

means of Canada balsam, and this is not difficult to do after a little practice.

By thus securing, as far as possible, an image of pure silver in a clean gelatine film, drying it and sealing it up, the photographer will have taken what appear to me to be the best steps possible to preserve the photograph. It may be a little more trouble than the ordinary routine, but hardly so much trouble as is involved in the practice of other photographic methods, such as wet collodion or daguerreotype. But whatever the trouble, nothing short of such treatment as has been indicated will give the photographer the satisfaction of knowing that he has done his best to preserve his plates. I have not referred to toning, although so great an authority as Sir William Crookes has recently referred to it, because a toning process gives a more complex image, and therefore a more difficult one to deal with, but also, and chiefly, because toning is an incomplete operation, and so gives an image of varying composition, and can hardly, by the nature of the action, produce a proportional change throughout the whole image. The fainter detail will be proportionately more affected than the denser parts. Measurements of the effects of the light are thus rendered impossible, or at least doubtful, and so useless.

But whatever care is taken to secure the preservation of the original plate, if it is valuable or likely to become valuable, it alone should not be trusted as the only record of the result it bears. Within a comparatively short time of its production, say within a few months, one or two prints should be obtained from the plate. These prints should be produced in the most simple manner possible in order to avoid personal bias or other possible errors consequent on a multiplicity of manipulations. They should be of the nature of printed-out prints, because a developed print (such as one on bromide paper) allows much scope for variation. Obviously the prints must be permanent. Platinum and carbon prints are the only ones that fulfil these conditions. Both are stated to require "development," but this is a misapplication of the word, or a different application from that which refers to the development of gelatino-bromide plates. The point is that the full chemical effect in both platinum and carbon prints is produced by exposure to light alone, the after treatment only utilising the change. A platinum print is probably more trustworthy as to permanency than a carbon print. The paper used must be of excellent quality, or the sensitive coating would be interfered with, and there appears to be nothing whatever that will affect a platinum image, unless, indeed, it is treated with chemicals that disintegrate the paper at the same time. Platinum prints, however, are not the best agents for showing fine detail or very small differences of density. In this respect they may be improved and much additional brilliancy imparted to them by applying any of the waxing preparations made for waxing prints. For rendering delicate tones, doubtless a carbon transparency would be superior to a platinum print. But if a photographic plate is of such a character that it is desired to preserve its record as nearly as possible for ever, it would not be an undue precaution or an excessive trouble to make two or three platinum prints as well as a carbon transparency from it. If the original plate is to be preserved by sealing it up with Canada balsam, then it should be varnished with a lac or similar varnish for getting the prints. The varnish could then be easily removed, if necessary, before the sealing up of the plate, or a varnish might be used that would be unaffected by the balsam. But on no account whatever must an unprotected film be touched by any platinum paper, carbon tissue, or any paper upon which a printed-out image can be produced, because all such papers contain soluble substances that prejudicially affect the image.

By working on the lines indicated, I think that it would

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be difficult to set a probable maximum limit to the duration of photographic records. We know how few years are sufficient to produce a measurable deterioration in many of the photographs as at present produced.

CHAPMAN JONES.

A LANCASHIRE COLLEGE.¹

MR. HARTOG and the authorities of the Owens College are to be congratulated on their work, which owes its origin in part, to quote the words of the preface, "To a request from the committee of the Education Exhibition, held in London in January last, that the authorities of the college should furnish an account of the institution for that Exhibition and for the Paris Exhibition, to which it was preliminary, in part to the desire of the authorities of the college for a record of its development and present condition in celebration of its jubilee."

The introductory chapters deal with the history of the college and its buildings, its government and finance, and its relation to the Victoria University. Then follow details of the classes and lectures, with particulars of the special departments and of other allied institutions, lists of fellowships and prizes, and, lastly, a striking record of original publications by members of the college.

It appears that the earliest attempt to establish a University in Manchester was made in 1640, when Henry Fairfax presented a petition to Parliament in favour of this course. The opposition of the city of York killed the project; the next similar attempt was made in 1877, but the opposition of the city of Leeds led to the establishment of the Victoria University.

Between these dates various efforts were made to promote a college for higher education in the city; none of these, however, met with marked success until, in 1851, the Owens College was founded in accordance with the will of John Owens, a Manchester merchant and spinner.

