times in China. When a man of distinction was buried in China in former times, a certain number of servants were buried with him. Now, figures made of pasteboard and paper, about three feet or so high, are burnt at the funeral service, in small furnaces provided for the purpose in the temples, together with cartloads of similar pasteboard gifts, which are thus sent by the survivors for the use of the dead in the next world. Earthenware figures were similarly buried with great men in old times in Japan.

"The pasteboard heads of these funeral servants and retainers are painted with streaks, some of which are put on in almost exactly the same style at the angles of the eyes as those of modern Japanese actors. It seems a fair conjecture that the streaks on these heads (Fig. 5) are a direct survival of an actual former savage form of painting which was once in vogue in China, probably used to make fighting-men hideous. It is well known that primitive customs survive in connection with funerals all over the world with extreme tenacity. The numerous interesting survivals existing in the case of English funerals are familiar."

In connection with colour and decoration, we must draw the attention of breeders of poultry to the important experiment on sexual selection suggested on p. 373. Mr. Moseley in fact proposes to test the existence of a preference for colour on the part of hen-birds, by variously dyeing and manipulating the colours of two of more cock-birds kept with her.

The last chapter is one of the most interesting in the book, since here Mr. Moseley does not compress his wonderful richness of material into the short space which is necessary where he adopts the method of telling the reader all that he saw and thought about in one locality after another of the long list visited by the *Challenger*. Here he launches out more fully into discussion and gives a summary, intended for the general reader, of the most striking features presented by the life of the ocean surface, of the deep sea, and of the colony of cockroaches, rats, and other animals and plants which established themselves or were introduced on board-ship.

The significance of colour in marine animals is very suggestively treated, and the origin and use of phosphorescence likewise considered in an original manner. He says (p. 590):—

"The light emitted by phosphorescent animals is quite possibly in some instances to be regarded only as an accidental product, and of no use to the animal producing it; although of course, in some cases, it has been turned to account for sexual purposes and may have other uses occasionally. There is no reason why a constant emission of light should be more beneficial than a constant emission of heat, such as takes place in the case of our own bodies, and it is quite conceivable that animals might exist to which obscure heat rays might be visible, and to which men and mammals generally would appear constantly luminous."

The concluding paragraph contains a suggestion which could be carried into effect without expense by the Government, and there can be no question as to the naturalist best fitted to direct such an undertaking. Mr. Moseley says:—

"The urgent necessity of the present day is a scientific circumnavigating expedition which shall visit the least known inhabited islands of the Pacific, and at the same time explore the series of islands and island groups which yet remain almost or entirely unknown as regards their botany and zoology. These promise to yield results of the highest interest, if only the matter be taken in hand in time, before introduced weeds and goats have destroyed their natural vegetation; dogs, cats, and pigs, their animals and their human inhabitants have been swept away, or have had their individuality merged in the onward press of European enterprise. There is still, to the disgrace of British science, even in the Atlantic Ocean, an island, the fauna and the flora of which are as yet absolutely unknown. The past history of the deep sea, of the changes of depression and elevation of its bottom, is to be sought to a large extent in the study of the animals and the plants inhabiting the islands, which rear their summits above its surface. These insular floras and faunas will soon pass away, but the deep-sea animals will very possibly remain unchanged from their present condition long after man has died out."

Besides numerous woodcuts, Mr. Moseley's book is illustrated by two coloured plates of antarctic icebergs, and a track-chart of the world, with contour-colours of the sea-bottom. A very copious and carefully prepared index is appended. Throughout the book the references to literature of all kinds bearing upon the myriad topics touched upon are very abundant, and form one of the most intrinsically valuable features of the work.

