FRAGMENTS OF BOOKBINDING TECHNIQUE

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From articles in 'PAPER AND PRINT'

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VELLUM
FOR LETTERPRESS BINDING

IT IS NOW almost twenty years since I was asked to take over the binding of some vellum books which were not proving a success. The previous binder was pleased to unload the job, for his men were having a real headache over them. One of these books I took over I saw quite recently in a shop window with the sun pouring on it, and there appeared no sign of any warping of the covers even under those very trying conditions. I felt my theory for handling vellum had been amply proved correct. On the other hand, during a vist to Windsor Castle Library I was shown a vellum book bound about the same time, and the boards were warped so badly that the librarian had a grooved wooden slipper made to slip on head and tail to enable him to get the book into its place on the shelf.

The method of binding was similar to that used by the first binder referred to, and both cases were unsuccessful. It was the traditional method practised by the vellum binders of half a century ago. I should be the last to question the skill of those craftsmen, for I know many of them to be craftsmen of the highest order. Their work was stationery work and very different from the modern letterpress. Laminated hand-made boards, with often a parchment lining to counter the shrinkage of the cover, was their basis. Moreover, the books were pressed, tied up in boards, and kept under pressure for a minimum of three weeks before they were exposed to atmospheric action.

Modern conditions will not permit of such practices being applied to letterpress work, nor is it practicable or desirable to apply those methods to the lighter and more dainty reading books. During the seventeenth century limp vellum was much in vogue for small books and today many of them are as beautiful as ever.

Before proceeding, let us examine the nature and manufacture of vellum. Vellum appears to have derived its name from the same

source as veal, for vellum proper is calf skin. Parchment is made from sheepskin and foril is made from split sheepskin; and skiver may be made from the outer portion of the split. The word vellum is often used to designate other skins than calf and becomes an indication of method of treatment, and so there is pigskin vellum, goatskin vellum and any other skin that may be treated in the same way as vellum. It would be impossible for me to give a full technical description of the manufacture of vellum. That could run into several volumes, require the aid of many specialists, and then leave much unsaid. I have been assured that it takes three months to produce a skin of vellum satisfactorily.

The skins go through several processes of washing and cleaning before they are put into lime pits, where they remain for several weeks. The hair is then cleaned from the outside and the fats from the inside. Other cleaning and dressing processes follow, and whilst the skin is sodden wet it is stretched on a frame and again treated with dressing. At the right moment the surfaces on both sides are scraped over with a huge half-moon scraper and allowed to dry thoroughly before removal from frame.

All sorts of finishes can be put on the surface and the skins can be prepared for writing, printing, book covers, and many other uses. Pure whites and tones of infinite variety can be obtained. Some of the unbleached skins will give character of their own in a bewildering variety of colours and veins. Large animals will give thick, hard skins, and the softer varieties come from the smaller and softer-skinned animals. The ancients made many of their fine leaves for very small books from premature births.

Thus far we can conclude that vellum and the like is just raw hide, cleaned, preserved, stretched and dried flat, and any moisture applied to it will soften it, but in drying again it will contract to its original shape. Further, many skins are transparent in places and require lining. Therefore, the most natural thing to do is to line the vellum with paper, using paste as an adhesive and softener. That is exactly what the Victorian vellum binders did so successfully on their stationery books, and that is exactly what I ask you not to do on letterpress books.

The first approach is to keep as much moisture as possible from the side and thus avoid contraction. Instead of lining the vellum with paper, line the boards covering the edges and a double

lining inside and allow to dry throughoughly. Glue the boards with well-frothed glue, fix the vellum on the boards, allow to set thoroughly under pressure, with blotting paper to absorb what moisture there may be in the glue, and then consider the back and the turn-in afterwards. If and when a suitable non-aqueous adhesive is found, there will be no trouble with any contraction. The back, joint and turn-in can be moistened at will and the back lined with paper. The adhesive used can be either paste or glue.

The guiding principle, then, is to avoid moisture where it can be troublesome, but apply it where it can be helpful. The contraction on the back and joint is helpful in making the cover fit snugly to the book and the contraction on the turn-in can be helpful to draw in the edges towards the book. Vellum and its like can vary in its character extensively and many modifications in detail may be necessary, but all must come within the principle explained. As far as practicable, thin skins should be used on thin, small books, and increased in strength and thickness as the book requires.

In practice one has, however, many small pieces too small for large books and too thick for small ones. Within reason, this thickness can be reduced for back joint and turn-in by scraping. The best scraper I have found was made from a table knife cut straight across and bent over half an inch from the end as near right-angle as possible, sharpened from the outside, with a fine burred edge on the inside of the angle. The scraping is done by drawing the knife towards the operator. This has the effect of removing the outer hard crust on the inner side, releasing the fibres, and giving a great measure of the desired flexibility for light work.

In many of the fascinating seventeenth-century limp vellum books the vellum was turned over on itself without adhesive or the support of boards. The intriguing right-angled turn of the yapp fore-edge was adopted to keep the book flat. Those were days when books were not expected to stand on their edges, but the same effect can be obtained with the support of boards, but the turn must be stuck down.

From these tiny little limp books to the formidable Memorial Book illustrated there can be an infinite variety, and modification should be made to suit individual books. In the case of the Book of Remembrance everything that could be done for durability, drawn from individual experience, and the experience culled

from books from the dawn of the Christian era, was applied to this book with the purpose of making it last as long or even longer than any of its predecessors. I give, therefore, the outstanding constructive principles applied.

For such a formidable book vellum leaves were necessary. Skins were selected of a suitable flexibility for the size and thickness of the book, with a surface suitable for writing on. The number of leaves being pre-determined, it remained to determine the number of leaves to each section. Not too many for the thread, but sufficient for the thread to hold on to. Three four-page folds insetted made the best balance. The thread was the finest unbleached waxed linen thread. The sections were sewn on double thickness thongs of white vellumized pigskin. This is proved to be the most durable of all leathers, retaining its flexibility indefinitely.

