it will ultimately be possible to complete our knowledge of these matters.

It is, therefore, with particular pleasure that we direct attention to Mr. L. A. Carr's paper on "The Ichneumonidæ of the Lichfield District, Staffordshire," in the first of the three volumes of annual reports and transactions here noticed, as an admirable example of the kind of work which can and should be attempted by all local societies.

In the course of only eight years' intensive and constant work, Mr. Carr has collected and identified no fewer than 1255 species of this difficult and much neglected group of insects. We do not overlook the work of Mr. Claude Morley and other isolated workers in this field, but obviously the few experts available in Great Britain cannot be expected to cover the whole ground unaided, even if the exigencies of time and expenses for travel could be met. Responsible local workers, like Mr. Carr, are required for all branches of zoology and botany, who, by their own enthusiasm, or aided by the organisation of their local societies, will make themselves responsible for one small part of the field of natural history in the immediate neighbourhood in which they live, and by care, patience, and steady work gradually get together the necessary data from which a true and accurate knowledge of the British flora and fauna can be obtained. Mr. Carr's paper is abundant evidence of the need for such work. No fewer than 335 species in his list are recorded from the British Isles for the first time, and sixteen of the species are new to science. Mr. Carr has had his identifications confirmed and his material examined not only by Mr. Morley but also by Profs. Habermehl and Schmiedeknecht and other leading authorities on the continent. His list is thus authoritative and forms a very valuable contribution to British zoology. Research of this kind is being done widely throughout Great Britain, but we would especially plead for more co-ordination and co-operation in such work by the local societies and urge upon them the example of Mr. Carr's work.

The smaller and less wealthy local societies have received much encouragement and stimulation by their affiliation to form larger bodies, of which the Yorkshire Naturalists' Union is so splendid an example. This and other similar bodies, like the recently formed Union of South-Western Societies, the South-Eastern Union of Scientific Societies, the Lancashire and Cheshire Fauna Committee, and the Faunal Survey of Glamorgan, are attempting to systematise research among affiliated societies and to carry it out on the broad lines suggested above. We should like to see this principle of larger unions extended to embrace the whole country, so that with the local societies affiliated to their proper union, and the unions in turn affiliated to one or other of the scientific societies in London, or, as now, to the British Association, a complete organisation would be brought into being for the thorough co-ordination of the work of local societies.

The unions perform another and perhaps equally important function in bringing the results of scientific research before the general public of the areas they represent, by holding annual congresses at which leading men of science deliver addresses on the special subjects of their own work. The annual volume issued by the South-Eastern Union of Scientific Societies for 1924 gives an account of its annual congress held at Guildford last year, at which Sir Richard Gregory presided and delivered an inspiring address on "Science in Civilisation," in which he sought to revive the belief in the power of science to promote spiritual and material progress and to plead for the fuller recognition of what it has done for the benefit of man. Among the sectional addresses delivered at this congress may be mentioned "Evolution and Eugenics," by Dr. A. F. Tredgold; "The Educational Value of Regional Survey," by Sir F. G. Ogilvie; "Some Remarks on Adaptation," by Dr. A. B. Rendle; and "Modes of Protection in the Pupal Stages of Butterflies and Moths," by Prof. E. B. Poulton.

It is impossible to estimate the value or to overemphasise the importance of the work which the larger unions are doing by this means. A direct link is established between the local societies and scientific workers of the first rank, and the stimulus which the former receive as the result of this contact must largely influence their members and encourage them in the work they are seeking to do.

From the same report we learn of another branch of work which the South-Eastern Union is endeavouring to do, namely, the compilation of a card catalogue of all faunal records for the area, with full notes of all localities. Such bibliographical work is important and useful, and we are glad that the Union, as well as other similar bodies, is alive to the necessity of doing it.

An admirable example of the work done by a local society in one special field is provided by the first part of vol. 14 of the Proceedings of the Liverpool Geological Society here noticed. The seven papers which go to make up this volume include the results of original research by members of the Society, and four of them deal exclusively with aspects of local geology, to the elucidation of which they form a most valuable contribution.

The three publications under notice give ample evidence of the importance and real value of the work of the societies publishing them. They are representative of the work carried on by kindred societies all over Great Britain, and they provide a splendid example to others of the results which can be obtained by organised research, and the scope of the research which local societies can profitably and creditably pursue.

Artificial Incubation.

TWO articles on "The Scientific Principles of Artificial Incubation," by Mr. Llewelyn B. Atkinson, which are of interest to biologists and physicists and of considerable importance to the poultry farmer, have appeared in the Journal of the Royal Society of Arts, November 28 and December 5, 1924.

In Egypt, China and Malay, natural methods of hatching have been replaced successfully by artificial for thousands of years, but among Western peoples the problem of artificial incubation was only solved so late as 1882, when Hearson produced his incubator with a capsule temperature regulator. The Chinese plan is described in "Farmers of Forty Centuries" by Prof. King of the University of Wisconsin, and it is claimed that with this apparently crude method 95 to 98 per cent. of the fertile eggs are hatched. By the Egyptian method described by Capt. Cadman at the Harper Adams Poultry Conference, 1923, 85 to 90 per cent. of the fertile eggs are hatched. Using modern European and American incubators, there is an all-round hatching efficiency not greatly exceeding 55 per cent. of the fertile eggs, though there are plenty of hatches up to 85 to 90 per cent. It is accepted that incubator-hatched chicks compare very unfavourably with those reared by the mother hen, and that the troubles attendant on artificial incubation do not end with the hatching.

