the fast-moving variants, and the homozygotes as shown in Figure 1. (Recently I have also detected a case of 
hetereozygosis of transferrin and comple- 
ment component C3). However, it is always necessary to keep in mind that 
α1-antitrypsin heterozygosity is not the only 
cause of α1 zone-splitting. In fact, in one case the additional band was 
α-fetoprotein (I). In my experience the 
better way to ascertain the cause of the 
splitting is the immunosubtraction 
electrophoresis technique (2), which in 
this case consists of the immunoprecipi-
tion of α1-antitrypsin at the begin-
ing of the electrophoretic run. In the 
case of α1-antitrypsin heterozygosity the 
two α1 bands will disappear. By the 
immunofection technique the results are 
not so good because the close prox-
imity of the two bands almost always 
causes the immunoprecipitates to fuse.

References
1. Aguzzi, F., Poggi, N., and Chiara, T., INTER:
terpretation of serum protein electrophoresis 
(possibilities offered by the techniques of 
immunofixation electrophoresis and immuno-
Lab. 8 (Suppl. 1), 171 (1978).
2. Aguzzi, F., and Poggi, N., "Immunosub-
traction" electrophoresis: A simple method 
for identifying specific proteins producing the 
cellulose acetate electrophoretogram. Boll. 

Francesco Aguzzi
Laboratorio Analisi 
Ospedale di Broni e Stradella 
27043—Broni, Italy

Performance of the Oxygen—
Hemoglobin Dissociation Analyzer 
("Hem-O-Scan"), Compared with 
the IL 282 Co-Oximeter

To the Editor:
Studies on the use of stroma-free 
hemoglobin solution as a temporary 
erythrocyte substitute necessitated 
the measurement of the oxygen—hemoglobin 
dissociation curve on samples of whole 
blood obtained from baboons during 
exchange transfusion (1). With the 
"Hem-O-Scan" oxygen dissociation 
analyzer (American Instrument Co., 
Silver Spring, MD 20910) this curve, in 
which percent saturation of hemoglobin 
with oxygen is the y-axis and the partial 
pressure of oxygen (PO2) is the x-axis, 
can be simply and easily obtained. 
The manufacturer specifies the reproduc-
ibility of P50 (the PO2 at 50% saturation) 
determinations for human whole blood 
or hemolysate, but no data are available 
concerning the accuracy of the P50 
value, or of any other point on the dis-
ociation curve. We assessed the accu-
tracy of the Hem-O-Scan under our ex-
perimental conditions.

We obtained anaerobically 62 samples 
of mixed venous blood from 12 baboons 
that were undergoing extensive exchange 
transfusion with stroma-free 
hemoglobin solutions. Aliquots of each 
sample were analyzed with a IL 813 
blood-gas analyzer (Instrumentation 
Laboratory, Inc., Lexington, MA 02173) 
for pH, Pco2, and PO2; with an IL 282 
Co-oximeter for oxygen saturation, total 
hemoglobin, methemoglobin, and car-
boxyhemoglobin; with a Damon IEC 
MB centrifuge for hematocrit; and with the 
Hem-O-Scan for a dissociation curve. The saturation, as measured with 
the Co-oximeter, was corrected for the 
proportion of methemoglobin and car-
boxyhemoglobin, to reflect the per-
centage of functional hemoglobin that 
in fact was oxygenated. This corrected 
saturation was accepted as the true 
value (2, 3). The oxygen saturation of 
each sample was evaluated from the 
corresponding dissociation curve, by 
reading the ordinate of the curve at the 
value on the abscissa corresponding to 
the mixed venous PO2.

Hematocrits of the 62 samples ranged 
from 0.1 to 42.0%, total hemoglobin 
cconcentrations from 36 to 141 g/L, and 
methemoglobin values from 0.0 to 
21.6%. The mixed venous PO2, species 
from 0.13 to 5.2 kPa (4.0 to 31.7 
nmHg). The corrected percentage satu-
urations, as determined from the Co-
oximeter, varied from 26 to 87%.

A plot of the 62 saturation data ob-
tained from the Hem-O-Scan dissociation 
curve (y) vs those measured from the 
Co-oximeter (x) was linear by the 
method of least squares. The linear 
correlation coefficient was 0.907, which 
was significant (p < 0.001). The slope 
of the line was 1.094, the intercept
−5.7%.

These results show that the Hem-
O-Scan provides accurate information 
concerning the relationship between PO2 
and oxygen—hemoglobin saturation over 
almost the entire range of the dissociation 
curve. Such accuracy is required to 
obtain information about a single point 
on the curve such as the P50; or the 
shape of the curve, as reflected in the 
Hill coefficient; or changes in the posi-
tion of the curve, such as measured by 
the Bohr and Haldane coefficients (4).
Furthermore, we found the Hem-O-
Scan to be accurate over a wide range of 
hematocrits, hemoglobin concentra-
tions, and proportions of methem-
globin.

References
al., Cardiac output response to extreme 
modulation with hemoglobin solutions of 
various P50 values. Crit. Care Med. 7, 380 
(1979).
2. Sehgal, H. L., Sehgal, L. R., Rosen, A. L., 
et al., Sensitivity of the IL 282 Co-oximeter 
to low hemoglobin concentration and high

All the individuals were subjectively

H. L. Sehgal
L. R. Sehgal
A. L. Rosen
R. DeWoskin
S. A. Gould
G. S. Moss

Division of Biochem. Research 
Dept. of Surgery 
Michael Reese Hospital & 
Med. Ctr. 
Chicago, IL 60616

Week-Day Variation in Clinical 
Chemical Analyses

To the Editor:
Seasonal and diurnal variations in 
concentrations of several of the analytes 
in blood are well known. Variations due 
to differences in life style on different 
week-days have received much less 
attention.

In Sweden, the mode of living during 
week-ends probably differs from the rest 
of the week. For example, the sales sta-
tistics for the Swedish alcohol monop-
oky, "Systembolaget," show considerably 
higher figures for Fridays and Satur-
days. It seems reasonable to believe that 
most of this is consumed during the 
week-end. Because smoking is associ-
ated with drinking (1), people may 
smoke more during week-ends. People 
stay up longer at night and sleep longer 
in the morning. There may also be dif-
ferences in food intake and physical 
exercise.

To study if this assumed difference 
during the week in alcohol consumption, 
smoking, and in life style in general 
might affect results of common clinical 
chemical analyses, we have calculated 
the mean and standard deviation for 26 
analytes made on samples obtained on 
Monday and compared with the same 
analytes in samples obtained on 
Thursdays. The samples were from a 
cohort of 48-year-old men participating 
in a health survey at the department of 
Preventive Medicine, Malmö General 
Hospital, Malmö. All sampling was 
performed in the morning by trained 
personnel and the patients had been 
informed in advance to fast for at least 
8 h before sampling. The samples were 
analyzed within 24 h at the Department 
of Clinical Chemistry, Malmö General 
Hospital.

All the individuals were subjectively