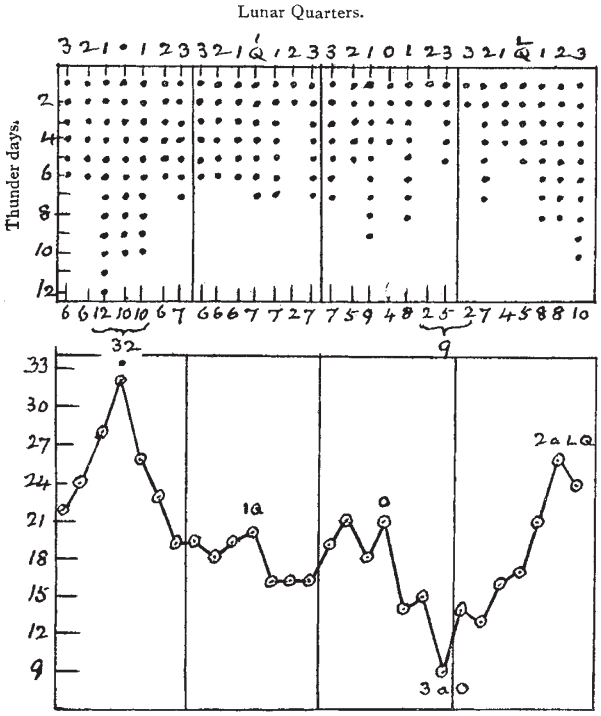
The Moon and Thunderstorms.

IT is known that several meteorologists have affirmed a connection between thunderstorms and the lunar phases. In his recent admirable "Lehrbuch," Dr. Hann appears to favour this idea somewhat, and he gives some account of researches on the subject (p. 662).

I do not remember to have seen the Greenwich data treated from this point of view. It might, therefore, interest your readers to see how days on which thunder was heard at Greenwich in the last thirteen years (summer half) are distributed in the week about new moon, about first quarter, &c. This is shown in the diagram, where each dot represents one such day. The number of dots in each case is given below; and in the curve, each point represents the sum of three consecutive members of this series.



It will be seen that the extremes come about new moon (maximum) and about midway between full moon and last quarter (minimum). While the three-day group commencing with second after full moon had 9, that about new moon had 32—nearly four times as many.

This curve might be usefully compared with that, similarly obtained, for wet days (or days with 0·5 in. or more) at Greenwich, in twenty-four years (given in NATURE of August 29, 1901).

Arranging those 182 days by weeks and reckoning percentages, we have :—

	Week about New Moon.	1st Qr.	Full Moon.	4th Qr.
	57	41	40	44
Per cent. ...	31	23	22	24

The latter figures may be compared with those given in Hann's work for

	N. M.	1st Qr.	F. M.	4th Qr.
Kremsmünster (Wagner)	26·4	27·4	20·9	25·3
Aix la Chapelle (Polis) ...	26·9	27·5	21·5	24·1
Batavia (van d. Stok) ...	27·4	24·5	24 2	23·9

All agree in showing a larger percentage about new moon than about full moon, and in the two earlier phases than in the two later. The values for Kremsmünster and Aix are for much longer periods, and it is possible that a larger induction for Greenwich might bring out still closer agreement. The grouping by weeks, in the case of Greenwich, seems hardly to do justice to the contrast presented. It may be well, further, to remember that a 26-day period in thunderstorms, corresponding to the sun's rotation, has been affirmed.

Sidmouth, February 6. ALEX. B. MACDOWALL.

Progressive Variation in the Malayan Peacock-Pheasant.