E. RAY LANKESTER

METEOROLOGICAL NOTES

FROM the third annual Report of the Forest Meteorological Stations of Germany, being the Report for 1877, we learn that this system of inquiry into the influence of forests on weather and climate now includes fourteen stations scattered over a region extending over 7° of latitude and 5° of longitude, the stations being at heights ranging from 10 to 3,051 feet above the sea. The instruments and observations have been planned on satisfactory and comprehensive principles, and in a few years results eminently *ad rem* may be looked for. In the meantime the thermometric observations point to highly important results. Each station has three sets of thermometers for air temperature, similarly protected—one set in the wood, the second set high up in the crown of a tree, and the third set in an open space outside the wood, while earth thermometers are placed both in the open and in the wood, on the surface of the ground, and at depths of 6, 12, 24, 36, and 48 inches. The results show in every case a lower air temperature inside the wood as compared with the open country outside, the mean difference amounting to 1°·3. As regards the temperature of the surface of the ground, the mean deficiency in the wood shaded by the trees is 2°·5, an amount which gradually diminishes with the depth to 2°·0 at 48 inches, the lowest depth observed. It would be a problem of great interest to ascertain how deep this cooling of the earth's surface extends when it is screened by trees from solar and terrestrial radiation. What are called the "true means" of atmospheric pressure are calculated from the observations at 8 A.M. and 2 P.M., the formula being

$$\frac{\text{VIII.} \times 2 + \text{II.} \times 5}{7}$$

Since the stations range in height from 10 to 3,051 feet, and otherwise differ in their physical conditions, it is scarcely necessary to point out that the method of reduction adopted is very faulty.

SOME years ago a good deal of writing appeared in the periodical press depreciatory of the climate of Rome on account, as alleged, of the exposure of that city to the pestilential malaria of the Campagna. Many of the opinions then expressed will not bear scrutiny when confronted with the facts of the mortality and health of Rome. It was to counteract these opinions, which obtained wide currency, that a book entitled "The *Times* Newspaper and the Climate of Rome," by S. A. Smith, was recently published. The author has brought to his task the experience of a twenty years' residence, by which he has been enabled to sketch familiarly and with general truthfulness the broad features of its climate in its hygienic rela-

tions; and in addition, strong feelings, we may almost add of animosity, towards the writers whose opinions he sets himself to combat. The result is a readable book, containing much valuable information to those who intend visiting Rome, though occasionally marred by the introduction of hasty writing and hasty feeling. In comparing (p. 151) the mortality from typhoid in London in 1870 with that of Rome in 1876, the deaths in London are stated to have been 2,008, or 10 per cent. higher than the deaths in Rome; whereas the deaths from typhoid in London in 1870 were only 976, giving a mortality from this disease of little more than half that of Rome. Technical knowledge also on occasions fails the author; thus it is strongly asserted (p. 120) that the diurnal fall of temperature takes place almost exclusively between 3 P.M. and sunset, and between 9 or 10 P.M. and sunrise, but the two hours after sunset are those when the temperature is most nearly stationary. The mortality statistics, now published weekly by Cocchi, will soon supply information for a satisfactory handling of various questions which have been raised touching the health of Rome.

THE Missouri (U.S.) Weather Service Report for January last is just received (February 24), from which we learn that at St. Louis the temperature did not rise to freezing from December 11 to January 15; the mean temperature of the first ten days of January was only 9°·0, and that of the whole month 26°·9, or 4°·7 below the average; and at Oregon, in the north-west of the State, the sleighing season ended on January 25, after a continuance of fifty days. The lowest observed temperature was − 24°·0 at Phelps City on the 3rd, and at Columbia on the 4th, and temperatures nearly as low were noted on these days at many other places. The rain- and snow-fall was moderate in amount, being about two inches in the extreme south-east and south-west and along the low country round the mouth of the Missouri, whilst in the north the fall was considerably under an inch of rain and melted snow. The cold of January, 1857, was much more intense than during last month, the mean temperature of that month being only 19°·3, or 12°·3 below the average. It is delightful to note the frank, effective manner in which Director Nipher is bringing about uniformity in his observers' reports; thus, after pointing out that "rainy" or "snowy" days are only those on which the rain or melted snow amounts to at least 0·01 inch, he adds that "this international rule is almost universally disregarded by our observers."

