The title of this paper is perhaps a little misleading since it is really concerned with the half-crowns of the Truro mint dated 1642. The same obverse die, however, was used on some half-crowns at Exeter in 1644 and again in 1645, so that, inevitably, the coins must be considered to some extent in relation to the other Truro and Exeter pieces.1

The type of the 1642 half-crowns portrays the king riding to the left on a galloping horse and holding in his left hand a baton. The reverse is an oval garnished shield (Pl. XI, 1). The design is considered to have been taken from the Scottish Rebellion medal by Simon of 1639 (Pl. XI, 2).

There are two reverse dies, which differ only in the placing of a pellet on either side of the mint-mark. There is only one obverse die (Pl. XI, 3 for reverse without pellet).

The authenticity of these half-crowns has been questioned by some numismatists in recent years, due mainly to the unusual appearance of some of the coins. Without actually examining specimens it is difficult to describe their exact appearance, and, unfortunately, the differences would not be apparent on a plate. Some of the known specimens have the appearance of being contemporary pieces, but the majority of them have a somewhat waxy surface, are very perfectly struck, slightly concave and very circular. This has led to the view amongst some numismatists that they are, perhaps, later copies. Moreover, the majority of these coins give the impression of being machine-made and this has hitherto underlined the doubt as to their authenticity.

In this paper, however, we intend to try and show that the coins are, in fact, all contemporary and that they were indeed machine-made, and not struck by hand. No one has, as yet, put forward any definite theories as to how or when these coins were produced, and there seem to be a number of possibilities:

(a) The coins are all contemporary and struck by the hammer.

(b) The coins are all contemporary, some being struck by hammer and others by machinery.

(c) Some of the coins are contemporary pieces and those of what might be termed 'modern' appearance are later copies produced, perhaps, in the late seventeenth or eighteenth century, presumably by a mill and screw press.

(d) The coins are all contemporary and all machine-made.

We propose to discuss the coins in connexion with these possibilities and, as we have suggested, we hope to bring forward evidence to show that

possibility (d) is the most likely. Our researches have been made along four main lines of thought:

1. Consideration of the available historical evidence concerning the Truro mint.
2. Examination of the weights of the coins and their relation to other half-crowns of Truro and Exeter.
3. Microscopic and spectrographic examination of four 1642 half-crowns, and also three other coins for purposes of comparison.
4. Examination of the coins themselves and their relation to the other coins of the Truro and Exeter mints.

1. HISTORICAL EVIDENCE

In considering the historical evidence, we are indebted very much to Miss Mary Coate, who published a paper in the *Numismatic Chronicle* in 1928 entitled ‘The Royalist Mints of Truro and Exeter’. Miss Coate obtained most of her material from contemporary records then held at the private home of the Vyvyan family at Trelowarren. These papers are now lodged at the Truro Museum.

Sir Richard Vyvyan was commissioned on 14 November 1642 to coin money, and a mint was established at Truro. There was no mention in the commission that any specific engraver was to be employed, but Sir Richard Vyvyan was asked to send three messengers to procure ‘Pyoners and Tooles up to seven or eight dozen’. ‘Pyoner’ was the local word for a working miner, and there is no evidence of any skilled engraver having been employed. There is, moreover, no evidence of machinery at the mint, and the list of tools at the mint, seized from Sir Richard Vyvyan’s house by the local Parliamentary Committee in 1646, does not include any mention of it. This, however, was some four years after the mint commenced work, and since only a relatively small number of the Truro/Exeter coins can have been struck by machine, it is quite probable that, by then, the machine had either been destroyed or was no longer in operation. The absence of evidence of the existence of machinery therefore does not, we think, preclude the possibility of its use, and the type of machine we have in mind, which will be referred to later, could easily have been made by local Cornish miners. A parallel case would be the Irish Ormonde money coins, which are definitely considered to have been struck by machinery, although no evidence of it exists.

Miss Coate’s paper makes it clear that the mint tools were provided locally and not by Bristol or Oxford, and the general evidence is that the bullion was also supplied from local plate and not from elsewhere.

