EXPERIMENT #2.   HEMORRHAGE

The loss of even modest amounts of whole blood upsets the balance of hydrostatic and osmostic forces in the capillaries. Use the **T**itles* command to put 5 or more of the following variables into the printout display: red cell mass (RCM), plasma volume (PV), plasma pO_2 (PO2V), erythropoietin (ERYTH), and hematocrit (HCT).

Establish the baseline values by running for 60 minutes at 5-minute increments. Establish a hemorrhage volume (HEMVOL) of 750 ml over a time of 30 min (HEMMIN). Follow the indicated variables for 2 hours at 5-minute increments. What happens to the red cell mass on this time scale? What happens to the plasma volume and to the hematorcrit? Follow these variables for a period of two days (2880 minutes) and observe the changes. How long does it take for the red cell mass to begin to increase significantly?

The fall of arterial pressure during and after hemorrhage evokes responses in addition to those in the capillaries. Design an experiment (i.e., decide upon the variables to measure) which could illustrate the renal response.

*View Output: in web-HUMAN

Notes on the Use of HUMAN–80 Student Manual Experiments in *web*-HUMAN

Essentially all HUMAN-80 experiments run *perfectly* in *web*-HUMAN. Nevertheless, those using the HUMAN-80 experiments with the current *web*-HUMAN model should be aware of certain minor compatibility issues and limitations.

What is HUMAN–80?: There have been multiple past versions of the HUMAN model of which *web*-HUMAN and HUMAN–80 are but two. Human–80 was a version of the HUMAN model designed to run on desktop PC's. Although both versions of the model behave virtually identically *physiologically*, they obviously differ vastly in how the user interacts with them. This means that those parts of a HUMAN-80 experiment instruction sheet that are user-interface specific are not necessarily fully compatible with *web*-HUMAN.

Adapting HUMAN–80 Manual experiments to *web*-HUMAN:
Essentially all HUMAN-80 experiments run *perfectly* in *web*-HUMAN. Just follow Dr. Randall's instructions step by step.

     - wherever possible the text of these exercises has been <u>edited or annotated</u> to increase compatibility of the instructions with *web*-HUMAN. Thus references to commands that differ between the two versions have been updated either by editing or by indication with a commented superscripted symbol (* or #) .

     - <u>experiment numbers</u> in HUMAN-80 *DO NOT MATCH* those in those in *web*-HUMAN. To create your own tabular output format simply load web-HUMAN experiment #1 and follow Dr. Randall's instructions using View output: to create your own data tables.

     - users should note that HUMAN-80 had <u>no graphic output</u>, only tables. In *web*-HUMAN you can choose to graph by simply selecting <graph> instead of just <text> below each variable in the View output: table.

     - HUMAN-80 instructions sometimes ask for users to look at <u>more than six variables</u>. To do so simply rerun the experiment with the additional variables displayed or use the <View Variable> option to obtain a value for a variable that is not in the tables.