The method of sewing was the original double flexible, where the thread pierced the thongs and then looped itself round them. The kettle stitches were reinforced and left as subsidiary raised bands. The swelling necessary to get the round and the joint was obtained by carrying the threads round the thongs between each section until the necessary one-third had been added to the thickness of the back. The ends were part of the section. The round formed itself from the swelling, and the joint was obtained by clamping with the backing boards, moistening the back until the sections were malleable enough to be forced over with a wooden concave tool, then well glued and consolidated.

It was not taken out of the press until the back was bone dry, for it would have been fatal for the moisture to escape beyond the backing boards. The back was lined up with stout undyed Niger morocco, well pasted and then well consolidated with the folder before it was quite dry and finally waxed to resist atmospheric action. Hand-made laminated rope boards, lined and counter-lined, and well seasoned, were used for the foundation of the cover. Recesses were made in the boards to correspond with the thongs. The boards were well glued, the vellum attached and pressed on a thick wad of blotting paper to ensure adhesion over the bevel. The turn-in was well moistened and made malleable with paste. Inside the yapp fore-edge a silver rod was fixed as an extra reinforcement. The space between the boards, constituting the back

and the joint, was lined with well-pasted hand-made paper and moistened to obtain the necessary malleability, and the thongs laced through to the outside only, the back and joints set in position and allowed to dry under pressure. The shrinkage of the cover set the back, the bands and the joints, and became part of the book.

It remained to lace the thongs inside and set them into the prepared recesses. The stones were recessed and fixed through the covers with U-shaped pins. The filling-in inside was a thin hand-made rope board, permanently fixing the thongs and the pins of the stones. The finishing is another story for another time. The cover was polished with a warm iron and slightly varnished. When the historian, in centuries to come, is trying to assess the social, economic and industrial life in this country after the second World War, in the midst of a mechanized world, this book will appear an enigma and perhaps we will smile, or perhaps not.

The courtesy of F. G. Marshall enables us to reproduce this binding on the frontispiece.

ADDENDUM

VELLUM SIDES FOR HALF-BOUND BOOKS AND VELLUM DOUBLURES

AGAIN I WISH to draw on past experience for my conclusions as to the best method of siding half-bound books with vellum. It is now over forty years since there was a boom in the West End of London for a special series of popular books to be bound in half Levant with vellum sides. This series was Black's colour-books, a very handsome demy, which sold as fast as they could be bound. My job as a finisher was to try to overcome the fault that had developed since it left the forwarding shop. This fault was the persistency of the vellum lifting along the edges contacting the leather. It was the job of we finishers to fix down those lifting edges, get them in the press and leave them until they thoroughly set. They came out of the press perfect, but a few hours' exposure and they were lifting again as much as ever. All the firms in the West End were working on these books and all but one were experiencing the same difficulty until the vellum sides were discarded as hopelessly impossible.

It fell to my lot some time after this to work for the firm that

experienced no difficulty with their vellum sides. I was all eyes to see what happened when the first batch of vellum sides was done. I learned much on that batch of books, which has proved useful in many other directions, for it proved a basic principle in the different methods of siding as one being conclusively better than another. As a provincial I had been taught to side a half-bound Levant book with a long slant pared on the leather after covering. If the sides were buckram or stout cloth, the material was taken to the top of the bevelled leather and when pressed the cloth sank into the soft pared leather and became quite flush. If the sides were a thin paper, then there was a filler of soft stout paper put down first, but this filler only came halfway up the bevel; the siding paper was naturally full size and again the pressing levelled up the side.

In London the method was to cut the leather straight through and fill in with a pulp board equal to the thickness of the leather and so there was a level side before the sides were stuck on. The sides crossed the cut by about one-thirty-second of an inch and after pressing, leather and filling yielded to pressure and again the perfect side resulted. This method could be a nightmare to the finisher for if the side were not accurately placed, the fillet would slip into the cut and there was trouble not easily overcome. The man in charge of this new shop I went to was a provincial and adopted the methods of siding I had been taught. Vellum had to be lined on account of possible transparency in places, but it was allowed to get quite dry under pressure. It was cut to size and glued with frothed glue and pressed immediately before turning in the edges. It was allowed to thoroughly set in the press and the vellum was quite flush with the leather when it came out.

The pared leather yielded and gave that extra pressure at the edges that was needed, making it impossible to lift. All that remained was to soften the turn-in with paste until it yielded and the perfect vellum side was the result. For vellum doublures pare the turn-in on a long slant, line the vellum, dry under pressure, glue with a frothed glue and set under pressure. If the boards need to be pulled in, paste may be used for fixing in the doublure, but always remember the contracting power of vellum is very great and pasting may overdo the contraction required.

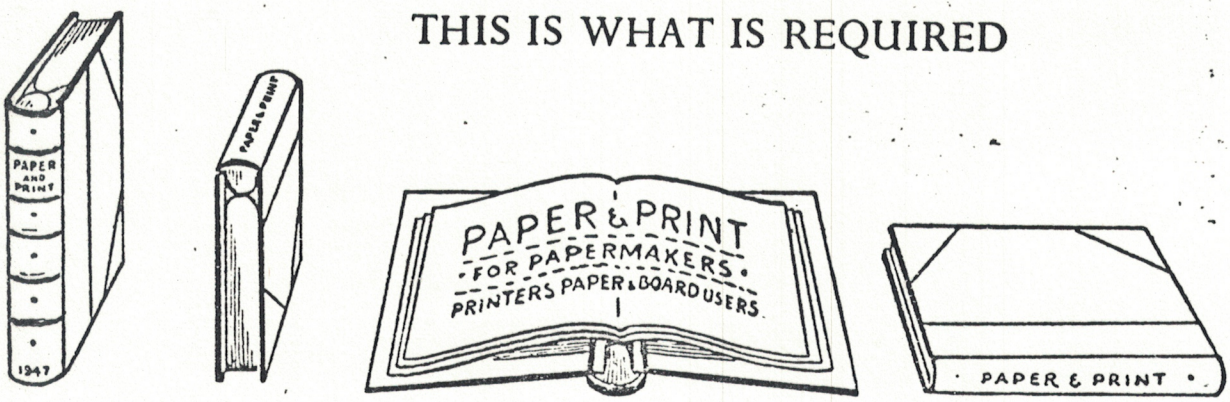
A METHOD OF BINDING A BOOK IN ONE SECTION

IN RECENT YEARS there has been a marked increase in the production of books of one section, with frequently a spread-over in the two centre pages, and sometimes other pages facing are imposed to open as one, making it imperative that the leaves open up flat. They are thread- or wire-stitched, often with a rather stiff cover and they are expected to function as an ordinary book. Everything is quite satisfactory about them until they are called upon to stand on the shelf. The problem is only half solved if a stiff cloth case is substituted for the paper cover, for it is impossible to letter the book on the back. In a large library, this book lettering is an essential feature of a book for ready identification. Many books (during the war) were published in this one-section manner by the Stationery Office; most of them were of exceptional importance and required careful preservation with that ready means of identification on the back.

