

**BULLETIN
OF THE
EUROPEAN COAL AND STEEL
COMMUNITY
THE HIGH AUTHORITY**

Steel in agriculture

Steel Congress 1966

Luxembourg October 25–27, 1966

No. 66

LUXEMBOURG

12th year – No. 2

1967



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NOTE

As in previous years, we are devoting an issue of the Bulletin to the High Authority's International Congress on Steel Utilization, whose subject on this occasion was "Steel in Agriculture."

The Congress, at which the Chair was taken by Count Moens de Fernig, a former member of the Belgian Cabinet and President of the Belgian Federation of Metalworking Industries, was attended by 725 delegates from some thirty countries.

We here reproduce the Congress statements and findings of interest to the general reader. A volume is in preparation containing the full Congress proceedings in the four Community languages and English. The proceedings of the 1964 and 1965 Congresses, on "Progress in Steel Construction" and "Progress in Steel Processing" respectively, have been published and may be obtained from the Central Sales Office of the European Communities.

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OFFICIAL OPENING SESSION

**in the presence of Their Royal Highnesses
the Grand Duke and Grand Duchess of Luxembourg**

ADDRESS OF WELCOME

BY DINO DEL BO

President of the High Authority

Your Royal Highnesses,

From the fact that you have once again graciously consented to be present at our Steel Utilization Congress, we may take it that the High Authority's action in launching the series two years ago has won your approval. May I say how sincerely my colleagues and I, and the whole Congress, appreciate this fact.

We have here with us today delegates from thirty countries, in Europe, in Asia, in Africa, in North and South America. This is evidence that international public opinion has grasped the importance of these occasions. Some of those present are here for the first time; others now rank as veterans, having regularly attended throughout the series. All kinds of groups are represented — steelmakers and manufacturers, national Civil Servants responsible for their countries' economic policies in general and steel policies in particular, college lecturers and researchers. This complex and significant pattern of attendance is symptomatic of the importance of the Congresses. The High Authority's aim in convening them — an aim absolutely in line with the E.C.S.C. Treaty's requirements — has been to organize a thorough study of the trend in the steel sector in the light of economic developments in general, and to underscore the growing realization that increased steel utilization will be achieved in proportion as the potential uses of steel are extensively explored in as many sectors of industry as possible.

Each of the Congresses has been held in Luxembourg, and the High Authority hopes to hold more here in the future. On each occasion all possible co-operation, understanding and assistance has been forthcoming from the Grand Ducal Government and the authorities of the city of Luxembourg, to whom I likewise take this opportunity to convey our warmest thanks.

The first Congress examined ways and means of increasing steel utilization in building, by encouraging a switch to industrialized production methods in the building trade.

At last year's Congress, devoted to steel processing, emphasis was laid on the more and more vital importance of ensuring that steel could be used for all the purposes, some of them entirely new, involved in technological progress.

We are now embarking on the third Congress, under the distinguished chairmanship of Count Moens de Fernig. With Count Moens presiding we can be sure that the proceedings will be a model of their kind. He has the unrivalled qualification of having been Commissioner at the great Brussels World Fair some years ago; in addition, he was

formerly Belgian Minister of Foreign Trade, a post requiring its holder to be specially alive to the interdependence of the different sectors of the economy, and, nowadays, of the different nations of the world. And lastly, he is particularly competent to judge in the matters with which we shall be dealing, since he is President of one of the biggest steel-consuming companies in the Community.

The subject of this year's Congress is Steel in Agriculture. That subject in itself is sufficiently indicative of the scope of the debates. The Congress is to discuss the increasingly extensive use of steel in a field, agriculture, which would appear at first glance only very remotely connected with it. More than that, it is to bear witness once again, in this particular sphere with which we are concerned, to the willingness of the developed countries to provide large-scale assistance in order to help meet the growing needs of the world's population, which by the end of the century will have reached the gargantuan figure of six thousand million.

At this Congress as in the past, discussion must be frank and objective. There are a number of points calling for particular attention.

In the first place, it will be necessary to discuss how to achieve a sufficient degree of rationalization of agricultural equipment, with particular reference to job specialization. Also, the Congress must try to establish how best to step up mechanization in those branches of agriculture where at any rate a start has been made, and to introduce it where it is still unknown. And it must consider ways of modernising storage and preservation facilities for agricultural produce.

We have thus before us a considerable range of problems, some of which have never really come up before. So delegates will be able to enjoy the intellectual stimulus of venturing into territory partly if not wholly unexplored.

The ultimate objective of the Congress is to bring home to all the importance of genuinely industrializing agricultural production, and the help we can give to agriculture in facing up to the great challenge of our time — to see that men, women and children the world over have at least enough to live on.

Accordingly, as was done last year, one part of the proceedings is to be devoted to the developing countries — not merely because some, indeed most of them, are situated in tropical latitudes and their agriculture therefore faces special geographical and climatic problems requiring to be tackled in special ways, nor because it is primarily there that crop diversification is so urgently needed, but, as I say, because common human decency demands that there should be solidarity between the already industrialized countries and those that still have a long haul ahead of them.

Such, your Royal Highnesses, and Ladies and Gentlemen, is the background to the Congress now opening.

I should like to recall in conclusion that at the end of both the first and the second Congress the respective Chairmen, M. Jeanneney and Herr Etzel, not merely asked but urged that the High Authority make still more intensive efforts to help steel — still the great basic industry today — to live up to its mighty past, to do more and yet more for understanding, co-operation and peace, to move forward towards a truly good and pros-

perous future. And they said the High Authority might best do so by having the Steel Utilization Congresses become a regular, established feature of the European Community.

We feel we have duly responded. And to see so many and such distinguished delegates here today is confirmation to us yet again that, despite present difficulties, our work has not been for nothing and may well still achieve further major successes.

ADDRESS

BY MR. PIERRE WERNER

Prime Minister of Luxembourg

To all those attending this Third Steel Congress, I would extend a warm welcome on behalf of the Grand Ducal Government and the people of Luxembourg.

The success of the first two Congresses has encouraged the High Authority to hold a third of these notable encounters on the many and varied openings for using one of the basic industrial products on which the whole majestic technological civilization of our times has been built up. The President and Members of the High Authority are to be most warmly congratulated on their action. In this country, where we are especially alive to the problems of the steel sector, delegates may be sure that the friendliest interest is being taken both by the authorities and by industry – indeed by the whole population – in the Congress's proceedings.

The theme of the Congress carries quite a number of associations. At first glance it appears a somewhat surprising choice, since the economic history of the last century and the early part of this produced a sense of conflict between the aspirations of heavy industry and of agriculture. The cost of living is too dependent on the state of agriculture for the industrialist to view that state without regard to its incidence, direct or indirect, on his production costs, and in an economy wholly given over to selfseeking, in which *laissez-faire* results in hardship for the weaker sectors, such antagonism is liable to develop. Fortunately, present-day insights into the facts of economics are bringing it home to us that economic progress on all fronts is interdependent and indivisible. In consequence, a process of levelling-up is going on among the major sectors with respect to mechanization and the introduction of new methods and techniques.

So, in an advanced society, we are reaching a stage where technical progress and rational work organization are being pursued simultaneously at several different levels and in many sectors. Agriculture is making up the leeway lost.

The point I have been trying to make is especially important in the case of countries which have always been and will long remain primarily agricultural. This is apparent in many of the developing countries. Their anxiety to equip themselves with manufacturing industries, while understandable and praiseworthy in itself, is often accompanied by an unduly conservative and casual attitude as regards working up agriculture towards the higher yields and bigger acreages and herds needed to feed a rapidly-expanding population. Here again, economic growth and individual welfare are dependent on the aid of improved technology, on the further aid of what human ingenuity has devised and developed in other fields, and – to turn to the more immediate concerns of the present Congress – on the use of the processes and equipment evolved by the steel manufacturers.

Here then is one link between steel and agriculture that is not so surprising after all. And there are others.

Thus we are fond of instancing what has been done by basic Bessemer slag, a by-product of steelmaking, to fertilize the immemorially barren lands of the Luxembourg

Ardennes. All credit to those long-headed persons in authority at the end of the last century, who made it a condition in granting mining concessions here that the slag should be made available at cut rates to farmers — surely a good example of really intelligent Government intervention!

Then there has been the history of the two sectors with regard to European integration. Here again, the Common Market for agriculture was laboriously negotiated and established years after the introduction of the Common Market for steel. Actually, everything started with coal and steel, as I emphasized yesterday at the unveiling of the monument to Robert Schuman.

Now if you will forgive me I should like to say just a word concerning certain problems now facing the European steel industry in general and the Luxembourg steel industry in particular. Surely, for the sake of continuing European co-operation, we must trust to be spared such a painful inconsistency as that the final installation of a complicated and intricate European market machinery for agricultural produce should coincide with a falling-off in market interpenetration in the heavy-industry sector, the first of them all to be integrated.

