enough to take up fully one-half of the Colorado as it spreads over the basin, and it would probably require from two to three years for the balance to fill the hole up to level. At such times as the river filled the basin to its level the flow to the Gulf of California has been through a channel which begins at the lower end of the basin, and makes a short cut directly south to the salt water. This is called Hardy's Colorado, and it is usually simply a dry channel or ditch. It may have been formed under circumstances similar to those existing at present. It is large enough to accommodate the entire volume of the Colorado after the evaporation which is sure to take place while the water is spread over the basin.

"Some idea of the terrible heat may be had from the evaporation which takes place. If the basin were filled to the river level, the lake would present a surface of about 1,600 square miles. This would be lowered at the rate of six feet a year by evaporation. The salt which is now being mined at Salton was deposited in the valley by the previous evaporations. The original salt deposit from the water which was a part of the Gulf of California is not responsible for all that is found there. The waters of the Colorado are saline, for the river flows through beds of rock salt at places many miles up from its mouth, and the successive deposits from the waters of this river as they have flooded the valley and then dried up have added largely to the original deposit."

OXFORD SUMMER MEETING OF UNIVERSITY EXTENSION STUDENTS.[1]

THE process by which university extension is carried throughout the country and made a vehicle for the further education of the adult student is well known, and is gradually becoming more and more appreciated in proportion as those who are responsible for the method improve the lines on which it is carried out. The machinery employed embraces lectures, classes, travelling libraries, etc., but one element vitally necessary to the university student is not supplied by these aids. This element is that of residence, and it was a happy suggestion on the part of the originators to propose that, for one month in the long vacation, arrangements should be made by which those who have profited by being brought into contact with a university lecture should enjoy the additional advantage of being brought under the charm that haunts the colleges and cloisters of Oxford and Cambridge.

The Oxford summer meeting commences on July 31, and is continued throughout the month of August; but, for the benefit of students who are unable to be present during so long a period, the course is divided into two sections, the second commencing on August 12. It has been found desirable to remove as far as possible the fragmentary and isolated character of the lectures given at these meetings, and therefore, while the course will be complete and independent in itself, it will also form the first part of a cycle of study which for its full development will embrace a period of four summers.

That these lectures propose something more than to add piquancy to an agreeable picnic will be shown from the following slight sketch of the subjects treated — and treated by authorities of acknowledged reputation. To take the lectures on natural science first: in physiology, Mr. Poulton will discuss the recent criticisms of Weismann's theory of heredity, and Mr. Gotch will lecture on the functions of the heart. In chemistry, Professor Odling lectures on the benzine ring, and under the supervision of Mr. Marsh a course of practical chemistry will be conducted in the laboratory of the University Museum. In geology, a course of practical instruction will be given by Professor Green and Mr. Badger, to include excursions in the neighborhood of Oxford. A class in practical astronomy will be welcomed at the university observatory; while electricity finds an able exponent in Mr. G. J. Burch. But the distinguishing feature of this meeting is the attention given to agricultural science "designed for agricultural audiences under county council schemes." This designation seems somewhat vague, and it will be very interesting to see the character of the audience attracted by this title. Four lectures are offered: the first entitled, "The Application of Science to the Art of Agriculture." This description is sufficiently wide, but does not indicate whether the lecture is intended as a sample of those which state-aided board schools in agricultural districts might well offer to lads who have passed through the successive standards, or as one addressed to the sons of farmers, and supplying that form of instruction which it is the duty of agricultural colleges to impart. Another lecture is offered on the management of poultry. This is more definite and more hopeful; and when we remember that the students who come up for these summer meetings are, for the most part, ladies, who can well be supposed to take an intelligent interest in this part of farming operations, we must admit that the subject is well chosen. Manures of various characters form the subject of the other two lectures, and will be doubtless of a sufficiently technical character.

The literature and history lectures are of special interest, and by the combination of many lecturers are made to cover with great completeness the mediæval period. Mr. Frederic Harrison gives, as an inaugural lecture, a survey of the thirteenth century, and strikes the keynote of this section; while in the entire course, which embraces some sixty lectures, we meet the names of Professor Dicey, of Mr. York Powell, of Mr. Boas, and a host of others, affording alike a sufficient guarantee for the excellence of the work, and a happy augury for the success of the meeting.

[1] Nature, July 16.

THE FORESTS OF ZULULAND.