One man whose business it was to collect all the Stationery Office publications and many other one-section books found himself with hundreds of books which became a problem to find because of the lack of the lettering on the back. He had appealed to his binder to do something about it, but he failed. When he came to me, he was in despair, and said please could I help him? It has occurred to me there may be many in a similar position, and so I thought I might give some details of the means I adopted to overcome the difficulties of these publications. They varied from an eight-page section to a section up to three-eighths of an inch in thickness and over.

First, a stub of paper exactly the thickness of the book is made and folded over the back as Fig. 1. Any paper with grain head to tail will answer the purpose, but the inside leaf contacting the book should harmonize with the existing cover of the book. For convenience of handling, the width of the stub at this stage, when

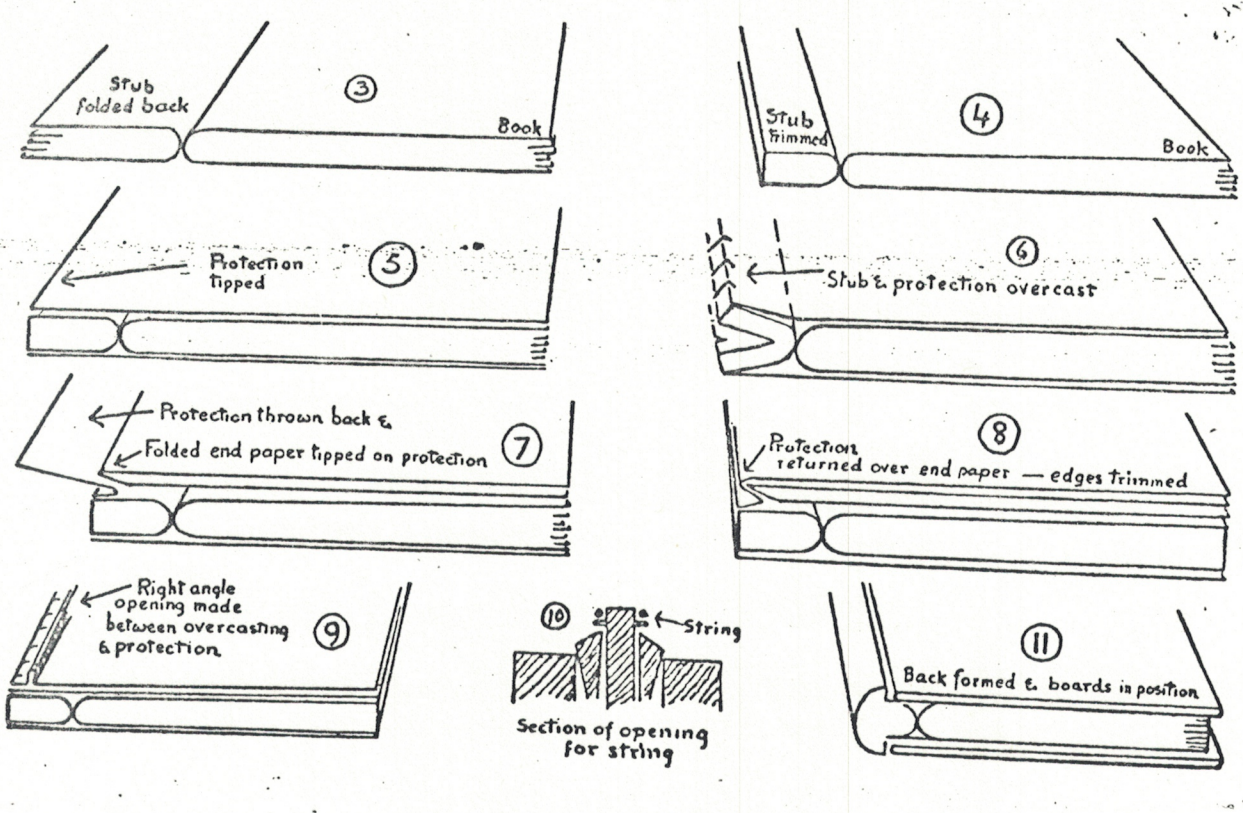
THIS IS WHAT IS REQUIRED



14

HOW THIS MAY BE ACQUIRED





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folded, could be about a third or more the width of the book. Previous stitching must be removed and stub and book stitched together as Fig. 2.

The strength of the thread and the length of the stitches must be determined by the thickness of the book. The thread should enter from what at this junction is the outside, pierce again from the inside the necessary distance and continue up to within a suitable distance from the edge, return through the same holes to the centre, continuing to the other edges and again returning to the centre where the knot is made. Fig. 2.

The stub is turned back on itself as Fig. 3. The stitching should be tight enough to allow free movement in opening, but not loose enough to give play between stub and book. The stub is trimmed very accurately parallel with the fold. The width is determined by the thickness of the book and the subsequent boards to be used, say a book of one-quarter of an inch thick could have a stub three-eighths of an inch wide. Fig. 4.

Fig. 5 shows a protection leaf tipped on the stub and Fig. 6 shows the stub and protection overcast together. On very thick books this may be done in half or even less of the stub at a time, and each series of overcasting stuck together. The distance of the overcasting should be slightly in excess of the thickness of the boards.

