

Third Annual General Meeting

The Indian Institute of Welding Presidential Address

By K HARTLEY

We are meeting here today on the occasion of the third Annual General Meeting of our Institute in an atmosphere which is both dark and bright. The dark side of the picture is represented by the political uncertainty which prevails in many parts of the country ; this has placed a big question mark over the entire economy which was otherwise beginning to show signs of revival. The bright aspect is that, after nearly three years of recession, economic activity has begun to increase even though not all sectors of industry have benefitted uniformly by the revival. Understandably, the consumer goods section has shown the greatest buoyancy while the capital goods sector is still trailing behind. However, utilisation of capacity in the engineering industry has been improving and is somewhat above the level that prevailed last year. The decision to launch the Fourth Plan also gives rise to the hope that developmental activity will soon start in full swing. Agricultural production has continued to remain at a fairly high level which has had a steadying influence on prices of food and agricultural raw materials in industry. Let us fervently hope that the revival of the economy is not impeded by developments on the political front.

Review of the Institute's Work

Last year the Institute had a busy programme. As the Annual Report of the Council shows there were a large number of meetings and seminars in various parts of India ; the Institute has indeed made its mark in both industrial and academic circles in the country and appreciation of its importance and its usefulness have begun to be recognised in many quarters. Once again we have been fortunate in having for our meetings and seminars a number of distinguished experts from abroad whose presence here has enabled us to fulfil our aim of acting as a pipeline for the inflow of technology from the more industrialised countries of the world.

Last month I had the privilege of leading a three member delegation from the Institute to the Annual

Assembly of International Institute of Welding held in Japan, which we attended as observers. This was the first occasion on which India had been represented at these important Annual Assemblies and it was in line with our pledge to keep in touch with international activity in our field. The delegation was impressed by the advances which have taken place in welding technology in various parts of the world and particularly by the rapid strides recently made in Japan. Delegates from other countries showed keen interest in developments taking place in this field in India and an eagerness to establish permanent contact with those interested in the advancement of welding technology in this country. The event was indeed a very successful attempt on the part of the Institute to raise to truly international heights the developments and activities of the welding industry in India.

Indian Welding Journal—the Institute's official publication—was launched last September and I am pleased to record that it has made a very favourable impact in engineering circles ; both issues of the Journal that were published during the course of the year were extremely popular and evoked considerable interest.

It is also a matter of gratification that our advocacy of improved training facilities has had effect and I am very pleased that Indian Institute of Technology, Madras has decided to start a post-graduate course in Industrial Metallurgy in which welding finds a preeminent place. I am confident that the example of IIT, Madras, will be followed by others and courses for advanced training in welding technology will be started by IITs and engineering colleges throughout the country.

The International Scene

While there were no major developments internationally, progress in welding techniques and equipment continues to be made. The recent achievement of modern science, the journey of man to the moon, was made in spacecraft in which varying welding techniques were used in no small measure.

Continuous gas lasers with higher power have opened the door to the use of laser for the shaping and cutting in the near future of a large variety of materials including non-metals. There have been some improvements in friction welding especially with dissimilar metals and advances have been made in ultrasonic and electron beam welding, particularly for sophisticated work in spacecraft. Fluxcored electrodes obviating the necessity of using a gas shield have been developed and this process will inevitably gain greater acceptance in the future.

The trend on a world scale continues towards the semi-automatic and automatic processes because of the savings of labour and time that are made possible: spiralling labour costs throughout the world have underlined the increasing need for mechanising welding operations and such mechanisation through the use of the semi-automatic and automatic processes is being rendered easier through the development of more advanced welding equipment. New equipment being manufactured in the more industrially advanced countries reduces considerably complexities in welding operations: the use of single knob control machines, for instance, makes it easier for relatively less skilled workers to perform welding operations and thus helps to speed up the pace of mechanisation.

Programme control welding machines of various kinds are also being developed and are bringing closer the age of automation in the sphere of welding.

Situation In India

The prolonged recession which affected particularly the engineering industry as a whole, created serious difficulties for the welding industry. Some of the electrode manufacturers in the country had to reduce production drastically and a few were even obliged to close down their factories. Despite these difficulties, however, those units that managed to survive succeeded in bringing about further improvements and progress was registered both in respect of import substitution and export promotion.

As Indian industry diversifies and is called upon to undertake the manufacture of varying types of plant and machinery, more and more types of special electrodes are being developed. For instance, special electrodes and consumables for hard-facing have been introduced by some manufacturers and consumables for use in rebuilding blast furnace bells and steel mill rolls, which were formerly being imported, are now available from indigenous sources.