The designer of the 1642 half-crowns must obviously have been a skilled workman, and it is possible that Sir Richard Vyvyan obtained a goldsmith from Exeter, which was noted as a goldsmiths’ town, rather than Truro. It may well be that this engraver did not accompany the mint when it moved to Exeter, and the general standard of workmanship of the Exeter half-crowns falls considerably below that of the 1642 pieces. Although the 1642 obverse die was used at Exeter in both 1644 and 1645 (Pl. XI, 4 for reverse of 1644 half-crown) its use there may have only been accidental, since both
these coins are extremely rare, and the 1645 piece, of which there is a specimen in the collection of the Earl of Ellesmere, may be unique.

2. **Weights**

As will be seen from the table showing the weights, we have weighed a number of specimens ranging from the 1642 half-crowns to the last issues of Exeter in 1645. In the case of the 1642 half-crowns, the specimen in the Ashmolean Museum is of low weight (206 grains) which is substantially less than the next lowest coin, which weighs 213 grains. Despite the inclusion of this lightweight piece, the eleven 1642 half-crowns weighed gave an average weight of 220 grains, which is completely consistent with the average weights of the other types, as the table shows.

Incidentally, the coin in the Ashmolean Museum was presented to that museum in 1745, so that this piece cannot be one of the fairly extensive group of forgeries produced towards the end of the eighteenth century. Snelling and Folkes (c. 1750) also illustrate the type.

The main conclusion to be drawn from examination of the weights of the series is that the average weight of the 1642 half-crowns is quite compatible with that of other coins of the period and, therefore, we can safely say that their authenticity cannot be doubted from the point of view of their weight.

3. **Microscopic and Spectrographic Examination**

Two specimens of the 1642 half-crowns were submitted to the Royal Mint for microscopic examination. These two coins were very kindly lent by Dr. Burstal from his collection. One of these pieces is an example of what we have called a ‘modern looking’ specimen, and the other is of a much more authentic appearance but is considerably worn.

A specific gravity test was carried out and showed that the coins were struck from silver of even higher standard than the normal alloy and approaching that of pure silver. The microstructure revealed that both coins were struck and not cast.

The two important points revealed by the Royal Mint analysis are, firstly, that these two coins were made from extremely good quality silver and, secondly, that they are struck pieces and not cast.

*Spectrographic Analysis*

Professor Thompson, of the Department of Metallurgy at the University of Manchester, very kindly carried out some spectrographic tests on seven coins, the results of which are set out below. The coins submitted were four 1642 half-crowns, a half-crown of Truro of the later type with oblong shield on the reverse, an uncertain half-crown, and a Tower Mint shilling Type 4. The last two coins were included merely for purposes of comparison.

It will be seen immediately from this table that the analysis of the four 1642 half-crowns is extremely similar, and particular mention should be made of the high gold content, namely 3 per cent. in each case. This suggests that the coins were struck from gilt plate.

Further evidence to support the view that the coins were made from melted plate is the notable presence of tin and lead in all the coins except the Tower
shilling, where these metals are scarcely apparent. The high percentage of lead and tin indicates a most unusual alloy, but would be quite consistent with the remelting of plate where these metals would have come from the solder used for the attachment of handles, spouts, &c. The analysis, therefore, is quite consistent with what one would expect to find with the use of plate as bullion, and the presence of gold, tin, and lead is notably absent from the Tower Mint shilling, which is again consistent with its origin. We are, of course, assuming here that the uncertain half-crown, if it is a contemporary coin at all, was struck at some provincial mint. This is apparent from its design.

It should further be noted that the two half-crowns from Dr. Burstal’s collection reveal identical quantitative figures, which strongly suggests that they were, in fact, produced from the same melt of metal.

It seems unlikely that a forger operating at a later date would obtain metal of high gold, lead, and tin content.

Professor Thompson puts forward the opinion that all four Truro half-crowns were struck in some sort of press. His reason for coming to this conclusion is that the uniformity of the impression on the coins could only have been produced by machinery.

