THE JOURNAL OF THE TEXTILE INSTITUTE

ABSTRACTS

LIST OF ABSTRACTORS

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In this Section the abstractors give digests of reports published in technical and scientific periodicals of the whole world. The opinions and claims expressed in the abstracts are those of the original authors and it must be understood that the staff of the Textile Institute do not necessarily endorse them.

1—FIBRES AND THEIR PRODUCTION

(B)—ANIMAL

Silk: Production in India. "*Times*" *Trade and Engineering*, 1942, **51**, 16.

Statistics of mulberry seedlings transplanted and cocoons distributed in Kashmir and Jammu show the improved condition of the Indian silk industry. Plans for expanding filature reeling are mentioned; the aim is to increase the output of silk suitable for parachutes by 1 million lb. Parachute silk cloth is now in production from raw silk reeled by the Kashmir State filatures from Persian cocoons. C.

Silkworms: Attack by Fungi. E. Masera. *Riv. Parassitol.*, 1940, 4, 51-60 (through *Rev. Appl. Mycol.* 1942, **21**, 289).

Besides being subject to spontaneous infection by *Beauveria bassiana* and *B. globulifera*, silkworms (*Bombyx mori*) at the Padua Silk-Growing Experiment Station were successfully inoculated with *Spicaria fumoso-rosea*, *Metarrhizium anisopliae*, *Sporotrichum paranense* and *B. densa*. C.

Sheep Rugging in Australia. I. W. Montgomery and C. C. Blumer. *Australia: J. Council Sci. Ind. Res.*, 1942, **15**, 10-12.

The results of trials on the rugging of aged ewes and of weaners showed that in both cases there was a financial loss without compensating gains in general well-being of the rugged sheep or in lamb production. W.

Merino Sheep: Relation of Tail Length to Blowfly Strike of the Breech. J. H. Riches. *Australia: J. Council Sci. Ind. Res.*, 1942, **15**, 3-9.

Further experiments on the effect of tail length on the incidence of breech strike (see also this *J.*, 1941, A401) show conclusively that the longer or 4-in. tail reduces susceptibility both to true breech strike and to tail strike. The effect appears to be permanent. The natural undocked tail reduces the incidence of pure breech strike to approximately the same extent as does the 4-in. tail, but is itself more frequently struck and is objectionable for other reasons. There was no evidence that the longer tail reduced lambing percentages in the experimental groups. W.

Merino Wool: Fleece Density of Plain-bodied Stud Rams. V. Bosman. *Fmg. in S. Africa*, 1942, **17**, 294-298.

Fleece density tests on a group of extremely plain-bodied stud rams confirm the author's earlier conclusion (this *J.*, 1942, A209) that high fleece density is not necessarily associated with skinfolds. W.

Pigmented Wool: Occurrence and Inheritance. R. B. Kelley and H. E. B. Shaw. *Australia: J. Council Sci. Ind. Res.*, 1942, **15**, 1-3.

A number of sheep were examined immediately after shearing for the presence of pigmented spots bearing black or brown fibres. Pigmentation varied from zero to 74 per cent., and was most common in old sheep. A series of matings showed that pigmentation is a recessive character. W.

Sheep: Anthelminthic Value of Phenothiazine Incorporated in Feed or Lick. H. McL. Gordon. *Australia: J. Council Sci. Ind. Res.*, 1942, **15**, 54-55.

Preliminary investigations show that the administration of phenothiazine in salt licks or in a food supplement cannot at present be recommended, because the amounts consumed are irregular and the effect varies accordingly. A full dose consumed over several days has little effect, and is therefore uneconomical. W.

Sheep and Cobalt. D. Robertson. *Farmer & Stockbreeder*, 1942, **56**, 966.

An account of an experiment in which pine in Cheviot ewes was cured by the administration of traces of cobalt. W.

Sheep Maggots. D. Robertson. *Farmer & Stockbreeder*, 1942, **56**, 1004.

It has been found that early this year the chief maggot fly in the North-East of Scotland was *Phormia terroe-novoe*, which is slightly larger than *Lucilia sericata*, has a bluer sheen and is not so easily destroyed by insecticides. Careful feeding of the sheep avoids scouring and so reduces the risk of strike. A dressing which destroys the maggots, heals the wounds and repels further attacks consists of water-white mineral oil, 71 parts; cresylic acid (99 per cent. purity), 4 parts; wool grease, 10 parts; paradichlorobenzene, 5 parts; pine tar, 10 parts. W.

British Wools. E. Hardy. *Text. Rec.*, 1942, No. 710, 19-20.

Data are given of the varying wool clips yielded by British sheep. W.

(C)—VEGETABLE

Cotton Plant: Effect of Ammonium Nitrate on Development. A. A. Lazarev. *Trans. Dokuchaev Soil Inst.*, (U.S.S.R.), 1940, **22**, No. 1, 159-170 (through *Chem. Abstr.*, 1942, **36**, 2073[1]).

Ammonia N is not favourable for cotton fertilization on saline soils. With kainite the negative effects on the early development of the plants were not eliminated, but the yield of bolls was higher and the total yield therefore was also higher. C.

Cotton Seed: Breeding in the Mississippi Delta. Mildred G. Barnwell. *Textile World*, 1942, **92**, No. 5, 73-76.

Cotton seed breeding in the United States is carried out by three distinct groups: (1) The Federal and State supported experiment stations, of which the Delta Experiment Station is a leading example. (2) Commercial breeders who supply pedigreed seed, selected, fumigated and scientifically packed, to cotton planters throughout the entire cotton belt as well as to foreign cotton-growing countries. (3) So-called multipliers or cotton planters who buy pedigreed seed from a certified breeder and sell, under certificate of the State Seed Improvement

Association, selected seed from their own planting, each bag of seed tagged to show its lineage. Brief accounts are given of the development and work of the Delta Experiment Station, the Delta Pine and Land Co. which developed Delta-pine cotton, the Stoneville Pedigreed Seed Co. which produces seed of various varieties, the most important of which are Delfos and Stoneville 2B, and the Robertshaw Plantation which is developing a variety called Bobshaw, and also of Coker's Pedigreed Seed Co. of Hartsville, S.C. The improvements and profits made possible by the breeding work of the last 40 years are discussed. C.

American Bollworm: Oviposition; Relation to Plant Moisture Content. *J. Econ. Entomol.*, 1941, **34**, 856-858 (through *Exp. Sta. Rec.*, 1942, **86**, 660).

An examination of the data obtained during 1935 to 1939 has shown that the correlation between the average percentage of moisture in the entire cotton plant and number of eggs of the bollworm *Heliothis armigera* per 100 plants was not significant. The correlation between oviposition and the percentage of water occurring in the growing tips only was found to be not significant in 1938 but was significant in 1939. In 1939 there was found to be a highly significant correlation between the number of larvae at each point and the percentage of moisture in the growing tips based on the weight of water in the entire plant. This highly significant correlation occurs even though it has often been found that a high percentage of the first-instar larvae is destroyed by predators. C.

Boll Weevil and Cotton Aphid: Control with Insecticides. C. F. Rainwater and F. F. Bondy. *J. Econ. Entomol.*, 1941, **34**, 733-735 (through *Exp. Sta. Rec.*, 1942, **86**, 653).

A report is made of identical experiments in which four insecticides or combinations of insecticides were tested with and without derris at the rate of 6 lb. per acre per application and equal parts of calcium arsenate and sulphur with and without derris at the rate of 12 lb. per acre per application. Eight effective applications were made at two locations. Analysis of the data showed that there was no significant difference in the degree of boll weevil control between any two insecticides and that each insecticide was significantly better than the check. Aphid population counts showed highly significant differences favouring the insecticides which contained derris over those which did not. Yield records showed that calcium arsenate plus derris was significantly better than calcium arsenate alone. C.

Pink Bollworm Secondary Hosts. F. F. Bibby and I. Moreno. *J. Econ. Entomol.*, 1941, **34**, 736-737 (through *Exp. Sta. Rec.*, 1942, **86**, 660).

The secondary hosts of the pink bollworm in the Lower Rio Grande Valley here noted are okra, which ranks second to cotton in importance; *Malvaviscus drummondii*, found in many places in the lower Rio Grande Valley, in a portion of Florida, along the entire Gulf Coast between Florida and Texas, and along the Atlantic Coast between Florida and Pamlico Sound, N.C., which is occasionally infested; and *Pseudobutilon lozani*, a mallow found in nine counties of Texas and in Mexico. C.

Cotton Plant Diseases: Symptoms and Control. M. di Fonzo. *Boletin Mensual, Junta Nacional del Algodón, Buenos Aires*, 1941, No. 80, 951-978.

The external symptoms of diseases of the cotton plant occurring in the Argentine Republic are described and shown in numerous coloured plates. Notes are given on the causes (parasites and climatic and physiological conditions), spreading, control, and importance of the various diseases, the disinfection of seeds and of plants, and the collection and sending of samples for examination. C.

Tetrachloro-*p*-benzoquinone: Use as Cotton Seed Disinfectant. E. L. Felix. *Phytopathology*, 1942, **32**, 4 (through *Rev. Appl. Mycol.*, 1942, **21**, 298).

Damping off of cotton (*Pythium* spp., *Corticum solani*, and other fungi) was effectively combated in flats of Mississippi cotton soil by the treatment of machine-delinted seed at the rate of 3 oz. undiluted or 4-6 oz. 25 per cent. "Spergon" (the active ingredient of which is tetrachloro-*p*-benzoquinone) in talc per bushel of seed. C.

Raw Cotton: Supply and Market Conditions. J. A. Todd. *Textile Manufacturer*, 1942, **68**, 269.

Conditions in home, American, Indian and South American cotton markets during June are reviewed. A more plentiful supply of long stapled cotton and a relative scarcity of American cotton in the home market are noted. Assuming an American 1942 crop of 12,000,000 bales, the prospective "free" supply for the coming season may be tentatively estimated at 17,600,000 bales, and domestic consumption at approximately 12,250,000 bales. United States Government owned stock will probably be reduced to about 4,400,000 bales after allowing for 1,000,000 bales earmarked for Lend-Lease shipments. In India, the area sown to Oomra, Bengal and other short staples this year will be considerably reduced, but the area sown to longer staples will be either equal to or slightly larger than that of a year ago. Estimates of the South Brazil crop have been reduced to about 1,500,000 running bales and of the Northern Brazil crop to 500,000 running bales, as a result of unfavourable weather conditions. The grade is abnormally low. Ordinary commercial demand cannot absorb more than a very limited quantity and the export outlook has suffered a further deterioration. The official June forecast of the 1942 Argentine crop is given as 330,000 bales (equivalent 478 lb.) which compares with 232,163 bales actually harvested last year. The domestic mills are consuming cotton at the rate of about 250,000 bales annually. The 1942 Peruvian cotton crop is unofficially estimated at 300,000-320,000 running bales and the 1942 Paraguayan crop at 32,000 bales. C.

(D)—ARTIFICIAL

Cotton Pulp: New Uses. F. C. Vilbrandt. *Chron. Botan.*, 1940, **6**, 97-100 (through *Chem. Abstr.*, 1942, **36**, 1775[6]).

A review and discussion, with special reference to the use of the whole cotton plant for the production of cellulosic materials. C.

Wood Pulp: Extraction. I. L. Kagan. *Proizvodstvo Drevesnoi Tsellulozy*, 1939, 117-130; *Khim. Referat. Zhur.*, 1940, No. 2, 118-119 (through *Chem. Abstr.*, 1942, **36**, 2134[4]).

The delignification of wood material without destroying cellulose during the boiling is best effected as follows: After the usual boiling and standing, raise the temperature to 128°, keep it at this level for 30 min. and then raise it to 140° for 2 hours. Six boilings under these conditions produce very small variations in the hardness and viscosity of pulp. A very high yield was obtained under production conditions. C.

Pulp Sheets: Steeping Test. Rayonier Inc. *Rayon Textile Monthly*, 1942, **23**, 145-7, 254-6.

An illustrated account is given of the full-size steeping press and the technique employed by Rayonier Inc. in testing the steeping qualities of their pulp sheets. The test employs 18 per cent. caustic soda containing 0·8 per cent. of hemicellulose, and the temperature is best kept within 18-20° C. C.

Cellulose Xanthates: Swelling and Solution. W. Schramek, V. Metzner and E. Seidel. *Z. physikal. Chem.*, 1941, B**50**, 298-304 (through *Chem. Abstr.*, 1942, **36**, 2133[4]).

The disappearance of X-ray interferences when cellulose xanthates are dispersed in dilute caustic soda can be compared with the swelling of regenerated cellulose fibres in 9-9·5 per cent. caustic soda. In the latter process there is neither a solution nor complete statistical disorder, the orientation of the molecules being almost completely conserved, with the effect that no solution of the originally crystalline regions appears. This state may be assumed to be the cause of the disappearance of the X-ray interferences. This disappearance is not a proof of a molecular-disperse distribution state. C.

Soybean Upholstery Fibre: Production. D. R. Ramseyer. *Soybean Digest*, 1941, **1**, No. 11, 12, 18 (through *Chem. Abstr.*, 1942, **36**, 1782[4]).

The process developed by the Ford Motor Co. involves (1) extraction of the oil, (2) extraction of the protein from the oil-free meal and purification of the protein by precipitation with acid, (3) dissolving the protein to produce a viscous stringy solution and spinning this solution into fibres, (4) after-treating to set the fibres and drying, and (5) spinning the fibres into yarn. C.

Substitute Textile Fibres: Availability and Usefulness. R. Haller. *Schweiz. Arch. angew. Wiss. Tech.*, 1941, 7, 285-294 (through *Chem. Abstr.*, 1942, 36, 2149[3]).

The availability and usefulness of textiles made from flax, hemp, nettle, broom, lupine, reed, peat, bast of the mulberry tree, potato plants and paper are discussed. Some methods of treatment are described. C.

Straw: Collection and Industrial Use in the United States. E. C. Lathrop and J. H. Shollenberger. *Paper Trade J.*, 1942, 114, *TAPPI*, 46-53.

The suitability, availability and geographical location in the United States of cereal straws for industrial use are discussed. Tables are given showing the structural composition of various straws, the results of chemical analyses of components of wheat straw, and the effect of the length of time left in the field after harvest on the physical properties and chemical composition of straw. Different varieties of straw vary considerably in the proportion of stems to chaff heads, and leaf blades. The most valuable portions of wheat straw from the standpoint of pulping are the stems. Combine-harvested wheat straw and stubble showed practically no loss of valuable constituents for pulping purposes after 35 days' weathering in the field. Present-day methods of harvesting and collecting straw are described and their costs and economies in comparison with those of older methods of using farm stack straw are discussed. C.

Cellulose: Depolymerization in Viscose Production; Effect of Manganese. F. E. Bartell and H. Cowling. *Ind. Eng. Chem.*, 1942, 34, 607-612.

Introduction of various metals into alkali-cellulose by dissolving compounds of the metal in the sodium hydroxide steeping solution alters the rate of lowering of viscose viscosity with length of time of ageing of the alkali-cellulose. Manganese and iron increase the rate of change of viscosity whilst copper decreases it. The effect of manganese in lowering the viscosity is unexpectedly great. During alkali-cellulose formation, manganese originally in the sodium hydroxide becomes concentrated in the alkali-cellulose. Manganese so introduced into alkali-cellulose increases the rate of depolymerization of the cellulose during the ageing process, not only by increasing the rate of oxygen absorption during ageing, but also by changing the relation between the amount of oxygen absorbed and the viscosity of the final viscose solution. When manganese is present, a given amount of oxygen causes a greater amount of depolymerization of alkali-cellulose during ageing, and the greater the manganese concentration, the less the amount of oxygen required to produce a given viscose viscosity. Even with high concentrations of manganese, however, some oxygen appears to be necessary for depolymerization of cellulose to take place. Manganese affects but slightly the rate of depolymerization of cellulose during xanthation. It has no effect on the relation between degree of polymerization of cellulose in the final viscose solution and the viscose viscosity. C.

Delustred Filaments: Production. A. E. Hulme. *Silk J. Rayon World*, 1942, 18, Feb., 18-20; March, 22-24; April, 14-16; May, 12-14.

A broad review is given of patented processes for delustring, including the use of titanium dioxide, methods involving precipitation from two solutions, and one-bath processes. C.

PATENTS

Staple Fibre Yarns: Production from Continuous Filaments. C. H. Hays and W. A. Dickie (British Celanese Ltd.). B.P.544,780 of 25/10/1940: 28/4/1942.

A bundle of continuous filaments is passed through successive sets of drafting rollers, the second set of rollers encountered by the bundle being driven with a peripheral speed substantially in excess of that of the first set so as to exert a draft of at least 5, and preferably 10 to 15 or much higher, e.g. 20, 30, 40, 50 or more, on the filaments, the speed of the second pair or set of rollers being, however, varied at regular or irregular intervals so as to produce a corresponding variation in the draft applied to the bundle of filaments. The filaments are thus stretched to breaking tension and thereby converted into staple fibre and at the same time the bundle is considerably reduced in size and given a variation in

thickness simulating, or even accentuating, the variation frequently exhibited by natural fibrous yarns. Filaments having a varying denier may be employed, the variations either occurring at the same point in the length of the bundle under treatment or, if desired, being somewhat distributed throughout the length of the bundle, e.g. in the latter case the bundle to be treated may be built up of several smaller bundles, the thicker portions of which do not coincide. It is possible to obtain counts equivalent to 45 denier in a single drafting operation. Cellulose ester, regenerated cellulose, and polyamide filaments may be converted into staple fibre yarns by this process. C.

Cellulose Xanthate Making and Dissolving Apparatus: Cleaning. Baker Perkins Ltd. (Peterborough). B.P.544,855 of 29/10/1940: 30/4/1942 (Conv. 29/4/1940).

In the manufacture of viscose wherein alkali-cellulose is xanthated in a closed machine and the resulting xanthate is dissolved in the same machine to produce viscose, the machine is cleaned before xanthating the next batch of alkali-cellulose by washing out the residual viscose with a solution of caustic soda which is sufficiently concentrated to avoid partial regeneration of the viscose and then rinsing the machine with a solution which is preferably of the same concentration as that used for steeping the alkali-cellulose. In this way any reduction in the alkalinity of the alkali-cellulose put into the wet machine is avoided. The washing solution may be employed as solvent for a further batch of cellulose xanthate. C.

Cellulose Ester Continuous Filament: Stretching. T. Jackson and F. B. Hill (British Celanese Ltd.). B.P.544,928 of 30/10/1940: 4/5/1942 (9/9/1941).

Filaments of cellulose acetate or other organic derivative of cellulose are assembled side by side to form a sliver-like bundle which passes into a stretching chamber through a slit of a length and width such as to embrace the assembly closely, and the bundle is stretched in the stretching chamber. The stretched bundle leaves the chamber by an orifice having a cross-sectional area appropriately reduced in accordance with the amount of stretch applied, the shape of the orifice advantageously approaching the circular because of the tendency of the originally flat bundle to assume cylindrical form under the stretching tension. The threads may enter the feed chamber preceding the stretching chamber by a slit, so that they remain in warp or ribbon form as they pass the nip rollers or other feed device in the chamber and are delivered in that form to the inlet slit of the stretching chamber. The stretching of cellulose acetate filaments enables strengths of 4·5 gm. per denier upwards to be obtained. The stretched filaments may be saponified in order to increase the strength to 6 gm. per denier or more. In the case of filaments intended for staple fibre, saponification may be effected before or after cutting. C.

Thread Drying Apparatus. Industrial Rayon Corporation (Cleveland, Ohio, U.S.A.). B.P.545,250 of 2/9/1940: 18/5/1942 (Conv. 28/9/1939).

Wet thread is dried continuously by subjecting it to the action of heat, wetting the thread again either while it is being heated or before it has cooled appreciably, and then continuously drying the thread under conditions permitting it to shrink. This method is particularly useful in the continuous production of multiple-filament viscose rayon. The rayon thread while still in the gel state is subjected to repeated drying by the action of heat with intermediate wetting on a number of reels while the thread is being heated or before it has cooled appreciably under conditions permitting shrinkage of the thread in the course of at least one re-drying operation. The apparatus includes a first unitary thread-advancing, thread-storing device which advances the thread lengthwise thereof in a large number of generally helical turns; heating means for heating the thread while stored on the device; thread wetting means; a last unitary thread-advancing, thread-storing device adapted to permit shrinkage of the thread while the latter is advanced lengthwise thereof in a large number of generally helical turns; and heating means for heating the thread on the last device to dry it substantially completely. The devices may be heated by means of a liquid having a boiling point substantially above the boiling point of water. C.

Superpolyamides: Stabilising. Imperial Chemical Industries Ltd. (E. I. Du Pont de Nemours & Co., U.S.A.). B.P.545,326 of 18/11/1940: 20/5/1942.

Synthetic linear superpolyamides are stabilised against degradation by ultra-violet light, heat, oxygen and moisture, by incorporation of N:N′-polymethylene-bis-*o*-hydroxybenzamides. The superpolyamide, in filament or sheet form, may be immersed in a solution of the bis-ortho-hydroxybenzamide in a non-solvent for the superpolyamide, or the superpolyamide and bis-ortho-hydroxybenzamide may be dissolved in a mutual solvent and the solution used in making filaments, films, etc. For most purposes, quantities of the N:N′-polymethylene-bis-*o*-hydroxybenzamide ranging from 0·1 per cent. to 25 per cent. by weight of the polyamide are most suitable. When used in amounts of 5-25 per cent. these benzamides have a plasticising action. C.

Yarn Package Hydro-extractor. American Viscose Corporation (Wilmington, U.S.A.). B.P.545,381 of 3/12/1941: 21/5/1942 (Conv. 7/6/1941).

A hydro-extractor for the treatment of yarn and thread packages comprises a rotor, means on the rotor for retaining the packages to be subjected to hydro-extraction, means, e.g. an annular screen, supported on the rotor protecting the material of the packages, a casing member surrounding the rotor, and means carried by the casing member for removing the protecting means to an inoperative position. With such a hydro-extractor, the material and any cover thereon are protected from damage or excessive stretching. C.

