

migration—on April 17 and 18, 23, 27 and 28—each of increasing intensity. There was another large influx on May 5. The immigrations of the willow-warbler (probably two races), which lasted from March 11 to May 6, and of the wheatear (two races), from March 19 to May 10, covered the longest periods among the species recorded; while those of the wood-warbler between April 16 and May 13 occupied the shortest time. Notice is drawn to the increasing and now extreme scarcity of the landrail in the south-east of England.

The records which are of most interest merely in themselves are perhaps those to be found in the section dealing with the autumn movements. The autumn of 1910 was noteworthy for the large influx of certain northern species, such as the wax-wing, northern bullfinch, mealy redpoll, and continental great tits. Jays were recorded as migrants to the south-east of England, and with them magpies (a flock of twenty), the latter being thus for the first time recorded as migrants to our shores. Great numbers of the little golden-crested wren were on the move round all our coasts between the end of August and mid-November.

#### LONDON WELLS.<sup>1</sup>

HOW complex and how serious is the problem of maintaining a supply of water suitable to its needs few of the inhabitants of London have any conception. We turn the tap for our morning tub or to fill the kettle for tea and would be surprised and annoyed if the water did not readily flow. During the past few years, however, many large users of water have turned their attention to the provision of private supplies, and the number of wells has greatly increased. The early wells of the city and surrounding area were dug in the superficial gravels and Tertiary formations alone, for in those days they yielded a satisfactory supply without the need of descending further; gradually these shallow wells produced a smaller volume and a deteriorating quality of water, and had to be deepened and sunk into the Chalk.

According to the researches of Mr. A. S. Foord, there were no deep wells either in or near the city till at least the middle of the eighteenth century. It is probable that the difficulty of dealing with the mobile Thanet Sands delayed the introduction of deep wells until the art of overcoming the trouble had been perfected. The yield of many of the older wells was increased by putting a boring at the bottom. Now, the practice of sinking shafts is almost abandoned in favour of boring alone. These borings are lined in the upper portion and are carried as far as necessary into the Chalk. This change has been brought about by the fact that borings are cheaper than dug wells, and that the latter would have to be sunk at least 100 ft. before any water could be reached.

The height of the water level in London wells

<sup>1</sup> Memoir of the Geological Survey, England and Wales. Records of London Wells, by G. Barrow and L. J. Willis. (H.M. Stationery Office, 1913.) Price 4s. 6d.

has been sinking for a long time, but in recent years the fall has been increasingly rapid. This is most clearly brought out in the memoir before us by maps showing the contours of the underground water-surface and by the data supplied with many of the well records. The lowering of the water-level, if continued at the present rate, must seriously affect all wells in the London area, not only as regards quantity, but also quite possibly with respect to quality also. Mr. Barrow has great faith in a remedy for this evil, one which has already proved effective in the hands of Mr. W. B. Bryan in maintaining the level in the waterworks district at Lea Bridge. He recommends that spare water should be conserved in reservoirs in suitable districts and poured as required into dumb wells sunk into the Thanet sand, whence it would permeate into the Chalk; in the introduction to the memoir he brings forward a good deal of evidence in support of this method.

The influence of the Tertiary cover on the quality of the water drawn from the Chalk is remarkable. Water taken from the Chalk beyond the Tertiary outcrop carries a preponderance of lime salts; that from the Chalk beneath the Tertiary is much poorer in lime, which the sodium salts have greatly increased. This change is usually attributed to the influence of the Thanet sand. Dr. Thresh's valuable experiments on the effects of this sand are briefly discussed; but this is a subject of great complexity and requires further study. The work on soils carried out by various agronomic surveys, and that of Cushman and others on the influences of colloids in clays, should have some bearing on the problem.

The well records in this volume are very numerous, and many are published for the first time. They should prove of the utmost value gathered together in this form. Only by complete and accurate records and their careful correlation with geological conditions can an outlook be obtained on the state of the underground water as a whole. If the recording of all borings for water in the United Kingdom were made compulsory, much unnecessary waste would be avoided.

#### THE LISTER MEMORIAL FUND.

WE are informed that the contributions recently made to the Lister Memorial Fund include the following: Clothworkers' Company, 100l.; Grocers' Company, 52l. 10s.; Ironmongers' Company, 25l.; Mercers' Company, 105l.; Merchant Taylors' Company, 262l. 10s.; Skinners' Company, 105l.; Society of Apothecaries, 52l. 10s.; Corporation of the City of Glasgow, 52l. 10s.; Royal College of Physicians, 21l.; Royal College of Surgeons, 52l. 10s.; Royal Dublin Society, 50l.; Royal Horticultural Society, 52l. 10s.; the Royal Society, 50l.; Harveian Society, 10l. 10s.; Pharmaceutical Society, 10l. 10s.; Physiological Society, 10l. 10s.; Royal Microscopical Society, 5l. 5s.; Royal Sanitary Institute, 5l. 5s.; the



Manchester Cooperative Wholesale Society, 21l., and many medical societies. Lord Strathcona has sent a donation of 100l., and Prof. Ehrlich, of Frankfurt, has sent one of 500 marks.

