

**Society – Technology – People****Theory-Interviews on the relationship between societal and technological change.*****Interview with Prof. Dr. Heinz D. Kurz***

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**1 Where do we find sources for technological change and social division of labour?**

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3 Continuing technological and organisational progress, the emphasis being on  
4 continuing, is a product of the modern era. It did not exist before. It was the  
5 developments that took place in Europe, England and Scotland in the 17th and 18th  
6 centuries that brought about a fundamental change in the conditions governing technical  
7 advancement. I am speaking of the development of what Joel Mokyr called “a culture of  
8 growth and innovation”. This had not previously been in place. If you look at world  
9 history, you will find that technological changes occurred sporadically at various points.  
10 But these were individual events, there was no continuity. This has changed. And the  
11 change is the result of unintended consequences of human actions directed at particular  
12 purposes. So, people created institutions which together ultimately generated a culture  
13 of innovation. There are two fundamental factors which contradict the production of  
14 something new and the introduction of this to economy, to society. The first of these is  
15 possession of old knowledge. Those who hold old knowledge are able to use this as a  
16 basis for achieving monopoly returns. They are, of course, opposed to the introduction of  
17 innovations which will terminate their monopoly. We can note, for example, that farmers  
18 in the 15th, 16th, 17th century in Europe long resisted procedures to increase production  
19 on their lands because they understood that this would reduce the scarcity of the soils  
20 and thus drive down basic yields. This is an argument in favour of technical progress not  
21 readily coming about and being implemented. The second argument is that new  
22 knowledge cannot permanently and on average be kept secret. This means that it will be  
23 adopted and imitated. And secondly new knowledge does not compete for consumption.  
24 Thus new knowledge in general is virtually a public property. What does this mean?  
25 Private goods, think of a sausage sandwich, when I eat it, you will not. But with a  
26 Bessemer process in steel production firm A can use it and firm B as well – one does not  
27 exclude the other. Such goods quickly become available within the overall system, but  
28 this creates a problem. Those who bore the costs of producing the new knowledge  
29 receive only part of the revenue. In fact, they may not receive anything at all. And others

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30 rake in the profits. Of course, this is a reason not to create new knowledge in the first  
31 place. This is referred to as market failure. Markets which are left purely to their own  
32 devices are not able to realise a sufficient degree of technological progress. And it can  
33 be said that competition is a momentum of technological change, a driver “par  
34 excellence”, if you will. The result of competition is that individual stakeholders are  
35 unable to be certain of whether they will survive in the market if a competitor introduces  
36 new products whilst decreasing manufacturing costs, i.e. if they launch goods on the  
37 market more cheaply, or implement newer products which exhibit better qualities.  
38 Competition acts like a productivity whip, a technological progress whip, and this is  
39 noticeable. This is also well documented in the literature. Marx speaks of the coercive  
40 law of competition, which forces individuals to realise technical innovations or otherwise  
41 be ruined. Smith and Schumpeter also express themselves very similarly, to name just a  
42 few important sociologists and economists. #00:05:13-7#

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### Who is driving technological change and social division of labour?

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47 I will begin with the structures. On the one hand, we certainly have structures that are  
48 compatible with providing incentives, as we economists like to say. This refers to laws,  
49 rules, and institutions and so forth which are open to new things. If this is not the case  
50 and a ban is in place in this regard, then this is of considerable detriment to new  
51 products. The second thing is the need for an initial and continuing training programme  
52 that provides fertile ground for new developments or else reflects these developments in  
53 the human capital that people are able to offer. A further important aspect certainly is the  
54 fact that progress produces not only winners, but losers as well. These questions have  
55 formed an object of discussion since the end of the 17th century. What are the  
56 mechanisms with which new things prevail? Adam Smith and others have essentially  
57 provided us with the following considerations. In a situation governed by competition,  
58 there is reason for a company to innovate technologically and carry out organisational  
59 progress is to arm itself against being displaced by others on the market. If companies  
60 successfully introduce a better production procedure in the sense of enabling them to  
61 reduce the unit costs of a given product, it is obvious that they will make extra profits on  
62 a market where they realise the same price as the competition which is producing to a  
63 worse standard. Such a company will generate higher profits than the other company. If  
64 these companies invest the same percentage of their profits in order to pursue growth,  
65 you will quickly see that the company which innovates will grow more quickly than the  
66 other company. New things are successively channelled in via differential growth. They  
67 diffuse within the system and displace other things in relative terms—though not  
68 absolutely. This is one mechanism. It is simply created via different rates of growth at an  
69 innovative company as compared to a static company. The second mechanism that  
70 plays a part is, of course, imitation. Companies which see that neighbouring firms are  
71 earning larger profits as the result of the introduction of a new technology will attempt to  
72 imitate the pioneering company. This may happen in different ways. Industrial spying is  
73 one such route, and this is not uncommon. But, of course, a company may also acquire  
74 a licence to use the new procedure or pursue other similar pathways. In such cases,  
75 new technologies are also introduced within companies which did not pioneer them. It is  
76 also obvious that innovations frequently suffer from growing pains. The first car that is