The first chairman of the Owens trustees was George Faulkner, the friend and partner of the founder, who, it is said on good authority, refused to become Owens's heir, and persuaded him to found a college. Owens's bequest realised about 90,000*l.*, and, in accordance with the founder's decision, the income from this was spent mainly on the provision from the first of an adequate teaching staff. To this Mr. Hartog with justice attributes a great share in the ultimate rise of the college. The histories of Owens College and of University College, Liverpool, a sister member of the Victoria University, teach the same truth. Owens College began in a hired house; University College in a disused lunatic asylum; but in both cases the devotion and splendid energy of the staff won in time the confidence of large-hearted men and women in their respective towns, and though the equipment of neither college is yet complete, the laboratories and class rooms, museums and libraries bear striking testimony to the wisdom of those who moulded the institutions in their early days.

Owens College began with five professors and two teachers. To-day its staff consists of thirty professors, thirty-four independent lecturers, and thirty-nine assistant lecturers and demonstrators.

But success did not come at once; the number of day students, which at first was sixty-two, in 1857 dropped to thirty-three; the local newspapers pronounced the scheme to be a mortifying failure. The trustees and the staff, however, held their course, and from 1858 onward the numbers have gone on increasing until, during last session, they reached the total of 1002. A building fund,

¹ "The Owens College, Manchester, founded 1851. A brief History of the College and Description of its various Departments." Edited by P. J. Hartog, B.Sc. Pp. viii + 260. (Manchester: Cornish, 1900.)

which ultimately realised 106,000*l.*, was started in 1867, and the first permanent buildings were opened in 1873. About the same time a fundamental change took place

generosity has done much, the number of donors is not very large, and the amount received from public funds bears no proper proportion to the work which the college is

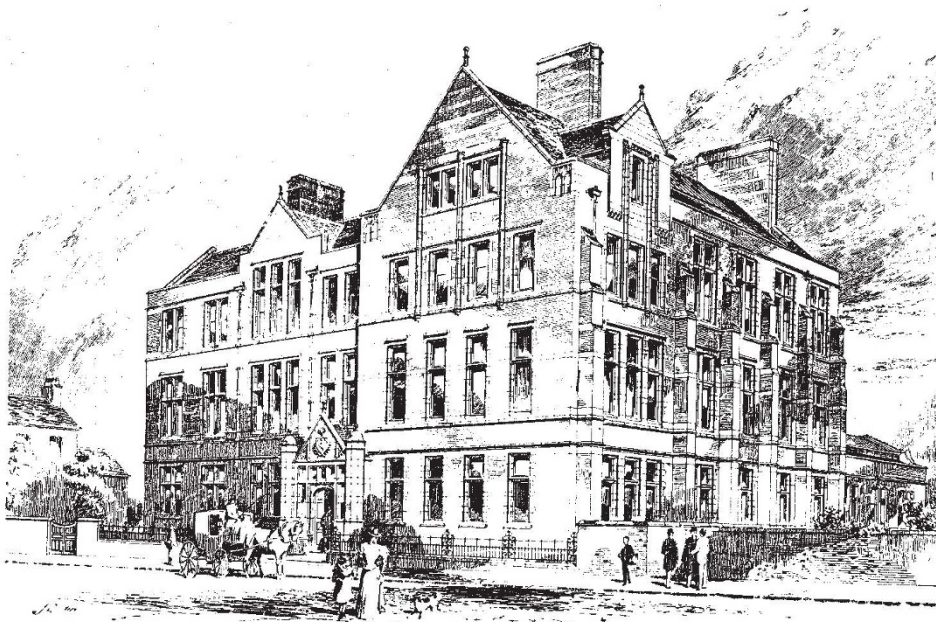


FIG. 1.—Physical Laboratories, Owens College.

doing for the city and county. In 1898, the Manchester Corporation contributed 700*l.* for technical instruction and 400*l.* for the museum, while the Lancashire County Council gave 250*l.*, to be raised to 500*l.* in the following year.