I hope I need only put this possibility before you to ensure that we shall all of us do our utmost to work out co-operative and equitable solutions to our difficulties.

I wish this third Steel Congress under Count Moens de Fernig the fullest measure of success. May it serve to underscore the interlinking in progress of the different sectors and so foster and further the well-being of our peoples.

STEEL IN AGRICULTURE: TRADITION AND PROGRESS

ADDRESS

BY DR. FRITZ HELLWIG

Member of the High Authority

The theme "Steel in Agriculture" is one which involves aspects ranging far beyond the technical and commercial side of present and future cooperation between two sectors of the economy. Some indication of this is offered by my sub-title, which is intended to suggest that steel in agriculture stands between two determining forces in the march of civilization – tradition, the outward and visible reflection of a certain *vis inertiae* inherent in human nature, and technological progress, the most striking product in our own time of the forward-thrusting mind of man.

To trace in full the interdependence of ironmaking and agriculture we have to go back to the dawn of prehistory. Today we tend largely to forget the millennia of interaction between the two. This is the effect of the specialized division of labour that is part and parcel of the modern industrial economy. The more the elaborate series of processing stages, subject to technological and economic laws of their own, has come between the ironworks and the farm, the more we have ceased to consider the close bond between them that formerly moulded the development both of ironmaking and of agricultural methods. Who today, when the subject of steel in agriculture is mentioned, remembers that for centuries the itinerant ironfounder and the itinerant smith used actually to set up their workshops on the farm or in the village? From recent research into the early history of ironmaking in different parts of the world, we know how closely the work of smelting the metal in tiny, primitive furnaces and then hammering it into usable shape was bound up with the methods of tillage then employed. The "forest smiths" of Central Europe would move into the peasant communities, bringing with them the small quantities of iron they had managed to produce in the neighbourhood of ore deposits and of charcoal, and there start to forge whatever ploughshares, scythes, sickles, hoes and so on the inhabitants might require. In the Far East, where forging and the making of forgeable iron came later, casting, already well known and highly developed, was used instead. It is one of the surprising facts of metallurgical history that the iron plough was devised independently, yet more or less simultaneously, in several different parts of the world.

In consequence of this breakthrough, it became possible for the first time to employ iron not merely, as heretofore, mainly for making weapons and personal ornaments, but for a wide variety of purposes which opened up completely new vistas for humanity. The invention of the iron plough may not have been the biggest technological advance ever achieved by the questing human brain, but it was the one with the biggest implications for the future of mankind, for it marked the beginning of the end of the nomadic way of life, of the tribes that moved from place to place hunting, driving their flocks, and appropriating whatever they found by the way. With the coming of the iron plough they were able to cease from roving, to begin systematic tillage and to settle where they tilled. But the most

lasting result of the economic and social revolution thus brought about by iron was in human relations, in the basic order of things which these now stabilized communities evolved for themselves. In place of the jungle law that had made existence a succession of pursuit and plunder, of battle, murder and sudden death, there came rules to regulate the behaviour of man to man. And even as the invention of the plough occurred independently in different places, so in the various emergent societies there grew up those great bodies of legislation which form the bedrock of civilization and whose fundamental principles are still with us today. Alongside the Ten Commandments of the Old Testament stand parallel enactments instituted by other peoples and other societies.

Of the technological advances that have decisively affected human history, there is, viewed in this wider context, scarcely one that has made such a difference as the first harnessing of iron to the service of agriculture. It may be that future generations will say something the same of what has been happening and is happening in our own day — and I do not mean this or that spectacular achievement in science or technology, I mean the results of that co-ordination of endeavour among a host of specialized disciplines without which we should not now be witnessing an unprecedented expansion in world population. The by now familiar references to the “population explosion” imply recognition, not only that the process has burst upon us with elemental force, but also that into its making have gone all kinds of individual contributions from the scientific, industrial, agricultural-engineering and organizational sides. Perhaps posterity will judge this age of ours by whether mankind has succeeded, by appropriate rules, in establishing that basic order of things that is so vitally necessary if unprecedented numbers of human beings are to live crammed together into an inhabitable area which cannot, after all, be stretched to accommodate them beyond a certain point. The same problem confronts our generation with respect to the gigantic forces put into men’s hands by the probing and control of atomic energy. If we further include the start made on the exploration of interplanetary space, it looks very much as if humanity were now entering upon a stage of accelerated technological and scientific development such as has not been experienced for hundreds if not thousands of years, a stage comparable in the demands it makes upon the men of our time to the invention of the plough.

And the relevance of all this to our subject today? Well, we all know that it is most of all the country-dwellers who are the repositories and custodians of tradition in the best sense of the word. We know too by now into what contradictions and discords traditionalist peoples and communities can fall when faced with a situation in which their position and their heritage can only be maintained by adopting the results of a scientific, technological and economic trend which has already brought increasing affluence and increasing power to others. Between the rational organization that stems from scientific, technological and economic knowledge and the irrational forces that influence the patterns of society there cannot, now or ever, be anything more than a kind of armed truce, for so long as man is endowed with a will of his own and able to react not only rationally but emotionally.

These are points that have to be borne in mind in considering the mechanization and rationalization of agriculture and steel’s contribution thereto. Now while agriculture does make use of steel in a great many different ways and forms, economically it does not constitute one of the major consumer sectors like vehicle manufacture or bridge-building. But in the present state of the steel market, both in the Community and in many other parts of the world, it is evident that the time has come for the industry to concern itself with the requirements of sectors consuming smaller tonnages of steel. The days of soaring

steel production, breaking one record after another, are over, for the time being anyhow. E.C.S.C.'s production in 1965 was 86,000,000 tons: in 1970 it is expected to be only about 10 % above that figure, because economic expansion during these years will be largely confined to sectors with a low steel consumption. This Congress has been organized to help the steel industry move away from its traditional approach to production and break new ground.

In the industrialized world of today steel in agriculture means tractors, cultivators, harvesters of all kinds: that is to say, the mechanization of outdoor farm operations. It also means the rationalization of indoor operations, with the aid of modern livestock housing, milking and dairy equipment, grain-drying apparatus, silos and so on. And again, it means the preservation, packaging and transport of processed agricultural produce in steel containers. The experts will be quoting you some startling figures in the course of the Congress, as that the amount of steel on a bigfarm — machinery, implements, buildings, fences — can come to as much as 45 tons, or that the capital outlay per worker, not counting that sunk in the land itself, can in extreme cases total anything up to \$ 100,000, or that from the world's annual production of tinplate (which is used principally for the canning of food-stuffs) there are manufactured no less than a hundred thousand million cans, 25 per head of the world's population. These are sidelights on the tremendous changes going on in agriculture, where the whole focus is now on pushing up productivity as hard as it will go, thus releasing a number of the extra workers without whom the all-round expansion of the Community economy during the last few years could not possibly have been achieved.

This trend, with fewer and fewer farmers feeding more and more people, will doubtless continue. In agriculture, in contrast to other sectors of production, there is still plenty of scope for increases in productivity and in value added but not, paradoxically, in the number of persons employed in it full-time. In fact, agriculture has its hands full enough dealing with unfortunate legacies from the past. There is the old, old tension between town and country, with its primitive prejudices on both sides; there are the sins of commission and omission that have been made in development policy; there are the economically ruinous inheritance practices that have resulted in pointless fragmentation of cultivable acreages, a process which can now only be reversed by an uphill struggle against strong resistance to achieve a more rational distribution of ownership. Nor is ownership the only matter over which suspicion and hostility tend to be shown: they are encountered too, though less frequently than they used to be, with respect to technological progress and the improvements thereby made possible in farming methods. Of course, it can happen that farmers are chary of laying out substantial amounts of capital owing to sheer bewilderment in face of the vast range of production aids offered them. The manufacturers could, for instance, well do something to standardize and concentrate their production, offer better after-sales service, and, as some of them are already doing, provide technical assistance and instruction, in order gradually to get their public more attuned to the idea of using the new methods and arrangements.

It is natural to wonder whether further technological developments in the field of steel and of steel manufacture for agriculture can be expected to yield major fresh advances leading on the new methods of cultivation, the winning of new markets, possibly even the farming of land hitherto rated as unfarmable. Well, there is certainly still room for improvement in present mechanical, transport and processing techniques, whether as regards better utilization of manpower or of agricultural produce, but such improvements would appear likely to come about by degrees rather than by a radical upheaval. The same

is true as regards energy availabilities and utilization. Nevertheless, I should like to cite you the example of a process recently evolved by modern science which well illustrates how technological progress in steelmaking can have revolutionary repercussions, forthwith or quite some while later, for agriculture. I refer to the synthetic ammonia process that has now become one of the most important methods of manufacturing the indispensable artificial fertilizers — a process whose existence we owe to the fact that some time earlier the steel industry's researchers had succeeded in solving the problem of producing weldless hollowware from forgeable steel. It is thanks entirely to progress in tubemaking technological potentialities, that high-pressure synthesis and working with pressures, high temperatures and corroding materials have become possible. We see the results of the steel industry's research and development work in this field alone on every hand as the opening-up of the earth's resources goes forward — above all in the energy economy of today.