Fig. 7 shows the protection thrown back and the folded endpaper tipped on to the protection. Supreme accuracy of placing endpapers flush with back is imperative.

Fig. 8 gives the book with the protection drawn over and ready for the formation of the joint. Fig. 9 shows how the joint can be made with folder and straight-edge out of the press. Fig. 10 shows the book clamped in the backing boards with the protecting paper and the endpapers turned back with the folder to the thickness of the boards. In this position the book can be glued up and a piece of string laid in the right-angle formed by the turned-back ends. When about half dry, the back can be shaped up with the hammer, resulting in a book with a firm joint and back ready for any sort of cover, as Fig. 11.

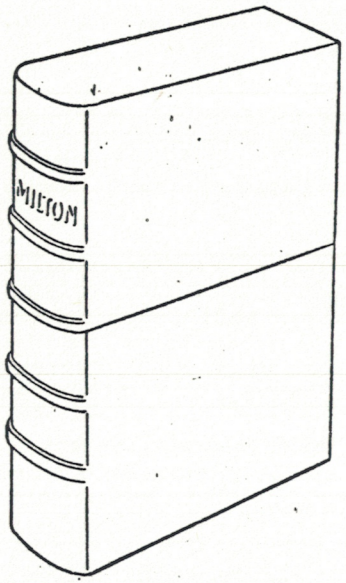
The back does not function in opening so that the cover may be tight back. Bands may be added if desirable. The ends may be reinforced with mull. A cloth joint can be overcast on in place

of the protection if added strength is required. In fact, there appears to be no limit to the variations that may be applied. If commercial considerations have any part in the job, then (heaven forbid it) the stub can be wire- or thread-stitched to the book.

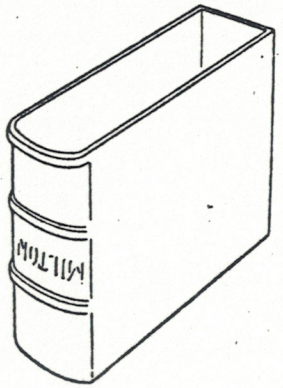
It will still function if the overcasting is cut out and the protection sheet tipped on only. In fact, wire-stapling can take the place of overcasting, but again I say, heaven forbid! The overcasting can be done by a machine that gives a zig-zag stitch, and the same machine will give a straight stitch which will run down the fold and join the stub to the book. Many stubs can be joined together by overcasting and become a simplified version of the Codex Sinaiticus method.

I hope someone will find this method as useful and fascinating as I have done myself.

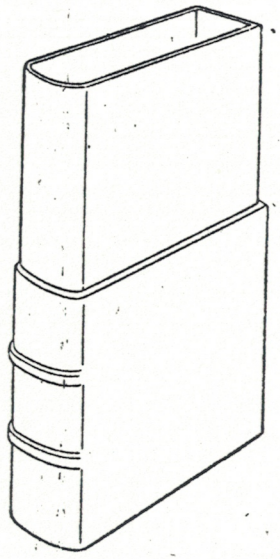
MAKING A MOULDED FIRE-RESISTING PULL-OFF CASE FOR VERY VALUABLE BOOKS



Moulded fire-resisting pull-off case (closed)



Lid from the case



Case with lid off showing leather neck

THIS CASE is misnamed by Americans as a Solander case. The Solander case was designed by Dr. Solander of the British Museum for conveniently holding prints and has no relationship whatever to the moulded case.

When the famous bindery of Robert Riviere and Son was burnt out about the year 1897 there were in hand many extremely valuable books to be put into moulded cases. The cases that were completed and contained the books were scarred but the treasures inside them were entirely unharmed. The books not yet in their cases were not so fortunate. It must be approaching a century since the eminent Mr. Joseph Zaehnsdorf, having made and delivered a moulded case to Mr. Quaritch, was called before a gathering of antique book lovers to be put to a very severe test of his confidence in his workmen and the quality of his boxes to withstand the test of fire. Mr. Quaritch asked him if he claimed that the case he had just delivered was fire-resisting. With his customary assurance, he unhesitatingly claimed that it was. Mr. Quaritch then picked up a book which he said was worth £400, put it in the case and threw it on a roaring fire which had been prepared for the test. The company fell into general conversation and waited.

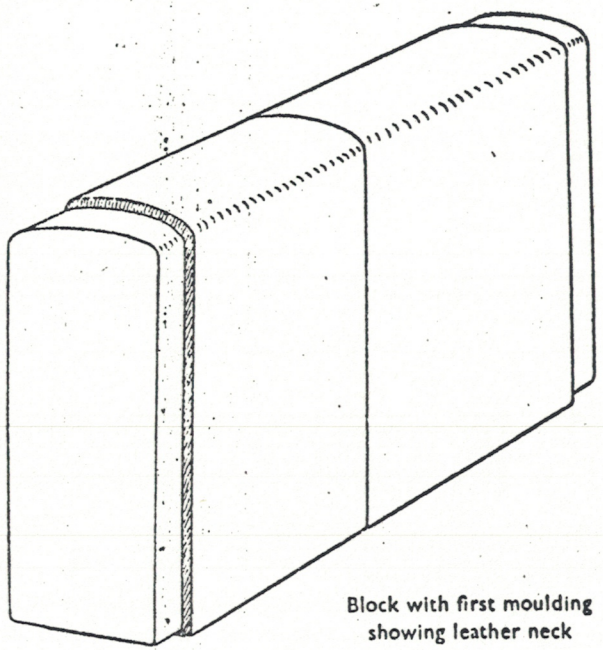
In the meantime, the fire was being constantly poked to keep up the fiercest possible heat until assured a satisfactory test had been made. There was, however, a further and final test made when water was thrown on the fire to cause something like an explosion. The poor charred case, which had previously been given devoted care, honest, careful and superb craftsmanship, was lifted off with the tongs, the lid removed and the £400 book was no worse for its ordeal. A triumph for Victorian craftsmanship and a triumph for Mr. Zaehnsdorf's confidence in his workmen. In a recent American book on bookbinding, a description of such a case, wrongly called a Solander case, is given and the method of making it. The method described is not fire-resisting to the extent of the Victorian one and I am afraid Mr. Zaehnsdorf would not have complacently stood by and witnessed such an ordeal with a case made to the American specification. It is now nearly 60 years since I first saw moulded cases made, but I have never been able to find out how and when they originated. My impression, however, is that they were a development of the fancy leather goods

trade, for in my youth I have made and seen many cigar and spectacle cases of similar construction. Not that this fact is any recommendation, but I know of no other origin, and I firmly believe their fire-resisting quality was never designed, but discovered by accident or intelligent anticipation before positive proof. There may be some doubts about their aesthetic appeal, but that is far out-weighed by the fact that a very valuable book, however far-decayed, can safely take its place on the library shelf without fear of further damage and an assurance of protection against fire.

