Development of the Arts.

Several orders of presenting this subject may be followed. We may take that indicative of the principal material used in the mechanic arts. This would give us the age of stone, 29 stone implements, next that of copper gold and silver or the golden age, both practically prehistoric, then comes the age of iron — While we are now in the age of Steam.

Again we may arrange the presentation according to the most prominent employment of the people, as the Hunters age, the pastoral age

the temple building age, the age of speculative reasoning, the greeks, the dark ages when man seemed to do nothing in particular from the decline of Rome to Luther; and the age of Science, the present. Again we may simply follow the history of the most enlightened people of the world as nearly as ~~we can~~ they are known, without special sub-divisions which is the plan we have adopted.

The condition of the Arts of any nation is an index to the mode or style of thought of the people—

and illustrates with considerable accuracy their capabilities in all lines of intellectual progress.

The arts are dependent for their progress upon intellectual culture. It is impossible for them to be developed in any considerable degree without a corresponding degree of intellectual development. This fact has been known and made use of in reckoning the condition of nations long since passed away. Indeed this is the mode by which we reckon the capabilities of prehistoric peoples. They have perished

from the earth away back in the far off and unnumbered centuries of antiquity, apparently leaving no sign that they have existed. Other people have possessed their lands and gone - others still have come and gone and still others have lived on the same ground all unknown to each other and have all died or moved on to strange lands leaving no writings ~~or records~~ to mark their coming or going, for they knew not of written language.

But to the antiquarian of modern times, each of these no matter how low in the scale of manhood

have written a history in the
relics of their mechanic arts
which they have left scattered
in the earth. Here is found a
stone of peculiar form, shaped
rudely, but with evident care;
here another, there another
each ~~shaped~~ fashioned for
a purpose - each shows an in-
telligent design that could only
have been conceived by the mind
of man
and fashioned by the human hand

Among these are possibly the
remains of the bones of some ani-
mals that have ceased to exist
on the earth so long ago, that

the oldest legends give no account of them. These bones show the undoubted marks of the stone implements used by their captors. Again we find stone implements of another fashion - more bold in design, more skillfully wrought, associated with scraps of pottery of rude device, but showing an advance of thought, tangible and definite, these are of a definite texture from a special earth or clay made in a definite way, the design when analyzed demonstrates a fixedness of form and purpose. Above these again in the ancient beds or at another point, we find still

another variety. The style is different, the handling of the clay has been different. Other earths have been used, rude designs in colors come into view and it soon becomes evident that in these there is an effort at the expression of thought. The rude figure of a man a stork, a cave, bear, a reindeer or other animal crops out upon a broken scrap of a water pot. It may be that the figure is ~~the figure~~ of an animal long since passed away from the face of the earth forever. With these again is associated a new variety of stone implements more

more varied in their uses and perhaps some scraps of copper curiously fashioned for the purpose of ornamentation. In this manner the life history of prehistoric men is being traced away back into the remoted recesses of time, not by what they wished to write for us to read but rather by what they could not avoid writing indelibly in the earth which they trod.

How was it with man in those ages so long ago ~~passed away~~? What is written in the fashioning of this stone. One end is brought to a point by the slow process of

rubbing it against another stone
grooves are cut here and there by the
same laborious process, or by a pro-
cess of chipping, so that a handle
may be secured. All this for what
that it may be of use in defense
or attack against either man
or beast. This was the best weap-
on they had to bring down the stag,
for food. Yet the associated bones of
this animal, tells of their success
against him and others more
powerful, also tell a story still more
sad. The weapon that was used to
bring down the stag or cave bear was
also used by man or against this

fellow man in the petty wars and broils of the ages long gone by and mans blood was then shed by man, and has continued to flow down through all the ages. No civilization has yet been able to abolish war. An evening devoted especially to the mechanics of war would be both interesting and profitable. It would show a very regular development of the forms of instruments and their mode of use and reflect as in a mirror the wealth or poverty of ~~a~~ nations both as to thought and riches.

The original seat or homestead of man upon earth has been a sub-

ject that has attracted the attention and enlisted the closest thought of many of the best men of modern times. The most general impression being that it was in Asia, somewhere east of the mediterranean sea. Others very confidently place it as far east as India. Many christian writers place it on the borders of the mediterranean ~~sea~~. But this matters not. The oldest historical traces of man are found in the far east and it is to this land that the antiquarians of today turn for the richest treasure of ancient thought. One of the most

enticing and significant facts in relation to ancient men is the early and very ~~very~~ evident efforts to register thought.