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77 produced may exhibit serious defects whilst the “second mover”, as we call him, secures  
78 the advantage. For this reason, we can often observe that pioneering companies go  
79 bankrupt, because they operate using procedures that are in urgent need of  
80 improvement. But, in any case, competition will provide a push to usher in the new  
81 product, and this will ultimately tend to displace the old technology. #00:09:18-8#

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84 **Which consequences will arise from technological change?**

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86 Humans have been using devices - produced production tools - for quite a while. Tools  
87 which they have controlled, to varying degrees of success. They may involve anything  
88 from agricultural implements to scientists with computers and they exert an influence on  
89 the way we work. In the case of new technologies, some of this equipment is of such a  
90 quality that it controls you rather than you controlling it. This will create a fundamentally  
91 new situation. Of course, individual productivity will rise very sharply in many areas. This  
92 means that we will experience technological advancement in sectors which are naturally  
93 very valuable to us. Think only of medicine, health provision, and related matters. Think  
94 of treatment in hospitals. It is possible to say that current technical advancement is  
95 characterised by a conflation or merger of three spheres. This is something which we  
96 have not previously seen in such a form. On the one hand, of course, we have the  
97 physical sphere. On the other side is the biological sphere and then we have the digital  
98 sphere. And then there are these cyber physical systems in which hardware and  
99 software are linked and communicate with each other. You can now buy and sell  
100 anywhere in the world. You can dismantle and split production processes and produce  
101 some individual parts in Germany and others in China. This closely correlates with the  
102 circumstance that transport costs have fallen considerably over the course of time. This  
103 has led to an unbundling of value-added chains. What you get, in essence, is an  
104 internationalisation of production and very rapid changeability of production. Flexibility  
105 will increase. It is certainly possible to say that what happens in the long term will be  
106 strongly dependent on whether a machine will remain a human tool and thus become an  
107 appendage of the person or whether, vice versa, the human becomes an appendage of  
108 the machine. My supposition is that the average long-term balance of probabilities  
109 suggests that things will move in the latter direction. This means that humans will lose  
110 much of their sovereignty, formative capacity, and diversity, albeit not everywhere, and  
111 will be forced to operate according to the rhythm of the machine. Occupations in which  
112 knowledge is codifiable and only low levels of skill are needed will be susceptible to  
113 being taken over by machines. We must not close our eyes to the fact that artificial  
114 intelligence is also increasingly penetrating the skilled worker sector. One of the reasons  
115 for this is the wage differential that has become discernible recently. Less qualified  
116 workers have even had to accept decreases in real wages whilst the incomes of highly  
117 qualified employees have risen very sharply. Those seeking to minimise costs will start  
118 to agonise whether qualified workers in the lower and middle management tiers can be  
119 replaced by machines. That we have artificial intelligence, machines that are able to  
120 learn by themselves, during the production process, never sleeping – and you see, if this

