agreement with the discussion given in the first part of this note.

In a recent discussion of the aurora green line Sommer suggested that the lines 5176 and 5149 correspond to the transition ^2D–^4S. The wave number difference between 5176 and 5149 is 101 cm^{-1}, and according to Compton and Boyce the difference between the ^2D levels is only 5 cms^{-1}. It is therefore difficult to see how the assignment of Sommer can be correct. In addition to this objection it should be noted that the most probable location of the lines corresponding to the transition ^2D–^4S is at about 5207 A, and the difference between this and the two lines mentioned above is too large to be ascribed to experimental error.

Three other bands, 5925, 6465 and 6323, have been explained by the writer by considering collisions between metastable nitrogen molecules and metastable oxygen atoms. A preliminary account of this has been given in a paper before the February meeting of the American Physical Society.

We wish further to call attention to a striking characteristic of the five α bands that have been mentioned in this note. Normally, the bands each possess several heads. In the aurora, however, the bands appear with only a single head. Such curtailed bands have been observed by the author in some experiments in which the aurora green line was excited in active nitrogen. This peculiar development of the α bands is, however, not understood at the present time and a further study of this phenomenon is to be made.

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SOUNDS REPORTED ACCOMPANYING THE FALL OF A METEOR

THE appearance of a large meteor coming to the earth or so near to the earth as to be both seen and heard, although not entirely unusual, is nevertheless of such interest as to justify permanent record. On June 23, 1928, such a meteor appeared in southwest Texas. Although falling in daytime on a bright afternoon, this meteor was of such brilliancy as to attract wide attention and to be seen for two or three hundred miles. It appeared in the sky, according to the most reliable observations, at or near 4:40 in the afternoon, and traveling with great swiftness in a northeasterly direction, disappeared without, so far as evidence has been obtained, reaching the earth.

The general appearance of the meteor is given by several observers. All agree that it flashed out in the sky to great brightness suddenly, and that its course was traversed in a few seconds. All who were near observers agree that although approaching the earth it ceased to be visible or disappeared by explosion before reaching the ground. The meteor is variously described as "a ball of fire shooting across the sky," as having "the appearance of a skyrocket," and as "a dark ball with a fiery tail." Phenomena usual to meteors were observed, including light, sound and a cloud or train.

To those who were near at hand the light of the meteor appeared as "brilliant," "incandescent," "similar to the light of the sun," "not blinding but very bright," "as bright as the sun." One observer says that although he was looking through smoked glasses the light of the meteor was a strain to the eye. Some describe the light as having a play of colors; others failed to observe any such variation in color. To those at a greater distance the light appeared for the most part a dull red. Obviously the condition under which the light was observed and the distance from the meteor affected its appearance. Those who were looking towards the sun seem to have seen the meteor with essentially the same distinctness and as showing the same brilliancy as those who were looking away from the sun.

The cloud which attended the meteor was seen from almost as great distances as was the light itself, and was seen in fact by many more people, for while the flash of light marking the path of the meteor lasted no more than one or two seconds, the cloud floating in the clear sky continued visible from some points of observation for more than an hour. This cloud doubtless appeared different from different viewpoints, and it is variously described. By those who saw it earliest the cloud is described as being at first a wisp or thread of smoke forming in the path of the meteor and gradually spreading into a cloud. It is described by all observers as light in color and cloud-like in appearance. Observations on the duration of the cloud are as follows: From localities east (looking toward the sun), seven to ten minutes, ten to twenty minutes, thirty minutes, thirty to forty-five minutes, nearly an hour; from localities west (not looking toward the sun), one hour and twenty minutes, and "until sundown"—about three hours. The length of the cloud according to the best measurements obtainable approximated fifteen miles.

Instrumental measurements on the cloud supplemented by approximate records as to the time required for the explosive sound to reach the earth indicate that at the time of final disappearance from view the meteor was between five and nine miles above the earth. The rate of travel of the meteor based upon an estimated duration of the flash of light and the length of the cloud appears to have been between five and seven and a half miles per second.