IN looking over the specimens of this species (*Polyplectrum bicalcaratum*) in the Indian Museum, I have come across a most interesting skin of an adult male, showing variation in the direction of greater ornamentation. Normally, this peacock-pheasant has ocelli only on the wings and tail and the upper part of the back; but in the present specimen several of the black-speckled buff feathers of the back, immediately below the ocellated region, have clusters of the small spots richly glossed with green like the ocelli, the rest of the black speckling of the feather remaining normal. The green specks are always near the end of the feather, in the position occupied by the ocelli. Furthermore, this bird has the long under-tail-coverts decorated near the tip of the outer webs with a not very bright green-glossed ocellus, the inner webs merely showing black patches, such as are normal on both webs of these feathers in other specimens. Thus this individual presents on the upper surface a variation which might be advantageous in sexual selection, and beneath a similar enhancement of beauty which could hardly be of any use, since the Polyplectrons show off in an attitude which prevents any display of the under-tail-coverts. It is therefore interesting as showing how the beauty of a species might be enhanced both with and without the assistance of preferential mating on the part of the females.

F. FINN.

Indian Museum, Calcutta, January 30.

The Inheritance of Mental Characters.

FURTHER discussion of this subject (*cf.* p. 245) should perhaps be postponed until the appearance of Prof. Pearson's detailed paper. Possibly, however, it may be permissible to discuss briefly Prof. Pearson's reply to my criticism.

(1) As to the possibility of proving the "soul" factor to be a reality, I would say that it may be possible some day to estimate very exactly the value of the other two factors (heredity and environment), and it will be significant if there is then found to be a residuum not accounted for. This line of reasoning is not new; compare A. R. Wallace, "Darwinism," chap. xv.

(2) It seems to me very likely that the correlation between the mental characters of brothers would be less than between the physical, if only the factor of heredity were considered. It does not follow from this that the mental characters are less inherited, taking the race as a whole, but only that they are less evenly inherited, so that the true measure of inheritance could only be determined by studying a number of successive generations. I tried to set this forth in the paragraph which Prof. Pearson says he cannot understand.

(3) There are, however, other disturbing influences. Even at birth, we must believe that we have not the simple product of heredity, as has been well explained lately by Prof. Ewart (*Sci. Trans.* Roy. Dublin Soc., October 1901, p. 366). Again, the several faculties do not mature at the same age, so that statistics based on children "in public schools, high schools, secondary and primary schools of all classes" cannot be strictly comparable, nor does it seem possible, in the case of mental traits, to make definite allowance for age, as can be done with more or less accuracy in the case of physical characters.

T. D. A. COCKERELL.

East Las Vegas, New Mexico, U.S.A., February 1.

ICELAND.[1]

FEW parts of the earth's surface possess so strange a fascination, at once attractive and repellent, as that large island which, away to the north-west of Europe, stands between the Atlantic and the Arctic Ocean. Its language and literature, its connection with the northern mythology, the antiquity and continuity of its annals, and its quaint customs and traditions have given it a special place in the history of nations. The strange aspect of its surface and climate—the home of frost and fire, the scene of some of the most colossal volcanic eruptions which man has ever witnessed, the site of vast snow-fields and glaciers, a region shaken with earthquakes, devastated by

[1] "Geological Map of Iceland." By Th. Thoroddsen. Surveyed in the years 1881–1898. Edited by the Carlsberg Fund. (Copenhagen, 1901.)

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appalling floods, swept by Atlantic storms and sometimes chilled by Greenland icebergs—these and other impressive features have made Iceland a region of peculiar interest to students of nature. To the geologist, in particular, the country offers a wide field for observation. Its ice-fields remain as relics of the Ice Age, and are still large enough to illustrate many of the characteristics of that period in geological history. Its volcanoes display almost every type of volcanic action, and present a marvellously extended chronicle, stretching back from the present day through the Glacial period into older Tertiary time. The vicissitudes of its climate and the general absence of a protecting cover of vegetation afford singular opportunities for the study of the progress and rate of denudation, while its many hundreds of miles of coast-line furnish inexhaustible materials for investigating the action of the sea on the shores, and the causes which lead to the advance or retreat of the land.