To make an impression upon some enduring substance that when seen by the eye of another, would suggest such a thought as was there present in the mind of him that fashioned it. This was the birth of the fine arts and the initial steps which led to the formation of written language. The first gleams of thought which we are able to recognize are expressed by pictures of some kind and seem to precede the thought of erecting a dwelling place farther than taking possession of some

friendly cave or sheltering rock, for we find among the bone heaps of some of these ancient cave dwellers ~~made~~ sketches of some of the animals which they pursued for food rudely traced upon the bones from which they had picked the flesh. Such tracings were evidently made with the rudest of instruments, most likely with the point of the same stone spear head with which the animal such as the reindeer was brought down possibly by some young hunter who was enthusiastically endeavoring to commemorate his first success. Little did he dream as he laboriously and with much expense of

time traced out his rude sketch, that his picture writing would be read and understood a hundred centuries after he was dead

We are told that when the rigor of the seasons compelled men to ~~construct~~ contrive shelter from the inclemencies of the weather they first planted trees on end and laid others across to support a covering and that the bands which bound those trees together at top and bottom first gave the idea of the base and capital of pillars from which simple hint originally has proceeded the more perfect art of architecture[19]. Thus

it was that man first began to build for himself a resting place and hedged it about that he might enjoy his sleep in quiet while wild storms raged without and his then terrible enemies, the lion & the tiger roamed the forest. But another and nobler thought had come to him.

For this time it matters not from whence or where - whether instinctively from the contemplation of the ever varied and incomprehensible productions of nature or by special and divine communication the conception came to him of a mightier being than he a thought that the incom-

prehensible, everywhere present to his gaze was under the control and guidance of a mighty ruler under whose dominion he was and ever ~~would~~ should be to whom he owed his being all the comfort he should enjoy and all the ills that should befall him. He became a worshipper of a divine being, a religionist, and it seems that the religious principle or the instinct of worship, if we may so term it, was in those early peoples the ruling power of the mind. Their deities were assigned some definite ~~powers~~ form for the purpose of representation and perpetuation which gave the most powerful incentive

to art cultivation that could possibly enter the mind of a rude and uncultured people. Each device was made to speak of their gods, no matter what form they assumed, a stork an alligator - an ox or lion with a mans head or the human form, each water pot of baked clay must in some way or manner bear a representation of it.

This was the ruling thought, the key which bound the ancient peoples together into larger and larger communities and with numbers working to a common end came experience in workmanship and advance in

design - with the enlargement of communities came out in bold relief another element of human nature which has proved ~~the~~ a most powerful element for the advancement of the arts

Pride the love of personal advancement which stands out with such prominence in all peoples both savage and civilized. Religion and pride in the ancient Times were powerful twin sisters in the development of art. The middle aged man who gravely thought out the plans for the rude Temple to deity had in his youth skilled ~~in~~ his hand in the making

of showy trinkets to adorn his person. It is surprising how much of the history of prehistoric peoples is written in the trinkets of personal adornment. We may well stand amazed when we see from the recent and great work of Dr Schliemann in the development of the ancient remains of Troy and other practically prehistoric cities, to what wonderful perfection the art of jewellery making had been brought by people who were as yet unable to perpetuate their history in written language. Some of the finest work of human hands ~~was~~ in any age had

been done thousands of years, before Homer sang his wonderful verses in ancient Greece. This was urged on by the demands of personal adornment adornment, far in advance of the more useful arts. But in this we are anticipating. The gratification of religious impulses demanded a mightier work upon which to engraft more magnificent models of adornment. It seems very early to have been demanded that the form of deity be represented, and this was not to be satisfied by the first feeble attempts. No sooner was one representation completed than an-

other was begun and this second must be greater than the first.

