know the complex and therefore delusive and often apparently contradictory character of the phenomena resulting from lesions of the brain, but I think the weight of experimental evidence (and surely this is more reliable than pathological) is the other way. Experiments on pigeons and dogs ("Dalton's Physiology," pp. 430 and 454) seem to show that lesions of the brain affect the opposite eye as well as the opposite side of the body. Anatomical structure also would lead us to expect this, for the fibres of the optic tracts cross over in the chiasma, in birds completely, and in mammals largely. But even if it were otherwise, I do not see that the question is materially affected. If right-sidedness is inherited, there must be, or must have been, some advantage in it; and there is no reason why inheritance should not have affected different sides of the brain for hand and for eye, if such were necessary to bring about the result.

Again, Mr. Wharton has the singular idea that because Europeans, who are a right-handed people, write from left to right, therefore Eastern nations who write from right to left must be left-handed! Obviously this does not follow. Many right-handed motions, such for example, as striking with a whip are from right to left, so that the contrary stroke, on account of its unfrequency, is called *backhanded*.

Lastly, Mr. Wharton alludes to the rules of boxing. The left hand is used mostly for striking, and the right for guarding. It would be well if some one acquainted with the subject would give us its history. My impression is that the present practice is comparatively recent, perhaps forty to fifty years old, and that formerly the right hand was used mostly for striking, and the left for guarding. I think, further, that even now the left is used more for feints and lighter blows, while the right is reserved for favourable opportunities to plant decisive blows.

Berkeley, Cal., April 23 JOSEPH LE CONTE

Dark Transit of Jupiter's First Satellite

ON May 18, at 8h., on observing Jupiter with my 10-inch reflector, p. 252, I saw three very dark spots—one near the planet's centre, and two others not far advanced upon the east limb. These I took to be the shadows of satellites, and on reference found that the shadows of Satellites I. and II. were really upon the planet; also Satellite I. itself. The latter was evidently the spot near the centre of the disk, and it appeared almost equally as black as the shadow. The satellite was situated close to the equatorial white spot, and in point of fact was projected upon the north-east borders of that object. The latter was estimated on the central meridian at 8h. 5m., so that its longitude, computed on the diurnal rate of 878°·46 (= rotation of 9h. 50m. 7·42s.), was 94°·3.

When near mid-transit, Satellite I., as regards its visible aspect, could hardly have been distinguished from its shadow, and I believe the very dark appearance of the satellite on this occasion to have been somewhat exceptional; for though I have observed a considerable number of its transits, I never saw it nearly so dark before. W. F. DENNING

Bristol, May 19

The Remarkable Sunsets

A COPY of NATURE (vol. xxix. p. 149) just received here contains an article on "Remarkable Sunsets" which were seen in all parts of the world during the latter days of November and the early days of December. It may interest your readers to know that precisely similar sunsets to those described in the paper referred to above occurred here for several days in December. The "rosy pink after-glow" immediately succeeded the sunset, and lasted from ten to fifteen minutes. The phenomenon considerably scared the Chinese, who feared it portended some evil to the Emperor. The winter has been remarkably mild and dry; the first fall of snow, a very heavy one, took place on March 1. This region is volcanic; we have occasional shocks of earthquake. ARTHUR SOWERBY

T'ai Ynen Fu, Shansi, North China, March 5

"Notes on Earthworms"

REFERRING to Mr. Hughes' communication to NATURE of May 15, p. 57, I myself to-day saw a small worm pursued by a black insect, also evidently the larva of one of the Carabidæ. I was attracted by observing the worm emerge from the ground and hurry quickly away. When about five inches from its burrow the larva came out of the same burrow, and briskly followed in a zigzag course, until it overtook its prey, which it then seized near the tail end and dragged under some loose earth. No doubt the worm had been pursued underground, and was endeavouring to make its escape. E. A. SWAN

224, Camberwell New Road, May 17

The Recent Earthquake

IN p. 57 of the last number of NATURE notice is taken of the lack of observation on the late earthquake in Central Kent, Surrey, or Sussex. In Tonbridge we have known of three instances in which it was certainly felt. On the morning of April 22 a lady in bed in a room on the first floor felt a push from the foot of the bed so strong that she asked her little girl, who was in the room, why she was shaking it so, which of course the child denied—the bedstead being of iron and too heavy for her to have moved; the vallance at the head of the bed swayed to and fro. The second instance we heard of was an Indian officer, who felt it, while standing leaning against his mantelpiece, directed about from north-north-east to south-south-west. The third instance was an invalid lady in bed on the first floor.

