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CONTENTS

	PAGE
Water Supplies and Emergency Legislation . . .	625
Faraday's Diary. By Prof. Allan Ferguson . . .	627
Industry and Leadership. By R. Brightman . . .	628
A Digest of Clinical Medical History. By D. F. F.-H.	629
The Genus <i>Lilium</i>	630
Short Reviews	630
Lord Avebury (1834-1913). By F. E. W.	632
Stabilisation of Radio Frequencies	634
Physiology of the Blue Whale. By Prof. August Krogh	635
Obituary :	
Mr. William Barlow, F.R.S. By Sir William Pope, K.B.E., F.R.S.	637
Dr. Fred Ibbotson. By C. H. D.	639
News and Views	639
Letters to the Editor :	
Production of Positive Electrons by β -Particles. —Dr. D. Skobelczyn and E. Stepanowa	646
Isomorphism and Chemical Constitution : Constitution of Formic Acid and Formates.—Sir P. C. Ray, C.I.E.	646
Conductivity-Temperature Curves of Paraffin Wax.—W. Jackson	647
Calcium Sulphate Hemihydrate.—Dr. W. A. Caspari	648
The Value of e/m .—Prof. R. T. Birge	648
Reaction Mechanism of Oxidation-Reduction Processes.—Dr. Joseph Weiss	648
A New Guinea Fish Poison.—Prof. A. Killen Macbeth	649
Polyspermy and the Endosperm.—Dr. Ivor Vickery Newman	650
Chemistry of the Red and Brown Algae.—Dr. Barbara Russell-Wells	651
Specific Resistance of the Interior of the Red Blood Corpuscle.—Dr. Hugo Fricke and Howard J. Curtis	651
Thermal Metamorphism around the Ballachulish Granodiorite.—A. Jean Hall	651
The Theory of Vision.—Dr. F. W. Edridge-Green	651
Occurrence of the Floating Barnacle in British Waters.—H. B. Moore	651
Research Items	652
Evolution in the Expanding Universe	654
Salmon and Trout Disease	654
A New Experimental Phonetics Laboratory	655
Chemical Society's Mendeléeff Commemoration	656
Increase in Temperature due to Solar Radiation. By E. V. N.	656
University and Educational Intelligence	657
Science News a Century Ago	657
Societies and Academies	658
Forthcoming Events	660
Official Publications Received	660
Recent Scientific and Technical Books	Supp. iii

Water Supplies and Emergency Legislation

THE time-honoured adage that 'It's an ill wind that blows nobody any good' may possibly receive a further exemplification of its truth and appositeness if the moral to be drawn from the lesson of the recent drought in Great Britain is brought home to the national conscience. Even if it were not a matter of common knowledge, and, it may be added, of harsh experience in many parts of the country, the serious admissions and warnings of the Minister of Health during the debate in the House of Commons on April 12 on the Water Supplies (Exceptional Shortage Orders) Bill would be more than sufficient evidence of the unpreparedness of the authorities to cope with a general shortage of water such as is now prevalent, and although an endeavour is being made in a nationally characteristic way to 'muddle through' the emergency, the situation is one which cannot be regarded with indifference and unconcern. In moving the second reading of the measure, Sir E. Hilton Young made a scriptural reference to 'the writing on the wall'. He could scarcely have chosen an illustration of graver import or more sinister significance.

Water is one of the most vital requirements of a community, whether for domestic or for industrial purposes. In Great Britain, happily, supplies are as a rule reasonably plentiful: in fact, their abundance under normal conditions has rendered us oblivious of their value and careless in their use. With apparently unlimited resources at disposal, consumption has tended to become prodigal and in many cases to be swollen by waste. For generations past, water supply has been a matter of purely individual or local concern. Undertakings have been promoted and administered by private companies and by municipalities, without reference to the larger needs and requirements of the country as a whole. The number of water undertakings in Great Britain is well over one thousand, each of them a separate entity and independent of adjacent concerns, however contiguous the boundaries of their respective jurisdictions. In addition, there are, at least, another thousand private proprietors.