The thought of building temples for the purpose of worship seems to have been an early conception which gave rise to an early form of semi-civilization, which may be justly called the temple building stage of human progress it stands out sharp and clear on the far off horizon of the ages past. Its beginning is lost away back in the dark centuries of prehistoric times while its ending is dimly, but very dimly lighted by the first gleams of written thought; but the necessary condition of the people in thoug

and government, who erected these marvellous works are as patent to us as if we had personally known them. It was first necessary that the people be completely under the influence of a priesthood, that one mind should practically control the entire community; that all should act as a unit - conform to the design of the principal personage. Together with this complete individual control certain necessities as to culture were required. The temple builders could not work without food. The supplies of such large bodies of men as this work demanded required either very considerable agriculture or

commerce or both. The arts incident to these pursuits must have reached a certain stage of effectiveness before these great works could be accomplished. The evidences upon these points go to show that the regions of great Temple building especially those most ancient were situated in the richest spots of earth as to natural resources spots of earth where nature supplied the food for the gathering; such was India which ~~was~~ is undoubtedly the oldest seat of temple builders. Such was the valley of the Nile before the Ptolemies ~~Ptolemies~~. All relics of the art of

agriculture found in these regions referable to those times show the utmost rudeness. A forked stick was both plow and hoe and a straight stick was the spade. With these the seeding and tending was done. The harvest was gathered with the unaided hand. The grinding was done between stones by hand. The domestic animals of the time were such as might live without gathering food for them by artificial means. Machinery was unknown as we of today understand the term. The principle of the lever and inclined plane were however not only well known but were very largely em-

played. When the moving of heavy masses was required a round stick was placed upunder it upon which to roll it, which very early gave the idea of a wheel which first consisted of putting a small stick of wood through a hole in the centre of the larger round piece. The wheel is perhaps as old as the oldest temples of India, though we believe the oldest relics of it are found on the nile. It is utterly impossible at this time to form any idea of the value of this early discovery to the human race. The lever as used by them was of the simplest form

a wood substitute for the crow of to-day And the inclined plane had nor assumed any such varieties as the screw & C. but was confined to the wedge and a few of the simplest forms.

The use of copper was perhaps important before the use of iron was discovered if indeed copper preceded the Iron. The fact that copper is found native in pure metallic masses would strongly suggest that it would be found and made use of before Iron which is only found in the form of ore which requires reduction. Copper was at a very ear-

by time hardened by baking with certain earths which has since been found to contain Zinc ore, brass of copper and Zinc was therefore made long before Zinc was known.

earths containing Bismuth antimony & wendisium

Copper and brass are contin
ually found in ancient works
in various positions sometimes
such as would indicate that it
was used as tools ~~there can be no~~
~~doubt~~ but that it ever found a prin-
cipal tool of the architect of ancient
times is extremely doubtful, not-
withstanding the great claims
that have been made for it even
to the recognition of an age of cop-

per. Iron had evidently been long in use before historic times. Among the hills of Arabia in a portion in which no timber whatever had been known to exist from the very earliest historic times, have been found to exist the remains of smelting works in connection with beds of Iron ore. The slag is there and the ashes with which it is mixed are wood ashes showing that the smelting had been with charcoal also the geologist of to day have no difficulty in determining that in remote antiquity this had been a wooded country. The ab-

sence of iron in and among ancient ruins is easily accounted for by the lapse of time. Then, lack of machinery would naturally prevent them from using any metal in heavy masses or other forms than simple hand tools, which would be destroyed by rust in the course of a few hundred years. A very few thousand years would be sufficient to remove all traces of our Rail Roads of to day. A few ties might become petrified and remain but the same influence that would preserve them would destroy the iron rails, so that if wholly undis-

turbed a streak of yellow earth would be all that would remain.

A little scrutiny of the writings of antiquarians show plainly that the most ancient works preserved in Egypt are not the finest as we have heard asserted. The most reliable tracings of the date of the different works point to a date about 6,000 years before Christ as the time of the building of the oldest structures found on the nile.

These as compared with those which followed are ~~comparatively~~ rude both in design and

workmanship while there can be no reasonable doubt that others more rude still preceded these and will doubtless yet be discovered in the sands of the contiguous desert. The facts seem to show that the original site of Egyptian art has been covered by the encroachments of these sands ~~of the desert~~. As we come along down the line of their kings each successive dynasty, with a few exceptions which mark unsuccessful families shows a decided improvement in architecture in the boldness and perfection of design the character of the ornamentation

and in the mechanical execution which reached its greatest perfection under Amen Hotep, some 1500 years before Christ. with this monarch the stage of temple building in Egypt practically ended. The power of the priesthood which had only been occassionally broken all along down through the ages the most marked of which was that by the Shepard Kings was after this time doomed to fight its way through opposing factions in such a manner as to prevent in a great measure ~~This~~ immense architectural ~~arrangements~~ operations. Temples

were indeed built even under the great kings the Ptolemies but they were of a different order.

