upon either of the two remaining cards." The lower (15) being selected, and the remaining card (11) being turned up, this proved to be the card originally drawn.

Having seen this experiment twice made successfully with members of my family, I offered myself as the next "subject" of it, with the determination to watch carefully for any manual guidance by which Mr. Bishop might be influencing my choice. The experiment succeeded with me as it had done with my predecessors, and yet I could not, any more than themselves, tell how I was led to make the five successive selections of the cards to be taken away, so as to leave behind the card I had originally drawn.

It may, of course, be assumed that Mr. Bishop knew where he had placed this card, although his "subject" did not; and he informed me that experience has taught him the positions to which the choice of his "subject" can be most easily and certainly guided. The influence of the eyes being excluded by the relative positions of Mr. Bishop and his "subject," the guidance *must* be conveyed through the hand which Mr. Bishop holds in his own; and yet I altogether failed to detect the mode in which it was given.

Of course it may be said that this is only a variation of the conjuror's trick of "forcing" the card which he has determined that the drawer shall choose. (I remember seeing it stated that Louis Napoleon, when Emperor, had defied Houdin then to "force" a card upon him; and that Houdin made him draw the card which in the French pack is designated Cæsar.) But though the same principle of "suggestion" is involved, the conditions under which it acts are altogether different. The conjuror stands *opposite* the drawer, looks at his face as well as at his hand, and continually shifts the position of the cards he holds, so as to prevent a *wrong* card from being drawn, while presenting the *right* one in the manner which he knows by experience to be the most suggestive. But Mr. Bishop does no such thing. The cards remain in their places with their faces downwards; and of the guidance given him by Mr. Bishop standing at his side, the "subject"—even when on the watch for it—remains quite unaware.

If I have made myself understood by your readers, I think I shall have satisfied them that this "experiment" (which may by no means invariably succeed) is of great psychological interest, as showing the large measure in which we may be guided in our choice among things "indifferent," by *influences of which we are ourselves unconscious.* WILLIAM B. CARPENTER

American Meteorological Observations

IN your valued journal (vol. xxiv. p. 16) I find an expression of your regret that it should have been decided that the printing of the *Bulletin* of Simultaneous Meteorological Observations should hereafter take place one year after date, instead of six months. It may be interesting to those of your readers who made use of the *Bulletin* in studying the general atmospheric phenomena of the northern hemisphere, to know that for several years past the data for several distant land stations in Greenland, Iceland, Siberia, Alaska, &c., have been omitted, merely because the mail facilities did not enable us to receive the reports in time for publication in the *Bulletin.* Thus a large portion of the region covered by our maps has been left unrepresented, for which the necessary data come regularly to hand a few weeks or months later. The case is still worse in reference to the marine reports for vessels off on long voyages; for instance, we regularly pay for and receive a large collection of material from the London Meteorological Office that never appears in our published *Bulletin* or charts. The proposed postponement of publication is in fact merely the outcome of several suggestions and recommendations from co-operating nations, in the propriety of which recommendations myself and assistants fully concur.

W. B. HAZEN,
Chief Signal Officer, U.S.A.

Office of the Chief Signal Officer, Washington, D.C., June 15

A Meteor

LAST night, June 24, at 11h. 29m. G.M.T., I observed a meteor, as bright as Jupiter, cross the tail of the great comet 4° or 5° above the head and disappear some 20° to the left, on the vertical of Beta Ursæ Minoris and at an altitude equal to that of the comet's head. It left a bright streak for some seconds. I did not see the beginning, and perhaps not the end, as it may have continued behind a cloud bank. The duration for the above path was three seconds, determined afterwards by experiment. Place of observation, lat. 51° 32′, long. 0° 11′ W.

G. L. TUPMAN

27, Hamilton Terrace, St. John's Wood, June 25

LOOKING at the comet last night from my garden at 11.25 p.m. I saw a large meteor pass nearly horizontally from a little east of north to within a short distance of the comet, rather above the head. It was as large as Venus when brilliant, but with a red or orange tinge. The motion was rather slow. A.

Adsett Court, Westbury-on-Severn, June 25

Earthquake in Van

IT may perhaps be considered worthy of a note in your columns that an earthquake was experienced in this neighbourhood on Monday, May 30, at a few minutes before 6 a.m.

Here in Van the shock was slight, consisting only of a tremulous motion lasting a few seconds; but I have to-day received information that at Bitlis the shock was so severe as to cause people to rush out of their houses in fright, and that a village named Téout, situated near the western shore of the Lake of Van, was destroyed by it, with the loss of a considerable number of lives. I have as yet heard no details, but if any further circumstances of interest should come to light I will communicate with you again.