That Iceland has been much less visited than such an interesting region might have been expected to be has probably arisen mainly from two causes. In the first place, it lies a good way off, across a stormy ocean on which the means of communication are neither so frequent nor so luxurious as modern requirements demand, and, in the next place, when the traveller reaches the island, he finds that to journey through it involves, not only a good deal of expense, but exposes him to privations which he is not always well able to endure. Many who have shrunk from the voyage in face of these difficulties have longed for what comes next in value after an actual personal visit to a country—a good map of it, on a sufficiently large scale and with enough of detail to allow its main characters to be intelligently grasped. Geologists will be glad to hear that this want has now been supplied. They are well aware that for some twenty years the indefatigable Icelandic geologist Dr. Th. Thoroddsen has been at work, summer after summer, mapping his native island and publishing from time to time short notices of his investigations. Only a few of these notices have appeared in English journals; more have been translated into German, but the fullest and best accounts of his work are those in Danish, and more especially the series of papers in the *Geografisk Tidskrift* published at Copenhagen from 1884 up to the present time. Maps of various portions of Iceland, which have accompanied some of these papers, have shown with what skill and energy their author was carrying on his self-imposed task, in the midst of all the known difficulties of Icelandic travel. The work on which he has been engaged was rather the duty of a Government than what can be expected to be undertaken by a private individual. But he has stuck to it with courage until his materials have grown ample enough to permit him to embody them in a general map of the whole of the island.

This map is now issued in two sheets, printed in colours and published at Copenhagen, with the help of the Carlsberg Fund. It is on the scale of 1-600,000, or about ten English miles to an inch, which is large enough to show much detail that has never yet been expressed on a single map and summarised in so clear and intelligible a manner. The title and explanations of signs and colours are given in English. The map presents a more striking picture of the geology and physical geography of the island than has ever been before available, and contains a vast fund of instructive information in regard to matters not only of local, but of theoretic interest.

One of the first features to catch the observer's eye, as he glances at the distribution of the colours, is the wide area occupied by the Tertiary basaltic plateau. This vast underlying platform, on which all the later volcanic manifestations have been displayed, still forms the surface of most of the western, northern and eastern districts. Its nearly horizontal sheets of dark brown rock have been cut into innumerable fjords and inlets on the coast, above which they rise in long lines of mural precipice. Among the basalts lie layers of terrestrial vegetation, the famous lignites or "Surtarbrandur," the positions of which, where known, are indicated on the map. The plateau is diversified by the uprise of numerous masses of liparite and granophyre, which are especially developed in the eastern part of the island. They may be compared with the granophyre intrusions which have disrupted our own Tertiary volcanic plateau in the west of Scotland. A further coincidence between the volcanic geology of the two regions is to be seen in the scattered patches of gabbro shown on the map, though this rock does not appear to play the important part in Iceland which it does among our Western Isles. For the first time some adequate conception can be formed from this map of the extent and distribution of the palagonitic tuffs, breccias and conglomerates, for which Iceland has so long been noted.

The post-Tertiary eruptions have broken out along a broad belt of ground which crosses the island from south-west to north-east. Dr. Thoroddsen separates the "doleritic lavas" as a pre-Glacial and Glacial series from the "post-Glacial basaltic lava" and the "post-Glacial liparitic lava." Of the area and distribution of the huge floods of basalt, which have transformed so many hundreds of square miles of the interior of Iceland into black waterless and verdureless deserts, we can now form a clear idea. The vast expanse of the Odádahraun, which has been the scene of the most colossal outpouring of molten material, can be seen in its true proportions. We can realise, too, the source and extent of the great eruption from Laki in the year 1783, which has been made so familiar by the imperfect and incorrect notices of it handed down in text-books.