Iron was freely used in Egypt in the form of tools of different kinds and swords and other weapons of war long before this time. They had also come into possession of the horse and chariot obtaining them from India during some of their wars in the east which lead them to the borders of that country. They had also arrived at a remarkable skill in the production of certain fabrics or cloths

which were undoubtedly woven with great diligence and patience by what would be regarded today as a very rude and ineffectual apparatus ~~and~~ something like the manner of weaving yet employed in China & Japan. The great beauty and perfection of the work depended not upon the wonderful machine, but upon the regular patience and skill of the hand that wrought in the same manner as the ~~same laces~~ finest laces of to-day are dependent as to machinery only on the common needle but for their beauty and per

fection upon the hand that wields it. In all ages of the world, pride the love of adornment has urged on to the most wonderful feats of manual skill such as seem almost superhuman. It is evident that the great ornamental and architectural feats of the ancients are the result for the most part of skilled handicraft rather than great mental training. The skill of the hand is very different from the well filled mind. The mind feeds for the most part upon conceptions conveyed by others

One mind conveys to posterity the facts it has acquired. The skilled hand cannot transmit its training to posterity. Each individual hand must work almost unaided by those who have preceded them. Hence we should not be surprised at the wonderful attainments of pure handicraft in remote Antiquity.

The history of Hindoostan is in most essential particulars, a repetition of that of Egypt or rather Egypt is a repetion of Hindoostan for the Hindoos are doubtless the oldest people

to whom we are doubtless, still more
indebted for essential improvement
in the arts than we are to the
Egyptians. They possessed a
much ~~more~~ larger area of good
fertile country and a more health-
ful climate. While their buil-
dings may not have been greater
they were evidently more richly a-
dorned and their art was more
masterly - Unfortunately for the
student of ancient works their
climate which was much like ours
was calculated to destroy instead
of preserve their wonderful works
while that of the Nile country

where there was neither frost nor rain, was and is one of the best spots on earth for the preservation of such structures.

For this reason Egypt has been the paradise of the antiquarian. Yet the ~~ed~~ evidences go to show the superiority of the ancient hindoos, both as to architecture and government.

An astonishingly large proportion of the forms of the more common implements which we use today may be traced back to this people. The common hoe, pick and spade, the

the present form of the ax and hoe fork and many others may be traced to India also the wheel although this has probably originated independently among different peoples.

They also preceded the rest of the world in the domestication and use of animals. The use of the horse originated there and was transported to Egypt and thence to Greece and Rome our common chicken came from there.

The original progenitor of which known as the jungle cock is still to be found in the wild state

in India. Alexander the great when ~~he saw it~~ as it, it is said he sat down and wept because there were no more worlds to conquer. probably had tidings from this great people only a few days march from him - knew of their wealth and their military strength and did not care to risk the result of engaging them.

The ancient writings of these peoples ~~and~~ of the chinese are the oldest probably in the world; That of the Egyptians does not seem to date back so far as the ~~oldest monuments of their architecture~~ oldest temples or sculptures, even in

their oldest hieroglyphic forms, the oldest monuments of their architecture being entirely without them. As we proceed down the long line of their dynasties, the form of their writing changes by being greatly abridged, something like our phonetic or short hand writing. These short-hands, (for of them there are two known as the Hieratic and the Demotic) seem to have consisted in the abridgment of the characters of or hieroglyphics by leaving out vowel sounds from the word sign yet without adopting any alphabet as we understand that term to-day although it did seem to approach a syllabic

3951
1480
5.431

form. These more recent short hand forms seem to be more difficult to read than the older and purer hieroglyphics. The oldest book now known to exist is a treatise on morals written by Prince Ptah hotep of the 5" Dynasty of Egypt. Its date is placed 3,951 years before Christ. and is 5,431 years old The book is now in the national library of Paris - Letters, accounts, bills of sale, contracts &c are found dating back for 9 centuries before christ, showing that trade was extensively ~~caused~~ carried on and that they had already invented and brought into general use plans of book keeping

and the general accounts of trade.