In making one of these cases, the condition of the book must first be considered. A book in the condition of almost complete collapse may need a four-fold wrapper so that it can slip in the case without fear of further injury. If the cover only is frail then a simple folder is all that is necessary, but if the complete book is sound, the case itself is enough protection.

The first procedure, then, is to make a block the size of the book, or book and folder together, or book wrapper together, but extended in length head to tail about half as long again. The two measurements taken, thickness and width, back to fore-edge, must be dead true. The book must slide in comfortably without effort or strain or it may sustain damage, and when it is in its case it should be so snug that no movement will take place when the case is handled, for rubbing may injure a delicate surface. The block may be made of wood or built up with millboard, the surface made perfectly smooth and then well dressed with french chalk. An absorbent block may advisedly be treated with size first, and then well waxed.

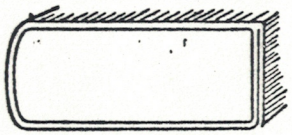
The block being ready, the case is now built up from inside, commencing with the lining. Paper, silk, cloth or leather may be used for lining. At this stage the lining must be substantially longer than the book, head to tail, in fact, almost as long as the block. Some craftsmen cover the block with a thin paper attached to itself only but not the block. They feel more confident of the lining not sticking to the block. I have not found this necessary myself. My own preference for the lining material is a good, smooth, hard sized, hand-made paper. The straight edge of the fore-edge can be used for making the overlapping join if the lining is paper, silk or cloth and may be doubled on the fore-edge. Leather may be spliced at one edge of the fore-edge. Whatever



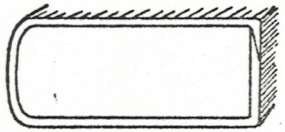
Block with first moulding showing leather neck

the lining consists of, the join must be very secure and leave no bulk to show on the outside, and it must fit perfectly snug to the block. There must, however, be no particle of adhesive escape on the inner side or it will stick to the block. As a precaution against this happening, when partly dry the lining must be moved up and down on the block to make assurance doubly sure this has not happened.

When perfectly dry, the lining can be removed, the book fitted in, and if all is well it can be replaced on the block and all subsequent operations proceeded with confidently. If the fit is not perfect, then the block must be modified accordingly and a fresh start made. A continuous series of layers of paper are glued or pasted to this lining, each layer drawn firmly over the previous one, and well rubbed down and consolidated before proceeding to the next. The fore-edge must be kept square and flat for the case will eventually be expected to stand on its fore-edge as well as its tail. A good quality brown paper is generally used for this moulding and it is most frequently glued. My own preference is a good quality



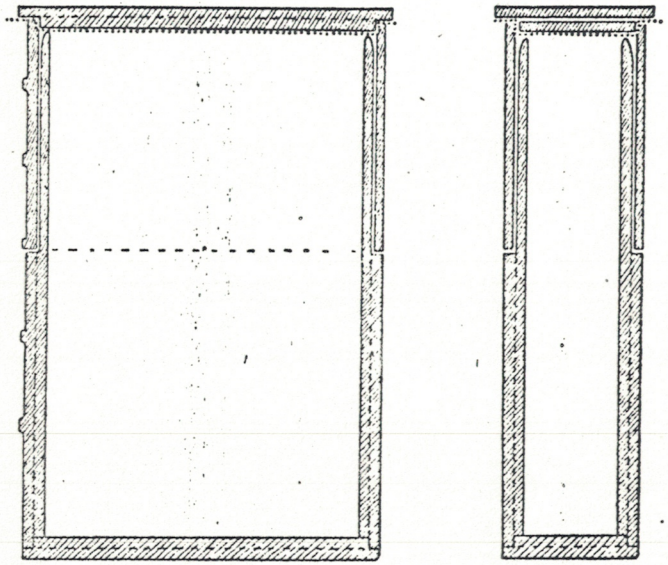
Section showing the overlapping lining on the fore-edge



Section showing the splice of a leather lining

hand-made paper, moistened well with hot water to soften the size and then pasted. This method, however, takes several days to dry, but this work can't be hurried if it is to achieve its purpose. It is advisable after selecting the paper to paste a number of pieces together up to the desired thickness and note how many layers are necessary to make that thickness, and when building to note that number. As a general guide I should say the thickness of the inner layer, which we are now considering, for a crown octavo book should be no less than an 8d. hand-made board which is equal to standard wire gauge 15. As these layers are drying, this interior should be occasionally moved on the block to make sure moisture in the adhesive is not causing any adhesion of the lining to the block. When bone dry, which may be several days, this first casing is cut perfectly true and evenly at the head and the upper portion finally becomes the neck requiring very special consideration. This neck will be covered with leather to about halfway down, rather more than less.

