of the S-waves from 3.1 to 4.1 kilometers per second is accompanied by an increase in density from 2.61 to 3.38 grams per cubic centimeter.

Thus we see that there is a considerable experimental basis for citing the increased velocity of seismic waves beneath the Pacific as evidence of greater density of crustal materials there than beneath the continents. The retarding effect of greater density is more than compensated by the greater proportional increase in elasticity, as Angenheister has pointed out.

It may be of interest to call attention to another case where an increase in velocity of transmission of elastic waves is associated with increasing density. At 0° C. and for a salinity of $35\frac{0}{00}$ the velocity of sound waves in sea water increases from 1,450 meters per second at the surface to 1,591 meters per second at a depth of 4,700 fathoms,[2] the density increasing from 1.02813 to 1.06649 grams per cubic centimeter. The velocity undergoes this considerable increase *in spite* of the density increase because the bulk modulus of the water increases from 2.16×10^{15} to 2.70×10^{10} dynes per square centimeter.

JERRY H. SERVICE
U. S. COAST AND GEODETIC SURVEY

FIELD TRIPS IN GEOLOGY

THE recent announcement concerning the establishment of a "summer school of geology and natural resources" by the Department of Geology, of Princeton University, and more especially of a "travelling course" to be given as a part of the work of this school, is of such general interest to all students of geology that an account of a very similar course given in 1924 by the department of geology of the Mississippi Agricultural and Mechanical College may be of interest also to readers of this journal. The points of similarity may be readily seen by a summary of the itinerary of the two tours.

The travelling course described in the Princeton announcement is to be offered in 1926, beginning July 1 and lasting seven weeks. The party, consisting of Professor Field and Professor Buddington and twenty students, will travel in a specially constructed sleeping, dining and lecture Pullman car. According to the itinerary, "the principal localities to be visited this year will be the Silurian Section at Niagara Falls; Mesabi Iron Ranges; Yellowstone National Park; Glacier National Park; Butte Copper Mines and Anaconda Smelter; Columbia River Basin and lava flows; Mt. Rainier; Crater Lake; Yosemite National Park; Los Angeles oil fields; Grand Canyon; Flagstaff volcanic fields; Petrified Forest, Arizona; Appalachian Coal Fields; Appalachian Province and the Coastal Plain Province." Truly a wonderful education in itself.

After an Appalachian field trip in 1922 in two Ford trucks and a more extended one in 1923, the department of geology of Mississippi A. and M. College conducted a Pacific field trip for eleven weeks in 1924 under the direction of the writer, travelling in three Dodge cars, two touring and one commercial body. Such mode of travel is far more fatiguing than in a Pullman car, but it is more flexible and permits of almost exclusive daylight travel. The itinerary was very similar to the proposed one of Princeton University, west of the Mississippi, but more detailed. The principal places visited were the Arkansas Bauxite mines; Eastland-Ranger oil fields; Carlsbad Cavern; Petrified Forest; Crater Mound; Walnut Canyon Cliff Dwellings; Flagstaff volcanic fields; Grand Canyon; Mohave Desert; San Bernardino Mountains; Los Angeles oil fields, and Rancho La Brea deposits; Catalina Island; Mariposa Grove; Yosemite; Placerville, Coloma, and Nacoma past and present gold mines; Crater Lake; Mt. Shasta; Columbia River gorge and Mt. Hood; Mt. Rainier; Vancouver; Columbia River lava flows; Coeur d'Alene mines; Anaconda and Butte mines; Yellowstone National Park; Great Salt Lake; Bingham copper mines; Dinosaur National Monument; and Joplin zinc mines.

It would be interesting also, perhaps, to compare the results of these two trips taken under such different modes of travel, so far as comparison is possible of tours under different leadership. And, speaking from experience, one would probably feel impelled to say that it takes a courageous heart to plan, besides the field work, three hours six days a week of lectures, conferences and quizzes.

W. C. MORSE
MISSISSIPPI AGRICULTURAL AND MECHANICAL COLLEGE

SPECIAL CHARACTERS FOR THE TYPEWRITER

I WAS interested in the suggestion of Mr. Hulse for adding a few characters to the typewriter, as published in SCIENCE for March 26, and also in the proposal of "Ad Infinitum," as published on page 477 of the issue for May 7.

The wavy underscore is certainly a good suggestion, although it may not accomplish much more than can be done by the colored ribbon. In some cases a writer may find it convenient to make use of both devices, and in any case he may use the one which serves his purpose best. But instead of the pair of brackets as used by Mr. Hulse, it seems that one might get along with a single vertical line, adding the horizontal portion at top and bottom by hand.

It seems like a rather hopeless undertaking to meet

[2] N. H. Heck and Jerry H. Service, "Velocity of Sound in Seawater," U. S. Coast and Geodetic Survey Special Publication No. 108.