Bath Chairs, Bureaux and Birds

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An Aspect of Office Furniture by P.M. Bee

The project selected was an investigation into office furniture from an industrial producer/consumer angle.

The first stage took the form of an investigation into the needs of an office system in a modern office situation involving interviews with office users, the reading of research articles on ergonomics and office needs and then correlating these with knowledge of production and distribution processes in order to reach a solution acceptable to all concerned. Having had experience in assembly and delivery of such equipment I formulated my own ideas for the basic system which are laid down as follows:-

1) In order to reduce manufacturers assembly time and to ease transport problems the system should be K-D. Knock Down.
2) To minimise production costs interchangeability of components is necessary using only simple constructions and minimal parts.
3) Ease of mobility and adaptability in the office situation is vital.
4) A given "atmosphere" must be suggested by the furniture to reflect the values of the users in order that they do not become alientated.

Considering the above, the desk illustrated was evolved which fulfils all requirements whilst adding aesthetic qualities to the whole. Colour is used on the large areas to create the desired image; for instance, vivid colouring would give a "trendy atmosphere" whereas sombre tones present an air of grace. The surfaces must be tough in order to withstand the heavy usage and is suggested that they be resin coated in production with a vinyl working surface.

The drawer units are modular, interchangeable and mobile thereby catering for the various users requirements and also doubling up as filing cabinets, storage drawers, etc. It was this part of the system which created most problems both in design and construction as mass production techniques, which were unavailable to me, were required. My eventual solution necessitated that the units be low pressure moulded using polyurethane foam and as such facilities were beyond my means these remained in mock-up rather than prototype form. Assessing the project in terms of the design problem I feel that I have achieved what, if commercially produced, would be a great improvement in the field of low-cost office furniture.

Geriatric Chair by John S. Evans

A visit to an old people's home or geriatric unit of any hospital highlights the need for a well designed chair to suit the individual needs of the aged. For those suffering from such ailments as arthritis or similar disabilities chair comfort is essential. Geriatrics have particular problems in rising out of chairs and the brief design project was to design a chair to suit the individual ergonomic requirements of geriatrics and to develop some method of aiding its incumbents when rising out of the chair.

To determine the individual comfort needs of disabled geriatrics an anthropometric jig was designed and developed from the advice given by members of the Ergonomics Department at Loughborough University of Technology. The jig was used to record the relative positions of the lumbar, shoulder and neck of a seated geriatric, as well as seat height, depth, arm height and length. Ergonomic data was gathered from eighteen individuals (ages ranging from 62 – 75 years) at two research centres, namely, Leicester Royal Infirmary, and the Orthopaedic Hospital, Gobowen, Oswestry. The data showed that standardisation was impossible; that is the overall design must incorporate some form of adjustment. For