Yarn Liquid Treatment Apparatus. American Viscose Corporation (Wilmington, Delaware, U.S.A.). B.P.545,594 of 12/3/1941: 3/6/1942 (Conv. 18/10/1940).

A method of applying liquid to a travelling yarn or the like comprises applying the liquid to a roller, discontinuously contacting the yarn with portions of the periphery of the roller and directing the liquid on the roller into contact with the yarn. The liquid may be directed across the periphery of the roller. Suitable apparatus comprises a rotatable roller having a grooved periphery, ridge members provided in the grooved portion of the roller extending transversely across the bottom of the groove and means for supplying the roller with the liquid to be applied to the yarn. The ridge members may extend across the full width of the groove. The means for supplying liquid to the roller may comprise a reservoir positioned beneath the roller in which the latter is partly immersed. C.

Ginnery Lint Condenser. Continental Gin Co. U.S.P.2,254,951.

A rotatable, foraminous drum that receives on its surface the lint-laden current of air has a portion of its interior defined as a chamber to receive the air current and admit it in whirling motion into a suction duct. C.

Skins: Tanning without Deteriorating the Hair. Böhme Fettchemie-G.m.b.H. F.P.850,853 of 28/12/1939 (through *Chem. Abs.*, 1942, **36**, 2178).

The skins are softened in a bath of *p*H 8-11·8, then limed in an alkaline bath containing a sulphide and sulphuric esters or sulphonates of fatty alcohols. W.

Sheep Maggot Fly Repellent. W. Filtness. Australian P.109,014 of 6/11/1939 (through *Chem. Abs.*, 1942, **36**, 2077).

A mixture for spraying on sheep consists of carbon tetrachloride (46 per cent.), kerosene (46 per cent.), castor-oil (3 per cent.), paraffin oil (3 per cent.) and eucalyptus oil (2 per cent.). W.

Blowflies: Combating. B. Van Heerden (to J. J. Gregory). Australian P. 110,141 of 14/3/1940 (through *Chem. Abs.*, 1942, **36**, 2370).

The preparation consists of anthracene oil 100, resin 20, phenol 5, zinc chloride 5 and petroleum ether (sp. gr. 0·716) 130 parts. W.

Wool: Separating from Skins. F. J. Hodges. Australian P.110,180 of 18/3/1940 (through *Chem. Abs.*, 1942, **36**, 2424).

The skin (which is not saved) is soaked for 24 hr. in 0·5 per cent. commercial hydrochloric acid, then the acid replaced with water which is heated to 170° F. till the skin disintegrates. The wool is collected, squeezed and scoured. W.

2—CONVERSION OF FIBRES INTO FINISHED YARNS

(A)—Preparatory Processes

Card Cylinder: Effects on Product of Increased Speed of Rotation. G. H. Dunlap. *Cotton (U.S.)*, 1942, **106**, No. 4, 95.

The author has arranged with 15 mills to increase the card cylinder speed from the commonly accepted maximum of about 165 r.p.m. and study the effect on the yarn. Full particulars of cardroom conditions and yarn tests are now tabulated for two mills, but comments are not offered at this stage. It is stated, however, that many of the mills have not encountered mechanical difficulties in running card cylinders at higher speeds, e.g. 192-196 r.p.m. C.

Cardroom Problems: Discussion. Operating Executives of Georgia. *Cotton (U.S.)*, 1942, **106**, No. 4, 99-102.

The following topics are discussed. (1) *Increasing production by increasing card cylinder speed.* Several members reported favourably on the results of a general increase in card speeds by increasing the r.p.m. of the main cylinder to 190 or 200, claiming that yarn quality was maintained though the amount of waste was reduced. (2) *Grinding the licker-in.* Devices for straightening licker-in teeth and grinding them to uniform height are mentioned. Two spinners claimed to get fewer neps with a re-ground licker-in. (3) *Frequency of grinding cylinder and doffer.* Various figures are reported for the weight of cotton carded between one grinding and the next. (4) *Causes of uneven scutcher laps.* Irregular flow of air through the cages is mentioned as a chief cause. (5) *Draft distribution in high-draft roving.* Several spinners report on their practices. It appears that as the limits of the machine are reached the drafts at the front and back rollers tend to reach the same amount. C.

Spinning Problems: Discussion. Operating Executives of Georgia. *Cotton (U.S.)*, 1942, **106**, No. 4, 102-104.

The following subjects are discussed: (1) *Synthetic rubber aprons in high drafting.* Experiences in the use of synthetic rubber aprons instead of leather are reported; they are generally favourable. (2) *Slip roller weighting.* One spinner reported a test with aluminium rollers, 1·16 oz., and wooden rollers, 0·49 oz., in comparison with the normal slip roller of 2·92 oz., on the same hank roving. The normal weighting was best. (3) *Distribution of re-buffed rollers.* Precautions are suggested to ensure that the front rollers are of even diameter. Thus, re-buffed rollers are put in the middle or back rows and the complete frame is changed at one time if possible. (3) *Consumption and renewal of travellers.* Several spinners reported on the frequency with which they made a general renewal of travellers and on the intervening extra consumption of travellers; the extra amounted to 15, 20, 25 and even 35 per cent. in different mills on medium counts and to about 6 per cent. in a coarse mill with $2\frac{1}{8}$-in. rings, 2/0 travellers, spindle speeds 9,000-10,000 r.p.m. (5) *At what point to doff bobbins.* For best efficiency in subsequent spooling on the Barber-Colman machine the bobbins should be doffed at about one-third from the top on their way down. C.

Mule Driving Mechanism. W. J. Guy. *Textile Recorder*, 1942, **59**, April, 49-52; May, 42-44.

A general discussion of the respective merits of belt and rope systems of power transmission in mule spinning. C.

Worsted Manufacture. J. Zeelander. *Mech. World*, 1942, **111**, 585. Flowsheet, No. 102. La.

(B)—Sizing

Spinning Room: Management. W. Stockton. *Textile World*, 1941, **91**, No. 9, 127-8; No. 10, 116; No. 11, 143; No. 12, 101; 1942, **92**, No. 3, 103; No. 5, 112.

Practical hints are given on spinning-room management with special reference to the prevention of "bunches", weight variations and slubs, remedies for creel troubles, splicing high-draft aprons, lubrication and care of rollers and saddles, traveller speeds, mounting spindles, care of ring rails, and the causes of badly wound bobbins. C.

Patents

Elastic Yarn: Production. United States Rubber Co. (New York). B.P.544,873 of 30/7/1941 : 30/4/1942 (Conv. 19/11/1940).

A method of making a balanced single cover elastic yarn consists in delivering a pre-twisted rubber thread and one or more textile strands or covering yarns along separate paths converging to a point adjacent twisting mechanism at independently controlled speeds such that the textile yarn advances faster than the rubber thread, the rubber thread and yarn advancing from the point of convergence still at the controlled relative speeds to the twisting mechanism by which they are twisted together by a yarn plying operation in a direction to remove part of the twist previously imparted to the rubber thread and place the yarn about the rubber thread so that as the thread assumes a central position the yarn will be helically wound about the rubber thread and form a cover. C.

Electrically-driven Spinning or Twisting Spindle. A.-G. Brown, Boveri & Cie Baden, Switzerland. B.P.545,017 of 18/11/1940 : 7/5/1942 (Conv. 17/11/1939).

An individually electrically-driven spinning or twisting spindle, spring-supported relatively to the spindle rail, particularly for high speeds of revolution, with a footstep bearing arranged underneath the spindle rail and with a motor having an external rotor which is constructed as a bobbin-carrier drum, is characterised by the feature that the centre of gravity of the mounted bobbin practically coincides with that of the bobbin-less revolving mass, and that the upper guiding bearing of the spindle shank is located within or immediately above the motor stator and at the same time approximately in the horizontal plane of the centre of gravity of the revolving masses. When the bobbin is pulled off, the moment of inertia of the revolving mass above the plane of the centre of gravity is equal to the moment of inertia of the revolving mass below this plane. The tubular spindle casing which contains the two spindle bearings and on its neck supports the internally disposed motor stator extends through the spindle rail with its lower end which contains the foot-step bearing and is closed in any suitable way for the protection of the bearings against dust and dirt. Immediately below the motor there is mounted on the spindle casing a bell-shaped upwardly flared base cover which is sealed with respect to the rotor drum with an air gap and which may be provided with additional arrangements, such as lead-in nozzles, securing hooks, braking means and the like. C.

Magnetic Waste Breaking Machine Safety Device. H. S. Greenwood (Rochdale). B.P.545,398 of 22/3/1941 : 22/5/1942.

Means for safeguarding and preventing the occurrence of fires in connection with machines or apparatus for opening, breaking-up, feeding or working cotton waste or other fibrous materials comprises a rank or ranks of abutting high coercive permanent magnets of short-limbed or U shape and made from a magnetised alloy, the magnets being assembled with like poles adjacent and in one or more ranks of abutting magnets in such a way that the textile or fibrous materials pass over the poles and the magnets attract and maintain a hold on any passing magnetic bodies. The magnets may be carried upon a hinged or movable metal plate or panel to enable arrested metal parts to be readily removed. C.

Exhaust Opener, Lap Machine or Scutcher Cage. A. Marshall (Todmorden). B.P.545,638 of 25/6/1941 : 5/6/1942.

An exhaust opener, lap machine, scutcher or other machine in which air-currents induced by fans or the like deposit the fibres on a revolving cage for removal therefrom in sheets or for rolling into laps, is characterised in that a cylindrical cage is furnished internally with an inlet or suction nozzle providing intake for air and an opening for the outflow of air extending parallel with the axis of the cage from end to end thereof and presented against or close to the inner surface of the perforated or reticulated circumferential wall of the cage and piped to a fan or other means for inducing currents of air to flow from without through the circumferential wall of the cage to the intake only through that part of the perforated circumferential wall of the cage which at any moment is opposite the intake, whereby the suction is controlled and the deposit of fibre on the outer wall of the cage is caused to take place wholly opposite to the intake

and evenly from side to side of the cage. The cage is caused to revolve by any suitable means. The intake for air is preferably made adjustable in position angularly relatively to the axis of the cage. The edges of the intake adjacent to the inner surface of the walls of the cage are preferably furnished with flaps of flexible material, e.g. leather, in order to provide a close fit with the surface. A sheet metal deflector plate is preferably provided which is supported on a light angle-iron frame secured to the framework of the machine, and extends from the beater stripping plate to the cage, the plate being furnished at the edge adjacent to the top edge with a flexible flap, e.g. of leather, which rests on the surface of the cage in line with the leather flap on the upper side of the air conduit in the cage. C.

Top Roller Weighting Device. J. G. Fife (A.-G. J. J. Rieter & Cie, Winterthur, Switzerland). B.P.545,657 of 7/10/1941 : 5/6/1942.

A device for weighting the top rollers of drafting mechanisms for spinning machines is characterised by the provision in a tube of an elastic hose put under pneumatic or hydraulic pressure and a number of pressure plates bearing against the hose which are connected with the top roller saddles by means of levers. The tube may serve as a support for the top roller holders. The device is preferably constructed so that each pressure plate possesses a protruding portion projecting from the tube and resting in a notch in the slotted wall of the tube. On its other end, the protruding portion of the pressure plate supports a weight lever and swings it about the slotted wall serving as fulcrum. C.

Heat-resisting Tyre Yarn and Cord: Production. United States Rubber Co. (New York). U.S.P.2,254,740/1.

(1) A tyre cord comprises a number of " hydrated " cotton yarns, stretched and twisted into a cord that exhibits a stress/strain curve " concave downwardly " at stretches appreciably below 5 per cent. under a load of 10 lb. (2) The yarn is " hydrated " while under sufficient tension to effect permanent elongation. C.

Crimped Yarn: Production. A. L. Johnston, Jun. (Plainfield, N.J.). U.S.P. 2,254,895.

Yarn is crimped (curled) by winding it under tension on an incompressible mandrel, and heating it to set the curl. C.

3—CONVERSION OF YARNS INTO FABRICS

(B)—Sizing

Rayon Warp Sizing Machine: Automatic Control. W. W. Humecky. *Rayon Textile Monthly,* 1942, **23**, 276-278.

Brief descriptions are given of modern systems for measuring and controlling the moisture content of rayon warps, the temperature of the drying cans, and the level and temperature of the size in the size box. C.

Rayon Sizing Oil: Properties. P. J. Wood. *Cotton (U.S.),* 1942, **106**, No. 4, 92.

The function of the oil used with gelatin for sizing rayon is stated. To meet the requirements the oil should have good wetting, softening and lubrication properties, but not tend to foam, oxidise, turn rancid or volatilise. These features are briefly explained. C.

(C)—Weaving

Rayon Loom Production Table. H. R. Mauersberger. *Rayon Textile Monthly,* 1942, **23**, 279-280.

A table is reproduced which shows the theoretical output (in yards) of a loom in a 10-hour day for shuttle speeds of 100 to 205 picks per minute (in steps of 5 p.p.m.) and for cloths with 20 to 180 picks per inch (in steps of 2 p.p.i.). C.

Automatic Loom Bobbin Changing Mechanism. *Silk and Rayon,* 1942, **16**, 218-9, 244.

In continuation of a detailed account of automatic looms for silk and rayon weaving, the writer describes the construction and setting of bobbin-changing mechanism. C.

Automatic Loom Warp Stop Motions. *Silk and Rayon,* 1942, **16**, 343-344.

Details are given of various types of warp stop motions suitable for silk and rayon looms. C.

Hand-threading Shuttle. W. Shuttleworth. *Textile Weekly,* 1942, **29**, 730 and 732.

A hand-threading shuttle is described which has a total length of $13\frac{7}{8}$ in. and is $1\frac{5}{8}$ in. wide at the bottom and $1\frac{17}{32}$ in. at the top. The centre back depth is $1\frac{5}{16}$ in. and its centre front depth is $1\frac{5}{32}$ in. Being deeper at the back than the front, this shuttle is more in conformity with the shape of the shed than most ordinary shuttles. The top front of the shuttle is well rounded off and the sides are tapered off for $3\frac{1}{4}$ in. This tapering allows the shuttle to enter and emerge from the shed with a minimum of friction near the selvedges. The block and spindle form one structure. The tapering spindle is just over 7 in. long, with a brazed expanding spring on its upper surface for cops. The shuttle can be fitted for bobbins. The block is " V " shaped underneath and is case-hardened for good wearing. When in its weaving position the block rests on a shaped wooden pin made of hard wood that passes through the shuttle. The block is held by a similar wooden pin. Cuts are provided for hand-threading. These comprise a cut which is parallel with the length of the shuttle and a second cut inclined at an angle of 52°. The first cut is not vertical but slopes to the front of the shuttle and enters the back of the tunnel below, which is used by the weft. The cuts are tapered at both ends to facilitate threading which is effected by a forward and backward movement of the hand. Details of the arrangements of the cuts, thread plate and guide pins are shown in diagrams. C.

Labour-saving Loom Devices. *Textile Recorder,* 1942, **59**, Jan., 21-22; Feb., 22-24; March, 29-30; April, 26-28.

Illustrated descriptions are given of devices for (1) securing a balance of weight for dobbies on uneven lifts, (2) eliminating weft trails in drop-box looms, (3) false reeds for fibrous worsted warps, (4) the Grob heald shaft false reed, (5) an oscillation back roller, (6) a tappet shuttle-checking motion for Lancashire drop-box looms, (7) a chain motion for border cloths, (8) a pick finder motion, (9) a weft feeler motion, and (10) a weft stop-brake motion. C.

Shuttleless Loom Stop Motion and Compensating Means. C. H. Baddeley. *Textile Weekly,* 1942, **30**, 19-23.

An illustrated explanation is given of the invention covered by E.P.539,928 C.

Double-warp Rayon Fabrics: Weaving. *Silk J. Rayon World,* 1942, **19**, June, 16-18.

Rayon fabrics may be reinforced by weaving a backing on a second warp and uniting the face and backing cloths by stitching. Typical constructions are shown and Hattersley looms suitable for these cloths are described. C.

Loom Accessories Costing System. *Cotton (U.S.),* 1942, **106**, No. 4, 91, 111.

Particulars are given of a system of checking loom accessories and bringing them into the production costs account. The basis of the system is a sheet held by the storekeeper on which 328 principal loom repair parts are listed in alphabetical order. C.

Rayon Crêpe: Weaving. *Silk J. Rayon World,* 1942, **18**, March, 14-17; April, 17-18; May, 14-17.

Practical hints are given on the selection of shuttles and temples, and the setting of healds and tappets. C.

Rayon Crêpe Yarns: Weaving Problems. *Textile Mercury and Argus,* 1942, **106**, 412 and 420.

A discussion of difficulties encountered and precautions necessary in the preparation for the loom and weaving of rayon crêpe warp and weft yarns, the control of crêpe weft in shuttles, and the method of lining shuttles. C.

Rayon Fabrics: Weaving. *Silk J. Rayon World,* 1942, **19**, June, 20-21.

Practical hints are given on the selection of reeds and healds, and the use of a fluted roller is recommended to prevent the warp from the beam clustering into groups. C.

Indian Textiles: Design. A. Leix. *Ciba Review,* 1942, No. 36, 1301-1311.

An illustrated account is given of native Indian textiles of the 19th and 20th centuries, their manufacture and their patterns. C.

Wool Characteristics in Relation to Navajo Weaving. J. O. Grandstaff. *U.S. Dept. Agric., Tech. Bull,* No. 790, Jan., 1942. W.

Machine-made Carpets. V. Price. *Text. Mfr.*, 1942, **68**, 208-209.

Lecture to Coventry Textile Society, describing the manufacture, especially the weaving, of Axminster and Wilton carpets. W.

(D)—KNITTING

U.S. Army and Navy Knitted Goods. *Text. World,* 1942, **92**, No. 4, 88-9.

Abstracts are given of new and amended specifications, with additional manufacturing details, for tubular cloth, lining cloth, wristlets and anklets, caps, mufflers, sweaters, undershirts and drawers. W.

(G)—FABRICS

Fabrics: Design. J. Chirnside. *Mem. & Proc. Manchester Lit. & Phil. Soc.*, 1939-41, **84**, 23-28.

The development of the modern style in textile design and the attitude of manufacturers towards the modern movement is discussed. The contemporary style in fabrics is the result of a combination of traditional craftsmanship, which includes the cottage-weaving tradition and the professional weaving and professional designing tradition, with formal or abstract art. As a result of putting all the traditional skill of the professional weaving craftsmen at the service of abstract artists a style of pattern has arisen which is appropriate to this century and possesses in marked degree the finer characteristics of all these traditions—the coarseness of texture associated with " folk " fabrics, the use of fine yarns and fine structure brought to perfection by weaving specialists of all ages, and the new, broad, modern vision of the formal painters. C.

Camel Hair Fabrics. J. Cairns. *Text. Mfr.*, 1942, **68**, 248-250.

The construction and finishing are described of camel hair fabrics for garments and blankets. W.

PATENTS

Seamless Hosiery: Knitting. Towles Ltd. (Loughborough) and P. W. Holt. B.P.545,153/4 of 9/11/1940: 13/5/1942.

(1) In the knitting of a stocking, sock or like article on a seamless hose machine, either the whole or the whole of the upper half section of the seamless toe and/or heel pouch is made elastic by knitting in elastic yarn. The pouches or half-sections thereof may be knitted solely of elastic yarn or one or more supplementary yarns of suitable material, e.g. wool may be used. The yarns may be of contrasting colours. (2) In a seamless hosiery article, a strengthening medium is incorporated in the whole of the upper half or section of the toe pouch or heel pouch or both and omitted from the lower half or section. As strengthening medium one or more yarns or threads of any suitable material, e.g. linen or cotton may be used, either alone or in association with one or more other yarns or threads. C.

Elastic Hosiery: Weaving. R. & J. Pickles (Burnley). B.P.545,164 of 24/2/1941: 13/5/1942.

A stocking or like garment is woven in tubular form from elastic warp and weft threads, the number of warp ends lifted being progressively modified at predetermined intervals so as to effect such variations in width as are requisite to produce the desired shape of the article, e.g. at the calf or ankle, and the exposed unwoven portions of the warp threads being subsequently severed. A loom of the jacquard type is convenient for this purpose. The yarns employed for both warp and weft of the fabric are preferably of combined textile and elastic filaments and are subjected to a fixation treatment before weaving, the fixing agent being subsequently removed from the woven article by immersion in a suitable solvent, to restore the full elasticity of the material. C.

Fabric Hose Pipe Seams. M. L. McCulloch (London). B.P.545,198 of 4/12/1940: 14/5/1942.

A fabric hose pipe, liquid container, or the like, has a seam or joint isolated from the interior by a sealing strip of material having opposed edges secured one on each side of the seam or joint, the sealing strip being appreciably wider than the distance between the lines along which its edges are secured to the interior of the pipe or container. Under pressure the sealing strip tends to be flattened

against the wall of the pipe, container, or the like, and in doing so tends to seal the joint. If the joint of the pipe or container and the attachment of the sealing strip are achieved by stitching, the stitching at the joint or seam may be stronger and coarser than that by which the sealing strip is secured. C.

Yarn Tensioning Device. T. Holt Ltd. (Rochdale) and E. Brierley. B.P. 545,208 of 27/1/1941 : 14/5/1942.

A tension device adapted to be assembled as a unit and applied in one operation to a creel from which yarn or thread is drawn and passed to a warping machine includes a bracket affording attachment for two main parts of the device, one stationary and the other oscillatable within limits, each of the parts affording a bearing for a tension element, one tension element being revolvably mounted on but incapable of lateral or vertical movement relatively to the stationary part and the other tension element being carried by the oscillatable part. The device is constructed mainly of wire and presents the minimum of surface for the lodgment of fly, permits easy cleaning of the device and facilitates passage of the thread between the tension elements. C.

Yarn Tensioning Device. T. Holt Ltd. (Rochdale) and E. Brierley. B.P. 545,209 of 27/1/1941 : 14/5/1942.

