the binary system and ultimately condensed into planets. He also suggests that "later encounters between pairs of planets while in the liquid state give promise of an explanation of the formation of satellites". Luyten and Hill have criticised Lyttleton's theory and have pointed out that the two colliding stars would retain about 94 per cent. of the length of the planetary ribbon and so only 6 per cent. of the length of the filament would become available for possible capture by the sun (the non-colliding component of the binary system) and subsequent formation into planets. Luyten has further pointed out that in order to capture even a part of the filament the sun must have been moving parallel to the filament for some considerable time and must itself have suffered a close approach or collision with the intruder. In the above case if the intruding start is more massive, the sun itself would be captured by it.

In a recent paper, Bhatnagar has shewn mathematically, that if there was collision between the sun's companion and a passing star, the distance between the sun and its companion would have been so much reduced that a second collision between the components of the binary system as well as between them and the intruder could not have been avoided. In the case of close approach between two stars without actual collision, Bhatnagar has calculated possible lengths of maximum tidal elongations and shewn conclusively that even at the instant of closest approach, no planetary ribbon joining the two stars is possible. It is evident therefore that so far no satisfactory theory about the origin of planets and satellites has yet been developed mathematically.

MANUFACTURE OF SCIENTIFIC INSTRUMENTS

BY

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THE manufacture of scientific instruments is an item of national importance, inasmuch as it occupies an eminent place in our scientific and engineering developments and corresponds to the manufacture of heavy chemicals in all chemical and allied industries. There is, of course, this important and obvious difference that the number of different heavy chemicals is small while the number of different kinds of scientific instruments is almost innumerable. The name *scientific instrument* indicates a classification suggesting that it represents a type of instruments employed in scientific pursuits in educational, industrial and research laboratories. Instruments employed in public utility services, like the telegraph, the telephone, motor cars, aeroplanes, air conditioners, etc., are also invariably scientific although they are not necessarily used in scientific institutions.

The present position as regards scientific instruments in this country is such that they are finding more and more employment in all spheres of life. With the spread of education, leading to higher standard of living and rapid industrial developments, the employment of scientific instruments is increasing rapidly. This is probably a good sign, suggesting progress, but unluckily the development is one-sided and somewhat unreliable, unless India can safely depend on manufacturing all the requisite instruments in this country and out of local raw materials. There have been and there are, even now, some enterprising concerns that endeavour to manufacture scientific instruments but the sum total of all such attempts is yet only a drop in the ocean. It would not be an exaggeration to say that the demand on scientific instruments and appliances is almost wholly met from articles of foreign manufacture.

The scientific instruments industry must occupy a peculiar position. It may not catch the imagination of the lay public, but it must be the special care of the industrialists. educationists and researchers, who should uniformly champion the cause of local manufacturers, because such a frame of mind alone can give proper encouragement to enterprising designers, inventers and mechanics. It should also be the anxiety of all industrial and scientific institutions to foster the spirit of depending, as far as possible, only on appliances of local manufacture.

There are already in existence about a score of manufacturers of scientific instruments in India, but most of them devote themselves to the construction of just those few articles that are usually employed in educational institutions. Their products are good and they serve a useful purpose, but the majority is still dependent on imported raw materials or ready-made components. In spite of this, the industry has made considerable progress. The passage through the assembly stage is unavoidable and yet very important; because it helps to train up workmen and develop confidence in their skill; it also gives the manufacturers time and opportunity to look about for local raw materials while the finished product, built out of foreign components, is becoming popular and attractive.

The other important question is as regards organisations which should control:

(i) the training and supply of skilled labour;
(ii) the testing and grading of scientific instruments; and
(iii) the marketing of the products.

Skilled labour for the various jobs in a scientific instrument maker's workshop is not easily available, and there is also no proper provision for training mechanics. Special faci-

lities may have to be provided for this purpose. It is also necessary to introduce, among the different manufacturers, the idea of specialisation at a certain stage. Each manufacturer makes all kinds of different instruments, with the result that the designers and the workmen have little chance of acquiring the necessary experience and skill to be able to produce articles of a definite quality. The purchaser, in spite of his anxiety to buy Indian-made articles, remains perplexed. It would, therefore, appear necessary to establish independent or State-controlled institutions which will be in a position to critically examine the different products of different makers and grade them properly. These institutions will also arrange to equip themselves with special expensive tools and precision standards which individual makers of scientific instruments can hardly be expected to afford and yet are required to employ.

The Universities and other public institutions which maintain large libraries will also have to widen the scope of their activities and endeavour to obtain literature bearing on the subject of the manufacture of scientific instruments, a subject which does not appear to have received much attention so far.

PROSPECTS OF HUMAN SURVIVAL

DR. KIRTLEY F. MATHER discussed the prospects of human survival in his Sigma Xi lecture delivered during the recent session of the *American Association for the Advancement of Science*, Ohio, 1940. On geological, palæontological and biological grounds, man will probably survive for at least some thousands of years. "Even if this present age is interglacial and not post-glacial, man's specific adaptability to extremes of climatic environment would enable him to survive. There is, however, one circumstance which militates against man's prolonged survival. This is the fact that in his conquest of the material world, which is the fundamental characteristic of his recent progress in civilization, man is using up his capital, such as oil, at a far higher rate than he is using his income, that is, the products of natural increase; and a further and even more alarming feature is that that capital expenditure is increasing progressively as the enjoyment of its amenities extends to the less sophisticated peoples. Hence, exhaustion of capital in possibly seventy years or less may seriously curtail man's future."—*Nature*, 1940, No. 3678, p. 663.

CENTENARIES

Ridson, Tristram (1580–1640)

TRISTRAM RIDSON, a British topographer, was born in a village near Terrington about 1580. He resided at Pembroke College for some years but left Oxford without a degree.

Ridson lived on intimate terms with his contemporary topographers and his *Chorographical description or survey of Devon* commenced in 1605 and completed in 1630 was a much used manuscript, till it was printed in 1714. Its value was such that it went through several editions till about a century ago. An index to this book was commenced in the *Transactions* of the Devonshire Association in 1894.

Ridson died in June 1640.

Duclaux, Pierre Emile (1840–1904)

PIERRE EMILE DUCLAUX, a French biochemist, was born at Aurillae June 24, 1840. Besides several papers he wrote more than half a dozen treatises of which his *Microbiologu* in four volumes is the most famous.

Duclaux was a friend and co-worker of Pasteur. He accompanied Pasteur to Milan when the latter visited the seeding establishment which had been named after himself. It was he that planned the *Annals* of the Pasteur Institute. Duclaux died in 1904.

Veitch, Henry James (1840–1924)

HENRY JAMES VEITCH, an English horticulturist was born at Exeter June 29, 1840. His father was himself horticulturist of his day. He was very keen in introducing new plants to cultivation. His firm were pioneers in orchid hybridisation. He was connected with the Royal Horticultural Society of which he ultimately became vice-president. He was awarded the Victoria Medal of honour in 1906 and was honoured by several other foreign learned societies. His two chief works are the *Manual of coniferæ* (1900) and the *Manual of orchidaceous plants* (1887–1894).

Veitch died at East Burnham Park July 6, 1924.

S. R. RANGANATHAN.