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121 is the case, if you have artificial intelligence and if this continues to develop in the same  
122 dramatic way as in the past, you will arrive at a situation in which humans are completely  
123 incapable of competing with machines except in a small number of exceptional cases.  
124 We will reach a point of technological singularity. In its extreme form, this means that  
125 machines are superior to humans in every regard. The new technologies of which we  
126 are speaking also make use of new forms of economic implementation. This is the  
127 platform economy—eBay, Alibaba in China Facebook, Google, and so forth. And the  
128 more data platform companies have processed, the more effective they will become.  
129 This is a type of data capitalism which we need to examine carefully. Data is a modern  
130 type of money which exists alongside real money. Even when you do not notice it, when  
131 you surf on the Internet, you pay with the availability of your data. These companies  
132 learn. Algorithms and machines learn from your data. They constantly improve their  
133 ability to tap into your preferences. They know when you wish to purchase certain goods  
134 and when you may be suffering from an illness thanks to implanted micro chips and the  
135 Internet. But this means that it will be virtually impossible to catch the company which  
136 has established a lead and processed the largest quantity of data. Such a company will  
137 turn into a gigantic monopoly, a footloose entity which does not comply with existing  
138 labour law and trade regulations. These companies base themselves out of areas where  
139 the lowest taxes are payable. These major firms pay no taxes whilst achieving vast  
140 profits. This represents a threat to national sovereignty and, of course, also to  
141 governments' budgetary sovereignty. If tax revenues decline but at the same time  
142 problems created by technological unemployment and the like, which the state has to  
143 cope with, you see that budget deficits are imposed with no possibility of doing anything  
144 about it. By technological development. Employee representative bodies will face  
145 difficulties as a result of the erosion of their base. The degree of trade union organisation  
146 appears to be declining and is in particular very low amongst cloud workers who take on  
147 temporary jobs in the gig economy. Poor pay may mean that workers are unable or  
148 unwilling to afford trade union memberships. So, worker representation is in trouble. But  
149 companies and their own representative organisations also face difficulties. If there are  
150 only a few very large companies, exercising power over the rest. Who cares about the  
151 rest? In order to gain any scope for representation at all, the rest would have to join  
152 forces, also in order to exert control over the major players. This is one reason why I  
153 believe that many people in society are no longer prepared to expose themselves to  
154 these giant monopolies. Coming developments will be very motley. There are, so to say,  
155 lovely jobs—popular occupations in which workers are creative. Creativity is a huge  
156 asset which will be in demand in the future, as will people with communication skills and  
157 knowledge that extends beyond their own sector. This will be sought after. So, these  
158 exist, lovely jobs, people who very much like to sit in front of their computer or operate  
159 these technologies. But there are also lousy jobs. These basically reduce work capacity  
160 and turn people into cheap henchmen. Also worthy of mention in this context is that  
161 there will be a return to the putting-out system. This is already the case. In the old days  
162 in Silesia, for example, entrepreneurs would distribute cotton amongst weavers for  
163 processing on hand looms at home. The introduction of new looms put a complete end

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164 to this practice. We are now experiencing the emergence of a growing gig economy.  
165 This involves jobs which are completed in one or two days before workers then lose this  
166 job again. This virtually constitutes the advent of digital day labour. Precarious  
167 employment within a larger environment. No trade union organisation, no social  
168 insurance, no health insurance or the like. People are left to their own devices and are  
169 pseudo self-employed. I believe that certain tasks will be cut in the longer term. It should  
170 be possible to preserve jobs, at least partially, if adaptations to the task profile take  
171 place. Of course, this places requirements on the training sector in turn. But noticeable  
172 economisations may occur. This is, if you like, a negative effect which contrasts with the  
173 positive effect of a rising quantity of goods and cheaper availability of such products.  
174 However, there are also many other effects of course. We know that new technologies  
175 facilitate the monitoring of people at and beyond work and allow much wider surveillance  
176 to be conducted than was previously the case. This could be said to constitute a threat  
177 to individual civil liberties. Developments in China are aligned towards maintaining  
178 control over people from early until late and to making evaluations in respect of  
179 availability of travel and other similar aspects. I think that this is a menacing approach. In  
180 a nutshell, technical progress exhibits characteristics that are reminiscent of Big Brother.  
181 Of a controlling and monitoring state. I see this as a huge danger. It should not be  
182 underestimated. Perhaps I can take this opportunity to refer to the work of Angus  
183 Deaton, a Nobel Laureate in economics who investigated the impacts of information and  
184 communication technology on various sectors of trade and industry in the USA. There  
185 was a particular focus on the sense of well-being of middle aged white Americans.  
186 Deaton discovered that it was possible to identify considerable gloom and dejection.  
187 People were embittered because they were suffering from poorer working conditions.  
188 This has led to a rise in obesity. People have become fatter, drug and alcohol  
189 consumption have increased, and family rifts are becoming more widespread. The final  
190 result is the so-called “death of despair”. Factors such as life expectancy, which has long  
191 since been rising in line with technological progress and has always been viewed  
192 positively, are now beginning to sink against the background of more recent  
193 developments. The negative effects are thus enormous. Of course, it is also clear that  
194 Trump and other similar persons enjoy considerable support from these groupings. This  
195 means that technical progress does not merely change the world of business and  
196 technology. It also alters culture and politics. So we are really speaking of the co-  
197 evolution of these systems with technology acting as the main driving force, so to speak.  
198 In order to prevent society from drifting off into populist politics, which of course  
199 possibly may exhibit belligerent tendencies, I believe that care needs to be taken to  
200 pursue an inclusive programme. #00:23:21-2#