Among the fundamental innovations in steelmaking that have had important side-effects for agriculture we must undoubtedly include the process devised by two Englishmen, Thomas and Gilchrist, whereby Henry Bessemer's converter process was adapted to enable steel to be produced from phosphorus pig-iron. On the European Continent, and here in our six Community countries, whose indigenous ores could not formerly be used to any great extent owing to their phosphorus content, the introduction of the Thomas or "basic Bessemer" process was the startingpoint for a tremendous expansion: I do not think it is an exaggeration to say that the modern iron and steel industry which is the outstanding feature of this land of Luxembourg, and of the neighbouring regions of Lorraine, Belgium and the Saar, owes its being to basic Bessemer. Now one of the great factors that helped to make basic Bessemer steelmaking such an eminently paying proposition was that the phosphorus slag could be turned over to agriculture as phosphate fertilizer without expensive further treatment. And who can say whether, had it not been for basic Bessemer, our steel industries here would ever have developed to the point of being able, ultimately, themselves to provide an important part of the initial impetus to the economic and political integration of their countries?

And so, in conclusion, I should like to express the hope that the present renewed encounter between steel and agriculture will once again be productive of the same kind of cross-fertilization as has so often occurred between them in the past.

*CO-OPERATION BETWEEN AGRICULTURE AND INDUSTRY
AND ITS CONTRIBUTION TO ECONOMIC PROGRESS*

ADDRESS

BY COUNT MOENS DE FERNIG

Chairman of the Congress

The organizers of the Third Steel Congress, and all those taking part, are most honoured by your Royal Highnesses' presence at this Opening Session.

That you have graciously consented to be with us this morning is evidence of your interest in the subject with which we shall be dealing in the next three days. May we be permitted to express our appreciation of your most valued encouragement.

My warmest thanks first of all to the High Authority of the European Coal and Steel Community for the honour they have done me in inviting me to take the Chair at this Congress.

The subject of the Congress is "Steel in Agriculture", and by way of introduction to our discussions I would suggest that we give a few moments' thought to the interrelation of agriculture and industry in contemporary civilization.

It is usual to date that civilization from the Industrial Revolution which originated in England about 1750 and spread across the Continent, taking root at different dates in different countries and climes, between 1810 and 1880.

But we tend to forget the all-important fact that the Industrial Revolution had been preceded by an agricultural revolution. What is more, it was that agricultural revolution, a development far too little studied by those seeking to understand how we came to be what we are today, which actually enabled the Industrial Revolution to take place.

It has often been questioned why the seventeenth century, with its succession of scientific discoveries, brought no industrial revolution.

For a very simple reason: because agriculture remained immobile. When Louis XV mounted the French and the Hanoverians the English throne, agriculture was still as it had been at the end of the Middle Ages. Everything, everywhere, was done by hand, with feeble and primitive implements: the swing-plough scratched the soil, the beasts were thin and scrawny, not much more than half the weight of ours today, and practically nothing could be done in the way of manuring, for poor dung will not make rich earth.

And among the people who lived thus precariously by their hearth-breakingly unproductive tillage, the death-rate was fantastic: it has been shown, for example, that around Beauvais in the early eighteenth century the average expectation of life at birth was 22!

Men were old at forty. Epidemics and famines carried them off like flies, in what French writings of the time call "mortalités". Ninety-five per cent of the population of

Europe were country-dwellers, and whether gentry or peasantry they lived in the same universal penury. In Beauce — today some of the most opulent farmland in France — it was said of the local squires that when they were having their breeches patched they had to go to bed. The peasant's lot was harder still. When a natural disaster struck, those who survived at all became wanderers on the face of the earth: the pauper vagrant was a reproach to the age that not all the panorama of brilliant courts and intellectual glories can obscure.

But by the end of the eighteenth century the picture had entirely changed. The countryside no longer had the depressed, neglected look of less than a hundred years before. In England there had been the massive land redistribution known as the Enclosure Movement, from the absorption into larger units of the ancient „open fields“. Everywhere new crops were being introduced, including more especially potatoes, maize and tobacco, brought in from America. And other most far-reaching experiments were in progress too: in the Austrian Netherlands, the present Belgium, for instance, conifers were being planted in the barren Campine and Northern Flanders and in the sandy soil of Brabant.

Improvements were being made in farming equipment: the plough proper was coming into general use. Improvements were being made in the livestock: new breeds had been introduced and were beginning to flourish. Big irrigation projects were being undertaken. The results were noticeable, indeed striking.

By the end of the eighteenth century, the average length of life in the Beauvais region, to which I referred just now, was up to 32, and among the middle classes in Beauvais itself to nearly 40; in England it was about the same. Poor enough by our standards, no doubt, but an astounding advance in the course of a few decades!

In Belgium, the population actually increased by 40 % between 1755 and 1785. Famines and shortages became less and less frequent, and agricultural surpluses began to occur here and there. And those surpluses were unquestionably to have much to do with the swift progress of the Industrial Revolution.

It is true to say, that an agricultural revolution preceded the Industrial Revolution — in fact, made the Industrial Revolution possible. And more than that: the two revolutions sprang from the same source.

I should like to dwell on this point for a moment, because I consider it of supreme importance. The agricultural revolution and the Industrial Revolution came to Europe as a result of one and the same movement in the mind of man. I refer, of course, to that changed pattern of human thought that we call the Enlightenment.

Modern industry and modern agriculture originated in the thinking of the same philosophers. The Bible of them all was the *Encyclopaedia* of Diderot and d'Alembert and Helvétius. Its wonderful engravings quite as often depict projected industrial techniques as they do the latest innovations in agriculture, and more especially English agriculture.

The *Encyclopaedia's* article „*La Culture des Terres*“ written by Diderot himself, is entirely based on the successful experiment with crop rotation which had turned the sandy wastes of Norfolk into first-class farmland.

Industry was all the rage in the world of art and letters. Painters painted subjects such as „*La Visite aux Forges*“. But agriculture was studied just as keenly. Rousseau went botanizing at Hermenonville, Arthur Young toured all over Europe lecturing everybody

he could get to listen to him on the new methods of tillage and stockbreeding. Louis XVI played at being a locksmith in the attics of Versailles, Marie-Antoinette amused herself posing as a farmer's wife at the Trianon. And Goethe, relating how Faust passes his time after the Gretchen tragedy is over, shows him reclaiming vast expanses from the sea and covering them with "pastures, gardens and villages".

And this brings us to another most significant point. Not only did the change whereby agriculture left behind its former perennial uncertainty and periodic dearth for relative plenty make industry possible at all, but — a fact we tend to forget — the "manufactory" was to begin with a village institution. From 1780 onwards in England, from 1810 to 1860 on the Continent, factories were far more the new village than the new city landmarks. Industrial enterprise was in its origins a country affair.

Here again the old prints are most illuminating. Take for instance the stream of lithographs that started to come out about 1850 in France and Belgium and England to acquaint the public with the new advances in technology. They make it abundantly clear that industrial plants of all kinds — ironworks, paper mills, breweries, vinegar and sugar factories, even collieries — were located primarily in rural areas: in fact, it was to be many years before they acquired their urban character.

This is borne out by what we know of the social trends of the time. Over a very long period the "manufactory" sucked in the extra agricultural labour rendered redundant by population growth and improved farming methods — women, children, temporary hands, and not a few of the footloose wanderers who were a regular feature of the social scene almost up to the beginning of the twentieth century, despite largely unavailing efforts by the vagrancy laws to catch up with them. Readers of Mme de Ségur will remember her charming character Diloy the tramp.

But for all the initial intertwining of agriculture and industry, of the village and the factory, we must nevertheless remember that it is industry which has been responsible for the growth of the great urban agglomerations, and remember, too, the sociological antithesis that has developed between the town- and the country-dweller.

An entirely modern phenomenon, this antithesis, for it cannot be too strongly emphasized that the towns were utterly unimportant units, politically and socially, before the rise of industry.

Industry made the towns, industry sent their size and their population soaring. Industry gave them the administrative influence they now possess — the result, in effect, of the concentrated power of analysis, planning and control they represent.

Industry made the towns places where the interaction of individual thoughts and ideas proceeds at tremendous speed. Industry created the city mentality; industry gave the city its appeal, and its dangers.

