

ifting Kite" in the *National*, and expatiates upon its superiorities over the balloon. The machine consists of a varying number (usually four or five) of sails of a flattened hexagonal shape. These are connected, one behind the other, to the ground-line, from which latter is suspended a basket-car, which has a parachute spread out above it in case of accident. The number of kites required to lift the car depends upon the wind. Lieut. Powell has tried his kites on several occasions, once during the meeting of the British Association at Ipswich, and though the result has in a few cases been disappointing, yet on the whole they have been very successful. To sum up, he remarks: "We have here a machine capable of lifting a man safely to a height, which has many advantages over a balloon. It is infinitely more portable; it is infinitely less costly. It requires no reserve supplies, and is not precluded from ascending by too much wind. It is practically invulnerable, and it promises to be of use in many circumstances rendering a balloon impracticable." What Lieut. Baden Powell specially wants is that the War Department, or the Treasury, should thoroughly investigate his invention and completely put it to the test. Our present Army Balloon establishment costs £3000 a year, and Lieut. Powell thinks most of this would be saved if the air-car were used, and with no loss of efficiency.

In a long paper contributed to the same *Review*, Mr. Mortimer Granville gives to the world "A New Theory of Gout." It is for students of chemical physiology and pathology to estimate the value of the evidence brought forward; all we need do is to indicate the kind of conclusions arrived at, viz.: (1) That gout is not a malady having for its cause an over-production of uric acid. (2) Gout is a malady which has for its cause the presence in the organism of an undue proportion of leucocytes, not necessarily in the blood, but in the organs and tissues generally. (3) If this view of gout be the true one, the treatment of the malady must be the treatment of leucæmia or anæmia. In other words, efforts should be made, by means of a meat diet, to multiply the red corpuscles in the blood, and so assist in bringing about a reduction of the white corpuscles—uric acid makers—within normal limits.

In *Scribner's Magazine*, under the title "Wild Beasts as they Live," Captain C. J. Melliss, a well-known authority on lion and tiger hunting, describes those animals from a sportsman's point of view, his article being illustrated by reproductions from a remarkable series of etchings of wild animals, by Evert van Muyden. Among the articles in *Knowledge*, we notice "The Filtration of Water," by Dr. S. Rideal; "Whip Scorpions and their Ways," by Mr. R. I. Pocock; and "New Stars," by Dr. A. Brester.

A passing reference must suffice for the remaining articles on scientific subjects in the magazines received by us. A paper on "The Limits of Natural Selection," contributed to the *Humanitarian* by Prof. C. Lloyd Morgan, is accompanied by a portrait of the author. A description of the arrangements made for the International Exhibition of 1900, with a plan showing where the exhibition will be placed, how the grounds will be divided, and what will be the names of the principal buildings, is given in the *Century*. Mrs. Lecky has in *Longman's* a very interesting account of the Institute of France, and the recent centenary celebrations. Among the subjects of popular articles in *Chambers's Journal*, we notice "The Metal Platinum," "Living Barometers," "Ivory," "Our Simian Cousins," "The Ancient Incas of Peru."

In addition to the magazines mentioned in the foregoing, we have received the *Fortnightly Review*, *Strand Magazine*, *Good Words*, and the *Sunday Magazine*, but no articles in them call for comment here.

SCIENTIFIC INVESTIGATIONS OF THE FISHERY BOARD FOR SCOTLAND.

THE part of the thirteenth annual report of the Fishery Board for Scotland, dealing with the principal scientific investigations carried on in 1894, in connection with the sea fisheries under the charge of the Board, has recently been issued. An idea of the scope and value of the work done may be obtained from the following summary:—

In the course of the year, the investigations, which were carried out under the supervision of Dr. T. Wemyss Fulton, were prosecuted on the same general lines as in previous years, and have resulted in further extensions of knowledge respecting the life-histories and habits of the fishes which form the basis of

the fishing industry, and of the operation of certain methods of fishing in relation to the food supply. Besides such inquiries, which are necessary for the proper conservation and regulation of sea fisheries, the operations in the hatching and artificial propagation of some of the more important food fishes have been continued at Dunbar Marine Hatchery, which was completed last year, and which have resulted in the addition of over forty-five millions of the fry of plaice, turbot and cod to the fishing-grounds along the neighbouring coast. Similar establishments are now in operation in the United States, Canada, Newfoundland and Norway, and others are in process of being formed in France and in Lancashire.

As in previous years a large part of the scientific inquiries, both biological and physical, have been carried on or rendered possible by means of the *Garland*, the small steamer obtained by the Board for this work; but, as has been mentioned in previous reports, her small size has curtailed the extent and usefulness of the investigations.

Part of the scientific work was also carried on at the marine laboratories at St. Andrews and Dunbar.

THE HATCHING AND REARING OF FOOD FISHES.