Amid all this medley of interests and authorities, apart from the formation within recent years of a few regional committees the functions of which are purely advisory and directed towards the attainment of a common policy among local undertakers, there has been no attempt at

co-ordination or organised control—nothing beyond the casual supervision of Parliamentary committees at times of legislative enactment for new undertakings and the occasional inquiries of the Ministry of Health or the old Local Government Board when sanction has been sought by local authorities for raising loans for expenditure on works.

It cannot be claimed that the country has been taken unawares in the matter, or that the evils of this haphazard procedure have not been pointed out. During the last half-century, Royal Commissions and Departmental Committees, as well as scientific bodies, have reported time after time on the need for systematic investigation and administration of the national water resources. One outstanding instance is the (1921) Final Report of the Water Power Resources Committee, which contains the following pregnant passage :

“We find that the difficulty in fairly allocating the natural sources of water is becoming greater year by year in England and Wales, and the evidence we have heard proves beyond doubt the urgent necessity in the national interests of some measure of control of all water, both underground and surface, in order that the available supplies may be impartially reviewed and allocated, and may be made to suffice for all purposes in the future. In consequence of the increase of population, the improvement in the conditions of life and the growing requirements of industry, the demand for water is steadily increasing, and the problem of meeting future needs is giving rise to anxiety in many parts of England and Wales.”

The recommendation is clear and unmistakable. Other instances might be cited with equal force. It will be within the recollection of readers of NATURE that only last autumn a special research committee of the British Association reported to the meeting at Leicester, after a careful and painstaking investigation extending over a period of twelve months, “that the position of inland water survey in the British Isles is far from satisfactory and that a systematic survey of the water resources of Great Britain is urgently required”. The Committee pointed out that the consumption per head of population for domestic purposes has a steady tendency to increase, due to improved standards of sanitation, such as the laying on of piped water supplies into houses in rural areas, the substitution of water-closets for privies, and the provision of baths and hot-water supplies. Furthermore, while the amount of water required is increasing and large volumes are being allowed to run to waste, supplies are becoming more and

more restricted, the most conveniently situated sources having been to a large extent already appropriated. Accentuating the growing paucity of available supplies is the fact, mentioned by Sir Hilton Young, that improvements in drainage have resulted in the more speedy draining away of surplus water and so rendered the effects of a drought more serious. It is not perhaps generally realised that the rapid spread of building operations during recent years, more particularly in urban districts, together with road-making, has brought about a considerable extension of the area of impervious surface, causing an appreciable augmentation of the run-off after rainfall.

The Bill just passed by the House of Commons is merely an emergency measure with the inseparable evils of inconvenience and expense. It has been forced on the Government by circumstances and, as such, is simply a temporary palliative and not a permanent cure for a state of affairs which, having risen in the past, is equally likely to recur in the future, if matters are left as they are. What is needed, and has been needed all along, is carefully considered legislation on the lines of the Water Power Resources Committee's Report, namely, the establishment of a controlling Water Commission the primary duty of which would be to compile proper records of the water resources and to make provision for the present and future water requirements of the country and, thereafter, to supervise the administration of these resources to the general benefit.

At the present time, records of available supplies are sadly incomplete, and an efficient survey is the only means of rectifying the deficiency. It is true that excellent records of the incidence and extent of rainfall have been, and are being, kept by the British Rainfall Organization, but this is only part of the scheme of a survey, which, in order to be effective, must cover the whole field of observation from the first arrival of water in the form of rain or dew to its final disappearance into the ocean. At present, as is pointed out in the British Association Report, there is no official department dealing with the direct hydrological measurements of the amount of water derived from rainfall, which is the really essential feature of the matter from a utilitarian point of view.

Hand-to-mouth methods are out of place in the economy of a properly administered community, and the conditions revealed in connexion with the present emergency should compel the attention

of the Government and bring home to it the necessity of taking steps without further delay to inaugurate an adequate service for the scientific measurement and impartial control of the water resources of the country. By so doing, it will bring British water administration into line with the practice in other leading countries, where an example in the matter has been set which can be followed with advantage to everybody concerned.