Down to the early nineteenth century unrest was something manifested itself from time to time in the countryside, in such outbreaks as the Jacqueries and the Peasants' Wars. After 1789, it tended more and more to be confined to the cities. And it was all too easy for the novelists and essayists of our grand-fathers' day, and for quite a few sociologists as well, to contrast this city mentality, this twin pull and thrust that the city exerted, with the gentleness, the conservatism, the virtues of the countryside.

Quite obviously, the cities of the Industrial Revolution were the product — in human terms — of the country. Since their own inherent growth potential was comparatively low, their population explosion was due in the main to immigration.

The conclusion seemed clear: the city had killed the country, and in particular industry had stifled and enslaved agriculture. And to that conclusion any number of observers jumped headlong.

All the same, this cut-and-dried presentation of the position is false. The towns did indeed drain away the population from the countryside, and especially from those parts of it that had always been poor and backward. But it was not, for the most part, the farmers and farm labourers themselves who migrated. The people who did, and still do, had not left the plough or the cowshed to make their move. A series of penetrating sociological surveys have shown that “those involved in the flight from the land have been chiefly small craftsmen and tradesmen and persons of standing in village society”, and that “the countryman proper has difficulty in adjusting to city life”. Moreover, it is evident that incomers from the country do not as a rule gravitate to industry, but much more commonly to the services sector, to retail trade (usually in foodstuffs), or to Government or other office jobs.

Yet at the same time industry has all along played its full part in aiding the steady improvement of agricultural efficiency. For the fact that this gigantic movement to the towns has taken place at all, and the teeming millions of town-dwellers nonetheless been regularly supplied with more and more and better and better food by fewer and fewer country-dwellers, is due to the continuous improvement over the years in tillage and stock-breeding methods, in fertilizers and in farm machinery and equipment.

In fact, then, there has never been a clean break between industry and agriculture. Progress in agriculture was the proximate cause of progress in certain major sectors of industry. And it has been thanks to agriculture - a more and more streamlined and modernized agriculture increasingly aware of what it can achieve and increasingly bent on achieving it — that industrialization has been accompanied by an astounding leap in the number of human beings alive in the world, and an equally astounding leap in the number of years they can expect to live.

The average life span in Northern France in the early eighteenth century was 22: today it is round about 70. Agriculture and industry between them have brought this about, operating throughout in harness notwithstanding some inevitable, and in the end often creative, tensions. Their interdependence has been far more important and more basic than all the cleavages between them.

And in any case the cleavages too are losing their sharpness. Everywhere nowadays life on the land is becoming more akin to life in the city.

What is more, agriculture no longer dances to industry's piping: it has regained its freedom of action and organization. All over Europe an élite of young farmers is developing, all of them marked by the same lively, forward-looking, clear-headed approach. They have shown that they have no intention of being at industry's beck and call: they want to think out agriculture's particular problems along specifically agricultural lines and deal with them in specifically agricultural ways. I am firmly convinced that European integration will help them to stick to their guns.

We sometimes hear it said that “agriculture has stopped being an also ran”. On the contrary, I am pretty sure that in a good many respects it is leading the field. In its concentration on research, in its determination to modernize its equipment from A to Z, in its productivity drive — the productivity increases on the top-class farms have been startling — in its sales promotion activity, even in its push to boost its exports, it most certainly is.

There is much debate in industrial circles today on the problems facing small and medium-sized business concerns. I feel certain that the heads of those concerns would find it most illuminating to study the problems, initiatives and successes of a top-class farm. They would find there a modernness of outlook, a preoccupation with efficiency and progress that can stand as a model for us all.

That is as it should be. Division of labour is right and proper, but the mind of man is indivisible. Whether he is feeding iron into a steel furnace, sitting at the dispatching board of a power station, reaping a field of corn or staring into an electron microscope, man has always with him those mysterious age-old faculties that from the beginning of time have been his bane and his blessing, the source of his vulnerability and of his power, that in a word have made him what he is — consciousness and creative imagination.

I wish you every success in the deliberations before you, the results of which I shall be summing up at the close of the Congress.

With the gracious permission of their Royal Highnesses the Grand Duke and Grand Duchess of Luxembourg, I now declare the 1966 Steel Congress open.

CONCLUSIONS OF THE CONGRESS

STEEL IN FARM BUILDINGS AND INSTALLATIONS

CLOSING REPORT

BY MR. HELMUT ODENHAUSEN

Rapporteur of Working Party I

In the mechanized, intensive agriculture of today, farm buildings and their installations are playing a more and more important part: indeed, rationalization of farmyard operations cannot proceed without them. While in some extreme cases nowadays farming can well enough be carried on without farmland, it cannot possibly be carried on without buildings. There are three purposes for which steel can be used in this connection: for the load-bearing structures, for roofing and walling, and for indoor installations and equipment.

1. *Load-bearing structures*

Quite substantial changes are in prospect with regard to the use of steel for load-bearing structures. Those at present manufactured are often unduly expensive, functionally unsatisfactory, and occasionally, inadequately corrosion-protected. Attention will be increasingly concentrated in future on enabling thoroughly corrosion-resistant structures of maximum simplicity and uniformity of design, usable for both industrial and agricultural purposes, to be mass-produced and so marketed at reasonable prices. I shall be adding a recommendation on this point at the end of my summing-up.

2. *Roofing and walling*

For buildings not requiring thermal insulation surface-protected steel plate and sheet are widely used, mainly in the form of large-surface sections galvanized by the hot-dip process.

Cheap heat-insulated roof and wall components for the type of sturdy building needed out in the country are still not being manufactured in sufficient quantities. This is another market to which the industry would be well advised to devote attention.

3. *Indoor installations and equipment*

Steel, mostly corrosion-protected by hot-dip galvanization, is proving very popular for indoor installations and equipment of all kinds, especially in livestock housing (*e.g.* gates, stanchions, boxes, bays and stalls, partitions and slatted floors). Steel installations of this kind are strong and light, of openwork construction allowing the beasts plenty of air and making it easy to keep an eye on them; they can be altered and extended as required, and they are thoroughly corrosion-resistant. The fact that steel does not absorb moisture and is eminently hygienic (its smooth, compact, easy-to-clean surfaces offering little or no lodgment for germs) makes it a good selling proposition.

Container storage at the farm has got off to a good start, and there is already a promising market for steel containers for the drying, storage and preservation of feedstuffs of all kinds. Self-supporting silos of hot-dip galvanized or enamelled steel sheet are durable, clean air-, gas- and watertight, and quick and easy to assemble, move and service and facilitate mechanical charging and discharging and such subsequent operations as automatic cattle feeding.

Unfortunately steel silos are all too often rendered uneconomic to build by absurd and antiquated regulations which not only impede technological progress but also stultify the farmers' efforts to reduce their production costs. In the agricultural sector too it is being found an intolerable nuisance that there has still been no harmonization of building regulations among the six Community countries.

Growing under glass being the most intensive method of plant cultivation, glass-houses can be expected to come in more and more with the general increase in affluence. These offer good openings for lightweight surface-protected steel structures. "Vertical" glasshouse design, with its great labour-saving advantages, may perhaps afford a new field of applications for steel.

Various other types of building rating broadly as agricultural, which were not discussed by the Working Party, are nevertheless also of considerable importance from the point of view of steel utilization, namely all those connected with the marketing of produce, such as fruit, potato and plant stores, cold-storage plants, poultry slaughterhouses, dairies, distilleries, premises for wine, cider and fruit-juice making, and so on. Farm-house construction was another aspect not discussed, since nowadays the farm-house is nearly always located away from the farm-yard installations and differs little from the ordinary urban dwelling.

There is every reason to take an optimistic view of the prospects for steel in agriculture, especially now that the problem of surface protection has been overcome. Hot-dip galvanizing is the main basic method, affording exceptionally effective and lasting protection, and there are the further possibilities of galvanization plus painting and hot-dip galvanization plus plastic coating, these extra treatments serving not only to give substantially increased corrosion-protection but also to improve the appearance of the metal. With a suitable coat of paint the buildings can be made to tone very pleasantly with their surroundings and with the landscape generally: there are plenty of excellent examples to show that steel need no be an alien intruder in the countryside, but can blend harmoniously into the rural scene. Conservationists unfortunately still often have a rooted prejudice against it, but a series of good practical examples should help in course of time to dispose of these outdated ideas.

Both the papers and the debates revealed the lively interest taken in the Working Party's theme. The occasion was one on which not only were leading agriculturists and steel experts able to compare notes, but an outline was given of some coming developments and suggestions made for expanding the use of steel in agriculture. On the basis of the Working Party's conclusions, the following recommendations are submitted for the High Authority's attention:

1. The High Authority is urged to finance research on the optimum cross-sectional dimensions for a multi-purpose farm building (recommendation by Dr. Odenhausen).

