SATURDAY, FEBRUARY 19, 1927.

CONTENTS.

	PAGE
The Preservation of Nature. By Dr. James Ritchie	265
The Chemistry of Rhythmic Actions. By Prof. Irvine Masson	267
The Physiology of Growth	269
Problems of Potato-Breeding	271
Science, Invention, and Industry. By E. C. S.	272
A New Approach to Religion. By J. C. H.	273
Our Bookshelf	274
Letters to the Editor:	
Stresses involved in Tests of Hardness, and a Table of the Comparative Hardness of Certain Metallic Elements.—A. Mallock, F.R.S.	276
Is Darwinism Dead?—H. Belloc; Sir Arthur Keith, F.R.S.	277
Radioactivity and the Heat of the Earth.—Dr. Robert W. Lawson	277
Progressive Lightning.—Dr. C. D. Perrine; Prof. C. V. Boys, F.R.S.	278
The Polishing of Surfaces.—Prof. James Muir; N. K. Adam	279
Wheat in 3500 B.C.—Prof. John Percival	280
The Length of Light Quanta.—Dr. G. Breit	280
A Polymorphic Oligochaete.—Rev. Hilderic Friend	281
Tuning-Forks with Parallel Prongs.—Dr. G. E. Allan	281
Adsorption of Dyes to Silver Halides: a Correction.—Dr. S. E. Sheppard	281
George Henry Lewes.—Sir E. Sharpey-Schafer, F.R.S.	281
The Electron as a Vector Wave. By Prof. C. G. Darwin, F.R.S.	282
Nerves and Muscles: How we Feel and Move. By Prof. A. V. Hill, F.R.S.	284
Obituary:	
Dr. Eugen Hultzsck	286
News and Views	287
Our Astronomical Column	293
Research Items	294
Diet and Cancer	297
Maori Navigation. By Sidney H. Ray	297
Planets and Periodicities. By C. E. P. B.	298
The Indian Lac Research Institute.	299
Women in Factories	299
University and Educational Intelligence	300
Calendar of Discovery and Invention	300
Societies and Academies	301
Diary of Societies and Public Lectures	303

Editorial and Publishing Offices:

MACMILLAN & CO., LTD.,

ST. MARTIN'S STREET, LONDON, W.C.2.

Editorial communications should be addressed to the Editor.

Advertisements and business letters to the Publishers.

Telephone Number: GERRARD 8830.

Telegraphic Address: PHUSIS, WESTRAND, LONDON.

No. 2990, VOL. 119]

The Preservation of Nature.

PUBLIC opinion is inclined to look upon the scenery and great natural monuments of a country as of the order that lasts for aye, and to imagine that their survival through many millennia betokens an infinite future. It little realises that in this and other civilised countries, human progress is constantly nibbling at the works of Nature, and that greatly as the rate of consumption has grown in recent years, the threat will undoubtedly be magnified in the years to come. The need of water-supplies for the centres of population has altered lakes and swamped valleys; the demands of industry have changed rivers and harnessed waterfalls; the vast requirements of the modern metal-ling of roads are cutting into the 'everlasting' hills; and the desire for speedy transport has driven and threatened to drive bleak roads through some of the select scenery of the land.

With all this there has been, of course, immense economic gain, but there has also been loss. There has been a loss of beauty, a destruction of things of æsthetic and artistic appeal; and who knows what unconscious influence these may have had upon the minds of men? But there has also been a loss to science, sometimes material, more often of those historic-sentimental records, which, linking the achievements of the past with present-day knowledge, stir the imagination and stimulate the broad view. The haunts of a dwindling native flora and fauna are being disturbed: the driving of a road (abetted by the importunities of collectors) banished the Artaxerxes butterfly from its first discovered site in the King's Park, Edinburgh, which had "stocked the cabinets of Europe." Just as in Italy the Barma Cave, the richest and most interesting of the Grimaldi caves, which have added so greatly to the knowledge of palæolithic man, has been exploited for building stone, so the M'Arthur Cave at Oban, the first recognised habitation of Azilian man and, until the discoveries of last summer, the oldest known human dwelling in Scotland, has been entirely quarried away. The historic rock on Blackford Hill within Edinburgh, on the smoothed surface of which Agassiz first detected indubitable traces of an ice age, is threatened by the road-metal excavations of Midlothian County Council, and similar operations in Haddingtonshire will eat into Traprain Law, the site of extensive Celtic settlements and of the discovery of a unique silver hoard belonging to an early century of our era.