SOUND

Two distinct sounds accompanied the passage of the meteor. One of these was the explosive noise often heard in this connection. This sound was of such intensity as to distinctly jar the buildings and to cause the rattling of windows at localities over an area approximating forty miles in east-west by sixty miles in north-south direction. The time required for this explosive sound to reach the earth varied from possibly thirty seconds for those immediately under the meteor at the termination of its visible course to one and a half or two minutes for those at a distance of fifteen or twenty miles from its overhead position. Aside from the intensity no other unusual features are reported in connection with this explosive sound.

The second sound reported to accompany the meteor is wholly unexplained, and this note is written chiefly for the purpose of recording these reports. This unexplained sound is described as a whizzing and whining sound and as like the passage of a skyrocket through the air, and as a "shhh" sound. In all instances this sound is reported as having occurred instantaneously with the flash of light. Reports of this noise come from observers at various places, some being as much as two hundred miles apart, and one hundred miles or more away from the locality where the meteor was overhead. The following observations indicate how definitely this noise is reported. The distances given in the following notes are from Laguna, near which place the meteor was overhead. An observer at Leakey, twenty-five miles northeast of Laguna, states that at the time of the appearance of the meteor he was repairing a wire fence and was stooping over close to the ground fastening the lower wires of the fence. In this position he heard distinctly a whizzing sound which he at first supposed to be made an aeroplane with the engine shut off preparatory to lighting in an aeroplane field nearby. Upon looking up, however, he saw the flash of the meteor. An observer at Hondo, about fifty miles east of Laguna, says: "I saw it fall, but would not have seen it had I not been attracted by the sound it made. It sounded 'shhh,' and shot across the sky from southeast to northwest." A lady driving southeastward by car some seventy-five miles northeast of Laguna writes: "My husband, daughter and myself were driving from Kerrville to San Antonio that Saturday afternoon. I heard a buzzing noise, and looking out of the car window saw a big ball of fire shooting across the sky in a northwest direction. I called my husband and daughter's attention to it and before they could get to the west side of the car the ball of fire was nearly all gone but they saw the sparks and smoke that it left behind." An observer at Winter Haven, sixty miles south of Laguna, says: "I was sitting with my back to the northwest when I heard a noise—a hiss or a whiz. A dog standing near growled and then barked." A lady at Uvalde relates that she was lying on the bed by her north window when she heard a "whining, whistling noise" which continued for a second or so before she looked up. Just after turning her head to look out of the window there was a long flash of light across the sky, so quick she was not sure at which end it began and at which it finished. She got the impression of two long, slender streaks of flame with a slit between them. Almost immediately after the flash, white smoke began to form along the line of the flash. The whining noise continued for an appreciable interval after the flash. The explosive sound of the meteor was heard one and one half or two minutes later. An observer near San Antonio, and about seventy-five miles east of Laguna, "heard a sizzling noise overhead and looking up saw a very brilliant object tearing through the air."

The writer has not been able to search the literature. However, in at least one previous instance a similar noise in connection with the fall of a meteor is recorded, this being a meteor which fell on October 1, 1917.[1] Since the rate of travel of a meteor is much in excess of the rate of travel of sound, it is impossible that the sound wave propagated in the usual way could have arrived coincidently with the light from the meteor. As already noted this noise is reported coincident with the flash at localities as much as two hundred miles apart. One must either consider some other possible explanation for the noise or must discard a considerable number of observations made independently, at various places and under varying conditions, all of the observations being in essential agreement. Any suggestions that may be made explaining such reported sound in connection with the meteor will be welcomed.

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OBSERVATIONS OF GREEN FLASH

FRANK T. DAVIES, physicist on board the *City of New York*, en route to the Antarctic regions with the Byrd Antarctic Expedition, reports as follows on a green flash observed off Bermuda on the evening of August 29, 1928: "At sunset a green flash was observed very clearly by the writer, Captain Melville and about six members of the crew. Meteorological conditions: Weather, fine; clouds, fairly high, stratocumulus about 0.3, nearly all circling around horizon and leaving western horizon clear except for smoki-

[1] J. A. Udden, "The Texas Meteor of October 1, 1917." University of Texas Bulletin 1772, page 45; also SCIENCE, December 21, 1918, pp. 616–17.