Correspondence.

Flying Machines.

To the Editor of the Scientific American:

The correspondent who writes about "flying machines," on page 117 of the present volume, has hit the keynote exactly. When the power of a man's lower limbs can be utilized toward flying, there seems to be strong indications of the difficulty being mastered and flying made a thing not impossible.

L. W.

Curious Snowballs.

To the Editor of the Scientific American:

I notice in your paper of March 3, an account of some curious snowballs (evidently wind formed) which were seen at Merrow Station, Conn., on February 21.

On the surface of the frozen Hudson River there were on the same date thousands of these snow cylinders. They can best be compared to rolls of cotton batting. The largest were about one foot in diameter. The zigzag furrows showed that they had traveled in a northeasterly direction. In the afternoon the larger cylinders became hollow, being then more like muffs in appearance than like rolls of cotton batting.

No one here seems to have taken the trouble to notice these snowballs; and it seemed to me that a record of such a phenomenon was noteworthy, if only as a corroboration of your Connecticut correspondent.

March 5, 1883. HENRY BOOTH.

Wind . Snow Balls.

To the Editor of the Scientific American:

While reading the account of a "Storm of Snowballs," by J. M. Merrow, in your last issue, I was reminded of one like it which occurred here on March 4, 1881, which I copy from my journal of that date. A man came with a load of coal, and while unloading, the horse became frightened at something and I took hold of the bit to quiet him, and I noticed he looked over in the lot with his ears up. I looked the same way, and was considerably startled myself.

The day before was cold (20° F.) and formed a crust on the snow. In the night the wind changed from northwest to southeast, with a fall of two inches of light snow, and the mercury rose to 33°. The wind rose to a gale shortly after sunrise, and blowed lumps of snow off the fences, trees, etc., rolling them along over the damp snow, growing larger as they advanced until they were too heavy for the wind to move. One of these near the fence was what the horse saw. What a grand sight it was! As far as we could see from an upper window, the fields were covered with rolls from the size of an egg up to twenty inches in diameter and forty inches long by actual measurement, and some were a great deal larger where they rolled down a hill by their own weight.

They were all in the form of a cylinder with conical cavities at each end nearly meeting in the center, the distance varying with the size of the nucleus. A strong south wind and higher temperature destroyed most of them before night.

We had another storm of snow rolls on January 12, 1882, the largest measuring twelve inches in diameter. The wind west, temperature 36° F.

Rome, N. Y., March 4, 1883. W. S. VALIANT.

Kangaroo and Opossum.

To the Editor of the Scientific American:

In the SCIENTIFIC AMERICAN of February 3 (page 69), Professor H. N. Mosely, in his "Challenger Notes," claims that the young kangaroo and opossum do not grow out of the teat of the mother's pouch. I lived in Queensland for some years, and can confidently state that they do. I have killed opossum with the young attached to the teat inside the pouch, when it was perfectly devoid of hair, and not measuring over one inch, perfectly blind and its head the largest part of it, and the mouth of the pouch so small that I could hardly insert the point of my little finger, and have seen the same on all kinds of kangaroo. It is hardly likely that the mother would, after having given birth to its young in the ordinary way, place its young in the pouch, and that a young one of that size would then attach itself to a teat so firmly that it is impossible to remove it without killing it.

February 10 issue of SCIENTIFIC AMERICAN, "Aerial Navigation." I would also like to state that I have killed albatross, measuring 15 feet 7 inches from tip to tip of wing, and many of them over 13 feet. The particular albatross that I mention was killed by myself during a voyage to Australia on board a British bark named the Alfred Hawley in 1864, about 700 miles south of the Cape of Good Hope.

R. G. D.

Vegetable Substitutes for Rennet.

To the Editor of the Scientific American:

My attention has been called to an article in the SCIENTIFIC AMERICAN (February 24) headed "Vegetable Substitute for Rennet," by Sir J. D. Hooker, from the Kew Report. It is represented in the article that a good vegetable rennet is a desideratum for making cheese, such as the ryots of India could find salable among a people who would not use cheese made with ordinary rennet.

If the discovery of a vegetable substance, having the property of rennet required in cheese making, would be of any importance, it would be desirable to have a knowledge of other sources, from which the substance may be obtained besides the one brought into notice by Sir J. D. Hooker—*Puneeria coagulans*—especially as this plant requires an apologist to vindicate it against the suspicion of being poisonous. Now, that large natural order, the *compositæ*, which comprehends about one-ninth of all flowering plants, furnishes several species that invite examination. But it suffices to mention a few of them, well known not to be poisonous. Indeed two of them are garden vegetables very generally cultivated. These are *Cynara scolymus* (garden artichoke) and *C. cardunculus* (cardoon). Besides these esculents, there are several species of *Cirsium* (common thistles), *e. g.*, *Cirsium discolor*, and *C. lanceolatum*. The parts of these plants of which I can speak from my own observation are the florets. When the involucrum has expanded sufficiently, if the group of florets is pulled off from the receptacle, and rubbed, so as to bruise them, on the inside of a dish, fresh milk poured into that dish will coagulate* in a short time without becoming acid. If the milk be previously prepared to the taste, the result of coagulation is a palatable and wholesome article.

