of 4 ft.; then to the 9-ft. level there was a grey volcanic ash. At this level, concretions appeared, and these formations increased down to the 12-ft. level. Implements occurred throughout the deposits, and pottery was found to a depth of 3 ft. from the surface. There were no sterile layers.

Dr. Leakey's analysis shows that the industries of the 12-, 11- and 10-ft. levels can be classified as Early Stillbay; those from the 9-, 8- and 7-ft. levels as Middle Stillbay; those from the 6-, 5- and 4-ft. levels as Upper Stillbay; those from the 3-ft. level as Magosian; those from the top 2 ft. of deposit as late Mesolithic or Neolithic. This industry includes some crude microliths, and appears to be derived from the earlier Magosian. A few simply decorated sherds were also discovered in this level. The industries from the older levels are fairly typical, but the 4-ft. level gives us a transition stage between the latest Stillbay and the Magosian. An analysis of the different types of artefact found is given, and the article is well illustrated.

The rock-shelter at Gorgora is obviously of some importance. Such transition industries as those of the top 2 ft. and the 4-ft. level are very interesting. The excavations are not yet completely concluded, and it is to be hoped that further investigations at this site and elsewhere in the neighbourhood will be undertaken at a not too distant date.

M. C. BURKITT.

QUARTZ CRYSTAL MODEL

DIFFERENT types of deformation extend the range of frequencies that quartz plates can cover and a single plate may be used for totally different ranges when made to vibrate in different modes. To obtain most of these various modes of vibration the plates must be cut from the mother quartz at different angles with respect to the electrical, mechanical and optical axes of the quartz crystal. There are also special orientations which provide better frequency stability in cases of temperature changes, and these orientations are used where stringent temperature requirements apply.

A recent interesting article by F. Caroselli (*Bell Lab. Rec.*, **22**, No. 9; May 1944) describes and illustrates a large fabricated model of a quartz crystal, employed for showing more clearly the angular relations of the various cuts of plates to the original mother crystal. The model has an outer shell about two feet high that shows the typical shape of quartz as it grows in Nature, and an inner display of crystal plates. The shell and display tiers are made of sheet lucite and the plates are lucite, roughened to appear like etched quartz. The plates include those used for oscillators and filters.

About the vertical axis the outer shell shows an array of faces that repeat three times in exact symmetry. This is the optical axis, and it is the only direction through quartz along which a light ray will travel without dividing into two rays of different velocities which are refracted by different amounts. The shell can be rotated with respect to the inner display so that its faces can assume three identical orientations with respect to the crystal plates. Three pairs of X and Y axes are marked on the apron of the model to demonstrate the trigonal symmetry of quartz.

Before constructing the outer shell of the model, formulæ were developed from published crystallographic data to compute the angles between adjacent faces. All identical faces were made the same size by having the major apex faces meet in the vertical axis of the model. Minor apex faces were located at an arbitrary distance from this central axis.

The model illustrates cuts used in ranges varying from less than 1 kc. to 24,000 kc., and each one is particularly suited for a definite range of frequency. In addition, there are several different cuts operating over the same range but having some specific characteristic. On the top tier of the display there is a plate the coating of which is divided so that it will vibrate by flexing the major surfaces; and on the bottom tier are a number of plates of the same cut but with the coating divided to excite the third, the fifth or seventh harmonics of a longitudinal mode of vibration.

COLOUR TELEVISION

A DEMONSTRATION was given a short time ago by Mr. J. L. Baird of his recent achievements of the reception of television in colour by a method which avoids the need for revolving disks and lenses; the apparatus is thus silent in operation and is claimed to be as efficient as the pre-war black-and-white receivers. The pictures in colour are also utilized to produce stereoscopic effects by the use of coloured viewing glasses, the left and right eye pictures corresponding to the left and right eye images.

For the reproduction of the received pictures a special cathode ray tube, termed a 'Telechrome', is used; this differs from the ordinary tube in having two cathode ray beams and a transparent double-sided screen. These two cathode ray beams are modulated by the incoming signals corresponding to the two primary colour pictures; and they impinge obliquely on opposite sides of the screen, these sides being coated with fluorescent powders of the appropriate colours. Thus the screen has formed upon its front face an image containing the orange-red colour components, and on its back face an image containing the blue-green components. When the screen is viewed normally from the front, these images are superimposed and thus give a picture in natural colour.

Such a two-sided tube has been developed with a screen, 10 in. in diameter, and was shown receiving a picture from a 600-line triple interlaced moving spot transmitter using a cathode ray tube in combination with a revolving disk with orange-red and blue-green filters. The tube gives a very bright picture due to the absence of colour filters and the fact that special powders are used giving only the desired colours, which are seen additively.

A method of using three colours has also been described in a patent specification. In this case, the back of the screen is ridged: the two sets of faces of the ridges are coated with blue and green powders respectively; and they are scanned by two cathode ray beams, modulated by the blue and green components respectively, of the incoming signals. The third beam, carrying the red picture components, impinges on the front of the screen as before. A new form of scanning is also being explored, using successive lines of different colour, with the object of reducing the colour flicker which is obtained when, as at present, the colour changes are by frame to frame only.