A device for applying drag or tension to yarns or threads being wound or unwound includes a three-armed lever of substantially Z-shape in side elevation, the lever being fulcrummed on a bobbin-carrying shaft attached to the creel frame and located closely adjacent to the frame, so that when in working position the lever is between the frame and a package placed on the shaft, the lever being influenced by a weight or spring acting on the distal end of its lower arm, spring braking means on the lever adapted in one position of use to exert a braking action on the bobbin-carrying shaft to prevent unrolling of the package and in another position of use to release the package so that thread may be freely drawn therefrom, thread guiding means on the lever adapted to extend substantially over the entire length of the package, and a cleat adjustable upon the creel frame to restrict the oscillatory movements of the lever in one or both directions. The device may be applied to pile fabric looms, winding machines or warping creels. C.

Loom Warp-lifting Device. E. Egli (Rüti, Switzerland). B.P.545,265 of 24/12/1940 : 18/5/1942.

A device for lifting the warp threads for shaft weaving is characterised by the feature that flat healds are aligned on an assembling rod embracing the latter, standing freely in a lateral direction, and are held in their upright position by accurate fitting, by their own weight, or by separate weighting means located underneath the assembling rod. The healds may be lengthened so far downwards away from the assembling rod that this lower portion forms a counterpoise for the upper part of the heald, holding the heald in a vertical position. Alternatively, the flat healds may be held in an upright position by weighting means comprising individual springs, indiarubber threads, small weights or the like attached to the lower ends of the healds. The healds may be lengthened downwards beyond the assembling rod, and loaded by a common weight bar, applied to their lower ends, in order to keep them in an upright position. The assembling rod is directly suspended at both ends and is slidable in a straight-line guide, or forms parts of a shaft frame suspended at both ends. C.

Ladder-resistant Knitted Fabric: Production. Hosiery Developments Ltd. (Nottingham) and R. K. Mills. B.P.545,328 of 19/11/1940 : 20/5/1942.

Ladder-resistant fabric is produced by a method in which each loop, or each of certain loops, is locked or tied by a loop passing therethrough and closely there-around. When the fabric is in its relaxed (non-tensioned) condition, the locking yarn extends, on the rear of the fabric, in the form of a substantially straight bar between the legs of each loop locked thereby and in free loop formation between adjacent locked loops. The front face of the fabric presents a substantially plane or non-plush surface and the back of the fabric shows a plush effect. The fabric may be produced on flat, straight bar or circular knitting machines with either bearded or latch needles. It is claimed that the fabric, in addition to being resistant to laddering, has the resilience, elasticity, and smoothness of face required in stocking fabrics. C.

Needled Fabrics: Production. American Reenforced Paper Co. (Attleboro, Massachusetts, U.S.A.). B.P.545,403 of 14/5/1941 : 22/5/1942 (Conv. 1/7/1940).

A needled fabric is composed of fibres needled through an unwoven perforate reinforcing network of fibrous strands, the network having strands extending in one general direction and crossing other strands extending in another general direction and including on each surface of the network strands extending along that surface without crossing through the network to the opposite surface thereof, the strands being spaced to form relatively wide openings in the network through which the fibres are needled. The fabric is made by arranging a set of fibrous strands in generally parallel spaced relationship, and overlaying a second set of fibrous strands in generally parallel spaced relationship across the strands of the first set and needling fibres through the openings formed by the crossed strands. The fibres of the second set may be bonded to the fibres of the first set by the application of an adhesive. C.

Smallware Loom Shuttle. Platt Brothers & Co. Ltd. (Oldham) and S. Whitehead. B.P.545,580 of 4/12/1940 : 3/6/1942.

A shuttle for a smallware or narrow fabric loom has two parallel compartments, one receiving a solid wound cop, i.e., a cop consisting entirely of yarn tightly wound without the use of a pirn or tube, and the other compartment housing a tension device embodying spring-influenced rollers, means for retaining the cop in the first compartment, guiding means for leading the yarn from the cop to the second compartment and means for regulating the tension of the yarn, whereby the tension is maintained constant and the yarn is kept free from snarls. The compartment for reception of the yarn cop is of U-shape in cross-section with serrated walls and open top. The diameter of a fully wound cop is slightly greater than the width of the compartment and the cop is forced down between the serrated walls. A blade spring is inserted over the cop in the compartment and retained in position by engagement of its ends with the end walls of the shuttle and serves to prevent chafing on the top shed. The second compartment has an open top and partially open floor and contains a plate forming a false floor, a first roller freely mounted on a peg projecting vertically from the plate, a second roller carried at one extremity of a spring member, the other end of which is secured to a block pivotally mounted on a stud secured to the plate whereby the second roller is urged into rolling contact with the first roller, a set screw screw-threaded into an arm of the block and having at its free end a hexagonal head in contact with the outer wall of the first compartment whereby the tension of the spring member may be adjusted, a spring plate secured to the first-mentioned plate and providing bearing for a horizontally disposed fluted roller, and guiding means in the plates for guiding yarn from the cop to the rollers. C.

Circular Independent Needle Knitting Machine. Wildt & Co. Ltd. (Leicester), H. H. Holmes and A. P. Saunders. B.P.545,676 of 21/2/1941 : 8/6/1942.

In a circular independent needle knitting machine which is adapted to operate with rotary reciprocatory motion for forming fabric for pouches, e.g. heel and toe pouches, and is capable of automatically narrowing and widening such fabric, provision is made for enabling needles which are to be rendered inactive during the formation of pouch fabric by reciprocating knitting to assume a non-knitting position in which the old loops on these needles are located in the hooks of the needles, and a picker system is provided which is so constructed as to be adapted to cause or permit the appropriate needles to take up or maintain this position, and to resume knitting, during narrowing and widening actions respectively. A movable cam, arranged in advance of the knitting cam system, is adapted in one position to enable all of the needles to clear and knit and, in another position, to enable the needles to remain in the knocking-over position. Jacks to be acted upon by the pickers and cams are provided in association with the needles which are to function for reciprocating knitting. Conveniently, the narrowing picker or pickers is or are adapted to move appropriate jacks out of range of a cam or cams associated with the picker or pickers whereby the corresponding needles are permitted to remain in the non-knitting position while the remaining jacks are acted upon by the cam or cams so as to enable the associated needles to clear and knit, and the widening picker or pickers is or are adapted to bring the same jacks

into the range of the said cam or cams, or into the range of another cam or cams associated with the widening picker or pickers, and thence into the range of the cam or cams associated with the narrowing picker or pickers suchwise as to enable the corresponding needles to clear and knit. C.

Loom Selvedge Motions. Draper Corporation (Hopedale, Mass.). U.S.P. 2,254,868/9.

(1) A selvedge motion comprises a housing with a longitudinal guideway, a pin extending transversely of the guideway, a member slidably mounted in the guideway and having an elongated portion bearing on the pin, a bifurcation serving as a stop for the sliding member, a needle mounted on the free end of the elongated portion, and means for moving the member transversely of the pin and swinging it vertically about the pin. (2) A similar device is adapted for mounting on the shuttle guard rail. C.

Cylinder and Dial Knitting Machine. Hemphill Co. (Central Falls, R.I.). U.S.P.2,255,068.

The machine has twice as many needles on the rotary cylinder as on the rotary dial, means for actuating the needles to knit rib and plain fabric in succession, and means (including shogging mechanism) for transferring stitches from the dial needles to some of the cylinder needles. C.

Fibre Knitting Machine. A. B. Carton (Brooklyn). U.S.P.2,255,078.

A rotating cylinder knitting machine is fitted with a brush that wipes fibres into the needles as these pass through the brush, and means are provided to lay the fibres in overlapping relation as they pass to the knitting point. **C.**

Strain-absorbing Stocking Top: Construction. Improved Products and Machinery Co. (New York). U.S.P.2,255,224.

A strain-absorbing area above the knee is knitted from the same thread as adjoining parts but is formed of wales of regularly knitted loops spaced apart by wales in portions of which the looping is omitted, these portions being arranged in staggered relation. C.

Trimming and Elastic Yarn Knitting Device. Pennant Knitting Mills Inc. (Brooklyn). U.S.P.2,255,293, 2,255,323.

(1) The claim is for a method of operating the needles on a circular latch-needle machine so as to incorporate a trimming yarn and knit a fabric with a design portion. (2) A similar device is used for incorporating elastic yarn. C.

Composite Fabric. H. B. Riehl (to The Pacific Lumber Co.). U.S.P.2,266,907 of 23/12/1941 (through *Chem. Abs.*, 1942, **36**, 2425).

Wool is used with the separated fibres of that part only of the bark of the redwood tree which lies between the cambium and the epidermis. W.

4—CHEMICAL AND FINISHING PROCESSES

(B)—Boiling, Scouring, Degumming and Washing

Cotton: Chemical Treatment and Research. H. G. Knight. *Amer. Chem. Soc. News Edn.*, 1942, **20**, 581-583.

Scouring, bleaching, dyeing and finishing processes and the contributions of chemistry to developments in these processes are discussed. The state of the cotton industry in the United States in recent years is reviewed, the need for research is pointed out, and various organisations now undertaking research on cotton are mentioned. Progress made in the study of the physical and chemical properties of cotton fibres, in the development of new and improved cotton products, and in research on chemical finishes is discussed and directions in which further research is needed are indicated. The work of the Southern Regional Research Laboratory at New Orleans is briefly described. C.

Wool Yields. R. H. Burns. *Natl. Wool Grower*, 1942, **32**, No. 5, 18.

The results are given of a shrinkage test on individual fleece samples from the same flock for the 1940 and 1941 clips, 50 samples being scoured for each year. The figures show that the greasy fleece weight is not necessarily an index of the clean wool production. W.

(E)—Drying and Conditioning

Textiles: Packing for Shipment. *Textile World,* 1942, **92**, No. 5, 81-83.

Specifications covering packing and shipping are quoted and shortages of certain packing materials at the present time are discussed. Wooden boxes and cartons are available in the United States, in numerous types and special waterproof papers, consisting of two layers of kraft paper reinforced with fibres which in turn are embedded in asphalt, are rapidly gaining in favour as wrapping and packing materials for certain types of textiles. Systems of packing piece-goods and warp tubes, and a baling system for print cloths, sheetings and drills, which are in use in American mills are briefly described and shown in photographs. A recommended shipping room system for small plants is outlined. C.

(F)—Carbonising

Carbonising and Drying: Use of Infra-red Lamps. Riggs & Lombard. *Text. World,* 1942, **92**, No. 3, 90.

A description of an infra-red lamp unit for carbonising vegetable matter in wool cloth after treating with acid and drying, and for use as a booster in front of an ordinary tenter dryer. W.

(G)—Bleaching

Bleaching, Dyeing and Finishing Problems: Discussion. American Association of Textile Chemists and Colorists. *Cotton (U.S.),* 1942, **106**, No. 4, 105-111; *Amer. Dyes. Rept.,* 1942, **31**, 174-181.

The following subjects are discussed:—(1) *Dyeing high-twist rayon with nylon and cotton yarns.* Several hosiery dyers reported that the size on the nylon yarn tends to melt and run down to the rayon welts, forming spots. (2) *Qualities of raw cotton that give trouble in dyeing.* Many complaints are brought against cotton from west of the Mississippi and especially western Texas. (3) *Radiant energy for drying.* Advantages are claimed. (4) *Economies in and substitutes for materials in use.* Various measures to conserve peroxides and chlorine are suggested. C.

(I)—Dyeing

Acetate Rayon: Dyeing and Printing. *Textile Mercury,* 1942, **106**, 381-382.

The application of vat and azo dyes to acetate rayon is discussed. Typical procedures are outlined and contrasted with the methods used in dyeing cotton. When applying vat dyes to acetate rayon the alkalinity of the bath should be reduced to a minimum and it is sometimes preferable to use slightly acid conditions. With azo dyes, the diazotised base should be applied to the acetate rayon before the naphthol. Dyeings produced with naphthol AS components can be improved by an after-steaming treatment in the presence of an acid reducing agent. A table is given showing shades obtained with various combinations before and after steaming. White and coloured discharges on acetate rayon can be produced by a method depending on the use of thiourea dioxide as discharging agent either alone or together with other discharging agents. Details of procedures are given. C.

Aridye Pigment Dyes: Application. *Textile World,* 1942, **92**, No. 5, 90-91.

The Aridye pigment-dyeing process for the production of fast-colour plain shades on cottons, spun rayons and mixtures uses emulsions of the water-in-oil type made by dispersing pigments in a solution of synthetic resins in a petroleum solvent into which water is emulsified. The preparation of such emulsions is described and suitable apparatus is shown diagrammatically. The four basic steps of the dyeing process are padding, predrying, drying and curing. Padding may be accomplished with a three-roll or two-roll padder of such construction that it will force the colour to penetrate the fabric uniformly with the least possible excess. This requires a dip and nip padder with extremely high squeeze. In the drying process the cloth should be heated gradually and uniformly throughout. The first stage requires the application of a moderate heat (an air temperature of about 180° F.) in such a way that it will penetrate the cloth, subjecting both sides to exactly the same drying conditions. In the second stage, the temperature may be considerably higher (air at 275 to 300° F.), so long as the heat is applied uniformly to both sides of the cloth. Ventilation is necessary to remove solvent vapours and water. In the curing operation the

temperature of the cloth must be raised to 280-300° F. by means of circulating air (preferably not over 375° F.) to cause the resins to polymerise and become resistant to solvents and to mechanical washing. Suitable apparatus is discussed and a diagram of a typical lay-out for continuous padding, predrying, drying and curing is given. The process involves only a moderate fire hazard: recommendations for reducing this still further are quoted. C.

Silk: Black and Brown Oxidation Dyeing. Z. P. Sharova and G. E. Chernina. *Shelk,* 1939, No. 8, 19-20; *Khim. Referat. Zhur.,* 1940, No. 2, 108 (through *Chem. Abstr.,* 1942, **36**, 2148[8]).

In the production of black and brown colours from *p*-phenylenediamine on silk and rayon, sodium chlorate is harmless to the fabric. Combinations of the black oxidiser with indigo dyes of the anthraquinone series (indanthrene), produce a complete range of mordant dyes and stable prints. C.

Dyes: Application; Theory. R. E. Rose. *Rayon Textile Monthly,* 1942, **23**, 161-3, 217-8, 287-8.

A review of recent ideas on the mechanism of dyeing rayon, cotton, wool and nylon fibres. C.

Naphtholated Materials; Effect of Light on —. *Ciba Review,* 1942, No. 34, 1231.

A table is given showing the effects of light on α- and β-naphthols and the various Cibanaphthols. Materials impregnated with β-naphthol are very sensitive to light and also to exposure to the air. The coupling capacity of the majority of the Cibanaphthols is destroyed by relatively short exposure to light. A few are more stable, the most stable being Cibanaphthol RP. The effect of exposure does not appear to be a simple splitting up into the free naphthol and alkali carbonate since after-treatment of the material with caustic soda does not regenerate the yellow colour and the ability to couple. C.

Ground Cellulose: Dye Adsorption. K. Hess and W. Gramberg. *Kolloid Z.,* 1941, **97**, 87-96 (through *Sci. Abstr.,* 1942, A**45**, 149-150).

Investigations were made of the adsorption of dyes on various types of cellulose fibres subjected to various periods of grinding. The relative amount of dye adsorbed is a characteristic value for the cellulose preparation and may serve for an approximate determination of the total surface of the crystalline coherent micelles. The influence of recrystallization of the ground cellulose on the adsorption of dyes has also been investigated. Graphs are given showing the adsorption values with different concentrations of dyes as a function of time. Adsorption isotherms show that saturation has not yet been reached even with the highest concentration investigated. X-Ray diagrams and photo-micrographs are given and discussed. C.

Thioindigoid Dyes: Constitution. J. Harley-Mason and F. G. Mann. *J. Chem. Soc.,* 1942, 404-416.

An account is given of an investigation of the factors determining the type of condensation of the thioindoxyls with the thionaphthenquinones, i.e. whether the methylene group of the former reacts with the α-carbonyl group of the latter to give a thioindigo or with the β-carbonyl group to give a thioindirubin. For this purpose, thioindoxyl and six substituted thioindoxyls were condensed with the corresponding thionaphthenquinones, and the product in each case compared with that obtained by the condensation of the thioindoxyl with the corresponding α-anil, where α-condensation must necessarily have occurred. The results show that the condensation in most cases is determined solely by the position of substituents in the quinone molecule and is unaffected by those in the thioindoxyl molecule. Thionaphthenquinone and 5- or 6-substituted thionaphthenquinones always give β-condensation, 4-substituted quinones always give α-condensation, and 7-substituted quinones may give α- or β-condensation: only with the last quinones, therefore, is the type of condensation affected by the thioindoxyl employed. Indoxyl and oxindole, however, always give β- and α-condensation respectively with all the thionaphthenquinones investigated, the effect of these two compounds being thus to suppress completely the influence of substituents in the quinone molecule. The significance of these results is discussed. C.

(J)—PRINTING

Discharge Prints: Cause and Prevention of Colour Changes in Dyed Grounds. H. P. Baumann. *Textile Colorist,* 1942, **64**, 36 (through *Chem. Abstr.*, 1942, **36**, 2148[9]).

In discharge printing, partial or spotty colour changes of dyed grounds may be caused by traces of copper reacting with the peroxide used as oxidising agent. Keeping the padding gum out of contact with the copper and having the pad rollers chromium-plated are suggested to prevent this trouble. Although the colour change can be prevented by the addition of ammonium thiocyanate or sodium pyrophosphate, the former breaks down with evolution of poisonous gas, whilst the latter destroys the stability of the peroxide solution. C.

Cellulose Acetate Rayon Crêpe Fabrics: Discharge Printing. *Silk and Rayon,* 1941, **15**, 650-2, 766, 786.

Practical hints are given on correct procedure. C.

(K)—FINISHING

Wash-resistant Finishes: Effect on Fabric Properties. O. Mecheels. *Textil-berichte,* 1941, **22**, 265-271, 324-326 (through *Chem. Abstr.*, 1942, **36**, 2149[3]).

Four types of finishes were investigated: a cellulose ether (I), an unspecified synthetic resin (II) used without formaldehyde, a urea-formaldehyde combination (III), and formaldehyde alone (IV). Wet strength is not appreciably increased by any of the finishes. Material treated with III shows much lower wet strength after washing than the original material. Tear resistance is improved by finishes that form a coating on the fibre. After washing it remains good for III and IV only. Treatment IV alters the structure of the fibre itself and formaldehyde must be used in excess to produce good uniform finishes. In high concentrations it makes the fibre shrinkproof. Treatment III gives the best handle to the fabric. C.

Lactic Acid: Application in Finishing and Laundering. G. S. Ranshaw. *Silk and Rayon,* 1942, **16**, 225-6.

A general account is given of the use of lactic acid in brightening silk and rayon, dyeing wool, silk, acetate rayon and cotton, fabric printing and laundering. Recipes are provided. C.

Textile Finishing Agents: Chemistry. *Silk and Rayon,* 1941, **15**, 696-8, 768-770; 1942, **16**, 40-42, 174-6, 290-2.

The chemistry of the following "key products for textile processing" is reviewed: (1) urea and related substances, (2) formaldehyde, (3) melamine and related substances, (4) glycol, glycerol and related products, and (5) triethanolamine and related products. C.

Starch-Soap Complex: Formation, Properties and Use. C. C. Kesler and W. C. Black. *Paper Trade J.*, 1942, **114**, *TAPPI*, 247-250.

The results of a study of the effect of soap on the viscosity of starch paste have in general confirmed those obtained by Heald. Maximum viscosities were found in a 4 per cent. starch paste at about 9 per cent. soap on the starch basis, and in a $2\frac{1}{2}$ per cent. starch paste at about 10 per cent. soap on the starch basis. The starch-soap effect has further been shown to be a measure of the dispersion or hydration of the paste. The viscosities of the starch-soap mixtures are profoundly affected by the presence of traces of certain metals. The presence of as little as 6 grains per gallon of $CaCO_3$ will reduce the viscosity of the complex by more than one half. Starches vary widely in their content of metallic traces, and it is conceivable that the viscosity differences noted in pastes made from starches, which are in some respects identical, may be due to the presence of traces of these metals in either the water used, or the starches themselves, and to the action of these traces on the naturally-occurring fatty-acid content of the starches. The property of the starch-soap complex to precipitate in the presence of ions which will make the soap insoluble, e.g. calcium ions, has been confirmed. The presence of as much soap as is necessary for conditions of maximum viscosity is not essential for the complete precipitation of the complex. When solutions of the starch-soap complex are made acid, as by the addition of mineral acids, the soap portion is apparently converted to the fatty acid which is relatively

insoluble, and the complex is caused to precipitate from solution. The possible mechanism by which soap increases the viscosity of starch solutions and causes them to precipitate under certain conditions is discussed and it is suggested that there is an absorption of the long-chain fatty acid molecule through association of its active group with those of the starch, possibly by means of the hydrogen bond. An industrial use of the starch-soap complex has been developed in which the starch-soap complex is caused to precipitate in intimate association with the fibres of a paper furnish. The precipitated material is retained in the web to a much greater degree than is ordinary cooked starch. C.

(L)—PROOFING

Gill Nets: Preservation with Chlorinated Rubber. G. Cave-Browne-Cave and R. H. Clark. *Canadian J. Res.*, 1941, **19**, B 241-260.

In a search for a preservative for gill nets tests were made on strands of linen gill net twine (5/40) treated with solutions of chlorinated rubber containing plasticizers, with and without additions of various bactericides. The effects of the treatments on tensile strength, flexibility, wearing quality, and loss of strength produced by immersion in the sea were determined. Notes are given on the methods of testing, a new instrument for measuring flexibility is described, and results are tabulated and discussed. The tensile strengths of the treated strands, after several weeks' immersion in the sea, showed all products from chlorination of gum chicle and gutta percha to be useless as preservatives, and the product of the chlorination of pale crêpe to be as effective, but not more so, than the commercial chlorinated rubber, Parlon. The addition of a plasticizer was found to be essential for the maintenance of the required degree of flexibility. After a strand of 5/40 linen, impregnated with Parlon plasticizer (dibutyl phthalate), had been immersed in the sea for several weeks its tensile strength was found to be a function of the concentration of plasticizer. An optimum concentration of plasticizer exists at which the life of a strand in the sea is greatest. For all concentrations of Parlon in benzene, and for all concentrations of plasticizer of any practical value, no knot slippage occurs. Treatment of strands with copper sulphate solution followed by a Parlon coating gave less effective preservation than a Parlon coating alone. Treatments with Parlon were more effective than treatments with a 30 per cent. or 10 per cent. benzene solution of copper naphthenate. The most effective preservative was a solution of 1 g. of copper naphthenate, 20 g. of 13 centipoises Parlon, and 11·4 ml. of dibutyl phthalate in 100 g. of benzene. In tests in which sections of treated net were sewn with regular nets and fished with for a season, the strength of the treated net after use was only slightly greater than that of the untreated net. An examination of the knots revealed that this difference was due to the fact that the Parlon preservative did not penetrate sufficiently into the knots. C.