Faraday's Diary

Faraday's Diary: being the various Philosophical Notes of Experimental Investigation made by Michael Faraday, D.C.L., F.R.S., during the Years 1820-1862 and bequeathed by him to the Royal Institution of Great Britain, Now, by order of the Managers, printed and published for the first time, under the editorial supervision of Thomas Martin. Vol. 3: May 26, 1836-Nov. 9, 1839. Pp. xii+466. Vol. 4: Nov. 12, 1839-June 26, 1847. Pp. xii+448. (London: G. Bell and Sons, Ltd., 1933.) 7 vols., £12 12s. 0d. net.

THE printing of Faraday's diary pursues its stately and regular course, and two further volumes are before us covering a productive period of eleven years—from the summer of 1836 to the summer of 1847. Once again we are privileged to toil after the amazingly versatile processes of Faraday's mind. It is the story of much less than a decade which is compressed into some nine hundred printed pages if we bear in mind that the diary is a significant blank between September 1840 and June 1842, and between February 1843 and February 1844. Moreover, when we remember the comparative paucity of the resources at Faraday's disposal and his propensity—indeed a necessity of his nature—to do everything for himself, so that it was impossible for him to depute work of even minor responsibility to a student or assistant, we feel that we have surveyed a record of single-handed achievement of which any great school of research might be legitimately proud. Think of it; Cavendish had, years before, measured specific inductive capacities entirely for his own satisfaction and, *more suo*, had left his results unpublished and unknown to his and to Faraday's generation. It was Faraday's part in this period to rediscover this property and to make those measurements which are quoted and misquoted in most elementary textbooks. Here, too, we find the story of the liquefaction and solidification of various gases by compression and cooling in closed tubes.

It is interesting to note—and the remark may bring some small consolation to the amateur glassworker—Faraday's comment on his own glass-bending that “the two bends were not very good; one was a little puckered”; interesting, too, to see that Faraday is consistently faithful to the spelling ‘guage’.

At a later date, we have the record of the discovery of diamagnetism, and the immortal entry which runs: “A piece of heavy glass, which was 2 inches by 1.8 inches, and 0.5 of an inch thick, being a silico borate of lead, and polished on the two shortest edges, was experimented with. It gave no effects when the *same magnetic poles* or the *contrary poles* were on opposite sides (as respects the course of the polarized ray) nor when the same poles were on the same side, either with the constant or intermitting current—BUT, when contrary magnetic poles were on the same side, there *was an effect produced on the polarized ray*, and thus magnetic force and light were proved to have relation to each other. This fact will most likely prove exceedingly fertile and of great value in the investigation of both conditions of natural force.”

Over and above these prime discoveries and their consequences, we have records of experiments on discharge in air and in gases, on regelation, on electrification by steam and air jets. . . . The effect of lightning on a tree in Greenwich Park is set down, as is an account of the aurora borealis seen at Brighton. The Gymnotus at the Adelaide Gallery is put under observation, and the unhappy animal (“probably very languid, though he gives good shocks when one's hands are well disposed”) in the presence of Mr. Bradley, Mr. Watkins and Mr. — deflected galvanometers, decomposed iodide of potassium and (at a later séance) gave “a spark across a striking distance” and did “burn or deflagrate gold leaves in a very striking and effectual manner”.

As in the earlier volumes, so here personal, social and political topics pass unnoticed. A queen comes to the throne; In-i-go Jones sets Buckingham Palace in an uproar; the first Education Act is passed; and the voices of the protagonists of the Anti-Corn-Law League are loud in the land. No trace of these alarms penetrates the peaceful atmosphere of the Royal Institution, and the nearest approach to personal gossip is chronicled in the last entry in volume four: “AT OXFORD. Sir William Hamilton and self talked over the relations of two electric currents at right