between the progression of the disease and SACE activity. Conversely, we recently observed three cases of rapidly progressive pneumoconiosis (CWP, 1 case; silicosis, 2 cases) characterized by very high SACE activity (>mean + 4 units of standard deviation), associated with an increased alveolar lymphocytosis.

Evidence of elevated SACE levels in non pneumoconiotic coal miners lead us to suggest that interaction between mineral particles and alveolar macrophages may be in part responsible for the increased SACE production in CWP. However, little information is available concerning the relationship between type of mineral particles and secretories activities of alveolar macrophages. In our study, SACE activity is not related to progression of fibrosis in CWP but acute forms of CWP and silicosis are associated with high SACE activity.

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The Continuous Measurement of Mixed Venous Oxygen Saturation

To the Editor:

The recent symposium (Chest 1984; 85:748-781) contained three papers on the use of mixed venous oximetry. While accepting that this form of monitoring will certainly have a role in management of the critically ill patient, the assumed constancy of oxygen consumption made in these and other anecdotal reports concerns us.

This assumption is made to allow oxygen delivery, which is the product of cardiac output and arterial oxygen content, to be related to mixed venous oxygen content using a manipulation of the Fick principle. As the contribution from dissolved oxygen to oxygen content in the venous system is small, content can be directly related to mixed venous oxygen saturation. In this way changes in oxygen delivery in response to therapeutic maneuvers are represented by changes in mixed venous oxygen saturation.

Two aspects of the assumed constancy of oxygen consumption concern us. Firstly, in our hands and those of others,1 routine unavoidable daily care such as x-ray films, ECG, nursing procedures, visitors and doctors' examination can increase oxygen consumption up to 26 percent. There may, therefore, be no such patient as the steady state, resting, critically ill patient, given the small time interval between these maneuvers.

Secondly, the assumption is made that oxygen consumption is always independent of oxygen delivery. This relationship may not be true below a critical threshold for oxygen delivery. This was discussed in a previous editorial in Chest.2 Furthermore, in certain conditions such as patients with adult respiratory distress on ventilators with positive end-expiratory pressure, the critical threshold may be elevated beyond normally expected levels.3 Even at near normal mixed venous PO2 reduced oxygen consumption has been demonstrated in dogs.4 The addition of a varying oxygen consumption, which decreases in response to falling oxygen delivery would tend to lead to constancy of the mixed venous oxygen saturation, leaving an erroneous clinical impression of cardiorespiratory stability. Avoiding this requires the independent measurement of oxygen consumption and oxygen delivery to define the critical threshold for the latter. Then mixed venous oxygen saturation can be followed with confidence as a clinical index. We do, however, accept that the time and cost-benefit advantages of mixed venous oximetry are negated by the rigorous approach.

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Endoscopic Photography

To the Editor:

The recent article by Lakin, Metzger and Haughey (Chest 1984; 86:499-501) contains a photograph of the normal human larynx in phonation which was published without permission of the original authors or publisher. This photograph was first published in the Atlas of Otorhinolaryngology and Bronchoesophagology and again in the second edition of the Atlas in 1984.

The photograph is of some historic significance. It was taken during the summer of 1937 by Paul H. Holinger, M.D. with the endoscopic camera developed by Joseph and James Brubaker in collaboration with Dr. Holinger. In the original publication, the photograph is an excellent example of the quality (color and detail) which can be obtained with this camera. The camera, and other like it, were developed under the auspices of The Jacques Holinger Memorial Fund, Chicago, which was established by Dr. Paul Holinger in honor of his father, also an otolaryngologist. To this day, motion picture films and color slides are made available for teaching purposes to physicians and medical educators throughout the United States. The collection, compiled almost exclusively by Dr. Paul Holinger, contains a complete representation of the normal anatomy and pathology of the larynx, tracheobronchial tree and esophagus.