PATENTS

Cotton Yarns and Fabrics: Constructions for Maximum Mercerising Lustre. Heberlein & Co. A.-G. (Wattwil, Switzerland). B.P.544,812 of 4/9/1940: 29/4/1942 (Conv. 4/8/1939).

In a method of obtaining a maximum mercerising lustre on cotton yarns and fabrics, doubled yarn is used having a twist opposite to that of the individual yarns and a twist factor equal to that of the individual yarns, and mercerisation is carried out under tension. In fabrics to be mercerised, the yarns that are perpendicular to the yarns primarily producing the lustre should be spaced as far apart as possible without affecting the character of the fabric or producing a structure in which sliding or slipping of the yarns will occur. C.

Fabric Lapping or Blocking Board. S. Hanson and W. S. Aldhouse (Manchester). B.P.544,813 of 17/9/1941: 29/4/1942.

A lapping or blocking board for fabrics comprises a single layer of double-surface double-corrugated paper, strawboard or like material (i.e. two corrugated sheets arranged one on each side of an uncorrugated intermediate sheet and enclosed between like surface coverings or backing sheets) with the corrugations running transversely of the board, and stiffening strips of wood disposed along the longitudinal edges of the layer and secured by binding strips secured to the surface coverings or backing sheets by adhesive. If desired, the board may be

further stiffened by means of strips or rods of wood, wire or other appropriate material arranged in the corrugations at suitable intervals. C.

Azo Dyes: Production. Society of Chemical Industry in Basle. B.P.544,817 of 25/10/1940: 29/4/1942 (Conv. 26/10/1939 & 10/9/1940).

Azo dyes are made by coupling suitable phenols or enolisable ketones with the diazo compounds of aromatic amines of given general formula. Specified bases include 1-aminobenzene-4-carboxylic acid-β-hydroxyethyl ester, 1-aminobenzene-4-carboxylic acid-β-hydroxyethyl ester, and 1-amino-2-nitrobenzene-4-carboxylic acid-β-hydroxyethyl ester. Specified phenols and enolisable ketones include phenol, *p*-cresol, resorcinol, dihydroxyquinolines, esters and amides of aceto-acetic acid and pyrazolones. The dyes produced contain an aliphatically bound hydroxyl group. When used in highly dispersed form they dye as such esters and others of cellulose yellow shades. Owing to the presence of the hydroxyl group the dyes may be esterified with organic or inorganic polybasic acids, whereby there are produced water-soluble dyes which likewise dye the materials fast yellow shades. The dyes may also be produced by causing a reducing agent, nitrous acid, a phenol or enolisable ketone, and a salt of sulphurous acid or of thiosulphuric acid to act in succession on appropriate nitro compounds. The dyes that contain a salt-forming group which imparts solubility in water, e.g. a sulphonic acid group bound to an aromatic nucleus, may also be used for dyeing and printing wool and silk. C.

Super-polyamide Fabrics: Crimping. R. W. Hardacre and Imperial Chemical Industries Ltd. B.P.544,820/1 of 28/10/1940: 29/4/1942.

(1) A process for crimping synthetic linear superpolyamide fabrics comprises locally treating, e.g. printing, the fabrics with aqueous solutions of zinc chloride or a metallic thiocyanate, removing the water from the printed portions of the fabrics and then steaming the fabrics. The portions of the fabric that are treated with the swelling agent acquire an increased affinity for direct, azoic, vat and acetate rayon dyes. (2) Similar effects are produced by treating synthetic linear superpolyamide fabrics locally with aqueous media containing a dihydric or a trihydric phenol, removing the water from the treated portions of the fabrics and then heating, e.g. steaming the fabrics. C.

Fabric Liquid Treatment Apparatus. R. J. Mann, W. Harmer and R. Martin (British Celanese Ltd.). B.P.544,854 of 29/10/1940: 30/4/1942.

Apparatus for the continuous treatment of fabrics in open width comprises a tank with a sinuous conduit through which the fabric can pass in open width, and means for creating a flow of the treatment liquid through the conduit. The outlet of the sinuous conduit is preferably below the level of the inlet, and the conduit is preferably of considerable length, e.g. over 30 ft. The means for creating the flow of liquid may comprise suitably disposed heating pipes or a pump, paddle wheel or other mechanical impeller. Feed and take-up mechanism speeds may be arranged to allow for shrinkage of the fabric and, if desired, control means may be provided to adjust the speeds automatically so that the fabric remains substantially free from tension or under some predetermined tension. The apparatus is particularly suitable for the treatment of fabrics comprising yarns of cellulose acetate or other cellulose ester or ether. C.

Thermoplastic Material Printing or Coating Apparatus. Champlain Corporation (Garfield, New Jersey, U.S.A.). B.P.544,884 of 15/7/1940: 1/5/1942 (Conv. 18/8/1939).

A method of printing or coating a travelling web of paper, cloth or other sheet material with a thermoplastic material having a higher viscosity when melted than wax mixtures used in carbon coating and having softening and melting points sufficiently high that the materials, when set, can be handled and will not offset or transfer at normal room temperatures, comprises applying the thermoplastic material, heated to a liquid state, to a surface of the sheet material in relatively closely spaced but segregated and uniform quantities, and intergrating these quantities into a smooth and continuous film. The integrating operation may be effected by the application of heat and the integrated film may be set by a cooling treatment. The segregated quantities of thermoplastic material may be applied by means of a heated intaglio roller and a co-operating impression cylinder. C.

Chromable Monoazo Dyes: Production. J. R. Geigy A.-G. (Basle). B.P. 544,887 of 25/10/1940: 1/5/1942 (Conv. 20/6/1940).

Monoazo dyes which yield on wool when after-chromed, green shades of excellent fastness to fulling, of very good fastness to light and good fastness to hot pressing, are made by coupling with 2-amino-naphthalene-3-carboxylic acid a diazotised 2-aminophenol-4- or -5-phenylsulphone or a diazotised 2-aminophenol-4- or -5-sulphamide substituted at the nitrogen atom of the sulphamide group by at least one alkyl or aralkyl group, the diazo component further containing outside the aminophenol nucleus a group imparting solubility in water. C.

Phthalocyanine Sulphur Dyes: Production. N. H. Haddock and Imperial Chemical Industries Ltd. B.P.544,953 of 2/11/1940: 5/5/1942.

Phthalocyanine sulphur dyes are made by reducing a copper phthalocyanine sulphonyl chloride with zinc in the presence of a mineral acid and oxidising the copper mercatophthalocyanine by contact with atmospheric oxygen or an aqueous suspension containing dissolved oxygen. The dyes obtained can be applied to cellulosic material from sodium sulphide solution in the same way as sulphur dyes. They give green dyeings of excellent fastness to washing, chemick and light. These dyeings may be discharged to clear whites by steaming in the presence of dimethyl(sulphobenzyl)phenylammonium chloride, sodium hydroxide and sodium formaldehydesulphoxylate. C.

Vinyl Polymer Yarns: Dyeing. G. W. Johnson (American Viscose Corporation, Meadville, Pa., U.S.A.). B.P.545,117 of 6/11/1940: 11/5/1942.

Yarns or other shaped articles comprising polymers of vinyl chloride or copolymers of vinyl acetate and vinyl chloride can be dyed with aqueous dispersions of suspension dyes when the dyeing operation is carried out in the presence of one or more normally solid organic compounds which have a solubility in the vinyl polymers of 2 per cent. or greater under the conditions at which the dyeing is carried out. Suitable organic compounds include various amino compounds, phenols, esters, ethers, etc., a list of which is given. They may be added to the dyebath or applied to the yarn before the immersion of the latter in the dyebath. C.

Multi-colour Printing Apparatus. Heberlein & Co. A.-G. (Wattwil, Switzerland). B.P.545,142 of 15/9/1941: 12/5/1942 (Conv. 13/9/1940).

In a process for multi-colour printing, there is used in combination with the printing roller, a doctor blade preferably resilient and if desired reciprocally movable laterally, upon which are mounted close to the edge of the doctor blade colour ducts preferably of anti-friction material and having openings bearing accurately on the printing roller, the colour being delivered to these colour ducts under pressure. C.

Fabric Stretching Apparatus. S. C. Bullen (Alkrington, Lancs.). B.P. 545,277 of 25/4/1941: 18/5/1942.

Apparatus for stretching fabric laterally comprises a resilient cylindrical or equivalent surface so mounted on a roller or drum as to rotate therewith but be capable of longitudinal movement thereon, a shaft on which the roller or drum is secured and by which it is positively driven, a collar with a spherical inner surface surrounding the shaft at each end of the roller or drum, the ends of the cylindrical surface being affixed to the peripheries of the collars, a spherical bearing rotatable with but slidable in relation to the shaft for each collar, means for varying the inclinations of the collars on the spherical bearings whereby as the cylindrical or equivalent surface rotates each portion of its surface will be successively expanded longitudinally to a maximum and then contracted to a minimum in one revolution, the amount of expansion and contraction depending on the inclination of the collars, a roller or other device for maintaining the fabric in contact with the cylindrical or equivalent surface and means for positively driving the shaft and with it the cylindrical or equivalent surface. C.

Cellulose Acetate Azo Dyes: Production. Society of Chemical Industry in Basle. B.P.545,283 of 14/11/1940: 18/5/1942 (Conv. 15/11/1939).

Azo dyes which are soluble in water and have good affinity for cellulose acetate rayon are prepared by treating with oxalic acid in the presence of an organic solvent, e.g. toluene, an azo dye which is free from sulphonic or carboxylic acid groups and corresponds with a given general formula. In an example the dye

prepared by diazotising 1-amino-4-nitrobenzene and coupling with N-(ethyl-β-hydroxyethyl)-aminobenzene is boiled with anhydrous oxalic acid in the presence of toluene. The dyes may also be obtained by first preparing stable intermediate products by treating appropriate amines with oxalic acid in the presence of an organic solvent and then combining the intermediate products with diazo compounds of the benzene series which are free from sulphonic and carboxylic acid groups and contain a nitro group in para-position to the diazo group. A table is given showing the shades produced on cellulose acetate rayon by dyes prepared from various components. C.

Impregnating and Coating Apparatus. C. J. Beaver, E. L. Davey and W. T. Glover & Co. Ltd. (Manchester). B.P.545,315 of 26/5/1941 : 19/5/1942.

In apparatus for impregnating and/or coating the sheet material is dried and then passed from a vacuum tank directly into a liquid impregnant at a higher pressure. The whole or greater part of the drying operation is performed outside the vacuum chamber and the sheet material passes into that chamber for a short final treatment to prepare it for impregnation by the impulsive action which takes place at the abrupt change of pressure. The apparatus comprises a small vacuum chamber which is arranged directly adjacent to the impregnating tank so that the sheet material can pass through a slot in the separating wall. This vacuum chamber preferably has a hot roller round which the sheet material passes, or other heating means. Outside this vacuum chamber are a support for the roll of untreated sheet material and hot rollers so arranged that the material passes round them as it comes from the roll on the way to the vacuum chamber, which it enters through a slot provided with a packing device. It then travels onwards through the vacuum chamber and from it into the impregnating tank and then to the final drying or setting arrangement. This final operation may involve the use of heat, but frequently will consist simply in the cooling of the sheet material by passing it through the atmosphere whereupon the impregnating material sets or becomes viscous to a sufficient extent to be retained by the material. C.

Brown *m*-Phenylenediamine Dyeings: Production. Calico Printers' Association Ltd. (Manchester) and L. A. Lantz. B.P.545,394 of 7/2/1941 : 22/5/1942.

Brown shades are produced on textiles by condensing *m*-phenylenediamine with formaldehyde in acid medium and oxidising the product. When the condensation product is obtained from 0·5-1 mol. of formaldehyde to one of diamine, the brown obtained by oxidation has a more pleasing shade and a better fastness to light than the well-known Paramine Brown. The condensation product may be applied in the form of printing colours, or padding or impregnating liquors. Oxidising agents may be added to the printing pastes and oxidation effected by subsequent steaming or ageing, or the printed and dried fabric may be after-treated in a solution of the oxidising agent. The browns obtained by oxidation of *m*-phenylenediamine-formaldehyde condensation products can be modified in tone by after-treatment in a solution of a diazonium salt, or by diazotising and coupling with one of the customary coupling compounds, such as β-naphthol. C.

Aldehyde Vapours: Application in Cellulose Derivative Delustring and Crêpeing. British Cotton Industry Research Association, R. J. B. Marsden and A. R. Urquhart. B.P.545,422 of 21/10/1940 : 26/5/1942.

Yarns composed of cellulose acetate or similar derivatives of cellulose, either in loose form or incorporated in a fabric which may contain other yarns, are treated with carbonyl compounds such as acetaldehyde, acrolein or, preferably, crotonaldehyde, the treatment being preliminary to such treatment as crêpeing in which the yarn or fabric is subjected to the action of hot water or soap solution. The carbonyl compounds are used in vapour form where the treatment is preliminary to a delustring process, and in vapour form or dissolved in some non-aqueous solvent where the treatment is preliminary to a crêpeing process. The efficiency of delustring and crêpeing treatments is improved by preliminary treatment of the yarn or fabric in the manner described. C.

Nylon Hosiery Board-setting Apparatus. E. I. Du Pont de Nemours & Co. (U.S.A.). B.P.545,446 of 23/11/1940 : 27/5/1942 (Conv. 24/11/1939).

A board-setting apparatus for the treatment of knitted goods, composed of synthetic linear polyamide fibres or filaments, with a moist vapour comprises

a supporting base carrying a movable mounting plate, boards for positioning the textile products for treatment on the mounting plate, and a tank so positioned as to form with the movable plate a pressure-tight chamber. The supporting base may have tracks mounted thereon and the tank may have wheels supported on the tracks. C.

Acylated Sulphonamide Moth-proofing Agents. J. R. Geigy A.-G. (Basle, Switzerland). B.P.545,452 of 31/1/1941: 27/5/1942 (Conv. 2/2/1940 and 22/6/1940).

Wool, fur, hair, feathers or other material of animal origin is protected against moths and other insects by treatment with an acylated sulphonamide of the formula $A.SO_2NX$ acyl, wherein A represents an aromatic nuclear halogen substituted residue and X an alkyl, aralkyl or aryl residue. The acylated sulphonamides may be obtained by acylating, preferably in the presence of catalysts, colourless aryl sulphonamides substituted in the nucleus by halogen and in which a hydrogen atom of the amide groups is replaced by alkyl, aralkyl or aryl groups. The products are colourless and sufficiently soluble in the technically usable solvents, and do not impart any undesirable feel to textiles treated therewith. C.

Wetting Agents: Preparation. K. Venkataraman, G. V. Shirolkar and B. D. Tilak (Bombay). B.P.545,496 of 31/5/1940: 29/5/1942.

Wetting agents and detergents are made by condensing lauric acid or the mixed fatty acids of coconut oil, in the form of the acid chloride, with an aniline *o*- or *m*-sulphonic acid containing a methyl group or chlorine atom in the nucleus *p*- to the amino group. The condensation, i.e. acylation of the amino group, is effected in admixture with water, acetone, methyl ethyl ketone, pyridine, or other suitable solvent and an alkaline substance, e.g. caustic soda or sodium carbonate. Surface active compounds of outstanding wetting, detergent and calcium soap-dispersing power are obtained by the interaction of lauryl chloride with the sulphonic acids of *p*-toluidine and *p*-chloroaniline. The products are used in the form of the sodium salts. C.

Dyeing Apparatus. M. Payen (St. Johns, Canada). B.P.545,527 of 28/11/1940: 1/6/1942 (Conv. 16/5/1940).

Apparatus for treating textile materials with liquids (e.g. dyes) comprises a bottom vat section, an upper section secured on the vat section, a top cover section removably seated on the upper section, a double-walled roof on the top section adapted to receive cooling fluid therein for condensing vapour from the bath below, and a channel formed on the upper edge of the upper section in which the top section is seated, the channel being adapted to collect liquid condensed on the double-walled roof and to cause the liquid to flow back into the vat section. Means are provided for heating the liquid in the bath and for maintaining it at a predetermined level. The material to be treated, e.g. fabric in the form of an endless web, passes through the liquid in the vat and over reels arranged in the upper section. C.

Laminated Fabrics: Production. Imperial Chemical Industries Ltd. B.P. 545,532 of 29/11/1940: 1/6/1942.

In the process of bonding together a number of plies of fabric by means of interlayers consisting of or containing a synthetic linear interpolyamide, water is introduced into the interpolyamide and the plies are then joined by the application of heat and pressure. Suitable interpolyamides of relatively low melting points, high strength and flexibility, are prepared from mixtures of diamines, aminocarboxylic acids, and dibasic carboxylic acids, each as such or in the form of an amide-forming derivative. C.

Water-repellent Elastic Fabric: Production. British Rubber Producers' Research Association (London), C. M. Blow and G. C. Burgess. B.P. 545,582 of 6/1/1941: 3/6/1942.

A process for rendering elastic fabric for bandages, plasters and the like water-repellent and of low water absorption comprises treatment of the soft twisted weft or warp yarn and/or the finished fabric with a positively charged latex prepared as described in B.P.497,793 and with a substance imparting water-repellency to the fabric. The water-repellent substance, e.g. paraffin wax or Velan P.F., may be applied at the same time as, or subsequently to the rubberis-

ing treatment. The positively-charged latex may be compounded and pigmented. C.

Biguanide Derivatives: Application against Gas-fading of Dyed Acetate Rayon. E. I. Du Pont de Nemours & Co. U.S.P.2,255,090.

Derivatives of the biguanide group $R[NR'\cdot C(:NH)\cdot NH\cdot C(:NH)\cdot NH_2]_m$ are claimed, where R is a benzene, naphthalene or heterocyclic nucleus, or a system of two benzene nuclei, variously substituted and joined by $-O-$, $-S-$, $-NH-$, $-CO-$, $-CH:CH-$, $-NH\cdot CO-$ and similar links; R′ is H, alkyl or hydroxyalkyl having 1-5 C atoms; and m is 1, 2 or 3. C.

Fabric Spotting Machine. W. S. MacLelland, Jun. (Ellerson, Va.). U.S.P. 2,254,691.

A machine for " spotting " fabrics with suitable solvents consists essentially of two bowl-shaped members between which the cloth is clamped. The solvents are fed in swirling motion to the movable, upper bowl, and are sucked through the cloth, the force of the impact and suction being controllable. C.

Halomethyl Ethers: Mothproofing Agents, etc. H. A. Bruson and C. W. MacMullen (to Röhm & Haas Co.). U.S.P.2,266,737 of 23/12/1941 (through *Chem. Abs.*, 1942, **36**, 2351).

Halomethyl substituted aromatic ethers having the general formula $(hal\text{-}CH_2)_n\text{-}R\text{-}X\text{-}A\text{-}Y$ (hal = chlorine or bromine, $n = 1$ or 2, R = a carbocyclic aromatic radical, X = oxygen or sulphur, A = an alkylene group, the chain of which may be interrupted by oxygen or sulphur, and Y = -OH, -O-alkyl, -O-aryl, -OCO-alkyl, -CO-alkyl, -COO-alkyl, -COOH or $-CH_2hal$), are prepared by condensing an ether with formaldehyde and hydrochloric or hydrobromic acid. The compounds are used in the preparation of wetting agents, resins, insecticides, mothproofing agents, tanning materials and other industrial products. W.

Textiles: Rendering Water-repellent. Sandoz Ltd. F.P.850,327 of 14/12/1939 (through *Chem. Abs.*, 1942, **36**, 2163).

Textile materials are impregnated with an aqueous emulsion containing an acylating agent derived from fatty acids containing >9 carbon atoms, and one or more neutral emulsifying agents, and, after removing the excess emulsion, dried and heated above 50°. W.

Fibrous Materials: Waterproofing. I. G. Farbenind. A.-G. F.P.850,811 of 27/12/1939 (through *Chem. Abs.*, 1942, **36**, 2165).

Solutions or emulsions of dithiocarbamic acid salts derived from higher amine compounds are used. W.

Textile Materials: Waterproofing. I. G. Farbenind. A.-G. F.P.850,862 of 28/12/1939 (through *Chem. Abs.*, 1942, **36**, 2166).

The materials are treated with the compounds obtained by reacting substances of general formula $RCONX_1X_2$ (R = an aliphatic or cyclo-aliphatic radical containing >6 and preferably 15 carbon atoms, X_1 = a lower aliphatic radical containing >1 carbon atom and one halogen atom susceptible to substitution, and X_2 = a hydrogen atom or an organic radical) in an aqueous medium with tertiary *N*-bases, e.g. triethylamine, pyridine, ethylpiperidine or diethylaniline. The materials are then baked. W.

Hair: Dyeing. J. W. Orelup. F.P.851,487 of 9/1/1940 (through *Chem. Abs.*, 1942, **36**, 2159).

Hair, previously treated with a substance possessing a superficial cationic activity, e.g. a condensation product of a fatty acid containing 6-20 carbon atoms and a polyamine, is dyed with a non-toxic acid dye. W.

Dyeings: Improving Fastness to Light. I. G. Farbenind. A.-G. F.P.852,030 of 22/1/1940 (through *Chem. Abs.*, 1942, **36**, 2160).

Organic non basic compounds containing 10-30 carbon atoms and sulphuric acid radicals are incorporated into animalized natural or artificial materials. W.

