

THE INFORMATION OF MACHINES

AND OF MEN:

WIZARDS AND TECHNOCRATS

Thirty years ago, if one were to speak about the “treatment of information,” the best one could expect would be politely smiling indifference. It goes without saying that this expression, until recently meaningless, refers to the information of machines.

As for human information, it also arouses some interest, but for a very different end. Whereas machines are questioned as though they were oracles, in the majority of cases men are given information so as to be subjected to other men, either directly, or thanks to a kind of neutralization.

Though they appear to be far distant from each other, despite the name they have in common, these two phenomena possess

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strange interconnections. Faith in the miraculous and ignorance of vital and elementary facts draw us away from the naive rationalism which conquered the ancients, and foster a permanent, if not increasing separation of man from his surroundings.

MIRACLE AND WITCHCRAFT

Two kinds of fairy, the benevolent and the malevolent, people our mythology, whether it be ancient or modern, the child's or the adult's. The spirit willingly withdraws from hideous, reasonable mediocrity and the sickening mean, being little attracted by an uncomfortable and ill-defined equilibrium, which demands continual effort, and ravished on the contrary by what is spectacular and marvellous, and allows itself to be carried to extremes,—that is, to hope or anguish.

Since the beginning of its existence, the machine has always known how to inspire these two emotions. Each invention, and correspondingly each disturbance, offer both gilded escapes (free of the constraints of the present)—that are all linked to the mythology of affluence,—as well as evil consequences, whether real or imaginary. These evil consequences take various forms: disorder in nature and particularly in atmospheric conditions the suppression of employment, the elimination of man by the monster or further subjection of man to this same monster, if not total annihilation, making man lose what was most distinct in his personality, turning his *raison d'être* to that of a robot... The "Modern Age."

The press, animated by the fundamental concern to please, to flatter, frighten and seduce, provides fuel for the drama, nourishing illusions, alternating between best and worst, in accordance with the old technique of religions, rulers and Westerns.

We shall consider some aspects of these two scenes, miracle and witchcraft.

I. MIRACLE

The subject is concerned more particularly with our times, and with the electronic machine, which modifies our life in various ways.

A methodical conquest

Everything happens as though the king of the machines, or their emperor, had decided on a methodical conquest to be achieved by their progressive irruption into domains that were formerly considered inaccessible. When pure mechanics gave some signs of breathlessness, the field was left clear for electronics. Accountancy already being three-quarters devoured by the first generation of machines, after the speedy absorption of what remains there were, the calculations relevant to mathematical analysis fell to the attack, then ballistics, astronomy, quality controls, etc... Once these victims were well-nigh consumed, the appetite of the conqueror was sharpened still further. It was the turn of economy, sociology, demography, linguistics and many others.

When social science had fallen largely under his control, this Moloch was carried away to seizing for himself the fortress of art, reputedly inexpugnable, naively straining to apply materially laws which remain full of mystery for the spirit. The secretion of synthetic music, and still more of poetry, leaves us perplexed, without these efforts being halted in any way by our scepticism. In fact a broad disharmony reigns over poetic harmony; is it very opportune to claim to be creating poetry, we might object, when we daily massacre such verse as exists?

Such an objection seems derisory to the progressive. No matter if Christopher Columbus was mistaken in meanings or in continents, they say; the essential was the setting-out.

The last refuges

Today it is the turn of the so-called "man of art," that is, the doctor, to be disquieted or inspired with enthusiasm by the automation of diagnostics and even of therapeutic treatment. "True," the cowardly or sceptical practitioner could say, "I have still the vast field of psychotherapy," which providentially opens out at the same moment. But turning to that, once again he finds electronics already in his place. The I.M.P.S. scale measuring 75 symptoms, we are assured, allows one swiftly to define the profile of him whom we no longer need to call the *patient*, so quickly is his fate determined.

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The witchcraft of the machine

The machine is not only supposed to be able to carry out in a few seconds calculations which would have taken the human brain millions of years. Admittedly sensational performances duly selected are loudly proclaimed every day, so certain is the orator or publisher of achieving an effect, but these results gradually become dulled and do not satisfy our insatiable hearts. After a while, the spirit ends by attributing to the computer a kind of power which is certainly not supernatural, but is truly more than human. Whence comes the idea that annoying problems will be resolvable by the computer, whence also a certain faith in the results which would be contested, and suspected, if they came from that pitiable, fallible machine that is man. I shall give two examples of this, one for each case they are in no way exceptional, on the contrary, they are typical.

1. A problem, which is easier to state than to resolve, exists over council housing in France (called H.L.M.), and no doubt in other countries also. Certain people, or families do not fulfill, or no longer fulfill, the conditions required for occupying those lodgings at a reduced rate. Either they no longer have as many children, with them as before, or their income has increased considerably, etc... But it is very difficult for the authorities of H.L.M. to get them to leave, much less to exchange them for families in needy circumstances.

