

April 7, 1933. There was no pain. She walks normally, does her own domestic work and spends several hours a day working outside the home. Her appetite is very good and she has gained 27 pounds since last October. At this date, 6 months after calcium was instituted, the patient having received her regular dose the day before, and blood drawn before breakfast, the blood calcium was 10.5 mg. per 100 cc. Blood phosphorus 4.2 mg. per 100 cc.

Roentgenograms (April 7, 1933) of the pelvis and upper femurs reveal a diffuse sclerosis of the bones. Most of the osteolytic metastases appear now as osteoblastic. The solitary osteoblastic metastasis in the upper left femur has not increased in size. It is impossible to state definitely if the other metastases have changed in size. Roentgenograms of the lungs show no metastases present.

The writer has been unable to find record of an instance of osteolytic metastases spontaneously changing into osteoblastic ones, or vice versa. It is generally held that this does not occur. X-ray therapy may cause sclerosis of an osteolytic carcinoma metastasis, but this must be regarded more in the nature of a healing process than a change in the bone destroying or stimulating properties of the carcinoma cells.

There is no other factor that could have caused the changes in the above patient, except the calcium administered continuously in large doses. The results in this case warrant the administration of calcium in large doses to all patients exhibiting skeletal metastases from carcinoma.

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Local Anesthetic Properties of Some Aliphatic Alcohols

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Macht called attention to the fact that it is not necessary to have complex chemical compound containing nitrogen in its molecule to produce local anesthesia. He showed that the simple aromatic compound, benzyl alcohol, exhibited marked local anesthetic properties when studied by different pharmacological methods.¹ During a

¹ Macht, *J. Pharmacol. and Exp. Therap.*, 1918, **11**, 263.

pharmacological study of 23^{*} isomeric octyl alcohols, Macht and Schroeder discovered that these straight chain alcohols all produced marked local anesthesia and, furthermore, that combinations of these acted synergistically.² These findings suggested an inquiry into the possible local anesthetic properties of other aliphatic alcohols. In connection with a study of 18 primary aliphatic alcohols of the fatty acid series made jointly in the Laboratory for Organic Chemistry, directed by Professor E. Emmet Reid, Johns Hopkins University, and in this pharmacological laboratory, tests were made to determine whether any of these alcohols exerted a local anesthetic action.

As a starting point for such experiments, 1% solutions of the 18 aliphatic alcohols were made in 95% ethanol. For the study of their local anesthetic effect on animals these were diluted 1 to 10, yielding a concentration of the alcohols of 1:1,000 in 9.5% ethanol. Alcohols containing more than 10 carbon atoms, which were not soluble to the extent of 1:1,000, were used in saturated solution. Pharmacological tests were first made on the conjunctival and corneal reactions of rabbits and then on living frogskin by well-known standard methods. While studying the anesthetic effect on frogskin, we made a note of (1) the rapidity of onset of anesthesia, (2) the duration of complete anesthesia, (3) the time of cessation of all anesthetic effect, and (4) the concentration of the alcohol used. The subjoined table shows the results obtained. Seven of the aliphatic alcohols studied exerted a local anesthetic action. Beginning with the most potent and ending with the least potent, they were as follows: octyl, heptyl, nonyl, decyl, undecyl, dodecyl and hexyl. Neither the propyl nor butyl nor amyl alcohols of the primary, secondary or tertiary varieties, nor alcohols containing from 13 to 18 carbon atoms exhibited any local anesthetic effect.

TABLE I.
Anesthesia for Frogskin.

Primary Alcohol	No. Experiments	Time of Exposure min.	Duration of Complete Anesthesia*	Cessation of All Anesthesia min.
Hexyl, 1: 500	10	5	Slight anesthesia	—
Heptyl, 1:1000	10	1	10 min.	24
Octyl, 1:1000	10	1	15 "	35
Nonyl, 1:1000	10	1	5 "	18
Decyl, 1:1000	10	2	2 "	5
Undecyl, 1:1000	5	5	Slight anesthesia	—

*Variations in readings not more than 10%.

² Macht and Schroeder, *Arch. f. exp. Pathol. u. Pharmacol.*, 1930, **158**, 53.