It is well known that the environs of the Lake of Van show many signs of ancient volcanic action; at least three volcanoes with distinct craters forming prominent features on or near its shores. Of these the Nimroud Dagh, on the western shore of the lake, is said by tradition to have been active not more than 400 years ago. It contains an immense crater five or six miles across, in which are situated hot springs. The village Téout which has been destroyed lies at the foot of the eastern slopes of this mountain. EMILIUS CLAYTON

Van, Turkey in Asia, July 6

Freshwater Actineæ

I YESTERDAY noticed in a small *freshwater* aquarium four specimens of a small freshwater Actinia of a very pale olivaceous colour. They have each six tentacles more than 1 inch in length when fully extended, but then so extremely fine at the ends as to be almost invisible. The body or stalk is about 0·1 inch long by 0·05 inch in diameter when at rest, and about 0·5 inch long and 0·015 inch in diameter when expanded.

I was not aware before of the existence of freshwater Actinia, but as the specimens to which I now refer are in all respects similar to sea-anemones, there can be no doubt on the subject.

I have succeeded in transferring two specimens, which have duly rooted and expanded themselves in a bottle and a tumbler, and I shall be happy, if they are of sufficient interest, to send one to your office or elsewhere for inspection. W. SEDGWICK

Royal Naval School, New Cross, June 24

The Observation of Hailstorms

IN the most casual survey of the literature relating to the phenomenon of hail one cannot fail to be struck with the remarkable contradictions which everywhere make themselves apparent. Some writers say that hail falls oftenest in the tropics; others assert that it is altogether unknown there! Howard states that the maximum hailfall in this country occurs in the summer season, while Dalton and others say that it is in winter. I think these singular discrepancies are attributable, in many cases at least, to imperfect observations. Most of the meteorologists who have given special attention to the phenomenon of hail have had their pet theories, and naturally their observations have been guided to a considerable extent by the requirements of the particular theories which they advocated. Thus we find Kämtz ascribing the formation of hail to the conflict of opposing currents of wind, Volta to the electrical condition of two separate layers of cloud, Leslie to the presence of strata of air at different temperatures, von Buch to ascending currents of air, and so on, all which theories are based, not upon invariable phenomena, but upon isolated features which happen to have come repeatedly under the notice of those particular observers in the particular hailstorms which they witnessed. I think it would enhance the

value of observations in some degree if all those who have opportunities of making them would draw up their notes on some regular and uniform plan. I do not presume to submit a scheme, but would suggest the following points as being of some importance :—

1. Date, and hour of the day.
2. Area of storm. If it assume the tornado form, give (*a*) length of the course, (*b*) breadth, (*c*) direction of motion, (*d*) rate of progression.
3. Physical features of the locality—(*a*) elevation, (*b*) mountains and plateaux, (*c*) rivers and valleys, (*d*) forests, &c.
4. Temperature (*a*) before the storm, (*b*) after the storm, and if possible to be observed (*c*) changes during the storm.
5. Barometrical readings (frequently taken during time of hailstorm).
6. Wind—(*a*) direction near the earth's surface, (*b*) direction in the higher regions as indicated by the cloud motion, (*c*) force.
7. Preceded or followed by rain.
8. Aspect of the clouds. Note if there be any appearance of two separate strata at different elevations.
9. Electrical phenomena. Should there be lightning, note the relation between the discharges and the fall of the hail—whether the lightning precede the hail, or *vice versâ*.
10. Duration of the storm at one spot.
11. Sound. Note if a peculiar noise precede the descent of hail.
12. Conformation and size of the hailstones.
13. General character of the weather before and after the storm.

Notes.—(1) The precise date of a hailstorm is an important point, as it determines the period of their occurrence. Respecting the *annual* period we have the most conflicting testimony. Shortly after the establishment of hail insurance companies valuable statistics were published by those bodies. From particulars furnished by the Farmers' Insurance Institute the following table was drawn up :—

Hailstorms in	January	0
,,	February	1
,,	March	2
,,	April	3
,,	May	7
,,	June	10
,,	July	17
,,	August	4
,,	September	2
,,	October	0
,,	November	0
,,	December	0
		46

