January 6, 1960

TUL1.961015.024

Memo to: Dr. Charles C. Sprague

From: Roy H. Turner, M.D.

Dear Charlie:

Three years ago we made fairly extensive observations, the results of which have not been published, on what happens to serum lipids when a person gets out of bed in the early morning and takes a standard exercise, (the 2-step test). Subjects were bled before rising, and immediately upon completion of the exercise, and again 8 or 16 minutes later. These experiments were originated because we had noticed in some around-the-clock studies of four normal subjects that the concentration of lipids in the serum was regularly greater in the morning when they reported to the laboratory than it was at 5:00 P.M. the afternoon before, although the subjects had had no food for 12 hours before the morning bleeding referred to. We imagined that some phenomenon of lipid mobilization was initiated by rising and exercising.

The results of our short experiments described above were quite consistent, in that practically all the subjects showed increased concentration of both cholesterol and phospholipid after exercise, relative to the initial resting control, and there was a regular trend to initial values with subsequent rest, sometimes "over-shooting".

The concentration of total proteins behaved in the same fashion, and when the values for lipids were corrected by a factor derived from concentrations of total proteins, (on the liklihood that all changes in lipids were manifestations of shrinking and then expanding plasma volume, brought about by changes in posture and muscular activity,) the changes in lipid concentration were wiped out.

At last I am coming to the first point of special interest; namely, the magnitude of changes in protein concentration observed in experiments of this sort were greater for women than for men. The big difference in serum lipids between young men and women as described by our methods is that women have smaller concentrations of neutral fat. In view of the fact that some of the lipoproteins, especially those loaded with neutral fat, represent the largest protein particles in the plasma, we have wondered if these large particles might play a role of some importance in controlling escape of fluid through capilliary pores. We have also wondered if they might play some

part in capillary hemostasis, and their scarcety might be one of the causes of spontaneous small hemorrhages, especially in the skin, for which no adequate explanation is now available, to which women seem especially prone.

As I mentioned yesterday, I would be greatly interested in a joint study with you or someone in your group on some aspect of this problem. A number of different approaches might be made, and the choice between them would depend a great deal on the availability of assistance of several sorts. I hope we can talk over some of the possibilities in the near future.

Sincerely,

RHT:gm