For Boys and Girls

WHEN the children's holiday programme goes on the air next week from YA and YZ stations, the aim once again will be to entertain young listeners, not to educate them. Giving *The Listener* a quick look at what will be offering, NZBS Broadcasts to Schools said they hoped also that some of the programmes would help children to enjoy their holidays outside the actual broadcast time. Among those which should help in this way are "Hints for the Holidays," which will round off the first day's broadcast on Monday, May 9.

Spencer Digby photograph

and "Having a Party," helpful advice to young listeners, which will take up the entire half-hour session on Friday, May 13.

The first week's programme will include on Monday a story for juniors, and on Tuesday a junior quiz arranged by Freda Boyce (above) and, for older children, a BBC programme about the excavation of Troy. Wednesday in both weeks will be taken up entirely by a two-part NZBS production of "The Enchanted Horse," a story from *The Arabian Nights*. On the first Thursday juniors will hear a nature talk by Crosbie Morrison, and seniors a programme of folk music.

In the second week there will be a story and a musical quiz for juniors on Monday and Tuesday, with a senior quiz and another archaeological programme for older children the same day. The highlight of Thursday's programme will be a recording made by Freda Boyce on the immigrant ship Captain Cook. On this day and the next younger children will hear more stories, and the week—and the holidays—will end with a talk by Jan Bussell on the Hogarth Puppets.

The holiday programme will be heard each day at 9.4 a.m. from YA and YZ stations, and the presentation will be by Airini Grennell, from Christchurch.

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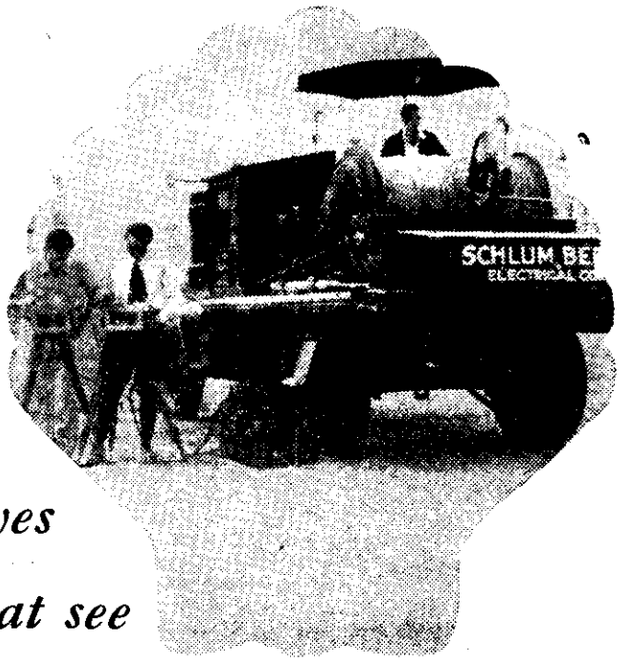

Eyes that see through the Ground

Put a matchbox on a high cupboard and tie a length of string on it, and you have a "scale model" of an oil well. The matchbox is the derrick, the string the drill-pipes or well casing. Various things can happen in so deep a shaft—collapse of the hole, penetration of masses of water from strata which have been

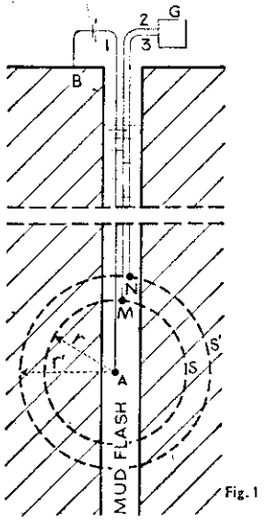

Fig. 1

drilled through, and so on. The driller must rely on his professional knowledge and intuition to put things right again.

Often he wants to see what sort of strata he has bored through. Examination of drill cuttings or samples of cores will tell him quite a lot. But this can involve considerable waste of time, or be very inadequate. The ability to see underground would be of great assistance to him.

In course of time technical science has provided him with a number of instruments which can "see" under the ground for him. One of these is the Schlumberger apparatus, now widely adopted in the development of oilfields. This instrument consists in principle of an electrode (A in Fig. 1), which is lowered into the uncased borehole at the end of a long electric cable. A certain electric voltage is applied to this electrode and transferred through the water-filled borehole into the surrounding layers. This voltage decreases the greater the distance from the electrode, or as the character of the strata changes.

★ ★ ★

It should now be possible to connect points of equal voltage by a line, in which we can imagine circles arising such as those which intersect points S and S' in Fig. 1. At these circles two more electrodes, M and N, hang in the well and are connected to a galvanometer (G in Fig. 1) set up on the surface. The voltage difference between S and S' is read on the galvanometer and shows the resistance of the stratum between these two circles (in actual fact we should speak of two concentric spheres, but in the drawing these are shown as circles).

The measurements are repeated at various depths, and a graph is made of the course of the resistances. Since salt water, fresh water and oil all conduct electricity to a greater or less extent, as the graph shows, the presence of these substances in the layers investigated can be presumed from studying such a line. And as an exact record is kept of the depth, a clear picture is thus obtained of the nature of the layers drilled.

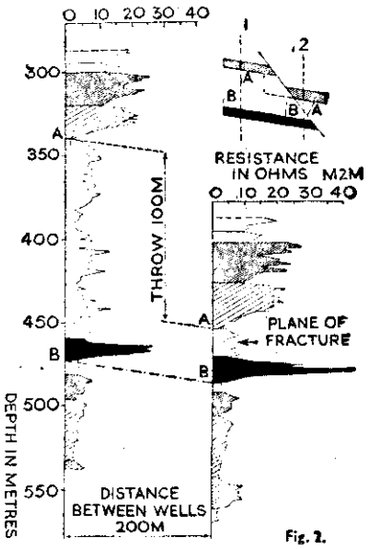

Fig. 2.

If measurements are carried out in several wells located close together, it is often possible, by comparison of the graphs, to draw conclusions as to the subsurface structures (see Fig. 2).

A great deal of other data can be got by applying the Schlumberger method. What has been told here is only one example of the way in which technical science is continually inventing new methods to aid the search for and production of petroleum.

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Top: The measuring car.
Left: Diagram of the Schlumberger apparatus.
Right: Comparison of two graphs shows a fault plane.

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