Consume or Create?

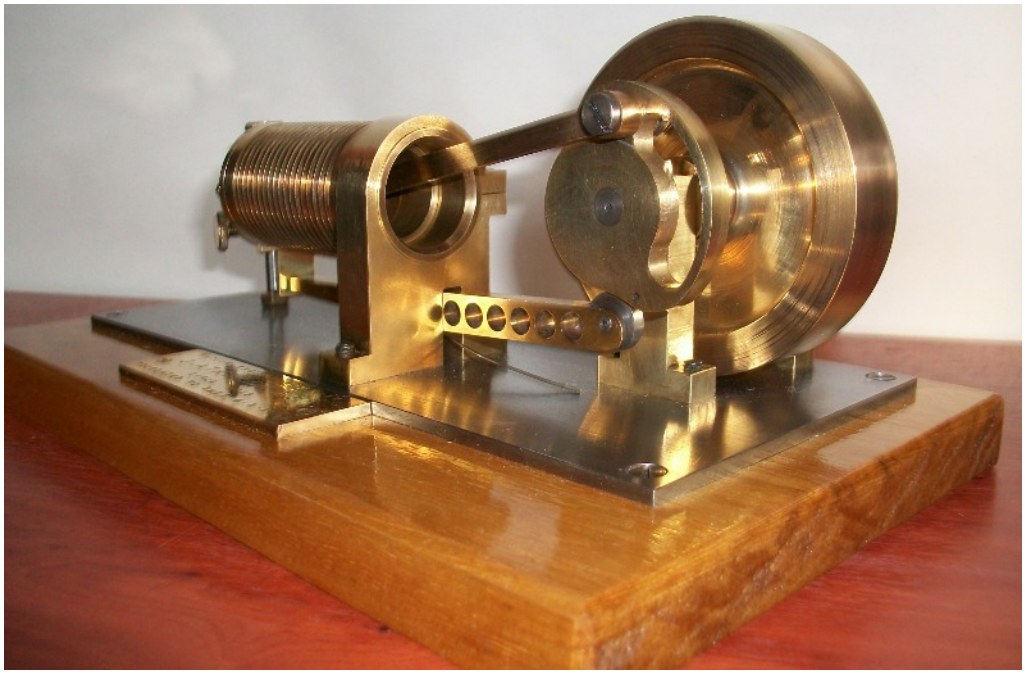

Photo 1. A restored model vacuum engine. The engine was constructed by a Mr J Atkinson sometime around 1945. In this instance, removal of tarnish and measurement of the components were the main activities. The only new item required was the wooden base.

Everybody has the need to consume. We all have to live, which requires everything from housing to clothes and food. Western society, based on capitalism, promotes the consumption side of human nature. Radio, television, Internet, and magazines, all persuade us to consume. Supermarkets, with their "*Whim buying*" sections part us from our money, often for products which are only destined for landfill.

However, we each have the ability to create too. The trick is to identify that "*Something*" which allows one's creativity a means of expression.

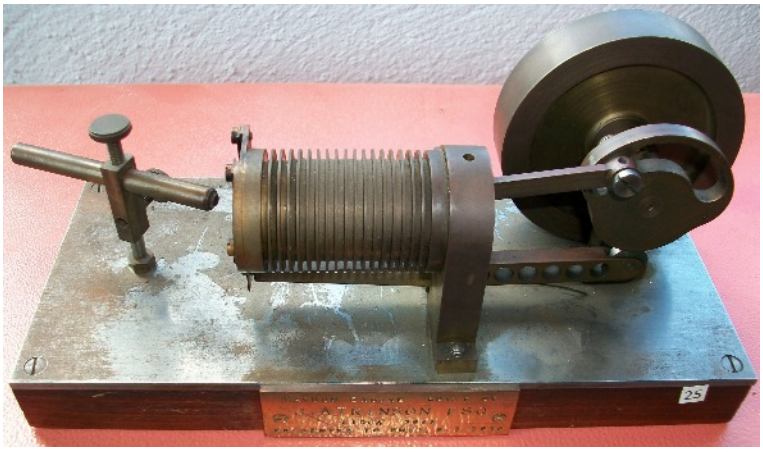

Photo 2. The model vacuum engine prior to restoration.

Restoration of engineering models is an interesting, and often challenging, activity. The type of models which appeal to me are usually associated with stationary engines.

They belong to an organisation which has a long tradition of preservation. Some of the models are merely unique, while others are particularly valuable. All of the engines being restored are manufactured to a high degree of precision. The tasks primarily involve cleaning and painting. However, repair is required in some instances, and the construction of new components in others. Photograph 1 illustrates an engine which has been restored. The condition of the engine prior to restoration is shown in Photograph 2.

Drawings and other documentation are usually non-existent. Consequently, one aspect of the restoration is the measurement of the individual components and the preparation of drawings, along with a dossier relating to the models. This activity can be more demanding than the restoration itself.

