TABLE III—Deviation from Average of Each Subject's Ability for Three Auditory Perceptual Tasks

Subject No.	Deviation Ratio for:		
	Frequency	Duration	Rhythm
1	-1.1	+0.5	+1.7
2	+0.2	+1.8	+0.8
3	-0.1	+1.1	+0.4
4	+3.3	-2.6	-0.4
5	+3.9	-2.2	+1.3
6	-1.7	+1.7	+0.6
7	-1.4	-1.1	+0.1
8	+3.0	+1.9	+0.7
9	-3.9	+0.7	+1.7
10	-1.7	+0.3	-1.8
11	-2.0	-3.4	-4.7
12	+0.2	+1.2	0
13	+0.8	-1.5	-1.7
14	+0.2	+1.6	+1.3

nature (at least in part). A more detailed series of investigations is necessary to determine this conclusively, and is in hand.

Every subject had his hearing assessed by pure tone audiometry. All were within normal limits with the exception of subject No. 4, who had a bilateral loss of 35 db in the low frequencies during the period spanned by the tests.

Conclusions

The data reported here suggest two conclusions:

Given any one auditory perceptual task, there is a wide range of ability to perform the task within a group of normal healthy young people. Intuitively one feels that this is not an unreasonable finding. Individuals clearly vary in their musical talent and are said to have no sense of rhythm or to be tone deaf. Tone deafness is well recognized by the layman, though there is no medical evidence presently available to support the existence of such a phenomenon.

The second conclusion is more surprising.

Given any one individual, there may be wide variation in his ability to perform differing auditory perceptual tasks. Reference to table III and the graph confirms this. For example, subjects 4, 5, and 8 have a high level of ability to determine the tonal difference between closely similar sounds, but subjects 4 and 5 rate significantly below average in their ability to detect differences in duration of sound intervals, while subject 8 is above average. The ability to detect differences of rhythmic pattern is not so clear cut and is probably an expression of certain shortcomings in the construction of the test, of which

Discrimination profiles for three auditory tasks.

we are well aware. Nevertheless, the results as a whole show that there is no correlation between these various auditory skills. It was to explore this possibility that three widely differing types of task were used. It is possible to construct a large number of tests involving different acoustical events and features, and it may prove that the tasks reported here have less significance than others now under investigation or yet to be studied.

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MEDICAL MEMORANDA

Long-term Oesophageal Obstruction by a Foreign Body

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A case of long-term obstruction of the oesophagus by a morula stone (a fruit similar to a plum) in a child is presented. The child had vomited after meals for several months and was grossly malnourished.

The sites of arrest of foreign bodies in the oesophagus are discussed.

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Case Report

A 4-year-old Motswana boy presented with a history of several months' vomiting which occurred shortly after taking food. There was no other relevant history and no history of ingestion of a foreign body.

On examination, the child was thin and apathetic and weighed 18½ lb. (8.5 kg). No abnormality was found on physical examination other than severe malnutrition. Observation in the ward showed the vomiting to be regurgitation rather than true vomiting. Barium swallow examination showed a non-opaque filling defect in the lower oesophagus.

At oesophagoscopy, a hard mass was found at 25 cm which could not be extracted through the oesophagoscope with any of the instruments available. As the object was just above the cardiac orifice of the stomach a laparotomy to enable removal of the object through a gastrostomy was done and a morula stone 3 cm × 5 cm was delivered easily into the stomach from the oesophagus. The gastrostomy was closed in two layers with catgut around a gastrostomy tube which was brought out through a separate stab incision.

The child made a slow postoperative recovery complicated by

bronchopneumonia which responded to penicillin. After an initial period of intravenous fluids he was able to eat and drink without regurgitation. On discharge three weeks postoperatively he was well, able to eat anything, and his weight had increased to 26 lb (11.8 kg).

Comment

Reference facilities being limited in Botswana, a search of the English literature since 1967 only has been possible. In that time, however, no similar case of long-term oesophageal obstruction by a foreign body has been recorded nor has an earlier case been mentioned in the reports consulted on the management of oesophageal foreign bodies (Tucker, 1970; Hoeksema and Huizinga, 1971). Therefore, this case, if not unique, is at least unusual.

