under each, their insect enemies are enumerated. Fruit-growers who find their trees or bushes suffering from the attacks of insects, cannot do better than refer to this book to discover the cause and remedy. In a few touching lines, Miss Ormerod dedicates the book to the memory of her sister and co-worker, Miss Georgiana M. Ormerod, who was equally interested in entomological inquiries with herself. W. F. K.

Gas and Petroleum Engines. Translated and adapted from the French of Henry de Graffigny, and edited by A. G. Elliott, B.Sc. Pp. x + 140. (London: Whittaker and Co., 1898.)

A READABLE and instructive account of gas and petroleum engines is given in this little volume. The text can be easily followed by non-technical readers interested in gas and oil engines in use at the present time, and engineering students will find in the volume a good general survey of internal combustion motors. The subjects of the eight chapters are: the history of the gas engine, working principles of the gas engine, description of existing gas engines, carburetted air engine, petroleum engines, gas generating plant, engines for use with poor gases, and maintenance of gas and oil engines.

The Story of the Farm, and other Essays. By James Long. Pp. xv + 158. (London: *The Rural World* Publishing Company, 1898.)

THE essays in this volume refer more to the economics than the science of agriculture. The author, who has had a long experience of agricultural public life, and has contributed many valuable manuals to the literature of farming, acknowledges that agriculturists fail to recognise the two great elementary requirements of the hour—technical instruction, to which alone farmers can look for their advancement in knowledge and success, and co-operation. The Countess of Warwick contributes an introduction to the volume, on "Women and the Future of Agriculture."

Publications of the British Fire Prevention Committee. Edited by Edwin O. Sachs. Vol. i. (London: British Fire Prevention Committee, 1898.)

TEN papers on methods of fire prevention and kindred subjects appear in this volume, which represents the first fruits of the establishment of the British Fire Prevention Committee. The papers call attention to the need for increased protection from fire by preventive measures, wider knowledge of methods of fire-combating, investigations of materials and forms of construction, and research into the causes of fires. They should thus be the means of imparting very useful knowledge, and obtaining active support for the movement for better preventive measures against fire, which led to the formation of the Committee under whose auspices this volume has been published.

The Story of the Cotton Plant. By F. Wilkinson, F.G.S. Pp. 199. (London: George Newnes, Ltd., 1898.)

THIS latest addition to the Library of Useful Stories, written by the director of the Textile School at Bolton, gives a clearly expressed and popular account of the chief cultivated species of the cotton plant, the pests and other injurious agents which molest them, and the methods of cultivation in different countries. The processes of picking, ginning and baling are described, and the plans for manipulating the cotton in carding, drawing, &c., dealt with. The early attempts at spinning are passed under review, and pave the way for an account of the modern spinning mule and the other processes in the spinning of cotton. The little volume, though perhaps not likely to be widely read, should be very popular in Lancashire.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Asymmetry and Vitalism.

PROF. JAPP has so entirely changed his position that it is useless to attempt to follow him. I would desire, however, to correct misunderstandings into which he has fallen in respect of my contentions with reference to his original position.

I did not intend to suggest that life originated in a crystalline form; but merely that, as living things can now assimilate crystalline bodies, the first living organism may have originated in connection with and by utilising a crystal, and that the asymmetry of this original living organism may have been controlled by the accidental asymmetry of the original crystal.

Once life began, I presume it descended, as it does now, by section and so forth, and, as I cannot follow Prof. Japp's difficulties as to a particular asymmetrical system breeding the like, I cannot see how the intervention of intelligence is required for its propagation, any more than for the growth of a particular asymmetrical crystal, once it is started.

This preponderating influence of the parent entirely explains the other misunderstanding Prof. Japp has fallen into. I never suggested that the rotation of the sun, probably a very feeble cause, could make a seed, with its impressed asymmetry, grow into a tree with a different asymmetry merely by bringing the seed from the northern to the southern hemisphere. All I suggested was, with reference to Prof. Japp's original position—namely, that at the *origin* of life the first living organism may have been given a particular asymmetry by its having been produced in one or other hemisphere. A cause which may have been quite sufficient to give this asymmetrical bias during the time of origination, may be quite inadequate to produce a change in the bias once it has been given.

GEO. FRAS. FITZGERALD.

Trinity College, Dublin, November 10.

Connection between Mànasarowar and Ràkas-tàl.

MR. LANDOR, in his account of his journey in Tibet, "In the Forbidden Land," claims to have disproved the connection between the lakes Ràkas-tàl and Mànasarowar. The notice in NATURE of November 3 speaks of the connection as being possibly open to doubt.

