

# The Romance of Weights and Measures

*Also by Keith Gordon Irwin*

THE ROMANCE OF CHEMISTRY:  
FROM ANCIENT ALCHEMY TO NUCLEAR FISSION

THE ROMANCE OF WRITING: FROM EGYPTIAN HIEROGLYPHICS  
TO MODERN LETTERS, NUMBERS, AND SIGNS



KEITH GORDON IRWIN

The Romance<sup>10</sup>  
of Weights and Measures

ILLUSTRATED BY JOHANNES TROYER

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## *Foreword*

As a youngster attending country school, I asked my father about the size of an acre. He said he did not know *why* it was so, but an acre was a strip of land 4 rods wide and 40 rods long, and so could be figured as 160 square rods. The school arithmetic text defined the acre as an area 22 yards wide and 220 yards long, or 4840 square yards. My teacher insisted that the easiest way to find the number of acres in a field was to multiply the width of the land in feet by the length of the land in feet and to divide the product by 43,560. But her way did not seem at all easy to me. Even measuring the size of the school yard in feet, using a foot rule, was a terrible job. By that time I had decided that the acre was something that was not intended to be simple enough for a boy to understand.

Years later I came across a brief statement about the acre made by Flinders Petrie, the noted English scholar. He reported that he had measured ancient English buildings, studied old English laws, and read comments in old itineraries and in old church and monastery records. He had reached the conclusion that the measuring system for distances and farm lands in use in early England was ex-

tremely simple. He stated that the size of the acre, which was part of the old system, had been laid out in a very simple way, and he went on to describe it.

He made two other equally surprising statements. One was that early England had a measuring stick that matched the meter. It had almost exactly the same length and was divided into tenths and hundredths in the same manner. His other comment was that the foot length was not known in early days in England and the introduction of this length unit upset the entire measuring system and destroyed its simplicity. Both ideas were startlingly new to me. Could Petrie be right? I tried to find out more from his writings, but he had joined an archaeological expedition to excavate the ruins of an Egyptian city that had been buried under the drifting sands. Fascinated by his discoveries of the measuring methods of ancient Egypt, he was too busy to bother with English records. In fact he never filled out the part of the English story that related to the measures for the harvest and for weights.

For a number of years I have gone ahead with the exploration of the English records, tracking down the reports of archaeologists, historians, and other scholars. Here, in these pages, is the elaborated story—begun by Flinders Petrie—of how the English weights and measures came to be.

# The Romance of Weights and Measures



# *How Engla-Land Became England*

## AN INTRODUCTION TO THE STORY OF ENGLISH WEIGHTS AND MEASURES

To get our story of weights and measures under way we shall be visiting England. But it is the land of fifteen centuries ago that we want, not the land of today. The Jutes will already have arrived to take over the land to the north of the white cliffs of Dover. The Angles will soon be coming across the North Sea in large numbers. Saxon war-boats will be darting in and out of the river mouths along the southern shores of England. For this great island across from France one era of history is closing, another is about to begin.

As the story opens the country formed a part of the old Roman Empire. The Romans had called it the Province of Britain. A defending wall had been thrown along the northern boundary of the province to keep out land invaders. Defending fortresses had been built along the eastern and southern shores to repel invaders who might come by sea. Paved military roads connected into a single network the ways, often cut through forests, by

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which the trained soldiers of the Roman legions could be moved swiftly from point to point. With these walls, fortresses, and legions the Romans were well able to hold and defend Britain.