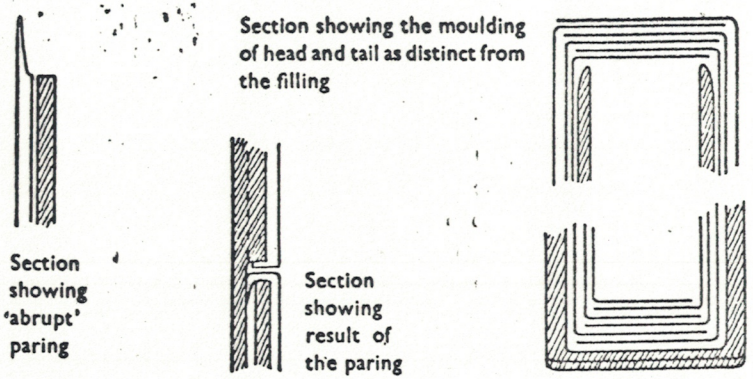
The leather must be of the finest quality, preferably a morocco, and may quite well be the same as the cover, but there is no objection to a lighter tone or even a contrast to the cover if so desired. It was customary to use what was called a bees-wing morocco, but as that appears to be non-existent the neck piece must be pared down very thin and very evenly. The top of this neck must be bevelled off so that the lid may eventually engage more readily, but to a distance not exceeding one-quarter of an inch. On the inside, to almost the same depth, the surface must be sanded down to equal the leather turn-in which should be pared to a feather edge. If bulk is left on this turn-in, the inner mould will not return to its place on the block and not fit the book. The join must be a feathered splice and made at one edge of the fore-edge, short only by one-thirty-second of an inch, and above all there must be no



Section showing untrimmed head-filling. The dotted line shows the fitting of the lining. The tail trimmed

bulk at the splice. When dry, this leather must be very highly polished, consolidated to the extreme, and leaving no irregularities whatsoever. It now only remains to complete the thickness of this inner case at the tail to the thickness of the leather-covered neck. One or two layers are generally sufficient, but it must be exact.

The inner case being complete, proceed exactly as before, building the outer case over the inner one, lining as previously, with frequent tests for assurance there is no adhesion to the under moulding. Any adhesion to the leather neck would be disastrous in the extreme. Again build layers of paper to the thickness of the previous one or even slightly in excess. Move the outer over the inner occasionally as it dries, but don't proceed further until it is bone dry. The two moulds may now be separated and the inner one carefully and truly cut off at the tail to the exact size of the book head and tail. Some people prefer the neck to be shorter than the book so that the book can be lifted out comfortably. Others prefer to have a thumb hole cut out, whilst others prefer a ribbon



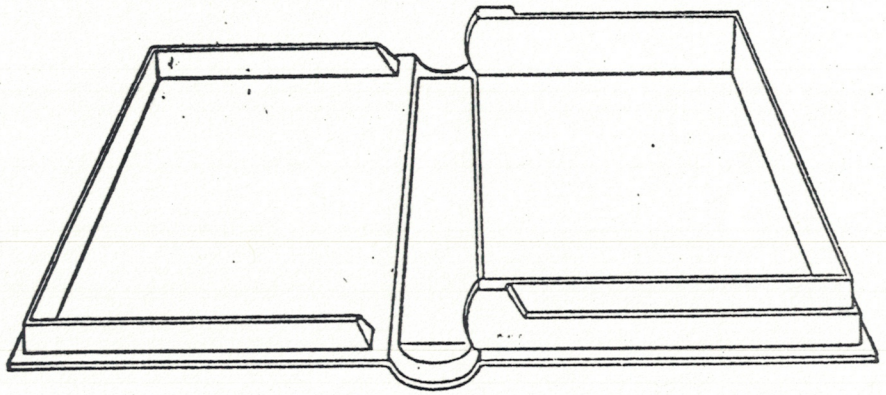
lifter. The short neck gives a feeling of the lack of complete protection. The ribbon lifter is generally neglected and lays in a crumpled heap at the bottom and the thumb hole is inclined to disfigure the book. My preference is to leave the neck full size and tip the book out into the hand. From this, the size of the outer case can now be determined, the lid cut off and the ends closed in. First cut two strips of good stout hand-made millboard exactly the size and shape of the inner mould. This will then fit just inside the outer mould head and tail. Place these temporarily, mark position and cut off the mould flush with filler. As there will be another similar piece of millboard on the outside of the filler, allow for this additional height, mark up the back for five bands and cut the outer case in two with a very clean cut, immediately under the third (i.e. middle) band. The upper portion can now be called the lid and the lower the base. These two portions now require to be filled in at the ends. Note which is the dividing line so that there is no confusion, for the wrong edge can easily be filled in by mistake and the fit may not be quite perfect. With the same material as was used for the original lining, line the already cut filler, leaving the lining a full quarter of an inch beyond the filler. This projection must be well glued and the lined filler filled into the head of the lid and the tail of the base, the glued edge of the projecting lining made to adhere securely to the inner and outer edges of the two ends. Then the second piece of millboard made about one-eighth of an inch larger than the outside, fixed securely to the inner one and allowed to dry under pressure. The projecting edges of

millboard and lining can then be trimmed off smoothly, any burrs, made by cutting removed, and the case is completely ready for covering.

This method is the tested London method of moulding these cases. I have, however, heard of the method of closing in the head and tail as weak in principle, for it is claimed this filling could burst out under explosion of steam. The alternative method is to make the block exactly the right size head and tail and mould the tail of the inner case as the sides are being done, and the head of the lid when the outer case is being built up. This is achieved by cutting the moulding paper large enough to cover sides and ends and turning the ends down when each new layer is added to the side. Whether this method will withstand a more severe test than the previous one, remains to be proven. There now remains a few points to be made on the covering. Although lid and base are in two pieces, for the uniform appearance of the side the cover should be cut out in one piece, divided afterwards and the two divided edges contacting in the final covering. The covering join should be on the fore-edge and be about one-thirty-second of an inch from the edge. The head and tail turned over from the side about one-quarter of an inch with spliced panels laid on afterwards. The turn-in of lid and base require very special consideration. The paring of the turn-in must not go one tiny fraction beyond the edge, otherwise there will be a most unpleasant dip where it is least desired when the lid and base contact.

The paring then must be abrupt and very fine. A little judicious sanding is necessary on the inside but only equal to the consolidated turn-in. The lid will be such a perfect fit that there will be no room for the turn without the removal of its equivalent. A fine blind line round the panels of head, tail and fore-edge will hide the joins and a little gold finishing will, as always, add further charm to a charming job. It now remains to fix the inner mould below the neck (with glue that will not ooze out) into the base and share with Mr. Zaehnsdorf the confidence in a job well done.