Dalton gives the following as the result of five years' observations :—

In	January	it hailed on	11 days.
,,	February	,,	7 ,,
,,	March	,,	5 ,,
,,	April	,,	8 ,,
,,	May	,,	11 ,,
,,	June	,,	6 ,,
,,	July	,,	2 ,,
,,	August	,,	1 ,,
,,	September	,,	6 ,,
,,	October	,,	7 ,,
,,	November	,,	7 ,,
,,	December	,,	13 ,,

Giddy thus sums up twenty-one years' observations at Penzance :—

January	23	July	1
February	25	August	0
March	25	September	5
April	27	October	17
May	7	November	22
June	5	December	43

Thomson ("Introd. to Met." p. 174) gives the following as the relative proportions :—

Winter	to all the other seasons	as	45·5 to 54·5
Spring	,,	,,	29·5 to 70·5
Autumn	,,	,,	22·0 to 78·0
Summer	,,	,,	3·0 to 97·0

From a comparison of these tables we see that Dalton, Giddy, and Thomson agree in making winter the season of maximum hailfall, while the insurance statistics point to the opposite conclusion, the hailstorms in June and July being much in excess of those in the other months of the year. I strongly suspect however that Dalton, and other observers who have arrived at similar results, included in their enumeration of hailfalls what we may call, in absence of a better name, *winter hail*. It is very unfortunate that the word *hail* has in our language been used to denote two entirely different phenomena, the French *grèle*, or hail proper, and *grésil*, or that small round powdery snow which often falls towards the end of a snowstorm and in the early part of a very frosty night. *Grésil* has nothing in common with *grèle*. The one falls exclusively in winter, and the other, I venture to say, as exclusively in summer.

(6) Dalton observed that the winds which brought hail-showers in the north of England were always south-west, west, or north-west. The wind often shifts erratically. Howard mentions a hailstorm during which it was first east, then south, afterwards west, again east, and finally west. Beccaria makes the following singular statement :—"While clouds are agitated with the most rapid motions, rain generally falls in the greatest plenty ; and if the agitation be very great, it generally hails."

I shall be glad to receive references to memoirs and papers on the subject of hail, also particulars of storms, from any of your readers who have them at hand. J. A. B. OLIVER

Athenæum, Glasgow, June 6

How to Prevent Drowning

IN the discussion that Dr. MacCormac's letter has elicited, the essential principle upon which the whole art of swimming is fundamentally based appears to have been overlooked. As Dr. MacCormac says, the human body naturally floats in water, and freely so in salt water ; but *how* does it float, supposing the necessary condition of buoyancy, the inflation of the lungs, is maintained? If the limp, dead body of a man is thrown into water in this condition it floats with the head and face immersed, but with that part of the back just between the shoulders upwards, and just bobbing out of water. This is a drowning position, and the first business of swimming is to counteract the tendency to this position, that is, to balance the body in such wise that the head shall be upwards and the lower part of the face uppermost, in spite of the natural tendency of the head to sink, it having a greater specific gravity than water, or the average of the whole body. Dr. MacCormac, in his letter (p. 166), says that "it is just as easy, if we only knew it, to tread water as to tread earth." Quite so ; but it is also about as difficult. No human being can "tread earth" without training, the principal effort in this training being directed to keeping the centre of gravity within the base covered by the soles of the feet ; and in like manner we must learn to keep the centre of gravity of the body and the centre of its buoyancy in a perpendicular line with mouth and nostrils in the air. I have been a swimmer since I was eight years of age, and consequently swim as naturally as I walk, and float easily in fresh or salt water, without any treading or paddling of any kind ; but though I can thus lie basking luxuriantly and motionless, I am just as unable to sleep floating as to sleep standing upright. I have often tried, and immediately I begin to doze my mouth is under water. The effort of keeping the face upwards is as automatic and unconscious as that of standing still on the ground, but there is an effort of balancing nevertheless.

I have taught many to swim, and my first lesson is on balancing the body ; the easiest formula for attaining this power is to *keep the hands down and look at the sky* while the chest is expanded as much as possible by throwing the shoulders well back in military attitude. Any man or woman of ordinary specific gravity who can do this can float *and breathe*, but to do it, simple as it is, requires practice or training, physical training of the muscles, and cerebral training in order to acquire that command of all the faculties without which there can be no treading of water or other device for keeping the mouth and nostrils in the air. If this were taught, not on paper, but in the water, to everybody, Dr. MacCormac's object would be attained. As it is, the human being compared with four-legged animals is relatively as inferior to them in water as it is on land. The calf or the colt walks a few minutes after it is born, the kitten or puppy in a few days ; but the human infant only after many months. W. MATTIEU WILLIAMS

Royal Polytechnic Institution, June 27