

REPORT: by R.F. Tylecote on the subject of a visit to
Her Majesty's Dockyard, Chatham, on Wednesday 1st November 1978.

The objects in question were two smitheries. No. 1 smithery was the first entered under the auspices of Miss Jane Geddes, of the Inspectorate, and we entered by what appears to be the main entrance on the south-east side. Immediately, we saw a stack in front of us (which is clearly marked on the drawing) adjacent to a partition wall, which is to be seen in the centre of the block. The stack was supported on four columns and seems to be of the original type, that is, probably dates to about the 1830's. In itself it is quite interesting but there are other similar stacks in either, or both, of the two smitheries. But below this particular stack was a sub-floor soaking pit which was certainly unique in these two smitheries. We saw no other example of this type of soaking pit. At the moment it is covered by a couple of steel plates which are oxy-acetylene cut and are therefore modern. We were not able to remove these two plates, which were of course too heavy and would need cranking, which, of course, was adjacent in the shape of crane No.5, but it is clear that the soaking pit is brick-lined and presumably has adjacent, below floor level, a coal-fired furnace which, of course, with the aid of the stack would provide the heating. Now, coal fired stoking pits have been, in the past, normal types to be seen in all the steel works but my feeling is that these are now completely obsolete in normal steel production works and, therefore, have probably been scrapped and are not to be found in such works in this country today. It seems that this soaking pit may be the last of its type. It is not marked on the plan.

Moving over to the south-west of the shop, we encounter a number of small, cylindrical forge hearths, stuck in the middle of the floor so that access may be obtained to them for localised heating of

large or lengthy objects (craneage of course was available for this). In the corners, with separate hoods, were a series of small chain-making hearths running along the south-eastern wall, adjacent to the main roadway. There is no doubt at all what these were; chain lies in profusion by them, they are standard smithing hearths and these are, in fact, the only ones that had hoods leading out for suitable ventilation. The other mid-floor hearths had no ventilation and, of course, it was clear that the ventilation was allowed to exit through the roof. All signs of pneumatic hammers adjacent to these mid-floor hearths were missing. The smithing hearths were not particularly unique; they had two water boshes, much rusted, near them and I presume one would find much more interesting ones lying around in the Black Country which would have been used by a cottage industry type of chain-makers, but I think it would be useful to preserve one of them and perhaps move it to a suitable site in smithery No. 2.

In the south-west part of smithery No. 1, there was nothing of real interest; there were more of these cylindrical forge hearths but the rest of the material in that corner had been scrapped; but in the south-western wall was an opening which entered into a large, specialised shop (which is not marked on the plan). This shop had two most interesting coal-fired heating furnaces, very wide, unusually wide compared with the coal-fired (for re-heating) furnaces in the smithery No.2. I would think that this shop was perhaps designed for the manufacture of anchors or the manufacture and repair of anchors. The width of the furnace suggests that something quite wide went in and one can imagine stocks and flukes and shafts of anchors etc. being put in. There was a central bending and working floor at a high level so that the components could be slid from this floor into the re-heating furnaces at either end (again, these were coal-fired by side-combustion boxes as were indeed

all the reverberatory type heating furnaces in the smitheries).

There is really nothing more in this shop of particular interest. At least one of the cylindrical, isolated forges should be preserved but I think that there is a better one, more worthy of preservation in smithery No. 2.

Adjacent to this area on the south-west corner was a machine shop, and what looked like a locksmith's shop. There are a good number of blanks for keys, and small working benches that looked like those used by locksmiths. One of the things that was most noticeable about this and the other smithery was the fact that there was no gas supply and the heating was done either by coal, in the case of the reverberatories where a long-flame fuel is wanted, or by coke for the chain-repairing forges. No other fuels seem to have been available. But there was a steam supply and the pneumatic hammers, which have all been removed, were supplied by a central compressor somewhere or other. I notice on the plan of No. 1 smithery that there was a boiler house and an air compressor house which would supply all the necessary power. It is interesting that no gas was installed at any time. I don't think there is anything more to say about this building. Compared with No. 2 smithery, No. 1 smithery does not seem to have very much worthy of preservation. It's rather rather an uninteresting building internally and the "steelwork" is not particularly interesting nor remarkable. From point to point there were these square bending slabs - that is the slabs into which one inserts pegs like a peg board for the bending of the various rods which had been heated in the isolated forge hearths in the middle of the shop. One thing that was noticeable in the adjacent area to the south-west - probably the anchor shop - was a whole pile of things that looked like enormous wedges with holes at the back. These may have been cutting implements to be used by forge hammers

for cutting pieces of bar in two - they are somewhat blunt but a sharp wedge would soon lose its edge when cutting through hot metal. But it does occur to me that we could get a lot more out of the subject by interviewing some of the old workers that must be around and I think that Miss Geddes should take out a tape recorder some time and go around and try and interview these people before they disappear.

