

LETTERS TO THE EDITOR.

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Cooperation between Scientific Libraries.

THE note in NATURE (February 15, p. 372) on Dr. T. Muir's paper in the Proceedings of the Royal Society of Edinburgh directs attention to a difficulty which, as you rightly say, affects many others than the mathematicians of Scotland. You adduce, for example, Wales; but may I, without giving offence to the Principality, venture to suggest that the metropolis itself has still better claims to dishonourable mention?

In the two sciences which chiefly appeal to me, geology and zoology, the difficulty mentioned by Dr. Muir has long presented itself forcibly, and there is a lengthy list of books that I have been trying to see in vain, some of them for more than five years. They are, so far as I can ascertain, in none of the many libraries of this city. Naturally, the remedy suggested by Dr. Muir long ago presented itself to me, and I have lost no opportunity of urging it in conversation and in print. In view of your own recognition of the importance of the subject, I venture to ask you to reprint for a wider public the following paragraph from a paper contributed to the *Museums Journal* for April, 1902. After alluding to the cooperation between American libraries in the matter of cataloguing, and to the specialisation among the libraries of Chicago, I wrote:—

"The extraordinary difficulty that a student has, even in London, in seeing the literature of his subject—in fact, the impossibility, unless he is prepared to spend large sums of money on his private library—must have made many a one long for the day when the learned societies and other library authorities of London shall take this question of cooperation in hand. To what end is all this fuss about an international catalogue of scientific literature, with its elaborate mechanism and enormous expense, if, when the list of books is in his hands, it be still impossible for the student to refer to them? The amount of money annually spent by Government, through the libraries of the British Museum, the Education Department, the Patent Office, and the like, when joined with that spent by the great societies, such as the Royal, the Zoological, the Linnean, the Geographical, the Geological, with the College of Surgeons and other public bodies of like character, is surely enough, if properly administered, to buy the world's output of books each year; and far more than enough, if we remember that all publications of the United Kingdom go to the British Museum as a matter of course, and that the donation lists of many of these libraries are nearly as big as their purchase lists. If only the money could be pooled, and the purchases distributed according to some pre-arranged scheme among the various libraries; and if a joint catalogue were prepared, and kept up from month to month, showing not only the titles of books, periodicals, and papers, but the libraries in which they were to be found, then weary searching and fruitless wandering would no longer be the lot of the conscientious student. Even as things are, without so radical a reform as a redistribution of income, I feel sure that a conference of librarians, bent rather on furthering the interests of the reader than the pride of their own institutions, and armed with the necessary powers for cooperation, would soon lift London libraries out of the hopeless muddle that we now have to struggle with."

I hope that now this subject has been taken up in your influential pages it will not be allowed to drop until those concerned have at least attempted the remedy.

F. A. BATHUR.

The Blondlot *n*-Rays

It would be interesting to know whether anyone has obtained success in repeating the latest experiment designed to show the objective reality of the *n*-rays, viz. that described by M. C. Gutton in *Comptes rendus* for January 15.

The writer has repeated M. Gutton's experiment with

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much care, but has met with no more success in obtaining any positive result than he has in repeating a large number of M. Blondlot's own experiments, most of which he has essayed, in all cases with absolutely negative results, provided proper precautions were taken to avoid effects due to temperature and other extraneous causes of disturbance.

According to M. Gutton's experiment, the effect of the *n*-rays that proceed from a Nernst electric lamp upon a spark in a primary circuit is to diminish the brilliancy of another spark electrically induced in a secondary circuit by the primary discharge. Here one would suppose that the degree of brilliancy of the secondary spark can only be a matter of the amount of the electrical energy in the secondary circuit, but the writer finds that a very sensitive Duddell thermo-galvanometer, which would indicate a very small percentage of variation in the amount of this energy, shows no variation whatever.

A. A. CAMPBELL SWINTON.

66 Victoria Street, London, S.W., February 20.

A 300-Year Climatic and Solar Cycle.

IN June, 1902, I made a few remarks on an apparent coincidence between sun-spot periods and longer periods of rainfall and famine in north China. Not being, in any sense, a meteorologist, I did not publish my conclusions except locally. In connection with a notice in the "Astronomical Column" of NATURE, November 9 last (vol. lxxiii. p. 38), they are of sufficient general importance to recall them. The notice in NATURE is headed "A 300-year Cycle in Solar Phenomena," and refers to a discussion in the *Astrophysical Journal* wherein Mr. H. W. Clough, of the Washington Weather Bureau, arrives at the conclusion that a 300-year cycle exists in solar and the allied terrestrial phenomena, and finds likewise an intermediate 36-year cycle, and supports both by a reference to various phenomena, such as auroræ, periods of grape harvest, &c.