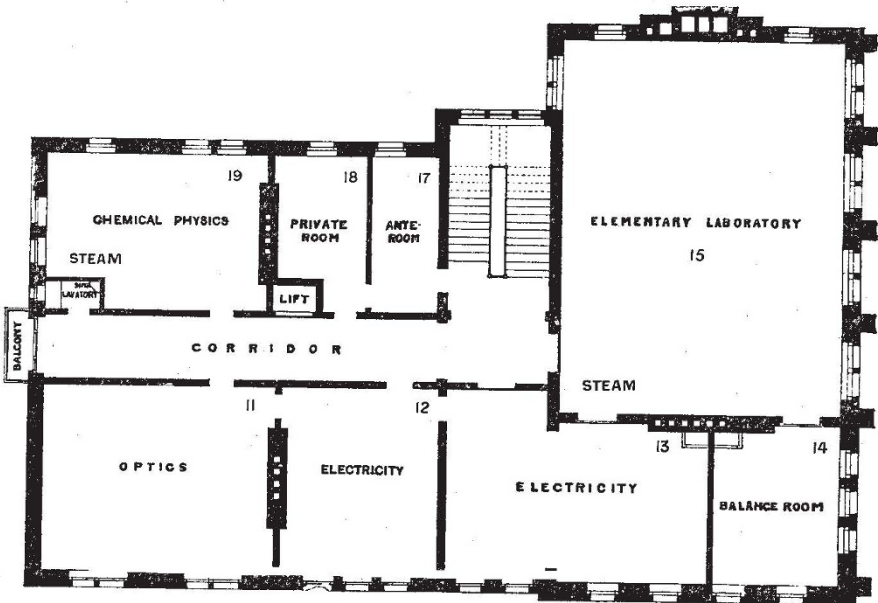
One other striking event in the history of the college must be noted. In 1877 a memorial, largely supported, was sent to the Privy Council praying for a charter to convert Owens College into the University of Manchester. This was followed by a memorial from the Yorkshire College asking that a charter should not be given to Owens College, but "to a new Corporation,

in the government of the college, which passed from the trustees constituted by the founder's will to the governors, council and senate appointed under the Owens College Act.

with powers to incorporate the Owens College and such other institutions as may now or hereafter be able to fulfill the conditions of incorporation." This petition

The funds of the college were largely increased by the Clifton bequest of 21,500*l.* for the engineering department and the Beyer bequest of over 100,000*l.*, received between 1876 and 1887. Since that date the legatees of Sir Joseph Whitworth have given about 120,000*l.* The capital is now 866,000*l.*, of which 418,000*l.* is sunk in land buildings and appliances; almost the whole of this sum is due to private benefactions. The income for the session 1898-99 was 39,000*l.*, and of this about 17,000*l.* was derived from students' fees, 12,700*l.* from special endowments, and 4,500*l.* from Government and other public funds.

These figures give some idea of the magnitude of the work done by the college, though in spite of the efforts made there is a continually recurring deficit. Increase in the number of students means a disproportionate increase in laboratories and teaching appliances, which cannot be met by an increase in fees; each extension of buildings involves increased cost in maintenance, rates and establishment. While private



FIRST FLOOR PLAN

FIG. 2.

proved successful, and the Victoria University received its charter in 1880. Owens College became by the terms of the charter

the first college of the University; in 1884 University College, Liverpool, founded in 1881, and in 1887 the Yorkshire College, Leeds, founded 1874, were associated with it as constituent colleges of the University. By its charter women are admitted to all the degrees of the Victoria University. They were first admitted to lectures of the Owens College in 1883, and of the 1002 registered students in 1899—all of whom, however, are not students of the University—126 were women.

Such is, in brief, the history of the first of the University Colleges of the country. Space forbids any attempt at a description of all the present buildings, or of the interior organisation of the college and its relation to the University; much information on these points may be obtained from the book, and the plan and illustrations, which have been prepared with great care and skill, give an admirable idea of the buildings. Among these the most recent are the Christie Library and the physical laboratory, opened by Lord Rayleigh in June last. The Manchester Museum, however, must have a special mention. The nucleus of the collection consists of the specimens belonging to the Manchester Natural History Society and the Manchester Geological Society, transferred to the college with some endowments in 1872. The college is bound to maintain the collections and give the public access to them, free of charge, on certain days. The public lectures, which have become well recognised institutions, are also delivered by the staff and others.

The collections are now housed in splendid buildings and maintained at a total cost of 2700*l.* per annum, of which some 900*l.* is provided by endowment while 400*l.* is a grant from the City Council.

Enough, perhaps, has been said to indicate the magnitude and importance of the work performed for the country by the Owens College; if more proof is needed it can easily be supplied from the volume under review. The ninety pages covered by the record of original publications contain the names of many who have made their mark in literature and science, together with the titles of numerous papers universally recognised as of the highest merit. The authorities of the college did good service to the cause of university education in the country when they prepared a volume such as this for exhibition at Paris. R. T. G.

