

for this preliminary work: Major Powell, who has probably studied the Rocky Mountain and arid region more carefully than any one else, declares that the scheme is a perfectly feasible one, and that the cost, though very great, will be but a small fraction of the value of the land reclaimed. While the western portion of the United States is not yet crowded when compared with Europe, or even with other parts of our own country, it is no longer true that "Uncle Sam is rich enough to give us all a farm." But, if 150,000 square miles of the arid lands of the United States could be reclaimed, the limits of our agricultural development would be enormously extended.

Re-organization of the United States Fish Commission.

The bill prepared by Professor McDonald, and introduced in the House of Representatives, to re-organize the United States Fish Commission and to define its duties, declares "that it shall be the duty of the commissioner of fish and fisheries to continue the systematic investigation of waters of the United States, and of the biological and physical problems they present, with the object of determining the character, abundance, geographical distribution, and economic value of the inhabitants of the waters, both salt and fresh, as also their migrations, and the cause influencing or regulating the same. This investigation is to be conducted on a broad and comprehensive plan, so as to arrive at the life-history of all species having economic value, as well as those species to which they are intimately and essentially related.

"That he will continue the investigation into the history of the methods and apparatus of the fisheries and for the preservation and utilization of fishery products now in use, and will cause careful study to be made of new methods and apparatus introduced from time to time with the object of determining their effect upon production, and furnishing the information upon which to frame intelligent legislation regulating the conduct of the fisheries and improving their methods and apparatus.

"That it shall be the duty of the commissioner of fish and fisheries to provide for the collection of the statistics of the fisheries of the United States, especial reference being had to the fisheries of the Great Lakes and of the New England and North Pacific coasts of the United States, which are of international importance, and may influence or become the subject of treaty stipulations. The statistical inquiry hereby authorized and directed shall be comprehensively planned to accomplish the purposes for which it is instituted.

"That it shall be the duty of the commissioner of fish and fisheries to continue the work of artificial propagation of food-fishes and other useful inhabitants of the water with a view to their introduction into and establishment in the interior and coast waters, and to the maintenance and improvement of the important commercial fisheries of the coast and interior lakes and rivers. To this end he will, in his annual estimates transmitted to Congress, provide for the maintenance and operation of the existing stations of the commission, and for the maintenance and operation of such additional permanent and field stations as may be from time to time authorized and directed.

"That the commissioner of fish and fisheries shall appoint such employees as Congress may from time to time provide, with salaries corresponding to those of similar officers in other departments of the government, and he shall, as Congress may from time to time provide, employ other persons, of expert knowledge, for such time as their services may be needed, including chemists, naturalists, and physicists, for the conduct of the researches and investigations required in the performance of the duties devolved upon this department, or which may be from time to time authorized and directed by Congress."

HEALTH MATTERS.

CONTAGION IN COURTS. — The State analyst of New Jersey, in a recent trial, when called upon to take an oath as witness, avoided kissing the Bible on the ground that he might contract disease by so doing, saying, "So many different persons have kissed that book, that I do not think it safe to touch my lips to it." The court held that the witness must kiss the book, and he reluctantly did so. This seems like a trifling matter, and yet it might be a serious one.

The danger of contracting disease in this way is not imaginary. Until courts so disinfect the Bible on which oaths are taken as to make the act of kissing it safe, we would advise the practising of a device which the writer has for years employed; viz., to kiss the fingers with which he holds the book.

EDUCATING THE WHITE BLOOD-CORPUSCLES. — Dr. Ray Lankester, in an address on 'The Struggle for Life' (*The Hospital Gazette*), in speaking of the function of the blood-corpuscles, said that the corpuscles could be educated to deal with the bacteria, and the future of preventive medicine would be the education of the white blood-corpuscles. The fact that one man, by constant use, could without injury take a dose of arsenic that would kill six ordinary men, was due to the fact that he had by weakened doses been educating and training the white corpuscles. They could be taught to eat and flourish under conditions which, if not commenced gradually, would be destructive to them, and that was the principle underlying protective inoculation. As a preventive of many fatal diseases in sheep and oxen, inoculation had been remarkably successful. The corpuscles first received a weakened breed of disease by inoculation, and thus when a violent attack came they were ready to receive and dispose of it. This education of the corpuscles, it seemed to him, was the explanation of the success of vaccination. They received a weak dose of the poison from the vaccine, and were in that way prepared for a stronger dose in the way of small-pox. He believed the white corpuscles could be trained to receive the most virulent poisons, and he hoped this training would be carried on so as to deal with a great number of diseases.

ELECTRICAL SCIENCE.

Sir William Thomson's Electrical Measuring-Instruments.

FOR some years past Sir William Thomson has been working on electrical measuring-instruments with a view to perfecting some means of accurately and easily measuring the heavy currents and the potentials used in commercial work. Mr. J. A. Fleming, in *Industries*, describes the latest forms Sir William has produced. The ammeters are six in number. The different types are, —

The Centi-ampère balance from	1 to	50 centi-ampères
" Deci-ampère "	" 1 "	50 deci-ampères
" Ampère "	" $\frac{1}{2}$ "	25 ampères
" Deka-ampère "	" 2 "	100 "
" Hekto-ampère "	" 10 "	500 "
" Kilo-ampère "	" 50 "	2,500 "

All of these instruments are on the same general plan. The attraction between two coils carrying the current — one movable, the other fixed — is balanced by a weight sliding on a scale-beam. Heretofore the difficulty in such an arrangement has been in getting heavy currents to the movable coil without greatly decreasing the sensitiveness of the apparatus. In these instruments there are two movable coils, fastened on the two ends of a light frame, and below each of them is a fixed coil. The frame has an axle in the middle by which it is suspended, and it is in the suspension that the chief novelty and improvement lie. The axle ends in two semi-cylindrical trunnions. Above them are two similar fixed trunnions. The two sets are connected by a number of extremely fine copper wires bearing on the rounded surfaces of the lower trunnions. This arrangement allows a free though limited movement of the frame, and the numerous fine wires will carry a heavy current. The winding of the two coils are such that one end of the frame is repelled, the other attracted, when a current passes. There is a scale-beam attached to the frame, and a weight moving on this is shifted until the frame is horizontal. The reading on the beam opposite the weight gives the current that is flowing. The great advantage of this arrangement, as in other forms of electro-dynamometer, lies in the fact that the readings are independent of any change in the strength of magnets, such as are used in ordinary commercial measuring-instruments, and also of the value of the earth's magnetism. The instruments, however, are not so portable as many other forms, and are somewhat difficult to adjust. They will be useful for standardizing the ordinary forms of voltmeter and ammeter.