By a series of simple signs Dr. Thoroddsen has succeeded in separately indicating the positions of the great lava-domes, comparable with those of Hawaii, such as the massive Trölladyngja and others on the plateau of Odádahraun; of the volcanoes of Vesuvian type, built up of lavas and tuffs round a central orifice, like Hekla; and of the crater-rows, like that of Laki. The map shows clearly the important place which this third type takes in the vulcanism of the country. A further separation is made of the "glacial volcanoes" from those which are "glacial and recent." The positions of solfataras, hot springs and mineral springs are marked, and space is found for lines showing the trend of raised beaches and the highest ascertained limit of submergence.

Nor are the superficial formations omitted; the various Drift deposits of the uplands are represented by one tint and those of the lowlands and valleys by another, while on the south coast, the wide stretches of sand and mud, discharged by the hundreds of streams that descend from the great snow-fields and glaciers of the Vatnajökull and the western Skaptafells district, are distinguished from the other recent accumulations. An interesting feature of the map will be found in the arrows that mark the direction of the ice-striæ on the rocks. These signs indicate that while the general movement of the ice-sheet has been outwards on all sides, each separate mass of high ground has exercised an influence in guiding the ice-drainage. This local effect is well brought out in the north-western peninsula, where the striæ descend into the fjords on either side of the main watershed. The Glámu Jökull, which still caps that portion of the basaltic plateau, is thus the lineal descendant of the ice-fields that once spread over the whole island.

In comparing the coast-line of different parts of the island as depicted on this map, the geologist cannot fail to be struck with the contrast between that of the southern district and that of the rest. From Reykjavik right round the western, northern and eastern sides of Iceland, where the ancient Tertiary basalt-plateau meets

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the sea, the shores are deeply indented with innumerable fjords and little inlets, above which the rocks rise in long lines of terraced cliff. Along the southern coast, the margin of the land consists for the most part of low flats and bars of fine sand and mud, brought down by the many rivers and streamlets that escape from the edges of the great glaciers and snow-fields. A contest is constantly waged between the Atlantic breakers, on the one hand, and the sediment-bearing inland waters, on the other. Bars and spits are thus thrown up, behind which stretch long narrow lagoons. For a distance of some 250 English miles such is the general character of the coast-line. In spite of the fury of the Atlantic storms and the occasional breaking down of the detrital barriers opposed to them, the sea has been losing ground. Since the Ice Age so much sand and silt have been carried down that a wide stretch of lowland has been gained, and the sea has become so shallow that for long distances no ship of any size can approach the coast. Yet such is the unfortunate physical geography of Iceland that, at least in the meantime, this accession of land brings but little advantage to the inhabitants. The territory is so liable to rapid inundation, and to be swept over by sudden floods, that it is too dangerous to be reclaimed, and often cannot even be crossed without serious risk. In that portion of it which lies nearest to the Mýrdal glaciers, an additional source of peril is furnished by the eruptions of Katla, which, buried under the snow-fields, from time to time finds a vent, disrupts and melts the ice, and sends it in huge masses down the floods that sweep over the plain and carry their freight of ice even out to sea. Dr. Thoroddsen has given in his various publications graphic though only too brief accounts of these operations, and his new map enables us to follow their scope with greater clearness.

Now that the great labour of preparing this map has been successfully accomplished, every geologist and every visitor to Iceland will hope that Dr. Thoroddsen may be able to devote himself to the preparation of a full description of his native country. He has accumulated a large amount of material, only a small part of which has been published, and this merely in brief outline. He has, doubtless, many parts of the island to revisit and many difficult questions to elucidate before such a volume or series of volumes can be written. We can only wish him continued health and strength for his important task. It is surely not too much to hope that work of so national a character and of so much general scientific interest will meet with such hearty support and aid in Denmark that it may be vigorously prosecuted to an early and successful conclusion. ARCH. GEIKIE.

