

their normal positions without altering the result." Granted. When once fertilisation has been effected and the arrangement of materials in the cytoplasm fixed, the nuclei which result from the division of the zygote nucleus enter on a period of inactivity so far as influence on the cytoplasm is concerned. But this inactivity does not last for ever, for though the Cynthia tadpole is incapable of regenerating anything, that same tadpole metamorphosed into an adult Ascidian will regenerate any part that is cut off—even its head. In the same way Roux showed that when one blastomere of a frog's egg is killed the surviving blastomere will give rise to half a tadpole; but that half-tadpole, if it lives, will *post-generate* the missing half, and this belated regeneration is accompanied by a migration of nuclei into the injured half.

It may be objected that it is difficult to imagine what kind of chemical composition an "organ-forming substance" possesses. This is true; it may be difficult to compare it with chemical substances found in dead matter, but our knowledge of the possible complications of organic substance in living matter is as yet small. This at least may be said, the active agent in development and regeneration can be displaced from its original position, and can be divided into two, and such attributes are much more easily connected in our minds with a substance than with a non-material entity, which, Prof. Driesch assures us, is not in space.

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The Piltdown Skull and Brain Cast.

IN suggesting that a reconstruction of the Piltdown skull, made by the use of casts of the actual fragments, is not trustworthy (NATURE, October 30, p. 267), Prof. Elliot Smith does Dr. Smith Woodward and Mr. F. O. Barlow less than justice. The casts now in circulation are most accurate representations of the originals, and reflect the greatest credit on the modeller, Mr. Barlow. Anatomists have had no difficulty in gaining the freest access to the actual specimens; even those who, like myself, regard the original reconstruction of the skull and brain cast as fundamentally erroneous, have had every privilege granted to them on repeated visits to see the Piltdown fragments in Dr. Smith Woodward's keeping. A reconstruction made from casts is then just as trustworthy as one made from the original fragments.

You have already (NATURE, October 16, p. 197) permitted me, by the use of a diagram, to demonstrate the errors in the original reconstruction; I also availed myself of that opportunity to show diagrammatically the only reconstruction which gives an approximate symmetry to the right and left sides of the head, and, at the same time, places the parts in their proper anatomical positions. It is clear, from his letter (NATURE, October 30, p. 267) that Prof. Elliot Smith knows of another method, one which fulfils the same conditions, but gives a much smaller brain-capacity. All that is necessary to convince me that he is right and I am wrong is a drawing of that reconstruction: one comparable with the drawings in my previous letter. I have articulated the fragments in the manner suggested in his letter, and find that the degree of asymmetry in his suggested reconstruction is as great as in the original. It is possible that I have misinterpreted some of the indications given in his letter. Any error of this kind would be cleared up by a drawing.

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Pianoforte Touch.

PRESSURE of other work has prevented me from replying earlier to Prof. Pickering's letter in NATURE for July 31. It is, of course, difficult to express any definite opinion about an experiment without fuller knowledge of the circumstances than can be acquired from a mere written description; at the same time it appears to me very easy to suggest explanations for the failure of the experiment. To strike the same note a hundred times in succession is certainly a very severe test to impose on a person's powers of discrimination. In this connection it would be interesting to perform, for the sake of comparison, one hundred tests of a totally different character, say the well-known tests of blindfolding a person and making him taste tea and coffee, according to a prearranged succession. It would be giving the hearer a fairer chance if the experiment were performed by playing over a short sequence of notes, say a simple melody a number of times in succession. I have always performed the test in this manner, and it has generally been successful.

Then, again, there is evidently a certain knack about producing these touch effects, and though one may try to strike a note sometimes in a pressing or caressing manner, and sometimes sharply, it is quite easy to fail to produce the desired effects, especially if the note is struck by the fingers. The best results I have been able to get in this way have usually been produced by holding the wrists high above the keyboard for a brilliant tone and right below the keyboard (so as almost to pull the keys down) for a soft tone. In producing the same effects with a pneumatic player, variation of the load on the regulating bellows by means of my sliding weight or some equivalent method produces sufficient differences, but the action of the feet in pedalling has so much effect on the touch that even here it is easy to fail, especially in experimenting where the performer consciously attempts to produce a particular effect and thinks of what he is doing. In the course of playing a composition the touch control is easier, as the necessary movements of the hands and feet are performed unconsciously, the performer only being conscious of the effect produced and not thinking of why or how he moves his levers and pedals to produce that effect.

Another point which has been overlooked in this discussion is that different makes of piano respond in very different degrees to small differences of touch. I recently tested a number of different pianos, and found that the make which I always use was by far the most sensitive, while one of the least sensitive was similar to the piano used by our local musical society, thus accounting for the comparative harshness of some of the professional performances compared with my pneumatic effects.

It is, of course, necessary to distinguish carefully between variations in quality of individual notes and variations in the quality of chords. The possibility of producing the latter variations in the pneumatic player is proved beyond doubt, and, to my mind, it is very largely the failure of either the instrument or the performer to produce a pleasing balance between the various components of a chord that renders the playing so mechanical and uninteresting. The usual effect is to produce with soft playing a heavy bass drowning a dull treble, and with loud playing a shrill treble drowning a weak bass. This effect is probably due to a large extent to the action of the regulating bellows, which in the ordinary players are controlled by springs. In playing a chord a number of different striking hammers of unequal mass have to be set in motion by means of the air pressure,