numbers of the *Review*. The Rev. H. P. Dunster argues for an extension of the postal service, in a paper entitled "An Agricultural Parcels Post," in which he maintains that the post-office should give facilities for the distribution of food. E. N. Buxton contributes an eminently readable article on "Sardinia and its Wild Sheep," descriptive of a hunt in the wilds of Sardinia. Lord Ebrington describes a "By-Election in 1747," giving the full details of the expenses of parliamentary methods more than one hundred years ago, and throwing much light on early politics. The number concludes with a long essay by Professor Huxley on "Agnosticism and Christianity," written in his most characteristic vein, which forms an important contribution to the already extensive list of papers on this subject published in this *Review*.

— Messrs. Longmans, Green, & Co. send us the first number of the *New Review*, a magazine of ninety-six pages, which is sold for the low price of fifteen cents. The prospectus lays great stress on the eminence of the contributors that have been engaged, and conveys possibly the impression that the writer's name will be considered of more account than the quality of his work. However, the articles in this first issue are on the same level as those of its larger rivals, though some of them are too brief for a proper presentment of the subject treated. The opening paper, on "Gen. Boulanger," is the best, and will of course attract the most attention. It is in two parts. The first, written with the general's own authority and presenting his side of the case, is by Alfred Naquet of the French Senate; the second, presenting the opposite side, by Camille Pelletan of the French Chamber. It appears that the general's followers are animated by dislike of parliamentary government, and, though professing to be republicans, they really want a sort of dictatorship tempered by the *plébiscite*. French parliamentarism has not been so successful as might be wished, owing to the fact that the ministry are not at liberty to dissolve the Chamber and appeal to the people; but to seek a remedy, as M. Naquet would do, in the virtual abolition of parliamentary government, seems very unwise. M. Pelletan thinks the rise of Boulangism an almost unaccountable phenomenon, but attributes it partly to the discontent which various classes feel towards the present government, and partly to the passion of the French people for a hero. It is plain, from the tone of the two articles, that the general's partisans are more hopeful than his opponents; and the outcome of the struggle will be looked for with much interest. The second paper in the *Review* is a rambling dialogue, "After the Play," by Henry James, designed as a critique of the contemporary drama. Earl Compton writes of "The Homes of the People," presenting anew the evils of the tenement-house system in cities, and advocating the erection of new and improved dwellings by the cities themselves. Lord Charles Beresford writes on "National Muscle;" Mrs. Lynn Linton, on "The Religion of Self-Respect;" and Mr. G. W. Russell, on "The Unionist Policy for Ireland." Mr. Russell's paper, though brief, is very suggestive, advocating measures for assisting the Irish tenants to purchase their holdings, and also a system of local government for Ireland similar to that already established in England. The concluding article is by Lady Randolph Churchill, detailing her observations during a month in Russia. It is written in a clear and simple style, and shows great keenness of observation, and will be sure to interest those who like to read about social life and customs. On the whole, the *New Review*, notwithstanding the brevity of some of its articles, promises to be a formidable rival of the older English reviews, as well as of some published in the United States.

— European scholars are devoting much attention at present to the centenary of the French Revolution and its influence upon European politics. *The Fortnightly Review* for June (New York, Leonard Scott Publication Company, 29 Park Row) opens with two papers on the Revolution, — the first, "What the French Revolution did," by Frederic Harrison, a brilliant and scholarly paper; and the second, by Gen. Viscount Wolseley, entitled "The French Revolution and War," in which he investigates the influence which that event exerted upon the science of warfare. The Marquis of Lorne presents a review of "Five Years' Advocacy of Provincial Parliaments," which he suggested some time since as a solution of the Irish difficulty; William Day, in a paper on "Turf Reform," argues for the necessity of devising fresh regulations, and instituting more stringent measures for purifying the turf and benefiting the whole racing community; E. C. K. Gonner writes on "The Foreigner in England," and maintains that there are many serious grievances arising from unrestricted immigration to England, calling for immediate action on the part of the authorities; Professor E. A. Freeman contributes a note on "The House of Hapsburg in South-eastern Europe," in which he questions some statements made by Mr. J. D. Bourchier in a paper on the same subject in the March number of the *Review;* Lady Dilke describes some benefit societies and trades unions for women, — a subject of much importance to all laboring women; Dr. Robson Roose presents some good and careful rules on the "Art of Preserving Life;" an anonymous writer criticises some recent changes made by the British Government in the matter of the Egyptian bonds; and Frederick Greenwood contributes an interesting sketch entitled "A Conversation in a Balcony." The number concludes with an eminently readable paper on "The Women of Spain," by Emilia Pardo Bazan.

LETTERS TO THE EDITOR.

***Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

The editor will be glad to publish any queries consonant with the character of the journal.

Cloud and Fog.

THE formation of cloud has been generally ascribed to the rising of a mass of saturated air to a cooler stratum, where the cooling due to expansion and that from the surrounding air produces a supersaturation and visible cloud. Not long since, Mr. John Aitken of Scotland propounded the rather startling theory that cloud could *not* be formed without the intervention of solid particles of dust, smoke, or other substance. This view was based on laboratory experiments, in which dust-free air seemed to show no condensation upon rarefaction. It would seem as though this view can hardly be possible. If two molecules of vapor have been sufficiently cooled, why may they not coalesce into a double molecule of water? If we consider that each double molecule of water needs a solid particle for a nucleus, there will be needed enormous quantities of these particles in each cloud, and more, it would seem, than can possibly be present in the cloud-forming strata.

A few experiments have been tried in cloud-formation, and a brief review of these is given here, the complete discussion and experimental proofs being reserved for another occasion. Most of the experiments were made with a clear glass water-bottle holding a half-gallon, and having three openings at the top. These were fitted with absolutely tight rubber stoppers having openings, which allowed the use of wet and dry thermometers to determine the moisture, and the use of glass tubes whereby the air could be compressed or exhausted at pleasure. An attempt was made to saturate the air by first passing it through a bottle of water; but, this not succeeding, it was passed through a bottle full of cracked pumice and water, a U-tube of the same, another U-tube having cotton soaked in water, and a straight tube with four inches of cotton (also wet). Near the compressor was a tube having three inches of dry cotton, and in the tube passing into the bottle there was another pledget of cotton. It was still found, after passing through this mass of moisture, that the air was not saturated, and it seems a practical impossibility to perfectly saturate air. Even after heating the bottle and tube of pumice nearly to boiling, the air was not saturated. It would seem as though this might explain in part the non-success of some former experiments in producing cloud in dust-free air.

Experiment 1. — Air was introduced into the bottle, as near saturated as possible, and then the whole was heated to 110°. The dry bulb rose a little faster than the wet. On suddenly cooling the outside, no cloud was observed, nor did the thermometers come together, but moisture was deposited on the sides.

Experiment 2. — The air was again heated to 110°, and it was mingled with nearly saturated air at about 65°. No cloud was observed.

Experiment 3. — The air was again heated, and a small piece of ice was suspended near the top. No cloud was observed, but a

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.