

Quartet will be heard in solos and concerted numbers of a light nature, and Mrs. Eileen Miller will sing several popular songs, while Mr. and Mrs. Ransom Myers will feature humorous musical sketches.

ON Friday evening a programme of operatic and musical comedy items will be given. The vocalists will be members of the Philharmonic Quartet.

Two other outstanding items of interest on Friday evening will be the sketches to be given by Mr. and Mrs. J. William Bailey of Wanganni, who are about to leave that city preparatory to settling in Auckland, where they have decided to open a school of dramatic art. The items to be played by the 2YA Orchestra will be the overture to "Masaniello," a selection from the opera "Romeo and Juliet," two musical comedy selections, "Dorothy" and "My Cinderella Girl," and the "Dolores Waltz," by Waldteufel.

A BRIGHT vaudeville programme will be presented on Saturday evening. The Salon Orchestra, under Mr. M. T. Dixon, will play Thurban's "Americana Suite," a selection from "The Cabaret Girl," Lotter's "Southern Wedding," and several of the latest dance novelties. Vocal solos will be given by Miss Rosina Exton (soprano), Mr. Claude O'Hagan (baritone), Miss Agnes McDavitt (contralto), and Mr. Seon Brown (tenor). Mr. Albert Davey will contribute to the humorous portion of the programme, and Mrs. Mildred Kenny and Mr. M. Tonks will entertain with banjo duets.

3YA Features

ON Sunday afternoon at 2.45 there will be relayed from the Christchurch Hospital grounds a concert to be given by the massed bands and the Royal Christchurch Musical Society. At 7 o'clock the religious service conducted in St. Andrew's Presbyterian Church will be broadcast. A relay of the concert to be given by the St. Kilda Band in the St. Kilda band ronduna will follow.

AT 7.15 on Monday evening Mr. E. J. Bell will give his fortnightly "Book Review." The Woolston Band, in conjunction with 3YA artists, will provide Monday evening's programme, which will contain numerous items appropriate to Christmas. Selections by the band will include "Adeste Fideles," "The Hallelujah Chorus" and "Christians Awake." Bandsman R. Ohlson will play "The Lost Chord" as a cornet solo with band accompaniment.

The singers for the evening will be Miss Merle Parry, Miss Winifred Barrett, Mr. Sydney Armstrong and Mr. Robert W. Rofe. Elocutionary items by Mr. James Laurensen will be Geo. Robey's "Thingumabob" and a character sketch of "Scrooge." Instrumental selections will be played by the Studio Trio.

THE Christmas Eve programme will continue from 8 o'clock till 12, and will prove a splendid entertainment. The atmosphere of Christmas will pervade the whole programme and the last hour will be devoted mainly to carols. The Instrumental Octet, under Mr. Harold Beck, will provide appropriate selections. Miss Myra Pollard, Miss Nellie Lowe, Mr. W. J. Trewern, and Mr. W. J. Richards will be singing. Miss Lily Hughes will recite, one of her numbers being "Christmas Bells." From 10 till 11 there will be dance music. From 11 till 12 the vocalists will be the Salon Quartet singing solos and Christmas carols. They will also take part in a dramatic sketch produced by Mr. Lauri Cheval and introducing carols.

ON Wednesday, Christmas Day, at 9 a.m., there will be a session for the children, conducted by Aunt Pat. On the evening of Christmas Day, a service held in the Anglican Cathedral will be broadcast. This will be followed by a studio concert, to which Miss Anita Graham, Mrs. D. W. Stallard, and the Christchurch String Quartet will contribute.

THERE will be a holiday programme for Thursday, Boxing Day. This will be contributed by the Studio Octet, under Mr. Harold Beck, Miss Khura Hart-Stewart (mezzo-soprano), Miss Eileen Irwin (contralto), Mr. Harold Prescott (tenor), Mr. W. H. Inkster (bass) and the Joyous Pair (songs at the piano with ukulele).

A POPULAR concert programme with dance music will be broadcast on Friday evening. The vocalists will be Miss Betty Sutton (soprano), Miss Rita Lucas (mezzo-soprano), Mr. L. C. Quane (tenor) and Mr. A. Gladstone Brown. There will be recitations by Miss Winifred Smith. The dance music will be provided by the Bailey-Marston Dance Orchestra.

EVERY year during Christmas week, a carnival is held at Caroline Bay, Timaru. This year one of the evening concerts is to be broadcast by 3YA and 4YA. The date fixed is Saturday, December 28.

4YA Features

THE service in the Central Methodist Mission will be broadcast on Sunday evening. The Rev. G. B. Hinton will be the preacher. The relay of a concert to be given by the St. Kilda Band will follow.

