hiss. I doubt much whether any pure tone gives the full impression of an "s," having often experimented with bird-calls of about the right pitch. Perhaps a rapid *change* of pitch is essential. RAYLEIGH.

Prof. Armstrong and Atomic Constitution.

IN the April number of the quarterly journal called *Science Progress* appears an article signed H. E. A., in which that distinguished chemist at length accepts, though not without hesitation and sustained scepticism, some of the results deduced by physicists from the phenomena of radio-activity; but he takes the opportunity of restating and reinforcing his opinion that the inert gases—helium, for instance—are not really monatomic—an opinion expressed by Prof. Armstrong soon after the discovery of argon.

To maintain this rather strained position in face of experimental facts, a considerable amount of what seems to me gratuitous hypothesis is required; and since it is desirable to come to a better understanding of this matter, I propose to criticise his attitude, in a friendly way, in the October number of the same journal. OLIVER LODGE.

Distribution of Amphidinium.

BIOLOGICAL readers of NATURE will perhaps recollect the record of the finding of the dinoflagellate, *Amphidinium operculatum* (previously unknown in Britain), on the beach at Port Erin a couple of years ago. Since then it has been present in great abundance at Port Erin on many occasions; Mr. R. D. Laurie has found it at Hoylake, near Liverpool, two of our young Liverpool zoologists (R. J. Daniel and J. E. Hamilton) now at the Belmullet Whaling Station, co. Mayo, inform me that they have noticed it on the shores of Blacksod Bay, and now I have to-day found it here in abundance, staining slightly in patches and streaks the beautiful white shell-sands of Iona.

Both the forms found at Port Erin—viz. the shorter discoid (the typical *A. operculatum*) and the larger more ovate form which I have described from Port Erin—occur here, associated with a few Naviculoid diatoms.

It seems probable that this curious dinoflagellate, known in the living state so far as I can ascertain to very few biologists, and previously recorded from only three or four far-distant localities, is really very generally distributed, and might be found by careful searching on many sandy beaches.

W. A. HERDMAN.

S.Y. *Runa*, Sound of Iona, N.B., July 20.

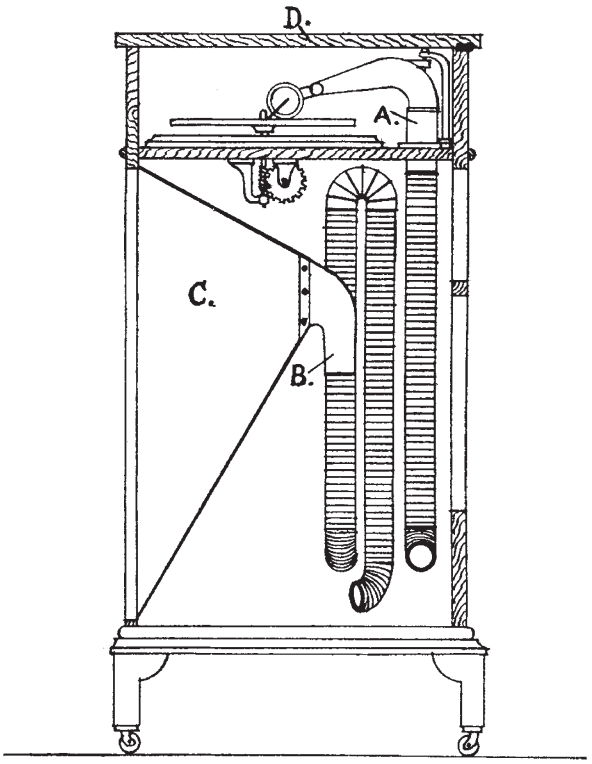
Gramophone Improvements.

I HAVE greatly improved my gramophone, at any rate for use in rooms of moderate dimensions, by applying to it both the long tube arrangement for eliminating scraping noises—described by Mr. Ernest De la Rue in NATURE of November 14, 1912—and also the "donkey's ear" form of trumpet, devised by Mr. Sidney G. Brown, which I have the latter's permission to describe.

The accompanying illustration shows an elevational section through the instrument as altered. From the sound-box, the sound passes through the usual movable arm and the socket A into one end of about 14 ft. of 2 in. flexible steel pipe, arranged in six vertical lengths, of which four are shown in the illustration; the other end of the pipe, B, being connected to the trumpet C. As in the case of Mr. De la Rue's machine, the bends in the pipe are made of zinc, and it seems that it is chiefly these bends that almost entirely eliminate the scraping noise due to the friction of the needle on the record.

The "donkey's ear" trumpet devised by Mr. Brown is shown in section at C. It is made of four flat pieces of three-ply Birch fretwork wood of about $\frac{1}{8}$ in. total thickness. It has an oblong mouth, and its special feature is that, like the ears of donkeys and many other animals, it is shaped with a top and bottom of unequal lengths so as to resonate comparatively equally to sounds of widely different pitch.

It has been found desirable to put a felt seating for the lid D to rest on, as though previous to the alteration the amount of scraping noise that came



out through the trumpet was so considerable that it made very little difference whether the lid was closed or open; with the new arrangement this scraping is eliminated to so great an extent that until the felt was inserted quite an appreciable amount of noise was found to come out round the lid.

Though the instrument is not so loud as previously, the reproduction of sounds of all descriptions seems now much more accurate than before, while the objectionable scraping noise has been virtually done away with. A. A. CAMPBELL SWINTON.

66 Victoria Street, London, S.W., July 24.

The Maximum Density of Water.

I FEAR Mr. W. B. Croft will get few to agree with him in supposing that it would make little difference in the conditions existing on the earth whether water was at its maximum density at 0° or at 4° above it (NATURE, July 17). If water was densest at 0° there would be little surface ice, as water does not change to ice at 0° unless in the presence of ice crystals or other solids. The ice-cold water would therefore, after sinking, freeze when it came in contact with the solid bottom, and we would have much anchor ice and but little on the surface. The small margin of only 4° does not seem to be quite enough entirely to prevent anchor ice; still we have reason to be thankful for these few degrees.

JOHN AITKEN.