THE meteorological observations made at the Hydrographic Office at Pola during 1878 have been issued, with a full abstract for the year, showing the hourly means of pressure, temperature, and wind-velocity. The most prevalent winds by far are from the quarter of the compass from east-north-east to south-east, these comprising nearly half the winds of the whole year, to which there is to be added a small secondary maximum of west-north-west winds. The wind falls to its daily minimum velocity at 5 to 6 A.M., and rises to the maximum so early as noon, hours all but coincident with the daily maximum and minimum temperature. From the three years' observations now available from Pola, it is seen that in common with sea-side stations of the middle and higher latitudes, the A.M. maximum of pressure occurs later in winter than in summer, in contradiction to inland places where it occurs much earlier. Pola being in latitude 44° 52′ north, and thus within the belt to which Rikatscheff drew attention some time ago, as characterised by the occurrence, or tendency toward the occurrence, of a third maximum of pressure a little after midnight during the cold months of the year, it is interesting to note that four out of the nine individual Decembers, Januarys, and Februarys, show the occurrence of this third maximum, which also appears in the general means of December and January for the three years. The amount of this third maximum is very small, and the evidence yet adduced is not sufficient to determine whether it is a real increase of atmospheric pressure, or merely an apparent increase due to undetected instrumental errors.

OUR ASTRONOMICAL COLUMN

BRORSEN'S COMET.—Notwithstanding the track of this comet at the present appearance is a very favourable one for observation in these latitudes during April and May, the theoretical intensity of light at maximum is much less than that attaching to the first appearance in 1846; indeed, in the middle of April, when it is greatest, it is only half that of the middle of March 1846. The comet in that year was never a conspicuous object in ordinary telescopes; it approached pretty near to the earth, and on March 25 its apparent diameter was about 9′, corresponding to a true diameter of 126,000 miles.

The following positions for part of the present month are reduced to 7h. Greenwich time from Dr. Schulze's ephemeris, which has been calculated for Berlin noon:—

	R.A. h. m. s.	N.P.D. ° ′		R.A. h. m. s.	N.P.D. ° ′
March 10	1 29 4	90 15·4	March 18	1 55 56	82 59·8
,, 12	1 35 39	88 33·0	,, 20	2 2 51	81 0·0
,, 14	1 42 20	86 46·3	,, 22	2 9 50	78 55·8
,, 16	1 49 6	84 55·2	,, 24	2 16 52	76 47·3

The comet will be nearest to the earth (distance = 0·683) on the night of May 3, its position at the time being between 49 and 55 Camelopardi. Between April 14 and June 11 it will not descend below the horizon of Greenwich, attaining its greatest north declination (65° 30′) on May 11, in the head of Ursa Major. The comet was found by Dr. Tempel, as already stated, on January 14, more than a month before the ephemeris by Dr. Schulze commences, and as we remarked in a former note, was thus observed with a much less intensity of light than at any previous opposition. The error of the ephemeris has not yet been published, but it appears not to be large. We shall continue the ephemeris in due course when better advised on this point.

In his report upon the work of the Observatory of Leipsic in 1877, Prof. Bruhns mentions that Herr Harzer a student in that university had, at his request, redetermined the effect of the attraction of Jupiter upon the elements of the comet at the near approach of the two bodies in May, 1842, and with satisfactory results. In 1857 the late Prof. D'Arrest made a first approximation, by the method of the *Mécanique Céleste*, to the orbit which the comet described prior to the great perturbation or on entering the sphere of activity of Jupiter about April 19·5 Berlin time in 1842; the elements at that epoch were found to be as follows (we annex the elements in 1846 at the time of the comet's first discovery for the sake of comparison):

	1842, April 19·5.	1846, Feb. 25·4.
Long. of perihelion	133° 26′·7	116° 28′·2
,, ascending node	107° 44′·0	102° 41′·0
Inclination	40° 51′·0	30° 55′·9
Excentricity	0·59275	0·79338
Perihelion distance	1·50130	0·65013
Log. semi-axis major	0·56661	0·49783
Period	7·078 years.	5·581 years.

It will be seen that the perihelion distance before the encounter with Jupiter was much greater than it now is, a sufficient reason, as was pointed out by D'Arrest, for this comet to have been missed, if it had moved in the orbit which was so much changed in 1842.

MINOR PLANETS.—M. Palisa notifies his discovery of No. 192 at Pola on February 17. At 13h. 47m. m.t. its R.A. was 11h. 10m. 20s., and N.P.D., 84° 6′, eleventh magnitude.

Hilda, the most distant of the minor planets, which is