NATURE STUDY IN SCHOOLS.[1]

WE have received the first part of the *Nature-Study Journal*, published by the South-Eastern Agricultural College, Wye, Kent, with a preface by Sir William Hart-Dyke and an introduction by the editor, Mr. A. D. Hall, principal of the College. This new publication is the outcome of a discussion held at the College during a summer course for teachers in 1901, and the thirty-one teachers, mostly from schools in Kent and Surrey, whose names are appended to the part received constitute the first members of a Nature-Study Society by which this journal will be maintained. The object of the journal, as set forth in the preface and introduction, is mainly to facilitate the teaching of "nature-knowledge" in rural schools, by enabling the teachers to interchange ideas and schemes of instruction and to be in communication with the Wye College as a central organisation. The whole subject of nature-teaching in rural schools has been brought into prominence of late years, and there has been a distinct revival in this branch of education to which we have, from time to time, called attention in these columns. The initiatory work of the Countess of Warwick in emphasising by practical example the necessity for the establishment of schools of science in rural districts (see article by Lady Warwick and Prof. Meldola, NATURE, vol. lix. p. 7), followed by the work of the Agricultural Education Committee inspired by Sir William Hart-Dyke and Mr. Henry Hobhouse, has been largely instrumental in bringing about this much-needed reform, and the demand for sound instruction in this kind of science has naturally been on the increase since the issue of the "Specimen Courses of Object Lessons, &c." by the Board of Education (NATURE, vol. lxiii. p. 603). It is to be hoped and expected that this demand will go on increasing, and the establishment of the present journal is therefore opportune. The great danger to education in this country is complete apathy and neglect in the first place, and then reckless precipitation and unorganised excess in order to try to recover lost ground. Rural education is bound to go through the usual phases, and we may already begin to ask ourselves whether there is anything to be gained by the multiplication of organisations, conferences and congresses, all carrying on much the same work and frequently overlapping in functions.

The Nature-Study Society has, however, in favour of its creation the circumstance that it is composed of teachers who are engaged in giving actual instruction in this subject in schools, and the journal is to be largely devoted to the publication of specimen lessons. Two such lessons are in the part before us, one on "Leaves and their Veining" by Mr. H. Brooker, of the Ewhurst National School, and the other by Mr. A. E. Chandler, of Puttenham, on "Dodges of Nature." The first point that cannot fail to strike the reader of these two lessons is their extraordinary divergence in standard. The collecting and classification of leaves according to their veining is a lesson in pure observation. The "dodges" referred to in Mr. Chandler's lesson are the contrivances for cross-fertilisation in long and short-styled primroses and in Salvia, and the pupil is afterwards told to collect some flowers of Arum, to study the inflorescence, and then to work out for himself the mechanism of fertilisation by the aid of hints given in the following form:—"What can be the work of the little hairs that nearly close the opening of some of the hoods? Do you notice any insects? Did you ever think out the design of an eel-trap or a lobster-pot?" It is obvious that these two lessons must appeal to pupils of different ages and acquirements. The new Society and its journal should have a useful career if only by enabling teachers to compare schemes, as in the two lessons noticed. Such specimens bring out very clearly the necessity for graded and connected series of lessons leading from simple observation and description up to observation combined with inductive reasoning. The introduction of nature study into rural schools cannot but be productive of good, and although, as the editor points out, it is not primarily directed to keeping children on the land, it may have this effect indirectly by leading children "to see that a country life has its own interests and is not merely stupid routine; particularly we want the children who do stay in the country to have laid a foundation of thinking about rural pursuits which can be built upon later." The Society will welcome as new members all teachers who are conducting nature-study classes, the only obligation being that the member shall be expected to send a specimen lesson for publication. The Society is worthy of support, and we commend it to the notice of teachers who are already holding, or who desire to conduct, classes in this subject, which is one that by proper handling can be made really fascinating to children of every degree of intelligence.

[1] *The Nature-Study Journal.* Published by the South-Eastern Agricultural College, Wye. No. 1. Pp. 12. (*Kentish Express* Office, Ashford, Kent.) Price 3*d*.

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