Prague Technical High School.—Professor Pichl: Meteorology and climatology, 1; climatological practise, 1.

Strassburg University.—Professor Hergesell: Meteorological conferences, 2; meteorological practise, 2. Professor de Quervain: Climatology, 1.

Stuttgart Technical High School.—Professor von Weyrauch: Aerostatics and aerodynamics, 2.

Vienna University.—Professor Hann: General meteorology, 2; dynamic meteorology, 2; oceanography, 1. Professor Pernter: Meteorological instruments, with practise at the central institute for meteorology and geo-dynamics, 3; meteorological conferences, 1; meteorological work for advanced students, 3. Professor Felix Exner: Insolation and radiation at the earth's surface, 2. Professor Valentin: Magnetic work, 2. Professor Przibram: Radioactivity, 2.

Würtzburg University.—Professor Wien: Electricity and optics, 5.

Beside the above definitively meteorological courses there are a great number of others in hydrodynamics, thermodynamics, optics, electricity, and general physics, which include applications to special atmospheric phenomena.

The expense of attending a course of lectures in a European university is usually not greater than the attendance on American lectures of the same grade. The added facility that one acquires in the use of the German or French language, as well as the stimulus that comes from working together with young men of the same tastes, will doubtless always attract the most ambitious American students. Of course the same arguments bring many foreigners to American universities, and this international scientific intercourse can but be of permanent value to a science that embraces the atmosphere over the whole globe.—*C. A.*

OBSERVATIONS OF "SHADOW BANDS" WITHOUT AN ECLIPSE.

In the Comptes Rendus, Paris, April 9, 1906, M. Cl. Rozet describes an interesting method that he has devised for observing "shadow bands."

Heretofore this interesting and mysterious phenomenon has been observed only during the occurrence of solar eclipses, but by a very simple method M. Rozet has been able to make daily observations of the bands at sunrise and sunset. The light of the sun at the time of its appearance and disappearance behind somewhat lofty mountains on the horizon is received on a white screen, arranged in the observer's room, and bands are produced apparently identical in character with those observed during an eclipse. The following is a summary of the results of M. Rozet's observations:

(1) The position of the dark bands on a screen perpendicular to the sun's rays is invariably parallel to that part of the crest of the mountain at which the sun rises or sets.

(2) The direction of the movement is always perpendicular to the position of the bands, but this movement may take place in two opposite directions, which may be called "direct" and "retrograde." In the direct movement the bands seem to fall, that is, to enter the shadow of the mountain projected on the screen; in retrograde movement to rise, i. e., to emerge from the shadow. They may move in either direction both at sunrise and sunset, and in successive appearances and disappearances of the sun at brief intervals, due to irregularities of the mountain crest, their direction may differ. In the same appearance or disappearance of the sun the bands usually move in a single direction; however, on several occasions, after a few seconds of direct motion, they have been observed to retrograde, and at other times times the screen was traversed at the same time by two distinct series of bands, not exactly parallel, and moving in opposite directions.

(3) The velocity of movement is subject to much variation; it has, however, been observed to have a pretty close relation to the velocity of the wind; the rapid movements are coincident with high winds, while the slowest movements occur when the air is calm or nearly so. The greatest velocities attained are approximately six to eight meters a second, the least one to two meters, and the ordinary velocity two to four meters.

(4) The bands are usually seen as soon as the sun appears. Sometimes they do not appear until two or three seconds after the beginning of sunrise; they also sometimes disappear a few seconds before the end of sunset; in these cases their movement is in the retrograde direction. When the appearance or disappearance of the sun takes place behind a portion of the mountain crest perpendicular to the sun's apparent movement the usual duration of the visibility of the bands is twelve to fifteen seconds. The visible part of the sun need not be very small; in one instance bands were observed when as much as a quarter of the solar surface was visible.

(5) At first faint, broad, and far apart, the bands become more sharply defined, narrower, and closer together up to the time of their complete cessation, whether at sunrise or sunset, despite the fact that the intensity of the light increases in the former case and diminishes in the latter. Sometimes, instead of occurring at uniform distances apart, they move in groups of five or six. Their breadth, which is commonly three to four centimeters, may vary from one to seven centimeters, while the distance apart, which is ordinarily three to four centimeters, may vary from one to twenty centimeters. The width of the bands and their distances apart appear to vary with the velocity; they are greatest when the movement is most rapid.

(6) The color of the bands is, over their entire length, a uniform gray, darker or lighter according as the bands are more or less narrow. Often one of the edges (the second with reference to the direction of movement) seems better defined than the other. The spaces between the bands are illuminated irregularly without relation to the increase or decrease of the solar light.

In the course of the observations the distances of the mountains from the screen and their elevation above the theoretical horizon have varied from 6 kilometers to 36 kilometers, and from 3° to 22°, respectively. Despite these great differences, no variation in the phenomenon has been observed which could be attributed thereto. The variation appears to be related solely to atmospheric conditions.—*C. F. T.*

TORNADO IN AUSTRALIA.

A very destructive local storm passed over North Sydney, N. S. W., on the afternoon of Tuesday, March 27. It had every appearance of being a mild form of the American tornado. During the previous morning the weather had been showery and stormy, and the daily weather map of the 27th shows that Sydney was, at that time, on the east side of a trough of relatively low pressure extending from Melbourne northward. In the Southern Hemisphere the circulation of the winds is such that a depression of this kind in the eastern part of Australia brings to Sydney northeast winds and rain, analogous to the southeast winds with rain that are experienced in the Northern Hemisphere when the center of a low area passes by on the north side of an observer. Our American tornadoes occur in this region of southerly winds, and move eastward; while this North Sydney tornado occurred in the corresponding region of northeast winds, and moved southeastward. The path of the tornado through North Sydney, with many illustrations of the damage done, is published in full in the Sydney Daily Telegraph of March 28. From the text, written by Mr. Andrew Noble, and some contributions by Mr. H. A. Hunt, the Government Meteorologist, we make the following abstract:

A little before 2 p. m. there was a sudden development, and before