When I asked an M.P. of a large French town what the procedure was in his city, and what means he foresaw of accomplishing this work of legality and social justice, he thought a moment, scarcely more, and answered: "I shall ask I.B.M." And as I did not really see what help he would get from the computer, and showed some surprise, he clarified: "The machine will make the necessary selections." In fact, the concierge of the buildings, or at any rate the manager, knew perfectly the 20 or 25 families concerned, and kept up an edifying correspondence with them. The problem was not to detect them, but to obtain their consent—a problem not statistical but human. But in answering thus, the M.P. got himself out of an embarrassing situation; he evaded it and gained, for the moment, peace of mind.

2. During the French Parliamentary elections of March 1967, the elected making up the House were drawn from the second

round. When a count had been taken of the first round and of the drop-outs announced in advance, it was possible to sketch out a first view of the new House. All that was needed after that was a knowledge of the shifting of votes from one round to the next, these maybe of an insignificant quantity, for some typical administrative divisions. After 8 or 10 partial results, an average probabilities calculator could, in counting the heads, state the composition of the House within a very narrow margin of approximation. But this poor man, with his soul laid bare, would have no credit with his listeners, or viewers. This is why a whole barrage of specialists, armed with an awe-inspiring machine, was mobilised at great expence, to obtain the same results a little more slowly because of delays en route. Indeed a most valuable move, for the oracle was obeyed religiously.

The important point here is not so much the question of time-lapse or of the approximation of the calculation, as the fact that the public would not have had any respect for a man, because it is ignorant of, or refuses to accept the calculation of probabilities, while it believes the machine, which applies the same calculation of probabilities.

The stronger power

When we find ourselves at grips with an obstacle, an adversary whom we cannot come to terms with, or when we are faced with a threat which is difficult to overcome by our own means, we willingly look for a higher authority which can come to our aid. The restraints imposed by nature were already, of themselves, ferocious and intense, even when they were not aggravated by the exactions of a lord or landowner. When pressed to it, it is possible to talk it over with an overseer or an officer, but not with hail or frost. Thence the need to look higher, to appeal to a superior power; thence the vital necessity for superstitions, protective gods, sorcerors.

When once natural constraints had been partly softened and partly explained by the laws of chance, the impositions of society became unbearable. The régime or the government in power takes upon itself the responsibility for our privations, that is, the difference between our resources and our needs; or, if you prefer,

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residual natural constraints and social constraints cross in a grid which seems a prison.

Hence a distracted need for evasion, which variously betrays itself in our cars, second homes, etc... but, for many of us, in our faith in a growing power, the machine made to set us free.

Exploitation

Human credulity has managed to change its character in the course of centuries, but it has always found men to exploit it. Robert Escarpit's gripping "*Littératron*" is hardly anticipatory, hardly an exaggeration.

Nowadays the man who would impress his own conviction on a circle of listeners must take care to add that what he has stated is "proved by statistics." He must assume an unimpassioned tone of voice to announce that the computer has expressed itself clearly in this fashion. This procedure is already employed in the most diverse places. Let us take two opposite examples:

(a) We read in a French financial newspaper the following headlines, in sizeable type: *A Revolution in the Economic Preview. Value Shifts seen in Advance by Computers.*

The result of the calculations depends, as everywhere, on the *information* given to the machines. These can accelerate a definitive calculation, but not by modifying the given basics.

(b) It is not only a matter of the capitalist countries. Predictions have been formulated in *Izvestia*, in the summer of 1967, about the year 2000, a game much in favour in the west. The value of the Soviet predictions is very uneven, covering as it does everything from athletic performance to wheat output per hectare, touching on the population of the U.S.S.R., the length of skirts, the style of living, etc. All the calculations, even the numerical ones, if any there be, are very easy to get hold of, once the hypotheses have been accepted but the force of these revelations was mainly increased by the announcement, carefully placed, of the intervention of electronic calculators.

Magic and surrender

The almost magical properties attributed to computers by a section of general opinion constitutes, as we have seen, the resur-

gence of a universal mythology which answers to basic needs. Our relative freedom, obtained, as far as regards nature, over a large part of the globe, was achieved only at the price of heavy social restrictions. This pressure creates in each of us, as we have seen, a need for escape, which, apart from material evasion, shows itself in many ways; in anger, in detestation, in laughter, games and other distractions, but also in dreams.

The machine provides a possibility of distraction, so long as it is really spectacular. On the other hand, it also corresponds to a certain spirit of submission, which is manifested in so many different ways: in superstitions, astrology, etc., also in fashions and popular crazes. The electronic machine being a typical *avant-garde*, it was necessary to set ourselves up on its own level, and if possible to overtake it. In this way everyone avoids the severe stigma of being behind the times, both in the eyes of others, and above all in his own eyes.

