were carried in the 1951, 1952-53, 1954 and 1955 editions respectively. The following article on Scientific Management of Game Fish in Canada's National Parks describes the methods by which, through research, angling opportunities are maintained and improved in the National Parks.

SCIENTIFIC MANAGEMENT OF GAME FISH IN CANADA'S NATIONAL PARKS

One of the main attractions of Canada's National Parks as resort areas is the game fish to be found in their myriad lakes and streams. Each year an increasing army of anglers find relaxation and enjoyment fishing these waters. Some of the most popular lakes were, by nature, well supplied with fish when the Parks were established but many of them were without fish stocks of any kind. Their present fruitful state is the result of a policy of management and of years of research into the problems encountered in maintaining fish stocks and improving them in lakes and streams of diverse physical conditions in all parts of the country.

The solution of problems affecting National Park waters is undertaken by two Federal Government agencies working in close co-operation. The Canadian Wildlife Service acts in an advisory capacity regarding all fish and wildlife matters in the National Parks and its officers conduct scientific investigations as and where required. Officers of the National Parks Service guided by the results of these investigations, operate hatcheries and egg collecting stations, distribute fish, collect data from anglers and perform other related duties.

Biological Investigations

Before fish are introduced into a lake or when a change in the fish population of a lake seems desirable, a biological survey of the area involved is conducted. A basic biological survey consists of obtaining as much information as possible regarding the fish present in a lake, the chemical composition of the water including the presence and concentration of dissolved gases, the amount and type of microscopic food available in the water, and the numbers and kinds of food animals present on the shores and in the bottom mud. From this basic information it is frequently possible to determine which species of fish might be most easily introduced into a given lake, which should be encouraged when several species are present, and which are most suitable in lakes heavily or lightly fished.

The first step in an investigation is to observe and record the physical properties of a lake. Soundings are made with a calibrated line attached to a weight or through the use of a small portable electronic echo sounder. In either method the soundings are made from a boat propelled across the surface in straight lines between fixed points on opposite shores. Using these soundings a contour map is prepared from which may be calculated the areas and volumes of the water strata of different depths. A temperature series is taken from the surface of the lake to the bottom at the deepest point. A common method is to suspend a reversing thermometer at the desired depth until it has assumed the temperature of the water. A release slipped down the line supporting the instrument turns it upside down, thereby breaking the mercury column so that it does not change position while being drawn to the surface through intervening layers of water. A more recently perfected method uses an electrical resistance thermometer which, when lowered to the desired depth, gives an immediate reading on a dial in the boat. This instrument can be used to take a series of temperatures without handling between observations and thus like the echo sounder saves a great deal of time.