Here is a clash between 'business' on one hand

and æsthetics and science on the other. Obviously so disintegrating a warfare ought to be stopped, but how? Not by a simple attitude of protest, for the claims of 'business' cannot be lightly brushed aside, and the county council 'steam-roller' has an effective way of overriding objections. A burst of local effort endeavours to meet each new aggression, and occasionally a treasure is saved. Stybarrow and Glencoin Woods in Ullswater have thus been rescued within the last few weeks, and the *Times* of Feb. 5 announced that negotiations were understood to have reached a successful issue "whereby the land on the west side of the Borrowdale road, from Peterfield to the entrance to Stable Hills Farm, will be saved from all possibility of being built on, and the uninterrupted view over Derwent Water into the famous 'jaws' of Borrowdale and across to Cat Bells will be preserved intact for all time." In both cases appeal is made for public subscriptions of considerable amounts, necessary if successful negotiations are to be converted into the full goal of permanent preservation.

More often, however, the 'steam-roller,' if checked at all, is only temporarily checked and soon returns to complete its work. A year or two ago the danger seemed to have been turned from Traprain Law, but now preparations for extensive quarrying on part of the hill are in full swing. On the whole, local effort is too little organised, too spasmodic, too late in getting into action, too lacking in persistence and in authority to deal efficiently with such emergencies.

The needs of industrial progress are clamant and cannot be gainsaid by a point-blank negative, but is there no room for compromise? Compromise implies give and take on both sides; what has the æsthetic and scientific side to bargain with? As the law of Britain stands, it has nothing; for though more than twenty years ago France passed its first law towards the protection of 'sites pittoresques,' in Great Britain public opinion remains the only support. The matter seems to rest upon the nature of property in land; does purchase or possession imply for the possessor an absolute right to deal anyhow with the land he possesses? We act as if possession held this absolute right, and as if only by special appeal or through special favour may the right be waived; but ideas are changing and have changed. The absolute right no longer holds in the great cities, where an owner may not build upon his land except in accordance with the interests of the community as expressed by the Dean of Guild Court or some similar body.

The time will come when a natural monument, whether its message be æsthetic, historic, or scientific, will be reckoned of as much value as a garage, and its preservation or destruction a matter not for the individual but for the nation.

Other countries, recognising their value in the national life, have moved or are moving towards a general conservation of the natural sites and monuments of artistic, scientific, historic, and legendary interest. A vast body of evidence in this sense was submitted to the "Congrès international pour la Protection de la Nature" held in Paris in the summer of 1923, and appears in the "Rapports, vœux et réalisations" of the Congress published in 1925. In 1906 the *loi Beauquier*, which provided for the classification of picturesque sites, particularly forest areas, by a special commission in each department, and for the safeguarding of these places, set the ball rolling in France. Since then various measures of preservation have been applied to the colonies of France by decrees of the colonial minister. In Switzerland, Spain, Poland, Yugoslavia, Hungary, and Russia the movement is strongly supported. In Great Britain spasmodic efforts have become crystallised in the Royal Society for the Promotion of Nature Reserves in the British Isles, and it has already done good work. We trust, however, that the lack of faith in the efficacy of parliaments and governments as protectors of the beautiful and interesting, expressed at the Paris conference by the president, Viscount Ullswater, does not mean that this influential society will refrain from impressing upon the government of the day the desirability of safeguarding natural monuments, until parliamentary recognition gives a national sanction far more effective than that of any private organisation could be.

If, as we assume, a method of compromise between industrial needs and the demand for the picturesque or significant will ultimately replace the spasmodic and point-blank opposition of the present, who is to arrange the compromise? It must be a body with authority, with knowledge, and with sympathies broad enough to gain the confidence of both sides. Local authorities are already sufficiently burdened with duties, and their very proximity may be apt to obscure the broad view.

