Musicians And Entertainers

(Continued from previous page)

he transferred into the regular army and obtained a commission in a Highland regiment, afterwards joining a North Country regiment. He got terribly knocked about, both legs broken and his shoulder badly shattered, among other things. But after a very slow restoration to comparative fitness he lived to delight us with his lovely voice, until his final lingering illness of nearly four years.

Peter Dawson and Harold Williams, two Australian baritones, served with the Australian Imperial Forces, and good soldiers they were.

Dance Band Leaders Too

Dance band leaders were to the fore, too. Jack Hylton was lost to the amusement world between 1914 and 1918. Sydney Kite was put into the regimental band of his unit—the Royal Life Guards—when he joined up in 1914. Jack Payne joined the Royal Flying Corps during the war, and it was during this service that he began to organise small dance bands to play to the mess during their tedious days in camp.

Bertini—a Cockney, born within the sound of Bow Bells—saw four years' service and was gassed during the war. Billy Cotton left school and joined the Army as a drummer when he was fourteen years old. At the age of sixteen he was drafted to the original Royal Flying Corps, became a pilot, and had many exciting adventures. Most of these he is too modest to recount, but they ended ultimately with a spectacular crash in which he was very seriously injured.

Coming to the organists, Sydney Gustard was shot through his toe. Berkeley Mason was rejected for Army service six times, became a special constable, and prowled round after "food hogs" with "catlike tread."

Dr. George Dyson enlisted in 1914, and saw some service in France, mostly as bombing officer. He wrote a training manual on hand-grenade tactics, then the only one officially sanctioned. He later succeeded Sir Walford Davies at the Air Ministry, and remained there until 1921.

Reginald Foort served as a naval lieutenant (1914-1919), and was at the Battle of Jutland. Frank Newman served in the Artillery during the War (France, Salonika, Egypt, and Palestine). Three and a-half years' service stands to the credit of Edward O'Henry, who was wounded three times and was eventually taken prisoner. When repatriated, he returned to Cologne as Professor of Music and Art to the Army of Occupation. Maurice Vinden served 1915-1919, and was invalided out after service in Mesopotamia.

And so the tale goes on. A whole volume would be needed to tell it fully. Kennedy Scott, Maurice Ravel, Ernest Butcher, Alfred Cortot, Hubert Eisdell, Paul England, Keith Falkner, Walter Glynne (Artists' Rifles and Welsh Guards), Roy Henderson (Artists' Rifles and Notts and Derbyshire Regiment), Andersen Tyrer, Kennerley Rumford, Jacques Thibaud, Leslie Bridgewater, Ivor Novello, Cedric Sharpe, Sydney Coltham, George Baker, Harry Fay and Sir Hamilton Harty all saw service.

Settled in New Zealand

Many now settled in New Zealand saw service also, including a South African War and Great War veteran, Harison Cook. Mr. Cook served as purser on Troopship No. 69, "City of Vienna," during the latter end of the Boer War. During the last war he left his job of principal bass and stage director of the Royal Carl Rosa Opera Company to serve with the artillery. On being demobilised, he returned to his old job.

Another South African War veteran is J. H. Squire of Celeste Octet fame. He was with Captain Percy Scott, of H.M.S. Terrible, who took guns to relieve Ladysmith.

Who said that art and manliness are contradictory terms?

FIGURE FOIBLES

Peculiar Habits of Some Numbers

(Written For "The Listener" By R.W.C.)

IN the Puzzle Page of *The Listener* some time ago, a correspondent, J. A. Reid, of Glenorchy, calls attention to the peculiarity of the number 142857, and says "I knew that this was the only six-figure number that would repeat its figures in the same manner if multiplied by 2, 3, 4, 5 or 6." I hope that he, as well as, perhaps, other readers, will be interested in the following comments. Recurring decimals, or groups of decimals, are shown within parentheses.