The process of dismantling, cleaning, and inspecting the various components invariably gives rise to a whole host of questions. Why was a particular material used? How was some component manufactured? What is the principle of operation of the engine? How could it be improved? The list is probably endless, and answers to the questions are seldom clear cut.

The reasons for making engineering models are many. At the most base level, they are toys. At another level they can have an educational function or provide occupational therapy.

Some models serve as part of the historical record. Certain models are regarded as dynamic works of fine art, and are sought by collectors. Many clocks and scientific instruments belong to this group.

For many years, industrial concerns relied upon engineering models to assist in clarifying customer needs. Much of this work has been displaced by virtual reality systems. The film industry still makes use of models for realistic special effects. Computer Generated Images remain inferior in some situations and are expensive to produce. However, the purpose of models for the film industry is to be visually effective. The need for precision engineering is secondary.

Experimental investigation provides yet another motivation for the production of models. My principle interest is in experimentation. For example, some of my effort is presently directed towards construction based on a model steam locomotive. The design is being adapted from a well proven locomotive known as a "*Black 5*". Photograph 3 is an illustration of a full size Black 5. It is taken from a print of the work by A.L. Hammonds painted in 1972. I purchased the model in a partly completed condition. Since I intend to use it for experimental purposes, I do not plan to replicate the original.

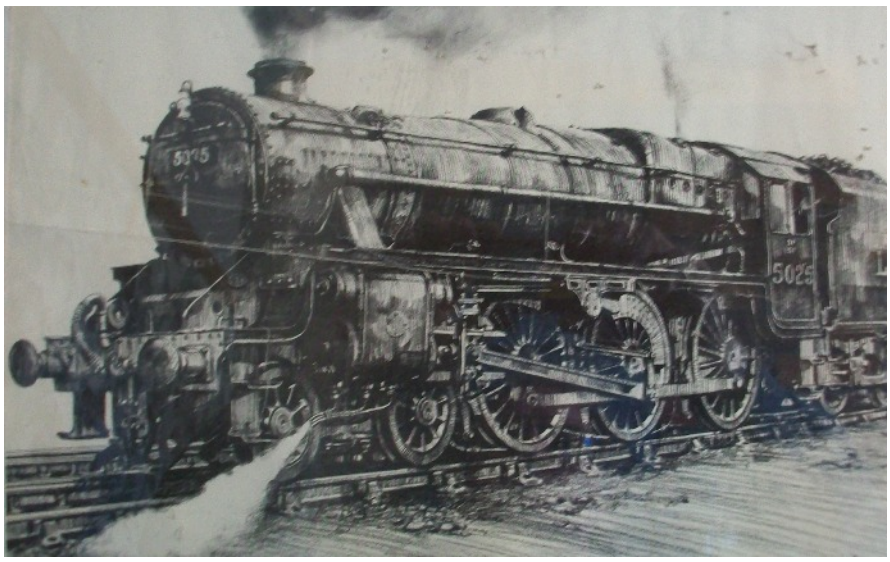

Photo 3. The Black 5 locomotive served with the London Midlands and Scottish railway for many years until the end of the steam era. More than 8000 of the locomotives were manufactured. The painting by A.L. Hammonds was made in 1972, and shows No. 5025 in steam, as she might have appeared during her working life.

It is a common misconception that steam power is obsolete. Even the most advanced nuclear power stations employ steam to drive their turbines. There are many aspects of the behaviour of steam operated plant which have never been fully understood. The subject of thermodynamics is to this day based on unprovable assumptions.

Renovation work may appear trivial, and even pointless, to the casual observer, but in reality it presents a technical challenge which involves the use of a broad range of skills. The tasks involved represent excellent practical workshop experience. The work serves to develop concentration, patience, precision, manual skill, and thoroughness, to an order that few people are given the opportunity to achieve. It is an inescapable fact that a workshop is a noisy, dirty, smelly, oily place, which can be dangerous to the careless individual. Oil under the fingernails and dirt on the clothes are integral aspects of workshop life. Many distractions which are usually taken for granted, such as mobile phones, can present a serious safety risk in the workshop environment. Some of the tasks can be arduous, tedious, and malodourous. The worker must always be alert to potential danger and act accordingly.

The acquired skills can prove valuable, and would at the very minimum enhance *any* CV. In contrast to attending a college course, the examiner is ultimately the person who has carried out the restoration. There is also the advantage that there are no course fees. On the other hand, there are no end of course certificates or graduation ceremonies. There is also no salary, the work being carried out on a voluntary basis. Instead, satisfaction is derived from completing tasks to a high standard, often subject to difficult circumstances and limited resources. Part of its purpose may be recreational, but restoration of precision models is no holiday camp activity. There is therapeutic value in many of the tasks, but it is far removed from any social work programme. Considering the philosophical design decisions taken by the model maker might influence the restorer's theological outlook on life, but restoration isn't for those seeking some form of religious experience. Some aspects of restoration are unquestionably hard work, but it is not an employment opportunity. A small number of individuals have managed to earn a good living through the production or restoration of models. However, the standard and breadth of skills required mean that very few could regard restoration as the basis for an investment proposal.