Mr. Atkinson sets himself the task of finding why it is

that with far more delicate arrangements than a hen provides, the results obtained by the use of the incubator do not always equal those given by the sitting hen. He concludes that an incubator which will do all that the best hen does and do it regularly and with certainty, is a perfectly realisable instrument. He gives very full details of the physical and biological factors involved in incubation, drawn largely from the results of his own experimentation, and the conditions underneath the sitting hen are compared in detail with those that exist within the various types of standard incubators. The outstanding conclusions at which he arrives are that practically every type of incubator has the air too dry; that the average temperature of the eggs in an incubator is much more regular than in a hen's nest; and that, whereas in modern incubators the whole of the egg is nearly of the same temperature, the temperature of the top being only slightly different from that of the bottom, in the hen's nest the difference between the temperature of the hen's body in contact with the egg and the temperature of the lower surface of the egg is between 14° and 20° F.

From these observations the author concludes that the secret of successful incubation lies in keeping the upper surface of the egg hot and the lower surface relatively cool. This object is attained by covering the upper surface of the eggs with a very thin sheet of india-rubber. The use of this in a hot water incubator, in which the heat reaches the eggs by radiation, is rendered extremely difficult by the fact that the temperature of the tank has to be raised to a most inconvenient degree. In the case of the hot air type of incubator, however, it is quite simple to get a difference of 14° F. between the top and the bottom of the egg by the use of this rubber sheet. It was found also that with this method rapid evaporation of moisture was prevented and that, in fact, the amounts of moisture and carbonic acid around the eggs were nearly those present in a hen's nest. Using this method, an incubator which previously had rarely given more than 55 per cent. hatched more than 95 per cent. of the fertile eggs. It is to be noted that the application of heat to the eggs is by direct contact and conduction instead of by radiation or convection. Every egg becomes its own regulator, controlling the passage of the heat from the upper surface of the egg to the cooler under surface. Mr. Atkinson states also that the chicks emerging from an incubator provided with this rubber sheet are far more viable.

The Blue Whale.

MR. GERRIT S. MILLER'S paper, "Some hitherto unpublished photographs and measurements of the Blue Whale" (Proc. U.S. Nat. Mus., Vol. 66, pp. 1-4, Pls. i.-ix.) is a welcome contribution to the literature of Cetacea. In spite of its predominating importance to modern whalers, the blue whale (*Balænoptera musculus*) is still imperfectly known, particularly with regard to cranial characters. Mr. Miller publishes specially good figures of the skull, the rostrum of which has not suffered from the warping which commonly occurs on drying. He informs us that the specimen (Washington Museum) was an adult male, 75 feet long, captured off Newfoundland in 1903; but it may be remarked that the free condition of the distal epiphyses of the radius and ulna figured in Pl. viii. is evidence that the animal had not completely passed the adolescent stage of Flower, and that in any case 75 feet is a small measurement for a really adult blue whale. The digits shown in the same figure appear to be too straight, and the hand is probably a reconstruction of a disarticulated flipper, as indicated by the fact that the numbers of the phalanges are low as compared with other records.

Mr. Miller makes no comparisons, and his facts must speak for themselves. With regard to the skull, the rostrum deserves special notice, its sides being parallel in its posterior half, then converging in a gentle curve to the tip;—in striking contrast with the triangular, straight-sided rostrum of the fin whale (*B. physalus*). The premaxillæ are noticeably parallel behind, instead of being arched outwards. The postero-internal processes of the maxillæ are long, the orbital plates of the frontals diminish greatly in diameter in passing outwards, and the nasals are stout and broad. The palatines have parallel sides, and in the side view the straight outer edge of the maxilla and the outline of the vertex are other features in which this skull differs from that of a fin whale. Excellent figures are given of the atlas, axis, sternum, pelvic bones and scapula, the last showing the restored cartilaginous parts. As bearing on the great variability of the bones in the larger Cetacea it may be noticed that the sternum differs conspicuously from those figured by True in 1904, as well as from that of the Longniddry whale described by Turner. The long series of measurements of bones will be valuable as material for comparison with southern blue whales, the identity or otherwise of which with the northern species it will be the special object of the *Discovery* expedition to investigate. S. F. H.

University and Educational Intelligence.

BRISTOL.—A research assistantship is open at the Merchant Venturers' Technical College to candidates with an honours degree in engineering. Applications should be made to Prof. A. Robertson at the College.

CAMBRIDGE.—Mr. Arthur Berry has been elected vice-provost of King's College. A new post of assistant director of magnetic research at the Cavendish Laboratory, without stipend from the University, has been established for Dr. P. Kapitza, Trinity College.

By a recent vote of the Senate, the University is to ask the Commissioners to remove from the statutes the paragraph under which certain holders of official positions, such as bishops, heads of house, and privy councillors, can at present be granted degrees *honoris causa* in virtue of the positions that they occupy. University and college teachers and officers are still to be eligible for the degree of Master of Arts, and the University retains its powers to grant honorary degrees to members of the Royal Family, to British subjects who are of conspicuous merit or have done good service to the State or to the University, and to foreigners of distinction.

Dr. Haddon is resigning from the readership in ethnology.

The vice-chancellor, Dr. Fitzpatrick, president of Queen's College; Dr. Giles, master of Emmanuel College; Mr. F. J. M. Stratton, Gonville and Caius College; and Mr. R. E. Priestly, Clare College, have been appointed delegates at the coming conference of the universities of Great Britain and Ireland.

Sir R. H. Biffen, St. Catharine's College; Mr. R. Adie, Trinity College; Mr. F. L. Engledow and Mr. C. W. B. Wright, St. John's College, have been appointed to represent the scientific workers on the Station Committee of the Horticultural Research Station, while Messrs. W. P. Seabrook, A. G. Daniels, and A. T. Paskett represent the fruit and vegetable growers.