In the whole world there exists no public organization, administration, scientific establishment, school, etc., which does not have difficulty in finding the financial credit necessary for its running. This is the normal situation, which hides the real penury of economic order. In the permanent argument with the budget authorities, everyone tries to find the definitive argument. In the last years, the acquisition of an electronic machine has proved the most efficacious. The financial controller has no means of judging how useful this machine may be, nor how large it is, but to refuse it would risk making him appear retrograde, whereas to oppose the employment of a human being does not raise the same psychological difficulty.

We recognize without difficulty the ludicrous and tragic administrative council Parkinson describes, where the mysterious reactor, which few of the administrators understand, carries with it all the votes, at the cost of the bicycle-shed.

For it is in the ascent into the elevated spheres of society, to the giddy domain which could in all respects be treated as the highest geological period, that we have the possibility of escaping the redoubtable affliction and constraints of book-keeping and stock-keeping which weigh so heavily on the potato-grower and the shoe-maker. Before a basic mistake of orientation has had time

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to be disclosed—if it ever is—enough time passes to allow it to create its own consequences, its own truth, its own history.

Moreover, since it is often far easier to buy or to hire a computer from a catalogue, and even to hire a qualified programmer, than conveniently to collect and to channel the sources of information, the choice and the subsequent operations are all self-evident.

Important mistakes and heavy losses are the result of this. They are beyond evaluation, we can never know them, and what is more, they can be refuted, attributing to every anticipatory act a creative value. In any case, let us remember that there are two possible ways of approaching a cow—to milk it, as in most countries, or to worship it, as in India. A combination of the two is possible, which allows us to avoid the choice.

Mechanical information

Whatever it may be, the treatment of information has become one of the most important techniques of our times. This new and enormous field constantly attracts new explorers, eternally enriching itself by its own progress and by the new needs which it creates for itself. “My value lies in what I lack”—this is the most certain formula for development. This favour, which is so highly estimated, makes us in some degree forget that to give proper information, the machine must itself be fed information.

Nevertheless the question is to determine whether machines are creators or simply obedient transmitters. In an international conference held a few years ago, a cyberneticist prophesied fearlessly: “In the first place we make machines, which will subsequently make other similar machines, but which will eventually create machines thought up by themselves and beyond our own power.” A fool in the audience asked him if it would not be even more worthwhile to construct a machine which would build apartment blocks. It was necessary to recommence from a different starting-point.

Certainly creation can emerge from a chain of chance, as in the evolution of species. Men would convince us that one need only imitate the evolution of species, and select from the mutations, or, like Valéry’s Serpent:

Let us create chance for him
And by this, the strangest of arts,
May the pure and wished-for heart be born!
(*Sketch of a Serpent*)

The late Sully Ledermann, expert in synthetic music, used to say that it was not impossible that one particularly lucky day, the machine would create a work of genius. Only, even if the machine accelerates and multiplies its experiences to the utmost, man stays in the rhythm exclusive to himself, to follow them and judge the results.

As for poetry, we can ask ourselves how we are to feed the machines with information, when we ourselves are uninformed.

If we stay for the moment in the region of current application, we must distinguish clearly between areas where the information is rigorously exact, by definition (the accounts of bank clients, for instance), and work of the social and economic order, which is to allow us to understand a little better the society in which we live, and which we intend to improve, or even to control.

In the second, the thing which is most important, that is, the quality of the rough material, usually leaves much to be desired. It is rarely possible to seize alive a social reality by a totally faithful sample. As in a photograph in which the film is unevenly sensitive to light radiations, so the different factors are touched on unequally. Hence the tragic vice of method, which is so common in social science: the forgetting or omitting of the factor which we do not know how to measure, which evades our instrument.

The well-borer

This miscalculation can be clarified by a symbolic episode whose authenticity we can guarantee:

A vine-grower in the South of France had called for a well-borer, who (he thought, luckily) was also a water-diviner. Having made his tests, the man said to the owner "You have water under your feet at a depth of seven-and-a-half meters of non-clayey soil." And when the other man let his delight be seen, and asked for immediate boring to this sump, at 7.5 meters, the diviner repeated: "I said, of *non-clayey soil*." His blood running cold suddenly, the

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vine-grower asked anxiously "But in that case I might come against 100 meters of clayey soil as well?" The answer was frank: "Obviously, because as for the clay—I don't sense it."

The fact that a number of economists, econometers, and sociologists, whether political or not, should reason in this way is even less surprising, because scientific scrupulousness, as honourable as it is misplaced, proposes the refusal of responsibilities and leads to valuing the unknown at zero. Moreover, most often, this unknown factor is the human one.