We do not ourselves agree with this contention, since there are examples of earlier coins, particularly those of James I, which were undoubtedly struck by hammered means, but which have an almost perfect evenness of impression. However, as we have already hinted in this paper, we do consider that the coins were machine-made, but not on account of this evidence.

4. EXAMINATION

Examination of the 1642 half-crowns and also those of 1644 and 1645 with the 1642 obverse, reveals the following points:

(a) There is a complete regularity of die axis between all nine half-crowns which we have been able to examine, and also between these coins and the two specimens of 1644 with the 1642 obverse. This regularity of die axis could not, in our opinion, have been produced on so many coins if they had been struck by the hammered process and this is, perhaps, the strongest point in favour of the coins having been struck by machinery.

(b) Most of the 1642 half-crowns show slight concavity. This is a feature which is again very unlikely in a hammered coin, but is quite consistent with the coins having been struck in some sort of 'rocker' press.

(c) The letter punches on the 1642 half-crowns are very similar to those found on the Type 1 crowns and, in some cases, particularly in the case of 'R' and 'S', the similarity is so great that they may, in fact, be identical.

Moreover, the general style of these Type 1 crowns shows very neat workmanship, and it is possible that they were designed by the same engraver as the 1642 half-crowns.

A characteristic of the Type 1 crowns is the presence of diametrically opposed patches of weak striking. This evidence of weak striking in opposite
positions on the coin again points to the fact that they were struck by machine rather than by hand. These patches of weakness would not be apparent from the use of a mill and screw press, but they are certainly consistent with a 'rocker' press method of striking. The patches of weak striking are not apparent on the half-crowns, but this may well be due to the fact that, where

Fig. 1.

the smaller half-crown flan was in use, the rocking movement was sufficient to cover the whole coin, whereas with the crown-sized flan it was not sufficient to do so.

(d) Some of the Truro crowns of Type 2 show evidence of pinching at the edge, which is characteristic of the use of machinery.

(e) Most of the 1642 half-crowns have regular flans, but there are specimens, notably the H. P. Hall specimen, which have irregular flans.

Dr. Kent of the British Museum has suggested that this irregularity could well be the result of careless operation of the 'rocker' machine, and the irregular shape does not of itself mean that the coin was not machine-struck.

We have more than once mentioned the possibility of a 'rocker' press. An example of this particular press is now in the British Museum (Fig. 1). It was fully described in an article in the Numismatic Chronicle in 1914. It is a seventeenth-century press of a type which was in use in Europe, and in
Germany in particular, and was called in Germany a ‘pocket press’. Briefly, a description of the press and method of operation is as follows:

The two cases for holding the dies are of bronze and the rest of the machine is of iron. The dies are sections of cylinders of roughly 2 inches radius. The mechanism was a rocking one. The base was fastened to some kind of block and a lever lashed to the top horizontal bar. By depressing this lever to one side, the whole machine, except the bottom case (containing the lower die) and the base, was rocked, and the two die cylinders were opened out so as to make space for the insertion of the blank between the dies. The lever was then pulled over in the opposite direction, exerting great pressure as the central parts of the die cylinders came together, thus striking the coin. When the movement was continued, the dies opened out again and the finished coin could be extracted.

The press itself is very crude and a similar type of press could easily have been made by local workmen at Truro. It is not at all large and, in view of its rough construction, it would not be at all surprising if its life was short.

We should now like to summarize the evidence we have discussed.

1. It is apparent that the coins were struck and not cast, and all are of exceptionally good quality silver. They are also of good average weight.

2. The existence of four reverse dies including those of 1644 and 1645 and the use of the same 1642 obverse die with these last two coins makes it reasonably certain that at least some of the 1642 coins are contemporary pieces. This view is further supported by the close similarity of style and letter punches between the 1642 half-crowns and the two succeeding types of half-crown as well as the Type 1 crowns.

