first speaker on this series and other speakers during the year will be Professor Edwin O. Jordan, Professor William H. Howell, Professor Stanhope Bayne-Jones, Dr. Maurice C. Hall, Professor James W. Jobling and Dr. Warren C. Vaughn. These lectures are given once a month to the faculty and student body in the School of Medicine.

DR. ARTHUR H. RING, secretary-treasurer of the American Academy of Physical Therapy, writes that the tenth annual meeting of the academy was held in the Hotel Walton in Philadelphia on October 12, 13 and 14. The first session was devoted to papers and discussions concerning the value of sunlight, climate and spa treatment of various diseases. There were reported in considerable detail the results of the studies on rheumatic heart disease in children, carried on the past two years under the general direction of Dr. Paul D. White, of Boston. On Wednesday afternoon there was a demonstration and discussion of the various lesions of arthritis and latest methods of treatment. Thursday and Friday were devoted to other papers on physical therapy of interest to members of the medical profession. There were clinics daily at the University of Pennsylvania Hospital, Jefferson Medical College Hospital and Temple University Hospital.

DISCUSSION

RADIO STUDIES DURING THE LEONID METEOR SHOWER OF NOVEMBER 16, 1932

THE Leonid meteor shower of this November promises to afford the best opportunity for testing the hypothesis[1,2] of a meteoric effect on radio transmission that has occurred since the advent of radio or that is likely to occur again until 1965. This is the year of maximum in the present 33 year cycle of this group of meteors. Because of the importance of studies of upper atmospheric ionization it is hoped that those who have suitable radio apparatus available will take advantage of the opportunity.

The Leonids are the swiftest of recurring meteors and therefore have the most energy for ionization.

Although the shower did not occur in 1899, because of the perturbations of the group due to the near approach of Jupiter, the excellent return exhibited last November and recent calculations based on their orbit and period lead to the hope of a truly great shower this year.

It is difficult to predict so far in advance (six weeks) the magnetic character of the day. November 16 falls near a sequence of magnetic storms and it is possible that if one occurs it will not start until the 17th or 18th. To offset the effects of a possible disturbance, radio observations outside of the auroral zones would be particularly advisable.

C. C. Wylie[3] has calculated the probable time of maximum for the shower to be November 16 at 1900 G. C. T. If it does occur at this time, stations in the Pacific are most favorably located for both radio and visual observation. For America the best time for observation would be the early morning hours of November 16th and for Europe those of the 17th.

BELL TELEPHONE LABORATORIES A. M. SKELLETT
NEW YORK, N. Y.

1 A. M. Skellett, *Phys. Rev.*, 37, 12, 1668. June, 1931.
2 A. M. Skellett, J. P. Schafer and W. M. Goodall, forthcoming papers in *Proc. I. R. E.*
3 *Pop. Astron.*, 40, 2, 97.

GEOLOGY—AN EASIER STUDY FOR BOYS OR FOR GIRLS?

FOR ninth-grade students, Victor C. Smith[1] concludes that physiography is not appreciably easier for boys than for girls. For a group of older students, who may be considered on the border-line between boys and girls and men and women, I find that physical geology is markedly easier for boys.

The group in question consists of 473 young men and women (214 and 259), whom I have had in an introductory, one-semester course in physical geology during the past four years. Nearly all are first or second semester college freshmen, 17 to 20 years of age. Instruction consists of lectures, laboratory work and field trips. No text-book is used, but students are encouraged to supplement class work by outside readings in all recent texts available. As the average size of a class is 25, there is considerable personal contact between instructor and student, especially in the laboratory and in the field. Grading for the course is on the following basis: A—exceptionally good, B—distinctly good, C—fair, D—unsatisfactory, E—failure. The individual student is graded on his work with no conscious effort to follow a distribution curve for the grades of the class as a whole. Tabulation of grades attained furnishes results given in the accompanying table.

The number of students doing exceptionally good work is too small to be of much significance, but, considering distinctly good work as well as that which is not satisfactory, the boys make much the stronger

1 Victor C. Smith, "Sex Differences in the Study of General Science," SCIENCE, lxxv, 1932, 55–57, January 8, 1932.

	Percentage				
	A	B	C	D	E
Boys (214, or 45.2 per cent.)	2.3	30.4	55.1	6.6	5.6
Girls (259, or 54.8 per cent.)	2.3	13.1	57.5	15.9	11.2
Entire group (473)	2.3	20.9	56.5	11.6	8.7

showing. This is also brought out by taking a general average for boys and for girls. On the basis of A = 4, B = 3, C = 2, D = 1 and E = 0, the boys show an average of 2.17 or C+, and the girls 1.80 or C−. Even when the 45 girls with the lowest records are eliminated, so that an equal number of boys and of girls are compared, the average for these 214 girls is but 2.09, a distinctly lower average than for the entire group of boys.