But it is not so. My brother, then Captain Henry Strachey, in the account of his visit to the lakes in 1846, published in the *Journal* of the Asiatic Society of Bengal, vol. xvii., gives full details on the subject. He crossed the stream that flows from Mànasarowar into Ràkas-tàl at a point about a mile from the latter lake. He describes it as about a hundred feet wide and three feet deep, running rapidly from east to west in a well-defined channel. He did not visit the actual point at which this stream leaves Mànasarowar, but in 1849 I did so (see *R.G.S.J.*, vol. xxi.), and there is no more doubt about the fact than that the Thames runs past Richmond.

Mr. Landor, so far as his map and descriptions enable us to judge, and as the notice in NATURE suggests, did not go far enough north between the lakes to admit of his ascertaining the facts bearing on the subject. RICHARD STRACHEY.

Lancaster Gate, November 12.

Arctic and Sub-Arctic Bees.

OF the wild bees of Alaska nothing is known, except that several species of humble-bees (*Bombus*) are common. Consequently, when Mr. Trevor Kincaid wrote me last year that he was going to Alaska, and would collect bees, I was expecting to see, on his return, quite a new bee-fauna. He collected carefully, and brought back a nice series, but all *Bombus!* No other genus was seen, although brightly-coloured flowers are quite numerous in Alaska. On the Pribilof Islands he found a fine new species of *Bombus*, which I named *B. Kincaidii*, but there was no other bee. I have written to Dr. W. H. Dall, to ask whether he ever saw any bees other than *Bombus* in Alaska. He replies that he collected there in 1868 four or five *Bombus*, and some wasps of the genera *Vespa* and *Pompilus*, but he has no record of other bees.

In Greenland, also, the bees are *Bombus*. Peary saw one quite at the northern end of that country. The one exception in America to the rule that only *Bombus* occupies the far north, so far as I remember, is the occurrence of *Osmia bucephala* at Great Slave Lake. In Europe and Siberia the same rule seems to hold, but doubtless several genera go further north than in America. *Andrena lapponica*, for example, is a decidedly northern type. The object of this note is to draw attention to the interesting question of the northern distribution of bees Those who have occasion to visit northern regions should collect what bees they can, noting the flowers they frequent, and in this way much valuable information may be gained. Probably some of your readers are already in a position to throw light upon the subject.

T. D. A. COCKERELL.

Mesilla Park, New Mexico, U.S.A., Nov. 6.

Why Birds are not Killed by Eating Poisonous Fruit.

THERE is a great difference of opinion on this subject. While some maintain that birds do not eat fruits of this kind, others hold that they eat only the surrounding pulp, as of the berries of Taxus, which is perfectly harmless, whereas the seed is very poisonous; others, again, have maintained that they do not eat sufficient to be poisonous. The real fact is, I believe, that none of these statements are true, but that actually the birds eat largely of these berries, both pulp and seed, and that they very shortly afterwards eject the seeds and skins by the mouth, thus avoiding any poisonous action.

The first experience I had of this habit was in finding in September last an immense number of thrushes and missel-thrushes feeding on the berries of *Pyrus aucuparia* in Sutton Coldfield Park. At least a square mile of ground had every patch of grass covered with the ejected seeds and skins of these berries, all the pulp having disappeared, while the colour of the skins was as bright and fresh as when they were swallowed; showing that they could not have passed through the alimentary canal. Each of the pellets was flat and round, and about the size of a sixpence. The birds were incessantly flying to and fro betwixt the trees in the adjoining woods and the park. The excessive drought of last summer, by decreasing the supply of their ordinary food, was evidently the cause of their attacking the berries at this early period.

The next evidence I had of this being the explanation of their immunity from the effect of poisonous food was in October last, when I found on Boxhill, in company with Prof. Conwentz, of Dantzic, a number of similar pellets, but consisting entirely of the seeds and skins of yew berries; the former being as bright green, and the latter as scarlet as they were on the tree. In each of these pellets I counted twenty or more seeds.

The real difficulty in accepting this explanation is that, so far as I know, no one has actually seen the birds eject the seeds. Two friends of mine saw, the other day, what was very nearly the accomplishment of the process. A thrush was seated under a well-fruited yew, and going through violent spasmodic contortions, the wings drooping on the ground; they thought it was ill, but it flew away strongly as if there was nothing the matter.