The evil is not a new one, but it has become accentuated since the considerable progress made by the machine, be it a drill or an electronic calculator. Natural lazyness and our belief in miracles do the rest. Here are two more significant examples:

An eminent scientist with a brilliant past and a promising future expressed himself as follows: "The computer now used by the Ministry of Education will enable us in particular to foresee the effective force of students less scandalously falsely." Whoever has attempted to foresee the numbers of university students, carrying his researches to the profoundest level, knows very well that the hazard lies not in the calculations, but in hypotheses formed on the proportions of graduates entering the University.

A young sociologist was carrying out an enquiry recently, which needed a sample of 1,800 answers to have any significance. When I asked her how many answers she had got, she replied that she hoped for 120 or 125 (with a definite important margin). And when I demurred, perhaps a little too timidly, at the slimness of this sample, she replied buoyantly: "Quite; I must go to Paris, so that I can have the most developed machinery at my disposal, and then I can get a better worked-out assessment." She thought that, like a stronger lemon-pressing machine, a more corpulent computer would better squeeze out the juice of her meager materials.

Is it a matter of an exceptional case? It does not seem so. At any rate it conveys a widely prevailing attitude—the hope (whether clearly formed or not) of seeing the machine correcting human imperfections. More than one mediocre tennis-player or skier prospects with the most exquisite care, purse open, for the most efficient racquet or ski, or indeed even ski-stick, manoeuvring in this way a calming transfer of responsibility. An innocent of the same family, who once asked the art-photographer André Vigneau what

camera he used for his masterpieces, found himself being advised to ask Picasso what was the make of his paint-brushes.

The machine of course also gains by the magic of numbers and the effects of repetition. When the derider of statistics begins his disquisition with the adage "Statistics, third form of the lie," which he thinks he discovered it as a sure bet that he will come out in a few minutes with a whole scaffolding of figures, balanced on the strength of his own voice, and the number of decimal points. To this simplifying definition of statistics, attributed to Dostoevski to give it a more imposing appearance, how much more we should prefer the most subtle definition: "Statistics is the art of making precise the things of which we know nothing,"—which is even more striking when applied to computers.

Choice by machine

We do not intend here the truly mechanical choice of cards or tickets, but of tasks. The machine suppresses or alleviates some of these, leaving in their place others, that is to say, the toughest.

A classic now is the taking-off and landing which are part of an airlight. When both of these take an hour and a half, it become increasingly less interesting for the long-distance traveller to win an hour on the duration of the flight itself, gained by the efforts of miraculous progress. And yet the psychological attraction of speed has remarkable influence on the passengers, which is freely exploited.

Indeed, due to this very improvement in the treatment of information, the other stages have become proportionately more important, ever attracting less and less attention from our spirit, magically bewitched.

Here is a typical example, the population census: it includes the following stages:

1. *Preparation.* Drawing-up of a questionnaire or questionnaires, consultation of interested organizations, try-out samples, instruction and stationing of the census agents, distribution of questionnaires, not forgetting administrative resistance or formalities, budget discussions, etc.

2. *Execution.* Filling-in of the questionnaires under the surveillance of the agents, collection and verification of the different districts, finding out the drop-outs, conflicts with the local

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administrative authorities, and general reassembling at the central office.

3. *Translation into the language of machines.* Reading the reports, various test controls, treatment of the reports incompletely or incorrectly filled in, codification, perforation.

4. *Treatment of the information.* Programming and execution, tabulation.

5. *Printing of the lists* and editing of commentaries to make them comprehensible.

6. *Analysis of the results.*

There would be other tasks to enumerate, such as the verification of the census, taken in circumscribed zones, the detection of mistakes or lies, etc.

Of the six stages we have listed, the treatment of the information is well-nigh the only one to have gained by technical progress. Even if it were to be pursued to such a point that these operations counted as nothing, in cost as well as in time, the total undertaking would not be appreciably diminished.

So we see that census-taking presents many more difficulties than it did before the war, employs more people, and costs much more. Certainly these censuses supply more complete information, and allow for more detailed investigations, which often answer to new necessities and needs that have become vital. Finally, a country's knowledge of its population is a more important undertaking than it was before the war, even in its relation to the national income. And nevertheless, in many cases it has not been possible to carry out the work that was planned. Some post-war attempts have had to be abandoned, notwithstanding their immense usefulness.

The analysis of the results (part 6) could be carried out outside the central statistics station, but the publication of the tables, fitted out with the commentaries necessary for their proper comprehension, often leaves much to be desired, because of a lack of qualified personnel.

Logic and optimization

Magic plays a role that is positive as well. More than one underdeveloped country only decided to carry out a census because of the allure of the machine. The public powers would certainly have

retreated from, or found excellent reasons against unwelcome tasks. The machine cost a few dollars, true, but it led in its turn to the creation of statisticians—an interesting by-product. The opposite order would no doubt have been more logical, but it had no chance of being followed.