THE SOLANDER BOOK-BOX PORTFOLIO AND ITS AFFINITIES



IT HAS FALLEN to my lot to handle many of the very early Solander boxes in the British Museum, probably some of the original ones. My admiration for the craftsmanship displayed and the super-efficiency and durability in use is beyond limit. I knew they were originated by Dr. Solander but until quite recently he was only a name. I am, however, indebted to Mr. Howard M. Nixon, Assistant Keeper, Department of Printed Books, at the British Museum, for facts about Dr. Solander's association with that institution, which commenced in 1773 and lasted until his death in 1782. The Dictionary of National Biography says: 'A useful form of book-portfolio box designed by him is still known as a Solander case.' In those more spacious days they were often covered in full morocco with well-designed panels lined in gold both back and sides and broad raised on back. The foundation was in wood, with the frames generally in pine-wood and the top and base was what we called 'cabinet made,' i.e. a centre panel framed around to prevent warping. The corners of the box frames were beautifully dove-tailed, the back shaped out of one piece of wood and the tops and bottoms were glued and screwed to the frames. The base and lid were held in place by two spring

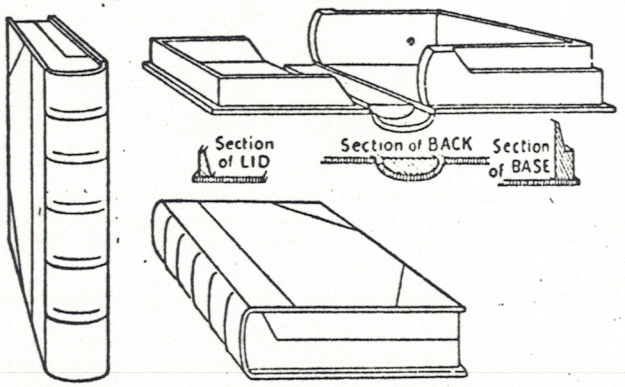
catches embedded in the fore-edge frames near head and tail. The fit was perfect and so skilfully designed as to be quite dust-proof. All very extravagant, perhaps, but I have handled some that have sustained injury by accident and returned them into commission after a full century of use. In that century it was obvious they had not been idle very long. The fancied extravagance vanishes on the long term policy and we of our generation have benefited.

A century of use in the British Museum is a very different proposition to the same period in a private library and the expenditure fully justified. They have proved themselves something more than dust-proof, for when Father Thames got out of hand some years ago and paid a most unwelcome and destructive visit to the Tate Gallery, some of those early boxes with their valuable contents were floating on the water for some considerable time. Whilst they were not designed to meet such a contingency, they were so well made that very little water got into them, reducing the damage so considerably that whatever expenditure was made on them it was justified a thousandfold.

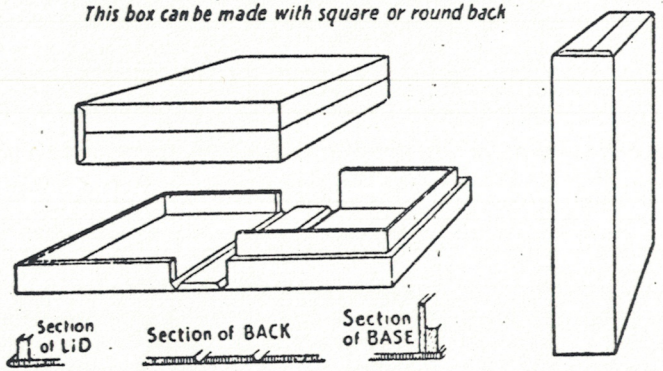
The convenience of the fall-down back is sometimes questioned and a preference shown for a fall-down fore-edge. One very famous London institute, much older than the British Museum, preferred the fall-down front, and it fell to my lot to supply them to their own specification. I watched the use of those boxes over a period of years and although the construction and covering were similar in both instances, the durability of the fall-down back could be counted in years as against weeks in the fall-down front principle. An analysis of causes of this discloses the fact that the true Solander imposes less strain on the hinges of the material by fully functioning from a right-angle when closed to a straight line when open. The fall-down front with a fixed back, however, strains its hinge at the back from a right-angle to about 60 degrees the opposite direction, with the added danger of someone leaning on the lid and completely breaking it off, which happened so often, causing considerable expense to repair. The introduction of three-ply wood in recent years has reduced the cost of these boxes very considerably without detracting from their durability.

There is much interesting evidence that previous attempts had

THE SOLANDER BOOK BOX — PRINT BOX

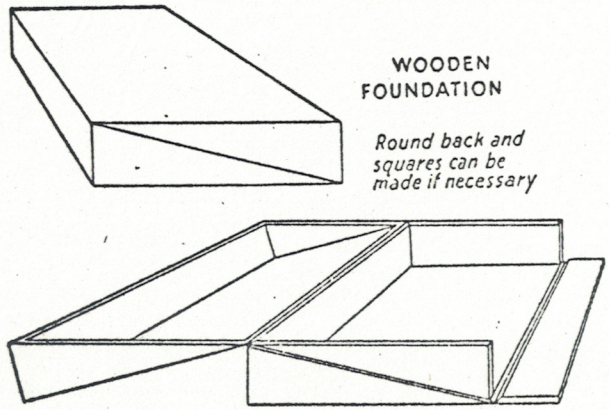


This box can be made with square or round back



FIXED BACK

FALL DOWN FRONT



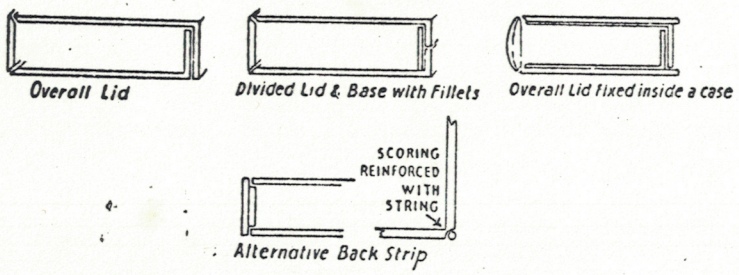
been made to save costs on the cabinet-made tops by substituting best black hand-made rope millboards, but these were not at all successful, for the tops were too heavy for the frames and their attachment was not secure for glueing, and screwing did not hold so well. A simplified form of the Solander box is most popular where demand on its use is not so great and its contents not so valuable. This is usually termed a 'Print Box' and belongs to present-day requirements, chiefly because it is so much cheaper and still retains a great measure of efficient functioning with reasonable durability.