3. The complete similarity of die axis makes it almost certain that the coins were machine-struck and, since we have shown that at least some of the coins were contemporary, this similarity of die axis makes it extremely likely that they are all contemporary, since a forger, operating at a later date, would be mostly unlikely to reproduce coins having the same die axis as the originals.

4. The spectrographic analysis shows the coins examined to be so similar in metal content that they must all be of one period, and again, since some of the coins must be contemporary, this evidence further supports the view that they are all contemporary pieces.

5. The pinching at the edges on the second type of Truro crown has led Dr. Kent to come to the conclusion that these pieces were definitely struck by machinery, which means, of course, that there was machinery at Truro at the time. Despite the lack of historical evidence of its existence, therefore, we can see no reason why a small ‘rocker’ press could not have been made and used at Truro.

6. The patches of weak striking, apparent on the Type 1 crowns in opposite positions, is characteristic of coins struck by a ‘rocker’ press, and the concavity of some of the 1642 half-crowns is again consistent with its use.

7. We are left with the question of the appearance of the coins, which was
stressed at the beginning of this paper and which has been the principal
cause of the doubts raised as to their authenticity.

Since the coins were the first of the series and assuming the existence of
a 'rocker' press, special care would have been taken in their striking, which
would account for the very perfect impressions that most of the coins show.
It is more than likely that, with a new machine such as the one we have envis­
egaged, considerable care in the striking of the first coins would have been taken
but, in view of the primitive nature of its design, it is equally possible that its
efficiency rapidly deteriorated and the less perfect examples of the 1642 half­
crowns are those which were produced after the machine had had some use.

In conclusion, whilst we do not pretend to have been able to produce abso­
lutely conclusive evidence, we feel that the suggestion we have made, namely
that all these coins are contemporary pieces and that they were struck in some
kind of 'rocker' press, is one which is quite consistent with the available evi­
dence and, moreover, the only solution which fits the facts as far as we know
them.

We should like to thank particularly Dr. J. P. C. Kent for his considerable
assistance in preparing this paper, and especially for the information which
he has so kindly given us concerning the operation and use of 'rocker' presses
in the seventeenth century.

We should also like to thank Professor F. C. Thompson for his very kind
co-operation in carrying out the spectrographic analysis.

We are also deeply indebted to Dr. Burstal, Mr. Ballingal, Messrs. A. H.
Baldwin & Sons, Limited, and to the museums and several private collectors
who have so kindly lent their coins for examination.

**HALF-CROWNS DATED 1642**

*Galloping Horse Type*

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. British Museum</td>
<td>1</td>
<td>225 grains</td>
</tr>
<tr>
<td>2. British Museum</td>
<td>1a</td>
<td>221 grains</td>
</tr>
<tr>
<td>3. H. P. Hall</td>
<td>1a</td>
<td>224 grains</td>
</tr>
<tr>
<td>4. Spink &amp; Son, Ltd.</td>
<td>1</td>
<td>223 grains</td>
</tr>
<tr>
<td>5. Dr. Burstal, Ex Brand</td>
<td>1a</td>
<td>218 grains</td>
</tr>
<tr>
<td>6. Dr. Burstal</td>
<td>1a</td>
<td>213 grains</td>
</tr>
<tr>
<td>7. A. H. Baldwin &amp; Sons, Ltd. Ex Carter</td>
<td>1</td>
<td>230 grains</td>
</tr>
<tr>
<td>8. A. H. Baldwin &amp; Sons, Ltd. Ex Lingford</td>
<td>1</td>
<td>216 grains</td>
</tr>
<tr>
<td>9. N. C. Ballingal. Ex Rashleigh</td>
<td>1</td>
<td>221 grains</td>
</tr>
<tr>
<td>10. Fitzwilliam Museum. Ex Montagu</td>
<td>1a</td>
<td>228 grains</td>
</tr>
<tr>
<td>11. Ashmolean Museum</td>
<td>1</td>
<td>206 grains</td>
</tr>
<tr>
<td>12. R. C. Lockett</td>
<td>1</td>
<td>230 grains</td>
</tr>
<tr>
<td>13. B. A. Seaby Ltd. Ex Cumberland Clark, Ryan, &amp; Ferguson</td>
<td>1</td>
<td>227 grains</td>
</tr>
</tbody>
</table>

