Let me give a concise account of what I know in regard to this matter. At the end of June of this year Mr. Weigall, the Government inspector in the Service des Antiquités at Luxor, acting on the instructions of M. Maspero, the director-general of that department, sent me a skeleton to be examined and reported on. The skeleton was practically complete, for, although the face, certain ribs, and part of the pelvis were broken, most of the fragments were sent. Mr. Weigall told me that the bones were found in their coffin in a tomb opened by Mr. Theodore Davis in January last, and that they were supposed to be the remains of Queen Tii. Moreover, he has assured me that no possible mistake could have been made, because he himself and Mr. Ayrton had packed the bones, and they were received and unpacked by me in the anatomical department of the Cairo School of Medicine. The fact that the bones were soaked with paraffin wax, and that no other skeleton is known to have been so treated in Luxor, puts their identity beyond all doubt.

The skeleton is undoubtedly that of a young man of about twenty-five years of age.

It does sometimes happen that a skeleton presents features of such an indefinite character that even the most experienced anatomist hesitates before expressing an opinion as to sex; but these bones do not fall into such a category. All of them, and especially the skull, pelvis, and leg-bones, present the male characteristics in such a pronounced or even exaggerated form that a junior student of anatomy would be considered exceptionally stupid if he failed to recognise the sex. The skull is big and heavy-jawed, the frontal sinuses and superciliary ridges are exceptionally large, even for a man, and the mastoid processes are typically masculine; although the skull is exceptionally capacious, the face is disproportionately big. On the evidence of the cranium alone the sex is obvious.

The pelvis exhibits the most characteristic masculine features. The shape of the pubes and the pubo-ischial rami, the size and shape of the subpubic angle (67°), the form of the obturator foramen, the proportions of the pelvic cavity, and the shape of the iliac bones all conform to the definitely male type. The femur also serves to demonstrate the male sex in its size, inclination of shaft, and size of head.

Mr. Theodore Davis and those who have disseminated extracts from his letters have dealt rather unfairly with the two medical men, whose opinions they quote, in giving such wide publicity to statements which could have been made only in the most casual manner by anyone with any medical training whatsoever. It is so absurd as to be altogether incredible that "a prominent American obstetrician" would quote the figures 90° to 100° for the female subpubic (misquoted "pelvic" by Prof. Sayce and Mr. Hall) angle, and 70° to 75° as the average for this angle in the male, with the object of demonstrating the female sex of a pelvis the subpubic angle of which is only 67° !

But, quite apart from the very obvious male characters of the skeleton, there are even more obtrusive features equally fatal to the possibility of it being Tii's, which could hardly have escaped the observation of a medical man, however casual.

The teeth are practically unworn; three of the "wisdom" teeth had just been "cut," and the fourth was only just emerging from the jaw at the time of death; and a large number of epiphyses on ribs, vertebrae, clavicles, sternum, and pelvis were either separate or in process of joining. In other words, the bones are clearly those of a person of about half the age Queen Tii is known to have reached.

The archæological and historical remarks in Mr. Hall's letter do not concern me.

In a short time I shall publish a full account of this skeleton, with photographs exhibiting the evidences of sex and age, and the points of similarity and dissimilarity to the mummies of Amenhotep III., Yuua, Thua, Thothmes IV., and perhaps some other royal mummies of the eighteenth dynasty.

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Cairo, October 4.

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The Interpretation of Mendelian Phenomena.

ALTHOUGH it is impossible within the limits of a short letter to attempt an answer to the question of the bearing of "Mendelism" upon biological problems in general, there are one or two points in Dr. Archdall Reid's letter in NATURE of October 3 which seem to require discussion.

Dr. Archdall Reid begins with the following statements:—"Mendelian phenomena are possible only when reproduction is bi-parental. They cannot occur, of course, when it is parthenogenetic." In the first of these statements the expression "bi-parental" should not be taken too literally, since in the majority of cases of Mendelian inheritance investigated hitherto the method of so-called self-fertilisation has been employed. I hope I may be pardoned for the assertion that the second statement is a little premature. For my own part I shall certainly await the result of experimental evidence upon the point before accepting it as conclusive.