LORD LILFORD'S LIFE.¹

THE scientific aspect of the late Lord Lilford's career is, we are informed in the preface to the present volume, to be written by another hand. The task of his sister has been, in the main, to set before the world the character and every-day life of her brother. And a noble theme, admirably carried out, the author has had before

¹ "Lord Lilford, Thomas Littleton, Fourth Baron." A Memoir by his sister, with an Introduction by the Bishop of London. Pp. xxiii + 290. (London: Smith, Elder and Co., 1900.) Price 10*s.* 6*d.*

her. To a man fond of field sports and an enthusiastic observer of nature, scarcely any more terrible affliction, save loss of sight, can be conceived than to be stricken down in the prime of life by a malady which rendered him for the rest of his days a helpless cripple dependent for every want upon the attention of others. And yet how nobly and how patiently was this affliction borne by the subject of this pathetic memoir! Of course, every alleviation that money could purchase or affection suggest was at his command, but even so the trial of existence under such distressing circumstances must have been a heavy burden. How much was done by the late peer to advance the science he loved so well, and to ameliorate the lot of his fellow sufferers in humbler walks of life, those who knew him intimately can alone tell. The story of such a life is a lesson and a bright example to us all, and it should thus attract many readers besides personal friends and those interested in ornithology.

But in a journal like NATURE, attention must be

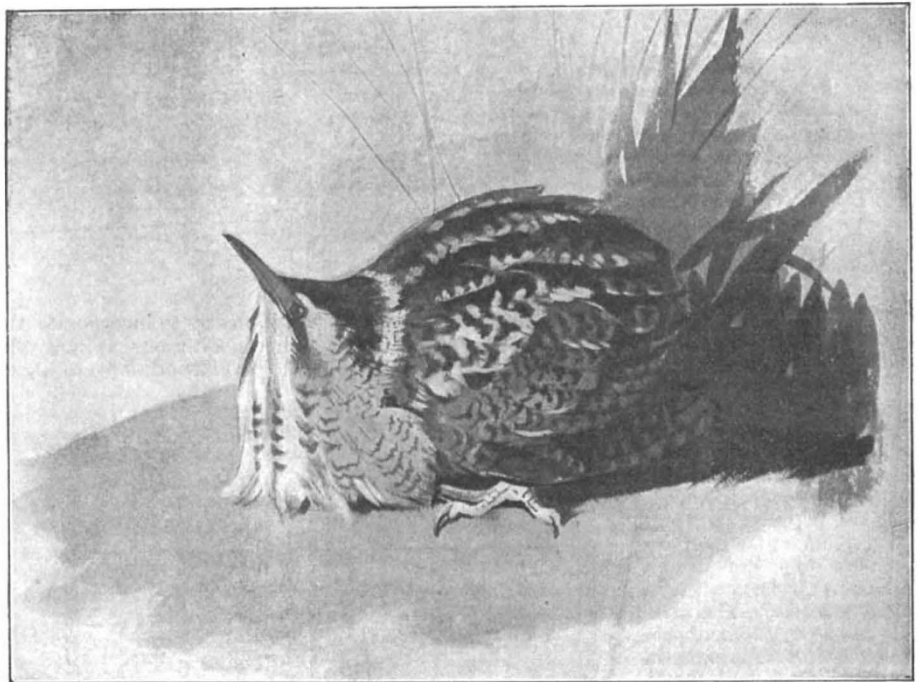


FIG. 1.—A bittern in the crouching attitude (from "Lord Lilford's Life").

directed to scientific rather than to moral attributes, even in a memoir which purports to treat chiefly of the latter. From his earliest days Lord Lilford appears to have displayed a remarkable fondness for animals, and throughout his life the observation of their habits seems to have afforded him the most intense delight. To those who are not endued with this love of living creatures it is difficult to realise how strong is its development in others. Although in earlier days a keen sportsman, Lord Lilford states he experienced more delight in watching the movements of wild birds than in shooting them; and in the collection at Lilford it was his aim that the feathered captives should enjoy as much liberty and space as was compatible with deprivation of complete freedom. The sight of a captive eagle moping in a cramped cage, with dragged feathers and unclean surroundings, was absolutely hateful to his sensitive nature; and the collection of eagles and other birds of prey at Lilford afforded an example, as regards mode of treatment, to the menageries of the world. But cranes were the birds which formed the great specialité of the Lilford collection, and only a