**HALF-CROWNS DATED 1644**

*With 1642 Obverse*

<table>
<thead>
<tr>
<th>Location</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Miss H. Farquhar</td>
<td>219 grains</td>
</tr>
<tr>
<td>14. British Museum</td>
<td>223 grains</td>
</tr>
</tbody>
</table>
HALF-CROWN DATED 1645
With 1642 Obverse

**Location**

15. The Earl of Ellesmere

**Weight**

Not known

**TABLE OF HALF-CROWN WEIGHTS**

<table>
<thead>
<tr>
<th>Type</th>
<th>No. of specimens weighed</th>
<th>Range of weights</th>
<th>Average weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRURO 1642</td>
<td>13</td>
<td>206-30 grs.</td>
<td>221 grains</td>
</tr>
<tr>
<td>TRURO undated, oblong shield type</td>
<td>7</td>
<td>219-29 grs.</td>
<td>223 grains</td>
</tr>
<tr>
<td>TRURO undated, oval garnished shield</td>
<td>22</td>
<td>214-29 grs.</td>
<td>221 grains</td>
</tr>
<tr>
<td>EXETER 1644</td>
<td>20</td>
<td>*197-228 grs.</td>
<td>218 grains</td>
</tr>
<tr>
<td>EXETER 1645</td>
<td>12</td>
<td>219-28 grs.</td>
<td>222 grains</td>
</tr>
</tbody>
</table>

* This coin may be false. The next lightest in this group weighs 214 grains.

**SPECTROGRAPHIC ANALYSIS**

**Percentage**

<table>
<thead>
<tr>
<th>Element</th>
<th>1642 half-crown</th>
<th>Another</th>
<th>Another</th>
<th>Another</th>
<th>Half-crown oblong shield type</th>
<th>Uncertain half-crown</th>
<th>Tower Mint shilling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>0·6</td>
<td>0·6</td>
<td>B/V</td>
</tr>
<tr>
<td>Copper</td>
<td>7·5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>0·6</td>
</tr>
<tr>
<td>Lead</td>
<td>1</td>
<td>0·6</td>
<td>0·5</td>
<td>0·5</td>
<td>0·7</td>
<td>0·7</td>
<td>0·6</td>
</tr>
<tr>
<td>Tin</td>
<td>1</td>
<td>1 Trace</td>
<td>Trace</td>
<td>Trace</td>
<td>1</td>
<td>1 Trace</td>
<td>Trace</td>
</tr>
<tr>
<td>Bismuth</td>
<td>Trace</td>
<td>B/V</td>
<td>N.D.</td>
<td>N.D.</td>
<td>Trace</td>
<td>Trace</td>
<td>Trace</td>
</tr>
<tr>
<td>Iron</td>
<td>Trace</td>
<td>B/V</td>
<td>Trace</td>
<td>Trace</td>
<td>B/V</td>
<td>B/V</td>
<td>B/V</td>
</tr>
<tr>
<td>Zinc</td>
<td>Slight trace</td>
<td>N.D.</td>
<td>N.D.</td>
<td>N.D.</td>
<td>B/V</td>
<td>B/V</td>
<td>N.D.</td>
</tr>
<tr>
<td>Silicon</td>
<td>N.D.</td>
<td>N.D.</td>
<td>B/V</td>
<td>B/V</td>
<td>N.D.</td>
<td>N.D.</td>
<td>N.D.</td>
</tr>
<tr>
<td>Magnesium</td>
<td>N.D.</td>
<td>N.D.</td>
<td>B/V</td>
<td>B/V</td>
<td>N.D.</td>
<td>N.D.</td>
<td>N.D.</td>
</tr>
</tbody>
</table>

*Key:* B/V = Barely visible
N.D. = Not detected