CONCLUSIONS OF THE CONGRESS

2. The High Authority is urged to establish Euronorms for farm buildings, building components and installations, which will at the same time ensure lining-up of the building regulations in the six Community countries.
3. The High Authority is urged to set up model farms at which extensive use will be made of steel and experiments conducted with new departures in this connection, and which will in addition provide training for young people intending to go in for farming (see paper by Mr. Thiry).
4. The High Authority is urged to prepare a comparative study on the practical and economic value of modern milking parlours, with special reference to the layout and equipment of the milking stalls (see paper by Mr. Corcelle).
5. The High Authority is urged to set up an Agriculture/Steel Industry Liaison Committee to help promote the increased use of steel in agriculture (suggestion by the Chairman of the Working Party, Prof. Ramadoro).

STEEL IN AGRICULTURAL MACHINERY

CLOSING REPORT

BY MR. JACQUES LECLERC

Rapporteur of Working Party II

What we should have wished to do, in dealing with the subject of steel in agricultural machinery, was to arrive on the basis of the Working Party's proceedings at a general approach to the promotion of the use of steel in this connection.

Actually, the papers and debates related mainly to general aspects of agricultural improvement, the need for standardization, and the specific characteristics of certain types of equipment Mr. De Forest of United States Steel did, however, suggest an approach for the future, and I feel that, although he based himself primarily on special instances, some of them of an *avant-garde* character, we can draw a number of very pertinent conclusions from his remarks.

The link between steelmaking and agricultural machinery is the manufacturer's design office. By thinking himself into the concerns of the designer, and of the agricultural equipment manufacturer generally, the steelmaker is enabled to suggest the right *qualities*, the right *shapes*, the right practical measures — processing, assembly, treatment — for overcoming the problems involved by employing *steel*.

United Steel's Research and Development Department, which I had the opportunity to visit last year, does not have a particularly large staff, but it is organized to go thoroughly into the problems of expanding the use of steel under three main heads :

- a) form (convenience, appearance, design);
- b) structure (construction, assembly, ease of operation);
- c) purpose, suitability and choice of materials (comparative testing of alternatives).

To my mind, this approach — form, structure, purpose — is the right one in the promotion of any product.

Market conditions and market studies will not of themselves ensure a future for new products where the products are not yet forthcoming or not yet tailored to potential practical requirements. Successful promotion of steel utilization will come when steel is offered in forms and structures fully in line with the users' needs.

In seeking to ensure more and wider uses of steel, then, the aim should be to see that the equipment manufacturers and steel producers are kept well informed concerning users' requirements. In agriculture, these requirements are focused on three things, *specialization, mechanization and modernization*.

However, these are wide general concepts. To come down to more simple concrete terms, why should wood be used in such and such an instance, rather than steel? Why this or that steel casting and not a welded assemblage? Where could folded sheet, or galvanized

plate or sections, be used in appliance etc ...? Where is there a tendency to wear, or fatigue, or corrosion?

In discussing agricultural machinery we often think too much of the purely mechanical side — transmission gear, special steels, heat treatment of particular parts. With motor cars it is the bodywork, not the engine, that boosts the firm's reputation and appeals to the user.

I make the point in order to emphasize that to expand steel consumption we must concentrate not only on the amounts of special steels needed for the international parts, but also on the large tonnages of ordinary steels required to house these and to administer to the user's convenience.

We must concentrate on ancillary equipment quite as much as on tractors.

We must concentrate, too, on quick, smooth distribution of the steel appliances required for at-farm repairs, servicing, and assembly and erection work. Steel consumption on farms will expand if arrangements are made to supply not only spare parts but also necessary components for immediate use, by simple assembly operations either in the farm's own workshop or at a co-operative centre. Steel can be sure of acceptance if it is made available on the spot by efficiently phased arrangements in forms and qualities tailored to the structures intended.

To turn to the points specifically urged or suggested by speakers during the Working Party's proceedings.

Among the desiderata mentioned in a number of papers was the standardization of equipment. As a matter of fact, speaking personally, I feel caution is called for here, since after all standardization is only possible for very carefully thought-out equipment designed to fulfil already standardized functions: efforts to standardize can actually be a handicap where mechanization is not sufficiently advanced to meet the various requirements that come up in specialized connections. Speakers referred, *inter alia*, to:

- studies on specialized equipment from the point of view of the purpose to be served;
- studies by manufacturers on the openings for mass production, since short production runs result in unduly costly equipment;
- study and introduction of standards for farm equipment;
- co-ordination of the activities of standards organizations.

Over and above this investigation of specialized requirements, needed to enable mass production to be undertaken and particulars obtained from farmers of what they are trying to produce as well as what they want to produce it with, it will be necessary to work on the co-ordination of specialized equipment in sets corresponding to given production chains. Speakers pressed for:

- analytical studies to arrive at a clear definition of production chain machines;
- studies to establish series of co-ordinated items of equipment (more especially harvesting chains);
- co-operation between manufacturers and farmers to study production chains;

- manufacturers to accept and act on their responsibilities as educators and advisers in the matter of machinery ;
- production chains to be organized in line with size of farm.

In a word, as I mentioned earlier, the need is for full-scale, organized engineering in the field of agriculture.

A number of points were made concerning improved convenience and safety in tractor design. Mention should also be made of suggestions put forward for reviving agricultural craftsmanship, by means of :

- efficient after-sales service ;
- instruction of farmers in mechanical skills ;
- well-equipped repair shops and spare-part and component depots ;
- provision for farm workshops of plans for ancillary installations and small buildings for erection by farm labour.

With regard to the properties of the steels supplied to agricultural-equipment manufacturers, it may be noted that structural steels, heat-treatment alloy and non-alloy steels and tool steels are nowadays all standardized, so that selection is a simple matter enough.

Not much was said about the hardness or fatigue strength of steel parts: speakers were concerned more with resistance to abrasion and corrosion. However, the choice of steel for a particular item of equipment, whether of ordinary or of special steel, is no great problem once it is clear how the item is to be used.

Clarity as to use, purpose construction, special attention to delicate mechanisms, simple design, ease of servicing and the place of the machine in fabrication chains – such are the main considerations to be borne in mind in production for agriculture, whether in designing new and possibly somewhat *avant-garde* prototypes or in adapting items to the size of the farms concerned, with due regard to the cost saving ensured by mass production. But the great point above all is the saving in money and effort for the user.

I have been asked to conclude by listing the measures the Working Party would like to see adopted to follow up E.C.S.C.'s initiative on a broad front.

The Working Party considers it essential to the expansion of steel utilization that efficient manufacture of agricultural equipment should be encouraged in all Community countries.

In such manufacture, particular attention should be devoted :

- to selecting the specialized equipment most appropriate to the purpose envisaged ;
- to establishing co-ordinated sets of machines and appliances in order to offer farmers a more straightforward choice among a smaller number of alternatives.

The steelmakers should consult more closely with the manufacturers and the manufacturers with the farmers, agricultural colleges and engineers.

The High Authority should encourage systematic, co-ordinated studies of equipment needs in the Community countries. It is especially urged to promote research with the aim

of securing the adoption of scientific calculation in place of the present empirical approach with regard to:

- the behaviour of materials at points of assembly ;
- the reactions of working parts to abrasion or wear under ultra-hard use.

In addition, it is urged to encourage steelmakers as a body to provide the research associations and manufacturers with technical information and advice in the form of recommendations as to selection and use.

*STEEL IN THE STORAGE AND MARKETING OF
AGRICULTURAL PRODUCE*

CLOSING REPORT

BY MR. CORRADO RICCI

Rapporteur of Working Party III

Introduction

The contents of the two introductory papers and the number and standard of the other papers contributed on points connected with the subject of Working Party III are conclusive evidence of the importance attached in all countries to the preservation of agricultural produce. The productivity drive which has been in progress for a number of years in the more advanced countries has led to the, at first glance, somewhat paradoxical result that it can be actually uneconomic to expand agricultural production beyond a certain point unless arrangements are made at the same time to eliminate the losses liable to occur between the harvesting of the produce and its distribution to consumers.

To do so, the experts are agreed that thoroughgoing modernization will be needed of the present facilities, at farm, co-operative and commercial level, for preserving and processing agricultural produce. At the same time, with markets steadily growing in size and extending further and further away from the production areas, greater streamlining of the distribution channels is becoming necessary.

It has been clearly brought out in the Working Party's discussions that steel can play an extremely part in the three main fields of utilization offered by the preservation of foodstuffs:

- (1) the manufacture of containers enabling the produce to be kept in sound condition for long periods and making for convenience of handling;
- (2) the provision of machinery for the transport, packing and processing of the produce;
- (3) the construction of storage premises designed in line with the biological considerations involved, and of processing plants.

So far, steel is not being used to the same extent in these three fields.

It is undoubtedly predominant on the transport and handling side, and there is a close correlation between the growth rate for such machinery and the growth rate for steel utilization. With regard to the packaging of foodstuffs, and of certain products used in agriculture — pesticides, fertilizers, chemical compounds and so on — there is a similar correlation, though here the development of alternative materials constitutes a potential threat to steel's position.

