

6 (262)

The role of tonicity in human isohemagglutination.By **FREDERICK P. GAY.**

*[From the Laboratory of the Danvers Insane Hospital,
Hathorne, Mass.]*

As was shown by Landsteiner and others, human bloods fall into three rather definite groups as regards isohemagglutination. The serum of members of group I agglutinate the corpuscles of groups II and III, but the corpuscles of group I are not agglutinated by any foreign human serum; members of group II agglutinate group III and are agglutinated by them; serum of members of group III agglutinate corpuscles of group II. Individuals in groups II and III, respectively, do not interagglutinate. It was found that constant relative differences in tonicity were present between these isoagglutinating groups, as was determined by the varying resistance, to hypotonic salt solutions, by the corpuscles of members of the respective groups, and by testing the tonicity of the various corresponding sera. Thus the tonicity of bloods of group I is found uniformly higher than that of bloods of groups II and III; bloods belonging to group II are higher in tonicity than those of group III. Simple hypertonic solutions of CaCl_2 , but more particularly solutions hypertonic both in respect to NaCl and CaCl_2 , produce a cohesion of human blood after several hours, that suggests isohemagglutination.

It is evident that hypertonicity alone, as regards total molecular concentration of all the substances present in serum, cannot account entirely for human isohemagglutination; although group II sera would agglutinate group III corpuscles, group III sera could not agglutinate group II corpuscles, as is the case. Relative differences in concentration of one or several salts or colloids could account for all the phenomena, as a given blood might be of higher molecular concentration in respect, say, to CaCl_2 , and yet in total concentration be inferior to another blood, which it agglutinates.

It may be shown that when a serum of group I agglutinates a member of group II, and another of group III, the agglutinating power is apparently specific for each, as may be proved not only

by ordinary absorption methods, but also by working with an "agglutinin" bound to the cells and then split off by heat to 50° C. (Landsteiner). Such a "bound agglutinin" is highly "specific"; that is, if it has been bound by cells of group II it agglutinates only members of group II and not members of group III. Such an apparent demonstration of multiple specific agglutinins does not, however, rule out simple tonicity as the sole cause of the isoagglutination, for it may be shown that when serum I has been absorbed by blood II, *the tonicity of the serum has changed to equal the tonicity of II*. Such an absorbed serum would naturally no longer agglutinate II, but would still agglutinate III, since serum II will agglutinate III.

There is strong evidence, then, for the belief that isoagglutination of human blood may be due simply to physico-chemical variations in molecular concentration, and may be independent of the presence of any hypothetical new chemical bodies (agglutinins).

7 (263)

Effects of calcium and magnesium salts upon the development of rigor mortis.

By **S. J. MELTZER** and **JOHN AUER**.

[*From the Department of Physiology and Pharmacology of the Rockefeller Institute for Medical Research.*]

The effects of calcium and magnesium salts were studied on rabbits, cats, guinea pigs, rats and frogs; most extensively, however, on rabbits. Effects were obtained by means of subcutaneous, intravenous or intra-arterial injections; the intravenous method being more extensively employed than the other methods. The infusions were given in solutions of M/1, M/2, M/4, or M/8 concentration. Of the calcium salts we used CaCl_2 , $\text{Ca}(\text{NO}_3)_2$ and $\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2$; of the magnesium salts, MgSO_4 , MgCl_2 , $\text{Mg}(\text{NO}_3)_2$ and $\text{Mg}(\text{C}_2\text{H}_3\text{O}_2)_2$.

The following are the chief results. Calcium salts hasten and magnesium salts retard the development of the rigor of skeletal muscles. After treatment with calcium salts the rigor may begin twenty minutes after death, and after magnesium treatment it may