Materials Processing Institute

THE 4TH INDUSTRIAL REVOLUTION WITH A FAIR AND EQUAL SOCIETY

A Speech Given at Redhills, Durham Miners' Association.

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Introduction

It is a huge honour and a privilege to speak here in the Pitman's Parliament, a building rightly recognised for its significance by Historic England. I was born and brought up in the communities represented here and I feel an overwhelming surge of emotion every time I enter this room, as I think about the ordinary working men, including members of my own family, who sat here to improve their communities and directly influence the politics of the day.

This is not though a place of the past. What excites me, is the renewed potential this building has to provide education, nurture our culture and act as a focus for binding our communities together. Just as this Pitman's Parliament was built brick by brick from the pennies and ha'pennies of working miners, organising themselves in response to the impact of the first industrial revolution, so our communities need an institution, like this, which will protect, support and enable them to adapt to the transformational impact of the fourth industrial revolution.

The 4th Industrial Revolution

You are all familiar with the first industrial revolution. Founded in Britain on coal and steam, it was accompanied by a surge of invention. The second and third industrial revolutions saw the introduction of electrification and automation. But just as the first industrial revolution replaced muscle with machine, so this 4th industrial revolution seeks to replace minds with machine learning.

We can all conjure images of that first industrial revolution where Stephenson's Rocket or the Spinning Jenny transformed Britain and the world, but also led to the societal disruption of urban relocation and the smokestacks of Victorian England. So think about the change today, and the work of a company like Boston Dynamics developing a robot to perform the basic human act of turning a door handle. It looks part dog, part boa constrictor, yet in a year, its robots now work in packs and use computer vision to leap across obstacles.

My approach to this shift from workers to algorithms is grounded in a sincerely held belief in the value of good work. Values I have inherited from the founders' of this very hall. The importance of work in creating a sense of self-worth, of confidence and purpose. The cohesive way in which work holds our families and society together. I say this having experienced what it is like to live in a community where there is a lack of work, to live in a family where there is unemployment. This experience has brought home to me the destructive and depressive power of worklessness and a drive to ensure that as few people as possible will live through it.

We must acknowledge that these technologies bring the risk, cause stress and are contributing to a crisis in mental health. Yet, we must embrace them and seek to benefit from their potential to decarbonise our environment and improve lives and our society for the better.

We Need a New Economic Model

The 4th Industrial Revolution is revealing that there are fundamental flaws in our economic system. We need a new economic model. Relentlessly driving to maximise GDP, ignores wellbeing and increases inequality, something I first raised in a speech in 2017. What was then considered radical is now increasingly mainstream: GDP is outdated and has the potential to be fully broken by these new technologies. To understand why this is, consider this, I play the cornet in the Durham Miners' Association Brass Band. I learned to play when I was nine and my tutor at that time was employed by the local authority. My early lessons, as stumbling and unmusical as they were, did at least contribute to GDP. This year, I am learning to play the trombone using entirely free tuition from YouTube.

Whilst adding greatly to my personal satisfaction, if not that of my family, this transaction is invisible to the economy, it does not contribute to GDP.

Why is this important? Well, if we take GDP as our primary measure of progress, we ignore the wider sharing economy, which is unquantified, but valued by people. This is something well understood by the communities in County Durham, who have always and instinctively stepped in to support one another, whether as a result of individual misfortune, through structured welfare programmes, or during times of industrial strife.

Not only are our measures wrong, but so is our perception of what constitutes a modern economy. It is strange that we have an industrial strategy for the first time in 40 years and yet we have no strategy for energy. More than this our industrial strategy has agreed a 'sector deal' for the creative industries, but not for steel.

In September, I met the Cabinet Secretary, Sir Mark Sedwill, when he visited my home town, Houghton-le-Spring. We discussed the damaging legacy from the closure of the collieries and the deindustrialisation of this region. He was right to highlight this, but in his words, there was an assumption that 'deindustrialisation' was an inevitability, when in fact it was a choice.

It is a misconception, uniquely held in the UK, that economic progress turns from manufacturing, to services, to financial services, whilst every other nation in the world realises that wealth is built on a foundation of industry and we know that this also builds community cohesion.

We need not only to change the way that we measure progress in our economy, but to acknowledge where and how prosperity is created. In this high technology revolution, as in all previous technology revolutions, those nations and people that will prosper, will be those that have a strong manufacturing base, *supported by not driven by* sophisticated services and financial services.

We Need to Reform Our Society

As these new technologies have changed our economy, so the changes in economics are disrupting our society, with jobs in the Midlands and the North most at risk. Over two-thirds of the hardest hit parliamentary constituencies are in these regions. However, in Shadow Chancellor John McDonnell's constituency, which contains Heathrow Airport, 40 per cent of jobs are at high risk of automation. Little wonder that he is more engaged than most politicians in this area!

We can expect that if we pursue a similar course of non-intervention as we did with deindustrialisation, then regional inequalities will grow. Just as the robber barons of the late 19th and early 20th century managed to accumulate vast riches through their corporations, so the founders of Amazon, Facebook and the like are able to corral a significant proportion of national wealth, but they are able to do this more quickly, with lower capital outlay and with fewer employees, than JP Morgan, Andrew Carnegie and the Rockefeller Family could have imagined.

Increasingly, the digital world enables mega corporations to be established and run by a very small number of people, concentrating wealth still further, driving an increasing gap between rich and poor and creating a more unequal society. This phenomenon is not new, it was also experienced in the first industrial revolution, only this time it is faster than before and reverses a trend of decades.