It is of particular interest that this is a photograph of the larynx of James Brubaker who worked with Dr. Holinger on the endoscopic photography project beginning in 1947. While they collected photographs of a wide variety of laryngeal pathology, there was little opportunity to photograph a normal larynx. When Dr. Holinger remarked about this one morning, Mr. Brubaker volunteered to be the subject. However, Dr. Holinger declined, refusing to take even the remote risk of a reaction to topical anesthesia when it was not absolutely necessary and medically indicated. Mr. Brubaker prac-
ticed for days with a laryngeal mirror until he was able to tolerate the examination without a topical anesthetic. Indeed, using a lightbulb, head mirror, wall mirror and laryngeal mirror, he learned how to visualize his own larynx. When the next opportunity arose, Mr. Brubaker again volunteered to sit for the photography session, this time without a topical anesthetic. The result was the photograph which appears on page 500, volume 86 of *Chest*. I would encourage interested readers to see the full color reproduction in the first edition of the *Atlas.*

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To the Editor:

We deeply regret having inadvertently sent this photograph in for publication with our article on upper airway obstruction. The intent of the picture was simply to demonstrate the location of obstruction in a visible way as it was difficult to describe verbally. We appreciate Dr. Holinger's history behind this photograph, telling of the extreme care, patience and expertise that was required to produce such excellent work.

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The Determination of Static Lung Volumes

To the Editor:

There are several statements in the "Static lung volumes" report (Chest 1984; 86:471-74) and recommendations which may be in error.

"Because of increased airway resistance, the transmission of pressure changes from the alveoli to the mouth may be incomplete and mouth pressure changes may underestimate alveolar pressure changes during the panting maneuver against the closed airway" (p. 472, 1st paragraph). It is very unlikely that airway resistance can effect the "transmission of pressure" in the absence of airflow. The flow associated with compression of the gas is too small to create a meaningful pressure drop.

"The variable pressure plethysmograph is fitted with a pneumotachograph . . . ." (p. 472, 2nd paragraph). I suspect this is a typographical error—should be either constant pressure or variable volume plethysmograph.

The paragraph starting "The convention of setting normal limits of all lung volumes . . . ." (p. 473, last paragraph, 1st column) does not clearly compare the three conventional alternative choices. The three choices are: 1) reference value = 20 percent of the reference value, 2) reference value - x percent of the reference value (x = 95 percent confidence interval = 1.96 x coefficient of variation), or 3) reference value - y (y = 95 percent confidence interval = 1.96 x SEE).

I agree that choice 1 is arbitrary and clearly not the best. Methods 2 and 3 are based on setting limits of normal such that there should be only a 5 percent false positive rate. This is reasonable and usual, although the clinical significance of the 5 percent versus any other false positive rate is unknown. The difference between 2 and 3 is that in 2, a fixed percentage of the reference is subtracted and in 3, a fixed amount is subtracted from the reference. The Recommendations prefer method 3 but states as the reason contrasts between methods 3 and 1. I believe method 2 is more convenient than 3, and that neither is absolutely more correct than the other. Moreover, the clinical interpretive difference between one or the other is insignificant. Consider, for example, that the difference in the limit of normal between methods 2 and 3 is 300 ml in an extreme case (190cm tall male, 40 y/o). In order to assess the importance of this difference, we can compare the 300 ml to potential sources of uncertainty.

A) For clinical assessment of an individual subject, the 95 percent interval for reproducibility on the same subject tested repeatedly on the same day (CV is 7.2 percent) is 581 ml.
B) The difference in reference value between Boren et al 2 and Goldman et al 3 is 1.25 L.
C) Although the Recommendations suggest a two tailed test, it is not unreasonable to ask separately what is the likelihood that this subject has increased or, independently, reduced FRC, in which case a one sided test is more meaningful. The difference in limits between these two approaches is 530 ml.

Thus the difference in limits determined from a percentage versus constant subtraction algorithm are comparable to other potential discrepancies. In view of the fact that experimental verification of either of the latter 2 choices is not certain, convenience should be just as a good reason as any for choosing one method of determining limits over the other as long as one recognizes the implications of each choice.

"The plethysmograph and the associated transducers, amplifiers, and recording equipment are expensive, and repairs are costly," (p. 472, 3rd paragraph, 2nd column) It is my personal opinion that commercial plethysmographs seem to have been overdeveloped, making them unnecessarily complicated and costly. The fundamental operation as described originally by DuBois, et al 4 has not been substantially improved. The plethysmograph system is inherently simpler than the alternate techniques. We routinely use the plethysmograph method in our laboratory. We find it is cost effective, reducing routine measurement time from 30 minutes with alternate techniques to less than 5 minutes. There is greater patient and technician acceptance of this method. The superiority of the method is amplified with measurements on obstructed patients.

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