The restoration work I do is carried out at my home. The machines I own are old. Photograph 4 shows my "*Little John*" lathe with some work in progress mounted "*Between centres.*" Although the technique of machining between centres is not as common as it was about forty years ago, it remains the most accurate means of carrying out certain operations on the lathe. The Little John lathe was manufactured to the highest standard about 50 years ago, and is comprehensive in its capabilities.

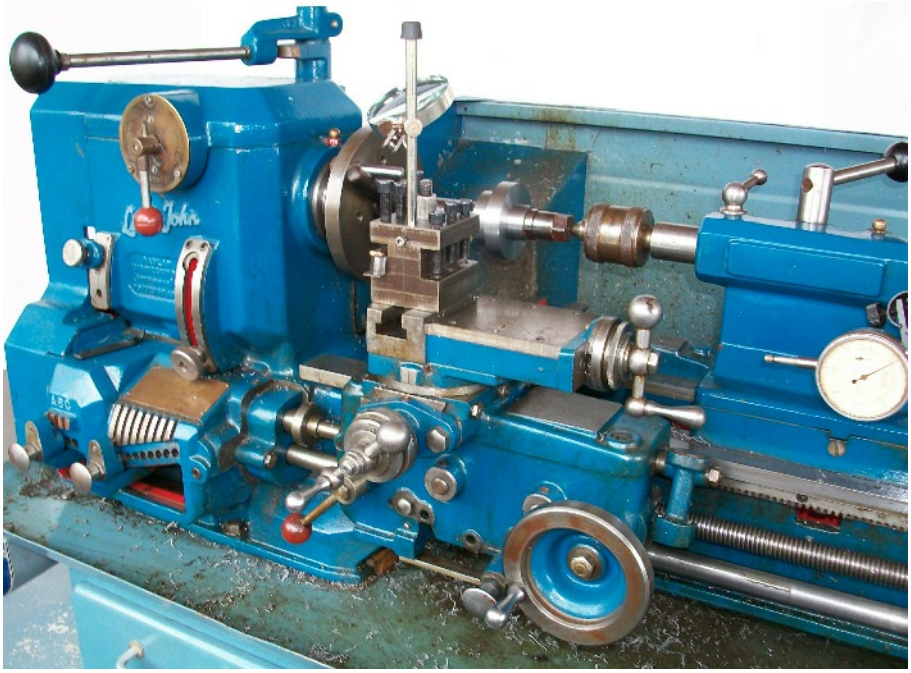

Photo 4. The Little John lathe is now more than 50 years old and was reconditioned by the previous owner.

It is a type of lathe that would have been classed as "*Toolroom*" standard. It would have been used for the most demanding of work.

The lever at the top left operates a variable speed drive which ensures that cutting conditions can be set to the optimum for each job.

The leadscrew, visible at the lower right is driven by a gearbox at the lower left, giving the lathe the capability to cut a wide range of screw threads.

There is a separate feedshaft below the leadscrew which provides automatic cutting along the length or across the face of the work.

My favourite machine was manufactured in 1941, and, like much of my workshop equipment, was purchased as scrap. However, it is all extremely capable when handled carefully and intelligently. On the other hand, machines never say sorry, and they are well capable of inflicting serious injury on any ham fisted or sloppy individual who maltreats them.

A workshop is a very personal world. The equipment for my machine tools is deficient in some respects, and the manufacture of items of tooling is an ongoing activity. There is always something to be done in a workshop, and not surprisingly, it isn't as organised as it ought to be. That is an aspect I will probably be addressing for a long time to come.

I have tried to avoid giving a description of the activities involved in restoration or model making in such a manner as might lead to the reader misconstruing them as belonging in some type of kindergarten. Precision engineering is definitely unsuitable for anyone who engages in childish behaviour or carelessness. The concentration demanded in restoration or model making means that it is unlikely to appeal to any person who exists in a spaced-out state of mind, or prefers their life to be full of "*Buzz*".

Another model presently awaiting restoration is shown in Photograph 5. It is a machine known as a "*Donkey pump.*" At the left hand end is a steam operated piston which is directly coupled to a water pump at the right hand end. The arm which protrudes to the front of the model travels left and right with the piston rod. It operates the steam valve in the left foreground, causing the piston to reverse at the end of each stroke.

