ISHIHARA TABLES: COMPARISON OF THE NINTH AND TENTH EDITIONS

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The assessment of the quality of isochromatic tables can only be empirical. Since their principal use, however, is for the detection of grossly colour-defective individuals who, by confusing red and green, are a danger to, and endangered by, modern traffic, a merely superficial test may provide a sufficiently valid result. But when a detailed answer is desirable, as when a certain amount of colour confusion can be tolerated, it will be found that clear-cut answers are obtained but rarely.

Criterion for Comparison

In the comparison of two different editions of the Ishihara tables it is necessary to test a given patient with both sets of tables in a random order so that the effect of memory becomes unimportant. Some sort of criterion must obviously be developed in order to evaluate the answers numerically. In the present instance, adequacy (A) and inconsistency (I), which are defined below, were chosen to compare the ninth and tenth editions of the Ishihara tables. All tables show at least one figure which the patient can or cannot read according to his colour vision. Some of them provide an alternative reading: thus Table 4 is designed to elicit the answer 29 or 70. If neither of these answers is given, and the patient reads 20 or 79 or any other number, this is considered to be a failure (F). The total number of F is subtracted from the number of tables (24, if the sample No. 1 is omitted) to yield the adequacy, A.

In itself, however, the adequacy is not a sufficient criterion. It may happen that the patient is diagnosed as normal following one table, red–green blind following another, and totally colour-blind according to a third. Again, another man may be completely red-blind by Table 22 and completely green-blind according to Table 24. Such diagnoses are not self-consistent. If, for example, the first patient gives six "normal" replies, then there are six inconsistencies (I=6), since if he were normal he would have shown it more than six times. Similarly, in the second case I=1, as one of the answers is unsuitable for an adequate diagnosis. A perfected diagnosis consequently requires A=24, and I=0—that is, all the answers must have been foreseen by the author and the 24 separate diagnoses must not contradict each other. The theoretical reason behind values of A different from 24 and values of I larger than 0 is that most colour defects are of an intermediate nature—that is, the patients are neither completely red-blind nor completely green-blind—and it is impossible to design a set of tables all of which would detect the defect. There are, moreover, individual variations in the spectral sensitivity which vitiate any attempt to standardize the tables in detail.

Results

In the present test, standard illuminating conditions were observed and 10 subjects examined. Of these, No. 1 was normal, No. 3 a deuteranope, and No. 5 totally colour-blind (a cone-monochromat, v.i.). The other defects were not identified. Patients 9 and 10, who do not occur in the accompanying Table, were also cone-monochromats and could not read any of the tables except the first. The results obtained were as shown in the Table.

The two editions thus provide equally self-consistent answers, but the later set appear to be more adequate. It is uncertain whether the difference in this respect is statistically significant.

Patient	Adequacy		Inconsistency	
	9th Ed.	10th Ed.	9th Ed.	10th Ed.
1	24	24	0	0
2	16	11	4	7
3	21	20	0	0
4	18	18	1	2
5	18	18	1	1
6	17	20	1	0
7	15	21	7	6
8	18	18	2	0
	147 (76%)	150 (78%)	16	16

Both sets of tables seem inadequate for the detection of total colour-blindness. If the patient suffers from rod-monochromatism an Ishihara test is generally superfluous because he will probably suffer also from photophobia, nystagmus, and reduced visual acuity. But such patients (not listed above) were not found to follow the Ishihara key: they were invariably successful with Tables 6 to 9. The reason for this is no doubt that the rod-monochromat's sensation of light is limited to the response mediated by the rods: this will allow blue–green figures on a background, isochromatic for the normal photopic sensitivity, to stand out as light numbers on a dark background. Although patients 9 and 10 failed on every table, patient 5 would not have been detected as being totally colour-blind had more reliable tests not been available. Again, another patient who would have been classed as totally colour-blind on the strength of the tables was found to be a protanope when tested more severely. These findings re-affirm the opinion that the Ishihara tables can be relied on to discover red–green defects: as regards total colour-blindness, however, the reliability of the answers they provide is much less.

Medical Memoranda

Congenital Syphilis of the Lungs

The following case of what is now a rare disease is reported because, despite knowledge of all the significant facts, difficulty was experienced in establishing the true nature of the lesions.

CASE REPORT

A woman aged 26 gave birth to a stillborn female infant. The mother alleged that the infant had been born some five weeks prematurely. She had had a miscarriage four and a half months after her marriage, but since that time had had one normal pregnancy and no further miscarriages. Prior to her confinement she had not attended an antenatal clinic, and it was only after the post-mortem examination on the infant had been completed that it was discovered that both the mother and father had positive Wassermann and Kahn reactions. There was no significant family history.

Post-mortem Findings.—The body was that of a female infant of 5 lb. 11 oz. (2.68 kg.) and apparently full maturity. There was gross oedema of the face, chest wall, and neck. A quantity of clear straw-coloured fluid was found in the pericardial sac. The heart was normal in structure and size. The ductus arteriosus and the foramen ovale were patent, the latter being very large and showing no valve. Both pleural cavities were full of clear straw-coloured fluid. Both lungs were atelectatic, and scattered throughout their substance were numerous globular tumours varying from about 2 mm. to 1 cm. in diameter. These tumours were yellowish white in colour, and, on section, rubbery and uniform in consistency. A number of the more superficial tumours caused bulging of the lung surface, and were quite sharply defined. The only other abnormalities discovered