Fibrous Materials: Waterproofing. I. G. Farbenind. A.-G. F.P.852,372 of 31/1/1940 (through *Chem. Abs.*, 1942, **36**, 2166).

Compounds are used of general formula $R_2R_3N\text{-}\overline{C:CH.CH:CH.CH:N}(A)R_1$ or $\overline{NH.CH:CH.CH:CH.C}:NR_2$ (A = an anion, R_1 = an aliphatic, alicyclic or aliphatic-aromatic radical, R_2 and R_3 hydrogen or organic radicals and, of R_1,

R_2 or R_3, at least one contains at least 6 and preferably 8 carbon atoms). The materials are then stoved at a temperature at which they are not deteriorated. W.

Fibres: Waterproofing. I. G. Farbenind. A.-G. F.P.852,552 of 27/2/1940 (through *Chem. Abs.*, 1942, **36**, 2426).

Natural or artificial fibres are treated with solutions or dispersions of condensation products having a betaine constitution and substituted at the nitrogen atom by the group R-X-CH_2 (R=a hydrocarbon radical or 12 or more carbon atoms which may be interrupted by hetero atoms, and X=oxygen or sulphur), then stoved at 80°-150°. W.

Textiles: Rendering Water-repellent. Färberei-Ges. Flores & Co. G.P. 681,817 of 14/9/1939 (through *Chem. Abs.*, 1942, **36**, 2426).

Textiles are impregnated with a carboxylic acid anhydride containing an acyl residue of a fatty or naphthenic acid containing >9 carbon atoms and a lower monoalkylcarbonic acid ester residue. W.

Germicides, Disinfectants and Mothproofing Compositions. A. Chwala (to I. G. Farbenind. A.-G.). G.P.704,410 of 27/2/1941 (through *Chem. Abs.*, 1942, **36**, 2091).

Di- or polycarboxylic acids or their derivatives are heated at over 200° with a mixture of (1) unsubstituted or substituted, primary or secondary, aliphatic or cycloaliphatic, 1,2- or 1,3-diamines which may contain other amino groups, and (2) salts of these amines with strong acids. The resulting imidazolines or tetrahydropyrimidines are effective germicides. In the form of their salts, e.g. with chlorobenzyl chloride, they are effective for mothproofing. W.

Animal Fibres: Mothproofing. E. Schirm (Deutsche Hydrierwerke A.-G.). G.P.705,246 of 20/3/1941 (through *Chem. Abs.*, 1942, **36**, 2060).

Aromatic hydroxy compounds containing at least one aliphatic radical containing >3 carbon atoms are used. W.

Mothproofing. H. Schüssler (to I. G. Farbenind. A.-G.). G.P.705,433 of 20/3/1941 (through *Chem. Abs.*, 1942, **36**, 2166).

Effective water-soluble compounds are derived from the action of sulphocarboxylic acids, halides or anhydrides or derivatives of naphthalene, biphenyl and di- or triphenylmethane containing several halogen atoms and one or more OH. The reaction is conducted in the presence of tertiary bases, e.g. pyridine. W.

Wool, Fur, etc.: Protecting Against Moths, etc. Deutsche Hydrierwerke A.-G. G.P.705,460 of 20/3/1941 (through *Chem. Abs.*, 1942, **36**, 2060).

Halogenated hydroxy aromatic compounds are used containing a higher aliphatic or alicyclic radical linked through oxygen, sulphur or nitrogen to the aromatic radical. Suitable aliphatic radicals are hexyl, octyl, decyl, dodecyl, etc., fatty acid radicals of myristic, palmitic acid, etc. Suitable alicyclic radicals are *cyclo*hexyl, methyl*cyclo*hexyl, etc. W.

Wool: Rendering Water-repellent. Merkel & Kienlin G.m.b.H. G.P.705,908 of 3/4/1941 (through *Chem. Abs.*, 1942, **36**, 2163).

Wool is treated with an oxygen-yielding compound, e.g. peroxides, per acids, permanganates, nitric acid, etc., thoroughly washed, and impregnated successively with aluminium acetate and an emulsion containing soap and paraffin wax. W.

Wool: Washing. E. Franz. G.P.706,653 of 30/4/1941 (through *Chem. Abs.*, 1942, **36**, 2163).

Raw wool is treated with a fatty acid to ensure permeation of the impurities, e.g. pitch. The excess acid is squeezed out, the remainder saponified by the usual means, and the wool washed clean. W.

Insecticide and Insect Repellent. C. C. Allen (to Shell Development Co.). Canadian P.402,541 of 27/1/1942 (through *Chem. Abs.*, 1942, **36**, 2060).

Acyl sulphides are used as a fly, gnat or mosquito repellent, either alone or in combination with known insecticides, e.g. pyrethrum, rotenone or nicotine. The acyl sulphides are prepared by reacting a mercaptan with a carboxylic acid, one of the reaction products being separated from the mixture by fractional distillation. W.

5—ANALYSIS, TESTING, GRADING AND DEFECTS

(A)—FIBRES

Cellulose: Staining Test. E. E. Post and J. D. Laudermilk. *Stain Tech.*, 1942, **17**, 21-24 (through *Brit. Chem. Physiol. Abstr.*, 1942, A II, 167).

Three drops of 2 per cent. iodine in 5 per cent. potassium iodide, diluted with 9 vols. of water containing 0·28 per cent. of glycerol, are applied with a glass rod, left for 30 sec. and blotted dry. Then one drop of saturated lithium chloride solution is added and the preparation is covered and examined. A blue colour developing within 5 min. denotes cellulose. C.

Cellulose Fibres: X-Ray Structure. E. Plötze. *Naturwissenschaften*, 1941, **29**, 707 (through *Chem. Abstr.*, 1942, **36**, 2133[1]).

X-Ray measurements showed that lattice dimensions, orientation and sizes of the crystallites of native fibres of cotton and ramie are about the same as those of low-molecular compounds. C.

Cellulose Acetate Rayon: Saponification. R. Haller. *Textilberichte*, 1941, **22**, 153-156 (through *Chem. Abstr.*, 1942, **36**, 2134[8]).

The action of various oxidising agents on cellulose acetate fibres was studied to see if any saponification took place; CrO_3, ClO_2, $KMnO_4$, H_2O_2, Bz_2O_2 and HCl had practically no saponifying effect. The swelling effects of cotton fibre in cupri-ethylenediamine solution should be obtained from surface-saponified cellulose acetate. Cellulose acetate fibres were saponified with 0·1N NaOH to a point where the methylene blue dyeing test showed a core of cellulose acetate still present. In acetone the inner core swelled but not with the bead-like swelling characteristic of cotton. The outer layer of cellulose separated and floated away. Thoroughly cleaned and bleached cotton does not exhibit bead-like swelling even though the cuticle is not removed. Bead-like swelling is attributed to pectins and waxes in the cuticle. Cellulose acetate was surface-saponified with Na aluminate and after-treated with alum; some Al was fixed in the outer saponified layer and the material gave slight bead-like swelling in acetone. A special fibre of circular cross-section was similarly treated. This gave marked bead-like swelling in 60° Bé sulphuric acid. Bead-like swelling is due to concentric layers of differing swellability. It is accentuated by circular cross-section. C.

Commercial Indian Cottons: Spinning Quality. N. Ahmad. *Indian Central Cotton Committee, Tech. Bull.*, Ser. A, No. 53, 1941, 103 pp.

Technological reports, including grader's valuation reports, spinning master's reports and spinning test results, are given on samples (supplied by the East India Cotton Association Ltd.) of fair average quality of the representative trade varieties which form the bulk of the Indian cotton crop, and on samples, representing early arrivals of the crop in each season, supplied through the Bombay, Ahmedabad and Southern India Millowners' Associations. The results relate to samples received during the last eight seasons. Tables showing the comparative results for the trade varieties and the corresponding standard cottons are given. C.

Standard Indian Cottons: Spinning Quality. N. Ahmad. *Indian Central Cotton Committee, Tech. Bull.*, Ser. A, No. 54, 1941, 115 pp.

Technological reports, including sections on agricultural details, grader's reports, fibre properties and spinning tests, are given on standard Indian cottons. Tables showing seasonal variations in fibre length, fibre weight per inch and highest standard warp counts, and summaries of fibre properties of standard Indian cottons, 1926-41, and spinning test results for 1931-41 are also given. Using the highest standard warp count as an index of spinning performance and comparing samples of the 1940-41 season with those of the previous season, only one cotton (Jarila) shows a definite improvement over the previous season, whilst ten have given practically the same performance, and ten show a falling off. The falling-off is most pronounced in the case of the Madras cotton, Hagari 1, and quite marked in the case of the four C.P. cottons, V. 262 (Nagpur), V. 262 (Akola), V. 434 (Akola) and Late Verum (Nagpur). C.

Insulating Materials, Refractories and Metals: Heat Transfer and Thermal Resistance. N. J. Hassid. *J. Soc. Chem. Ind.*, 1942, **61**, 63-65.

It is suggested that the theory of heat transfer might more conveniently be developed from thermal resistivity, rather than thermal conductivity, as a first principle. A rational development is outlined and units of thermal resistance defined. A specimen problem illustrates the ease of working by this method. Tables of thermal resistivities of insulating materials, refractories, metals and alloys are appended; values include cotton 41·3, loose kapok 50·5, wool 46, asbestos 11·4, cork 37·0, copper 0·00446, all at 0° C., in "practical thermal resistance units," i.e. the thermal resistance that limits heat flow to 1 B.Th.U. per hour per ° F. (or C.H.U. per ° C.). C.

South African Merino Wool: Basic Characteristics. IV. Scaliness. V. Bosman and C. M. Van Wyk. *Onderstepoort J.*, 1941, **16**, 543-554.

A series of South African wool samples were examined for scaliness, using essentially the apparatus and methods described by Speakman and Stott (this *J.*, 1931, **22**, T339), with modifications in the methods of sampling and the technique of mounting the fibres. The percentage differences in friction between the two directions varied from 30 per cent. to 130 per cent. At 70 per cent. R.H. and 70° F. the mean was 66·0 per cent., the standard deviation 17·6 per cent. and the coefficient of variability 26·6 per cent. No significant differences in scaliness between fineness groups within a staple were obtained. The regression coefficient of percentage difference in friction on fibre fineness was −2·30, showing that on the average the percentage difference in friction decreases by 2·30 per cent. for every micron increase in the fibre fineness of the sample. The values for percentage difference of coefficient of friction for the different quality numbers of South African merino wool are given. Wool from rams gave a lower value for scaliness concordant with a coarser wool. The scaliness of the wool grown by three sheep on constant feed decreased with age, though no corresponding changes in fibre fineness occurred. Crimp gave no indication of scaliness. No values of coefficients of friction are given in any case. W.

(B)—YARNS

Dyed Silk: Stability Tests. K. Markuze and M. I. Babynicheva. *Trudy Tsentral. Nauch.-Issledovatel Inst. Shelka,* 1939, No. 2, 3-42; *Khim. Referat. Zhur.*, 1940, No. 2, 108 (through *Chem. Abstr.*, 1942, **36**, 2148[9]).

Methods for testing the stability of dyes on silk and other fibres to light, wet treatment, friction, etc., are critically examined and new methods for silk, rayon and silk mixed with wool and cotton are proposed. The proposed standards give a numerical evaluation of the stability of the dyes to various factors. C.

(C)—FABRICS

American Army Fabrics: Specifications. *Textile World,* 1942, **92**, No. 5, 68.

Specifications for cotton and acetate rayon fabrics for sleeping bags are given. The specification for banner silk fabric is also given for the purpose of assisting attempts to devise a substitute of rayon. C.

Clothing: Hygroscopic Properties. Jean H. Nelbach and L. P. Herrington. *Science,* 1942, **95**, 387-388.

In studies of heat loss from clothed subjects it has been noted that the thermal effect of moisture changes in clothing can be of large order in relation to human heat production. Such effects may produce confusing results in studies of heat loss under conditions of widely different relative humidity. In changing a clothed subject from a low to a high relative humidity at the same temperature, the effect appears as a plus error in the subject's heat balance since heat is evolved as a result of absorption of moisture by the clothing. If a considerable fraction of this heat is released in a short time, the practical effect may be considerable. Tests have been made with a man's woollen garment weighing 1·86 kilos when dry at 70° F. The garment was allowed to come to equilibrium at 70° F. and 25 per cent relative humidity. It was then weighed and packed in an air-tight metal container, while the temperature and relative humidity of the room were being adjusted to a new level. The garment was then unpacked and hung on the balance and weight gain or loss was recorded continuously at set intervals until full equilibrium was reached. This procedure was repeated, using a new temperature and relative humidity setting for the last half of the operation. The

garment was tested over a temperature range from 45° to 90° F. At each temperature a high and a low relative humidity was established (77 per cent. and 33 per cent. approximately). Graphs are given showing the gains and losses of weight in the suit for the first six hours. Final equilibrium was reached in most cases within 24 hours. More than half the total change in weight took place in the first two hours of exposure. Relative humidity influenced the weight change far more than temperature, although the effect of 10° rises in temperature was observable for comparable relative humidities. A hysteresis effect was noted when the relative humidity was varied from a low to a high value and back to the original at a fixed temperature. The importance of a thorough knowledge of the hygroscopic properties of clothing materials for the designing of protective garments for optimum comfort under extreme conditions is pointed out. C.

Clothing: Influence on Air Conditioning Requirements. C. P. Yaglou and Anne Messer. *J. Amer. Med. Assoc.*, 1941, **117**, 1261-2 (through *Bull. Hygiene*, 1942, **17**, 334).

A difficulty in the heating or cooling of buildings lies in reconciling conflicting comfort requirements of men and women. In a study of these requirements healthy men and women were subjected to ordinary air conditions of the type prevailing in their workrooms and offices. A minimum of two hours was allowed for adaptation before making observations of skin, clothing and body temperatures, metabolic rates and sensations of comfort. When men and women, wearing their customary winter clothing were in equilibrium with air and walls at 72° F., 30 per cent. R.H., and an air movement of about 30 ft. per min., the mean skin temperature of women was about 2° F. lower than that of men, whilst the mean clothing temperature was 2° F. higher. Under these conditions most of the men were comfortable, but the women generally were cold. To make most of the women comfortable, the air and wall temperatures had to be raised to 76° F., but the men were too warm at this temperature. Under comfortable conditions (71·5° F. for men, 76° F. for women) the mean skin temperature of men and women was almost the same, 92° F., but the mean clothing temperature of women was about 5° higher. In warm summer weather, when air and wall temperatures averaged 80° F., the women were comfortable but most of the men were too hot. The mean skin temperature of women was still 1° lower than that of the men and their clothing temperature 1° higher. These differences disappeared at about 94° F., when skin and clothing temperatures approached air temperature. When man and woman wore similar clothes they were comfortable at about the same environmental temperature, despite the great difference in their metabolic rates. With a minimum of clothing a temperature of 82-83° F. satisfied both sexes. When men were dressed in women's summer clothes weighing 0·8 lb. (including shoes) they wanted a temperature of 80° F., which was about as high as that preferred by women similarly dressed. But when the men wore their own summer clothes (3 lb.) they wanted a temperature of 76° F. When women wore men's winter clothes, weighing 6·2 lb. against their own 1·5 lb., a temperature of 72° F. was required, which was only 0·5° higher than that preferred by men wearing similar clothes. It was concluded, therefore, that differences of comfort standards between men and women, and individual differences, were largely due to differences in dress and could be reconciled by adjustments of clothing. C.

Copper: Detection in Dyed Fabrics. *Ciba Review*, 1942, No. 36, 1317.

The ash from the fabric is digested in hot hydrochloric acid (1 : 1) and the extract is added to water in a beaker. The same volume of acid is added to the same volume of water in another beaker. A few drops of ferric chloride are added to each beaker followed by a few drops of K. thiocyanate and then some Na thiosulphate. The blood red colour will soon be discharged if the solution contains copper. C.

7—LAUNDERING AND DRY-CLEANING

(A)—Cleaning

Soap: Saving by the Use of Dispersing Agents. G. Ullmann. *Textile Manufacturer*, 1942, **68**, 283.

Considerable savings in the use of soap can be made by adding small quantities of sulphonated oils or other suitable dispersing agents to soap or soap solu-

tions. In this way an increase of activity of the soap is produced and lime soaps are rendered harmless merely by dispersing them. The sulphonated oil is first dissolved in about five times its own weight of water and added to soap baths either before or together with the soap. Recipes for soap baths for use in the treatment of printed cotton fabrics and bleached cotton yarns, and the scouring and milling of wool are given. C.

Lipstick: Curse and Cure. *Laundry Age,* 1942, May, p. 53.

This article deals with the various kinds of lipsticks and how the spotter may treat them. La.

What's Wrong with your Washing? British Launderers' Research Assoc. *Power Laundry,* 1942, **66**, 79, 183, 327, 423, 575, 623; **67**, 37.

(1) Bleaching Do's and Don'ts. (2) Second Rinse Bleaching. (3) Unskilled Labour need not mean "Indifferent Washing". (4) Falling Lather must be checked. (5) Washes May Cause Staining. (6-8) Those Chemicals! A series of articles on troubles brought about by defects in washing processes and other causes. La.

Fabrics and the Laundry. British Launderers' Research Assoc. *Laundry Record,* 1942, **64**, 33, 93, 133, 187, 245, 293; **65**, 24.

(1) Damage Caused by Trolleys. (2) Damage Caused by Stitching. (3) Curtains Damaged by Exposure. (4) Semi-stiff Collars Provide Many Research Problems. (5-7) Terry Troubles. A series of articles dealing with fabric damage that may appear in the laundry. La.

(C)—Finishing

Tea Cloths: Laundering and Serviceability. Margaret B. Hays and Ruth E. Rogers. *Rayon Textile Monthly,* 1942, **23**, 289-290.

Particulars are given of a test of the serviceability of a brand of tea cloth ("dish towel") composed of 45 per cent. rayon staple, 38 per cent. cotton and 17 per cent. linen, when used in two homes employing different laundry practices, one including the use of a bleach and a sour and the other using soap suds only. The data recorded are (1) number of times laundered (up to 50), (2) weight per sq. yd., (3) thickness, (4) warp and weft counts, (5) warp and weft breaking loads, (6) fluidity in cuprammonium, and (7) copper number. C.

8—BUILDING AND ENGINEERING

(A)—Construction and Maintenance of Buildings and Plant

Plastic Coatings: Use in Textile Mills. E. A. Gurkov. *Korroziya i Borba s Nei,* 1939, **5**, No. 5-6, 97-109 (through *Chem. Abstr.*, 1942, **36**, 2150[5]).

Bakelite plastic coatings for apparatus used in textile mills was found satisfactory for many parts. Methods of application are described. Etching in 20 per cent. sulphuric acid, polishing with sand, and phosphatization of the metal surface preliminary to application of bakelite were found effective, especially the combination of the last two, in increasing the adhesion of the film. A more elastic film was obtained by using an alkyd lacquer either as a foundation under the bakelite, or in mixture with the bakelite in different proportions. A combination of 20 per cent. alkyd lacquer (sp. gr. 0·920) and 80 per cent. bakelite lacquer (sp. gr. 1·020) dissolved in a mixture of alcohol and benzene was found to be the best foundation, this was followed by three layers of lacquer of sp. gr. 0·895 from bakelite mixed with 10 per cent. of dibutyl phthalate or 10 per cent. tolyl phosphate as plasticizer. A filler of 85 per cent. ferric oxide, 10 per cent. talc and 5 per cent. zinc oxide was used with excellent results. A simplified procedure for applying "textolite," adapted for the textile industry, comprises coating the metal with a bakelite foundation, and winding with air-dried cotton soaked in bakelite, subjecting to a pressure of 3-5 kg./sq. cm., drying in air and then in the oven at 90°, again soaking in bakelite, and baking in the oven at 150°. A combination of bakelite with paper instead of cotton also was found to be very good. C.

Synthetic Resins: Application in Varnishes. E. A. Bevan. *Chem. and Ind.,* 1942, **61**, 261-267.

This paper gives a general account of the synthetic resins used in the manufacture of surface and protective coatings by the paint, varnish, linoleum and

printing ink industries. These are classified into six main groups: (1) Coumarone resins and indene polymers, (2) Vinyl ester polymers, (3) Monocyclic ketone products, (4) Urea, including melamine, resins, (5) Glyptals, or alkyd resins, and (6) Urea-formaldehyde resins. The production and structure of the materials are discussed. C.

(C)—Steam Raising and Power Supply

Steam: Economy in Bleaching, Dyeing and Finishing. P. L. Geiringer. *Textile World,* 1942, **92**, No. 3, 84-5.

Practical hints are given on the saving of steam in the heating of kiers, dye-baths and drying machines, and on the recovery of steam from exhaust pipes, agers and the like. C.

Boiler House: Improvement of Efficiency. D. R. H. Williams. *Textile Manufacturer,* 1942, **68**, 277-279.

An account is given of improvements in boiler-house arrangements which in one mill have resulted in a reduction in coal consumption of at least 15 per cent. and a considerable reduction in the consumption of water. The improvements included a reorganisation of arrangements for the collection of condensed water, and the installation of control instruments. Details and photographs are given. C.

Fuel Efficiency. Mines Dept.: Fuel Efficiency Committee. *Fuel Efficiency Bull.*, Nos. 1-4, 1942.

These bulletins deal with steam production and consumption, heat insulation (lagging), correct methods of condensate and air removal, and making the best use of condensate. W.

Wool Scouring Liquors Containing Sulphated Higher Alcohols: Clarification. L. J. Sitomer and F. C. Vilbrandt. *Virginia J. Sci.*, 1941, **2**, 206 (through *Chem. Abs.*, 1942, **36**, 2150).

Dialysis, precipitation, agitation, absorption on stone in a packed column and electrolysis were studied to undertake clarification of the stable colloidal wastes resulting from cleansing raw wool in the presence of synthetic detergents. Electrolysis showed very little promise; dialysis indicated the best possibilities. W.

Economisers. F. J. Matthews. *Laundry Record,* 1942, **64**, 189.

