action we obtained was essentially, a local one, and was not due to the central actions of isonipecaine.

Subsequent studies on the local anesthetic properties of isonipecaine revealed that it possesses considerable specificity for nervous tissue when applied locally. The drug was compared experimentally with an equal concentration of cocaine. The results of our preliminary studies are summarized in Table 1.

TABLE 1

LOCAL ANESTHETIC PROPERTIES OF ISONIPECAINE COMPARED WITH COCAINE

Method (3)	Criterion	Drug	Minutes
Rabbit cornea	Duration of anesthesia	1 % cocaine	31
		1 % isonipecaine	19
Intradermal wheal in man	Duration of anesthesia	1 % cocaine	78
		1 % isonipecaine	57
Frog sciatic	Onset of sensory block	1 % cocaine	2.5
		1 % isonipecaine	2.6
	Onset of motor block	1 % cocaine	13
		1 % isonipecaine	17

The fact that isonipecaine exhibits local anesthetic properties suggests that the compound may possibly be used advantageously as a preanesthetic agent for chloroform or cyclopropane anesthesia, and for operations involving the heart. There have been several recent reports[4, 5, 6] stating that the administration of certain local anesthetics depresses cardiac irritability. Consequently this depression results in a lessened tendency for cardiac disturbances during chloroform[7] or cyclopropane[8] anesthesia, and during operations on or near the heart.[4 5] Isonipecaine may possibly act in the same manner. In fact, the information at hand on the cardiac effects of isonipecaine favors this conclusion. Like others[1, 9] we have found that isonipecaine has a depressant action on the heart.

Also in the event of isonipecaine poisoning, it would seem logical to prevent or treat the overdosage with agents similar to those used in cases of local anesthetic toxicity. This suggestion is based on the fact that the chief toxic symptoms manifested in experimental animals after isonipecaine or local anesthetics administration are quite similar. These symptoms are referable to the central nervous system, consisting of restlessness and tremors which may proceed to clonic convulsions. For the treatment and prevention of poisoning by local anesthetics, Tatum and others[10, 11, 12] have indicated that the barbiturates are the preferable agents to employ.

These studies will be described in greater detail elsewhere. We have also initiated studies on the possible applications of isonipecaine suggested above, and we hope to report on them soon.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

INTRAVENOUS TUBING FOR PARENTERAL THERAPY

CONTINUOUS or frequently repeated intravenous treatment is often complicated by trauma and thrombosis to the extent that all available superficial veins become destroyed. The discomfort of numerous venepunctures may also become a serious problem, particularly in uncooperative or disoriented patients. These difficulties can largely be avoided by the use of flexible plastic tubing which can be inserted into a vein through a needle and left in place as long as required. This method has been used extensively on dogs in which the leg veins, external jugulars and even portal vein have been employed for continuous and intermittent infusions. In 11 dogs the tubes have remained in the external jugular veins for 4 to 5 weeks without untoward developments.

In 4 such dogs which were recently sacrificed for post-mortem study, the veins were thrombosed around the tube in 2, while in the remaining 2 the vein remained patent. Whether thrombosis is related to the mere presence of the catheter or to the irritating solution which was introduced daily through it has not yet been determined.

The following technique is recommended for patients. The skin over the vein to be used is anesthetized with procaine; a tourniquet is applied, and a 15-gauge needle is introduced. The flexible tubing is then threaded through the needle into the vein for a distance of 5 to 6 cm. The needle is removed over the tube, while the latter is held by pressure with the fingers over the vein. The point of entrance is covered with collodion and the free portion of the tubing

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[11] A. L. Tatum and K. H. Collins, *Arch. Int. Med.*, 38: 405, 1926.

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is secured to the skin with adhesive tape. A 20-gauge needle, the bevelled point of which has been ground off, provides a suitable adapter for connecting the end of the tube to the intravenous apparatus. When not in use the cannula is plugged with a large sterile pin. The plastic tolerates boiling or sterilization with 70 per cent. alcohol.

Such cannulae have been used for continuous intravenous penicillin therapy, for the infusion of glucose and saline solutions and for a total intravenous feeding with a mixture of 10 per cent. glucose, amino acids and vitamins. Although the longest time the same cannula has been left in place is 12 days, it should be possible, with proper care, to keep them in for much longer periods. There is no tendency for the tubes to become plugged even when they are not used for several days. Thrombosis of the vein itself, on the other hand, occurs when concentrated or otherwise irritating solutions are infused for extended periods. Although the method appears to be of definite value in selected cases, further investigation regarding both technique and materials must be completed before its general clinical use can be safely recommended.

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A DEVICE FOR MEASURING AVENA COLEOPTILE CURVATURE

A TRANSPARENT celluloid protractor with a movable arm attached at the center of the base is commonly used in hormone research for measuring Avena coleoptile curvatures. This instrument is somewhat difficult to use accurately because it is necessary to orient the coleoptile shadow picture while looking through two thicknesses of celluloid. The contacting surfaces of the protractor and movable arm become dulled with use and may become somewhat translucent instead of clearly transparent. At the base of the protractor and movable arm there are a considerable number of lines, which also adds confusion when using the device.

A simple measuring scale was developed to overcome the above difficulties. This device consists of a series of carefully constructed angles which are photographed and then printed on contrast process Ortho film to give narrow black lines on transparent celluloid. Fig. 1 illustrates this measuring scale, which is 3×5 inches. This device is used by moving it laterally over the shadowgraph of the curved coleoptile being measured, until the bottom and top of the coleoptile are oriented parallel with the bottom and top lines of one of the angles. The degree numbers at the top of the angle lines are written in both directions so that by turning the scale over either positive or negative curvatures may be measured.

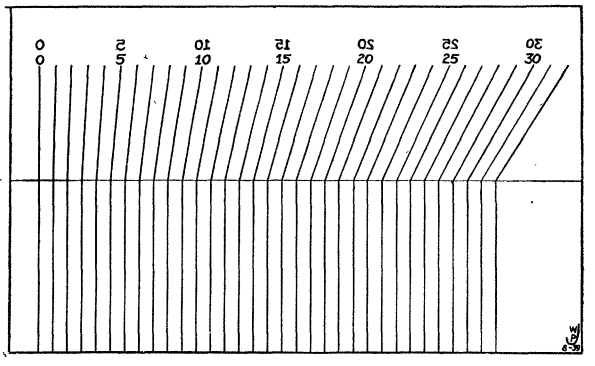

FIG. 1. Avena coleoptile curvature measuring device.

The measurement of coleoptile curvatures with this device is rapid and accurate. The scale illustrated in Fig. 1 contains angles from 1 to 32 degrees and covers the majority of reliable curvatures encountered in Avena tests. A second scale (not illustrated) contains angles from 25 to 57 degrees.

The measuring device has been used in the research laboratories of Dr. G. S. Avery, Jr., at Connecticut College for several years, and by a number of other laboratories where hormone tests are conducted.

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