Is not the above stated property of these plants enough to warrant further experiments on them in quest of a vegetable rennet?

WM. JOHNSON.

Rolla, Missouri, February 27, 1883.

American Manufacturing Interests.

The following table from the Census Bureau shows the capital invested and the value of products of all the establishments of manufacturing industry, gas excepted, in each of the States and Territories, as returned at the census of 1882:

	Number of establishments.	Capital.	Value of products.
Alabama	2,070	$9.668,008	$13,565,504
Arizona	66	272.600	618.365
Arkansas	1,202	2.953,130	6,756,159
California	5,885	61.243,784	116,218,973
Colorado	599	4,311,714	14,260,159
Connecticut	4,488	120,480,275	185 637.211
Dakota	251	771,428	2,373,970
Delaware	746	15.655,822	20,514,438
Dist. of Columbia	971	5,552,526	11,882,316
Florida	426	3,210,680	5.546,448
Georgia	3,593	20.672,410	36,440,948
Idaho	162	677,215	1,271,317
Illinois	14,549	140,652,066	414,864,673
Indiana	11,198	65,742,962	148,006,411
Iowa	6,921	33,987,886	71,045,926
Kansas	2,803	11,193,315	30,843,777
Kentucky	5,328	45,813,039	75,483,377
Louisiana	1,553	11.462,468	24,205,183
Maine	4,481	49,988,171	79,829,793
Maryland	6,787	58,742,384	106,780.563
Massachusetts	14,352	303,806,185	631,135,284
Michigan	8,873	92,930,959	150,715,025
Minnesota	3,493	31.004,811	76,065.198
Mississippi	1,479	4,727,600	7,518,302
Missouri	8,592	72,507,844	165,386,205
Montana	196	899,390	1,835,867
Nebraska	1,403	4,881,150	12,627,336
Nevada	184	1.323,300	2,179,626
New Hampshire	3,181	51,112,263	73,978,028
New Jersey	7,128	106,226,593	254,380,236
New Mexico	144	463,275	1,284,846
New York	42,739	514.246,575	1,080.696,596
North Carolina	3,802	13,045 639	20,095,037
Ohio	20,699	188.939,614	348,298,390
Oregon	1,080	6.312,056	10,931,232
Pennsylvania	31,232	474,510,993	744,818,445
Rhode Island	2,205	75,575,943	104,163,621
South Carolina	2,078	11,205,894	16,738.008
Tennessee	4,326	20.092,845	37,074,886
Texas	2,996	9,245,561	20,719.928
Utah	640	2,656,657	4,324,992
Vermont	2.874	23,265,224	31,354,366
Virginia	5,710	26,968,990	51,780 992
Washington	261	3,202.497	3,250,134
West Virginia	2,375	13.883,390	22,867,126
Wisconsin	7,674	73,821,802	128,255,480
Wyoming	57	364,673	898,494
The United States	253,852	$2,790,272,606	$5,369,579.191

NATURAL HISTORY NOTES.

Use of the Saw in the Sawfish.—In presenting the beak of a sawfish (*Pristis*) from the Lake of Bay, Philippine Islands, Dr. S. Kneeland, at a recent meeting of the Boston Society of Natural History, suggested a use for this toothed projection which seems more reasonable than the ones usually given; namely, that it is an instrument for more or less horizontal insertion in the mud or sand of shallow water, and which, by a vigorous sweep of the long, upper lobed shark-like tail, is quickly pulled out backward. The lateral teeth are sharp edged in front for easy insertion, but concave behind to offer resistance and more thoroughly stir up the bottom. This action is doubtless accompanied with a series of short, horizontal movements of the anterior part of the body. The mouth is small underneath, and provided with pavement-like teeth, as in the rays, adapted for crushing mollusks, crustaceans, and hard-cased creatures on which it feeds. Dr. Kneeland thinks the stories of its attacking the smaller cetaceans in open sea are due to errors of observation arising from confounding the saw fish with the sword fish (*Xiphias*). He further believes that its weapon, mouth, teeth, habits, and habitat cannot be reconciled with the active carnivorous propensities usually ascribed to it. Ray-like, it is a bottom feeder, with crushing, not tearing, teeth. The snout is too blunt for piercing, and the lateral teeth would offer an obstacle thereto rather than an advantage.

