gradients which is reflected in a
decreasing radioactivity count and falling
hematocrit.” They go on to say that “in
some instances a different pattern was en-
countered” and this pattern was that of rapid
hemodilution.

Furthermore, in an extensive experience in
our laboratory with rapid, massive hemor-
rhage in rats (50 per cent of the total circu-
lating volume), maximum hemodilution did
not occur until 8-12 hours following the hem-
orrhages. We believe therefore that practically
none of the available evidence supports the
use of the hematocrit drawn shortly after a
major bleeding episode as indicative of the
magnitude of the blood loss. If this false
premise is used as an indicator of blood volume
restoration, the amount of the loss will be
underestimated since maximum hemodilution
will almost certainly not yet have occurred at
the time of the determination.

The determination advocated by the au-
thors, filling an important need and being
simple, is attractive but we believe that any
sense of security based upon such a variable
indicator is not valid, and urge that any
clinical use of the hematocrit measurement
be made with full understanding of the
usual physiologic sequelae of major bleeding
episodes.

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Monitoring During Anesthesia

To the Editor.—The several points which
Dr. Holaday makes in his recent letter to the
Editor (Anesthesiology 22: 543, 1961)
concerning “Monitoring During Anesthesia”
are very well taken and deserve to be re-
emphasized. While it may be true that “few
anesthesiologists possess the skills necessary
to define their needs” in terms of, for example,
the frequency response of a given electronic
amplifying system, we believe that any rea-
sonably well-trained anesthesiologist should
discerning enough to be able to tell his
engineer exactly what information he is inter-
ested in recording. And any reasonably well-
educated engineer, after spending a few ses-
sions in the operating room, would have no
difficulty in knowing how to go about getting
this information.

Perhaps an equally important problem cen-
ters around the fact that we are not exploiting
to any significant degree those methods which
have been proved in the laboratory and are
available for clinical use. To sight a specific
element: the ear oximeter. While this device
doeas not provide individual determinations as
accurate as a blood gas analysis, the informa-
tion is continuously available and is accurate
enough (±2.5 per cent) in the upper ranges.
It is certainly far more accurate than the
human eye can hope to be. It will provide
valuable information and, in our experience,
is quite reliable. (Recently, without any
prompting on our part, our cardiac surgeon,
in surveying the surgical mortality of mitral
stenosis over a ten-year period, arrived at the
conclusion that the improvement noted in the
last few years was directly attributable
to the more accurate information available
with the ear oximeter during surgery.) One
could easily point to other examples wherein
known reliable methods of monitoring certain
physiologic phenomena are not being com-
monly used to any significant degree.

In attempting to seek out reasons for this,
I find that often a knowledgeable anesthesi-
ologist will “poo-poo” the value of certain
well defined physiologic determinations. One
claimed that he could tell more about homeo-
statics by having the surgeon feel the aorta
than with a direct arterial tracing. Still an-
other claimed that all these “fancy” goings-on
served only to detract the anesthesiologist’s
attention from the patient. These anesthesi-
ologists would look askance at any study in
animals which did not contain accurately
defined physiologic data, and yet are satisfied
to discuss with great finality what happened
to their patients and why, based upon a five-
minute reading of indirect blood pressure,
pulse and respiratory rate.

The argument is offered that these instru-
ments are expensive. In this respect, perhaps
we ought to look about us and answer the question, "What have we done to make anesthesia safer for our patients in the past thirty-five years?" This has been a period during which we have introduced some very remarkable drugs—all very useful, very fast and very potent. True, we have trained more and better doctors to handle those drugs. But have we given them any better tools with which to work? Almost none! The anesthesia machines are prettier, the flow-meters, less troublesome, and the CO₂ absorbers collect CO₂ better. But the only monitor is still the same mercury (or air) manometer. The empty space in the cabinet could easily be taken up with some useful monitoring equipment, none of which is too complicated for anyone to operate.

It is time that we began to utilize physiologic monitors more commonly. In the final analysis, the more information we have about what is happening to our patients, the better will we be able to make intelligent decisions about what to do.

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Machines and Men

To the Editor.—Every so often an article appears pointing out how valuable this or that device is in the conduct of anesthesia or in monitoring the patient. Somewhat less often an article appears decrying the substitution of machines for clinical acumen. Thirty years ago, the British Journal of Anaesthesia published an editorial, "Machines and Men," and a letter to the editor which covered both sides of the argument quite well:

"The ever increasing tendency of machinery to preponderate in the affairs of mankind, which is probably the most noticeable feature of the modern world, is in no department of life more remarkable than it is in our specialty of anaesthesies. So much, indeed is this the fact, that one observer remarked that the anaesthetist of the future will not be a doctor clad in a sterile overall in the operating theatre, but an engineer in dungarees working outside it. Here, with a vast machine that records respirations and heartbeats, blood pressure and muscle tone and the rates of flow of liquids and gases and their pressures, he will sit with oihiean and spanner and regulate the wheels and cranks and cogs of his machinery, without eye or ear having direct cognizance of the patient who is being operated upon.

"This is, of course, but a fanciful sketch and yet it is not in some ways very far removed from present truth. And the question at once suggests itself, is it altogether for the patients' good that the anaesthetist should become more of a mechanic and less of a medical man? Is there, in fact, any danger that by this increased attention to the mechanical side of his art, he will lose something of the medical side, and that by knowing so much more of the machinery that he uses, he will know proportionately less of the man on whom and for whose benefit it is being used? We confess to a certain apprehension that there is some foundation for these fears. This apprehension arises from observation of the young anaesthetist of today as he matures. We notice and applaud his mechanical skill. We marvel at, and perhaps envy, his unrivalled assortment of tubes and taps and mechanical devices of various kinds, but we are, on the other hand, sometimes a little shocked at the comparative inadequacy of his clinical acumen and observation. It does not cheer us to see him successfully carrying out a difficult and elaborate method of administration without realising that his patient has achieved a condition in which remedial measures are immediately necessary. We believe that it is still the patients' condition which should be the anaesthetist's first care, not the condition of his machinery.

"Nobody, of course, can question the benefits which improved machinery have brought to the administration of anaesthesies. It is only through advances on the mechanical side that the wide and efficient use of nitrous oxide and oxygen has become possible, that intracheal insufflation has become an everyday practice and that continuous level supplies of ether vapour can be given with ease. Have