The number of foreign bodies found in the oesophagus has increased greatly since the end of the second world war (Hoeksema and Huizinga, 1971), including such objects as coins, pins, dentures, and bones (Rains and Capper, 1965). More bizarre oesophageal foreign bodies have been recorded in Africa such as a maize cob found in a Kenyan patient (Davey, 1968). However, the swallowing of a foreign body is usually witnessed either by a parent or sibling or heralded by the onset of choking, pain, or dysphagia. Rarely does an ingested foreign body give rise to long-term ill effects other than by penetration of the oesophageal wall.

Gray's Anatomy (1958) quotes four sites of anatomical narrowing of the oesophagus: first at the level of the cricopharyngeus, second where it is crossed by the arch of the aorta, third where it is crossed by the left main bronchus, and fourth where it pierces the diaphragm. The inferior constrictors and the cricopharyngeus, by virtue of their attachments to the laryngeal cartilages, have a fixed transverse

diameter. Therefore, most oesophageal foreign bodies are found in the cervical oesophagus (Tucker, 1970). Of foreign bodies which become impacted in the thoracic oesophagus, most are held up at or near the cardia but a few lodge at the constriction caused by the bronchus (John, 1969).

It has been said that the swallowing of a large, solid bolus such as poorly chewed meat will result in the object becoming impacted, usually in the lower oesophagus (Paul and Juhl, 1965). The morula stone swallowed by this child was such a bolus.

Morula is the Setswana name for a tree of the Anacardiaceae family, *Sclerocarya caffra* Sond. The fruit is the size of a small plum and pale yellow when ripe. It is aromatic and edible, being eaten by baboons, monkeys, and elephants as well as humans. It has the local reputation of making elephants drunk and is often a cause of choking in young children due to lodgement of the stone in the upper oesophagus. Like many African plants and trees, the morula has many medicinal uses—for example, the Zulus regard it as a potent insecticide (Watt and Breyer-Brandwizk, 1962).

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Haemolytic Syndrome Associated with a Red Cell Lipid Abnormality

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Until comparatively recently the biochemical lesions in haemolytic disease have been attributed to protein abnormalities—for example, enzyme defects or haemoglobinopathies. Many workers have noted abnormalities of cell lipids associated with these lesions (Shohet, 1972) but these have generally been regarded as a secondary feature. In the case reported here the evidence points to an underlying primary disorder affecting mainly the cell lipids.

Case Report

In October 1971 a 32-year-old man was referred to the Royal Free Hospital by his general practitioner for investigation of a

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12-month history of cyanosis. The patient, a chronic schizophrenic, had been psychologically dependent on 40-50 tablets codeine compound* daily for the preceding two years. During 1971 he had been treated with a wide variety of psychotropic drugs in more conventional doses. He had no other symptoms, and the past medical history and the family history were negative. On examination the patient had cyanosis of the lips, tongue, fingers, and toes. His skin was pale but he was not short of breath.

The haemoglobin on admission was 10.2 g/100 ml with a reticulocyte count of 22%; the blood film showed anisocytosis, polychromasia, target cells, fragmented cells, Howell-Jolly bodies, and Heinz bodies (14%). The platelet count was normal but there was a polymorphonuclear leucocytosis of 12,000/mm³. Contrary to expectation spectroscopic examination for sulphaemoglobin and methaemoglobin with a Hartridge reversion spectroscope showed no abnormality on three separate occasions. Arterial blood pH, PCO₂, and PO₂ were normal. Fresh and incubated red cell fragility showed two populations of cells, one with increased and one with reduced fragility. Autohaemolysis with and without glucose on 24 and 48 hours' incubation was within normal limits. Glucose-6-phosphate dehydrogenase and pyruvate kinase activity were normal. Tests for paroxysmal nocturnal haemoglobinuria showed nothing abnormal and starch-gel and paper electrophoresis showed no abnormal haemoglobins. The Coombs test was negative. The serum bilirubin never rose above 0.8 mg/100 ml. Routine biochemical, bacteriological, and radiological investigations showed nothing abnormal; in particular there was no evidence of renal damage. The cyanosis subsided within two days after discontinuing the codeine. The pallor improved more gradually over the next few weeks. During the next 6 weeks the Hb rose to 13.0 g/100 ml, the reticulocyte count fell to 2%, the leucocytosis subsided, and the appearance of the blood film improved.

After discharge in January 1972, the patient was followed up and

*This compound is now available as aspirin, phenacetin, and codeine sol. tabs. B.P.