Sudden Destruction of Marine Animals.—In the *Geological Magazine*, Professor T. Rupert Jones accounts for the manner in which large numbers of marine animals have, in past ages, suddenly perished in their own element and become entombed: 1. (fishes) by either unusual or periodical influx of fresh water from the land; 2. by volcanic agency; 3. by earthquake waves; 4. by storms; 5. by suffocation, when massed together in frightened shoals, or when burrowing in sand and mud and accidentally buried by other sands and mud; 6. by being driven ashore by fishes of prey; 7. (fishes and mollusks) by too much and too little heat in shallow water; 8. by frost; 9. (fishes) diseases and parasites; 10. (fishes and mollusks) miscellaneous causes, such as disturbance of equilibrium of living and dead organisms, ferruginous springs, poisons, lightning, etc.

A Myriapod which produces Prussic Acid.—A foreign myriapod occurring in hot houses in Holland, and identified as belonging to the genus *Fontaria*, has the power of secreting prussic acid. Attention was called to this animal by its emitting a distinct odor of oil of bitter almonds when excited, and which was especially apparent when the animal was crushed. Maceration of specimens in water showed at once that the smell was due to the above named acid, this being detected in the water. A series of experiments have been made by C. Guldensteeden-Egeling to test the hypothesis that the myriapod secretes a material which, under certain conditions, is decomposed and gives rise to hydrocyanic acid as one of its products. These experiments have fully confirmed such hypothesis; for, by the use of various reagents, a body has been shown to exist which is broken up by water and yields HCy among the products of its decomposition.

Professor Cope, in commenting upon this, says that *Fontanaria virginica*, a common myriapod in Pennsylvania, has long been known to emit a powerful smell of prussic acid.

The Ancestors of the Dog.—Professor Cope in an article on the "Extinct Dogs of North America," in the March number of the *American Naturalist*, says that the origin of the canidæ is doubtless to be found among the forms of the creodonta—flesh eating animals of various degrees of power, without scapholunar bone; with well-defined canine teeth; with low type of brain, and generally imperfect ankle joint. They stand in nearest relation to the insectivora, but have points of resemblance with the marsupialia. Professor Cope originally included them as a subdivision of the insectivora, but subsequently placed them with the latter and several other sub-orders in a comprehensive order which he termed bunotheria. This view of the origin of the carnivora has since been reaffirmed by Huxley.

Fangs of the Rattlesnake.—At a January meeting of the Philadelphia Academy of Natural Sciences, Dr. Leidy exhibited a series of fangs taken from a rattlesnake fifty-two inches in length. The rapidity with which the functional fangs are reproduced was shown by the presence, on each side of the jaw, of five fangs in varying degrees of development, so placed as to replace those which are lost.

Steam Thrashers.

The farmer is getting the advantage of the inventive faculty of the present age. Steam thrashing machines are slowly but surely displacing the old method of thrashing by horse power. It takes more help to keep the machine running up to its full capacity than it did by horse power, but then a much steadier motion is given, and the much dreaded "thrashing days" are shortened by one-half, which is a great boon to the farmer and his wife. There is only one team needed, and that the thrashing men furnish themselves, and use it for hauling water for the steam engine. Where the thrashed grain has to be taken any distance, of course teams have to be used for hauling it away. The steam thrashing machines are made extra large, with a big cylinder at which two men stand to feed it. This necessitates two band cutters and an extra two men to pitch to them. These steam thrashers, combined with the improved machinery for putting the grain into the ground in the spring (we refer to the screw pulverizer) and the self-binding reaper, make the farmer practically independent of hired help, for a crop of 100 acres of small grain can be sown, reaped, and thrashed as easy as 20 acres could by the old and slower methods. This is a very important item in the farmer's economy, for in some sections help cannot be obtained during the rush of harvest at any price, and where it can be got it is generally of an inferior character and has to be paid exorbitant prices of from $2.00 to $3.00 per day. The steam thrasher is of immense benefit to the farmer, and the day will soon be here that every neighborhood will be supplied with a machine. Farmers can use the steam power that it takes to run the thrashing machine for all the necessary purposes of grinding grain, shelling corn, and cutting hay with a chaff-cutter, when the machine is not in use for thrashing.

Suitable arrangements must be, however, provided for guarding against fire. Where possible the engine should be placed far enough away from the farm buildings so there will not be the remotest chance of fire. The best way to carry this power from the engine to buildings is by a wire rope, as a belt cannot be used to carry power as far as a wire rope; and then, too, the belt, when used in wet weather, will get wet and slip.—*Breeder's Live Stock Journal.*

* No experiment has been made, as far as I am advised, with a view to determining whether the coagulation is caused by the flower or by the *achenia* which come off from the receptacle with the florets. It would be important that this point be decided.