AN interesting and valuable report on the forests of Zululand, by Colonel Cardew, has been issued by the British Colonial Office as an official paper. Colonel Cardew's report, an abstract of which we find in the Proceedings of the Royal Geographical Society for July, deals in the first place with the existing state of the forests of Zululand, then with the measures necessary to preserve them, and lastly with the establishment of a staff necessary for the enforcement of the laws and regulations required to effect the better preservation of these forests. As to their general distribution, the forests of Zululand, Colonel Cardew says, may be conveniently divided in the same manner as has been done by Mr. Fourcade, assistant conservator of forests, in his report on the Natal forests; that is to say, into high timber forests, thorn bush, and coast forests. The high timber forests are situated on the Nkandhla and Qudeni ranges of mountains in the Nkandhla district; on the Entumeni and Eshowe Hills and the Ungoye Mountains, in the Eshowe district; on the slopes of the Ceza, and on the Useme, Empembeni, Makowe, and other hills in the Ndwandwe district; and on the VBombo Mountains, in the district of that name. The thorn bush is to be found to a greater or less extent in all the river valleys of Zululand, the timber increasing in size and the bush in density on the lower parts of the rivers, especially in those of the Umkusi, and White and Black Umfolosi. It is very large and dense in the country west of St. Lucia Lake.

The coast forests are of no great extent, with the exception of the Dukuduku; they grow in small patches along the streams and rivers near the coast, and especially at their mouths, and also cover the low sand-hills which border the coasts of Zululand. The Dukuduku is situated on the north side of the lower Umfolosi River in the district of that name. It is several miles in extent and very dense, and was the place of retreat of the coast chiefs during the disturbances of 1888. Dealing more particularly with the distribution of the high timber forests, Colonel Cordew states that the Qudeni forests clothe the slopes and spurs of the Qudeni Mountain, a magnificent range rising to an altitude of some 4,500 to 5,000 feet, and situated between the Tugela and Insuzi Rivers. The forests are of great extent. In the absence of a survey it is impossible to say what area they cover, but they clothe the southern, eastern, and northern slopes of the mountain, and from their extent and vastness are most imposing in appearance. They are certainly the finest forests in Zululand, and are composed of the most valuable timber, of the same nature and variety as that of the high timber forests of Natal. Yellow wood, both onteniqua and upright, abounds, and there is also every description of hard wood, but from want of adequate protection these noble forests have in many parts been ruthlessly destroyed. Woodcutters do

their work in the most reckless and wasteful fashion, and are subject to no sort of efficient control.

The district of Nkandhla comprises the long range of mountainous country which forms the watershed between the Umhlatuze and Insuzi rivers. The highest ridge, which attains an altitude of at least 4,500 feet, is called Nomance. The Nkandhla forests are of great extent, and are situated chiefly on the southern slopes of the Nkandhla range. One belt of forest, called the Dukuza, is several miles in length, and takes two hours to traverse on horseback. Many are of opinion that these forests are finer than those of the Qudeni. They have not suffered at all from the spoilers in the shape of sawyers, but licensed pole-cutting has been going on to some extent on the Nomance ridge. This pole-cutting is very destructive to forests unless the work is carefully supervised by a forest department, and the poles to be cut selected with a view to proper cultural treatment, which has not been the case.

The Entumeni forests are situated on the highlands, which rise to an altitude of 2,800 feet, between the Mhlatuzi and Matikulu rivers. The timber in these forests is inferior to that of the Qudeni and Nkandhla. The Eshowe forests are not very extensive; they grow in patches on sheltered kloofs and hollows, and along water-courses and streams, filling up the valleys. They are most abundant on the eastern and southern slopes of the Eshowe range. They furnish no hard woods of any value.

Next to the Qudeni and Nkandhla, the Ingoye forest is the finest in Zululand. It is situated along and on the southern slopes of the Ingoye range, which forms the watershed between the Mhlatuzana and Mlalazi rivers. It grows at an altitude of from 1,000 to 1,500 feet, and is of great length, extending from ten to twelve miles. It is a virgin forest in the sense that it has never been cut into by sawyers, but the work of denudation by the natives is very apparent, more so than elsewhere. It is evident from the stumps of trees left, and from patches of wood here and there, that the lower slopes of the Ingoye range were formerly clothed with forests to its base, but gradually by the process of cultivation and wattle cutting the forest line is receding up the mountain. Other patches of forest land are scattered here and there throughout Zululand, but these are the most important forests which call most urgently for some regulation, lest by the joint action of whites and natives they should be to a great extent deteriorated or even destroyed.

BOOK-REVIEWS.

Education and Heredity. By J. M. GUYAN. Tr. by W. J. Greenstreet. (Contemporary Science Series.) New York, Scribner. 12°. $1.25.