In last year's report the reasons which induced the Board to establish a hatchery for sea-fishes at Dunbar were given, together with a detailed description and plans of the building, and an account of the work during the first season it was in operation. The present report contains an account by Mr. Harald Dannevig, who is in charge of the hatching work, of what has been accomplished during the current season, and of the work now in progress. It is satisfactory to be able to note that the various pumping and incubating apparatus have continued to work well and without any hitch, and that the number of fry of the food fishes which have been successfully dealt with this season considerably exceeds the number turned out last year.

The great majority of the young food fishes which have been propagated have consisted of plaice, of which 44,085,000 eggs were obtained from the spawning pond, yielding 38,615,000 fry. The number of cod hatched numbered 2,760,000, and the number of turbot 3,800,000. This seems to be the first time that the eggs of the turbot have been hatched at any hatchery, and the success in this respect has enabled the development of this important fish to be studied and described by Prof. M'Intosh.

In regard to the practical results of marine pisciculture in adding to the fish supply, it may be stated that in the United States, Newfoundland and Norway—where cod alone has been propagated on a large scale—according to the official reports published in these countries the abundance of young cod has been materially increased. In the neighbourhood of the hatchery on Dildo Island, Newfoundland, the shoals of this fish were so numerous during the past season that they were described as a "solid thick mass covering the bottom for long distances on both sides of the island," and it is stated that fishermen from other parts, on hearing of the abundance of cod, came to Dildo to fish. Sufficient time has not, of course, elapsed since active operations were begun at Dunbar to afford any indication as to the influence of the work in increasing the fish supply, but there are some points of importance that may be considered in connection with the subject. There can be no doubt that the great majority of the fry distributed on the fishing grounds are destroyed from natural causes; but if only a fraction of one per cent. survive, the resulting benefit would far exceed the expenditure upon the work. If one in a hundred of the fry distributed from the hatchery survived, and if the price of the marketable fish be placed at sixpence, the resulting value to the fisheries would be about £18,000. It would require the survival of only one in a thousand, and the marketable fish to be sold at only one penny each, to cover the expenses of the work.

THE INFLUENCE OF MARINE CURRENTS IN TRANSPORTING FLOATING EGGS AND LARVÆ FROM OFFSHORE SPAWNING AREAS.

Previous investigations have shown that the inshore waters are destitute of spawning grounds for the great majority of the food fishes, and that they receive their supplies from the spawning areas situated at some distance from shore. In the present report a preliminary account is given, by Dr. T. Wemyss Fulton, of experiments which have been made to determine the influence of marine currents in transporting the floating eggs and young fishes to various parts of the coast. It is shown that they may be carried in the course of their development long distances in a

definite direction, to other parts of the coast, and that the fish supply of a given area of the territorial waters on the east coast may be derived, not from the spawning areas *ex adverso*, but from those situated further north.

THE LIFE-HISTORIES AND DEVELOPMENT OF THE FOOD FISHES.

The report contains an important paper by Prof. M'Intosh, giving the results of his continued investigations on the eggs, young, and development of several of the food fishes, the work having been carried on, as in previous years, at St. Andrews Marine Laboratory. The principal investigation relates to the development of the turbot, which has now for the first time been elucidated, fertilised eggs having been procured from the hatchery. The ripe egg of the turbot has an average diameter of 1.0287 mm., and is perfectly buoyant, floating at the surface of still water or suspended midway, and it possesses a prominent oil-globule. The embryonic fish, which is of a reddish colour, emerges from the egg about the sixth or seventh day, so that the period is short before hatching occurs. The larvæ in a few days become active and dart rapidly through the water, and they are hardy; the yolk-sac becomes absorbed about the seventh day, and thereafter they feed for themselves, being extremely quick in noticing the movements of the minute crustaceans and other forms in the water around them. Prof. M'Intosh states that no form hitherto observed at St. Andrews appeared to be more hardy, or to undergo the vicissitudes of temperature and manipulation with greater impunity than the young turbot; there are grounds, therefore, for expressing the hope that they may yet be reared in great numbers from the post-larval to the adolescent and adult condition in suitable enclosures. The various stages in the development of this valuable form are described and figured. Another species whose development is described is the long rough dab, the pelagic eggs of which are found in considerable abundance in March and April.

Mr. H. Charles Williamson contributes an elaborate paper on the reproduction of the common eel, which has been, and still is, in many respects, involved in considerable obscurity. He gives a very full account of the reproductive organs, both as described by other naturalists, and as observed by himself in a number of specimens examined at St. Andrews; and the paper includes a description of the migrations of the eel, and all that has been ascertained about its spawning. It is a remarkable fact that the ripe egg of the eel has never yet been discovered.

Mr. Williamson also gives a detailed account of the distribution of the pelagic eggs and larvæ of various species of food fishes, obtained in tow-nets, including those of the plaice, haddock, cod, whiting, saithe, sprat, dab, turbot, gurnard, long rough dab, flounder, &c. In another paper he describes the variation in the size of the eggs of a number of the food fishes. Dr. Fullerton has also furnished an elaborate description of the larval and post-larval development of the brain in the lesser sand-eel (*Ammodytes tobianus*), accompanied by illustrations. The important subject of the rate of growth of fishes is at present receiving considerable attention in connection with fishing questions. In the present report Mr. Arthur T. Masterman gives the result of his researches on the subject at St. Andrews, dealing especially with the rate of growth of the plaice.