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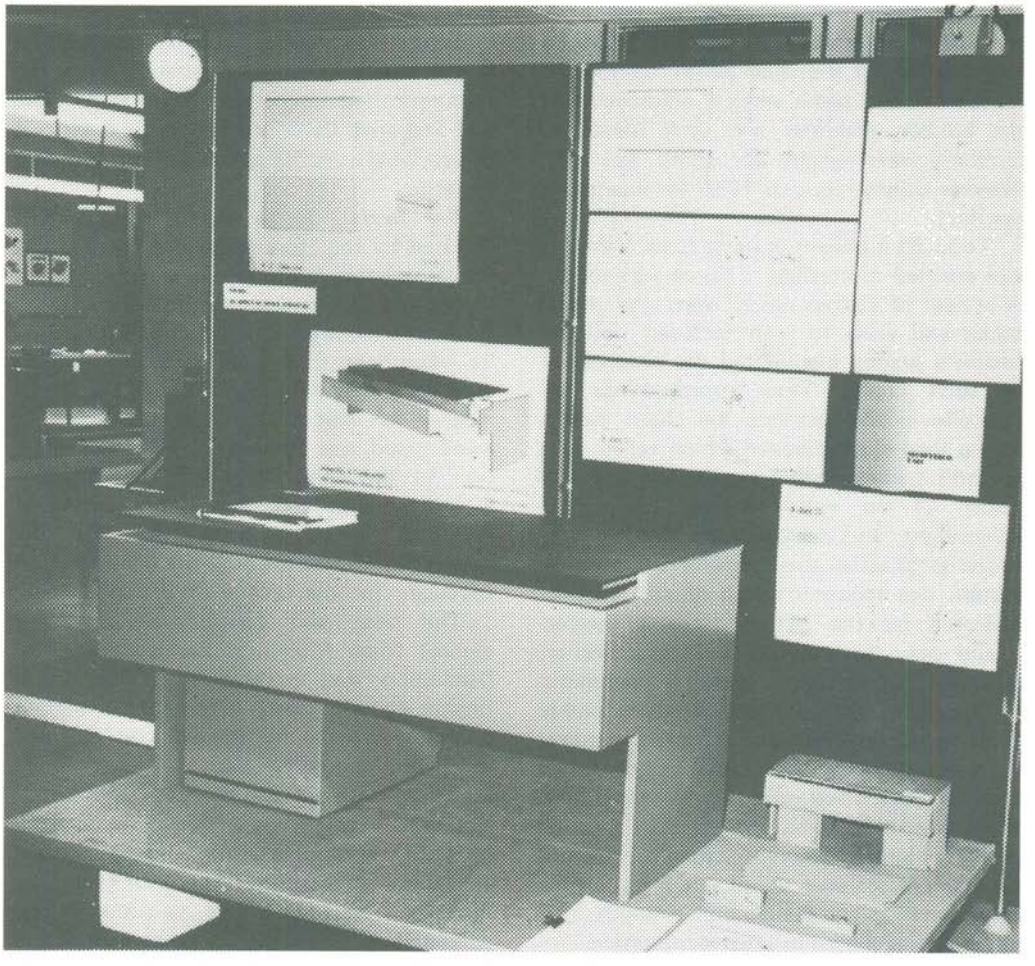

An aspect of office furniture

example from the recording of the back measurements it was possible to determine a back profile for the chair which required 2" horizontal and some vertical adjustment at the lumbar, shoulder and neck positions. Similarly seat height for some was 18" whereas others required 19½" for maximum comfort.

To assist a person in rising from a chair it was decided to consider a tip-up seat action. A review of various tip-up seats was undertaken and visits to manufacturers and old people's homes highlighted the inadequacy of such chairs. Their shortcomings lay basically in the fact that the chairs used a spring loaded mechanism which relied on a person's body weight for reloading and as a result, at the extremes (i.e. heavy and lightweight individuals), the spring was found to be either too strong or too weak. A system was required which could be easily operated by the patient; this it seemed would only be achieved by introducing an adequate power source within a pneumatic or hydraulic system. Various power plants were tested, ranging from a circulating pump to a small compressor attachment for a portable drill. Their main disadvantages were either excessive noise properties or inferior power potential. However when a refrigerator compressor was tested it conformed to both criteria, i.e. silence and strength, and was eventually used in the overall design.

Apart from the power source, the tip-up seat presented another problem, that of the action or locus of the seat. This problem was overcome by taking a series of photographs of a person from the seated to the standing position. From the photographs it was clear that a fixed centre pivot action would not support the thighs and the person would experience a tendency to slide off the seat when being raised. The seat action had to stimulate the leg action and the seat had to be designed to lift, not only at the back, but also at the front. This was achieved by incorporating a 'scissors' action beneath the seat.

Safety was another important aspect, and a seat which operated separately from the arms afforded dangerous finger traps. The seat and arms therefore had to be envisaged as one whole unit so as the seat raised so did the arms.

The overall design was to some extent dictated by the aforementioned factors, and the completed design had to incorporate the ergonomic, mechanical and aesthetic criteria. What was required was a chair which offered its incumbents the homeliness of a fireside chair not the cold precision of a piece of mechanical engineering and with this in mind wood was chosen for the main structure of the chair. It offered the psychological warmth and invitation essential in furniture designed specifically for the elderly, as well as the qualities of lamination necessary for the profile of the chair back.

