

sculpturing. The microscopic structure has not yet been examined.

In general the form, size and arrangement of the ossicles are much as in the bones in the *Grypotherium* skin from Patagonia. The skin fragment first described by Woodward was thought to represent mainly the region of the neck and shoulder. The Californian specimen mantles over the outer side of the scapula, and is presumably not far removed from its original position with relation to this bone. The generic position of the form represented by this specimen appears as yet somewhat uncertain, but a satisfactory determination of its affinities will probably be possible when the skeletal material available has been finally assembled. JOHN C. MERRIAM.

A SUGGESTION FOR INTENSIFYING THE DÖPPLER EFFECT.

It has never been pointed out, I believe, that the relation between the conjugate foci of a concave mirror furnishes, at least in theory, a means of enormously intensifying the Döppler effect. If we have a source of light a little outside the principal focus of a concave mirror we shall have an inverted image formed at a considerable distance; and if the source move toward or from the mirror the image will move in the opposite direction with a much greater speed.

Let f_1 and f_2 be any two conjugate focal distances, and F the principal focal distance; then

$$\frac{I}{f_1} + \frac{I}{f_2} = \frac{I}{F}$$

Differentiate with respect to t ;

$$-\frac{I}{f_1^2} \frac{df_1}{dt} - \frac{I}{f_2^2} \frac{df_2}{dt} = 0$$

Writing v_1 and v_2 for the speeds of the source and the image, we have

$$\frac{v_1}{v_2} = -\frac{f_1^2}{f_2^2}$$

that is, the speeds are proportional to the squares of the distances from the mirror.

To show the theoretical possibilities of this formula let us suppose a source of light

moving with a speed of 10^8 cm. per second at a distance of 10 cm. from the mirror, whose focal length, of course, must be a trifle less than this figure; at what distance must the image be formed in order that its speed shall be 10^{10} , one third of the speed of light?

$$\frac{x^2}{10^2} = \frac{10^{10}}{10^8}$$

$x = 316$ meters, nearly, a distance obtainable in the laboratory with a moderate number of reflections.

The chief difficulty to be overcome in any experiment of this nature would be the faintness of the image due to its great size. A continuously moving source of light could be obtained either by a wheel with mirror teeth or with a self-luminous rim.

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THE COMPULSORY RETIREMENT OF THE DIRECTOR OF THE BRITISH MUSEUM OF NATURAL HISTORY.¹

IN a letter which we publish to-day Professor Ray Lankester, who is this year president of the British Association, tells the story of the summary termination of his directorship of the Natural History Museum, some imperfect versions of which have obtained currency. The standing committee of the trustees have taken advantage of the civil service rule that the head of a department may call upon any officer in it to retire at the age of sixty, upon such pension as he is entitled to by the general regulations. That rule is not usually acted upon in the absence of some special reason, unless the officer has completed such a term of service as entitles him to the *maximum* pension. Dr. Lankester was appointed at the age of fifty-two, so that when he reaches sixty next May a regulation intended to apply to men who have spent their lives in a government office decrees that his pension shall be £160, which the treasury of its goodness may raise to £300. In any country but this it would be thought grotesque and monstrous that a distinguished man of science asked to serve the state after the age

¹ From the *London Times*.