Some notes on the care of economisers, including consideration of air infiltration, short-circuiting of gases, fouling of pipes, dampness, and insulation. Appreciable saving follows regular attention to these points. La.

Economisers are Prone to Accidents. F. J. Matthews. *Laundry Record,* 1942, **64**, 305.

Further notes on plant stoppages, high feed-water temperature, leakage of water, blow-down, etc., and scaling of water passages as related to economiser safety precautions. La.

Aercon Draught Balance. *Power and Works Engr.*, 1942, **37**, 125.

A description of a device which maintains the furnace draught constant by allowing more or less air to enter the flue, other than through the furnace, to compensate for any change in chimney conditions. La.

Speed Regulation of D.C. Motors. G. W. Stubbings. *Power and Works Engr.*, 1942, **37**, 116.

The elementary theory of D.C. motors ignores certain characteristics such as the effect of the armature current on the field and this leads to an over simplification of the theory of speed regulation. The alterations in theory and practice necessary for speed variation under these more practical conditions are explained. La.

(D)—Power Transmission

Machine Gears: Durability and Lubrication. *Engineer,* 1942, **173**, 522-524.

Tests have been made with case-hardened steel gears and various lubricants, including medium engine, light engine and castor oils and medium engine oil containing various dopes. The results confirm the importance of having a tooth profile modified to suit the loads to be carried. With generous profile relief and a copious supply of lubricant, greater loads could be carried with undoped oils than could be carried by unmodified gears when running with a restricted supply

of doped oil. All the dopes tested improved to a greater or less extent the load-carrying capacity of the base oil. Tests have also been made with ground spur gears of different types of steel lubricated with a medium-viscosity solvent-treated mineral engine oil to which was added 1 per cent. by volume of methyl dichlorostearate to increase the film strength. The results show that case-hardened gears can be loaded to higher specific loads than direct hardened medium-carbon steel gears, even when the latter are surface hardened by either cyaniding or nitriding. The results do not indicate any one case-hardening steel as being definitely better or worse than the others tested, from which it would appear that the wearing properties of a carburised case are not greatly affected by the alloy content, but more by the resultant hardness. Pitting does not appear to be affected by the form of profile or by the method of supplying the lubricant, but is, on any one steel, accelerated by low surface hardness. Scuffing, on the other hand, is caused by interference or lack of sufficient profile modification. It occurs more readily on some steels than on others, and does not seem to be directly connected with the surface hardness, but is directly influenced by the effectiveness of the lubricant supply. C.

Plastics: Lubrication. E. G. Acheson Ltd. *Engineer*, 1942, **173**, 471.

A fabric plastic can sometimes function dry against steel and non-ferrous alloys. When it is employed as a straightforward journal bearing and is subject to continuous rubbing against a shaft, the use of a coolant, such as water, is sometimes necessary. Dry lubrication may be effected by means of films formed with " dag " colloidal graphite. Dispersed in a volatile carrier, such as acetone, the colloidal graphite is brushed on to the fabric plastic surfaces after machining, and the carrier evaporates leaving a thin slippery film. The kinetic coefficient of friction of such a dry film compares favourably with a boundary film of lubricating oil, whilst static friction is also low. In some cases a dispersion of " Aquadag " colloidal graphite in water has been employed, but the type of carrier used for the colloidal graphite depends on local conditions. Another possibility is the incorporation of this product dispersed in acetone into a synthetic resin, which can then be applied to the surface of the plastic bush or bearing. An advantage of the above technique is that the graphite film formed with the colloidal product adheres well to the surfaces on which it lies. C.

Vegetable Oil Lubricants: Properties and Uses. J. S. Aggarwal and L. C. Verman. *Indian Indust. Res. Bull.*, 1940, No. 18, I, 5-25 (through *Brit. Chem. Physiol. Abstr.*, 1942, B I, 187).

Heat-treatment of castor oil makes it more susceptible to oxidation, especially in the presence of Fe, but lowers its viscosity, and Fe promotes oxidation of castor oil, but appears to have little effect on the oxidation of mineral oil. Raw and refined ground-nut and cottonseed oils were treated with a large number of antioxidants and the viscosities, acid values, and Conradson carbon residues of the oils were determined before and after subjecting them to a modified Air Ministry oxidation test. These modifications involved the use of oxygen instead of air and the introduction of steel balls into the oxidation tube. Tabulated data show that vegetable oils, especially in presence of Fe, polymerise more readily than do mineral oils, and that even in presence of stabilisers they become more acidic and give higher Conradson carbon residues. Most of the stabilisers effective with ground-nut oil were ineffective with cottonseed oil. Tin compounds, organometallic compounds, and colloidal graphite which show pronounced antioxidant properties with mineral oils are ineffective with vegetable oils. Chromium and tin compounds promote oxidation of refined ground-nut oil. Organic sulphur compounds are of little value for stabilising vegetable oils. Generally the most effective stabilisers are the phenols and aromatic amino compounds, but neither the phenolic OH nor the NH_2 is alone responsible for the antioxidant properties. α-Naphthol was effective, but β-naphthol was not. It is suggested that it may be possible to inhibit the corrosive properties of phenols without interfering with their antioxidant character. C.

Lubricating Oils, Rubber and Stainless Steel Equipment: Conservation. W. E. Gooday. *Textile Manufacturer*, 1942, **68**, 280-281.

The selection of lubricants is briefly discussed, the importance of cleanliness in storage is pointed out, methods of applying lubricating oils are considered,

and methods of reconditioning used oil are described. Notes are given on the care or rubber products, such as hose, belts and clothing, and the care of stainless steel equipment. C.

Pyrotenax. *Power and Works Engr.*, 1942, **37**, 124.

A brief description of the characteristics and uses of Pyrotenax Mineral Insulated copper clad cables, which employ compressed magnesia in a copper sheath as insulation. La.

High Temperature Lubrication. *Mech. World,* 1942, **111**, 569.

Compound oils and greases frequently cause trouble, owing to carbonisation, when used in high temperature situations. It has been found that Acheson "dag" colloidal graphite in a light mineral oil can be used at least up to 600° C. in all types of atmosphere. Suspensions in kerosene or water can be used if even a light mineral oil is unsuitable. La.

(F)—LIGHTING

Textile Mills: Fluorescent Lighting. E. Mauldin. *Textile World,* 1942, **92**, No. 5, 86-89.

The advantages of fluorescent lighting are pointed out and tables are given showing the characteristics of available fluorescent lamps and recommended levels of illumination for the various departments of gray goods mills. Auxiliary control equipment and arrangements for reducing the stroboscopic effect are discussed. It is pointed out that installations should be planned to make tube replacements and cleaning as easy as possible. Photographs showing fluorescent lighting installations in various American mills are given. C.

(G)—HEATING, VENTILATION AND HUMIDIFICATION

Air: Compression and Expansion. A. L. Egan. *Engineering,* 1942, **153**, 423-424, 443-445.

A study of the relationship between heat and work during simple adiabatic compression and expansion, the thermodynamics of turbo-compressors and turbo-motors, and the work output of compressed-air motors. C.

Germicidal Air Duct Lamps: Application. M. Luckiesh and L. L. Holladay. *Gen. Elec. Rev.*, 1942, **45**, 223-231.

The investigation described was planned to obtain data on the installation of germicidal ultra-violet lamps in ventilation systems. The air in a cylindrical duct containing a 36 inch, 30-watt lamp, was infested with *B. coli,* the concentration of which was determined at each end of the duct. The criterion for determining whether an irradiated bacterium survived was its ability to develop a colony. The effects of humidity, character and rate of air-flow, ultra-violet reflection factor of the lining of the duct, distribution and concentration of bacteria and dosage of germicidal energy near $\lambda 2537$ were studied. The proportion of bacteria, P/P_0, surviving after being exposed for time t to an intensity E of lethal radiation is an exponential function of the form $P/P_0 = e^{-KEt}$. When the exponent of e is -1, Et is termed a "unit lethal exposure", corresponding to a survival of 36·8 per cent. It was found that the unit lethal exposure varies from 4·5 milliwatt-minutes per square foot for dry air (20 per cent. R.H.) to 10 for moist atmospheres (75 per cent. R.H.). Advice is given regarding the determination of the number of lamps necessary in a given installation. C.

Humidity and Vapour Pressure Nomographs. K. D. Beardsley. *Gen. Elec. Rev.*, 1942, **45**, 281-283.

Nomographic charts are given for the determination of humidity, expressed as vapour pressure in inches of mercury, from observed wet- and dry-bulb temperatures. The derivation of the charts is briefly explained and their use is discussed. C.

(H)—WATER PURIFICATION

Automatic Self-cleaning Water Strainer. H. A. Brassert & Co. *Engineering,* 1942, **153**, 446.

An automatic self-cleaning strainer for removing solid particles from water drawn from muddy rivers, and also from town water supplies, consists of a cylindrical cast-iron casing, inside which a perforated cast-iron tapered drum is slowly rotated. The holes in the drum are fitted with screening discs, either

of stainless steel or porcelain, in both cases perforated with many small holes to form a mesh. The holes in the drum are tapped and the discs are retained in position by screwed rings. The drum is open at the bottom, and above and below the screen holes has bearing faces which are lapped to run, with very small clearance, in corresponding bearing rings in the casing. The raw water enters the strainer through a flanged orifice which communicates with the chamber formed between the inner surface of the casing and the outer surface of the tapered drum. Clean water passes to the interior of the drum and to the discharge chamber below, which communicates with a flanged outlet. Any foreign matter in the raw water is retained by the screening discs. The self-cleaning feature of the strainer is provided by means of a wash-out orifice situated inside the casing at one side and cast integrally with it. The orifice is a vertical slot, $1\frac{1}{2}$ in. wide, and the face in which the slot is formed is machined and lapped to the contour of the tapered drum. The orifice communicates with an independent discharge pipe. As the drum rotates the screening discs are brought, in turn, over the wash-out orifice so that flow through them is reversed and matter strained from the raw water and accumulated on them is flushed away to discharge by a flow of clean water from the inside of the drum. The wash-out discharge, carrying the whole of the material separated from the raw water, may be led if desired to settling basins. The drum is connected to a vertical shaft which is slowly rotated by an electric motor carried by the cover and driving through a gear-box. C.

Water: Micro-straining. P. L. Boucher. *Engineer,* 1942, **173**, 420-422, 445-447.

Straining tests with all kinds of possible straining materials and with many samples of natural and industrial waters, revealed the fact that much of the suspended matter in such waters is in a very fine state of division and will readily pass through ordinary fine wire cloth. Attempts to reduce such finely divided matter by straining proved to have little effect until the finest, 350-mesh, wire cloth was used. Even this material, in many experiments made with different water samples, allowed much visible sediment to pass. By bright electro-plating of the cloth the original 39-micron aperture can be reduced considerably. Tests have shown that the most effective size for the apertures, taking flow capacity and straining efficiency into account, is about 20 microns. Tests with a nickel-plated cloth of this type are described. The results of corrosion resistance studies indicate that the cloth can be used with confidence in water having *p*H values between 5·5 and 9·0, which range covers ordinary natural and industrial waters. A model rotary strainer for small-scale tests is described and results obtained with River Irvine water, water containing silt, and " gas water " are shown graphically. Considerable proportions of the suspended materials were removed by micro-straining and when the water was first chemically treated in order to flocculate the suspended matter, removal of solids by micro-straining amounted to 70-90 per cent. and more, being even as high as 98 and 99 per cent. in certain cases. Possible applications of micro-straining, and the types and dimensions of suspended solids removed by this process are discussed. C.

9—PURE SCIENCE

Asiatic Cotton Virescent Mutants: Genetical Behaviour. C. P. Yu. *J. Amer. Soc. Agron.*, 1941, **33**, 756-758 (through *Exp. Sta. Rec.*, 1942, **86**, 458).

The virescent genes v_2, v_3 and v_4, mutants affecting the chlorophyll content occurred in pure lines of Asiatic cotton, and with their allelomorphs showed simple Mendelian inheritance. The v_1 and v_2 segregate independently and are complementary factors. The v_3 and v_4, also two different genes, segregate independently. The v_4 shows independent inheritance with genes for anthocyanin pigment, corolla colour and curly leaf. C.

Upland Cotton: Influence of Internal Genetic Change on Fibre Length. J. H. Moore. *J. Amer. Soc. Agron.*, 1941, **33**, 679-683 (through *Exp. Sta. Rec.*, 1942, **86**, 471).

Mass-selfed and open-pollinated progenies of a Mexican strain of American upland cotton were planted for 3 successive years on a field that had grown only Mexican strains. No change was noted in combed fibre length or in its variability or in plant type or seed after 1, 2 or 3 years of mass-selfing or open-

pollination. Arrays on the Baer sorter showed no real differences in fibre-length distribution of ginned staple at the end of four seasons in a comparison of the two kinds of seed stocks with the original seed. Where contamination of seed is avoided, varieties registered or eligible for registration apparently do not run out as measured by fibre length. C.

Micropipette: Construction. F. Rosebury and W. E. Heyningen. *Ind. Eng. Chem. Anal. Ed.*, 1942, **14**, 363-364.

The construction of a micropipette and the setting up of apparatus for density determinations in heavy water analysis are described. The instrument is a modification of one described by Keston, Rittenberg and Schoenheimer, from which drops of highly uniform size are expelled and measured for density by the falling drop method. A stainless steel screw with bakelite knob presses upon the head of a piston, the shank of which is seated in a steel platform the extension to which is glass tubing which, in turn, is sealed to capillary tubing. C.

Polarograph: Construction and Operation. N. H. Furman, C. E. Bricker and E. B. Whitesell. *Ind. Eng. Chem. Anal. Ed.*, 1942, **14**, 333-340.

The article describes in some detail, with a photograph and diagrams, a polarograph of the Nejeldy (Heyrovský-Shitaka) type which was constructed when a suitable instrument of the standard type was not available. It is said to have given excellent performance over a period of a year. Typical records taken with the instrument are reproduced. C.

Polarographic Work: "Water Wave" and its Elimination. I. M. Kolthoff and E. F. Orlemann. *Ind. Eng. Chem. Anal. Ed.*, 1942, **14**, 321-323.

In the polarographic analysis of solutions having a concentration of indifferent salt (e.g. alkali and earth alkali salts) greater than about 0·5M, large errors may be caused by the occurrence of a "water wave" due to the reduction of water molecules. The water wave and the abnormalities caused by it are completely eliminated by the addition of 0·01 per cent. of gelatin to the solution. C.

Sodium Thiosulphate: Standardisation. B. D. Sully. *J. Chem. Soc.*, 1942, 366-368.

It is shown that copper is a powerful catalyst for the reaction between potassium dichromate and potassium iodide and a new method of standardising sodium thiosulphate based on this fact is described. This method avoids the use of a mineral acid with potassium iodide and is more rapid and more accurate. The recommended procedure is:—To 20 ml. $\frac{N}{10}$ potassium diochromate in a 250 ml. flask add 5 ml. glacial acetic acid, 5 ml. $\frac{N}{1000}$ copper sulphate and 20 ml. distilled water. Then add 20 ml. 15 per cent. potassium iodide and titrate with $\frac{N}{10}$ sodium thiosulphate at 20-25°, using starch paste for the end point. 0·05 ml. is substracted from the titration reading to allow for the iodine liberated by the copper sulphate catalyst. C.

Cellulose Mixed Esters: Analysis by Partition Method. C. J. Malm, G. F. Nadeau and L. B. Genung. *Ind. Eng. Chem. Anal. Ed.*, 1942, **14**, 292-297.

The partition method has been found to be practical and satisfactory for the analysis of mixed esters of cellulose and particularly for cellulose acetate propionates, acetate butyrates and acetate propionate butyrates. The procedure is described; it involves: determination of the total combined acids, saponification and isolation of the acids, determination of the partition coefficients between butyl acetate and water of the acid mixture and, separately, of each acid, calculation of the molar ratios of the acids and calculation of the weight per cent. of the acids from the molar ratios and the total acid content of the ester. In the case of propionyl or butyryl contents less than about 35-40 per cent., the acyl content should be determined by the Eberstadt, or other, method, but for higher contents, the alcoholic alkali procedure must be used. It is claimed that commercial cellulose acetate propionates and acetate butyrates can be analysed with an accuracy of about $\pm$0·2 weight per cent. acyl. The effects of some variables—butyl alcohol content of butyl acetate, temperature of extraction, acid concentration and different extractants—are discussed. C.

Copper, Lead, Zinc: Separation with Salicylaldoxime. L. P. Biefeld and W. B. Ligett. *Ind. Eng. Chem. Anal. Ed.*, 1942, **14**, 359-361.

The paper describes work on (*a*) the effect of *p*H on the precipitation of zinc salicylaldoxime and (*b*) the best conditions for separating copper, lead and zinc in the same solution. Zinc salicylaldoxime begins to precipitate at *p*H 5·8, is completely precipitated in the range 7·1-8·1, and is again soluble above *p*H 9·7 if the *p*H is regulated with ammonia. Copper, lead and zinc in the same solution may be separated with salicylaldoxime by precipitating the copper in weakly acidic solution (using modified methyl orange as indicator), filtering it off, and then making the filtrate strongly ammoniacal to cause precipitation of the lead complex. The separation of lead from zinc in strongly ammoniacal solution is improved by the addition of a large amount of ammonium nitrate. C.

Ethanol-Methanol-Water System: Analysis. J. Griswold and J. A. Dinwiddie. *Ind. Eng. Chem. Anal. Ed.*, 1942, **14**, 299-300.

A graph is reproduced showing the relationship between boiling point (°C. at 760 mm.) and the ratio refractive index/density at 25° C. for the ternary system ethanol-methanol-water. This affords a rapid and accurate physical method of analysis involving no assumptions or adjustments. C.

Pentachlorophenol: Estimation. W. Deichmann and L. J. Schafer. *Ind. Eng. Chem. Anal. Ed.*, 1942, **14**, 310-312.

The method described—which has been developed for the determination of pentachlorophenol in biological material, utilizes the formation of a reddish-yellow pigment with fuming nitric acid. This is determined spectrophotometrically. C.

Organic Nitrogen Compounds: Colour Reactions with Selenious Acid-Sulphuric Acid. B. T. Dewey and A. H. Gelman. *Ind. Eng. Chem. Anal. Ed.*, 1942, **14**, 361-362.

The colour reactions of a number of organic nitrogen compounds with selenious acid-sulphuric acid are listed and discussed. It is suggested that in certain cases they provide a sensitive method for detecting and distinguishing different compounds. The colours produced by 1-naphthylamine, 2-naphthylamine and di-2-naphthylamine can be readily distinguished. Diphenylguanidine shows no colour; triphenylguanidine yields a pale but definite blue which changes to yellow; neither is coloured with sulphuric acid alone. C.

Particle Concentration: Photoelectrometric Analysis. W. Seaman, A. R. Norton and C. Maresh. *Ind. Eng. Chem. Anal. Ed.*, 1942, **14**, 350-357.

A method is described for the estimation of one constituent of a mixture which involves measuring by means of a photocell and galvanometer, the intensity of light transmitted by that constituent. The method is applicable to any mixture of which one constituent can be made luminous and the other constituents invisible or of low luminosity, e.g. by crossed Nicol prisms, selective staining with use of colour filters, or fluorescence. Estimations of (*a*) potato starch, (*b*) anthraquinone-β sulphonate, and (*c*) anthraquinone-1,8- disulphonic acid as barium salt are discussed. C.

Cellulose Cupriethylenediamine Solution: Fractional Precipitation. F. L. Straus and R. M. Levy. *Paper Trade J.*, 1942, **114**, *TAPPI*, 211-215.

The paper discusses the fractional precipitation of cellulose from its solutions in cupriethylenediamine and gives the results of fractionation experiments on a " lightly bleached native cotton ", and purified and hypochlorite-degraded flax cellulose. Solutions of cellulose in 0·5M cupriethylenediamine were prepared, the cellulose being dissolved in the presence of an 80 per cent. excess of solid cupric hydroxide. Cellulose fractions were precipitated from these 1 per cent. solutions by titration with 8N sulphuric acid. The cellulose fractions were redissolved in cupriethylenediamine and their viscosity determined. The degree of polymerisation is calculated ($=260\eta$) from the intrinsic viscosity $\eta = 2 \cdot 3023S$ where S is the slope of the straight-line graph connecting the reciprocals of the concentration and log. relative viscosity. The nature of the cellulose-copper-ethylenediamine complex is discussed in relation to these experiments. C.

Cellulose Esters: Crystallinity. W. O. Baker, C. S. Fuller and N. R. Pape. *J. Amer. Chem. Soc.*, 1942, **64**, 776-782.

Recognising the importance to physical properties of the balance between crystalline and amorphous phases in cellulose and its derivatives, the authors have studied the effects of (*a*) heat, (*b*) solvents, (*c*) hydrogen-bonding agents on cellulose triacetate, acetate-butyrate and tributyrate. X-ray patterns (Debye-Scherrer) are reproduced to show the effects of (*a*) solidifying near the melting point, quenching at −75° C., and annealing for different times (5 minutes-95 hours) at different temperatures (100°-225° C.); (*b*) chloroform and acetone vapours at 25° C. on the quenched samples; and (*c*) immersion of the quenched samples in water for 1-5 hours at 100° C. The results show high crystallinity and order on solidification a few degrees below the melting point, whilst quenching leaves chain sections apparently locally parallel but randomly rotated about their longer axes. The temperature coefficient of the rate of solid-state annealing of cellulose tributyrate is interpreted as an activation energy. Comparison of the solid state crystallisation rates for the three esters indicates that the most significant structural modification by longer acyl residues is separation of the cellulose chains. Solvent vapours facilitate chain motion in the quenched solids. Water seemed to neutralise dipoles in the tri-esters and permitted increased chain motion, but its effect was most marked where it could bond with residual hydroxyl groups. C.

Cotton Hull Fibre: Catalytic Hydrogenation. H. R. Henze, B. B. Allen and B. W. Wyatt. *J. Org. Chem.*, 1942, **7**, 48-55 (through *Chem. Abstr.*, 1942, **36**, 1909[3]).

