epinephrine release with Innovar? If we carry their argument to its logical conclusion, the blood pressure should have been unstable with cyclopropane and halothane, since apparently no epinephrine was released with these two agents.

7. In our own reported studies, we used “trained” dogs—i.e., animals who had anesthetics, to which they were accustomed, at regular intervals. This is probably the most important factor that might prevent fluctuation in the epinephrine levels on account of psychic influences.

In comparing data about anesthetics, it is virtually impossible to obtain reliable information or draw valid conclusions unless the same subjects are used in each case in a small series, or relatively large groups undergoing similar operations are compared. This is particularly true when dealing with a laboratory procedure that may not be sensitive enough to insure reliable values during each and every assay.

Although the above remarks are critical, I am delighted that the authors undertook to do a study of this kind. There are still too few anesthesiologists engaged in this line of investigation to have a forum for exchanging views on this important topic.

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To the Editor:—We thank Dr. Dobkin for his questions and comments. I would like to emphasize initially that the study was a clinical study. The patients and conditions were as we ordinarily see them in the operating room. Bearing this in mind, I can perhaps answer the comments and criticisms.

1. The distribution of males and females was not given because I know of no evidence that catecholamine metabolism is different in males and females. However, I have this information and respectfully submit it at this point.

<table>
<thead>
<tr>
<th>Distribution of Patients</th>
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<tbody>
<tr>
<td>Males</td>
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<tr>
<td>Cyclopropane</td>
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<tr>
<td>Halothane</td>
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<td>Innovar</td>
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I must agree with Dr. Dobkin that although our results are at variance, one must be careful about drawing conclusions and comparisons. None of the drugs given have been reported to interfere with the fluorometric assay of NE and E.

2. This is a valid point and is alluded to in the discussion of the results. Patients receiving neuroleptanalgesia rarely go to “sleep” until nitrous oxide is administered for a few minutes. On the other hand, they rarely appear overtly anxious during induction and none of our patients had any induction excitement. This is the most popular technique by which neuroleptanalgesia is practiced clinically, and we felt that it is valid to study a patient’s response to a common clinical situation.

3. The significance may not lie in the P value, but in the fact that each of the five patients in the Innovar group increased his excretion of epinephrine during the anesthetic period by 200–500 per cent. The P value of course gets larger as the number of observations gets smaller and as the confidence limits get smaller. We used 90 per cent confidence limits in an effort to adjust for sample size. The significant fact is that every patient given Innovar behaved in the same way.

4, 5. The total volume of urine excreted during a period of time was utilized for analysis. None was left in the bladder. The volume was always in excess of 60 mL/hour during the anesthesia and during the surgery. If the excretory rate was 2.24 µg./hour for NE and 2.20 µg./hour for E, then we had a sample volume of at least 120 mL containing 4.48 µg. NE and 4.40 µg. E. The trihydroxy indole fluorometric assay will detect 0.001 µg. NE or E. Therefore, even though our recovery rate was 75–80 per cent, the error would be very small because the amounts of NE and E present in the sample are large. This state-
ment cannot be made for plasma which normally contains 0.5 to 1 μg./l. of E and sample size is usually only 25–50 ml. It is in the analysis of plasma that one is crowding the lower limit of sensitivity of the analysis.

6. Droperidol, which is one of the component parts of Innovar, is said to have moderate alpha adrenergic blocking effects. If this is the case, then the blood pressure should fall when the drug is administered. But falls in blood pressure are seen infrequently in neuroleptanalgesia in actual clinical practice. Cyclopropane and halothane, however, have no alpha adrenergic blocking activity, to my knowledge, and stable blood pressure is not necessarily dependent on catecholamine levels.

7. has been dealt with and deserves no further comment. I might add that although not published yet, this work has been confirmed by Dr. Bryan Craythorne at The University of West Virginia.

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CATECHOLAMINE EXCRETION Infused radioactive norepinephrine in dogs was cleared from the plasma at a rate averaging 64 per cent of the glomerular filtration rate. Norepinephrine was shown to be freely filterable and it is suggested that the amine is partially reabsorbed from the glomerular filtrate. Metabolism of norepinephrine in the tubular fluid by catechol-o-methyl transferase has not been excluded. The clearance of this catecholamine was not affected by changes in urine pH or flow. Total chronic denervation of one kidney had no effect on the rate of excretion of endogenous norepinephrine. The norepinephrine excreted in urine would appear to be solely derived from the catecholamines in circulating blood. (Ocory, H. R., Pfister, R., and Chidsey, C. A.: Studies on the Renal Excretion of Norepinephrine, J. Clin. Invest. 46: 482 (April) 1967.)

RENEAL TRANSPLANT Sodium metabolism in relation to changing blood pressure levels in human renal transplantation was studied in 2 patients. In one hypertensive patient a sodium diuresis occurred, reaching a maximum during the sixth and seventh postoperative weeks. At the same time, blood pressure fell, although remaining slightly elevated for the remainder of the period of study. A markedly raised total exchangeable sodium returned to normal following this period of increased sodium loss. Studies of the pre- and postoperative extracellular volumes indicate that this sodium loss was exclusively extracellular. The second case was initially normotensive but developed a moderate degree of hypertension 7 days after operation. This was associated with an elevation of a previously normal total exchangeable sodium. Resolution of this hypertension occurred following a sodium diuresis. (Scales, T. D.: Sodium Metabolism in Relation to Changing Blood Pressure Levels in Human Renal Transplantation, Amer. J. Med. Sci. 253: 531 (May) 1967.)