

these changes are causally related to such activity. The change in potential produced by a slight chemical change in a complex solution like the plasma may be of greater significance than a corresponding change in the potential of a simple solution of its inorganic constituents. For even a slight change in the plasma during activity may be sufficient to modify or to neutralize the electrical potential between the proteid complex in the cell and the solution in which it is held. This might result in the precipitation of the proteid complex, or sufficient change to act as a stimulus.

At the request of Dr. Carlson, who has been working on this problem, I made an approximate analysis of the *Limulus* blood, not knowing of the analyses already made by Genth and by Gotch and Laws.³ The results of the three analyses agree so closely that all of them are given. No attempt has been made by me to find how the acids and bases are combined except the usual routine methods given by Hoppe-Seyler and the methods adopted by the A. O. A. C.; both of these methods were used wherever they differed.

BLOOD ASH OF LIMULUS.

	Genth.		Gotch and Laws.
NaCl	83.50 %	79.207	85.184
KCl	2.395	4.667	2.707
K ₂ SO ₄	1.686	3.264	.594
CaSO ₄	3.470	2.159	3.986
CaCO ₃	1.448	2.950	.275
MgO	5.128	1.959	6.457
MgCl ₂	1.840	3.848	—
Mg ₂ P ₂ O ₇	.444	1.709	0.236
Fe ₂ O ₃	.081	traces	.029
CuO	.085	0.297	0.508
P ₂ O ₅	—	—	—
SO ₃	—	—	—
Cl	—	—	—
SiO ₂	—	—	—

BLOOD OF LIMULUS (McGUIGAN).

Summary of results.

	Per Cent.
Water	91.784
Solids:	
Proteid	5.162
Ash	2.676
Other organic constituents.....	.378

8.216

³ Von Furth, 'Vergleichende Chemische Physiologie der niederen Tiere,' 1903, p. 88.

Ash.

Cl (total)	54.820
NaCl	28.600
KCl	2.930
CaO	2.510
MgO	5.580
P ₂ O ₅	0.340
Fe ₂ O ₃ (not determined).....	trace
CuO	0.273
SO ₃	1.570
SiO ₂420
Cl (uncombined with K and Na).....	3.281
CO ₂	not determined

Although the results agree fairly well, yet there are differences. Whether or not these differences are sufficient to cause an appreciable change in the metabolism of the ganglion cells as evidenced by the behavior of the heart muscle remains to be investigated. Any change in the metabolism of the ganglion cells would be more stimulating if the changes in the composition of the plasma were sufficiently rapid to prevent the acclimatization of the colloids. However, as the sea water itself varies in composition in different localities, in order to get a close agreement in the blood ash, it may be necessary to select animals from the same locality. The ash which I examined was prepared at the Marine Biological Laboratory, Woods Hole, Mass. The proteid and moisture content were determined immediately after the removal of the *Limulus* from the water. Before any definite conclusions can be drawn from this work it may be necessary to make more analyses.

HUGH McGUIGAN

WASHINGTON UNIVERSITY

QUOTATIONS

THE GREAT MEN OF FRANCE

THE word *plébiscite* has been for more than thirty years a word of ill-omen in France. One of the most widely circulated of French newspapers, the *Petit Parisien*, has, however, been rehabilitating the word during the last few weeks in a way too striking to be ignored. It appealed to its readers all over the country to vote on the question of the relative pre-eminence of great Frenchmen of the last century. Fifteen million answers have been re-

ceived, and what gives value to this striking demonstration is that we have here the opinion of average France, not that of a political *coterie* or of a cultivated *élite*. The world knows now approximately what France thinks of her great men and what her conception is of civic duty, as well as of intellectual and moral distinction. It is the revelation to the foreigner of an idealism certainly unsuspected. Only those observers who have had the privilege of studying the evolution of the French mind and feeling over an unbroken series of years on the spot were aware of the profound transformation which the Republican school system and stable Republican government in general have affected in the points of view of the present generation of Frenchmen.

The winner of the recent contest is Pasteur. Victor Hugo runs him close, having received 1,227,103 votes against 1,338,425 for the world-renowned man of science. But it is characteristic that two men of peaceful pursuits should precede on the list those great Frenchmen who might have appeared at first sight to have most contributed to that special kind of glory known as French. Gambetta follows Victor Hugo with 1,155,672 votes. Then come Napoleon I. and Thiers with 1,118,034 and 1,039,453 votes, respectively. For the sixth place what foreigner would have suggested the name of Lazare Carnot? Yet a moment's reflection will reveal the reasons for his juxtaposition with Thiers. The latter has certainly been acclaimed as the 'libérateur du territoire,' and what, after all, was that work of his but the repetition of the incomparable services rendered by Carnot in the organization of the Republican armies of the Revolution? With remarkable persistency, moreover, the French soul to-day vibrates between the primordial patriotic concern as to the defence of the integrity of French soil and its emotion of gratitude in presence of the great peaceful benefactors of the nation in the fields either of science or of art. The order of the names that succeed Lazare Carnot's is the proof of this statement—Curie, the discoverer of radium; Alexandre Dumas *père*, who has charmed several generations not only of Frenchmen, but also of Englishmen; Dr.

Roux, the inventor of the diphtheritic serum; Parmentier, the introducer of the potato into France; then Ampère, the father of dynamic electricity; Brazza, the founder of French West Africa; Zola, whose place here thirteenth on the list shows conclusively what France now thinks of his courageous deed as author of 'J'accuse'; Lamartine, a consoling election for those who have always regarded the author of 'The Lake' as the most seductive Frenchman of the nineteenth century; and François Arago, the astronomer and physicist.

This brings us to the sixteenth place, which is held gloriously by Mme. Sarah Bernhardt. But immediately afterwards comes M. Waldeck-Rousseau, MacMahon, the hero of the famous "J'y suis, j'y reste"; President Carnot, who certainly incarnates here a very characteristic conception of civic duty; Chevreul, the chemist; and Chateaubriand, the most eloquently French of all the writers of the last century, unless exception be made for Michelet, who figures twenty-third on this list after de Lesseps. This is a victory which shows how short-lived is French rancour. Ten years ago no *plébiscite* in France would have given such a result, the stupendous energy of the creator of the Suez Canal having been forgotten amid the tempest of the Panama scandals. The next four names are Jacquard, the inventor of the weaving machine, Jules Verne, President Loubet, and Denfert-Rochereau. The list is to be continued until we have before us 502 names. These results constitute a lesson full of instruction not only for the rulers of France, but for foreigners curious as to the temperament and ideals of contemporary Frenchmen.—Paris correspondent of the London *Times*.

CURRENT NOTES ON LAND FORMS

IN taking up again the series of 'Current Notes on Physiography,' begun in 1895 in the first of the New Series volumes of SCIENCE, the senior reviewer has as associates Professor D. W. Johnson, of Harvard, and Mr. Isaiah Bowman, of Yale. The term physiography was taken, at the beginning of the series twelve years ago, to be the modern equivalent of what has long been known as physical