Professor H. H. Chapman returns to the Yale Forest School to assume his duties as Harriman professor of forest management. He has been assistant district forester, in charge of silviculture at Albuquerque for the past two years.

At the recent commencement the following appointments were made in the department of zoology, college of liberal arts, Syracuse University: Dwight E. Minnich, Ph.D. (Harvard, '17), of Oxford, O., instructor in zoology; Harry S. Pizer, M.Sc., of Brooklyn, N. Y., assistant in zoology.

Dr. Frank A. Hartman, of the department of physiology, the University of Toronto, has been appointed head of the department of physiology at the University of Buffalo.

Colonel J. G. Adami, F.R.S., professor of pathology, McGill University, Montreal, has been elected vice-chancellor of the university in succession to Sir Albert Dale.

Professor Grafton Elliot Smith, professor of anatomy in the University of Manchester, has been appointed to the chair of anatomy at University College, London.

DISCUSSION AND CORRESPONDENCE

TECTONIC FORM OF THE CONTINENTS

Our prevailing notion concerning continental mass is strictly geographic in significance. In our definition tectonics finds no place. Relation of sea and land is made causal and essential; whereas it is only accidental and trivial. The outstanding feature is a broad basin with high mountainous rim and a low sea-level interior. This is a statement of the observation of the late Professor J. D. Dana. In its larger, or telluric, aspects this definition is genetically without meaning.

In the final analysis of the major relief features of our globe the hydrosphere is for simplicity's sake left out of account. The effect then is as if the entire face of the earth were a land area. A condition is premised analogous to that of our waterless moon. Genetically the oceans serve only to obscure the tectonic essentials of relief expression.

Recent experimental reproductions, in spheroidal masses, of those broad basinal tracts that correspond to the oceanic depressions of the geoid are accompanied by results having curious significance. They point to the fact that we shall have to modify our basic conceptions concerning all the major deformations of the earth's crust.

Instead of distinguishing between continental elevations and oceanic depressions, a circumstance imposed by an unweening importance attached to the presence of the sea, a notion handed down from time immemorial, the proper discrimination to be made is between the cordilleran ridges of the continental borders and the intervening lowlands, whether above the level of the waters in the continental interiors, or beneath sea-level in the oceanic areas. On this basis the tracts which we are accustomed to designate the oceanic depressions and the sea-level interiors of the continents are arranged in the same taxonomic category. Consideration of any such datum plane as sea-level may be with full propriety entirely neglected. The meridional disposition of the continents thus comes to be readjusted as relatively narrow orographic ridges in place of broad basin-shaped plateaus.

The tectonic consideration of a waterless earth casts a new light upon the schematic form of our globe. In its logical consequences the contractional hypothesis finds expression in such figments of the imagination as the *reseau pentagonal* of Elie de Beaumont, and the tetrahedral globe of Lothian Green. To be sure the form known as the tetrahedron is of all geometric solids the one form which possesses the least volume in comparison with a given surface area, while the sphere contains the greatest bulk within the same surface; yet the collapse of the latter is not necessarily a crystallographic shape as that indicated by the former.

In the present state of our knowledge any schematic form of our earth is largely conjectural. However, it is suggested lately that in the case of a collapsing spheroid the initial tendency towards a faceted form would prob-

ably not be directly in the line of any limiting shape, as a four-sided figure, but towards something intermediate between a limiting shape and the most general form, or a figure having twelve or twenty-four faces. That the rhombic dodecahedron is possibly the real plan, if there be any, although having in nature curved surfaces, seems to be borne out by the trend of the chief mountain ranges of the world, and by the situation of the main volcanic activities at the sharp solid angles or the points where each set of faces intersect.

Viewed, then, in their telluric relations the continents are probably best regarded not as broad basins with upturned rims but as somewhat irregular, interrupted, meridianally disposed ridges. These ribs appear to be directly traceable in their genesis to released cumulative tension that depends upon the secular retardation of the earth's rotation.

CHARLES KEYES

AMERICAN ASSISTANCE FOR RUSSIAN EDUCATIONAL INSTITUTIONS

TO THE EDITOR OF SCIENCE: Revolution, war and anarchy threw Russia out of the rut of normal life. And in no phase of Russia's national life have the results been so disastrous as in public education, which can not be placed again on an adequate and normal footing without the assistance of the Allies.

Just before the war, there was adopted a plan for universal education, also for opening a number of higher institutions of learning, especially, technical and agricultural colleges. These educational institutions are open, but on account of complete lack of the supplies needed for conduct of studies and practical work of the students, and, because it has been impossible to obtain apparatus, tools, etc., from Germany and Austria whence they formerly came, it becomes necessary to conduct the studies one-sidedly and incompletely and it is difficult to expect good results from such studies.

There is only one way of obtaining such supplies for Siberia, where several higher institutions of learning have recently been opened, and that is to purchase the supplies in the United States where, at present, most of the laboratory instruments and other technical supplies, so far as I know, are manufactured and are quite satisfactory as to quality.

The writer, who came to this country as the representative of the Ministry of Agriculture, would like to dwell upon this mattter in reference to the laboratories and institutions in different branches of agriculture and experimental stations and also to throw light upon the general aspect of this question.

Equipment of the Russian educational institutions with necessary supplies is furthermore complicated by other circumstances, such as: lack of means and complete impossibility of making purchases for cash owing to very low exchange rate of the rouble at the present time. And, meanwhile, the matter of education is urgent and a way out of this difficult situation is possible only in case the American scientific and academic circles would realize that the problem of education in Russia at present is tragic, if they would have a desire to come to aid and organize such aid.

During the difficult struggle against the Bolsheviki, Siberia had an opportunity to become acquainted with and learned to appreciate the brotherly assistance of the American Red Cross in the matter of organizing hospitals and havens for refugees. The scientific educational matters as well as the work of the Red Cross may and must be outside of politics. It is sufficient to be in sympathy with a people in order to come to their assistance. And, if my American academic colleagues share this point of view and would give an impetus to this new movement in the matter of spiritual aid to Russia, then, I am firmly convinced, the Americans would organize this aid in as splendidly efficient a way as they have organized the Red Cross.

It is, however, self-evident that this aid must be given on an entirely different basis. There could be no question of charity, but simply the matter of facilitating the purchase of the necessary technical equipment by permitting purchases to be paid for in instalments.

I do not, by any means, offer my suggestion as the only feasible plan, but would only like