First, here is the reason for this number's seemingly fantastic habits. 142857 are the six figures which recur in the decimal form of the fraction 1/7. Most school-children are familiar with the fact that all the "sevenths" fractions when converted consist of recurring decimals using these same six figures *in the same cyclic order* but beginning in turn with 1, 2, 4, 5, 7 and 8. Now the decimal form of 1/7 is found by dividing 1.0 by 7, and in this simple division each step leaves us with a certain remainder which must obviously be less than the divisor 7. For instance, 7 into 10 gives 1 with a remainder of 3; 7 into 30 gives 4 with a remainder 2, and so on. There are, counting the original 1, six possible remainders before any need be repeated, namely the figures 1 to 6 inclusive. This means that we get a six-figure decimal before the recurrence. The multiples of the fraction —2/7, 3/7, etc.—are of course found by multiplying this decimal by 2, 3, etc. (If we multiply the isolated six-figure group by 7 to find 7/7, or unity, we certainly do get .(999999), but as this is recurring it is equal to 1.)

Fractions and Decimals

The correspondent mentions dividing a row of 9's by prime numbers, and gives certain results. Actually this is again a question of the decimal forms of certain fractions. Most of us remember from our school days that simple fractions with denominators 5, powers of 5, 2, powers of 2, multiples of 2 and 5, or of powers of 2 and powers of 5, "come out evenly" in decimal form. For example 1/25=.04, 1/16=.0625 and so on. We also know that denominators of 3 and its powers and multiples, give some sort of recurring decimal. For example 1/6=.1(6), 1/9=.(1) and so on. Decimal forms of all other fractions we usually consider to be like the brook and to go on for ever. This is not so.

Sweet 17

Take the number 17, which Mr. Reid dismissed as "only middling." If we find the decimal form of 1/17 by dividing 1.0 by 17, we have sixteen possible remainders in this division before repetition must occur, namely the figures 1 to 16 inclusive. This gives us the sixteen-figure recurring decimal .(0588235294117647). Everyone of the other "seventeenths" decimals from 2/17 to 16/17 is a sixteen-figure group consisting of these figures in the same cyclic order, beginning with the eleventh, the twelfth, the fifth, the eighth, the sixth, the tenth, the fifteenth, the seventh . . . etc. figures in turn. (There is no apparent rhyme or reason for the order of these commencing figures.)

Anyone sufficiently interested to do the calculations will find the same thing with 19, 23, 29 and so on; in fact with all prime numbers greater than 13. In each case there will be a recurring decimal consisting of one fewer figures than the number in the denominator, and every fraction with each particular denominator will give a decimal group consisting of the same figures, in the same cyclic order, but commencing with a different figure each time.

Consider 11 and 13

To return to the cases of 11 and 13, which the correspondent said are "no good." They certainly do not give the above type of permutations of the same groups of figures, but watch! 1/11=.(09), 2/11=.(18), 3/11=.(27), 4/11=.(36), etc. Thirteenths are even more peculiar. 1/13=.(076923), 2/13=.(153846). No connection at all! But we find that 3/13, 4/13, 9/13, 10/13 and 12/13 consist of the first group of figures, while 5/13, 6/13, 7/13, 8/13 and 11/13 consist of the second. Instead of a twelve-figure group (13-1) we have two six-figure groups.

The Figure 3

The figure 3 and its powers give some strange results. 1/13=.(3), 1/9 (or $1/3^2$)=.(1), 1/27 (or $1/3^3$)=.(037), 1/81 (or $1/3^4$)=.(012345679) (notice the unaccountable omission of 8). 1/243 (or $1/3^5$) is even more peculiar — .(004115226337448559670 781893). Upon examination this formidable decimal is found to consist of nine sets of triplets, 004, 115, 226, 337, etc. (a complicated sort of Arithmetic Progession), and is consistent right to the end as 670 is the same as 66(10), 781 as 77(11) and 893 as 88(12) with the extra 1 as a kind of carry-over to the next recurring group.

Magic in 9

The figure 9 has always been regarded as a "magic" number, and if space permitted many amusing and surprising calculations could be given involving this figure. As a matter of fact, the whole question of strange and apparently inexplicable properties of certain numbers, and of the relations between numbers of certain forms, is intensely interesting, and has excited the attention of mathematicians for centuries—probably since some prehistoric man noticed that he had the same number of toes as he had fingers, and used them to count his herd of tame brontosauri.