AT 7.40 on Monday evening the Radio Man will give a lecturette on Wireless. Irish opera will be the motif of the programme on Monday. A specially engaged orchestra will perform on this occasion and all their items will be of Irish origin. The Harmonists Quartet will sing the principal vocal numbers of the Irish opera, "The Lily of Killarney," and the in-

cidental music is to be played by the orchestra. Two Irish numbers by Percy Grainger will be performed by Mrs. E. Drake, the studio pianiste, and Miss Anita Winkel will present two of Winifred Lett's Irish poems, Miss Mae Matheson will sing "The Last Rose of Summer." "Killarney" will be sung by Mr. H. Johnston, and Mr. P. M. Tuohy, the popular baritone, will sing "The Kerry Dance."

ARTISTS who will be new to some Dunedin listeners are contributing to a special Christmas Eve programme at 4YA. These are: Miss Veronica Mackenzie, Miss Mollie Fenton, and Mr. Wm. Yates, all from 2YA. The programme for the occasion contains specially selected items. Mr. Laurie North, the son of Dr. North, of this city, will sing Allitsen's "Psalm of Thanksgiving" and two Schubert numbers, "The Wanderer" and "To Music." Mr. North is the possessor of a remarkably fine baritone voice, and is a very popular artist in the city. The Studio Trio will perform bright numbers. A dance music session will follow the usual programme until 11.30 p.m., following which a gramophone recital of Christmas music will be presented.

AT 9 o'clock on Wednesday morning, Christmas Day, Big Brother Bill will conduct "Santa Claus Hour." At 10.30 the service in First Church, conducted by the Council of Christian Congregations, will be relayed. At 5.30 there will be a Christmas Carol session conducted by Big Brother Bill.

On the evening of Christmas Day an appropriate concert will be broadcast. This has been arranged by Mr. Ernest Drake. A vocal octet will sing "Adeste Fideles," "Silent Night," "Good King Wenceslas," and other Christmas songs, as well as miscellaneous items. The soloists will include Miss Aileen Young (soprano), Miss Mary Pratt (singing "Softly Awakes My Heart"), Mr. Les Dalley, whose tenor solo will be "The Star of Bethlehem," and Mr. F. Kershaw (bass solos, "Nazareth" and Verdi's "Il Lacerato Spirito"). Mr. Ernest Drake will sing a solo, and in association with Mr. Fred Tuohy, the duet, "Fickle Hearted Mimi." Instrumental items will be played by Miss Ethel Wallace (violin). There will be elocutionary numbers by Miss Anita Winkel.

A NEW combination consisting of professional musicians, the "Melody Four," will contribute the greater portion of the "Boxing Day" programme at 4YA. All the instrumentalists in this combination double on wood-wind and strings, so listeners can be assured of plenty of variety. Mr. Buster Brown will present further numbers of Scottish humour, and there will be recitations by Mr. Lester Moller. The vocalists for Friday evening's programme will be Miss Evelyn A. Shepherd, Mrs. Ritchie, Mr. G. Crawford, and Mr. Alan Breck. A miscellaneous programme will be presented. The instrumentalists will be a quartet, the members of which will also play solos.

ON Saturday evening the Caroline Bay (Timaru) Carnival will be relayed.

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Surveying by Radio

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IN order to determine the exact position of a survey ship during hazy or foggy weather or when the ship is out of sight of land, the American Coastal Survey officials utilise a method called "Radio Acoustic Ranging." The purpose of the survey is to chart the coast lines at regular intervals out to a certain depth.

In using the radio method there are two shore stations set out by the ship about 35 miles apart. Each of these is equipped with a radio transmitter, receiver and a three-stage bomb audio amplifier. About a thousand yards off shore is a box containing three hydrophones. At a given signal a bomb is dropped overboard from the ship and the exact time and log reading are taken at that instant.

In the ship's radio cabin is a chronograph which records seconds with one pen and under-water sounds and radio signals with another pen. As the bomb explodes, the chronograph pen makes a dash on a tape. Seconds are recorded by another pen. After the bomb explodes, the ship operator informs the two stations by radio and they switch on their amplifiers in order to receive the sound impulse from the bomb. The amplifiers are used to step up the sound of the bomb received by the hydrophones to such a volume as to trip a relay and start an automatic key. The shore operator throws over a switch and three telegraphic dashes are sent back to the ship. Both shore stations must be turned to the same frequency, so that the ship's receiver can hear them without changing the dial setting.

These three radio dashes from each shore station are recorded on the chronograph tape and the exact time is noted. As sound travels under water with a speed of about 1477 metres per second, the distance to both stations is found and the exact position of the ship can be located on the chart.

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