As regards storage, steel is not at present employed to the extent it might be, principally because not many prefabricated structures suitable for farm use are available. This

is one of the fields in which the lag between industry and agriculture is most apparent, since although progress in agriculture is making it more and more important that farm buildings and installations should be "industrial" in character, they still tend to remain on the old traditional lines.

In order to deal more fully with the problems of storing and preserving the main types of produce, taking account of the points of similarity among the steel products used for the purpose, it is proposed to consider produce under four heads :

- cereals and forage,
- potatoes, vegetables and fruit stored fresh,
- dairy produce, wine and other liquid produce,
- canned foodstuffs.

Cereals and forage

The storage of cereals presents no particular problem where the moisture content on harvesting is below 14 %. For on-farm storage the steel industry already offers a wide range of galvanized-sheet silos suitable for both indoor and outdoor use. Batteries of similar silos with mechanical transport devices can also be employed at co-operative assembly centres and at the auxiliary centres run by the big storage networks. For the construction of large-capacity silos prefabricated steel components have the advantage of making the structure substantially lighter in weight and quicker and easier to erect. Steel silos have therefore every chance of becoming competitive *vis-à-vis* the traditional reinforced-concrete type inasmuch as reduction of the load-stresses on the ground beneath is a most important consideration.

At present, the use of the combine harvester very commonly makes it necessary to effect some extra drying of the grain, either at the farm or at centralized plants. The preference is mainly for on-farm installations, as with these the drying can be done more promptly and the farmer is able to sell on better terms.

Similar installations are also coming increasingly into use for forage, the traditional method of haymaking, which is both costly and uncertain, being gradually discarded in favour of indoor drying. The latter method and the fact that it is then necessary to have somewhere to keep the hay dry make it particularly suitable to use steel sheds and barns for the purpose.

Potatoes, vegetables and fruit stored fresh

Potatoes account for 20 % of human consumption of agricultural produce, and the question of proper storage for them, especially on the farm, is a very considerable problem in northern Europe. The requirements storehouses should fulfil as regards design and atmosphere are now well known, thanks to the systematic research which has been carried out in this connection and the many excellent examples in service in various countries. The basic prerequisites thus already exist for their standardization and construction from suitably protected prefabricated steel components: the successful experiments effected in a number of countries are highly instructive in this regard.

The advantages of storehouse standardization and prefabrication are still more apparent in the case of fruit and vegetable refrigeration, a field in which there are good and practical reasons for trying to secure the standardization without delay throughout the Community countries of all refrigeration equipment.

Prefabricated steel refrigeration units are not as yet in extensive use in Europe, owing partly to the technological difficulties involved in their manufacture and partly to the greater concentration, so far, on large centralized plants than on smaller-scale installations. However, improvements in the properties of the steels and insulating materials used and the standardization of small-sized gas refrigeration units have enabled progress to be made in overcoming these problems, as can be seen from some recent successful examples.

Dairy produce, wine and other liquid produce

Milk is particularly tricky to store owing to the special importance of keeping it pure and the speed with which bacteria multiply in it at normal ambient temperatures. Milk containers must therefore:

- be totally non-reactive to their contents,
- allow of absolute cleanliness, to be obtained by means of powerful chemical detergents, sterilizing agents and so on,
- cool rapidly to around about 4° C.

These requirements are satisfied by the stainless-steel refrigerating tanks which first came on to the European market in the 1960s and are gaining in popularity despite the problems arising from the small size of the herds in many European countries.

Stainless steel is particularly suitable for use in connection with milk and its derivatives, as can be seen from the fact that the dairy industry is employing it more and more in preference to any other material. In the wine trade also it is being increasingly used for fermenting and storage vats, which have in the past ordinarily been made of wood or reinforced concrete. This is because stainless-steel containers do not react with the wine, can be mass-produced, require practically no maintenance, remain gastight, are good conductors of heat (an important point in the blending of wines to the required standard), and can be employed in a variety of ways.

The same is true with regard to beer, for which stainless-steel containers are being used more and more for purposes of both storage and transport.

Still more, stainless steel is an eminently suitable material for the carriage of liquid by road tanker, since in this case it is necessary, apart from the properties just listed, that the tank should be usable for transporting quite a number of different types of fluid.

Canned foodstuffs

For the past hundred years tins have been *the* material for the preserving of foodstuffs, despite efforts from time to time to introduce various rival products. World tins production per annum stands today at something like 10 million tons, of which 7,500,000 go to the canning of foodstuffs, producing round about 100,000 million cans, or 25 per head of the entire world population.

The canning industry's faithfulness to tins is mainly due to the constant technological improvements which have been and are being made both in the quality of the

actual tinplate and in the can-manufacturing processes. The two most important recent developments in this connection have been the substitution of cold-rolled for hot-rolled sheet and of electrolytic for hot-dip tinning.

The present trend is towards the use of thinner and thinner sheet, the reduction and possibly the supersession of the tin coating, and the continuous fabrication of cans with larger and larger capacity plant, the result being to lower the cost of the container and hence its incidence on the selling price of the produce.

A number of problems, however, still remain, notably the devising of easier ways of opening the can and of more effective protection of the outer surfaces, in order to prevent local corrosion liable to put the consumer off.

The use of tinplate in agriculture is not confined to the canning of produce: it also includes the making of containers for chemical and para-chemical products. Here too, with new products and methods appearing all the time, it is necessary to develop appropriate types of packaging.

In the tinplate sector also, therefore, there are extremely important technological choices to be made, which can only be satisfactorily settled on the basis of ongoing detailed consultations between the steelmakers, the farmers and the marketing experts. The need for such consultations, to be held not merely at regular intervals but all the time and at several different levels, was repeatedly emphasized in the course of the Working Party's discussions.

Conclusions

Viewed objectively, there is still a certain cleavage between the steelmaking and manufacturing industry and agriculture.

This is not due purely to traditional factors, but is also the result of natural differences in past development with regard to production processes and techniques, enterprise structure and psychological considerations. So far as steel is concerned, therefore, the future expansion of production and consumption requires not only improvements in the quality of the various products, but also an efficiently-organized system of technical information at institutional level.

Accordingly, it is considered desirable that the High Authority of E.C.S.C. should set up a *Study and Co-ordination Centre* dealing with the uses of steel in agriculture, to be responsible for:

- *assembling* and disseminating information on the uses of steel in agriculture,
- *pinpointing* the fields in which the use of steel could resolve problems of special importance to progress in agriculture,
- *promoting* the establishment of Study and Co-ordination Committees drawn from the steelmaking and manufacturing industries and from agriculture, with the aim of instituting closer co-operation,
- *working* for the European-level unification of standards relating to stainless steel and other steel products relevant to the purposes of agriculture.

*STEEL IN THE AGRICULTURE OF THE DEVELOPING COUNTRIES,
ESPECIALLY TROPICAL COUNTRIES*

CLOSING REPORT

BY MR. CHARLES GOUZÉE

Rapporteur of Working Party IV

Working Party IV discussed, firstly, the general features of agriculture in the developing countries, secondly, the various factors helping and hindering agricultural production, and thirdly, in this context, the role of steel and the action which might be taken by the steel-producing and marketing organizations.

Speakers recalled

- that in the developing countries anything up to 80 % of the working population were employed on the land,
- that amid the traditionalist, “artisan” agriculture practised up to now – sometimes by primitive, sometimes by very elaborate methods – there were already quite sizeable nuclei of more “industrialized” cultivation based on the use of either animal-drawn or motor-powered equipment,
- that owing to the predominance of the agricultural sector in the economics of the developing countries any fluctuation in foreign exchange rates or deterioration in terms of trade was liable to produce especially damaging effects.

Reference was made to the part which agriculture had played in the transition from a subsistence to a trading economy. It was through increased productivity in agriculture that development in other sectors would become possible: thus it was for agriculture

- to feed more people with less manpower;
- to raise export crops that would earn foreign currency for capital investment;
- to supply the raw material for the country’s own agricultural industries;
- to increase farmer’s earnings in order to initiate internal money flows;
- by means of the movements started and taxes paid by it, to aid the establishment of basic communications and social infrastructures.

Development programmes should, it is considered, be designed to help agriculture perform these various functions.

The Working Party discussed at some length the optimum degree of concentration and point of impact of such programmes, both as regards practical implementation and as regards basic aims and organization.

For agricultural equipment steel is of course essential: steel consumption per head of population is an index of development generally, in agriculture as elsewhere. Steel and

machinery will be needed right from the start in improving the manual implements available, and subsequently in going over to harness cropping. They will be needed still more, and in larger quantities, where it is felt necessary or desirable to introduce powered traction, whether for cultivation proper or for land reclamation and improvement, which require heavier machinery still. The figures the Working Party was given concerning India, which was stated to need 15 million tractors, the number at present in service in the entire world, are illustrative of the scale on which production must be envisaged in one of these fields; equally astronomical estimates can be made with respect to traditional implements, to earth-moving machines and to irrigation and drainage installations.