Their absence in the earlier dynasties shows that long centuries were required for their formation. We believe that no bills of exchange was used in any of the ancient civilizations. This is an invention of recent date, introduced by the jewish money loaners of Europe and quickly adopted by the moneyed men of the civilized ~~nations~~ nations. From Egypt the tide of progress in the arts seems to have swung around the Eastern border of the Mediterranean sea and today almost the whole of

the south coast of Asia minor is found strewn with the remains of Temples built by a people contemporaneous with ancient Egypt but perhaps less cultivated. They seem to have had no written language, and nothing is known of them except what has been preserved by the greeks in their legends of the siege of troy, which was perhaps the final overthrow of a very powerful people.

The only great temple, an accurate history of which we have transmitted to us is that built by King Solomon at Jerusalem. In this

the combined strength of two nations was employed one thousand and hundred during 7 years actual workmen. But we need not dwell on this as you are all so familiar with it.

Or is probable that in the siege of Troy the greeks overthrew a people more cultivated than the

The recent explorations of Dr schli man at the site of this ancient city, throws much light upon the of the arts at the time and prior to its final overthrow. They were a people of immense wealth in silver and gold and their ornamented work in the forms of jewelry was most miracu-

lous. Indeed this may well be said to be the greatest feature of their art which has never since been equalled in profussion of design and possibly not even in the masterly skill of execution. This was perhaps the Zenith of ornamental work in the precious metals. They were also great and very old builders, as the fact of three cities having been built on the same site at Troy each on the buried remains of the preceding abundantly attests. The very early greek arts were similar to the Trojan but not so rich. Their decorative

art was of a magnificent character. Their Temple building was meagre as compared with the Egyptians, but their designs decoration and workmanship were of a far higher type showing a very marked improvement of both the mind that conceived and the hand that wrought. Especially is this seen in the sculpture of the human form. In no other age or among no other people has the sculpture of the human form reached such profession or such perfection. The centure which lead to this was the form of religious thought which dified the human form. The greeks however very

poon acquired a taste for literary production of a speculation type in which they excelled, the then known world as this went up and attracted the best minds, the decorative arts declined, Not much of progress in the practical details of the more useful arts can be claimed for them. This passed again to Alexandria in Egypt where much scientific work was done & the use of steam came very near discovery. So near indeed that a toy engine or model was actually put in motion. This seems to have consisted of a closed kettle with a

small tube for the steam to issue through which was directed against the paddles of a wheel made something like the modern over shot water wheel, which would make the little wheel spin around until the kettle would boil dry. It seems never to have been utilized in any way by the attachment of machinery.

A very wide form of lathe seems to have been in use at this time for turning large pieces of wood. The stick was supported in forks upon trunnions fixed in each end to which cranks were fixed so that it could be turned by a man at either end. While a third

held a tool against it by means of a support. This was the original form of the lathe that wonderful machine which is now of such vast importance to the world and capable of performing such marvellous work.

From Alexandria we follow the arts to Rome but the most that we find here is a repetion of ~~other works~~ older works. We believe the most ancient trace of the microscope that has yet been found was in the burned city of Pompei. These were simple lenses cut from a very transparent amber. They were evidently used by jewelers of that time. As ill-

ustrating the extreme slowness of the utilization of the means at our hand I may say that it required a thousand years after the power of the lense had been known for men to learn to use it for the correction of the faults of vision incident to old age. Probably the earliest form of the microscope was what is called the Loup, a small ring of fine wire with a handle in which a drop of water is suspended, which constitutes the lense. It makes a very good one too. The art of printing seemed on the eve of discovery in Rome & it seems very remarkable that it should

have been so long delayed. The signet ring was known and used for stamping papers instead of signing the name, in very remote ages and Jeason is reported to have said that "if a man had letters prepared on suitably prepared blocks, he could by properly arranging them reproduce the whole of Homers poems."

In this remark we find the important facts of the art of printing as it stands today. Yet it required over a thousand years for its realization and the immeasurable benefits to human advancement. But we must hurry on from Rome the Mahom-

medans became the leaders in art & science which they held until about the Fourteenth century. For a period of about 8 centuries they led the world in arts and science, they invented our numerals. numerals, algebra and made considerable amount of really great Progress in Chemistry & Medicine & practical machinery, indeed the idea of accomplishing work by means of machinery seemed to have originated with them. A very singular phenomenon appeared in Europe during these dark days which seems to have been instrumental in supplying the facts from which to weave the science

of modern chemistry which is doing so much for modern progress. I allude to a general belief in and search for the philosophers stone, a kind of rock that turned to gold. This foolish search led to a great amount of chemical experiment in which very many facts were brought to light and preserved for the benefit of the world.