This more reassuring observation can have a wider significance; as with most other technological developments, the profit of society should be measured not by total but net value. The decrease from one to the other can be considerable; it even happens sometimes that by a reasonable reckoning the present methods turn out to be more costly than the former ones, the private administrations and enterprises sometimes being forced to pay themselves out of obsolescence, which could not have been foreseen at the beginning of the undertaking. Even if the calculated reckoning could be made correctly and could show the extreme shortlivedness of the paying-off, the decision could sometimes be justified by the concern not to allow a retrogressiveness in methods, as in personnel, which would later be difficult to overcome.

II. THE EVIL CHARM

The accusation levelled against the machine, that it is the devourer of men, or at least of employment, does not date from today, but, without doubt, from the days of the first machine. Diocletian, who was building a temple, found an engineer offering him a machine which would raise up the columns. The answer he got was negative: "Let me feed the little people."

Public opinion, enlightened be it or not, expresses the same concern with every progress, or rather every new form of progress. The history of the machine was inundated with tears at its birth.

Let us quote—among many others—Montesquieu, who reproaches water-mills with "depriving labourers of their work," or the abbot Duguet, who gives the following advice to the Dauphin in his edifying *Treatise of Political Morality* (1793): He (the prince) must oppose all inventions which make one man take the place of many, and which consequently take from them their work and their livelyhood... He must content himself with doing justice to the ingenuity of the inventor, and must severely prohibit anything which will do no more than to increase the numbers of the needy and the lazy.

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These examples can be multiplied: there is Jacquard, the inventor of the loom, who, on being asked by the Prefect of Lyon to go to Paris, took his place in the carriage not knowing whether, on arrival, he would be congratulated or put into prison; there is Sismondi, who evoked the futurist idea of the King of England left alone on his island, enjoying a much elevated level of existence, thanks to the play of press-buttons and levers, without even the aid of economics.

Many other actions are brought up to join the reproach of suppressing mankind—such as pure diabolicism, or, if not that, then at least the destruction of natural order,—of which the most persistent form is the accusation of encroachment on the normal course of the seasons.

Let us deal only with the idea according to which the machine reduces readily available labour not only locally and temporarily, but definitively and generally. In spite of the considerable increase of the total number of posts in the countries supplied with machines, as opposed to other countries, the belief remains undiminished, to such a degree that the most eminent economists hesitate to compromise their reputation on this awesome subject.

The last major stage of progress, that of electronics, differed so much less from the rule that in the beginning the evil magic far exceeded the good. In the first days of automation the most gloomy prophecies were made. A large French weekly, for instance, announced that after a time-lapse of ten years there would be no more office workers. Once when I was giving a lecture on automation to an audience consisting for the most part of lawyers, I felt some kind of unease, some lack of communication of which I could not find the origin. So I happened to say, on the spur of the moment, that the last machine to be made would not be the one whose function was to make its fellows laugh, as some people said at the time, without particularly believing it, but one to speak in their defence. However surprising the result may seem today, I must assure you that the relaxation of atmosphere was not short-lived, and that after this optimistic observation the hardest parts of my report went by without difficulty.

Not only were the blackest prophecies made, but the opinions formed after the fact, by the most serious authors, took no account of the results which arose to contradict them. Since 1950, at

which date the era of automation began, the number of civilians employed in the U.S.A. rose from 59,900,000 to about 75,000,000 today; say, an increase of 15 million over and above the rise in the population of working age. The rate of activity has increased at various ages since the introduction of automisation. But these figures are never quoted.

To this increase we can add that of military posts. Contrary to the well-established opinion, armament does not increase employment—in conditions of unchanged financial politics—because the sums allotted to it have been put to the charge of the economy, or could well be still of use to public civilian expenditure. If public opinion believes in the economic virtues of armament, it is because all its operations are visible, and also because stepped-up armament often necessitates inflative politics, which are an artificial and temporary stimulant.

The increase in employment has been considerable in Japan, which has been mechanised, electronised, and automised for the last 20 years. The active population has risen from 33 million to 49 million—an increase of almost a half. Moreover, a decrease in under-employment has followed in agriculture and the light industries.

One might say that these results, which follow up on so many others, benefit from the treatment reserved for the strange category of news which is not reported. This category is peculiar not only by force of its own character, but because of the slight attention paid to it by the sociologists.

To tell the truth, the popular reproach levelled against the machine, which we have just formulated, has not so much the character of a malediction as the appearance of a seemingly rational criticism based on the judgement of the senses. It is a matter of a local perspective, which does not go with any general examination of the multiple incidences of technical progress, particularly in income and expenditure. But increasingly often this same disquieting illusion of social perspective gives occasion for a curious spectacle:

When it is a matter of computers, the argument of men ousted or replaced yields to the sacred character of electronics. This playful jousting between two opposed feelings can be translated into the victory of miracle over witchcraft.

