"Hypercapnia" versus "Hypercarbia"

To the Editor.—I was very interested to read Dr. Lamont's comments (ANESTHESIOLOGY *22: 325, 1961*) on the usage of "capnia" and "carbia" when referring to carbon dioxide tension. Apart from the disadvantage of the combination of Greek prefixes with Latin nouns, is it not reasonable that *carb*on dioxide tension should be referred to as hypo- or hyper-*carb*ia? As far as their origin is concerned the use of either word seems reasonable for are not smoke (kapnos) and charcoal (carbon) the waste products of combustion? May I press my plea for a general adoption of "carbia."

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Respiratory Complications and Muscle Relaxants

To the Editor.—The article by Drs. Salanitre and Rackow (ANESTHESIOLOGY *22: 194, 1961*) suggests a causal relationship between the giving of relaxants and the appearance of respiratory complications and of hypothermia in young infants. Their evidence consists of an invidious comparison of the incidence of these complications in a group which had received relaxants (especially *d*-tubocurarine) with a group which had received no relaxant. The argument they present fails to be convincing (as yet) because they do not show that the groups compared are similar except for the use of relaxant.

It would seem likely that the incidence of the use of muscle relaxants would be highest in thoracic and abdominal procedures and lowest in operations outside of the major body cavities. If this be the case, then the association of muscle relaxants with hypothermia and respiratory complications may be merely an association of the last two with the type of procedure. One might expect (1) that exposure of the moist, well-perfused viscera to the outer world would result in hypothermia, (2) that intra-abdominal and intrathoracic procedures would last longer, (3) that postoperative pain at the operative site in the above areas would result in hypoventilation etc., (4) that intrathoracic procedures (*i.e.*, tracheoesophageal fistulas) are often associated with pre-existing lung disease, and (5) that many intra-abdominal procedures at this time of life are associated with an abdomen that is already too full, so that following corrective surgery there may be a deleterious limitation to the movement of the diaphragm. Thus, the association of respiratory and other complications with muscle relaxants in young infants is interesting, but one may not assume that a causal relationship exists from the evidence thus far presented.

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To the Editor.—We thank the Editor for permitting us to answer Dr. Eger's criticism of our paper "Respiratory complications associated with the use of relaxants in young infants," ANESTHESIOLOGY *22*: 194, 1961.

We believe our groups of patients with and without relaxants are comparable as to type of operation, duration of operation and age distribution. We submit these data in support of this statement.

Our data shows 49 cases of major abdominal and thoracic surgery (including tracheoesophageal fistula, diaphragmatic hernia, duodenal atresia, meconium ileus, perforated viscus, biliary atresia) in the nonrelaxant group and 59 similar cases in the relaxant group. The findings in these groups were as follows:

Nonrelaxant group—49	
Hypothermic infants	21 (43%)
Infants with respiratory complications	7 (14%)
Hypothermic infants with respiratory complications	1 (2%)

Relaxant group—59	
Hypothermic Infants	38 (64%) $P < 0.05$
Infants with respiratory complications	23 (39%) $P < 0.01$
Hypothermic infants with respiratory complications	18 (30%) $P < 0.001$

The duration of surgery in the two groups was not significantly different.

In addition, the age distribution was quite similar for the two groups in the entire study:

0–7 days	28	32
1–4 weeks	15	14
5–8 weeks	50	40
9–12 weeks	21	20

In view of these data, we feel confident that the nonrelaxant and relaxant groups were comparable and that, in fact, a relationship exists between the administration of a relaxant and the increased incidence of hypothermia and respiratory complications in this age group.

We are as completely cognizant of the importance of drawing comparative and contrasting references from comparable clinical circumstances as is Dr. Eger. This problem of "being sure" plagues all clinical studies. We are convinced that within the limits of biological imponderables, these case groups are similar. The comparisons between them are not invidious. They simply let the chips fall where they may.

It should be emphasized that we do not believe that relaxants must not be used in young infants. We do believe that they must be used even more carefully than in the adult and certainly not casually.

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"HOPE" in Indonesia

To the Editor.—I have just returned from the SS HOPE in Indonesia after serving for a little more than two months as anesthesiologist. It was truly an exceptional experience in many respects. The trip provided an unusual opportunity for travel. HOPE Project personnel were exposed to unique Indonesian hospitality on many occasions. Receptions at the President's, governors', and mayors' mansions provided opportunities to see the best and unusual entertainment and to meet interesting people. I enjoyed invitations to the homes of local doctors to visit, to eat and to live with them. Our visits to their hospitals, exchange lectures and tours gave us insight into how the eighty-five million people in the fifth largest nation in the world are cared for by only fifteen hundred doctors.

The variety of anesthetic techniques employed in Indonesia is limited by lack of money, inadequate equipment and a small number of qualified personnel. Even the few questionably modern anesthetic machines were in need of repairs or lacked the agents that might make them useful. As a result local infiltration with procaine and diethyl ether were the most common primary agents. Most centers used the Oxford vaporizer, an inexpensive, accurate and efficient machine. I found its usefulness and safety enhanced by the use of a divided connecting piece at the face mask with a rubber flap valve over the exhalation port. This gadget, when used with an anatomic face piece, effectively reduced the mechanical dead space and the resistance to breathing. These are important factors in improving anesthesia with this machine in the hot climate encountered in Indonesia. Thiopental was available for induction and curare was used in some cases for relaxation. The selection of endotracheal tubes and connectors and laryngoscopes was limited. For example, in Bali, with a population over two million, the only laryngoscope was broken and a flashlight was used to help with the placement of an endotracheal tube. We repaired the laryngoscope. In Surabaya most of the endotracheal tubes in use were pieces of thick