The idea that these birds only suck off the pulp from the berries is, I think, fallacious. Prof. Conwentz and I found under a large tree on Boxhill a great number of small fruit-bearing shoots, which had clearly been bitten off by squirrels; the ground was quite covered with seeds divested of their aril, and unbitten, though a few berries with the pulp bitten had been dropped by the squirrels. Mr. Morton Middleton tells me that at Dicksgrove, Co. Kerry, the yew-berries are largely eaten by thrushes, missel-thrushes, blackbirds, greenfinches, linnets, &c., and afterwards rejected, but he has not seen the birds in the act of doing this. He says, however, that turkeys, not being able to eject the seeds, are killed by them, although Rhind ("Vegetable Kingdom") says that these, as well as peacocks and fowls, eat them with impunity. Mr. Bennett (NATURE, October 13, 1898) asks for information as to the effect of birds and animals eating poisonous plants, and says that blackbirds eat the berries of *Atropa belladonna*. It does not appear that this was more than a supposition, neither is there any observation, so far as I am aware, as to what part of the berry, seeds or pulp, is poisonous. He says that mice eat the seeds of *Datura stramonium*. Here again we do not know whether they eat more than the kernel, which they would readily extract from the seed, as I have found them do in the case of *Ranunculus repens*, a small hole being bitten at the edge of the seed, while every kernel was extracted from the double-handfuls of seeds, which were collected in heaps.

"J. C." (NATURE, vol. lviii. p. 597, October 20, 1898) saw thrushes feeding freely on the berries of *Daphne mezereon*, an undoubtedly poisonous plant. In this instance there can be little question that they eject the seeds. He says they were so stupefied that they might apparently have been taken with the hand.

Mr. E. Langley, in the same number of NATURE, says that he saw blackbirds also eat these berries, but they did not appear the worse for a number of them.

Gilbert White ("History of Selborne, 1789, 329) speaks of milch-sows being killed by yew-berries, while "barrow-hogs and young sows" did not suffer. He attributes this result to the former being weak and hungry, and therefore eating a much larger quantity.

Prof. Tuson found (*Field*, 1877) that pheasants were killed by the leaves of yew, and there are several similar instances recorded since that date.

A. von Kerner made a number of experiments to show that seeds eaten by blackbirds, germinated in the following June; whilst those not so eaten, remained on the ground three or four years. O. Kirchner says that a species of Motacilla eats the berries; but this I regard as a doubtful statement. I have frequently seen them capture flies attracted by the fruit, but have never seen them touch the fruit itself. Every one is, of course, familar with the manner in which owls disgorge the fur and bones of mice and skulls of small birds, a habit which Mr. Harting tells me is shared by all the raptorial birds, as well as by shrikes, flycatchers, and rooks; and there are other facts alluded to by Sir Herbert Maxwell in his "Memories of the Months," and others of insects feeding on deadly poisons without any injury. The habit of ejecting the indigestible parts of their food by birds, seems to require further observation and experiment.

JOHN LOWE.

Sun-spots and Air Temperature.

THE following comparison is, I think, instructive:—

Make out a table (from Greenwich data), in which each month since the beginning of 1841 is simply characterised as + or −, according as its mean temperature has been above the average (warm), or below it (cold).

Then, in each five-year group having a sun-spot maximum year central, count the warm and the cold months; and the same with five-year groups having a minimum central. We get these tables:—

Max. groups.	*a* Warm months.	*b* Cold months.	*a* − *b*
1846–50 ...	38	22	+ 16
1858–62 ...	32	28	+ 4
1868–72 ...	34	26	+ 8
1882–86 ...	33	27	+ 6
1892–96 ...	35	25	+ 10
	172	128	+ 44

Min. groups.	*a* Warm months.	*b* Cold months.	*a* − *b*
1841–45 ...	26	34	− 8
1854–58 ...	30	30	0
1865–69 ...	35	25	+ 10
1877–81 ...	26	34	− 8
1888–92 ...	17	43	− 26
	134	166	− 32

Thus, in each of the maximum groups, there is an excess of warm months; and taking the whole, an excess of 44 warm months. In most of the minimum groups, on the other hand, an excess of cold months; total excess, 32 months.

With regard to the exceptional case—1865–69—in the second table, it may be worth remarking that 1860–70 is one of Brückner's warm periods. It seems to me that a consideration of both those cycles—the sun-spot cycle of about 11 years, and Brückner's of about 35 years—furnishes the clue to a great deal of our weather.

A. B. M.