In France the Government appointed a special commission for the precise purpose, and this would seem to be the most satisfactory method. We need a Nature Monuments Commission, an advisory body attached to one of the great departments of

State, with the needful statutory backing. This body, with such local help as could be obtained, might draw up lists of Nature monuments and haunts of rare animals and plants deserving of preservation, but a chief function would be to receive from recognised local bodies complaints of threatened destruction, and to decide whether the particular needs of economic development were such as to demand the sacrifice of a national asset, or whether some adjustment might be arranged so that whole or part of the threatened natural monument might be preserved.

Until recent years the handiworks of prehistoric man and his successors existed in Great Britain unprotected from the elements or from the despoiler (except where private ownership bestirred itself), and, as a consequence, hundreds of stone circles of the bronze age and prehistoric sepulchral cairns, as well as buildings of Roman or later times, have been demolished and converted into stone dykes and insignificant barns, byres, and cottages. But the creation by government of an Ancient Monuments Commission has saved the situation, and invaluable work has been done by this body in scheduling and protecting the irreplaceable relics of the former inhabitants of Britain. Here is a precedent for the creation of a Nature Monuments Commission, and here in many ways is a model for its labours.

JAMES RITCHIE.

The Chemistry of Rhythmic Actions.

The Problem of Physico-Chemical Periodicity. By Dr. E. S. Hedges and Dr. J. E. Myers. Pp. 95 + 2 plates. (London: Edward Arnold and Co., 1926.) 7s. 6d. net.

THE normal chemist is so well used to seeing his reagents pass away in a decently continuous fashion, that when he finds them attacking each other in a succession of recurrent spasms, he is a little apt to shy off. The thing is, perhaps, too nearly suggestive of heart-beats, of vital processes, and of human activities: domains into which chemists are wariest of intruding than formerly, and which they prefer to leave to their bolder brethren, the physiologists and the historians. At all events, rhythmic, pulsating, or periodic reactions have seldom been systematically followed up in any general way by chemists. There have been, it is true, such detailed inquiries as Ostwald's on the periodic dissolution of a specimen of chromium in acid, as Bredig's on the pulsating decomposition of hydrogen peroxide by mercury, and as the numerous studies of the

Liesegang effect in jellies; but Dr. Hedges and Dr. Myers have now worked their way to a more comprehensive survey than these, which they have summarised in a small monograph. The broad plan of this is, first to classify periodicities of various sorts, then to set forth the experimental factors that operate in each class, and to give in the end an indication of the views which the authors—themselves notable experimenters in the field—have formed as to underlying causes. The full and important bibliographic index contains about 300 references, of which about one-third centre in the Liesegang phenomenon. About twenty fall outside the last thirty years.

The kinds of periodicity discussed are shown by the authors' definition of the word: "the recurrence of some property or accentuation of a property at regular intervals of time, distance, or other quantity." The sub-atomic recurrences that give rise to periodicities such as Mendeléeff's are intentionally excluded. Three main classes may be distinguished. In one, the speed of a chemical reaction shows pulsations, time being here the variable; in another are the reactions or properties in which space is the variable, so that fixed space-patterns are formed, like the layers in an agate; and in another class the variable to which the pulses in properties are referred is not obviously time or space, but some adjustable condition such as degree of dilution or extent of mechanical stress.

One example of the third class is Holker's effect, in which a row of tubes of a colloid solution show alternating groups of 'thick and clear' when each tube is given a stronger dose of electrolyte than its left-hand neighbour had. Another example placed in this category (labelled "static periodicity") is found in the waxings and wanings of the mechanical and other qualities of some metals when subjected to continued cold-working.

The second class includes all the phenomena first studied thirty years ago by Liesegang: the stratification caused by the advance of a reagent into a jelly containing a second reagent. The valuable critical survey of the work in this class shows that although stratification is favoured by the presence of jellies, these are not essential to it. It can, for example, occur by the slow merging of gaseous ammonia and hydrogen chloride; yet even here it is to be noted that the smoke produced is a colloid, and so are the glass reaction-tubes. It is obvious, in all cases, that a prime necessity is that diffusion must be going on, and to that extent time-rates must come into the affair; but the authors say that there is nothing to suggest