When a suspension of cotton batting in caustic soda is subjected to a pressure of 75-85 lb. and then hydrogenated in 7 per cent. caustic soda at 250° and 4,800-5.400 lb. pressure, the cellulose is completely dissolved, yielding a colourless homogeneous solution. Cotton hull fibres (300 g.) react with 8·11 mols. of hydrogen giving 3·31 mols. of gaseous hydrocarbons (chiefly methane), 0·15 mol. of carbon dioxide and 2·39 mols. of acid material. An ether extract of the neutralised solution may be separated by steam distillation into five fractions, (*a*) b_{754} up to 150°, (*b*) b_{33} 76-96°, (*c*) b_5 75-105°, (*d*) b_5 110-114°, (*e*) $b_{3\cdot5}$ 114-146°. Fraction *d* consists of a mixture of γ- or δ-hydroxycaproic acid and its lactone. Fraction *a* contains acetic acid and either propionic or one of the butyric acids. C.

Hydrated Cellulose: Structure. B. Baule, O. Kratky and R. Treer. *Z. physikal. Chem.*, 1941, B **50**, 255-297 (through *Chem. Abstr.*, 1942, **36**, 2133[2]).

The formation of a micellar structure at precipitation in which crystalline (micelles) and amorphous regions are linked like a network by fibre-molecules can be explained by considering the mobility and ability of crystallisation. A quantitative examination can be made by X-ray study of the orientation processes connected with the deformation. The hypothesis of a leaflet form can explain the observed course of orientation; the characteristic extension effects, such as the squeezing out of water of highly swollen fibres, and the value of the maximum extensibility are also explained. The network hypothesis is confirmed by these results. C.

Erythroamylose Particles: Shape. M. Samec. *Z. physiol. Chem.*, 1941, **267**, 243-250 (through *Chem. Abstr.*, 1942, **36**, 1963[4]).

The molecular weight of erythroamylose from potato starch, as determined by the osmotic method, is about 230,000. The specific viscosity is comparatively small and this leads to a much smaller viscosity-molecular weight constant $[K = (0\cdot18 - 0\cdot10) \times 10^{-4}]$ than that of amyloamylose ($K = 0\cdot9 \times 10^{-4}$). The particles of erythroamylose therefore appear to be more spheroidal. The specific viscosity of erythroamylose decreases only slightly with increase of temperature, but the addition of a small amount of α-amylase from malt leads to a very noticeable decrease of viscosity with temperature. This effect, which is observed during progressive stages of the reaction, is significant for the explanation of enzymic coagulation. At the beginning of the reaction with α-amylase the average particle size decreases more than the specific viscosity and *K* therefore

increases until it reaches the value for amyloamylose which shows that more elongated particles are formed during α-amylolysis of the original erythroamylose. C.

Liquid Rosin (Tallol): Production and Properties. K. B. Edwards. *Chemistry and Industry*, 1942, **61**, 233-235.

An account is given of the production and general characters of the so-called liquid rosin or Tallol, a by-product from the sulphate or Kraft process of producing paper pulp, which is used in the preparation of emulsions, disinfectants, insecticides, plastic substances, cheap paints, cutting and soluble oils, soaps, etc. The results of typical analyses of United States, Swedish and Finnish products are tabulated. C.

Sodium Palmitate: Solubility in Organic Liquids. C. W. Leggett, Jr., R. D. Vold and J. W. McBain. *J. Phys. Chem.*, 1942, **46**, 429-440.

Solubility curves have been determined for sodium palmitate in glycerol, dimethylene glycol, palmitic acid, isopropyl, ethyl, *n*-heptyl and *n*-cetyl alcohols, *o*-, *m*-, and *p*-cresols, *n*-heptane, *n*-cetane and Nujol. Parts of the solubility curves were obtained for sodium palmitate in acetic acid, ethyl acetate, acetamide and *n*-butylamine. At high temperatures and concentrations of soap, the phase separating from isotropic liquid has the typical appearance of neat, super-neat and sub-neat soap. As the concentration is decreased, this is replaced by a soft, wax-like material which may be rather translucent, whilst at low concentrations nearly transparent gels are formed. At intermediate temperatures a more opaque, harder, wax-like material prevails. At room temperature, except for the transparent or translucent anisotropic gels in the dilute systems, the material tends to be either like a hard wax or like an anhydrous soap curd phase (crystalline), with heterogeneity over large ranges of concentration. The appearance of the different systems is described. The following factors were found to be important in affecting the solubility of sodium palmitate: (1) the nature, number and space relationships of the polar groups of the solvent molecules, (2) the polarity of the solvent as measured by the quotient of dipole moment and molar volume, and (3) the size and shape of the solvent molecules. The solubility curve for potassium oleate in ethyl alcohol (Bird) indicates that the solubility behaviour of other alkali-metal soaps in organic liquids is likely to be qualitatively similar to that found for sodium palmitate. C.

Liquids: Surface Tension and Adhesion to Solids. G. Macdougall and C. Ockrent. *Proc. Roy. Soc.*, 1942, **A180**, 151-173.

A method of determining the surface tension of liquids is described which involves the consideration of the advancing and receding contact angles of a liquid drop on a tilted solid surface. The theory has been tested by an improved optical projection technique for a variety of liquid/solid systems and the results obtained are in agreement with the accepted values. The advancing and receding contact angles are characteristic constants of liquid/solid systems and the calculated and measured values of the minimum receding angles are in agreement. The prevailing views of " hysteresis " effects or " stationary " contact angles which have arisen to account for the data available are incorrect and the discordant experimental results reported are due to inadequate technique. The difference between the adhesions corresponding to the advancing and receding angles is ascribed to the work done in removing an adsorbed unimolecular layer. The work done in g.cal./mol. in forming this adsorbed layer is in reasonable agreement with that expected from studies in gas/solid systems and the forces involved are van der Waals'. Further, different solids that might be expected to show similar surface structures yield similar values for the work done. The variation in the value of the advancing angle in some liquid/solid systems and its constancy in others is reconciled with the polar character of the solid surface, i.e. it is suggested that short-range forces are involved. It has been found that monolayers of ferric stearate on glass are orientated with their hydrocarbon tails away from the interface in agreement with electron diffraction measurements. It is suggested that the methods may be useful for investigating the structure of monofilms and built-up layers of monofilms. C.

Plastic Materials: Rheological Properties. G. W. Scott Blair. *J. Sci. Instruments*, 1942, **19**, 88-93.

An earlier empirical classification of rheological properties is discussed in the light of a power-law relation between stress, strain and time. Partial differentiation of stress, strain and time products with respect to stress and strain (but not to time) give expressions which tally comparatively well with the earlier empirical classification. Reasons are given for preferring the power-law treatment to the more usual process of dividing strains arbitrarily into recoverable and non-recoverable parts both where purely physical concepts are in question and also in studying such concepts as " firmness " when judged subjectively by handling materials. A tentative explanation is given for the fact that whilst the elasticity of rubber can be judged by handling about three times as accurately as can the viscosity of bitumen of the same order of firmness, the subjective and objective time units involved in a direct comparison between these materials are also related in the ratio of three to one. C.

Soap Fibres: Orientation of Micelles. S. Ross. *J. Phys. Chem.*, 1942, **46**, 413-417.

Inspection of the electron-microscope photographs of Marton, McBain and Vold in the light of the knowledge of fibre structure already provided by X-ray diffraction (Thiessen) indicates that there is selective non-axial orientation of the micelles in soap fibres. Further applications of the electron microscope to soap-fibre structure studies are discussed. C.

Vapour Pressure: Thermo-electric Measurement. R. R. Roepke. *J. Phys. Chem.*, 1942, **46**, 359-366.

In order to demonstrate the sensitivity of the modified thermo-electric method (Baldes) of measuring vapour pressure, the vapour-pressure lowerings of 0·00226M and 0·01086M sodium chloride were compared with that of 0·0292M sucrose, four different thermocouple units being used. The author discusses the conditions under which the method must be used to obtain an accuracy comparable with the sensitivity. C.

Drying Agents: Water Absorption Rates. R. Loisy. *Bull. Soc. Chim.*, 1941, **8**, 583-587 (through *Chem. Abstr.*, 1942, **36**, 1535[6]).

The rate of water absorption from a current of air of 9 per cent. or 90 per cent. R.H. was determined for calcium chloride, charcoal impregnated with calcium chloride, two silica gels, and pumice or silica gel impregnated with sulphuric acid. The falling off of the rate with time was more marked at the lower humidity. Silica gel containing sulphuric acid was the fastest absorbent. C.

Sedimentation Constant Calculation Chart: Construction and Use. H. K. Schachman. *J. Biol. Chem.*, 1942, **143**, 395-402.

Details are given of the construction of an alignment chart for the evaluation of sedimentation constants from sedimentation data and its use in a sample computation is described. It is shown that the device is accurate, convenient, and capable of effecting a considerable economy in time. C.

Iodide Ion: Photo-oxidation. R. Livingston. *J. Phys. Chem.*, 1942, **46**, 233-238.

A quantitative study of the eosin-sensitized photo-oxidation of iodide ion is described. The results show that at relatively low intensities, the quantum yield is inversely proportional to the square root of the intensity of the absorbed light and directly proportional to the square root of the oxygen concentration. Values as high as 2·8 have been observed. These findings are compared with the results of Livingston and Hurd and a suitable modification of their mechanism is proposed. C.

Colour Blindness: Industrial Aspects. F. H. G. Pitt. *Proc. Phys. Soc.*, 1942, **54**, 219-244.

A paper read to the Colour Group of the Physical Society, with the subsequent discussion. The author reviews the information available and discusses the methods of testing and of distinguishing between different types of colour blindness. Three main groups are distinguished according as to whether the colour vision is a function of 3, 2 or 1 variables: Trichromats, whose vision may be normal or anomalous; Dichromats, who are sub-divided into Protanopes (Helmholtz: red blind), Deuteranopes (green blind) and Tritanopes (blue blind);

and Monochromats. Anomalous trichromatism may yield varying characteristics, but those of the dichromats form a well defined set. Dichromatism and (normal) trichromatism are compared from the points of view of hue discrimination, luminosity and colour mixture. It is noted that dichromats can see all their colours as spectral colours (deuteranopes distinguish about 30, protanopes 20, and normal trichromats 150). The Ishihara Test picks out the dichromats and the more pronounced of the anomalous trichromats, but does not always distinguish between protanopes and deuteranopes. The Nagel Anomaloscope differentiates between protanopes and deuteranopes and between protanomalous and deuteranomalous trichromats. It is suggested that colour blindness tests should be made before persons enter any industry or profession where colour blindness would prove detrimental (many examples are given). Tests of the Ishihara type are recommended for mass testing, supplemented by the Board of Trade lantern test, and if necessary, the Nagel anomaloscope. The question of testing children in schools is reviewed by a representative of the Board of Education. C.

Phase-contrast Microscopy. C. R. Burch and J. P. P. Stock. *J. Sci. Instruments,* 1942, **19**, 71-75.

Slight optical non-homogeneities in certain transparent specimens are usually rendered visible by putting the specimen out of focus. One then sees not the non-homogeneities themselves, but the focal spots and lines they produce. Zernike's method of phase-contrast illumination (1934), on the other hand, provides the maximum contrast when the specimen is accurately in focus, so that what is seen bears a closer resemblance to what is "really there." In this method, slight irregularities in a wave front, produced, e.g. by slight non-homogeneities of refractive index in the medium traversed, are transformed into corresponding irregularities of amplitude, and so rendered visible as corresponding variations not of refractive index but of (apparent) transparency. A simple method of adapting an ordinary microscope for phase-contrast is described, together with the preparation of a test slide to check its performance. The method has proved helpful in studies of the interaction between leucocytes and mobile organisms. C.

Macromolecules: Theory of Van Der Waals Attraction Centres. F. London. *J. Phys. Chem.*, 1942, **46**, 305-316.

The theory of intermolecular attraction is extended to anisotropic force centres and to molecules containing extended electronic oscillators (charge-transfer spectra). Possible applications of the resulting long-range forces to macromolecular system are briefly discussed. C.

Asiatic Cotton Flowers: Anthocyanin Pattern. R. A. Silow and C. P. Yu. *J. Genetics,* 1942, **43**, 249-284 (Reprinted as *Mem. Cotton Res. Sta. Trinidad, Ser. A, Genetics,* No. 18).

Seven additional types of anthocyanin pattern in cotton are described and shown to be controlled by members of an extensive allelomorph system of which 14 members are now known in the cultivated diploid Asiatic species, *Gossypium arboreum* and *herbaceum*. All seven of the new types were found in China, six in field material and the seventh as an anomaly in experimental cultures. The information relating to the genetical behaviour of this and similar series, whose manifold expressions do not conform to a single simple seriation, is reviewed from the standpoint of deciding between the alternative interpretations of close linkage and multiple allelomorphism with pleiotropy. Although the cotton series, in which a new "pattern" arrangement appeared under controlled conditions, might have been expected to be a particularly suitable subject for this purpose, it was not possible to reach a definite conclusion on the experimental evidence. C.

Aspergillus Glaucus Fungi: Classification. C. Thom and K. B. Raper. *U.S. Dept. Agric., Misc. Publ.*, No. 426, 1941, 46 pp.

The wide distribution and omnivorousness of habit of fungi of the *Aspergillus glaucus* group, a group showing green heads and yellow perithecia, are discussed and an account is given of comparative culture and microscopic studies of strains obtained from collections in various parts of the world. On the basis of the results of these studies the strains have been brought together into a series of

aggregate species each characterised by the production of ascospores within a particular size range and bearing typical markings. The species aggregates recognised are *A. repens, A. ruber, A. chevalieri, A. amstelodami, A. minor, A. umbrosus, A. echinulatus, A. medius, A. carnoyi,* and *A. niveo-glaucus,* n. sp. Within these aggregates, for each of which a type is described, the additional species and varieties recognised are *A. pseudoglaucus, A. chevalieri* var. *intermedius,* n. var. and *A. montevidensis.* Tables are given showing the allocation of named cultures contributed by culture collections and individual collaborators. On the basis of variation studies, forms showing the ascospores of a series but differing in colony morphology and details of activity are regarded as variants, not taxonomic varieties. C.

Chaetomium Globosum: Growth on Cotton Fibre and Yarn. Dorothea E. Klemme. *J. Bact.*, 1942, **43**, 171-180 (through *Rev. Appl. Mycol.*, 1942, **21**, 288).

Sea Island cotton fibre and yarn manufactured therefrom were sterilized, inoculated with *Chaetomium globosum* (which has been found on awnings, tarpaulins, shock covers, tents, etc.) and incubated for 28 days in a Warburg apparatus. In both materials the daily oxygen consumption reached a maximum at about the eleventh day, after which the rate decreased (almost imperceptibly from the 18th to the 28th). Coinciding with the production of perithecia by the fungus, there was a slight fall in the rate of oxygen absorption on yarn between the fifth and eighth days, followed by a renewed increase until the attainment of the peak. The amount of oxygen absorbed by *C. globosum* on the fibre sample was significantly greater than that consumed by the yarn (0·32 milli-equivalents per g. as compared with 0·21). Corresponding to these differences was a much more extensive output of catalase on the fibre than on the yarn, indicating the superiority of the former as a substratum for the fungus. It was further shown by preliminary experiments that the organisms growing on unsterilized, uninoculated samples of Acala cotton fibre consumed a materially larger quantity of oxygen than those present on unbleached cotton fabric, denoting that raw cotton is likely to deteriorate more rapidly than yarn or fabric in a moist atmosphere. C.

Amino Acids: Conductometric Titration. J. T. Pinkston and H. T. Briscoe. *J. Phys. Chem.*, 1942, **46**, 469-473.

Tests with various acids have shown that amino acids can be successfully titrated conductometrically in monoethanolamine. Typical curves are given for the titration of acids against the salt obtained by the action of sodium on monoethanolamine ($H_2NC_2H_4ONa$). Evidence of the formation of complex ammines is found in conductometric titration curves of cobaltous chloride and cupric chloride against monoethanolamine, diethylamine and piperidine in ethanol. C.

Sodium Hydroxide Concentrated Solutions: Specific Heats and Heats of Dilution. H. R. Wilson and W. L. McCabe. *Ind. Eng. Chem.*, 1942, **34**, 558-559.

Data are presented on the specific heats of caustic soda solutions over a concentration range of 50·2 to 75·9 weight per cent. and a temperature range of 81·6° to 254·6° F., and on heats of dilution over a concentration range of 48·64 to 75·51 weight fraction at 200° F. Details are given of the methods of determination and the apparatus used. The results have been combined with existing data for lower concentrations, and an enthalpy-concentration chart has been constructed covering a range of 0 to 80 weight per cent. of sodium hydroxide and a temperature range 100° to 400° F. The enthalpies at the higher temperatures (250° to 400° F.) were obtained by extrapolating specific heat data, but these enthalpies should be adequate for engineering calculations. C.

Gluten: Ultracentrifuge and Diffusion Studies. A. G. McCalla and N. Gralén. *Canadian J. Res.*, 1942, C **20**, 130-159.

The molecular characteristics of gluten in sodium salicylate solutions were studied by means of sedimentation velocity, sedimentation equilibrium, and diffusion measurements. The proportion of total gluten protein molecularly dispersed increased with increase in concentration of sodium salicylate up to 12 per cent., but the dispersed portions had essentially the same sedimentation constant ($2·5 \pm 0·15$) regardless of the concentration of the dispersing medium. The most

soluble 25 per cent. of the gluten was all molecularly dispersed, but was definitely inhomogeneous. The weight average molecular weight of this fraction was 44,000, but there is reason to believe that the minimum weight may be about 35,000. None of the other fractions was entirely molecularly dispersed, the proportion decreasing with decreasing solubility of the fractions. Aggregates of many sizes existed in all of these fractions, but only the most insoluble contained aggregates large enough to cause opacity. Sedimentation constants of the molecularly dispersed portions increased slightly with decreasing solubility, whilst diffusion constants decreased markedly. None of the fractions yielded normal curves (diffusion diagrams) but the more soluble the fraction, the more nearly normal the curve. The inhomogeneity responsible for the varying rates of diffusion was due partly to differences in proportion and properties of the molecularly dispersed gluten and partly to aggregates. All properties showed progressive changes both within and between the arbitrarily produced fractions. These results, therefore, support the hypothesis that gluten is a protein system showing progressive and regular changes in properties with change in solubility. C.

Gels: Structure and Swelling. P. H. Hermans. *Kolloid Z.*, 1941, **97**, 231-237 (through *Sci. Abstr.*, 1942, A **45**, 149).

The changes of shape during the shrinking of the 3-dimensional network structure, formed by non-porous gels when dried, are discussed in relation to the pliability of molecular chains. Phenomena observed in quantitative investigations on deformation and orientation of isotropic cellulose gels may thus be explained. In the swollen state the maximum ductility varies with (degree of swelling)$^{-\frac{1}{3}}$. Shrinking and swelling of the isotropic gel proceed parallel with reduction and increase, respectively, of the radii of curvature throughout the network. Recrystallization phenomena may also be explained by these considerations. C.

Polystyrene-Xylene System: Rigidity. J. D. Ferry. *J. Amer. Chem. Soc.*, 1942, **64**, 1323-1329.

Solutions of polystyrene in xylene, which in static deformation appear to be viscous liquids with no yield value, support transverse vibrations and therefore possess rigidity. The propagation of transverse vibrations in such solutions has been studied over a concentration range of 15·7 to 52·3 per cent. polymer and a temperature range of -5 to 40°, between frequencies of 200 aind 4,000 cycles. The dispersion of velocity at low concentrations and the damping at high concentrations are described. Both phenomena are analysed in terms of a single relaxation time of about 4×10^{-4} sec., which is independent, to a first approximation, of temperature and composition. The modulus of rigidity various from 10^4 to 10^6 dyne cm.$^{-2}$ in the range studied. Its decrease with increasing temperature is characterized by a heat effect of 1·5 kcal. The results are discussed in terms of the molecular behaviour of long-chain polymers. C.

Polystyrene-Xylene System: Viscosity. J. D. Ferry. *J. Amer. Chem. Soc.*, 1942, **64**, 1330-1336.

The viscosities of solutions of polystyrene in xylene have been studied over a concentration range of 15·4 to 52·3 per cent. and a temperature range of 1° to 30° C. The dependence of viscosity upon shearing stress can be described by a single parameter which is proportional to concentration up to 30 per cent. and is interpreted as an internal modulus of rigidity. The dependence of viscosity upon temperature follows the usual exponential relation and is associated with activation energies ranging from 3·8 to 10·7 kcal. The pendence of viscosity upon concentration shows positive deviation from a linear logarithmic plot, and can be described by the theory of Powell, Clark and Eyring. The elastic recoil at 52·3 per cent. concentration is described by a modulus of rigidity identical with that characterizing the dependence of viscosity upon shearing stress, and a relaxation function whose mean time constant varies with temperature in the manner of a viscosity with an activation energy of 9·3 kcal. The viscosity and rigidity data are all interpreted in terms of two molecular mechanisms, each with a characteristic modulus of rigidity and relaxation function. One of these, in which the modulus of rigidity is proportional to the concentration (up to 30 per cent.), and the mean relaxation time approximately proportional to the

macroscopic viscosity, is tentatively identified with the uncurling of flexible chain molecules. The other, in which the modulus of rigidity is proportional to the third power of the concentration (up to 30 per cent.), and the relaxation time is independent of concentration (and hence viscosity), is tentatively identified with the bending of carbon-carbon bonds. C.

Dyes: Phototropic Effect. E. I. Stearns. *J. Optical Soc. America,* 1942, **32,** 282-284.

In a study of 162 commercial dyes in solution, a phototropic effect was observed in 15 cases. In these, a 50-watt lamp at a distance of 2 in. for 1 min. from a 1 cm. cell containing the dye solution and having a transmission of about 30 per cent. at the wave-length of the absorption maximum of the dye, caused an effect when the solution was measured within 2 min., an " effect " being defined as an extinction coefficient change of 1 per cent. at any wave-length. Calconese yellow JT shows a very rapid recovery, the effect being largely reversed in 2 min. This dye also shows an irradiation effect when dyed on cellulose acetate. Instances of phototropism of various dyes in solution and on cotton, wool, nylon and cellulose acetate are quoted. C.