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203 **How are drivers and consequences of technological change connected?**

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205 Division of labour exists within companies, between companies in a region or country,  
206 and thirdly, of course, internationally. I will begin with the last of these. It is already

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207 possible to say that international division of labour is massively on the rise because of  
208 the unbundling process of value-added chains. This means that globalisation will take  
209 place more strongly than before, and division of labour may actually occur between  
210 regions and regions which lie far apart. If transport costs are low, it is no problem to  
211 import certain preliminary products from China to Europe. And, as we know, the Chinese  
212 are currently involved in the creation of a major innovation in the form of the “One Belt,  
213 One Road” project, i.e. a new Silk Route. This will take the form of a railway line that  
214 passes through the whole of Eurasia with stop-off points at certain places where large oil  
215 and gas deposits have recently been discovered. Scarcity of such resources will thus no  
216 longer constitute a problem, and this will be a major issue. Globalisation will advance  
217 unless military disputes lead to a new Cold War. This is something which at present  
218 cannot be excluded. Then, of course, there is division of labour between regions within a  
219 country. This, too, I believe will increase. We will see knowledge-based and knowledge-  
220 generating centres in particular, and these will be present to a greater extent than  
221 before. They will increase in relative significance compared to other centres, and labour  
222 division will also become much stronger between companies depending on the  
223 qualifications profiles of workers. The increase in pseudo self-employment, in the gig  
224 economy, and in the putting-out system is leading to a fragmentation of the labour  
225 market into lone participants. Each of these will try to take their own fate into their hands  
226 and it is to fear they will generally not really be successful. To this extent, they are  
227 different to the superstar companies that technical progress has created today. These  
228 firms are basically no longer in jeopardy. This is because of the endogenous learning  
229 processes of the machines, of the algorithms. Once a company is ahead of the pack, it  
230 will stay there. This means that monopoly positions are no longer assailable. This was  
231 not previously the case. It used to be the case that when a company had a monopoly,  
232 they were in danger of jeopardising their own monopoly by introducing technical  
233 innovations. This is far less prevalent today. There was also much more free competition  
234 in the past, as many firms entered into both national and international rivalry. Nowadays,  
235 however, there are no more than seven companies which call the shots worldwide in  
236 significant sectors. #00:26:55-8#

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239 **What measures can be taken to steer technological change?**

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241 Well, how can we approach this issue? There are economic policy measures which are  
242 able to exert a level of control. One of these, for example, is to tax companies where  
243 business is transacted and not at the location of group headquarters. If you buy a book  
244 from Amazon in Germany, for example, you would pay tax in Germany rather than in  
245 Ireland. This is one option. The second possibility is to significantly increase taxation.  
246 One thing which we can say today is that huge superstar monopoly firms represent a  
247 stronger danger to freedom than most nation states. These companies possess an  
248 unprecedented level of power and have become uncontrollable. This means that the  
249 state will need to re-embrace its old task of securing individual freedoms. It can only do  
250 so by bringing these superstar companies to heel.