It is the discovery ~~however~~ of electricity, steel & steam however that has given the great impetus to modern thought and art improvements. Steel indeed was used in very ancient times perhaps two or three thousand years before christ or even earlier than this. There is

perhaps no better illustration of the slowness of the advance of thought than is afforded by this example.

The ancients as do all uncultured peoples dealt with isolated fact without seeking out the collateral facts with which they are connected.

Modern cultured peoples demand that the collateral facts connected with any principle and important fact be known and properly connected together into an associated chain which constitutes science. The modern mind does not rest until the whole matter is made as clear as possible. If one mind fails another takes it up

and it is kept moving and never allowed to rest. Now in the case of steel ~~machinery~~ making. The ancients made tools of Iron and by roasting them with animal charcoal converted the surface into steel and their blades such as swords and knives were converted into steel, for their whole thickness. This fact seems to have spread so pretty ~~near~~ much the whole world without one step in advance for a period of four or five thousand years - when but a little over one hundred years ago another step was taken. A very simple thing it would seem for the world

to be so long in finding it out. It was simply to case harden small iron bars and melt them and cast into suitable ingots and what was known as cast steel was produced.

There is a curious story connected with the first production of cast steel which will serve to illustrate the condition of the arts during the last centurys. A new article appeared in the markets of which tools could be made and tempered without the necessity of case hardening. Artisans found that the bars were actual steel throughout, that they could be wrought and tempered as claimed. But no one

knew where it came from. It was one of the secret manufactures then so common. In those days an important fact was kept secret as long as possible and if successful was only transmitted from father to son or by purchase; but the world was rapidly becoming too wise for this and a young English artisan determined to look the matter up. He traced it from merchant to merchant, along the lines of trade and finally to a small village in germany where he found a shop with closed doors from which he suspected it came. He lingered in the neighborhood until he ascer-

learned that work was being carried on at night - It was winter - and one very cold stormy night while this shop was in full blast there came a knock at the door, and a cry for help. The master of the work came to the door and there he found a ragged half clothed man who begged that he might come in and warm for he was dying of cold, after a few questions which seemed to show that the fellow was as ignorant as he was destitute he was allowed to come in. The poor man sank down before the fire as one exhausted and drawing his old slouched hat over his eyes

seemed to fall asleep. No further attention was paid to him, work went on but the position was well taken, the feint well played and a sharp eye peered out from out from under that old hat and saw small bars baked with the materials for case hardening and placed in the fire case hardened bars removed from bakes placed in the furnace melted and cast into 'ingots and those ingots drawn ~~together~~ under the hammer until all trace of them having been cast was destroyed. This was enough the secret was obtained. The spy awoke with a well feined yawn and stretch

Kindness

and thanking his host for his ~~kindness~~ ~~Kindge~~ said he would trudge on his way, and sped with all haste to England. In a short time a great shop was established on English soil for the manufacture of Cast Steel. Certain important improvements in spinning machinery were stolen from an inventor in Italy in a similar manner and brought to England and very ~~many~~ many others that might be mentioned if space would allow.

It is not always cultured men who seize upon important facts. This is often done by very ignoran

persons who seem to have an aptness in this direction. But if the ~~first~~ pact should require intricate machinery or difficult engineering culture is required for its highest utilization. Again very important facts are often brought to light by scientists who seem to have no idea of their utilization which is done by others and perhaps less informed men. A fine illustration of the former proposition is afforded in the invention of the steam engine. Watt had a partner in his shop and one day when Watt himself was out there came a poor wandering

journeyman to his shop seeking work (The word journeyman seems to have arisen from an old custom or law in Germany that an artisan after having served his apprenticeship should travel and work for a while with different men in different parts of the country, after he could show a sufficient number of certificates ~~of his capabilities~~ from artisans of different parts to his efficiency he was entitled to set up for himself. Such men were called journeymen and the term came to be applied to all who worked for others) Hall's partner turned him

away but as he went out he met Watt, who ever on the alert, noticed something peculiar about the man's hat and said, "my good man, what kind of a hat is that you've got.

"It's just a timmer hat sir. I had a long way to gang an I wanted nothing to keep the water out.

"A timber hat," said Watt, "where did you get it? How was it made?"

"I just turn it on my lathe sir."

"Turned it on your lathe said the astonished Watt!" no that is not possible; the lathe turns things round; your hat is made oval to fit your

head. ~~I kew that ewr~~

"I kew That ewr, but I just gave my lathe to gang awitter gair to please me and turn my 'at.

