producing a hypotensive response both in conscious as well as in anaesthetised animals.

TOXICITY OF PETKOLIN TO PLANTS AND RATS, AS COMPARED WITH OTHER CHLORINATED INSECTICIDES

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(Received November 4, 1963)

Toxicity of Petkolin and certain other chlorinated insecticides has been tested on wheat, maize, sugar cane, cotton and certain vegetables. Petkolin, Makrolin, Heptachlor and Methoxychlor were not toxic at 3% concentration, while DDT, Aldrin, Dieldrin, BHC, Toxaphene and Chlordane showed toxicity. At the same concentration the toxicity of Endrin was much higher than that of the other insecticides tried. At 5 percent concentration, Petkolin was non-toxic while Heptachlor, Methoxychlor and Makrolin were found toxic to plants.

Toxicity of Petkolin, in comparison with Makrolin, DDT and BHC, has been studied on albino rats by means of subcutaneous injection. The LD₅₀ values for Petkolin, Makrolin, DDT and BHC were 9000-11000, 9000, 1800 and 70 mg./kg. body weight of the rat, respectively.

STUDIES ON CERTAIN CHEMICAL CHARACTERISTICS OF KAGHANI WOOL FIBRES

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A study has been made on various samples of Kaghani wool collected from Kaghani valley. Eight representative samples were analysed for certain chemical constituents and tested for physical properties. Wool with finer fibres contained a higher percentage of sulphur, wool wax and suint, but less ash, than did the coarser wool. The wool with fibres of larger diameters had a lower mean breaking stress and lower tensile strength but a higher mean breaking force and greater mean elongation than had the wool with finer fibres.

STUDIES OF THE PHYSICAL, CHEMICAL AND RHEOLOGICAL PROPERTIES OF LOHI WOOL FIBRES

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(Received November 20, 1963)

Lohi wool collected from the breed home tract was tested for physical characteristics such as diameter, length, medullation, moisture content and percentage regain. Strength and stress at 20 percent, 30 percent and at breaking point were also determined of the three types of wool viz. true, heterotypical and medullated. Moreover, the chemical characteristics such as nitrogen content, sulphur percentage, vegetable matter, scouring loss, wool wax and ash percent were also determined. It was concluded that Lohi wool can be utilized in the manufacture of carpets, rugs and blankets. Some suggestions for the development of this breed have been furnished.

**A CONTRIBUTION TO THE BIOLOGY AND LARVAL DEVELOPMENT OF THE
PISTOL SHRIMP, ALPHEUS CRASSIMANUS (HELLER)**

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Larval stage of the pistol shrimp (*Alpheus crassimanus*) found along the shore at Karachi, (Manora Island, Buleji rocks and Break waters) was obtained by rearing the animal in the laboratory. The first larval stage is described and illustrated to help in their identification in the plankton. This paper also records the observations on the habit and habitat of the adult and larval forms.

FLAME PHOTOMETRIC MICRODETERMINATION OF BORON IN ORGANO-BORON COMPOUNDS, USING ION-EXCHANGE RESIN

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Boron is determined in organic compounds by fusion with sodium in a nickel capsule in a sealed glass tube. The fused mass is passed through a cation-exchange resin when boric acid is obtained which is estimated by a flame photometer. The accuracy of the method is $\pm 0.3\%$.

SHORT COMMUNICATION

PREPARATION OF MONOCHLOROACETIC ACID

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CHEMICAL EXAMINATION OF SNAKE SLOUGHS

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(Received March 11, 1964)

**ISOLATION OF CLERODOLONE, CLERODONE, CLERODOL AND CLEROSTEROL
FROM CLERODENDRON INFORTUNATION (BHAT)**

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**RESIDUAL ACTION OF MAKROLIN AS COMPARED WITH OTHER INSECTICIDES ON
TRIBOLIUM CASTANEUM (HERBST) TENEBRIONIDAE: COLEOPTERA**

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ANTIBIOTIC-PRODUCING MICRO-ORGANISMS FROM WEST PAKISTAN SOILS

Part II.— *Aspergillus Quadrilineatus*-Some Bio-Chemical Studies

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(Received February 25, 1964)

ANTIMICROBIAL ALKALOIDS FROM EUPHORBIA THYMIFOLIA

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(Received May 5, 1964)

COMPOSITION OF OIL FROM THE SEEDS OF CUCUMIS PROPHET ARUM

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BATTERY PLATES FOR LEAD ACCUMULATOR

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AND

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