In 1877 Mr. A. Hosie, H.M. Consul at Chengtu, published a paper in the Journal of the China Branch of the Royal Asiatic Society on droughts in China (new series, xii., 51), extracted from Chinese records. As the records included all China, south as well as north, the tables did not at first sight exhibit any apparent periodicity. Some years after, on making a careful division into north and south, I was struck with a remarkable period of about 300 years, which seemed to me marked clearly in north China as an especial era of drought and famine. As, however, there seemed no reason for founding a new period, for the intercalation of which there was as yet no accumulated evidence, I proceeded no further with the subject. Mr. Hosie's paper went from the year 620 to 1643, covering a period of 1023 years, and attached to it was another notice of sun-spots observed in China, also going back for some 1300 years. The latter table, on account of the want of any observation instruments, is, of course, very fragmentary, but at the time I deduced from it without reference to European observations, which I had not by me, a probable period of 99 maxima in the 1920 years covered, which seemingly gave a mean of 11.085 years, and which, produced to modern times, fell in sufficiently satisfactorily with the European records of the last century. Sir Norman Lockyer in 1901 had also published observations bearing on a climatic curve of about six sun-spot periods, and commenting on all these I made the following remarks, which are entirely confirmative of Mr. Clough's findings, although deduced from such entirely different authorities.

"I now come to the long period or era which Mr. Hosie's records seem to require. The first of these calling for notice seems to cover the three sun-spot periods 664-697, though this is not so well marked as the others. The second covers the similar period from the maximum in 963 to that in 996, when besides two years of drought in northern China, 961 and 962, we find no less than twenty-three years out of the thirty-three characterised by excessive droughts in one or more of the northern provinces. The third covers the periods 1262-1295, when, in addition to the antecedent year 1260, there are noted twenty-one years of drought in the same provinces. The fourth is included between the spot maxima of 1561 and 1594, and though not so marked as the second and third, yet ten years of

drought are recorded, besides the preliminary drought years of 1557-1558. The fifth will, then, cover the equally well marked cycle of drought, which, beginning in or about the year 1860, has continued with scarcely an exception up to the present."

This was written in 1902, and it is noticeable that, as required by the cycle, the intervening years have proved of normal rainfall in northern China. Proceeding, I stated:—

"We have thus four well marked eras of 29·25 years, the beginnings of which in each case were marked by perfectly similar climatal phenomena, each being characterised as a period of drought in one special locality. It has always seemed to me that meteorologists have been in the habit of excessive generalisation, and that the true way to arrive at the secular variations of climate is to compare all observations made within a limited locality, where the conditions are more or less specialised. The mean rainfall of China, as I remarked at the beginning, would not have afforded the necessary data for such a comparison as I have attempted, the reason being that droughts in north and south China are in effect complementary, and never occur contemporaneously: and herein lies the key to the phenomena.

"According to the accepted theory of the 'monsoon,' it is produced by the excessive heating of the continent of Asia between the degrees of 35 and 45 N.L. which causes the rarefied air to flow off and leaves a partial vacuum to be filled in by moist warm air rushing across the equator. If from any cause the heat radiated from the sun be greater one year than another, the regions where the monsoons are elaborated are raised to a higher temperature, and the force of the monsoon increased, and the warm air carrying an extra supply of moisture is carried further north and spread over a wider area; hence the north of China, the usual limit of the monsoon, is superabundantly watered.

"If, however, the heating of the surface be insufficient to set up the normal circulation, the moisture from the tropics is dumped down in or about the latitude of the Yangtse basin, and mid-China receives a superabundant supply of rain, while the entire north is parched, and famine in one or more province is the result. Hence a wet summer in Shanghai is rarely or never accompanied by a sufficient rainfall in the north."

Similar conditions to a large extent prevail in India, and hence it has happened that the latter third of the last century was a period of drought and famine, which severely taxed the resources of the country. I wound up the note with the following remarks:—"It is not for me to suggest an explanation. But the 299½ year will probably be found to depend on some hitherto unsuspected cosmical cause."