The impact of these new technologies on productivity is also contributing to this inequality. In the past it was

taken for granted that increased productivity results in increased wages, but this is no longer certain. Many middle ranking jobs are vanishing entirely. Just as manual labour declined in the 20th century, so thinking labour is declining in the 21st.

The broad sweep of history tells us that the first industrial revolution raised living standards like never before. This is true, but for a generation, or more who lived through it, it was misery. Living standards fell before they rose, infant mortality increased, before it reduced, housing became dangerous, before it improved. Just last Saturday I attended the memorial service for Thomas Hepburn, the founder of the first miners' union. One of Hepburn's achievements was to fight and win for a reduction in the working shift for boys under the age of 12, from 18 hours a day to 12 hours a day.

We must not forget that the rights and privileges we enjoy today have been the result of a struggle, at great personal cost to the individuals involved. Whilst the technologies of the 4th industrial revolution undoubtedly have the potential to bring long run improvements in all of our lives, we must not accept that there will be a period of a lax of regulation, where gains can be exploited by a lucky few, whilst the struggle for equality and prosperity for the many must begin anew.

We Need a Political Response

These challenges to our economy and society are leading to competing visions for the future of our society. We should not forget that the fascism which swept Europe in the 1930's was born at time of the greatest income inequality and social change until the present day. Concerns over future capacity for employment have led to ideas such as the universal basic income, and inequality has reignited the desire for greater employee involvement in companies, whilst direct action is being taken on climate change. Set against this is the reality of insecure work and calls for greater deregulation.

These new technologies do though enable people to work outside of existing economic clusters, meaning that decentralisation, as well as democratisation of industry and services, is now possible. One way we can both decentralise and democratise our economy, is to adopt new models of ownership. In the past, societal forces drove the co-operative movement and worker ownership is gaining popularity now, even in private companies such as Richer Sounds and Ardman Animations, but we need to go further. When setting up the Materials Processing Institute, I set aside conventional forms of ownership to create a not-for-profit entity, with no shareholders and a democratically elected employee director on the board. I, like everyone in the company, am an employee and we work together to deliver a shared vision.

In Conclusion

The 4th Industrial Revolution has the potential to decarbonise our economy and improve our lives. But, there are competing visions for the future of our society and we must fight to ensure that people are not forgotten, that we avoid rising inequality and that we invest in to our communities. We can do this, by recognising that progress is about more than increasing GDP and by decentralising and democratising our economy.

We have a responsibility in doing this to those who have gone before us. Those who worked hard to gain the rights that we now enjoy. But getting this right for me is also deeply personal. I have two small children and I can be sure that whatever jobs they will be doing in twenty years time, probably haven't even been thought of yet. But I want my children and everyone's children, to have the opportunity through good work and secure employment, for a fulfilling and purposeful life, in a fair and equal society.

Materials Processing Institute

Chris McDonald is the Chief Executive Officer of the Materials Processing Institute. The Institute carries out industrial research and innovation in advanced materials, industrial decarbonisation, digital technologies and the circular economy supporting the materials, processing and energy sectors for over 75 years. Chris led the divestment and return to independent, not-for-profit ownership of the Institute in 2014.

Chris's background is in industrial research and manufacturing, where he has worked internationally. A graduate of Cambridge University, Chris is a Fellow the Institute of Chemical Engineers and of the Institute of Materials, Minerals and Mining. He sits on industrial advisory boards at a number of universities, including Oxford and Sheffield.

Chris has an interest in innovation management and industry dynamics and in addition to leading the Institute, he provides expert opinion and consultancy support to companies, institutes, Governments and public bodies in innovation and technology strategy and management. He also advises on the technical due diligence aspects of mergers and acquisitions.

Chris is prominent in the development of public policy, around innovation, steel, SMEs, where he works to support growth and inward investment. Chris is the policy chair for Innovation and Enterprise for the Federation of Small Businesses, a member of the CBI Regional Council and Shadow Monetary Policy Committee for the North East, the Chair of the UK Metals Council and a member of the Steel Advisory Board for UK Steel (EEF).

Chris is often called to commentate in the media on innovation leadership and the steel industry.

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Chief Executive Officer
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The Materials Processing Institute is an independent, open access and not-for-profit technology and innovation centre working with industry, government and academia worldwide. Support ranges from small scale, site based investigations, through to long term collaborative research programmes.

The Materials Processing Institute is expert in advanced materials, industrial decarbonisation, digital technologies and the circular economy, specialising in challenging processes, particularly those involving high specification materials, high temperatures and difficult operating conditions.

The Institute has over 75 years' experience as a leading UK technology provider. Extensive materials processing knowledge is supported by state-of-the-art facilities with a broad range of equipment, from laboratories through to demonstration, scale-up and production plant.

Scientists and engineers work with industry and apply their expertise to develop and implement robust solutions to research and development and improvements for products and processes.

Expertise is spread across a wide range of disciplines, including:

- Materials Characterisation, Research and Development
- Simulation and Design
- Monitoring, Measurement and Control in Hostile Environments
- Process Development and Upscaling
- Specialist Melting and Steel / Alloy Production
- Engineering / Asset Management
- Materials Handling
- Minerals and Ores

Research and project management teams deliver support across a wide range of industrial and manufacturing sectors including:

- Metals and Metals Manufacture
- Chemicals and Process
- Nuclear
- Oil & Gas
- Energy
- Aerospace and Defence
- Mining and Quarrying

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