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The fundamental human error is not abandoned for all that, and looks for its revenge in other, less sacred fields. Thus, when a simple reorganization (such as amalgamation, concentration, etc.) allows an economization of personnel, without the help of guessing machines, the resistance is strong enough to guarantee a refusal of economization, the arguments against it really returning to a consideration of the work as an end in itself. In this way a large part of the enormous progress achieved on the subsidiary plane is used up in the formation of a bureaucratic Parkinsonian fatty-deposit. We, the superior men, find great pleasure in watching extreme Orientals setting four labourers to a task for which one would have sufficed. Perhaps our superiority consists in only using this kind of duplication in higher places.

III. HUMAN INFORMATION

If in general the men with the necessary abilities exert themselves to make as sure as possible of the information of machines, the intentions as regards the information of men is most often the opposite of this. Here it is either a matter of giving pleasing information, which rings a bell and so causes it to spread, even if there is no desire to sell, or to feed the reader or listener appropriately so as to induce him to act in the desired way—which is usually the concern of politicians or men of commerce. There are very few papers in the world whose pure concern it to elevate the reader without dominating him in some way.

We could take as an example of this precisely the information given to men about machines. All is engineered to avoid a tame or austere technical presentation which would put everything properly in its place. The lands of robots, machines, and of space travel are a blessed region for fables and for dreams.

Here again we happen upon the laws of news transmission, which we bumped into, slightly by accident, a little earlier. These laws present striking analogies—even a real identity in some calculations—with those that govern the spreading of epidemics. In this case we must add to the speed of transmission the question of the fidelity, or rather distortion, of each transmission. The spectacular performances achieved by machines (electronic or not)—or rather, thanks to a machine—belong to the category of news

which spontaneously gains by swift dissemination (oral or written, individual or collective), this dissemination being accompanied by distortions to the miraculous and the marvellous. While on the other hand ungainly undertakings which have not been touched by the magic wand are passed over in silence, as is also the progressive growth of their relative importance.

Instructed thus, public opinion willingly believes that problems of productivity have been, or are almost solved. Without going as far as to believe that the era of free distribution is at hand, there is a growing impression of a potential or even real abundance, which is the creator of problems of frustration. These frustration complexes are intensified by the development of needs, which themselves belong to the afore-mentioned category of stubborn news which does not spread, since the term "need" seems to imply to him who encounters it some kind of reproach. Such frustration reaches all levels of society, even those which are in general favoured by the socio-political regime.

The feeling of alienation can take many forms, regressive or progressive, as it arises from nostalgia for the good old days, or the violent wish for revolt. Dissatisfaction and discontent can simulate progress, but this is the place for serious distinctions to be made.

Scholars and sorcerers

Distorting selections of this kind crop up in many places, to such a degree that the scholars, the specialists, dare not go against the tide, or do not find a loudspeaker, if they dare to attempt it. Because of this, public opinion has before it an image of the world far removed from the reality, that is, from the conclusions drawn by serious study. Innumerable subjects of distress or concern, such as town traffic-jams, poorness of living quarters, the deficit in the Social Security, etc... find their explanation here.

The capitalist regime, which willingly considers itself rational, accumulates technical faults, even misconceptions, to such a degree as to suggest, in various cases, that it is playing a game in which the loser wins. Among these tours de force, we could quote the politics of transport in nearly all the European countries. This policy has succeeded in creating a deficit in national transport, one of the most profitable of concerns, and which should be the

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supporter of culture and sanitation, which are always sacrificed because they have the grave fault of not providing marketable riches.

The man of physical or natural science, although broken in by experimental method, contradicts his appearance by being more susceptible than others to error in social matters. He is rigorously restrained by his own discipline, is sometimes scrupulous to the very heart, and therefore appreciates the joys of liberty—that is, enslavement to spontaneous longings, which are by nature emotional. Since he is not vaccinated against the virus, he is not used to the struggle against himself which research into human science demands.

Chance, the natural game of selections, would be sufficient to create these illusions, but it is too tempting to stress this orientation, which is so advantageous to the man who exploits it. The creation of images, formulae, is a technique which cannot be taught, but is transmitted or discovered by personal genius. These formulae and images are also machines for not thinking, not suffering, for giving us a good conscience.

It is moreover a well-known law of acoustics that the hollowest bodies are the most resonant. We are still at the stage of incantations.

The disconcerted sovereign

Democracy, so everyone says, is the rule of the people as sovereign. But it is also necessary that this sovereign should be so enlightened as to be able to govern, or at least be able to direct those to whom power has been allotted. In fact, this sovereign is fundamentally ignorant, at least in economic matters, or, more precisely, he is misinformed.

During the truly liberal era, when intervention was considered to be condemnable in itself, this shortcoming of information did not present particular disadvantages. Besides, the few decisions that were to be made (customs protection, fiscality) were proposed, if not made, by a financial or economic oligarchy, the popular voice having almost no effect.