It might appear that restoration work would be most likely to appeal to a person with an interest in Mechanical Engineering. However, those with an aptitude for Applied Mathematics or perhaps Applied Physics, might find that the work involved would help them develop practical problem solving and analysis skills.

Some individuals who engage in precision engineering activities for recreational purposes are members of the medical profession. There are gifted artists who have found that the variety of materials, methods, forms, and textures, commonly associated with precision engineering, provide scope for self expression.

Others, involved in the study of industrial history, sometimes combine their work with the construction of representative models.

One very highly respected model engineer is Cherry Hill. She is over 80 years old and still active as a model engineer. Cherry Hill's work is unquestionably important as part of the historical record. There are people who have adopted small scale precision engineering in response to long term unemployment or other social dislocation.

Irrespective of the level of knowledge possessed by anyone contemplating working with precision models, manual dexterity and a willingness to develop skills in numeracy are valuable personal characteristics.

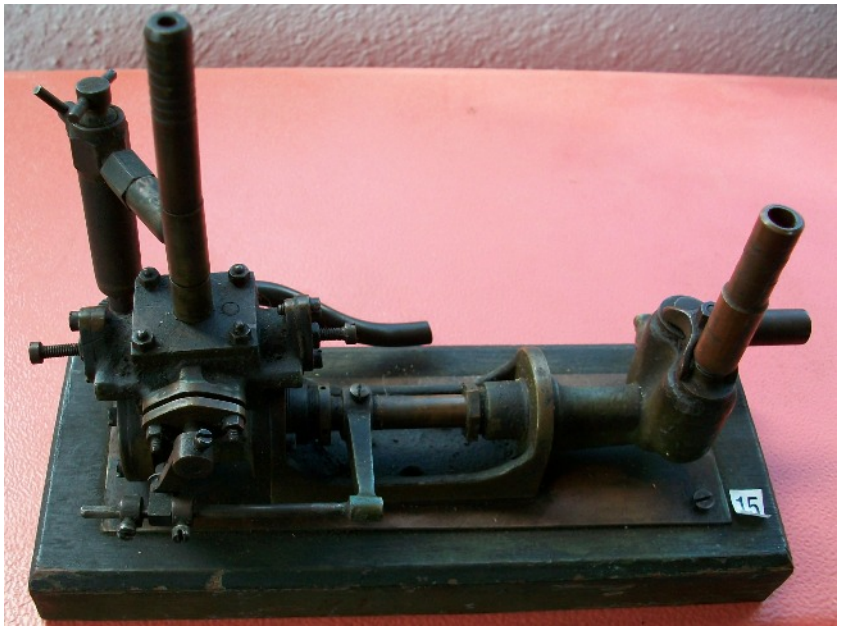

Photo 5. This is a model of a steam donkey pump. Pumps of this nature are still used for supplying water to steam boilers. Nothing is known of the maker or date of manufacture of this particular model. However it is a good example of typical practice from a century ago. Some machining is needed to restore this model and it will require to be repainted. Certain components may have to be replaced altogether to restore the model to working condition.

Particularly in restoration work, it is necessary to be able to use both Imperial and Metric systems of measurement. The two systems are frequently employed on a single component, and the machines themselves may have a mix of Metric and Imperial graduations. An operator soon discovers that a facility with mental arithmetic and trigonometry is a significant advantage.

My own interest in using models for experimental purposes has, in the past, given rise to more than one challenging project for a university student. Much depends on the availability of a student who is completely trustworthy, *very* level headed, and prepared to exercise the *utmost* care. Workshop experience can be acquired, but it is essential to possess a willingness to listen, learn, and do.

A very satisfactory home workshop can be set up for less than €2,000. That might appear to be a large sum of money to a young person or someone of limited means. However, it is surprising how quickly money can be saved by eliminating unnecessary personal activities. It might be as simple as spending less time on the telephone, or choosing *not* to download some must-have "*APP*". A few Euro *not* spent on the Lotto each week quickly accumulates. Perhaps "*Noble neddy*" could lose the race without your each way stake at the bookies. For some, cutting out cigarettes or alcohol will not only save money but also bring improved health. I am fortunate in having established a fairly well equipped workshop during wealthier times. Nevertheless, I was obliged to make significant economies to turn my dreams into reality.

Each person will be different in the ways in which they can make savings. It is just a matter of lifestyle choice. Bill Gates, the wealthiest man on the planet, decided to save for a computer while his friends preferred "*Hanging out*", socialising. It wasn't long before Mr Gates had saved up a few dollars.

Creating is much more difficult than consuming. Creating things can be very hard work indeed. Perhaps the most difficult lesson is learning to accept that making anything accurately takes a very long time. However, those who develop a taste for creative work, find a satisfaction that is deeper and longer lasting than any pleasure to be had from consuming.

It's surprising what one can achieve with sufficient commitment. As a bonus, there might be something permanent left behind for a future restorer to ponder upon.

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