The inevitable trend towards semi-automatic arc welding from manual arc welding is perceptible; some

of the consumables are already being manufactured in India and the production of semi-automatic equipment seems imminent.

Permit me to cite a few examples to show how, despite the difficulties and the rather gloomy economic climate prevailing, welding in India has continued to play a vital role in Indian industry and is keeping pace with developments in every sector.

Electrodes used for the Leander class frigate of the Indian Navy built by Mazagon Dock at Bombay were indigenously manufactured. So also have been the special electrodes required for the fabrication of railway wagons which are being exported to cold countries like Poland, Hungary and Korea. Electrodes used for such wagons have to be capable of giving weld deposits which can withstand low temperature impact. Indian electrode manufacturers have faced this challenge successfully and they are equally ready to face the challenge of the requirements to build the wagons for which orders are currently being negotiated with the Soviet Union. The electrodes that will be required for the manufacture of wagons capable of withstanding the rigours of the Siberian climate will need to be of a very special type capable of withstanding temperatures which are amongst the coldest in the world. I would also like to place on record the importance of the introduction of the electro-slag welding process at Bharat Heavy Electricals, Tiruchirapalli in the welding of pressure vessel shells.

Some Problems

Raw Materials

I now come to some problems which continue to hamper production and to overcome which Government action is required. Some of these difficulties relate to essential raw materials for the manufacture of electrodes. For instance, import of stainless steel wires is not being allowed for the production of stainless steel electrodes for general consumers. This brought production of these types of special electrodes to a virtual standstill for nearly nine months before Government agreed in April 1969 to issue import licences. I would be the first to advocate a ban on the import of any raw materials for which a suitable indigenous substitute is available but it seems to me that only harm to industry and to the economy can result from a refusal to issue import licences for a raw material not yet manufactured locally for which there is a desperate need in many areas of the engineering industry.

There have also been difficulties in importing essential requirements of powder ferro-alloys for electrode

coatings. I hope that by 1970 we shall have been able to develop indigenous sources of supply in adequate quantities but meanwhile shortfalls must be made up by imports and it is to be hoped that adequate licences for this purpose will be issued.

Outmoded Codes and Regulations

Some of the codes and regulations now prevalent in India for certain fabrication jobs were drawn up in the days before welding technology had developed to anywhere near the extent it has today. Now that welding has made considerable progress, however, these codes and regulations have become outmoded but surprisingly enough certain authorities in India still insist on following them thus preventing the application of welding in jobs for which welding is eminently suited. This not only results in wastage of materials and continuation of outdated processes but it also hampers the progress of welding technology in the country; the fact that in the more industrially-advanced countries welding is used extensively in such cases is either not known, or, if it is known, it is ignored deliberately for reasons which are difficult to appreciate.

In certain other cases considerations of false economy are leading to a regression in fabrication techniques. Let us take the example of wagon building. The Railways switched over some time ago to 8-wheeler BCX wagons of the welded type in place of the rivetted 4-wheeler CR wagons; this not only speeded up fabrication and effected considerable economy in the use of steel but it also resulted in the creation of greater freight carrying capacity per rupee invested than was possible earlier. By some curious logic the Railways have in some cases reverted to 4-wheeler covered wagons of the rivetted type. The initial investment is apparently smaller—a fact that seems to have weighed most with the Railway authorities—but the wastage of time, labour and metal involved, as well as the fact that owing to the much quicker wear and tear of this type of wagon, the freight carried per each rupee invested will be much less, has evidently not been considered.

Another problem that creates difficulties for welders is the multiplicity of standards. Many projects in India are executed with the help of foreign collaborators. Other countries frequently have their own standards which vary in minor detail from those in this country but project authorities often insist on manufacturers and engineers conforming to the standards of the collaborating country concerned. This creates considerable difficulty for Indian engineers and those responsible for supplying the fabricated materials. International Standards Organisation (ISO) has, of

course, been tackling this problem for some time and Indian Standards Institution (ISI) is trying to conform to ISO standards wherever possible. International Institute of Welding is also taking active steps to develop international standards in respect of welding equipment and consumables. Acceptance by all countries of ISO standards will inevitably be a slow process as there is a natural tendency for every country to continue with its own standards. It would perhaps be well for the Government of India, when negotiating with foreign countries collaborating on national projects to insist, wherever possible that Indian Standards are made use of.

Steel Prices

In my address last year I referred in some detail to the adverse effect of the high prices of steel for welding in India. It now appears that our steel prices, which are already among the highest in the world, might be increased still further. The impact of this on engineering activity in India generally and on welding in particular can easily be imagined. Another problem that has arisen recently is the scarcity of flat steels and weldable quality steel causing a hold up of work in many places. I can only express the hope that wiser counsel will prevail and attempts to further increase the prices of steel will be abandoned and at the same time steps taken to ensure the steady supply of flat products and weldable quality steels.