It is no longer so in the western countries, after the First World War. For one thing, the decisions and alternatives are far more numerous and of more far-reaching consequences for another, the

citizens have become aware of their rights, and see to it that their power is effectively exercised. Since this time, information has become a vital function in the organism, but a function which has not yet succeeded in creating its organ. Quite on the contrary, as we have seen, a tight pack of counter-information falsifies judgement, even shuffling the cards in defence of personal interest. The result of all this is certainly not absolute impoverishment, but considerable losses, a highly imperfect use of the resources of our time, which stresses still more frustrations and alienation. The degree of illusion varies considerably with the country; moreover, its character agrees with that of the political regime.

Faced with this impossibility of effectively giving power to the sovereign, two solutions have been found, apart from simple dictatorship; the capitalist regime is a compromise between money and numbers; the socialist regime is the institution of a regent council, in power during the minority of that sovereign, the people.

The technocrat

In this fairy land an evil genie appears. This creature, which may or may not be helped by the machine, but which is in any case animated by the desire to know and to find the key of their mechanisms, proposes such distasteful solutions that a pejorative name has to be found to discredit them as quickly as possible, and so to relegate them to the Rogues' Gallery; the name "technocrat" is enough to excite a bitter feeling of aversion in the purest of spirits.

The researches of Professor Kohler into the behaviour of superior apes demonstrate that animal intelligence begins when the animal shows itself capable of finding a way round something. The tool is a way out for man, its results being sufficiently ancient and obvious to be universally recognized. Similarly the machine is a way out, admitted, but with some reservations, as we have seen. But in social and economical matters it is extremely difficult to make general opinion recognize a detoured method, one of postponement. The struggle is waged for the immediate, and it is so bitter that a singular contrast emerges between the physical and social realms.

Until the great revolution of the 16th century, one needed only

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to refer oneself to a superior power which was capable of commanding nature. Since that time, man has attempted to command this very nature directly, and has discovered that the best way of doing so was to obey it. To be sure, the scientific method was not born without difficulties, particularly in medicine, but it ended up by establishing itself in such a way that it provides a very strong bond between the most directly opposed political regimes.

In the social and economical realms the revolution remains to be raised; we are still in the most obscurantist of Middle Ages. The Soviet needed all of half a century to discover under the crust of dogmatism the value of some instruments (interest, competition, etc.) which were in themselves formally condemned, because of the evil use to which they were put by the capitalists. Yet have we ever seen a knife or a hammer prosecuted in an Assize Court?

It was still necessary to effect this rehabilitation by the almost magical aid of calculations carried out by the machine.

Double fear

The fear inspired by the technocrats is of two kinds: either they will gain a sufficient ascendancy over the politicians to draw them away from the solutions dictated by universal suffrage, which agree with popular interests, or one day they will seize this power for themselves.

Whoever has approached Civil Servants who can, even simply by virtue of their office, have some influence over politicians, has never failed to be surprised by their concern to avoid unpopularity. Maybe this concern is praiseworthy, maybe they are right to avoid the solutions by which they gain most, because they have slim chances of being accepted, but one finds it hard to imagine in any other field (medicine, physics, chemistry or biology) that scientific judgement could be influenced by a concern to know whether popular ignorance should not lead them to modify the conclusions drawn from scientific experience. Let us recall the famous observation made by Leibnitz:

“If geometry were to oppose itself to our passions, to our own interests, as morality also does, we would not contest or violate it any the less, in spite of the proofs of Euclid and Archimedes, which would be considered full of paralogisms, and treated as dreams.”

Certainly facts are not sufficiently clear to dictate a frank solution proper for the achievement of the proposed objectives. But the pressure of interests and emotions insinuates itself among technicians with such intensity and sometimes such subtlety that it is strange to see the reverse reproach being made. The technocrat is and remains the technician with whom no-one can agree.

Public opinion willingly admits the existence of a technique in plumbing, in agriculture, in medicine, but not in the regions where personal interests are at stake.

As for the fear suffered by men on the Left of seeing the technicians seizing power, it is of as edifying a naïveté as the desire of the men on the Right to entrust it to them. From the day when, by some coup, this power were to fall in the hands of the technicians in some field, these men would straightway become politicians, seized by the nature of problems such as they present themselves. In the opposite case they would swiftly vanish, submerged, even if they, as the great sorcerers, were to invoke the revelations of the computer.

Another form of technocracy

Perhaps the term is not proper this time, but this deformation is rarely described and scarcely touches public opinion, being the reverse of the one just described. Should we speak of technopathy?