But while the overall requirements are known to exist and can be roughly calculated, it is difficult to obtain an accurate idea of the specific requirements, let alone meet them. The type of equipment that should be used, the type of measure that should be advised cannot be the same in densely and in sparsely populated countries, in dry and in wet ones, in fertile and in barren ones, in ones with plenty of foreign currency to spare and in ones without, in ones with an industrial infrastructure and in ones tied to the soil, in ones that welcome scientific progress and in ones that reject it.

In the course of the discussion various aspects of the problem were touched upon and a number of points urged.

With regard to *agricultural machinery*, several speakers were in favour of the development of models specially designed for use in the tropics: this would involve, in addition to co-operation by the research departments of the producer firms in the industrial countries, experimentation in tropical conditions.

The hope was also expressed that private firms would make a push to work up their *after-sales service* arrangements. The Governments of the developing countries could assist them in this and enable the arrangements to operate more effectively by reappportioning the equipment used and having large concentrations of equipment of similar type built up in individual areas.

With regard to *storage*, detailed recommendations were put forward concerning improvements to steel silos. Attention, it was considered, should be focused on the construction of airtight welded silos and on the production of steel walls coated or clad inside with an insulating material to eliminate condensation. Here too it was urged that a careful study should be made of the specific requirements of tropical countries, covering optimum-size selection, the provision of simple and effective ventilation devices, and the production of specially corrosion-resistant steels.

Attention was drawn by individual speakers to the advantages of *permanent magnet steel* and of certain *drills* particularly suited for use in the tropics.

It was pointed out, however, that real progress would not be achieved in tropical agriculture simply by supplying equipment: the equipment would not do its job properly unless *proper reception arrangements* were instituted to ensure its rational utilization.

Accordingly, the Working Party would emphasize the importance of:

- conducting preliminary studies to determine the optimum degree of mechanization appropriate to each particular set of circumstances;
- organizing agricultural schemes as part of broader programmes designed to ensure parallel progress in establishing a social and educational infrastructure, training local technicians and developing economic channels which will make it possible to market the produce, amortize the investment and pay for the equipment;

- giving priority to schemes which can be expanded from the initial pilot projects into more comprehensive programmes.

These recommendations relate to schemes launched within the developing countries. There will of course also have to be international agreements for the marketing of these countries' produce. Governments are urged to support all endeavours to stabilize the prices of tropical produce. It is also hoped that industrial countries wishing to increase their exports to the developing countries will recognize the corresponding need to step up their imports from them.

One speaker referred to the likelihood of world famine — a contingency which we cannot but take as the background to the Working Party's general conclusions.

With this in prospect, it is becoming more and more urgent that industry should do its part in aiding the development of tropical agriculture. The fact that a working party on the developing countries has been organized at this Congress is evidence that E.C.S.C. is willing to help in this. We feel it could do so by arranging the establishment of a standing liaison body linking planners of technical assistance projects, recipients of that assistance, and industry.

There are precedents. The aid given by makers of fertilizers towards F.A.O.'s experiments is one example. Co-operation between silo manufacturers and the American organizations which are helping the developing countries to grapple with the storage problem could be another.

Such a procedure could be generally introduced, every technical assistance project on any considerable scale being jointly studied by the sponsoring organization, representatives of the developing country concerned, and the suppliers, who would provide equipment, advice and information, whether as a gift or against payment. By instituting such a system, E.C.S.C. would be helping to tackle one of the great problems of our time: moreover, it seems clear enough that notable advances in the agriculture of the developing countries would be automatically followed by a rise in steel consumption in other sectors.

CLOSING SESSION

CLOSING ADDRESS

BY COUNT MOENS DE FERNIG

Chairman of the Congress

On the completion of these three days of debate on what the steel producers and manufacturers are in a position to do for agriculture, I should like, before putting to you a few points as to the lessons the iron and steel industries can learn from the Congress's proceedings, to say a few words of thanks, in which I am sure that I shall be speaking on behalf of us all.

First of all, our thanks go to Their Royal Highnesses the Grand Duke and Grand Duchess of Luxembourg, who so graciously showed their interest in the Congress by consenting to be present. This was a much-appreciated encouragement to all of us from the outset.

Our sincerest thanks also to the Luxembourg Government. The Grand Duchy has given us its hospitality, a venue for our discussions and every facility for the organization of this Third Steel Congress, and I should like the authorities to know that we appreciate this also.

I said in my opening address that I should now be summing up the Congress's proceedings, but I feel that in view of what we have just heard from the rapporteurs of the four Working Parties I need not do so in any detail. There seems little object in my summing up their summings-up, so I propose simply to offer a few comments.

The iron and steel industries can, I think, draw some very pertinent conclusions from the tremendous strides agriculture has made, technologically and economically, in the industrialized countries of the world during the last twenty years.

It was up against some very difficult problems with regard to farming techniques, to profitability and to marketing alike, arising out of the small size of many holdings, the comparative slackness of the market and the difficulty of reorganizing and of recruiting the necessary labour. These problems are now being overcome in Europe by a drive on three fronts – organization, research and mechanization.

The headway which has been made in this direction is of course due in part to the support agriculture is receiving from the official quarters responsible. But at the same time it is due in large part to the work of the farmers' own associations, and to the vigour and the go-ahead spirit with which the individual farmer, big or small, despite his well-known independent-mindedness, has taken up and put in hand the changes and new techniques devised for him. There is a moral there for everyone, and more particularly for the equipment manufacturers, who are in many cases also pretty limited in their range of action at present.

Actually, the manufacturers have some exceedingly competent research establishments working for them. But whereas the steel firms proper, with their highly-trained executives, have very quickly absorbed and applied the findings of research, the construc-

tional steelwork and mechanical-engineering companies seem to be taking much longer about it — quite apart from the fact that their research may possibly have been rather less intensive.

The problem is, then, twofold: to step up research on steel utilization and to disseminate the findings more efficiently.

In this connection, ladies and gentlemen, I should like to pay tribute to the High Authority of the E.C.S.C., and very specially to its eminent President, Professor Del Bo. The High Authority has taken it upon itself to make substantial grants for steel research, particularly on ways of improving the quality of the metal, and it is now asking the manufacturing firms to submit detailed, carefully-thought-out research programmes. It is up to the manufacturers to respond — but it is up to them also to organize themselves, as the farmers have done, so that the small firm too can have the benefit of the research that is being done: there must be regular dissemination of research results among *all* manufacturers on whatever scale, to create the same urge to progress via technology as we now see in agriculture. Meantime E.C.S.C., by promoting contact between the manufacturers and their customers as it has done at this Congress, is also giving proof of its keen and continuing interest in the market expansion of the iron and steel industries and the consequent need to develop new products. The Working Parties' rapporteurs have made it clear to us what a respective market agriculture is for the new equipment and techniques, and that is a very valuable encouragement to research.

But, as I say, I wanted just to make some general points which seem to me to emerge from these interesting discussions.

One is that, to meet the needs of such a distinctive and difficult sector as agriculture, the manufacturers will have to undertake major adjustments in their production and marketing arrangements which, while doubtless rewarding in the long term, will cost them a great deal at the start. Consultation between the manufacturers' and farmers' federations would certainly help to give the two sides a better idea of one another's problems and enable the resources available to be disposed more in line with market requirements. The present Congress was a start in this direction: I hope very much that the talks begun here will be followed up in the different countries.

Then again, it would appear that particularly extensive and growing use is being made in agricultural buildings and equipment of the new materials in competition with steel. This competition should act as a stimulus to technological progress for the steel producers and manufacturers; moreover, the new insights they gain in this field will be applicable in many others as well, to the benefit of society generally. Which will be one more demonstration that healthy bodies thrive on a good tussle.

Another point I would note is this. The push being made to increase the technological efficiency of agriculture and of agricultural buildings and equipment may not be such an eye-catching business as space exploration or nuclear research. Nevertheless, it involves a number of forward-looking people getting together to deal with a mass of problems presented by traditional technology. The work that is being done to improve our knowledge of the materials in use and of the best ways to use them, and the results already achieved, are clear witness of the economic benefit to be drawn from consistent, persevering studies in fields admittedly obscure, yet all-important to humanity, since they directly concern the population as a whole.

These are a few of the general considerations I thought it well to bring out in referring to the excellent job which the four Working Parties have done.

What with the breadth of the subjects handled and the many new aspects involved, the Working Party chairmen and rapporteurs moreover had no easy task. To them, and to all those who took part in the discussions, I would extend most cordial thanks for their contributions to the success of the occasion. And we are all greatly indebted to Director-General Peco, who was the linchpin of the whole Congress and who was responsible in the first place for giving us this challenging subject to debate.