The Roman people, used to sunny Italy, did not like the climate of this northern province. It was chilly in winter, cloudy in summer. It rained too much. So the only people from more pleasant places who came to Britain to live were the soldiers, the military officials, and some merchants and traders. Only a small portion of this defended province was really occupied by the Romans. The military posts were on the military highways, and the highways had been built only for strategic purposes. Away from the highways there were large areas with deep forests. There were also treeless areas with almost barren hills, while along the rivers running through the interior of the country the dampness from abundant rains made pastures that were deep with grass. Regions like these—forests, barren hills, deep pastures—did not make good grain farms. There were, it is true, some sections of the province where grain could be grown. The Roman officials made their homes in such places; their crops were cared for by military slaves. One of these sections was the south side of the Thames River, across from the military post of Londinium (London). The valley of York in more northern Britain was even better for grain farming; here was the military capital of the province. The Britons, who were the natives of the land, kept largely to the lush pasture lands where there was an abundance

of feed for their cattle and pigs. Their simple homes were apt to be located in clustered groups along the dells.

After several centuries of widespread military control, the great Roman Empire collapsed. Its military power had been wasted as army generals fought among themselves to become the next emperor of Rome. In this fighting, whole legions were destroyed. Toward the last, even Rome itself needed to be protected. Legions were withdrawn from the various outlying Roman provinces to protect the city. In the case of Britain, only a few legions had been left to defend the province. In the year 407 the last two legions in Britain received orders to embark on boats for the Continent. The people of Britain were assured that these legions were being borrowed for emergency duty and would soon be returned. Three years passed. The military posts were, of course, without soldiers to man them. Stores that had catered to military trade were boarded up. In the larger population centers the people wrote pleading letters to the emperor, begging him to let the legions come back to defend them.

In 410 they received their reply. The emperor was sorry, but there were no legions for Britain. Rome could no longer defend this part of its Empire. The welfare and protection of the land was left to the people themselves. The emperor wished them success. These people who had never been permitted to carry weapons and who had never been given any training in military self-defense were suddenly told they must defend themselves against invading foes. In a state of panic those who could do so

crowded the piers of Londinium, seeking passage to France. Yet there were several cities, clustered around military locations, that kept on with their activities, partially manning the fortresses.

At Londinium, however, the warehouses were empty, the shops closed, the harbor deserted except for some fishing boats. The long wooden bridge spanning the Thames had only an occasional traveler crossing its unguarded length.

In the confused period that followed the withdrawal of the final Roman legions from Britain, several tribal groups from across the North Sea got a foothold along the island's shores. Historians think it probable that a rather mild change of climate occurred at this time, so that northwestern Europe got less rain than formerly. In any case, a decrease in the annual rainfall of Britain encouraged grain farming in many new areas. The Jutes from Sweden reached the island first, but they were few in number. Then came the Angles, in a migration that lasted for a century and a quarter. By the end of that migration period their entire tribe had reached the new lands across the North Sea. In time, Saxons from along the Elbe River, sailing across the same sea westward, attacked the southern shores of Britain. They had set out as marauders and plunderers but later established settlements.

In their migration the Angles took over the eastern part of Britain. A boat loaded with stout fighting men would appear off the coast of Britain. After rowing up some stream the invaders would make a sudden sortie.



If strongly opposed, the group would withdraw to strike again at some less protected spot. Eventually they would secure a strong foothold. Then the boat would be sent back for the wives, children, and family possessions. The first group of invaders would not advance far from the shore, but would build homes and lay out farms there. A little later another wave of newcomers might land at the mouth of the same stream. They would push past the first group and build their homes farther upstream. So, gradually, the country went on filling up with people from across the North Sea. The native peoples who had been living in these districts were to move toward the higher hills, stubbornly and slowly, taking their possessions with them.

The Saxons who struck along the southern shores of Britain formed but a part of the entire Saxon confederacy of tribes that had occupied sections of Germany. Unlike the Angles, these Saxons, intent on plunder, went to the places where the possibilities of plunder and pillage would be greatest. They appeared off the mouths of large streams and operated as huge war parties, ready to ravish the settlements near the shore. The old Roman fortresses, now only partially defended because there were so few trained men, offered some resistance to the marauders. But the defenders were taken and destroyed. After that, the Saxons moved quite readily inward from the seacoast. The fortified Roman military posts spaced out along the military highways were destroyed completely. The native Britons were forced back to Cornwall and the fastnesses