In the absence of Dr. Archdall Reid's definition of what he means by "the problem of sex," I am not sure that I entirely understand the remainder of his first paragraph; but the suggestion may be made that "the function of sex," "the causation of variation," "retrogression of characters," and "mode of development" are less immediately to the purpose in the present condition of biology than the problems of the actual method of transmission of existing characters. Upon the problem of the "alleged transmission of acquirements" Mendel's facts may even be said to throw some light; but in any case it seems rather severe treatment to belittle the importance of a biological discovery merely because it does not immediately lead to the solution of all the most difficult problems which biology affords.

Once more it must be repeated that the appearance of a blended first cross is no criterion of non-Mendelian inheritance. In the case of a problem like that of man, complicated as it is by the fact that he has "crossed more often than any other animal," and further rendered intractable by the circumstance that he is not amenable to experiment, a great difficulty arises in discovering which are the actual allelomorphs concerned. For these natural characters pay no heed to our definitions; so that if an investigator makes the mistake of first rigidly defining the "characters" with which he proposes to deal, and does not keep a perfectly open mind, prepared to revise his definitions in the light of the evidence which experiment alone can afford, he runs a great risk of finding only confusion where a proper analysis would have shown the presence of perfectly definite methods of inheritance. It would be extremely interesting to students of genetics to learn upon what evidence Dr. Archdall Reid bases his positive statement that there is no segregation in the case of the mulatto.

There is certainly occasion for surprise in finding it maintained that "nature selects only mutations"; but that natural conditions lead to the obliteration of a host of mutations is as fair a deduction from the fact that such mutations appear under cultivation as the current deduction that the conditions of cultivation actually cause the occurrence of this kind of variation. We have the testimony of de Vries and others that the former process actually takes place. That the latter process does so is an assumption which still lacks the support of facts.

R. H. LOCK.

Botany School, Cambridge, October 7.

The Colour of Dye Solutions.

It is generally accepted that the colour of dye solutions depends upon the chemical structure of the dye, and colour changes are usually attributed to some change in constitution; but certain recent investigations on colloidal solutions show that this argument must be accepted with caution. It is well known that colloidal solutions of the metals are highly coloured. Further, it is recognised that many dyes exist in solution in what, for lack of a better term, must be called the colloidal state. Some observations of my own point to the following statement as being true for certain dyes:-

The absorption spectrum of the dye in solution may be

either (a) a characteristic absorption, consisting of one or more narrow bands and depending on the chemical structure of the dye molecule, or (b) a "resonance" spectrum due to colloidal particles, and much more remotely connected with chemical constitution. This spectrum is ill-defined.

The detailed experiments which have led to these conclusions will be communicated in a paper shortly to be published. A word or two is desirable in explanation of the term "resonance" spectrum. By this is denoted the type of absorption exhibited by colloidal metal solutions, glasses, and certain photographically prepared films (F. Kirschner, *Drude's Annalen*, 1904, xiii., 239; Kirschner and R. Zsigmondy, *ibid.*, 1904, xv., 573; K. Schaum and E. Schloemann, *Zeit. wiss. Phot.*, 1907, v., 109). It is probable that all absorption is due to resonance, no doubt, and hence the narrow-band type (a), but in this case the resonators would be the molecules or the contained electrons, whereas in case (b) the resonance of larger aggregates is the cause of the absorption.

The investigation is to be continued, but a striking case was found in one of the pinacyanols, a class of dyes recently introduced as photographic sensitizers. This dye gives in aqueous solution a flattish, ill-defined absorption, the solution showing all the characteristics of a colloidal solution. In alcohol and organic solvents the absorption was of a narrow-band type, entirely different, and this spectrum was also obtained by heating the aqueous solution to boiling point. The behaviour was quite analogous to that of starch, which gives crystalloid solutions at the boiling point.

S. E. SHEPPARD.

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The Convection Explanation of Electrolysis.