M. I. PLARR

22, Hadlow Road, Tonbridge, Kent, May 19

Animal Intelligence

ONE night a loud knock was heard at the back door, and as the door could not be reached by any one outside the house except by getting over the garden wall, some alarm was caused. On the knock being impatiently repeated, the door was opened, and the cat ("Mrs. Muffins") walked in with great dignity. Since then she has never failed to make known her presence in the same way, always waiting after the first knock. Some weeks elapsed before it was ascertained how the knocking was produced, but at length it was discovered that a slip of wood which runs down the side of the door was loose at the bottom; this slip she pulls out with her paw, and then allows it to rebound. She is a very affectionate mother. Some time ago her mistress, by accident, hurt her kitten. "Mrs. Muffins" walked up to her and gave her two or three sharp slaps on the dress. To-day the same thing has occurred; but on this occasion, as the servant was the offender, "Mrs. Muffins" followed her into the kitchen to chastise her. I may also add that she has shown great intelligence in making her wants known to her friends.

E. A. LONERGAN

AGRICULTURE IN THE UNITED STATES[1]

WE may learn many a good lesson by observing the admirable manner in which the various Boards of Agriculture discharge their duties in the United States. With a sound discretion the mutual influences of geology and agricultural practice are prudently considered in association with the investigations of the chemist and the records of the Census Office. In these respects the various States are greatly in advance of anything provided in the United Kingdom. We have our Geological Survey most carefully conducted, and the maps showing the solid geology of the country are excellent. In addition to these we have another series of geological maps showing the drifts covering up these rocks, but at this point we cease to follow the example set us in the United States. Aided as each individual State is by a series of experts, such as the State Botanist, the State Geologist, the State Entomologist, the State Chemist, and similar officials, we thereby find most valuable help rendered to the agriculture of the country. This assistance is rendered more effective by reason of the concerted action by which it is so generally characterised. Each scientist views any given subject from his own special standpoint, and the great advantage of concerted action is the more mellowed judgment which is thereby secured.

In the Report before us we have one of those happy blendings of science and practice which is so well calcu-

[1] "Geological Survey of Alabama, embracing an Account of the Agricultural Features of the State." By Eugene Allen Smith, Ph.D., State Geologist.

lated to benefit the district dealt with, and which, instead of insulting the practical man, gives him information which he gladly utilises. The Report commences with a general discussion upon the composition, mode of formation, and the properties of soils, and the changes produced by cultivation. In the second section, soil in its relation to vegetation is somewhat elaborately dealt with. In the third section, soil in its relations to animal life is very completely presented to the reader's attention. The question of the absorptive powers of soils is ably dealt with. "As to the cause, opinions vary, but closer study of the phenomena of absorption have led back to the pretty general acceptance of the explanation originally offered by Way, which, as expressed by Mayer ('Agrikultur Chemie'), is as follows:—'We find in the soil easily decomposable double silicates, the exact composition of which is unessential, which, along with alumina, always contain some other base, an alkali or an alkaline earth, or even several of these bases at the same time. These silicates have the property, under certain conditions, of exchanging their accessory ingredients (not the alumina). The artificial silicate of Way had the composition of a zeolite, and it remained only to experiment with naturally occurring zeolites, which was done by Eichhorn, Mulder, and others, with the result of showing . . . that they all possess the power of exchanging a portion of their original content of lime or soda for an equivalent of potash or ammonia; in other words, of absorbing the latter bases. . . . According to Mulder . . . while the fertility of soil does not depend exclusively upon these zeolites, yet its chemical activity is altogether determined thereby.'' These comments are the more noteworthy because there has been a tendency amongst some chemists to undervalue the importance of Way's discovery, but the testimony of practice is too strong for it to be altogether ignored.

An exceedingly important connection is shown between the production of cotton and the systems of management pursued in Alabama. Speaking of the Great Cotton Belt of Alabama, the Report points out that the soils upon this belt have been largely exhausted by improvident culture, cotton being planted year after year upon the same soils, without any attempt being made to maintain the fertility by the use of manures. In other parts of the State where cotton is produced a selection is generally made of the better soils, rotation of crops is more generally practised, and in some sections fertilisers are in more general use. This is largely occasioned by the relative proportions of the population and the capital they have at their command.

