place them beneath the same bell-jar, it will be found that the first fluid remains clear and free from *Bacteria* for an indefinite period, whilst the second invariably becomes turbid in one or two days.

What is the explanation of these discordant results? We have a right to infer that all preexisting life has been destroyed in each of the fluids*; we have proved also that such fluids are not usually infected by *Bacteria* derived from the air; in this very case, in fact, the putrescible saline fluid remains pure, although the organic infusion standing by its side rapidly putrifies. We can only infer, therefore, that whilst the boiled saline solution is quite incapable of engendering *Bacteria*†, such organisms are able to arise *de novo* in the boiled organic infusion.

Although this inference may be legitimately drawn from such experiments as I have here referred to, fortunately it is confirmed and strengthened by the labours of many investigators who have worked under the influence of much more stringent conditions, and in which closed vessels of various kinds have been employed ‡.

Whilst we may therefore infer (1) that the putrefaction which occurs in many previously boiled fluids when exposed to the air is not due to a contamination by germs derived from the atmosphere, we have also the same right to conclude (2) that in many cases the first organisms which appear in such fluids have arisen *de novo*, rather than by any process of reproduction from preexisting forms of life.

Admitting, therefore, that *Bacteria* are ferments capable of initiating putrefactive changes, I am a firm believer also in the existence of not-living ferments under the influence of which putrefactive changes may be initiated in certain fluids—changes which are almost invariably accompanied by a new birth of living particles capable of rapidly developing into *Bacteria*.

II. "On Just Intonation in Music; with a description of a new Instrument for the easy control of all Systems of Tuning other than the ordinary equal Temperament." By R. H. M. Bosanquet, Fellow of St. John's College, Oxford. Communicated by Professor H. J. S. Smith, F.R.S., Savilian Professor of Geometry in the University of Oxford.

(Abstract.)

The object of this communication is to place the improved systems of

* [*Note.* Jan. 31, 1873.]—In 'The Beginnings of Life,' vol. i. p. 332, note 1, I have cited facts strongly tending to show that *Bacteria* are killed in infusions of turnip or of hay, when these have been heated to a temperature of 140° F. They also seem to die at the same temperature in solutions of ammonic tartrate with sodic phosphate.

† See 'Beginnings of Life,' vol. ii. p. 35, and vol. i. p. 463.

‡ See a recent communication by Prof. Burdon Sanderson, in 'Nature,' January 9th.

tuning within the reach of ordinary musicians; for this purpose the theory and practice are reduced to their simplest forms.

A notation is described, adapted to use with ordinary written music, by which the notes to be performed are clearly distinguished.

The design of a key-board is described, by which any system of tuning, except the ordinary equal temperament, can be controlled, if only the fifths of the system be all equal. The design is on a symmetrical principle, so that all passages and combinations of notes are performed with the same handling, in whatever key they occur.

The theory of the construction of scales is then developed, and a diagram is given, from which the characteristics of any required system can be ascertained by inspection.

An account is then given of the application of such systems to the new key-board, and particularly of an harmonium which has been constructed and contains at present the division of the octave into fifty-three equal intervals in a complete form. Rules for tuning are given.

Finally, the application of the system of fifty-three to the violin is discussed.

Throughout the work of former labourers in the same field is reviewed: the obligations of the writer are due to Helmholtz, the late General T. Perronet Thompson, F.R.S., and others.

III. "On the Composition and Origin of the Waters of a Salt Spring in Huel Seton Mine, with a Chemical and Microscopical examination of certain Rocks in its vicinity." By J. Arthur Phillips, Mem.Inst.C.E. Communicated by Professor Ramsay, F.R.S. Received December 12, 1872.

(Abstract.)

Huel Seton Copper-Mine is situated about one mile north-east of the town of Camborne, Cornwall, and is distant from the sea, on the north coast, a little more than three miles.

The workings of Huel Seton are entirely in "killas," or clay-slate, and the saline waters issue at the rate of 50 gallons per minute, and at a temperature of 92° F., from the eastern fore breast of the 160-fathom level. This has intersected a fault, or cross course, which may be traced in a northerly direction to the sea. The temperature of the level from the end of which the water issues, like that of the water itself, is 92° F. The following results, in grammes per litre and grains per gallon, were obtained by analysis. Sp. gr. 1·0123. Total solid contents 14·3658 grammes per litre, or 1005·61 grains per gallon.