Across the road from No. 1 smithery is No. 2 smithery, marked No. 11 on the Chatham plan of 1830, which is marked as M on the plan of 1976. This is a larger and more modern unit but it has an interesting "steel frame" (almost certainly all wrought iron). This structure would cost an enormous amount to preserve because it needs a great deal of scaling and repainting. In a way the structure is much more interesting than that of No. 1. The main occupation of this smithery seems to have been in plate bending. That is, we have extremely long heating furnaces and a very large laying-off floor. This is full of peg boards, i.e. cast iron plates with holes in them, which were designed for steel bars placed vertically around which red-hot metal was bent. The metal was heated red-hot in the very long heating furnaces; there are in fact four of them which were coal-fired at intervals by fire boxes along their length. These furnaces terminated in stacks somewhere in the middle of the building - no longer visible either on the plan nor in fact. These were needed in order to get the necessary draught. Adjacent to these very long and very narrow re-heating furnaces were a series of wider and shorter reverberatory furnaces for rather wider work. In some ways these resemble those in smithery No.1 annexe, which I call the anchor shop. Items that had been heated were taken out of these furnaces, across a track, which would seem to have been a transport track. On the plan I notice the word "bevelling machine" which would be capable of cold bevelling by oxy-acetylene.

I can't think of any other method of bevelling narrow plate for bending. This machine would be used for putting a chamfer on the edge of the plate for arc welding. It seems to be odd having this machine in the position shown, as it would be used on cold sheet. The track was used for a bogie which would allow metal to be taken out of any one of the four heating furnaces and put in any position on the laying-off floor.

To the south-west of the very long heating furnaces are a series of the usual cylindrical or tubular forge furnaces - the isolated forge furnaces with their craneage. One of these is most interesting because it shows the top, brick, superstructure that was necessary, and no doubt widely used in some of the others, to heat a bar locally and these bars would have been placed on top of the forge furnaces horizontally. That is, one builds a muffle furnace over them and packs it with coke. The forge furnace would be receiving its air supply from underneath presumably via a flexible hose, as there is no indication of any permanent air supply across the floor; but there are disconnected hoses lying around which connected the forge furnaces to points in the compressed air main.

The bulk of the material from the shop has been removed and it is only the furnaces which are of particular interest.

Conclusions and Recommendations.

A lot of the equipment in these two smitheries was not so long ago standard in shipyards, generally, throughout the country. Once the iron ship came in, repairs and manufacture required bending facilities and the cheapest way of doing this was by means of the coal-fired heating furnaces and the laying-off floors. It is quite clear that the main function of these two smitheries was precisely this, for plates, rods, tubes and bars. I suspect that in some of the older ship repairing yards of this country we could find similar

equipment to what is present at Chatham. But this must be fast disappearing with the advent of arc welding. With the use of standard rolled sections with oxy-cutting and arc welding, the old job of bending wrought iron has diminished considerably and the bending of mild steel also. I have enquired of my friends in the steel-producing industry and they tend to think that all the old coal-fired heating furnaces have gone completely and one would not find any in the industry. I have before me a 1978 calendar put out by Priest Furnaces Ltd. of Longlands, Middlesborough, Cleveland, and this shows a coloured drawing of a recuperative slab re-heating furnace designed in 1925 for the South Durham Steel & Iron Co. It shows what is clearly a coal-fired furnace but one with a recuperator. I would have thought that this would have been one of the last of its type. It might be worth finding out whether this was the end of an era or whether it went on longer. After this, gas firing became normal.

I would recommend taken over smithery No. 2 with the interesting "steel work" and the series of coal fired reheating furnaces. The laying-off floor would not cost much in maintenance. Smaller items from smithery No. 1, i.e. the chain hearths and one or two of the cylindrical forge hearths and craneage could be moved into the north-east end of smithery No. 2, especially into the south-east corner where there would be some space available. This is an area with very interesting overhead steelwork; but it would certainly be costly to clean up and maintain this steelwork. This leaves only one interesting exhibit in No. 1, i.e. the underfloor soaking pit. There is an old type of stack in No. 2 of interest, but it might be possible to move both soaking pit and its stack to smithery No.2. This would leave quite a lot of space for other items in No.2 which could be utilised

- the wooden laying-off floor in the north-east corner would seem to be quite useful. The only problem really is that smithery No.2 is more recent than No. 1, but the former contains the more interesting collection of equipment.

4th November 1978.

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