Upon examination, Watt found that the hat had indeed been turned and recognizing a genius in the poor wanderer before him asked him in and told him to take hold of any machine he thought he could handle best and his wages should be satisfactory.

This man who had invented the renowned oval lathe the initial step to all form turning, just to please him and turn a

that, was none other than Henry Bolton, afterward Watts partner and associate in the invention of the steam engine which was the result of the native inventive genius of the one guided and directed by the superior engineering ability of the other.

Mr Morse is accredited with the invention of the magnetic telegraph and rightfully as far as the utilization of the thought is conceived. The essential facts which lead to the invention was developed by the more purely scientific research of the late Prof. Henry of the Smithsonian Institute when he was comparatively a young

man when working purely as a scientist.

Prof. Henry, while working in his laboratory and gradually unfolding these great facts in regard to electricity and the transmission of its powers through long coils of insulated wire and noting them at its opposite ends probably had but a dim conception of the immense value to the human race. He only viewed these facts from the scientists stand point and recorded them that the world might know them. But Mr. Morse caught them up and looked them over with a few different thoughts

I fancy he at once asked himself the question. What can I do with them. What is their practical value to me, and to the world, and at once began to scrutinize the collateral facts with a view to their utilization. What a stupendous change has come over the facts since they stood in the scientists laboratory.

When they were cared for only as facts in nature of value only to those who sought knowledge purely for the sake of knowing — under the manipulation of the purely practical mind of morse they become the means of speaking from city to city, from

from ocean to ocean, and dipping down into oceans bed the american ~~mechanic~~ merchant orders his goods from London and in a few hours receives back the answer that the goods are shipped - How different is this from the thought expressed in the model of the steam engine at alexandria two hundred years before christ. The world was not ready for the thought. They had not the means of executing the thought if the Times had demanded it. Such a utilization required cast steel as its forerunner required the machine lathe as its forerunner required a fund of mechanical intelligence of which the world at that time

had not the slightest intelligence conception.

When the Roman senator suggested the thought of printing from movable types or as he said with suitably prepared blocks with letters upon them, the world had means sufficient to have made it of immense value. But the practical mind to grasp the conception in its immensity and ~~continue~~ the detail of its utilization was not at hand nor the world ready to receive his suggestion if he had been. A thousand years more of observation, collation of facts and thought, were required for its realization. The great difference in the progress of the present age and the ages past

is in the mode of connecting facts and the manner of the mind in arriving at conclusions, especially as pertains to the arts. The ancients used isolated facts - they did not seem capable of connecting many facts together and utilizing them as a compact whole as is done in the present age. Papyrus was used as paper - it answered the purpose and they seemed not to have looked for other material for ages. Then leather or velum was introduced and these two stood together and alone for other ages - Finally the idea of paper making was utilized, but it required the collective genius

of the present age to develop it wonderful detail which has rendered it so cheap that the poorest of the land may use it as freely as they wish. Even five hundred years ago the poor and the middle classes lived in what to day would be deemed hovels - with dirt floors and almost destitute of furniture. None but the very rich could afford such a luxury as a wood floor. The condition of the arts of the period were such as rendered such things so extremly dear. It required so much labor to produce them that none but the rich could afford them.

Now by the discovery and the weaving of facts into machinery these things are

~~are~~ rendered so cheap that they who cannot have them must be poor indeed. They are so cheap because the labor of each man is rendered more productive. Formerly the labor of all the people was not sufficient to give all good board floors, and the other necessaries of life - Now with our improved ~~condition~~ production it is more than ample.

Very much of our improvement in recent times is due to a better recognition of the rights of individual men. When men could take no advantage of inventions, further than the supplying of some individual want of the hour there was not much incentive to inven

tion. Plus as men became wiser and division of labor into specialties more competent lead to those secret manufactures of which we have spoken. Plus in turn to the stealing of these secrets. Finally governments to correct these evils offered patents to insure men the use of their inventions - which was practically saying to each other man of the nation, "here, if you will contrive an appliance by which any useful article can be made with less labor, you shall have the first benefits of your inventions". Plus has proved a powerful incentive to improvement. Each man works with

a fair degree of certainty, that he will reap the reward of success. The world has gradually been learning that that which benefits one man must benefit the entire community. It is through the persistent thought and labor of the individual that the commonwealth must advance.

