of good air sometimes contains as little as 0·085 milligramme of organic ammonia.

A gramme of air—that is about 700 cubic centimetres—contains only 0·000085 milligramme of organic ammonia. Expressing the organic ammonia in its equivalent of dry albumen we have in 700 cubic centimetres of air 0·00085 milligramme of dry albumen. Translated into volume this 0·00085 milligramme of dry albumen will fall short of a cube, the face of which is $\frac{1}{10}$th millimetre in diameter.

Expressed in English measures, the result is, that rather more than one pint of average atmospheric air does not contain so much organic nitrogenous matter as corresponds to a cube of dry albumen of the $\frac{1}{250}$th part of an inch in diameter.

Now is this quantity adequate to admit of the existence of the immense multitudes of germs, the existence of which in atmospheric air is assumed by the vitalists?

J. ALFRED WANKLYN

Colour of the Sky

WITH reference to Mr. Brett's observations on the colour of sea and sky, I have one or two remarks to offer which I think may be of interest. Smokers have all noticed that the smoke from the end of a pipe or cigar is bluer than that which they puff from the mouth, and many may have wondered, as I did for a long time, what the reason of this could be. The contrast may be well seen on a bright sunny day. This is, in fact, the simplest form of the experiment of the condensation of vapours causing them to pass through a fine blue to a white condition, which Professor Tyndall exhibited about two years ago, and which he employed to explain the blue colour of the sky, and the remarkable polarisation of its light. The finer state of division in the freshly-formed smoke gives it its bright blue colour, as does the finely divided aqueous vapour give to the blue sky; the smoke which has passed through the pipe-stem and mouth has become more condensed, and consequently gives a whiter cloud.

The colour of water is, it appears, to a great degree dependent on the same cause as that of the sky. The investigations which Mr. Brett asks for have been already commenced. M. Soret, of Geneva, soon after Professor Tyndall's researches on the cause of the blueness of the sky were published, made similar researches on the waters of the lake of Geneva, and found that the light from the water, when blue, was polarised as the light from the sky, and, so far, there was the probability of the cause of the colour being similar in the two cases. (See *Comptes Rendus* (Paris), April, 1869.) That particles in a fine state of division are the cause of the blueness of water as well as of sky is also made evident from a comparison of the waters of different lakes, seas, and rivers. There are two popular theories as to the cause of the colour of masses of water, which have very deep root, and yet must, it seems, be abandoned. One is that seas or lakes are blue by reflecting the blue sky. On this ground I have heard Mr. Brett's picture in the Academy this year of a deep blue sea, severely criticised, because the sky, which he has painted with it, is not correspondingly blue, and could not furnish the sea's tint by reflection. Mr. Brett is, however, quite right in his fact, as many people know well enough; and the criticism was misplaced, if the blue colour of a mass of water is dependent on the reflection of light from within water containing finely-divided particles—not from the surface only—as explained above. The second popular theory which seems to be ill-founded is that the green colour of lakes, rivers, and seas is due to plants growing on the bottoms and giving their colour by reflection. The green colour is produced in the same way as the blue in all probability, and may be due to a yellowness of the water in some cases, but it is less easily accounted for than the blue colour. M. Sainte-Claire Deville is quoted by M. Soret as stating that waters which give a white residue on evaporation are *blue*, whilst those which give a yellow residue are *green*. Reflection of the colour of the sky, and of the plant colour from the bottom, does no doubt produce colour of water in some cases, but it is only in shallow pools that the latter can have any effect, or through perfectly smooth surfaces that the former can be effective. Some cases of water-coloration which I have noted will be not out of place here:—1. Intensely blue on a bright day, with pale sky and large cumulous clouds, was the colour of water in reservoirs twenty feet deep at Plumstead, depositing chalk (by means of which the water is softened according to a patent process). 2. Intensely blue (the bluest here noted)—Mediterranean at Marseilles. 3. Bright blue—Lake of Geneva. 4. Darker blue, tending to Indigo—sea near Guernsey; also the Laacher See, in the Eifel. 5. Pale blue—sea near chalk cliffs, being at a little distance from the coast green or greyish. 6. Pale blue or greyish blue—the Rhone, the Mosel, glacier streams, &c. 7. Green—the Rhine, the Scheldt (very markedly so at Antwerp, as testified in Belgian pictures), the Seine, Thames Estuary, &c. 8. Intense green—in patches on the Lake of Geneva; in the evening, when the sun was just below the mountains, more frequently on the Lakes of Thun and Lucerne. 9. Bright green—the sea, on a windy day, with bright sun, off the Isle of Man. 10. The sea round the coral reefs of Florida is said to be intensely green; when away from the coast it is deep blue. 11. On a heavy, clouded day, with rain, gleams of sunshine out at sea give patches of green colour and reddish brown. 12. Water standing in an old copper mine at Killarney was intensely green, whilst the water in the lake at the side was black in the mass. 13. Red colour is produced in some seas by algæ, in others and in some rivers by the breaking up of soil coloured red by iron. 14. Opaque green colour is produced in ponds (Serpentine and ornamental waters) by unicellular organisms, which sometimes swarm in these waters. They may similarly become red. Perhaps the most remarkable instance of blue colour, due to the optical properties of water, is the blue grotto of Caprera, where, at any rate, the reflection of the sky is eliminated. A similar phenomenon is the glorious blue and green of the glacier fissures.