Exports

One of the most heartening features of the present situation in the country is the steep rise in exports of engineering goods last year. Engineering exports have been able to find a market not only in Asian and African countries but also in Europe and North America. The welding industry in India can therefore legitimately claim a share of the credit being bestowed on the engineering industry because without first class welding equipment and consumables and high quality welding this export achievement of engineering products would not have been possible. It is also a matter of satisfaction that today India is exporting not only engineering goods but machinery for entire plants such as textile mills and sugar mills.

Despite the built-in difficulties of exports so far as electrodes are concerned, it is gratifying to learn that their export also showed considerable improvement last year. The increase in exports is due partly to the intensive drive launched by the engineering industry and the electrode manufacturers and partly to the growing tempo of activity in some of the developing countries. In this context I would like to welcome the

export incentives provided by Government by way of concessional steel prices and other subsidies. It has recently been suggested to Government that rutile supplied from the State factories in India to electrode manufacturers should be at international prices for electrodes which are exported and I do hope that Government will consider this question sympathetically.

Technological Development

The developments that have taken place in welding in India during the last three years would not have been possible without the flow of technology that has taken place steadily and the high standard of local research and development effort which has enabled the country to adapt foreign designs and formulae to Indian conditions. Not only have Indian manufacturers and engineers taken full advantage of the import of technology, but they have today reached a stage where they are able to make original designs and even to export, on a limited scale, technology and know-how.

It is precisely because of this experience that it is so essential to ensure that import of technology to the extent necessary is not impeded. Technology never remains static and if a constant flow is not maintained we shall be left behind. As far as the protected Indian market is concerned this might perhaps have no immediate serious repercussions but in the fiercely competitive international market any slide-back will have disastrous consequences and will mar the prospects of our extending export outlets. I would, therefore, urge upon the Government not to take too rigid a view on import of technology and would point out that successful research and development in India requires that minimum imports of models and samples of equipment and consumables for the welding industry should be permitted without which such research and development will be severely hampered.

Another suggestion which I would like to make is that our national institutes and laboratories, some of which are fairly well equipped to carry out research in welding, should establish closer contact with industry. A meaningful collaboration between industry and these Institutes, such as, for example the Central Mechanical Engineering Research Institute, Durgapur and the National Metallurgical Laboratory, Jamshedpur, could prove of great help in developing welding technology in the country and in equipping us to solve some of the tasks that lie ahead. I would also urge upon the various units which are engaged in the manufacture of welding equipment and engineering units which are extensively using sophisticated welding techniques to devote greater attention to research and development lest we find that the next phase of the country's development leaves us behind.

Tasks Ahead

This brief survey of the welding industry and its problems that I have attempted here should make it clear that conditions for a rapid advance have emerged. With industrial production showing an upswing—and despite the political uncertainties I sincerely hope that the upswing will be maintained—the welding industry will be called upon to tackle many complicated tasks. In the fields of development of special manual electrodes as well as consumables for semi-automatic welding in particular, considerable effort will have to be made so that our engineers and scientists and those employed in fabrication work of various types, in fact the whole welding industry, will prove equal to the task.

I would just like to make mention of some developments that are expected shortly in the steel industry which will have an impact on welding. Medium high tensile steel, which in the past has been obtained from overseas sources, is now being manufactured indigenously; fabrication work involving this type of steel will obviously generate a demand for medium high tensile steel electrodes and for welding techniques suited to it. Weathering steel containing nickel, chromium and copper for use where the atmosphere is highly corrosive is also being developed in some of our steel plants and this will also obviously require special electrodes and suitable welding technology.

The Indian Institute of Welding will continue to make every effort to help the process of revival that has started in the country and to aid in the spread and development of the latest welding techniques. It will also try to make its contribution to research and experimentation in this field. The practice of holding seminars and meetings that has been initiated will, I am sure, continue in future also and will secure the participation of increasingly larger numbers in the activities of the Institute so that we can grow from strength to strength. In my address last year I referred to our intention of establishing branches in various parts of India: whilst this wish has not yet been fulfilled we continue to work in this direction and I sincerely hope that our desire will be possible of achievement before too long. I also hope that Indian Welding Journal will become an even more powerful vehicle of communication and that contributions to it will be forthcoming from experts in all corners of the country.

I am sure you will agree with me that The Indian Institute of Welding can look back with satisfaction on its achievements during its brief history. The Institute has become a really dynamic organisation, determined to play an ever increasingly active role in the industrial and economic development of the country.