The chair was upholstered using the correct foam rubber as recommended by Dunlopillo and covered in a 'Sanitized' Dralon material which offered hard wearing qualities essential for the old and infirmed who will be using the chair.

When the chair was finally completed it was taken to Thorpe House in Loughborough where some of the old folk tested it out. Initially, they were reluctant to try out the chair because of its mechanical properties, but eventually, once it had passed through its first test by an old dear of 92 years of age many others tested it out. The chair, after a morning's trial period, seemed to offer its incumbents both the ergonomic and mechanical properties necessary in a geriatric chair.

Quorn Aviaries by B. Naylor

It became evident in July 1973 that livestock kept by the children of St. Bartholomews Junior School, Quorn, Leicestershire, as part of a comprehensive educational

The Geriatric Chair

programme would need rehousing when they were transferred with the children to a new open plan complex on the opposite side of the village in September.

Faced with this problem Mr. M.V. Morton, Headmaster of the school, suggested that the pupils should be intimately involved both in the construction and utilisation of satisfactory breeding environments for captive budgerigars, canaries, small foreign birds and various rodents such as rabbits and guinea pigs.

The housing of birds was given first priority. Research involving the circulation of a ten page avicultural survey to 100 bird breeders in the Midlands followed by consultations at many private and commercial breeding establishments reinforced with valuable information gleaned from books, magazines and personal experience provided sufficient data to determine the primary functional requirements of an aviary. The secondary functional problems posed by the use of such a facility by young children were

also considered. This still left two major obstacles, economic viability and the production of a simple structural system for children with few if any skills and tools. Uncertain future curricula demands and the possible expansion or reduction of stock introduced pre-conditions of flexibility and adaptability within the design concepts.

Two cedar wood sheds, 10' x 8' were available but whilst suitable, with modifications, for temporarily housing livestock during the winter, they would prove unsatisfactory for use all year round. They also lacked aesthetic merit when viewed in relation to the environment in which they were placed.

A modular system of flights was devised to be used in conjunction with these or other sheds or in isolation as a complete design solution. It was primarily a geometrically inspired design based on a cube which later developed into a diamond shaped prism. The use of this feature in exploratory models revealed an interesting variety of possible combinations all of which had the potential of a satisfactory solution with both functional and aesthetic merit. A one metre module was used but was later modified to facilitate the use of 36" wide rolls of wire which unfortunately were the only ones currently available. Green, plastic-coated Twilweld wire was either ½" x ½" or ½" x 1" mesh was considered to be the most suitable for visual and protective requirements although it proved in the short term less economically viable. Douglas Fir and Baltic Pine in 28 x 28 mm finished section was chosen for constructing the supporting frame although it was found necessary to protect both with a non-toxic wood finish such as Cuprinol. Protective coated fittings were advocated to avoid oxidation and consequent deterioration but these were difficult to obtain. Clear wire reinforced plastic was found to be the most suitable material available for covering exposed areas of the flight giving protection to the birds during periods of inclement weather and affording security from attacks by cats and other predators.

The flights were designed primarily for children to construct with a minimum of supervision but may also be suitable for many aviculturalists who cannot afford to purchase a commercial product and would prefer to construct their own even though their skills and experience are limited. Hence no complicated joints were used, merely the application of a process first devised for the manufacturing of modular roof trusses. This involves the butting together of pre-cut lengths of wood, held with water resistant plywood gussets nailed into position to produce a set of modular frames without the use of glue. These are then jointed together with 6 mm coach bolts to form complete flights. It was necessary to design uncomplicated jigs to ensure that the joints would be secured at the correct angle whilst nailed together in a horizontal position.

Complete colour coded diagrams were produced to illustrate the position of each member in conjunction with assembly drawings, models and instruction sheets.