Committees for the purpose of collecting subscriptions have been formed by the Universities of Oxford, Cambridge, and Durham, and other universities are also making efforts locally to promote the success of the memorial. Arrangements have also been made for the formation of committees in the British Dominions beyond the seas and in foreign countries.

The proposed memorial will be of a threefold character, and consists of (1) a simple marble medallion bearing a sculptured portrait of Lord Lister, to be placed in Westminster Abbey among the monuments of the nation's illustrious dead; (2) a larger and more conspicuous monument, to be erected in some public place in London, and (3) the founding of an International Memorial Fund, from which either grants in aid of researches bearing on surgery or rewards in recognition of important contributions to surgical science will be made, irrespective of nationality. A considerable sum of money is required to carry out these proposals. Donations should be sent to the treasurers of the fund at the Royal Society, Burlington House, London, W.

#### NOTES.

SIR OLIVER LODGE has been elected president of the British Association, in succession to the late Sir William White, for the meeting to be held in Birmingham next September.

THE Lord Mayor has given permission for the annual meeting of the British Science Guild to be held at the Mansion House on Wednesday, May 21, at 4 p.m., when he will preside, and Sir William Mather, P.C. (Lord Haldane's successor to the presidency), will be present. The annual dinner of the guild will be held on Monday, May 26, at the Trocadero Restaurant. The guild has recently been considering the important question of pure milk and the Government Milk Bill, and has drawn up a report in connection with it. A report has also been prepared on national education, and it will be presented to the Government in connection with the contemplated organisation of our educational system.

LORD BURGHCLERE, chairman of the Royal Commission on Historical Monuments, Sir Thomas R. Fraser, F.R.S., professor of materia medica and clinical medicine, University of Edinburgh, and Mr. E. H. Tennyson-D'Eyncourt, Director of Naval Construction, Admiralty, have been elected members of the Athenæum Club, under the provisions of the rule of the club which empowers the annual election by the committee of a certain number of persons of "distinguished eminence in science, literature, the arts, or for public services."

THE death is announced, on April 7, at sixty-nine years of age, of Mr. F. G. Smart, fellow of the Linnean and the Royal Geographical Societies.

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MR. G. C. CURTIS is starting for Hawaii in order to carry out a commission to construct for the geological museum at Harvard a relief model of the volcano Kilauea.

PROF. IRA N. HOLLIS, who has been head of the department of engineering at Harvard since 1893, has resigned his chair in order to accept the presidency of the Polytechnic Institute, Worcester, Mass.

THE death is announced, in his seventy-sixth year, of Prof. H. Alexan Bezjian, teacher of physical science in the Central Turkey College, Aintab, Turkey-in-Asia, and described by *The Times* as "one of the most distinguished scientific men that Turkey has yet produced."

THE medical faculty of the University of Birmingham has suffered a severe loss by the sudden death of Prof. Jordan Lloyd, who had been a member of the University staff since the foundation of the University, having previously occupied the chair of surgery at Mason College since 1891.

THE summer meeting of the Institution of Mechanical Engineers will be held in Cambridge, and will begin on Monday, July 28. On the following day the Vice-Chancellor of the University, the Mayor of Cambridge, and the members of the local committee will receive and welcome the president, Sir H. Frederick Donaldson, K.C.B., and the council and members of the institution, in the Senate House of the University. Papers will be read and discussed on that and succeeding days, and there will be visits to engineering works, laboratories, and places of interest in Cambridge, as well as various social functions.

ON Tuesday next, April 15, at three o'clock, Prof. W. Bateson will deliver the first of two lectures at the Royal Institution on the heredity of sex and some cognate problems, in continuation of those delivered before Easter, and on Thursday, April 17, Prof. J. Garstang will begin a course of three lectures on the progress of Hittite studies. The Friday evening discourse on April 18 will be delivered by Dr. T. M. Lowry on applications of polarised light, on April 25 by Prof. J. Garstang on Meroë: four years' excavations of the ancient Ethiopian capital, and on May 2 by Mr. H. G. Plimmer on blood parasites.

A JOINT meeting of the Institution of Electrical Engineers and the Société Internationale des Electriciens will be held in Paris on May 21-24. The inaugural meeting on Wednesday, May 21, will be held at the Conservatoire des Arts et Métiers. The programme includes papers and discussions on the electrification of railways; long-distance transmission of electrical energy; lighting by means of vapour-tube lamps; and wireless telegraphy. There will be a reception and banquet at the Palais d'Orsay by invitation of the Société Internationale des Electriciens; a cinematograph demonstration by M. Gaumont; visit to the aerodynamical laboratory of M. Eiffel at Auteuil; reception by M. Eiffel at the highest platform of the Eiffel Tower, and inspection of the wireless installation, as well as many other social functions.