"The system of credits in the large cotton-producing regions prevails to such an extent that the whole cotton crop is usually mortgaged before it is gathered, and when we consider that the prices charged for provisions are at least 50 per cent. higher than regular market rates, . . . it will need very little calculation to show that the labourer will have the chances too greatly against him, even to be out of debt to his merchants, when he relies solely upon this crop to provide the money, and the exorbitant interest on the money advanced is not likely to be lessened so long as the merchants' risks continue to be as great as they are. Where the blacks are in excess of the whites there are the originally most fertile lands of the State. The natural advantages of the soils are, however, more than counterbalanced by the bad system prevailing in such sections, viz. large farms rented out in patches to labourers, who are too poor and too much in debt to merchants to have any interest in keeping up the fertility of the soil, or rather they lack the ability to keep it up, with the natural consequence of its rapid exhaustion and a product per acre on the best lands in the State lower than that which is realised from the very poorest. Where the two races are in nearly equal proportions . . . there is found the system of small farms, worked generally by the owners, a consequently better cultivation, a more general use of commercial fertilisers, a corresponding high product per acre, and a partial maintenance of the fertility of the soils."

The entire Report is literally crowded with interesting and most important details, such as skilled experts are likely to formulate for the guidance of higher officials and for the assistance of those engaged in the cultivation of the land. The well-organised system existing in the United States, whereby the causes of failure and success are rendered prominent, is doing great service to that country, for they clearly recognise the truth that the advancement of agriculture is a national duty, because just in proportion as additional wealth is thus created within the States, so do the people generally participate in the advantages thus secured.

BIRD SKELETONS[1]

THE author of this important work, shortly after his return from his explorations in New Guinea and the Moluccas, was appointed Director of the Royal Zoological Museum at Dresden, and under his care the last-named museum is fast becoming one of the leading institutions in Germany. During his travels in the East Dr. Meyer appears to have amassed a considerable amount of material for his projected work on the skeletons of birds, and now that five parts of the "Abbildungen" have appeared, we think it well to draw the attention of English naturalists to it, as it will undoubtedly prove to be one of the most interesting osteological works yet attempted. The skeletons are all contained in the Dresden Museum, and Dr. Meyer proposes to carry on the work until his material becomes exhausted; but we trust that all ornithologists who can aid the author in his excellent enterprise will not fail to do so.

The works on the osteology of birds are not numerous, and this important portion of ornithological study has been too much neglected and systematically overlooked. The chief English work has been the "Osteologia Avium" of the late Mr. Eyton, and there are, of course, Prof. Owen's well-known memoirs on the *Dinornis* and its allies, on the Great Auk, and a few scattered representations of skeletons here and there. France can boast of Prof. Milne-Edwards's splendid volumes on fossil birds in comparison with recent forms, as well as the fine series of illustrations in the "Histoire Naturelle de Madagascar" of M. Grandidier. In Germany Prof. Selencka, of Erlangen, commenced, in Bronn's "Classen und Ordnungen," a systematic treatise on the osteology of birds, but unfortunately he discontinued this useful work after the issue of a few parts. Dr. Meyer's labours therefore deserve the acknowledgment of all scientific men as being an attempt to fill up a gap in our knowledge of birds. There are probably eleven thousand species of birds described up to the present time, but the osteological characters of only a very small proportion of them have been noticed, and a very inconsiderable number of the three thousand genera have been illustrated. As Dr. Meyer only figures those species which have not been before represented, each illustration represents a new fact for science, and we trust that he will be able to continue to add to the already rich materials at his command, and bring to a successful conclusion the important task which he has set himself.

Dr. Meyer does not avail himself of the usual mode of illustration by lithography, but has had all the skeletons photographed from nature, and then reproduced by

[1] "Abbildungen von Vogel-Skeletten herausgeben mit Unterstützung der generaldirection der konigl, Sammlungen für Kunst und Wissenschaft in Dresden." Von Dr. A. B. Meyer. Parts 1 to 5, pp. 1 to 40, Plates 1 to 50. (Dresden: Published by the Author, 1879-1883.)