beautiful white streak ran perpendicularly from the ice to the bottom, where it recurved, and finally disappeared in thin filaments. It was discovered that this was due to camphor-smoke purposely introduced. No appearance with ice was noted in dust-free air.

*Experiment* 4. — Nearly saturated air, with a little smoke, was compressed, and suddenly released from pressure. A haze filled the whole bottle.

*Experiment* 5. — On repeating this again and again, occasionally introducing a little smoke, it was found that the degree of saturation made little difference. Finally the haze was produced in air having a relative humidity of two per cent and a dewpoint of −21°, the outside air being at about 80°.

*Experiment* 6. — The bottle was filled full with water, removing every particle of air. All the dust-particles were driven from the compressor, and by it the water was forced out with air nearly saturated. On compressing this air, absolutely dust-free, and releasing it, a beautiful mist of clearly rounded water-particles was noted. The appearance was very different from the cloud-haze before noted, which had no rounded particles, but was an indefinite white haze. The difference between the two could not for a moment be mistaken.

*Experiment* 7. — On introducing a little smoke, the haze was very prominent at first; but, after a few compressions, the haze began to disappear, and there were seen together both haze and mist. The haze was finally entirely sifted out, but repeated compressions and expansions failed to change the mist in any way.

*Experiment* 8. — Dust-free air, nearly saturated, was suddenly expanded by an air-pump, and the mist appeared as before under compression, but was much shorter lived. No. 7 was also repeated with the air-pump, but the effects in all cases were less marked than under compression. It appeared in the air-pump experiment as though the mist formed at the top of the bottle, and it was feared that there might possibly be a leakage around the stoppers or tubes. This led to No. 9.

*Experiment* 9. — The bottle was filled full and inverted, great care being taken that not a particle of dust should get in. A little water was left at the bottom, and this formed a most effectual stop for all ingress of air. The air-pump gave the same mist as before.

The following are the proofs that the mist was formed in nearly saturated air without the intervention of solid particles of any kind: 1. The haze from dust or smoke was entirely different from the mist in dust-free air; 2. It was a very easy matter to sift out the smoke-haze by repeated compressions, but not so the mist; 3. The mist was the same so long as the compression and saturation remained constant (it was impossible to diminish this after hours of labor); 4. The mist settled down to the bottom after each compression, and finally moistened it with drops, showing that an enormous number of mist-globules had settled. If each mist-globule had taken a dust-particle along, it is easy to see that after a very short time every mote would have been deposited.

*Conclusions.* — 1. It seems practically impossible to perfectly saturate air by cooling, by expansion, by mixture of cold and warm air, by passing through wet substances, or in any analogous manner. 2. This is probably the reason that no permanent haze cloud or mist has yet been formed by direct experiment. 3. Cooling by expansion or in any other way, and consequent condensation, is not needed to display invisible smoke or moisture particles. 4. The mixing of two bodies of air of widely different temperature, and nearly saturated, will not produce a cloud. 5. The sudden cooling of nearly saturated air will not produce a cloud. 6. A velocity of one hundred and more miles per hour of an ascending current will hardly suffice to produce cloud or mist by expansion in nearly saturated air. 7. It seems possible to unite smoke particles so as to form visible haze in dry air. This may be a mechanical aggregation due to a violent bombardment of the particles on sudden expansion. 8. The same statement may be made of moisture-particles in nearly saturated air.

Some of these conclusions are very remarkable, and I sincerely trust that other experimenters will make the few simple trials needed. To one having access to a laboratory the whole expense will be practically nothing.

H. A. HAZEN.

Washington, June 11.

## Osteological Notes.

PROFESSOR FLOWER, in his admirable hand-book on the osteology of the *Mammalia*, lays special stress on the disposition of the lateral bones of the cranium as constituting points of difference between the *Catarrhini* and *Platyrrhini*, the Old and New World monkeys.

On careful examination of the skulls in this museum in reference to this subject, I find that there are exceptions to almost every rule, that might be offered, and that authorities differed even on these exceptions. Notwithstanding these differences, however, it may be affirmed that (1) the *Catarrhini*, as is the rule in man, have the alisphenoid join suturally with the parietal and frontal, with one or both, or they may have the squamosal join with the frontal; (2) the *Platyrrhini* have the parietal and malar join suturally, thus preventing the union of the alisphenoid with the parietal and frontal, or of the union of the squamosal with the frontal.

It is generally taught that the *os planum* of the ethmoid enters into the formation of the inner wall of the orbit in man and apes only. Gegenbaur, on this point, says, "Except in some *Edentata*, it is in the Primates only that a portion of the lateral surface reaches to the median boundary of the orbit, where it forms the *lamina papyracea*." The great anatomist overlooks the *Felidæ* in the order of the *Carnivora*, in many of which family, as in the domestic cat (*Felis domestica*), in the tiger (*Felis tigris*), in the jaguar (*Felis onca*), and in the lion (*Felis leo*), as well as in several of the *Viverridæ*, the *os planum* is distinctly visible in the wall of the orbit.

The perforation of the transverse processes of the seventh cervical vertebra by the vertebrarterial canal, as also the presence of an articular cavity on the hinder edge of the body of this same vertebra for the reception of the head of the first rib, are distinctive characters in some of the orders of the *Mammalia*, and considerable importance has been laid upon their presence or absence in the matter of classification.

*Seventh Cervical Vertebra.*

| Primates. | Transverse Process. | Articular Cavity. |
|---|---|---|
| Homo | Perforated | Absent. |
| Gorilla | " | Present. |
| Chimpanzee | Imperforate | " |
| Orang | " | " |
| Hylobates [1] | " | " |
| Carnivora | " | Absent. |
| Ungulata [2] | " | Present. |
| Proboscidia | " | " |
| Cetacea | Imperfectly developed | |
| Sirenia | " | " |
| Insectivora | Imperforate | " |
| Chiroptera | " | " |
| Rodentia [3] | " | " |
| Edentata [4] | " | " |
| Marsupialia | Perforated | " |
| Monotremata [5] | " | " |

[1] In the other primates the perforate or imperforate condition of the transverse process of the seventh cervical vertebra varies much. Mivart says that he has never seen it perforated in *Hylobates*, *Mycetes*, *Brachyurus*, *Nyctipithecus*, *Chrysothris*, *Hapale*, *Lemur*, *Galago-arctocebus*.

[2] The giraffe has the seventh cervical perforated.

[3] *Lepus* has the seventh cervical perforated.

[4] In the Sloths the three-toed has the eighth cervical perforated, and the two-toed, the sixth cervical.

[5] The *Echidna* has the seventh cervical imperforate, and the *Ornithorhynchus* has an articular cavity for first rib on the same.

The above table, based upon an examination of the articulated and disarticulated skeletons in this collection, may prove serviceable to those interested.

D. D. SLADE.

Mus. Comp. Zoöl., Cambridge, Mass., June 12.