"supramaximal painful stimulus" as stated in the letter. Nor did we say that fentanyl produces "about the same responses" in humans and dogs. Nor did we ignore the rapid decay of the action of fentanyl.

In our unanesthetized dogs (pups), a hemostat (15 cm in length) was clamped quickly and full length to the skin at the base of the tail for 1–2 s in the awake dogs, but full ratchet for up to 10 s under the action of fentanyl. This evoked in the awake animals predictable increases in heart rate and blood pressure together with purposeful movements. Whether we stimulated supramaximally we do not know, but in agreement with others, we found the evoked autonomic responses to be useful and quantifiable "pain" indices. As we have shown, the responses so provoked were suppressed by fentanyl in a concentration-related manner and were completely abolished at and around plasma concentrations of 30 ng/ml where the cardiorespiratory side effects also had reached plateau. Liu et al. certainly used enormous doses of fentanyl (0.05–2 mg/kg) in dogs, but they only looked at the cardiovascular not the analgesic effects.

Our conclusion that "in dogs plasma concentrations in the order of 30 ng/ml are sufficient to reach the full action of fentanyl" is therefore supported by the data presented. It is also true that humans are rendered unconscious and unresponsive to noxious stimulation (absence of heart rate and blood pressure increases during tracheal intubation) at similar plasma concentrations. Thus, dogs and humans do seem to require about the same fentanyl plasma concentrations for abolishing the autonomic responses to noxious stimulation, even though there are obvious differences in the kinetics of fentanyl. Clearly, the fentanyl plasma concentrations decay (for unknown reasons) much more rapidly in dogs than in humans, which would necessitate more frequent reinjections or higher rates of infusion to maintain a certain plasma level in dogs.

Finally, I'd like to point out an essential semantic aspect of this dispute. Stanley and Port repeatedly use the term "anesthetic," which we strictly avoided in our article because opiates and general anesthetics are not the same. The former exert their highly specific actions via receptors confined to the nervous system, whereas the latter impair rather unspecifically cell functions in general and precipitate a comatose state. Therefore, when anesthesia is required, we recommend anesthetics alone or together with opiates but not opiates alone.

I realize that our observations hardly can be reconciled with Dr. Stanley's belief in the use of a large single dose of the highly lipophilic fentanyl without nitrous oxide for the purpose of "stress-free" anesthesia.

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REFERENCES

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Lightwand-guided Nasotracheal Intubation Is an Effective Technique

To the Editor—"A Complication of Lightwand-guided Nasotracheal Intubation" reported by Stone et al. in the December issue discloses a disadvantage of this technique, but it seems to miss a major point. That is, a very difficult technical feat was successfully accomplished by the transillumination technique of intubation.

We have used this method of intubation with a Flexi-lum 10° Surgical Light® over the past several years on 78 of our most difficult intubations and have not yet failed. This technique only takes a few seconds for intubation and is not difficult to master. To minimize the possibility of disconnection of the bulb, we are careful not to allow the light source tip to protrude past the end of the endotracheal tube.
Unfortunately, many anesthesiologists are not aware of this aid to intubation. Perhaps if more were familiar with the technique, an instrument would be designed for anesthetic use and made commercially available specifically for this purpose.

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LED Monitors and the Color-blind

To the Editor:—With the advent of more equipment into the surgical suite, much of it with red light emitting diode (LED) displays, red–green color blindness in one of the anesthesia staff here has become a problem.

Color blindness is a relatively common inherited X-link recessive trait. About 8% of the white male population suffers from this trait. Red LEDs typically emit light in the 660–630 nm range. Light in this range is difficult for red–green color blind people to visualize.

The problem equipment was the Accutorr 2* automatic blood pressure recorder. Our staff member found it very difficult to read it except at very close range. Other anesthesiologists had no trouble with this device.

The Accutorr 2* blood pressure recorder is relatively unique: it uses a circular polarizing front panel to decrease reflections. This polarizer gives the device a pleasant dark front but decreases light transmitted from the display by at least 50%. We suggest that red LEDs not be covered with a dark front plate in monitoring equipment. Those currently in use should be replaced with monitors that are more easily read by the color blind. In the short run, we suggest that readers remove the front polarizing plates and replace them with clear front panels.

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Multiple and Complementary Mechanisms Produce Analgesia during Intravenous Regional Anesthesia

To the Editor:—Lillie et al. have joined the groups of investigators proclaiming to have discovered the "Site of Action of Intravenous Regional Anesthesia (IVRA)."1 Two proposed sites of action are evident.* The most recent report indicates that small nerves or possibly nerve endings are the site of initial analgesia. This conforms to the conclusions of Miles et al.2 and Fleming et al.3 that the local anesthetic acts on nerve endings earlier than on nerve trunks. In sharp contrast, Raj et al. presented evidence that the local anesthetic acts on major nerve trunks, possibly reaching into the trunk via small venules within the nerve core.4

There are some puzzling differences between the

* Accutorr 2* is produced by the Datascop Corporation, 580 Winter Avenue, Paramus, New Jersey.

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