

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 matter 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

to indicate a plan which, it seems to me, could be realized and would suggest that it would be possible to work along the following lines: Let a competent American scientific-academic organization take up this matter. The writer can make a formal request on behalf of the Russian Ministry of Agriculture and the Ministry of Education. If the organization in question regards the matter favorably, *i. e.*, it decides that it is expedient and necessary to render those portions of Russia which had been freed from the Bolshevik domination, assistance in the purchase of the books, the instruments, the glassware and other technical equipment for institutions of learning, laboratories and experimental stations, let such an organization enter into negotiation with firms who manufacture and supply the American scientific-academic institutions with technical supplies. The purpose of these negotiations would be the arrangement of easy terms of payment on the purchases which would be necessary. Further negotiations could be carried on by an authorized person who has lists of necessary articles and who might be assisted by the Russian Economic League or some other institution which does purchasing of different commodities for Russia. In this way, it will be something like a loan in goods, such loan being made with the spiritual aid of American scientific and academic circles and with certain concessions on the part of the American firms.

It might be mentioned that such concession should prove a very good business investment, since it would be an excellent foundation for substituting American apparatus and tools for the German articles which are the only ones used in Russian schools so far. This concession would be practically an equivalent of advertising American supplies in Russian educational institutions. The very fact of equipping the Russian institutions of learning with American supplies and having the Russian instructors work with the American-made apparatus and tools clears the way for general adoption of American apparatus and tools in Russia. The habit of using a certain kind of apparatus plays a more important part than may be supposed at first sight and it seems

that the time is ripe now to introduce in Russia the habit of using the products of American genius and industry.

I hope sincerely, that the suggestion set forth in this letter may be received sympathetically by the American scientists as well as by the special manufacturing and publishing firms which might be concerned with the carrying out of such a plan. I am ready to enter into all necessary negotiations in respect to this matter and I thank in advance any one who will be kind enough to help me with advice or suggestion concerning my efforts in this direction.

N. BORODIN

FLATIRON BUILDING,
ROOM 1010,
NEW YORK CITY

SCIENTIFIC BOOKS

The Elements of Astronomy. By CHARLES A. YOUNG. Boston, Ginn & Co. 1919. Pp. x + 508.

Lessons in Astronomy. By CHARLES A. YOUNG. Boston, Ginn & Co. 1919. Pp. ix + 420.

These are new and revised editions of the most excellent text-books of the late Professor Charles A. Young. From the time this series first appeared some thirty years ago, these books have held high rank among the many that have been written. They show a wide grasp of the fundamentals of astronomy, and these fundamentals are presented to the student in a clear and comprehensive manner.

The author's presentation of the problems involved in the study of the motions of the planets is especially noteworthy. For the mathematician these motions involve the greatest complications and require the most intricate formulas, yet Professor Young places the essential facts before the student in a simple and clear manner. By the aid of a few diagrams and some apt illustrations, the fundamentals of celestial mechanics are explained, and explained so clearly that the youngest student should have no difficulty in understanding the problems and in grasping the essential facts and principles.

The present edition was revised by Miss