The technician who is truly so, of any well-known technology, enjoys sufficient credit to allow himself occasionally to be carried away by personal considerations. For instance, it is the architect who is more concerned about his façade than about details of the interior—for this is the only part which would benefit from widespread photographic diffusion; or the engineer in a country of small development who undertakes great spectacular dams, which threaten to run aground, but which carry the name of the constructor and appear on the covers of magazines, instead of a series of little, rather obscure tasks necessary to halt erosion. The politicians who patronise these activities happily take the responsibility for them upon their shoulders, along with the popularity which accompanies them.

Far from being an obstacle, technical difficulty is sometimes a supplementary reason for undertaking an enterprise which is certain of some éclat, just as a film is preceded by how much it cost,

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and an enumeration of the efforts that have been accomplished. Rather than intensifying culture, by encouraging the employment of manure, Kruschew set out first of all on the conquest of virgin lands, which have all the attractions of an Eldorado.

The Mont Blanc Tunnel was driven in almost the least suitable point in the whole range, but it was absolutely necessary that it should bear the glorious name of that mountain. Far from discouraging initiative, the risk of poisoning from exhaust gas has stimulated new research from a simple love of the task, which is most laudable on the moral plane, but, when all is said and done, rather costly. Nevertheless, a canal or a tunnel, or any piercing of nature, benefits from a particular favour in the eyes of popular opinion, due to a certain map-mystique.

The economist is not exempt from such whims. He is more sure of being listened to if he finds an image which is encouraging because of its ease (the “*décollage*”, the multiplier effect, abundance, etc.), than if he were to describe the mechanism in all its severity. It is precisely because his authority is not recognized, in the same way as the doctor’s is not, for instance, that he is obliged to resort to such methods. We are right at the opposite of technocracy as it is currently supposed to be.

IV. CONCLUSION

Many indeed are the voices that have been raised to denounce the danger that faces man of being flooded out by his own creations. There has never been a lack of cautions against Prometheus or the Sorcerer’s Apprentice. If these warnings have not had more attention payed to them, it is because too often in the past the adversaries of the “*develish*” machine were the privileged and the so-called right-thinking men, who judged (and not without reason) that innovation was the chief adversary of their system. Of course the criticisms expounded here are not levelled against the machine, which has still many surprises in store for us, but against defective use of it, and enslavement to it.

A defence or a possession?

That is why the situation today is very different from the one existing at the appearance of any other piece of progress. The

declaration made by Mr. André Malraux, Minister of Cultural Affairs, before the French National Assembly, is significant as an example:

The new phenomenon is the appearance of the conquering machine, endowed with an unsuspected strength, and for the first time we witness its autonomous development.

For the first time a civilization is ignorant of its *raison d'être*, and, face to face with the victorious machine, it resists this strange return to the past.

As for ourselves, we believe that a development in the world of the imaginary has evolved parallel to the development of machines. Our civilization understands that it is attacked by powers which affect the spirit via the imaginary.

In the face of this attack, it is indispensable that the defence should be organized at a State level.

So humanity would be on the defensive; her concern would be to ward off threats rather than to establish her own power. In any case, the key to success lies in the formidable information which no one of either régime has yet succeeded in placing in the service of men, so great is the fear of seeing them escape. To inform is to set free.

Cursed reason

It is true that we have passed the age of reason, and willingly tease our fathers for having decorated it with a cult and a capital letter. Let us give a hearing to those of its detractors who are most... reasonable:

A food that is without vitamins is the source of formidable deficiencies under the guise of equilibrium and satiety. We are allowed to discourse about nature or myths which it is proper to cultivate, but it is impossible for us to overtake them. It hardly matters whether the pioneers of Donogoo wanted to find gold or uranium; the main thing was to follow a star.

Others, less formal, content themselves with rejecting austere disciplines:

We want to dream, it is our right; we want to take wing, to get drunk, to come to life. And unfortunately, instead of dancers, it is always computers that we see arriving.

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We may defend all things, uphold any doctrine, take any attitude, on condition always that we do not bring ourselves into too violent self-contradiction. The whole defence of poetry and of dreams would be far more plausible if it did not coincide with a desire for positive, clearly-stated material results at the same time. The conflict between reclainer and technocrat finds itself at the beginning again.

To calculate, to reason, to count; these are for sure hardly honourable; they are not particularly noble, at least. If economic science is so poorly thought of, it is because it is the science of sordid things. And nevertheless, when we hear the story of the savage whose counting was limited to "One, two, three,... many," we laugh with dignity, since humour is the most acceptable form of superiority. Yet there is one thing still more dangerous than not counting, and that is to count wrong.

It might seem curious to set out such a critique of the machine, whose function is precisely that of counting. The paradox easily explains itself when we see robust mathematicians in love with these new creations, to such a degree that they outstrip the creations themselves, which, for all their power, have a hard time in keeping up with them.

Glory to you, beneficent machine! If you are inexpert in writing verse, at least you know how to make poets!