The urine of young adult males and females is collected during the evening and night in large amber-colored bottles, packed in ice and containing a small cube of CO_2 snow; 50 cc of benzene is added to each bottle. A large funnel is inserted through an opening in the cork of the bottle, and the stem of the funnel is closed by a cork attached to a long glass rod. When in use this cork is removed and urine passed into the funnel. The cork is then immediately replaced. This method of collection results in a minimal amount of decomposition of the urine and keeps the freshly voided urine cold in an atmosphere saturated with CO_2 and under a layer of benzene. The following morning the bottles are removed to a dark room and the urine extracted with 50 cc of benzene for each liter of urine. An electrical mechanical mixer with a small fan-shaped stirring rod is used for agitation and extraction. The extraction with benzene is continued for from 10 to 15 minutes, and repeated with fresh benzene. The benzene is separated, and the fractions pooled and evaporated at 40° in vacuo to dryness. The residue is taken up in ether, the ether evaporated and the ether residue is shaken with the desired amount of physiological saline. The final aqueous product is colorless, has no odor of urine, turns faintly pink in 20 hours, and is non-irritating to rats when injected subcutaneously or intraperitoneally. The final product is made so that 1 cc of the extractive is equivalent to 300 cc of urine. The potency of such extracts will vary with the concentration of the original urine. The precautions employed in the collection of the urine minimize the effect of light and oxidation of the substance in the urine.

Although the substance obtained by the above method from urine raises the resistance of suprarenalectomized rats to histamine poisoning, as also does the life-prolonging hormone of the suprarenal cortex, proof is lacking that it is identical with the life-prolonging hormone.

DAVID PERLA
J. MARMORSTON

PRELIMINARY REPORT ON REDUCING TRANSPIRATION OF TRANSPLANTED EVERGREENS

IN the semi-arid Great Plains Region, coniferous evergreens are the most desirable shelterbelt trees and are the most permanent when once established. Unfortunately, their mortality in transplanting is particularly high, losses of 50 to 100 per cent. being not uncommon on prairie farms. Probable factors responsible for this loss are: (1) Climatic conditions favoring a high transpiration rate; (2) necessity of moving evergreens in full foliage; (3) slow rate of regeneration of roots destroyed in digging and resetting.

Since the fall of 1931 the Cheyenne Horticultural Field Station has been investigating means of reducing the transpiration rate of transplanted conifers. Through the work of Neilson[1,2] and others[3,4,5] the coating of dormant deciduous nursery stock for protection in storage, shipment and transplanting is being used to some extent in horticultural practise. Following the work of these investigators, various materials have been applied to the above-ground parts of dormant conifers in an attempt to cut down excessive transpiration of transplants until the damaged root systems can develop sufficiently to again support the trees.

Many materials have been tested, consisting chiefly of waxes, gums, resins, oils and asphaltic compounds, alone, and in various mixtures. Proprietary preparations employed included a rubber compound, a special petroleum wax, a Duco formula, a paraffin emulsion and four commercial nursery waxes. Early in the trials it was found that waxy materials which gave thick and nearly complete coverage of coniferous needles reduced transpiration almost to nothing; however, such heavy coatings caused severe injury to the plants. The temperatures at which materials can safely be applied to dormant evergreens is much lower than for dormant deciduous trees, but varies somewhat with different species, *e.g.,* Colorado blue spruce (*Picea pungens*) can not safely be treated with materials above 65° C., while yellow pine (*Pinus ponderosa*) can stand 5 to 10 degrees higher. Difficulty of securing thin coatings of waxy materials at these temperatures led to the use of pure oils and emulsions of oils and waxes which can be applied with a sprayer. Of the many oils tested, castor oil and corn oil were the only ones that did not injure the conifer needles when applied in pure form. Emulsifying some of the injurious oils greatly reduced or entirely removed their toxicity.

The non-toxic oils and several emulsions of oils and waxes have been tested on different typyes of conifers

[1] J. A. Neilson, "Paraffine Wax—an Aid to Growth in Transplanted Trees and Shrubs," *North. Nut Grow. Ass'n. Proc.*, 19: 44–51. 1928.

[2] J. A. Neilson, "Reducing Storage and Transplanting Losses in Nursery Stock" *Flor. Exch. and Hort. Trade World,* 78: (No. 5) 27, 35. 1931.

[3] C. N. Pillsbury, "The Use of Rubber in the Propagation, and for the Protection of Nursery Stock," *Flor. Exch. and Hort. Trade World,* 77: No. 17, 28–29, 41. 1931.

[4] H. B. Tukey and Karl Brase, "The Effect of Paraffining, Pruning and Other Storage Treatments upon the Growth of Roses and Cherry Trees, *Am. Soc. Hort. Sci. Proc.,* 28: 489–495. 1931.

[5] T. J. Maney, "An Apparatus for Spraying Plants with Melted Paraffin or Other Waxes," *Am. Soc. Hort. Sci. Proc.,* 28: 496–497. 1931.

without injury, and the efficacy of these coatings in reducing transpiration has been determined. The table shows a comparison of a few materials sprayed on uniform lots of five-year-old dormant pines.