In the industrial civilization of today, all sectors of the economy are interlinked, and progress often derives its initial impetus from contact between men of widely-differing backgrounds. To focus the minds of such men on a common objective and enable them to make the acts of choice that are entailed by a policy of technological progress necessarily limited as to the means of action for implementing it, there need to be organizations like our present host the High Authority. And one of the things this Congress will undoubtedly be seen to have done is to have given men working in different fields the opportunity to get to know one another and to view their own concerns in a wider context.

It is greatly to be hoped that this man-to-man contact, a counterpart to the co-operation between producers, manufacturers and users to which I referred just now, will lead on to fresh advances for the good of society as a whole — the ultimate objective of international organizations in general and of E.C.S.C. in particular.

And now, before I ask President Del Bo to speak to us, I should like once again to thank him and his fellow-Members of the High Authority, both personally and on behalf of all present, for their action in inviting us to the Congress and for the most efficient way in which the occasion has been organized. I feel confident that good results will follow the work that has been done here.

That this will be so is my fervent wish at the end of this Congress.

ADDRESS

BY DINO DEL BO

President of the High Authority

On behalf of the High Authority, may I first of all offer our sincerest thanks to the Sovereigns of the Grand Duchy and to the authorities of the city of Luxembourg, which has once again housed our Congress.

At the same time, with respect more specifically to the Congress proceedings as such, we would offer some further tributes of special gratitude.

First, to the Congress Chairman who has so admirably ensured, that these three days of study and debate went so smoothly and successfully. Then again, to those who have attended our third Congress — both the “old hands” who have regularly taken part on the previous occasions also and the newcomers here present for the very first time, including more especially the representatives of the agricultural sector. These last, true to their cast of thought, initially regarded the new departure with their usual caution, indeed if I may say so with *a touch of healthy pessimism*. But once they had taken the plunge they became, as has been noted on all sides, even keener and harder workers for the success of the Congress than the delegates of the past. And lastly, our thanks to the representatives of the Press — the big general dailies and weeklies, the economic and business papers, and, still more, the specialized farmers’ periodicals of our various countries. Press coverage has done much to aid our Congress, by reporting it, by offering the necessary comment and evaluation, and by drawing attention to the further exertions that still lie ahead.

Concerning future action, we have just had from our rapporteurs detailed and thought-out, yet at the same time thoroughly clear and straightforward summings-up of what the Congress has felt and said during these three days and what it would now wish the High Authority to do. For our part, I have to remind you that we are strictly bound by a Treaty, which makes it entirely out of the question for us to take on the functions of a board of building contractors, as the findings of the first Congress suggested, or, as was urged from some quarters at the second, to own and operate a processing enterprise. Similarly, we cannot possibly run a model farm however attractive the idea may appear to some of us personally. Nevertheless, so far as our terms of reference permit, we shall certainly, as is our responsibility, bear most carefully in mind the points that have been made both in the past and at the present Congress.

Generally speaking, I would say that these go to confirm what was brought out following the first and second. Steel has got to be launched in an ever-growing number of new economic sectors. And for that purpose there has got to be a sustained publicity campaign to prepare those sectors to make due use of steel when the time comes.

What we have sought to do in convening this Congress of steel men and farmers is to draw a wide arc from a basic heavy industry to a primary producing activity, in order partly, of course, to help resolve the specific problems arising between steel and agriculture, but also to demonstrate, practically as well as symbolically how such contact between two at first sight widely different and sometimes indeed conflicting sectors can

always be achieved provided both sides bring to the encounter the fullest mutual understanding, a willingness to think things out together, and a real social and political solidarity in the best sense of the term.

To the Directorate-General for Steel, then, must go the credit for suggesting to the High Authority as the theme for the Congress this field of immense, though long-term, potentialities. By doing so they have demonstrated once again that the so-called "Eurocrats" have very commonly a touch on affairs that merits fuller appreciation from public opinion in the different countries.

I feel, too, that there is something else this Congress has shown us. It has confirmed that, to get results, the High Authority should press ahead with its work of establishing contact between the steel producers and all those who can broadly be ranked as steel consumers. And, in this particular instance, it has brought out the further point that the industrial planners too should be included in that contact — the people (nowadays primarily technologists) who have the tricky job first of selecting the materials to be used and then of working out the optimum size of the installations from the economic and operational standpoint, and are thus responsible for ensuring that both producers and consumers are able to forge ahead simultaneously to the benefit of all.

This is the case, needless to say in modern industrialized countries. It is the case still more in the countries which have more recently attained independence. We have duly noted the findings of Working Party IV. We fully recognize that the developing countries, located mostly as they are in tropical climates, have in the matter of agricultural installations and equipment special needs requiring to be further studied and taken most carefully into consideration. And we recognize, too, another and a yet greater fact — that, just as their movement to full independence, now gained or in the few remaining cases very shortly to be gained, is irreversible, so too is their movement to industrialization. No industrialized country, let alone a Community such as ours, can suppose the developing countries' march towards industrialization can possibly be halted. The first step is to industrialize agriculture, since only by judicious industrialization in this sector can the new countries introduce crop diversification and so build up sufficient capital reserves to go ahead by swift stages to the establishment first of the necessary infrastructure and then of industry proper.

At the same time, there is another basic fact we have been shown. It is this: the big thing the developing countries are anxious we should do is buy their products. And we have to remember — a point very specifically for the attention of the farmers — that those products are still today in overwhelmingly large measure agricultural.

So may I be permitted to put in the further plea that the statesmen and the farmers of the industrialized countries, while of course seeking by political and restrictive measures to safeguard their lawful interests and inalienable rights, should also bear in mind that for so long as our countries maintain subsidized prices for home-grown produce, and quota restrictions on the importation of produce from the developing countries, our aid and goodwill will remain merely the outward form and not the real thing. The problem is one we cannot sidestep, even though, to avoid awkwardness, it is too often preferred not to talk about it.

Lastly, I feel there is another task we should tackle together — the promotion of the research and study work without which certain problems of economics, technology and general policy will never be overcome. And unless they are overcome we shall never

progress as we should, not only in industrializing agriculture, but in enabling our industries to draw abreast of those in the major developed countries outside the Community.

Never before has there been such constant reference as today to the competition that is growing up in the world. We must trust that such competition as this, economic in character, will be the only one.

Well, in that competition it is absolutely vital that Europe should not be worsted. It is absolutely vital that Europe's brains should prove of as high a standard as they have done in times long and not so long past, that it should continue to play its part in the betterment of the human lot. From being ourselves the prime movers we must not, must not allow ourselves to become nothing but passive accepters of great decisions and great advances sprung from the intellect of others.

It is partly to this end that we are planning to continue with our series of Steel Congresses. This year we organized an encounter between steelmaking and the world's very oldest activity, agriculture; next year's Congress, in all probability, will deal with one of the world's newest, a sector already of tremendous importance for our own time and with a future so immeasurably vast that it is hard indeed for us today to form any idea of it. I refer to petrochemistry, the subject the High Authority is envisaging adopting in 1967.

I should like now to end with an observation of wider scope. We have all of us registered the note of warning struck by the Luxembourg Prime Minister at the opening of the Congress. M. Werner's emphasis that the Common Market in so basic a sector as steel must be safeguarded, and not allowed to become eroded and to vanish away, came as no new or unfamiliar thought to the High Authority, which has for months been devoting careful study to the incipient crisis that looks like coming upon the Common Market for steel.

I am now in a position to tell you that, pending the forthcoming session of the Council of Ministers, the High Authority is preparing, in order to meet this contingency, to take the action it is empowered to take, to request that the six Governments assume their due responsibility, and to put to the Council what measures it now feels should be adopted to ensure that, parallel with the further consolidation of the integration of steel production, integration will also be maintained in the steel-manufacturing and steel-consuming sectors, and beyond, in the economies of the six countries generally.

This is a matter of very great moment indeed, affecting, as we are aware, the whole standing of the High Authority. We Members care keenly about that standing, not just as people, but with a consuming, all-absorbing intensity. For to us the Community movement is something that has sprung from the agonies of our six countries' young men and women in two world wars, from the hope that blossomed in and after 1945, and from the heart and soul and mind that intellectuals and thinking producers, technologists and workers have put, despite recurrent and still persisting obstacles, into the building of Europe.

On this, I think, we can wish one another good success, and it is fitting too, that we should do so in the watchful presence of those from other parts of the world, who notwithstanding resolved of their own accord to associate themselves with our great venture, and rightly expect not to be betrayed and disappointed.

And so I felt it to be allowable, indeed most fitting and proper, at the conclusion of this Congress to look for an instant to wider horizons, and, while continuing to concentrate on our daily labours, to be mindful, all of us, of the things we are striving for and the ultimate ends towards which Europe is to move.