A single diamond prism shaped prototype was developed at Loughborough College which has been effectively tested for strength and functional efficiency with satisfactory results. Its aesthetic merit is subject to personal evaluation and can only be adequately assessed when seen in the context of the natural environment in which it will be placed. Proof of the systems adaptability can be found in the application of this same prototype for keeping rabbits and guinea pigs, simply by laying the unit in a horizontal position rather than in the preferred vertical position for birds.

The children of Quorn Junior School showed immense interest in this project and were able to complete one of the proposed flights with little supervision. Few practical difficulties were experienced except where the placing of screws was necessary for the holding of brackets and other fittings.

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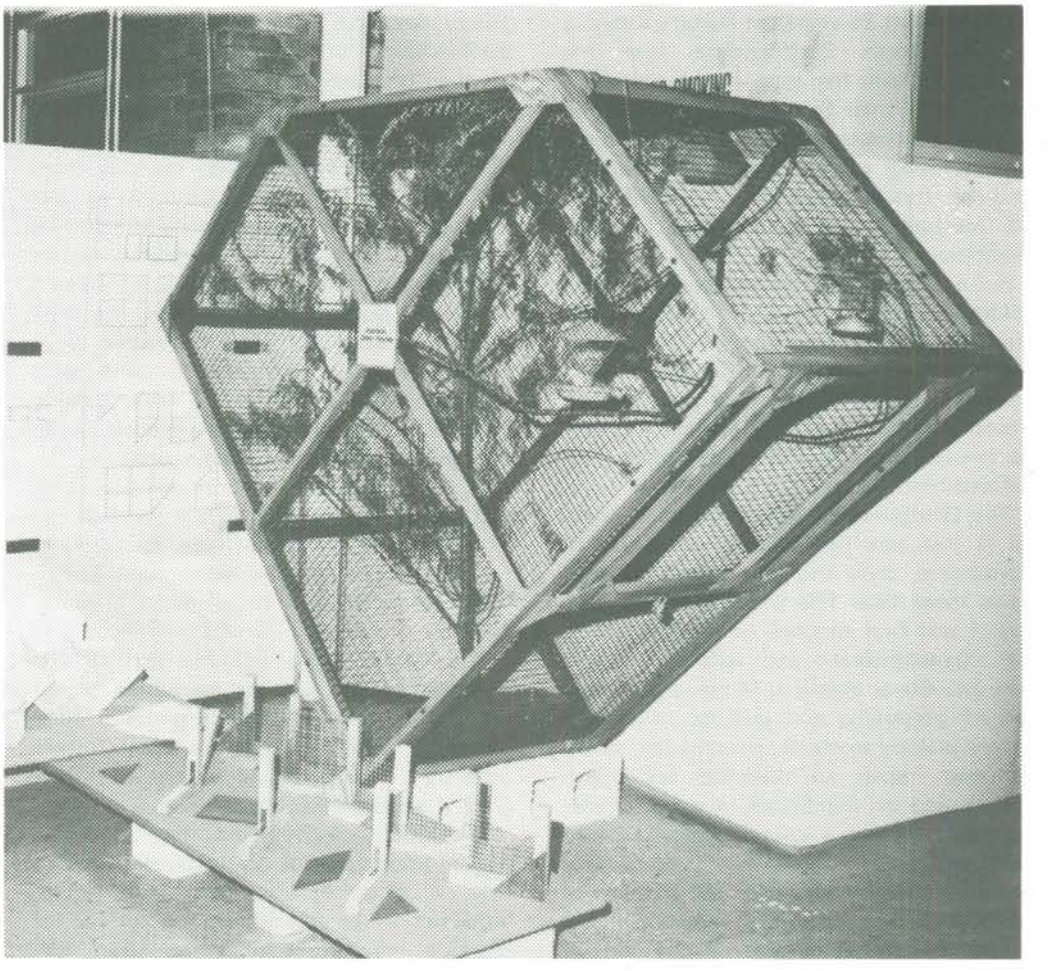

The Quorn Aviary