PINE (PINUS AUSTRIACA)

	*Daily loss before treatment	†Daily loss after treatment
Corn oil	20.7 gms	2.4 gms
(1) Sulphonated linseed oil emulsion 33⅓ per cent.	20.8	8.4
(2) Crystal No-Dri 50 per cent. solution	20.7	18.0
Beeswax emulsion	20.9	18.3
Untreated (control)	20.3	26.3

* Averages for 8 days.
† Averages for 7 days.
(1) Prepared by heating 9 parts boiled linseed oil to 470° F. and adding 1 part flowers of sulfur to the hot oil. Emulsified by mixing with laundry soap and water.
(2) Manufactured and sold by the Crystal Soap and Chemical Co., Inc., Philadelphia.

The trees had been grown in pots long enough to be thoroughly established and to ensure that all were living. The pots were sealed in metal cans and the trees exposed to outdoor conditions. Trees were grouped into five lots of four trees each and transpiration (loss of weight) was determined every two days, water being added after each weighing to make good the loss. After a period of eight days during which the comparative transpiration rates of the five lots were determined, different treatments were applied to each lot and the loss in weight determined for seven more days, water loss being replaced as before. It will be noted that in the period before treatment the groups were selected so that their average daily transpiration rates were practically equal. After treatment the groups showed wide variation in water loss. The data show that all coatings reduced transpiration as compared with the untreated control, pure corn oil in this instance, causing a reduction of 88.4 per cent. Whether such a great reduction in transpiration is necessary or even desirable is not yet known, although no detrimental effects were noticeable after several months. Further investigations are under way to determine the ultimate effect of these coatings on the tree's metabolism.

In actual practise the materials are best applied by spraying seed beds or nursery rows before digging. Thousands of conifer seedlings and transplants have been treated this year with oils and emulsions, apparently with good results. It is believed that these coatings may also prove useful in protecting coniferous seed beds from excessive drying out over winter. In this connection the efficiency of the sulphonated oil is of interest, as this material is also a repellent for rodents that attack nursery beds.

A complete report of these investigations will appear in a later publication.

J. L. EMERSON
A. C. HILDRETH
CHEYENNE HORTICULTURAL FIELD STATION
U. S. DEPARTMENT OF AGRICULTURE

BOOKS RECEIVED

ANTEV, ERNST. *Alpine Zone of Mt. Washington Range.* Pp. viii + 118. 38 figures. Merrill and Webber.

BAILEY, L. H. *The Cultivated Conifers.* Pp. ix + 404. 114 figures. Macmillan. $7.50.

BOYNTON, PAUL L. *Intelligence: Its Manifestations and Measurement.* Pp. xi + 466. Appleton. $2.50.

Bulletin of the Academy of Sciences of the United Provinces of Agra and Oudh, Allahabad, India. Volume I, 1931–32. Pp. 150 + 49. Illustrated. The Academy.

Bulletin of the Association of Field Engineers, June, 1932. Pp. 128. Illustrated. U. S. Coast and Geodetic Survey.

Contributions to the Calculus of Variations, 1931–32. Theses Submitted to the Department of Mathematics of the University of Chicago. University of Chicago Press. $3.00.

CRUM, ROY W., Editor. *Proceedings of the Eleventh Annual Meeting of the Highway Research Board, December, 1931.* Part I: *Reports of Research Committees and Papers.* Pp. 443. Illustrated. National Research Council, Washington.

FAIRCHILD, HERMAN L. *A Chapter in Earth Science History.* Pp. xvii + 232. Illustrated. The Geological Society of America. $2.50.

GALT, WILLIAM. *Phyloanalysis.* Pp. 151. Kegan Paul, Trench, Trubner & Co., London. 2/6.

GOWANLOCH, JAMES N. *Fishes and Fishing in Louisiana.* Pp. 638. Illustrated. Bulletin No. 23, Department of Conservation, State of Louisiana.

GRAY, LEWIS C. *History of Agriculture in the Southern United States.* Pp. xix + 567. Carnegie Institution of Washington.

HEGNER, ROBERT W. *Invertebrate Zoology.* Pp. xiii+ 570. 403 figures. Macmillan. $3.75.

LASLEY, JOHN W. and EDWARD T. BROWNE. *Introductory Mathematics.* Pp. xvi + 439. McGraw-Hill. $2.75.

LINDSEY, ARTHUR W. *A Textbook of Genetics.* Pp. xvi + 354. 128 figures. Macmillan. $2.75.

LINGEL, ROBERT. *Educational Broadcasting, a Bibliography.* Pp. x + 162. University of Chicago Press. $1.50.

LINTON, RALPH. *The Tanala: A Hill Tribe of Madagascar.* Pp. 334. 35 figures. Field Museum of Natural History. $2.25.

MILLER, CASPER O. *The Ether in its Relation to the Structure of Matter and the Transmission of Force.* Pp. 442. 45 figures. Henkel Press.

MOSELEY, EDWIN L. *Other Worlds.* Pp. xi + 231. 55 figures. Appleton. $2.00.

Recent Social Trends in the United States: Report of the President's Research Committee on Social Trends. Vol. I: Pp. xcv + 750. Illustrated. Vol. II: Pp. vi + 751–1568. McGraw-Hill. $10.00.

ROQUETTE-PINTO, E. *Boletim do Museu Nacional.* Vol. III. No. 3. Pp. 133–256. Illustrated. Museu Nacional, Rio de Janeiro.

TYSON, LEVERING, Editor. *Radio and Education.* Pp. viii + 298. University of Chicago Press. $3.00.

WOODS, ALAN C. *Allergy and Immunity in Opthalmology.* Pp. xiv + 176. Johns Hopkins Press. $2.25.