These statistics show clearly that, for the group in question, the study of geology is markedly easier for boys than for girls. From contact with the individual students, I believe that an important element in this difference is that the boys adjust themselves more readily to the changes in methods of instruction, in passing from high school to college, especially to the demand for a greater degree of initiative on the part of the student and to the greater emphasis placed on cause and effect relations as contrasted with mere memorizing of facts from a prescribed assignment in a text-book. However, the exceptional girl can and does do work equal to that of the exceptional boy.

Geology, though more difficult for the average girl than for the average boy, appears to furnish her a more attractive way of fulfilling the science requirements of a college course than do biology, physics or chemistry. During the last few years, freshman classes have been composed of about 55 per cent. boys and 45 per cent. girls, while the geology group under discussion consists of 45 per cent. boys and 55 per cent. girls. Contrasted with this distribution, boys generally outnumber girls at least two to one in the elementary courses in biology, physics and chemistry. This would seem to indicate that older girls, in common with the ninth-graders studied by Smith, find biology, physics and chemistry more difficult or, at least, less attractive, than do boys. In contrast, geology is more difficult for the older girl than for the older boy, but not for those of ninth-grade age.

These data and conclusions are, of course, for a group of students from one city institution and receiving instruction from one individual and that a man. It would be interesting to learn whether or not statistics from institutions with different settings and in other localities confirm these conclusions.

GRAGG RICHARDS

DETROIT, MICHIGAN

THE ACTIVATION OF UREASE

THE recent studies by Waldschmidt-Leitz and coworkers[1] on the significance of sulhydryl compounds as activators in a large number of enzymic processes led to a reinvestigation of the factors affecting the activity of urease.

It has long been known that heavy metals "poison" urease, whereas cyanides, H_2S and certain amino acids "protect" the enzyme or activate it after it had been "poisoned." The action of these protective substances has been ascribed largely to the effect upon the poisoning or inhibiting influence of the heavy metals (Cu, Hg, Ag) by the formation of complex ions, as with cyanides and amines, or of insoluble compounds, as with sulfides. But since the heavy metals catalyze the oxidation of the thiol (SH) group in cysteine, glutathione and similar compounds, while cyanides and sulfides reduce dithiol, –S–S–, groups to thiol, –SH, groups, it is plausible to suspect that some thiol compounds may play a part in the activity of urease. This suspicion was strengthened by the application of the nitroprusside test for –SH to various jack bean meal extracts and to crystalline urease preparations of widely varying range of activity. It was found at once that the more active preparations gave a stronger nitroprusside test than the weaker ones. Furthermore, the most active jack bean meal in our possession (164 units per gram of meal) was found to contain 70 mg of reduced glutathione per 100 grams, using the combined methods of Vivario and Lecloux[2] and of Kühnau.[3] That the –SH compound was glutathione rather than cysteine was surmised from the fact that the highly specific Sullivan reaction was negative before and positive after hydrolysis. On partial oxidation by means of aeration of highly active crystalline urease prepared with the use of solvents carefully freed of metals,[4] it was observed that the –SH reaction became weaker with the decrease in activity. The activity could be restored to the original titer by cyanides, cysteine and reduced glutathione, but only partially restored by alanine. The loss of activity could be prevented if the air current used for oxidation was saturated with aqueous cyanide vapor or by the addition of a sufficient excess of cysteine before aeration was begun.

That the –SH groups are not solely responsible for urease activity is suggested by our observation that urease solutions oxidized by aeration or by H_2O_2 to the complete loss of activity can be reactivated but to a very slight extent by means of –SH compounds, sulfides or cyanides.

Experiments now in progress indicate that it may

[1] Summarized in *Naturwissenschaften*, xix, 964, 1931.
[2] *Arch. intern. de Physiol.*, xxxii, 1, 1930.
[3] *Biochem. Zeit.*, ccxxx, 353, 1931.
[4] J. B. Sumner, *Ergebn d. Enzymforsch.*, i, 295, 1932.