Visual Purple Solutions: Photosensitivity. Eye: Scotopic Sensitivity in the Ultra-violet. C. F. Goodeve, R. J. Lythgoe and E. E. Schneider. *Proc. Roy. Soc.,* 1942, B **130,** 380-395.

Measurements of the spectral variation of the photosensitivity of visual purple solutions have been extended into the far ultra-violet. The products are the same as in the visible, " indicator yellow " being produced by bleaching. Dark adaptation curves, produced by various observers, including one with an aphakic eye (without lens), were of the same type at 365 as at 546 mμ. The limiting scotopic sensitivity (the reciprocal of the potential retinal illumination in quanta/sec./sq. mm., which is just sufficient to excite vision) of normal eyes at 365 mμ is more than ten thousand times smaller than that to be expected from the photosensitivity of visual purple at this wave-length, a fact which is attributed to the presence of light-absorbing substances in front of the retina. The scotopic sensitivity of the aphakic eye was, however, as expected, indicating the absence of absorbing substances. The aphakic eye was almost as sensitive at 365 as at 546 mμ. The limit of vision in the ultra-violet was accurately determined and, for normal eyes, found to correspond to the threshold of absorption of the lens, 309 mμ. The limit for the aphakic eye corresponded to the threshold of absorption of the cornea, 298 mμ. C.

Turbidity Comparator. R. P. Krebs, Patricia Perkins, A. A. Tytell and H. Kersten. *Rev. Sci. Instruments,* 1942, **13,** 229-232.

An a.c. operated photo-electric turbidity comparator for comparing the turbidities of suspensions of micro-organisms is described. In this instrument light from two incandescent lamps enters two slits to illuminate the suspended particles in a test tube. The light scattered by the particles enters another slit placed at right angles to the two previously mentioned and passes to a photo-electric cell. The current from the photo-cell is amplified and read on a micro-ammeter. The lamps are of the type in which the filament is in the form of a circle so that circular filaments and entrance slits are coplanar. The power supply for both the amplifier and the light source is electronically stabilized. Photographs and wiring diagrams are given, and the standardisation and use of the instrument are discussed. C.

Carbon Particles; Absorption of Light by —. R. Ruedy. *Canadian J. Res.,* 1941, **19,** A117-125.

From Mie's theory of the action of small spherical particles on plane waves of light, the expression giving the loss of light due to absorption and scattering is reduced to a formula involving only Bessel functions of orders given by half integral values. The result is used for calculating the absorption by small carbon particles whose diameter is comparable with the wave-length of the incident light, particles that can be measured only by interference methods. When the diameter is less than 0·2μ the coefficient of absorption decreases toward the red end of the spectrum. The reverse is true for particles of 0·3 and 0·4μ diameter. C.

Carbon Particles; Scattering of Light by —. R. Ruedy. *Canadian J. Res.*, 1942, A **20**, 25-32.

Spheres of carbon for which $2a/\lambda$, the ratio between the diameter of the particle and the incident wave-length, is less than about 0·1 scatter the light uniformly in all directions. The intensity of the scattered radiation for any angle is proportional to the square of the volume of the particle and inversely proportional to the fourth power of the wave-length. As the ratio $2a/\lambda$ increases from 0·25 to 0·5 and greater values, the diffused light collects more and more into a main beam that appears as a continuation of the incident ray and that decreases in width as $2a/\lambda$ increases. Blue light prevails in the scattered radiation. When the size of the particles is unknown, the intensity, distribution, and polarization of the scattered light give an at least approximate value for the radius. C.

Colours: Matching; Visual Sensitivities to Differences. D. L. MacAdam. *J. Optical Soc. America*, 1942, **32**, 247-274.

An apparatus is described which facilitates the presentation of pairs of variable colours without variation of luminance. With this instrument, various criteria of visual sensitivity to colour difference have been investigated. The standard deviation of colour matching was finally adopted as the most reproducible criterion. Over 25,000 trials at colour matching have been recorded for a single observer, and the readings are analysed in detail and compared with previously available data. The standard deviations of the trials are represented in terms of distance in the standard 1931 I.C.I. chromaticity diagram. These increments of distance are represented as functions of position along straight lines in the chromaticity diagram, and also as functions of direct departure from points representing certain standard chromaticities. Such representations are simpler than the traditional representations of wave-length thresholds and purity thresholds as functions of wave-length, and the accuracy of the representations is improved by this simplicity. Chromaticity discrimination for non-spectral colours is represented simultaneously and on the same basis as for spectral colours. Small, equally noticeable chromaticity differences are represented for all chromaticities and for all kinds of variations by the lengths of the radii of a family of ellipses drawn on the standard chromaticity diagram. These ellipses cannot be transformed into equal-sized circles by any projective transformation of the standard chromaticity diagram. The consistency of these data with the results of other investigators is exhibited in terms of the noticeabilities of wave-length differences in the spectrum and of noticeabilities of purity differences from a neutral stimulus, as functions of dominant wave-length. C.

Furniture: Colours and Reflection Factors. P. Moon. *J. Optical Soc. America*, 1942, **32**, 293-298.

Spectrophotometric curves are given for wood and linoleum desk tops, enamelled steel desks and filing cabinets, cloth upholstery materials, and artificial leather of various colours, and the calculated reflection factors and trichromatic coefficients are tabulated and discussed. It is pointed out that a person sees best and visual fatigue is reduced to a minimum when the entire field of view is of approximately the same luminosity as that to which the fovea is adapted. Thus it is important that furniture should not be too dark nor too light, compared with the object on which the attention is focused. The materials at present in use have low reflection factors and the use of lighter colours is recommended. From a survey of the results of this and previous studies of the reflection factors of ceilings, walls, and floors, the following conclusions are drawn: (*a*) The ceiling and walls of a room should be pure white, not ivory, cream or yellow. This use of maximum reflection factor gives the most economical lighting system for a given illumination, as well as the best diffusion of light. Harsh shadows and glaring contrasts tend to disappear. (*b*) Venetian blinds and window shades should be white and should cover the windows when the artificial lighting system is in use. (*c*) Floors should have sufficiently high reflection factors so that they do not contrast unpleasantly with the remainder of the room. (*d*) Present desk tops are much too dark for good visual conditions. (*e*) Steel filing cabinets, desks, etc., should be produced in lighter, more cheerful colours. C.

Fluorescent Lamp: Use as Voltage Stabilizer. L. G. Parratt and R. G. Stephenson. *Rev. Sci. Instruments,* 1942, **13**, 233-234.

Most supply lines exhibit voltage fluctuations of several per cent. over short and long intervals. A graph of the current as a function of the voltage across the type of discharge in a fluorescent lamp contains a region of negative slope and commercial lamps exhibit a rather constant negative resistance over several volts. A voltage stabilizing arrangement is shown which utilises a fluorescent lamp and a positive resistance equal in magnitude to the negative resistance and in series with the lamp. This arrangement provides an output voltage which is stabilized to the degree that the resistance of the lamp and of the load remains constant. Typical data on the performance of the device with Hygrade Sylvania fluorescent lamps of ratings 20, 40 and 100 watts, with no special precautions for maintaining constant temperature, are listed. C.

Porometers: Theory. H. L. Penman. *Proc. Roy. Soc.*, 1942, B **130**, 416-434.

The mathematical theory of porometers, as used by Gregory and his collaborators for the study of stomatal movements, is given for viscous and diffusive flow of gases. It is shown that under certain conditions the theory applies to both kinds of gas movements; a correction is included for those cases in which the basic assumptions for diffusion are not realized. From determinations of the total leaf resistance to gaseous flow the conductance of the stomata can be found if the mesophyll resistance is known. The importance of this quantity is discussed and demonstrated, methods of measuring it are suggested, and possible checks upon the reliability of the result are described. As an illustration, the theory is applied to some data on two pelargonium leaves; the treatment gives results that are internally consistent, and deduced rates of assimilation are found to be of the same order of magnitude as those observed in practice. C.

Rubber: Frictional Properties. F. L. Roth, R. L. Driscoll and W. L. Holt. *J. Res. Natl. Bur. Stnds.*, 1942, **28**, 439-462.

Laboratory measurements of coefficients of friction of soft rubber compounds were made by towing specimens on horizontal tracks and by allowing them to slide down inclined tracks. The specimens were prepared by attaching the rubber to a metal backing and moulding it against glass surfaces having different degrees of roughness. The coefficients increase markedly with speed, ranging from about 1 at 10^{-4} cm./sec. to more than 4 at 5 cm./sec. The occurrence of vibrations prevented observations at higher speeds. Static friction is greater than dynamic friction for speeds appreciably less than 10^{-3} cm./sec. and less than dynamic friction for greater speeds. The coefficients decrease slightly with increasing pressures and are independent of the size of the specimen. Except at very low speeds the smoother surfaces yield the higher coefficients. Materials such as talc or bloom on the sliding surfaces cause large decreases in the coefficients. Attention is called to the dependence of the coefficients of friction on the speed, which is shown in several previous investigations on rubber and other materials. C.

Starches: X-Ray Diffraction Patterns. R. S. Bear. *J. Amer. Chem. Soc.*, 1942, **64**, 1388-1392.

Five varieties of Katz's V (Verkleisterung) type of starch X-ray diffraction powder pattern are described, and conditions for their production are outlined. It is pointed out that in the study of the V modifications of starch are to be sought important connections between iodine-colour, Schardinger dextrin formation, and the behaviour of starch molecules during the gelatinization process. Relation of these properties to current ideas of straight-, branched-, and helical-chain starch molecules is briefly discussed with reference to the X-ray evidence. C.

Stretched Cellulose Fibres: Degree of Orientation. P. H. Hermans. *Kolloid Z.*, 1941, **97**, 223-228 (through *Sci. Abstr.*, 1942, A **45**, 144).

A critical survey of various methods for determining the degree of orientation of stretched cellulose fibres, based on the X-ray diagram, anisotropy of swelling, optical anisotropy, refractability and dichromatism. Only the first method

allows of determining the total distribution function of orientation, whilst the other methods furnish average values of the angle of orientation. None of the methods is universally applicable, and the results obtained by the different methods are not easily comparable. C.

Viscose Film Cross-sections: Electron Diffraction Pictures. E. Franz, L. Wallner and E. Schiebold. *Kolloid Z.*, 1941, **97**, 36-37 (through *Sci. Abstr.*, 1942, A **45**, 144).

The super-microscopical picture of a section of a viscose film cut by a microtome shows that it is not permissible to assume that a plane section is obtainable. In the interpretation account must be taken of the effects caused by the electron beams on the object to be investigated. Thus the blister structures shown in some pictures may be explained by action of these beams. C.

Bulked Articles: Sampling. R. H. Parsons. *Engineer*, 1942, **173**, 528-529.

The sampling of large consignments is discussed and the method of determining the probability of a given proportion of good articles in a bulk is explained. The probabilities of the good articles in the bulk lying between certain limits are listed for two cases, (1) when the sample contains nine good and one bad, and (2) when it contains eighteen good and two bad articles. A table is given showing actual probabilities of certain minimum percentages of the bulk being good when samples of various sizes are found to contain no bad specimens. Cases in which more than one sample is taken from a given consignment are discussed and the effects of variations in the composition of the samples on the probabilities of given percentages of good articles in the bulk are examined. C.

Wool Fibre: Structure. E. Elöd. *Kolloid Z.*, 1941, **96**, 284-301.

After a general introduction dealing with theories of wool structure, the author reports results obtained by treating wool with metallic mercury and water at moderately high temperatures and at its isoelectric *p*H. By this means he removed 50-75 per cent. of the wool sulphur as mercuric sulphide. A wool treated in this manner lost only 5-6 per cent. of its weight on treatment and showed little loss of strength. The elastic properties were almost unaltered and it gave α and β keratin X-ray diagrams substantially the same as those of untreated wool (except for the interference due to mercuric sulphide in the fibre). No supercontraction of the fibre occurred during the treatment or on subsequent boiling with hydrochloric acid, but the treated fibre supercontracted in boiling bisulphite to the same extent as untreated wool. From these results the author postulates a number of ways in which cystine may be linked into the peptide chain and advances his views on keratin structure. A discussion is also reported. W.

Unhairing: The *p*H Values and Soluble Calcium of Liquors Containing Cyanides, Sulphites and Arsenic Oxide. E. R. Theis and M. O. Ricker. *J. Amer. Leather Chem. Assoc.*, 1941, **36**, 201-210.

The chemical reactions of various " sharpeners " in lime unhairing liquors are discussed. Carbonate and sulphite increase *p*H and decrease dissolved calcium, while cyanide, thiosulphate, sulphate and arsenic oxide increase dissolved calcium with little effect on the *p*H. W.

Unhairing: Effects of Sulphydrate Ion. E. R. Theis and W. A. Blum. *J. Amer. Leather Chem. Assoc.*, 1942, **37**, 93-102.

Calcium sulphydrate causes a decrease in *p*H, which retards unhairing. The addition of calcium chloride further retards unhairing. Hence, sulphydrate ion is not sufficient for unhairing, but hydroxyl ion is also necessary. Sodium sulphide increases breakdown of collagen structure, whereas sulphydrate and arsenic sulphide do not. W.

Synthetic Rubber. E. R. Bridgwater. *Mech. World*, 1942, **111**, 551.

A short article on the properties and derivation of five types of synthetic rubber now in commercial production, i.e. Buna S, Buna N or Perbunan (for oil resistance) neoprene, butadiene and polysulphide types. La.

PATENTS

Cellulose Higher Fatty Acid Esters: Production. Eastman Kodak Co. (Rochester, N.Y.). U.S.P.2,254,652.

Cellulose is treated with an acid anhydride and a higher fatty acid ($C_{10}-C_{18}$) in a solvent, phosphoric acid being the sole catalyst until the reaction is substantially advanced, when sulphuric acid is added and the esterification completed. C.

Ethylcellulose: Production. Dow Chemical Co. (Midland, Mich.). U.S.P. 2,254,249.

An alkali-cellulose having 0·8-1·1 of NaOH and 0·28-0·38 of H_2O per part of cellulose is treated with an excess of alkyl halide (C_1 to C_4) until there are 1·5-1·9 alkoxy groups per $C_6H_{10}O_5$ unit, fresh alkali is then added until the total is 1·1-3 parts, the etherification is continued until 45-70 per cent. of the alkali has been consumed, and the cellulose ether is then isolated. C.

10—ECONOMICS

American Textiles: Consumption Trends. A. F. Hinrichs. *Rayon Textile Monthly*, 1942, **23**, 17-19, 72-73, 165-166.

The trends in the buying habits of American consumers are discussed on the basis of two surveys made by the U.S. Bureau of Labor Statistics in 1917-19 and 1934-36. Much statistical information is summarised in the following charts: (1) Cost of goods purchased by wage earners and lower-salaried workers in 32 cities; (2) Average expenditure for major categories (i.e. food, clothing, rent, fuel and light, furnishing and miscellaneous); (3) Average clothing expenditure for various income groups; (4) Average family expenditures for clothing, 1935-36, for various income groups in cities of various sizes (the influence of the size of the city is insignificant); (5) Percentage of income spent for selected items; (6) Textiles purchased at different income levels; (7) Purchases at different income levels of (7) silk and rayon, (8) wool, (9) cotton, (10) dresses, (11) pairs of socks, (12) pillow cases, and (13) cotton dresses for town wear. C.

Argentine Cotton Industry: Progress in 1940. P. A. Cavadini. *Boletin Mensual, Junta Nacional del Algodón, Buenos Aires*, 1941, No. 80, 979-1008.

Recent progress in the Argentine cotton industry is reviewed and tables are given showing the quantities of domestic and foreign cotton textile goods passing through the Argentine market, Argentine productions of cotton yarns and fabrics of various types, consumptions of Argentine and imported raw cotton by the spinning mills and mills producing absorbent cotton, consumptions of cotton yarn by weaving, knitting and hosiery mills, consumptions of cotton by mills producing mixture goods, numbers of spinning, weaving and knitting mills, numbers and types of spindles and looms, hours worked, wages paid, etc. The total consumption of cotton in the Argentine Republic in 1940 reached a record value of 39,494,271 kg. Cotton spinning mills consumed 38,430,566 kg. of which only 346,399 kg. was imported. Total production of cotton yarns amounted to 32,925,458 kg. in 1940, the average counts being 15. The number of spindles increased to 347,328, of which 346,464 are ring spindles. The consumption of cotton yarns by the Argentine textile industry in 1940 amounted to 31,397,032 kg., compared with 29,226,538 in the previous year, of which 10·3 per cent. was imported. The average count of the imported yarns was 40·74 and that of the home-produced yarns 14·57. The number of looms increased to 6,061, of which 2,409 are ordinary looms, 85 looms with automatic attachments, and 3,567 automatic looms. The output of all-cotton woven fabrics amounted to 19,990,383 kg. in 1940, of cotton hosiery to 1,831,321 kg., and of knitted cotton goods to 5,012,172 kg., the first two figures representing increases and the last a decline compared with the corresponding figures for 1939. C.

Cotton Spindles: Activity in the United States, 1932-1941. Association of Cotton Textile Merchants. *Cotton (U.S.)*, 1942, **106**, No. 4, 98.

Statistics of spindle activity and cloth production are tabulated. " Spindles in place " have declined from 32,326,526 at the beginning of 1932 to 24,146,130

in 1942, but the percentage of " average active spindles " has risen from 71·92 to 93·53. C.

Rayon: Production and Consumption in Sweden. *J. Text. Inst.*, 1942, **33**, P. 75-76 (from *Chemische Industrie*, 1942, **65**, 48-49).

Statistics of production of rayon and staple fibre in Sweden in 1938 and 1939 are tabulated, particulars are given of the leading firms, and statistics of imports are classified by type of product and by country of origin. C.

Rayon Fabrics: Production in the United States, 1939. *Rayon Organon*, 1942, **13**, 64-67.

Tables are given showing (1) products, by kind, quantity, and value, for the United States, for Rayon Manufactures and Silk Manufactures Subgroups: 1939 and 1937; (2) value of narrow fabrics and small-wares of rayon and silk: 1939 and 1937; (3) rayon and silk thrown or processed, for sale or on commission, by quantity and value: 1939; and (4) consumption of materials in the Rayon Manufactures and Silk Manufactures Subgroups: 1939. The tables are taken from the 1939 Census of Rayon and Silk Manufactures which covers (*a*) the weaving of rayon and silk broad and narrow fabrics in which the warp content is entirely or principally of rayon and/or silk; (*b*) the spinning and throwing of rayon and silk yarns; and (*c*) the manufacture of silk and rayon sewing thread. Rayon goods produced in the cotton, woollen and knitting industries are not included. C.

Textile Wholesale Trade Index Numbers. *Bd. Trade J.*, 1942, **148**, 306.

Index numbers are given for (1) sales for the home trade, (2) sales for export and (3) the value of stocks at the end of the month, based on average monthly sales or stocks in 1937 = 100, for the years 1935-1941, and the months January, 1941, to May, 1942. The index numbers for May, 1942, are 100, 97 and 91, respectively. The home trade index number is 5 per cent. lower than the April number, although it is normally rather higher in May than in April. The effect of early deliveries of spring goods is seen in the fact that the home trade numbers for April and May together were 17 per cent. below February and March, whereas usually there is a rise of some 8 per cent. Sales in May also appear rather low. The wholesale stock index rose slightly on the month, whereas there is normally a fall of 5 per cent. Compared with a year ago (i.e. the eve of clothes rationing) the value of stocks is up by 11 per cent. C.

Canadian Textile Industry. Manual of the Textile Industry of Canada, 1942, 176 pp.

A series of articles is given discussing the Canadian textile industry during the past year, with details of output, the price ceiling programme, war-time economy in textiles, price control administration, and activities of the cotton, wool, knitted goods, clothing trade and rayon industries. W.

11—INDUSTRIAL WELFARE, INDUSTRIAL PSYCHOLOGY, AND EDUCATION

American Textile Schools: Organisation. D. E. Heard. *Rayon Textile Monthly*, 1942, **23**, 75-7, 167-8, 295-6.

A general review is given of textile education in the United States, with particular reference to the organisation of research. There are five important textile schools in the Eastern States and five in the South; they are briefly described. C.

Textile Education and Recruitment. *Textile Weekly*, 1942, **29**, 666, 668, 698, 700, 707.

A report is given of a Conference on " The Future of Technical Education for the Textile Industry " held on June 6 at the Oldham Technical College. The history of the industry was briefly reviewed and the present unsatisfactory conditions discussed by A. C. C. Robertson, who suggested that cotton operatives should be engaged on a yearly basis of payment for all jobs in the mill which have well-defined operation. J. Millward pointed out that, given post-war

reconstruction based on the re-opening of world trade by lasting co-operation, the cotton industry could confidently look forward to stability, exports, regular employment, reasonable working conditions and wages commensurate with those in other industries, which factors should ensure a steady flow of new entrants to the mills. He also pointed out that, in order to make the best type of workman, youths should enter the spinning trade at a reasonably early age (below 16). Mr. E. Raymond Streat advised a break with the past and a planned policy of production and progress based on new bold lines. He recommended the modernising of the industry and pointed out that the Cotton Board believes that the industry can be made prosperous by a policy based on a wise system of price management, coupled with sound Government trade policy at home and abroad, and with schemes of trade promotion and technical progress on the basis of constant research. He stressed the need for scientifically trained men and classified young people entering the mills into three groups: (1) young people who will be operatives and get the required training in the mills; (2) ambitious young operatives who intend to equip themselves as overlookers, foremen, mill managers, etc., who will require a background of sound technical education; and (3) the fully-trained scientist—the textile technologist proper—who should have a University degree. Discussing the education of these groups, Mr. Streat suggested that there may be too many so-called Technical Institutions in Lancashire and that every technical school or institution should be part of a county-wide scheme, playing its allotted part. Other speakers suggested promotion based on technical education and real merit rather than on seniority and name, co-operative control in the industry, good equipment in technical schools, and travelling scholarships. C.