to be causing disturbances in the air all along its path in the same way as a slowly moving object causes a rushing or tearing sound. Prof. Boys has actually photographed the "onde de choc" of a bullet in flight (reproduced in Barton's "Text-Book on Sound," p. 82), but we have a familiar analogy in two dimensions in the bow wave of a ship.

It is difficult to estimate the speed of sound at a height of 25 miles, but the result of an experiment by S. R. Cook (*Phys. Rev.*, 23, pp. 212-237, September 1906), on the speed of sound in air at liquid air temperatures, might be taken as a limiting case. At 91° A. he found the speed to be 181 metres per second. The speed computed for the fireball of November 15 was about 17 miles per second. At 91° A. this would be about 150 times the speed of sound, and at normal ground temperatures of, say, 283° A. it would be still 80 times the speed of sound. For these high speeds the "onde de choc" would be a conical wave of such a narrow angle that the wave front could be regarded as parallel to the line of flight. This fact might serve to discriminate between sounds due to an explosion at a point in the path of the meteor and that due to its "onde de choc."

In the case of thunder to which the sound of the meteor has been likened, the originating lightning flash is practically instantaneous and usually takes a very irregular path. The sound wave begins with a front shaped like the flash, and this, even more than reflection, probably accounts for the prolonged sound of rising and falling intensity to a distant observer. The flight of a meteor is more regular, and its sound would be expected to be more uniform in intensity than thunder. It may, however, be complicated by the separate "ondes de choc" of fragments thrown off in the course of its flight.

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Einstein Shift and Doppler Shift.

IN answer to Sir Oliver Lodge's question (NATURE, December 26, p. 938), it depends on our point of view whether the Einstein shift is considered to be imposed on the light at its origin or in course of transit to us. We cannot state the frequency of the ether vibrations without presupposing a system of time-reckoning, and in the non-Euclidean region round the gravitating star the ordinary conventions of time-reckoning have broken down. There is a particular system of time-reckoning (t) commonly used in relativity investigations; but it must be understood that no merit is claimed for this system except that it renders certain calculations easier. In this reckoning the Einstein shift occurs at the origin of the light, and is carried to us by the light without change. But if we pay attention rather to the proper-time (s), which gives us an absolute point of view, atomic vibrations have the same period s wherever they are situated; and the Einstein shift is imprinted on the light as it travels through the non-Euclidean region into the comparatively flat region of space-time where we observe it.

The answer to any problem of observation must, of course, be the same whichever point of view we take. The companion of Sirius will not produce the shift in light reflected by it from another source, because alternatively (1) no change of period t occurs, or (2) the change of period s during the approach is neutralised during the recession. I should add, however, that the so-called reflection of the light of one star by another (often conspicuous in eclipsing variables) is really an absorption followed by re-emission; and this kind of "reflected" light would suffer the Einstein shift.

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Genes and Linkage Groups in Genetics.

IN the flatfishes "mutations" are not uncommon; albinos, piebalds, etc., reversed examples (sinistral individuals of dextral species and dextral individuals of sinistral species), and ambicolorate fish. There are many degrees of ambicoloration, from specimens with a small coloured patch or a few scattered spots on the blind side to others in which the whole blind side is coloured like the eyed side. When ambicoloration is complete, or nearly so, it appears always to be associated with other variations; the migration of the eye is delayed, so that it gets in the way of the dorsal fin as it is growing forward on the head, the scales of the blind side resemble those of the eyed side in structure, the asymmetry of the paired fins is less marked. It is clear that the one thing that holds these variations together is that they are variations towards symmetry, and it is interesting to note that the head, which is the most asymmetrical part of the fish, is the last to be affected; thus it often happens that the whole blind side is coloured except a patch in the orbital region, and that the scales of the blind side are as rough as those of the eyed side except on the head.

The basis of this linkage group—ambicoloration, monomorphic scales, delayed migration of eye—is a tendency towards symmetry. These facts seem to be capable of an interpretation not very different from that given by Prof. MacBride in his letter in NATURE of December 26, p. 938.

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The Palæolithic Drawing of a Horse from Sherborne, Dorset.

IN the third edition of his "Ancient Hunters," p. 536, Prof. W. J. Sollas states that the drawing of a head of a horse on bone from Sherborne, which I described in 1914 as an example of Palæolithic art, "is a forgery perpetrated by some schoolboys." I read this statement with surprise, because the bone is in a semi-fossilised condition, and I think all who study the specimen will agree that the drawing must have been made when it was fresh. When it was exhibited to the Geological Society, indeed, it was generally accepted as of Palæolithic age. Through the kindness of Mr. Nowell Smith, headmaster, and Mr. R. Elliot Steel, formerly science master of Sherborne School, I have therefore communicated with Mr. Arnaldo Cortesi, the survivor of the two schoolboys who discovered the bone. He writes, "I confirm the genuineness of the find," and remarks that at the age of fifteen years he was too ignorant of the subject to take part in any such "trick" as Prof. Sollas suggests.

I may add that in the autumn of 1923, with the kind permission of Major Wingfield Digby, Mr. Elliot Steel and I examined one of the fissures in the quarry whence the bone is supposed to have been obtained, but we had no success. The teeth of mammoth and rhinoceros from the lower part of the same valley, now in the Sherborne School Museum, are still the only other Pleistocene remains from the neighbourhood.

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