

The science of learning, as distinguished from the art of teaching, was the subject of J. P. Lysaught, Ed.D., of the College of Education (Univ. of Rochester). From investigations reaching back to the work of Edward Thorndyke in the 1920's, three principles of efficient learning have evolved. The first, "Law of Effect," states that for learning to occur problem solving must be followed by knowledge of results. Repeated experiences without knowing "consequences of responses" is inadequate for learning. Secondly, the "Law of Recency" states that the results must rapidly follow the experience. The shorter the elapsed time from stimulus to response to awareness of result the more efficient the learning process. The third principle is that the

most efficient pace for learning differs significantly among individual students. Programmed learning, a process of arrangement of presented materials for maximum learning, provides the essentials of (1) individual control of pacing, (2) immediate feedback and (3) behavioral statement of objectives. For the skeptics Dr. Lysaught presented the evidence of 30 studies on programmed learning carried on from 1962 to 1967. Twenty studies showed programmed learning more effective than more traditional methods; in only one study was programmed learning less effective.

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### Anesthesia

**LOCAL WITH ADRENALIN** "Local anesthesia, especially with adrenalin content is best avoided as it lowers the resistance of the tissues. Tissues must have maximum vitality. Adrenalin should never be injected into a digit because from this gangrene has often resulted." So states Bunnell's Surgery of the Hand. The current misconceptions concerning the use of local anesthetic and epinephrine (Adrenalin) mixture in the hand stem from this source. Accurately calibrated and stable mixtures of a local anesthetic and epinephrine (0.5 per cent lidocaine with 1:200,000 epinephrine) are available and can be safely used for local infiltration for surgery of the hand. It was used without complication in 421 patients requiring surgery of the hand. Slow, careful infiltration with minimal amounts of agent, sedation, and a fine, low-intensity cautery for complete hemostasis are essential. The use of this method and its lack of complications can often eliminate the use of the tourniquet and the annoying pressure of "tourniquet time" and the inherent danger of general anesthesia in emergency patients. (Johnson, H. A.: *Infiltration with Epinephrine and Local Anesthetic Mixture in the Hand, J.A.M.A. 200: 990 (June) 1967.*)

**SPINAL BLOCKS** Vasoconstrictor drugs were added to tetracaine solutions to be injected into the subarachnoid space in 8,851 patients to determine the optimal dose which would safely and consistently prolong the duration of spinal block for a significant period of time, Epinephrine, 0.2 mg. extended the anesthesia 50 per cent; phenylephrine, 5 mg. approximately 100 per cent and ephedrine sulphate 50 mg. did not prolong the duration. No systemic or serious neurological complications resulted. Regardless of the volume or dosage of local anesthetic solution, the optimal dose of epinephrine in the subarachnoid space was 0.2 mg. and that of phenylephrine 5 mg. Epinephrine, 0.5 mg. increased the duration of some but not all by only 15 minutes more than did the 0.2 mg. dose. Smaller doses of phenylephrine were not as effective in prolonging the duration of anesthesia. (Moore, D. C., and others: *Prolongation of Spinal Blocks with Vasoconstrictor Drugs, Surg. Gynec. Obstet. 124: 983 (Nov.) 1966.*)