I do not pretend in this to take any credit to myself for any discovery. My part was confined to drawing up a column of centuries divided into three lines; in one was marked the year, in the second the dates when sun-spots had been observed, and in the third the years when droughts had been recorded in the northern provinces; in each of the latter a dark line was drawn across the column. The result was remarkable at the first glance, the dark lines congregating themselves thickly at the ends of the seventh, tenth, thirteenth, and sixteenth centuries, the rest being almost a blank. Personal experience showed me how the nineteenth century had followed the same rule. Mr. Clough's observations may therefore be looked upon as fully borne out by Chinese records; and it only remains to ascertain the cause of the phenomenon, which has certainly had a very considerable effect on the history of Asia.

I may point out the curious coincidence that the climatic cycle of about thirty-four years seems to agree with three sun-spot cycles, while the greater period of 299½ would seem to correspond with twenty-seven.

Shanghai, January 8.

THOS. W. KINGSMILL.

The Origin of Bronze.

In connection with Prof. W. Gowland's remarks on the origin of bronze in his presidential address to the Anthropological Institute, abstracted in your issue of February 15 (p. 381), it may be of interest to direct attention to the fact that Plutarch, in his "De defectu oraculorum," refers to worked-out copper deposits in the island of Eubœa, from which were formerly manufactured swords

which were "cold-forged" (*ψυχρήλατος*), and in this connection he quotes Æschylus, who mentions a "self-sharpened (*αὐτόθηκτος*) Eubœan sword," self-sharpened meaning, I presume, sharpened without fire. I believe that bronze containing only a small proportion of tin is malleable in the cold, but do not know if this would be the case with that referred to by Prof. Gowland as containing antimony. It would be interesting to know if tin is associated with copper in Eubœa. Swords of pure copper would hardly be of much use.

JOHN W. EVANS.

Imperial Institute, February 23.

Result of War affected by Soldier's Stature.

MR. TWIGG at p. 340 of your issue of February 8 points out that the Japanese had an unquestionable advantage in the recent war, as being smaller than the Russians—they were smaller targets for fire-arms. This is quite correct, but the advantage is inversely as the cubes of their heights, and not as the squares only, which would only apply to plank dummies. Bullets come from all sides, and not from the front only, so that the thickness of the men's bodies must be taken into account as well as their height and breadth. The average targets offered by each to the enemy are (taking Mr. Twigg's figures) as the cubes of 1585 and 1642, or as 106 to 118, an advantage in favour of the Japanese of about 12 per cent., or nearly double that calculated by Mr. Twigg.

W. E. WARRAND.

Westhorpe Hall, Notts, February 24.

TWO BOOKS ON BIRDS.¹

TO watch the ways and habits of birds is a taste which is growing rapidly. Some watchers of birds, indeed, are not content to stop at observing their habits; they want to know how the birds acquired those habits and of what use they are to them. They speculate upon what a certain habit, if persisted in, may ultimately lead to. They wish to know, among other things, how a bird came by its colours, and what purpose in the bird's economy is served by, for instance, the red inside to its mouth, seen only when it gapes. And when careful, minute, and scrupulously accurate observers write down on the spot what they see, or think they see, natural history will always be the richer for their labours; and the theories and speculations which these inquisitors weave from what they have seen and heard cannot fail to prove interesting and suggestive reading.

Mr. Selous, at once the pioneer and the great exponent of this "close observation," who in a former work on bird watching touched upon the birds of the Shetlands, returned to his loved islands two years later, and now gives us a whole volume devoted to their birds and seals. In some three dozen short chapters he discourses, with digressions, delightfully upon his experiences. With the exception of a few "peckings," and minor interpolations—mostly having to do with the working out of ideas jotted down in the rough—the chapters contain his journal, written from day to day amidst the birds with whom he lived without another companion on one or other of these remote islands, "hated by thousands" of birds, and feeling himself the most unpopular person on the island. Nothing more need be said to recommend the book to the notice of those who follow birds in the field. For his digressions, leading him sometimes wide of the subject of birds, the author does not apologise.

¹ "The Bird Watcher in the Shetlands. With some Notes on Seals—and Digressions." By Edmund Selous. Pp. xii+338; with 10 illustrations by J. Smit. (London: I. M. Dent and Co., 1905.) Price 10s. 6d. net.

"Nature-Tones and Undertones." Being Sketches of Life in the Open. Illustrated by Photographs from Nature. By J. Maclair Boraston. Pp. 223. (London and Manchester: Sherratt and Hughes, 1905.) Price 6s. net.