THE title of this book is misleading, there being nothing in it about the relations of education to hereditary tendencies except a brief passage at the end of the second chapter. A large part of the book is devoted to a presentation of the author's peculiar theory of the origin of the moral sentiments, a theory which he evidently deemed of great value, but which seems to us about as worthless as a psychological theory well can be. M. Guyan affirms that the mere power of doing right leads us to do right, or, as he expresses it, "to be inwardly aware that one is capable of doing something greater is *ipso facto* to have the dawning consciousness that it is one's *duty* to do it" (p. 72). Evidently M. Guyan was not much gifted with the philosophical faculty. When, however, he leaves these discussions about the origin of the moral faculty and turns to his proper subject of education, he says many things that are wise and suggestive, though nothing that is really original.

His first point is the importance of moral education, on which he dwells at considerable length, maintaining, in opposition to Ribot and others, that precept and example have a powerful influence on the moral nature, modifying in a marked degree the inborn tendencies of the individual. Physical education, too, is dwelt upon at considerable length, the author fearing the effect of over-study upon the young and especially upon girls. When he comes to treat of intellectual education he takes somewhat different ground from what his scientific proclivities would lead us to expect, putting science in a secondary place, and assigning the first to the humanities. "We ought," he says, "to place esthetic before intellectual and scientific instruction, because the beautiful lies nearest to the good, and esthetics, art, literature, and what have been so well called the humanities, are the least indirect influences making for morality" (p. 161). The book as a whole, barring the author's strange theory of the moral sense, is a good one, and will doubtless be interesting to educators.

AMONG THE PUBLISHERS.

THE *Illustrated American* for Aug. 1 contains a good portrait of the late Edward Burgess.

— Charles L. Webster & Co. have now ready Mrs. Alexander Ireland's "Life of Jane Welsh Carlyle."

— G. P. Putnam's Sons have just ready in the Story of the Nations series "The Story of Portugal," by H. Morse Stevens.

— The Seegur & Guernsey Co., 7 Bowling Green, New York, will publish at once the "Cyclopædia of the Manufactures and Products of the United States" in a revised and enlarged form.

— In *Outing* for August is an article on "Photographing in the White Mountains," by Ellerslie Wallace, and one on the "Theory and Introduction of Curve Pitching," by O. P. Caylor.

— Howard Lockwood & Co. have just issued Part 2 of their "American Dictionary of Printing and Bookmaking" It extends from Blatt to Chinese Printing, and is, like its predecessor, freely illustrated with technical cuts and with portraits.

— In its August number the *New England Magazine* publishes the "Harvard Commencement Essays." The topics are, "The Harvard Senior," by Henry R. Gledhill; "Edward Rowland Sill," by Charles W. Willard; and "A Remedy for American Philistinism," by Charles Lewis Slattery.

— The August *Babyhood* contains an article on hay-fever by Dr. Samuel Ashhurst, who lays great stress on the importance of counteracting the tendency towards hay-fever in childhood. "Science for Children," in the same number, is an article that contains information as to how to make out-door life at the present season profitable to both mother and child.

— In the *Atlantic Monthly* for August, Olive Thorne Miller, in "Two Little Drummers," treats the yellow-bellied woodpecker (sometimes called the sap-sucker) and the red-headed woodpecker; and Agnes Repplier contributes a paper on "The Oppression of Notes," which will touch a responsive chord in readers who have struggled with foot-notes far too copious and obtrusive.

— "The Press as a News Gatherer" is the subject of a paper by William Henry Smith, manager of the Associated Press, in the August *Century*, and is the first of several separate papers on journalism which are to appear in that periodical. Mr. Smith traces the origin and growth of the Associated Press, and discusses topics of special interest to newspaper editors, as well as to the public.

— John Wiley & Sons are engaged upon the work of getting out Thurston's "Manual of the Steam Engine." The first volume is printed, and will soon appear; the second is in press. The work makes two volumes of about 850 pages each, and is intended for use by engineers generally, as well as by students in the graduated courses directed by its author in Sibley College at Cornell University, and for other technical schools giving attention to such advanced work. Part I. is devoted to the development, structure, and theory of the engine; Part II. to the design, construction, and operation, and to the finance of its application. Part II. also includes a chapter on engine-trials, with special attention to experimental research and the scientific study of the engine. Messrs. Baudry & Cie of Paris have applied for and received the contract for publication of a translation into French, to be issued next year. They have already in hand, and well advanced, a translation of Thurston's "Engine and Boiler Trials," published in America and Great Britain by the Wileys, and which has already passed to a second edition. It is anticipated that the