Mr. Harald Dannevig also furnishes an account of the experiments he has made in regard to the influence of variations of temperature in accelerating or retarding the development of the eggs of fishes. The species dealt with were the plaice, cod, haddock, whiting and flounder.

Finally, the report contains a paper, by Mr. Thomas Scott, on the fauna of the Firth of Forth area and of inland waters; Mr. A. J. Herberson contributes an elaborate paper, accompanied by numerous tables, dealing with the physical observations on the temperature and density of the sea; and Dr. Wemyss Fulton gives an account of the scientific fishery work and the condition and regulation of the sea fisheries in other countries possessing them, and of the principal methods employed to protect and develop them.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Dr. A. R. Forsyth, F.R.S., Sadlerian Professor of Pure Mathematics, has been appointed by the Council of the Senate a member of the Governing Body of Eton College, in the room of Dr. Ferrers, F.R.S., resigned.

NO. 1362, VOL. 53]

An Isaac Newton Studentship in Astronomy and Physical Optics will be vacant in the ensuing Lent term. The studentship is of £200 per annum for three years. Candidates must be at least B.A.s of the University, and under the age of twenty-five on January 1, 1896. Their names should be sent to the Vice-Chancellor between January 14 and 24 next, together with statements as to course of study or research proposed in each case.

The Observatory Syndicate report that they have abandoned the expectation of receiving public subscriptions for the proposed photographic telescope. They now contemplate the erection of a triple apochromatic telescope, the objective of which is to be furnished by Messrs. Cooke, of York, at a cost of £550. The tube of the instrument will be hinged, the larger part of the tube with the eye-piece lying in the polar axis. The rays from the objective at the end of the short movable part of the tube will fall on a flat mirror at the hinge, and be thence reflected to the eye-piece. The flat mirror will be furnished as a gift by Dr. Common, and Sir Howard Grubb is to be entrusted with the construction of the tube at a cost of £1100. The necessary moneys it is proposed to draw from the Sheepshanks Funds, and the Syndicate ask the Senate to sanction this appropriation.

Prof. Ewing, F.R.S., has been appointed Chairman of Examiners for the Mechanical Sciences Tripos, 1896. Among the annual appointments of members of the various Boards and Syndicates are the following:—Mr. Glazebrook, F.R.S., General Board of Studies; Mr. W. Gardiner, F.R.S., and Mr. W. Bateson, F.R.S., Botanic Garden Syndicate; Mr. Love, F.R.S., Library Syndicate and Observatory Syndicate; Mr. Heycock, F.R.S., Museums Syndicate; Dr. Hobson, F.R.S., Proctorial Syndicate, and Mathematical Board; Mr. Capstick, Highest Grade Schools; Prof. Bradbury and Dr. Shore, State Medicine; Dr. D. Hill, Agricultural Science; Mr. Shaw, F.R.S., Fire Prevention, and Board for Physics and Chemistry; Dr. A. MacAlister, Special Board for Medicine; Dr. Gaskell, F.R.S., Board for Biology and Geology.

It is proposed to invite representatives of the chief educational authorities and institutions to meet in Cambridge during the ensuing Long Vacation, in order to confer on questions arising out of the Report of the Royal Commission on Secondary Education. The Vice-Chancellor, on behalf of the University, will convene the conference.

THE Calendar of the University College, Nottingham, for the fifteenth session, 1895-96, has been issued.

THE following are among recent appointments:—Dr. J. Munk to succeed Dr. Gad at the Berlin Physiological Institute; Dr. Paul Kempf and Dr. Wilsing, of the Potsdam Astrophysical Observatory, to be Professors; Prof. Theel, of Stockholm, to be Director of the Natural History Museum there; Dr. Strahl, of Marburg, has been appointed to the chair of Anatomy in Giessen University.

THE *London Technical Education Gazette*—the official organ of the Technical Education Board of the London County Council—contains the following satisfactory announcement:—"It has been part of the policy of the Technical Education Board in connection with higher education, and will be, if possible, through the proposed Teaching University of London, when that University is established, to secure for students who can devote their evenings only to study, a course of instruction of the highest type in all branches for which provision is now made for day students in the universities and university colleges, and to provide that the teachers of these classes shall be the same professors as take the day classes, or others of equal standing. As a step in this direction the Board has arranged with the authorities of University College for the conduct of four courses of lectures and practical work in the departments of Mechanical Engineering, Electrical Engineering, Chemistry, and Applied Mathematics."

SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, November 7.—Mr. A. G. Vernon Harcourt, President, in the chair.—The following papers were read:—On flame temperatures and the acetylene theory of luminosity, by A. Smithells. The author criticises adversely Lewes's theory of the luminosity of hydrocarbon flames on the ground of ex-