Leaving the question of surface reflection aside, which can only come into play in the case of road-side pools and such mirror-like waters, and also leaving aside the appearance of vegetation in clear shallow streams and ponds, it seems that at the present time we may ascribe the blue colour of masses of water to a peculiar reflection of the light from within the water, accompanied with polarisation, and depending on suspended particles. Blackish, brownish, and yellow colour is due to vegetable matter in solution; reddish brown to iron, sometimes; green, sometimes, to copper or algæ, but the green commonly seen on seas, lakes, and rivers, like that of glacier-fissures, probably admits of a similar explanation to that of the blue. I trust some physicist may be induced to enter into the subject in these pages. Has not the production of a series of tints at sunset an origin which may tend to explain the various tints of blue and green waters? I find that Mr. Sorby in the *Philosophical Magazine*, November, 1867, ascribed the blue colour of the sky and the successive yellow orange and red tints of the setting sun to the absorption of the red rays more than the blue, by the fine aqueous vapour of the higher regions of the atmosphere, and of the blue rays more than the red by the coarser vapours near the earth's surface—as *e.g.* a fog.

The foregoing notes may suggest to others similar observations of greater importance, which it would be interesting to collect. It would be very satisfactory, and of interest to many readers, if some one who could speak with authority on the physics of light, would discuss these phenomena, however suggestively, in your pages.

E. RAY LANKESTER

Poisonous Fishes

IN answer to your correspondent M.D.'s second question in your issue of June 30th, I beg leave to refer him to Dr. Günther's article in this Society's "Proceedings," on a Poison Organ in a genus of Batrachoid Fishes. (P. Z. S., 1864, p. 155.)

Zoological Society of London, P. L. SCLATER
11, Hanover Square, London, W., July 10

Fall of an Aerolite, 1628

YOUR correspondent T. W. Webb may be glad to know that a graphic account of the Aerolite he refers to (NATURE, July 14) as having fallen in Berkshire in 1628, will be found in Vol. II. of Chambers' Papers for the People, published 1850, in an article entitled "Memorabilia of the 17th Century," p. 10. This article also contains many other very extraordinary and well-described accounts of earthquakes, floods, mirages, and various startling atmospheric phenomena which occurred during the 17th century. Amongst the latter the accounts of parhelia, or mock suns, and haloes, and the falls of two or three aerolites, are worth noticing.

Unfortunately, throughout the article the sources whence the various notices have been taken is uniformly omitted.

Alderley Edge, Manchester, July 17 J. P. EARWAKER