The tops are three-ply wood with machine dove-tailed pine frames and usually without projecting squares, although these can be planned, but with additional cost and only an advantage if expected to stand on its tail on the shelf, which also necessitates catches. The inside fillets on the base for guiding and supporting the lid are loose until covered, when they are glued and tacked to the frame. Millboards may be used for these fillets without detriment.

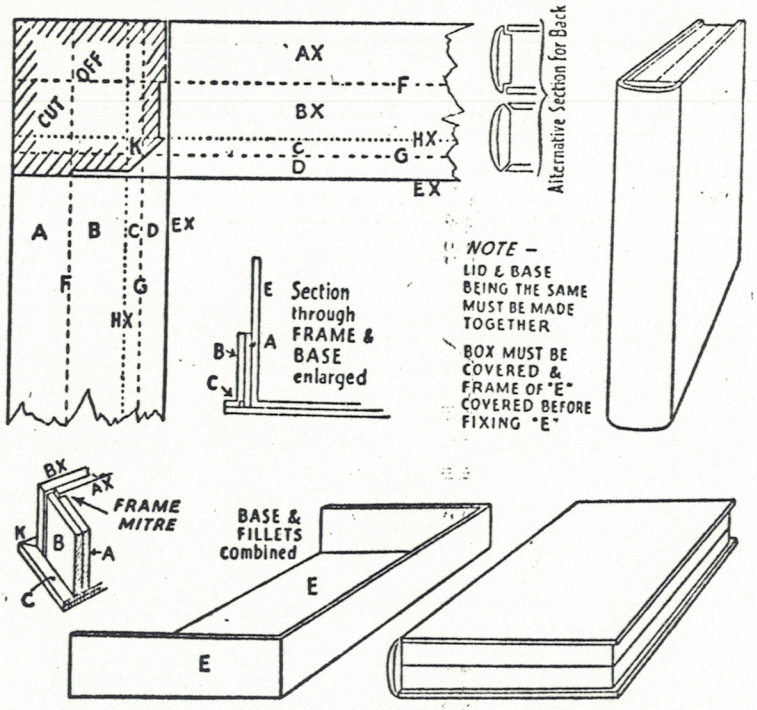
The woodworker has some delightful tricks when making these boxes. The base is marked out as required, the frames of base and lid are in one piece after dove-tailing the corners and are glued and screwed to the two pieces of three-ply. The projecting three-ply is cut off with a circular saw flush with the frames and then the frames are cut in two down the centre, also with a circular saw, and divided, making a perfect fit of lid and base. The fillets are added afterwards. There is a projection of the three-ply at the back equal to the thickness of the board, cut off at an angle of 45 degrees and the back strip is also cut off at the same degree so that top, base and back make perfect contact. There are other methods of making back attachments but the 45 degrees relationship is the most efficient in use and the simplest in covering.

Out of this box has developed a similar one for books on a millboard foundation and there are numerous ways of building it up. Perhaps the commonest one is where a base is made to fit the book and a lid made to cover the whole base. Usually the frames are just glued to the edge of top and base and reliance is made on the covering to hold the whole lot together. My own preference is scoring the board and bending up the frames. The opening of the scored line can be glued up and filled with glued string, making the frames

SECTIONS FOR MILLBOARD FOUNDATIONS



REINFORCED MILLBOARD FOUNDATIONS
SCORED AND MITRED FRAMES



E—scored base made to fit book. A becomes inside of frame, half depth of E. B—outside of frame, half thickness of board less than A. C—projecting squares. D—base of frame, equals C plus two thicknesses of board. EX—base fits at this line. F and G—deeply scored lines on outside. HX—scored line on inside. A and B must be glued together and pressed, C and D glued next and pressed; frame lifted and glued to base and mitre joined and left under weight.

MITRE CUT-OFF. A flush with line EX, B and AX plus one thickness of board, BX plus two thicknesses, K 45 degrees through junction G.

quite strong before covering and in consequence much simpler to cover. This box can just as readily be made with centre opening and fillets on a millboard foundation as the overall lid covering just described. In fact, the centre opening becomes essential when the book is very thick. For standing on the shelf projecting squares can be given to these boxes and rounded backs to harmonize with the rest of the library. There are numerous ways of doing this but perhaps the simplest way is to make top and base, cover the edges, make a case as for a book with a millboard rounded back, and securely glue top and base into the case. Of course it can never be claimed that a millboard foundation can equal a wooden one for durability, but we are living in days when it is difficult, if not impossible, to get these made in wood, especially when only one may be wanted.

This has led me to experiment on different methods of getting the maximum strength out of millboard for a good type box. I give a diagram of the one that has so far proved most satisfactory. Choice of board is most important in this case for it must be a board that can be scored and turn back on to itself. The principle is based on the print box. The variations and modifications for specific purposes of boxes with a millboard foundation is almost unlimited but I hope I have given the general foundation principles on which the variations can be made. In covering, all sorts of methods can be adopted and I find each individual craftsman has his own pet method. Edges may be covered separately, covers separately and fillets separately, all three being assembled after covering, or the whole box covered in one piece. The upper part, the lower part and the back can be glued and attached to its cover and left to dry before the turn-in of the edges is considered. This method is best for beginners, for it gives more time for planing corners of the turn-in. In the case of wooden boxes the wood must be well sized before covering and it is most helpful for millboard, especially if it is rather porous. This cannot be an exhaustive treatise for that would take many pages of diagrams and explanations, but it is hoped it will be a basic guide for individual invention. One warning, however: individual boxes can never be done cheaply. Millions, yes, but not one.