EVOLUTION OF THE EMBOUCHURE IN NORTH AMERICAN INDIAN FLAGEOLETS.

Instrument No. 76,164 in the U. S. National Museum, from the Cocopa Indians, is made of cane. The septum of the reed is not removed, but two small holes are burnt into the cavity, one on either side of the septum and the wood between the holes removed. By covering the upper hole and the intervening space between the holes with the finger and blowing in the upper end of the reed, a proper direction is given to the breath against the outer edge of the lower hole and a whistling sound is produced. Finger holes in the section below the septum enable the player to produce a variety of sounds.

The second step in the development of the embouchure is illustrated by instruments Nos. 107,535 from Tucson, Arizona, and 11,314 from the Apache Indians, in the same Territory. Both have the same style of embouchure as the first named. But a piece of cloth or deerskin tied over the upper sound hole and the space between the holes takes the place of the finger in directing the breath. It may be noticed that in none of the flageolets mentioned has the maker sharpened the edge of the lip or hole against which the wind impinges.

The third step is marked by instruments with a thin edge on the lip where the sound is made. In No. 8,429, from the Ree Indians, one section of quill is used to replace the finger or cloth in directing the breath, and another to form a sharp lip, and they are lashed down tight with sinew. In Nos. 72,884 and 94,005, from the Creek Indians, and in many other examples, the reed is replaced by a piece of soft wood split and hollowed to imitate the interior of the cane flageolet, and the pieces then joined with gum and thongs. In these the 'languid,' or languette, is left in the carving and the sound holes are united by an excavation as in 1 and 2. The air channel is formed by excavating a shallow notch in the upper edge of the diaphragm, or 'languid;' the lip being a thin piece of metal; the cover is a piece of wood, laid on and fastened with thong. This is usually carved and is a prominent feature in this style of flageolet commonly called 'courting flutes.'

The fourth and last step in this evolution is exemplified by No. 23,724, from the Sioux of Devil's Lake Agency. The air passage between the two sound holes is not cut out of the diaphragm between, but a metal plate extends over and beyond both holes, and there is a rectangular slot cut out of the metal long enough to expose both holes and of the same width as the holes. The carved cap is lashed on top of the metal plate so as to form the air passage, which is bounded by the diaphragm, the edges of the metal and the underside of the wooden cap.

The Ree specimen, No. 8,429, shows that the Indian flageolet was in use before the knowledge of the Europeans. This specimen consists of a tube of hard wood. Instead of making the embouchure like those in European whistles and flageolets, placing a plug with an air channel between it and the wall of the tube just above the sound hole, they have made a long hole or slot in the wall of the tube and plugged the bore, with the gum or wax so placed that the slot is open above and below the plug. This plug, or 'languid,' is not quite even with the outer surface of the tube; the upper portion of the slot is covered with a split quill, its lower edge being even with the lower face of the plug, or 'languid,' and the shallow space between the edge of the plug within the slot and the quill forms the air channel which directs the wind against the edge of another split quill lashed over the lower part of the slot to within a quarter of an inch or so of the upper quill, thus forming a modification of the Indian cane flageolets, but not of the European form at all.

This peculiar style of the Indian flageolet I have not met with, except among the Indians of the United States, and those chiefly west of the Mississippi. There are whistles made of bone, stone or other materials by the Indians of the United States which are of the European character and they may have been known before the coming of the Europeans. But the peculiar construction of the flageolet I have described is so different from the common form that I have no doubt of its entirely Indian origin.

E. H. HAWLEY.

SCIENTIFIC BOOKS.

Traité élémentaire de météorologie. Par ALFRED ANGOT. Paris, Gauthier-Villars. 1899. Pp. vi + 417. Price, 12 francs.

Professor Angot occupies the position of meteorologist to the French Bureau Central Météorologique, and is so well known to meteorological workers the world over, that a formal treatise from his pen will receive careful consideration. It is not too much to say that Angot is to-day the foremost meteorologist in France, and as such his treatise will be considered an authority in his own country. The question naturally arises: Does the book represent the meteorology of to-day?

The author in his preface explains that he is not giving a complete treatise on meteorology, but merely a non-mathematical presentation of the elements of the science. The subject of meteorological instruments and their use has been excellently presented by the author in his 'Instructions météorologique,' and he has omitted this from his present treatise; thus having more space to devote to the results of meteorological observations and theories.

Professor Angot remarks that little attention is paid to instruction in meteorology in the institutions of learning in France, and he refers to the contrast existing in the United States, where 'a great number of special chairs are devoted to meteorology in the high schools as well as in the universities.' I must say that I am surprised to learn of this activity in the study of meteorology in our country, for my own observation has revealed an almost utter indifference, in fact the indifference which comes from ignorance, to the claims of meteorology on the part of those who have the say of what shall and what shall not be taught in our schools and colleges. If there is any institution in the United States, except Harvard University, that devotes $500 a year to meteorological instruction I have not yet heard of it; and, looking at the matter from another point of view, it may be remarked that our publishers who have brought out works on elementary meteorology express a disinclination to have their fingers burned by a repetition of the experiment.

Angot has divided his work into five books, which follow a brief introduction. Book I. treats of the Temperature; Book II. of the Atmospheric Pressure and Wind; Book III. of the Water in the Atmosphere; Book IV. of the Disturbances in the Atmosphere; Book V. of the Forecasting of the Weather and Meteorological Periods.

In the introduction the author explains the derivation of average values, the various periodic changes which occur in meteorology and the significance of interpolation.

Under the heading Temperature there is given first an excellent chapter on actinometry, which is followed by the usual treatment of the periodic diurnal and annual changes of temperature, and their variations with change of altitude, latitude and continental or oceanic surroundings, and the distribution of temperature over the earth's surface. An unusually full section treating of the influence of temperature on vegetation, and a quite lengthy chapter on the temperature of the soil and water surface closes this book. The charts representing the geographical distribution of the temperature (and the other elements) show the convergence of the meridians, and are consequently an improvement on the ordinary Mercator's projection.

The treatment of the barometric pressure is especially full as regards the diurnal variation; and, as was to have been expected, the cause of the semi-diurnal oscillation is referred to as still unknown.

The general conceptions concerning the direc-