AT p. 14 of a recent text-book entitled "Electrochemistry," by Prof. R. A. Lehfeldt, the author mentions the convection explanation of electrolysis, and states that "Faraday was sufficiently impressed with it to form the hypothesis of ions, i.e. of charged particles in the liquid travelling under the action of the electric force."

So far from being impressed favourably by this "explanation," Faraday considered it might have a "dangerous influence" and "do great injury to science by contracting and limiting the views of those engaged in pursuing it." He therefore constructed his terminology of electrolysis specially to get clear away from this "explanation."

Again, Faraday did not form a "hypothesis of ions as particles." The word ion refers to the nature of the substance evolved at the electrode, not its dimensions. The ion of Faraday might weigh an ounce or a ton.

The opinions which the modesty of the great observer permitted him to express may be found in the seventh series of his "Experimental Researches." To attribute to him, for any purpose, other opinions absolutely alien to these is, I submit, either scientifically reprehensible or grossly careless.

J. BROWN.

Belfast, August 18.

CLASSIFICATION OF PORTRAITS.

EXPERIMENTS of various kinds that I have made to define the facial peculiarities of persons, families, and races by means of measurement led to the following results that seem worthy of publication. The most elementary form of portrait will alone be considered here, namely, the outline of the face from brow to chin, as in a shadow or in a silhouette. It contains no sharply defined points whence measurements may be taken, but artificial ones can be determined with fair precision at the intersections of tangents to specified curves. It will be shown that it is easy to "lexiconise" portraits by arranging the measurements between a few pairs of these points in numerical order, on the same principle that words are lexiconised in dictionaries in alpha-

betical order, and to define facial peculiarities with greater exactness than might have been expected.

The individuality of a portrait lies more in the relative positions of six cardinal features (see the figures below) than in the shapes of the lines that connect them, so long as the general character of the connecting lines is roughly indicated. A few standard types, perhaps ten in all (though I prefer to use more), represent as many concave, convex, and sinuous varieties of outline, between each specified pair of the six cardinal points, as need to be noted. I may recur to this in a future letter.

This will be apparent to the reader's satisfaction if he compares portraits under unfavourable conditions, as through a blurring medium, or out of focus; or, again, if he substitutes connecting links that differ somewhat from the true ones. Consequently my first endeavour was to define accurately six points that should severally be good representatives of the six cardinal features in the outline. Those features the limits of which are vague are expressed by *italic* letters in Fig. 2, and their representative points by the same letters in *capitals* in Fig. 3. The features are these:—*c*, the tip of the chin; *l*, the lower, and *u*, the upper lip; *m*, the hollow between the upper lip and the nose; *n*, the tip of the nose; *f*, the hollow between the nose and the brow. In order to find their respective representative points, proceed as shown in Fig. 2, by drawing (upon tracing paper) a tangent, YY, to both *c* and *f*. Then draw a short tangent to *n* parallel to YY (accidentally omitted in the Fig.). A tangent to

both *c* and *n* intersects the first of these lines at C and the second at N, and determines them. A line drawn from N tangential to *f* determines F. Thus the fundamental triangle CNF is obtained, in which YCFY is used as the axis of Y, and the length of CF (divided into 100 equal parts, here called "cents") determines the scale of measurement. In the life-sized portrait of an adult, 1 cent may be regarded as roughly equivalent to $1\frac{1}{4}$ mm. or to $1/20$ th of an inch. M, and consequently the triangle CMN, is determined by the intersection of one line drawn from C with another from N, both tangent to *m*. U and L lie at the intersections of tangents drawn in either case, parallel to X and CN respectively. They require less attention than the preceding letters, because *u* and *l* are usually small.

The positions of the six cardinal points may be expressed in either of two ways—(1) as in Fig. 3, by rectangular coordinates, YCY being the axis in Y, and XCX perpendicular to it, the axis in X. Or (2) as in Fig. 4, by triangulation. Here an additional line, NP, drawn perpendicularly from N to YCY, is convenient. I have compared both of these methods, and found each to have its advantages and disadvantages, depending on many variable causes, of which the scale of the portrait is one and the available in