

LATIN AMERICAN PERSPECTIVES

Volume 10 Number 4 October 1988

MEDIA CULTURE & SOCIETY

 SAGE PUBLICATIONS
ISSN 0163-4437

Editors

Richard Collins, James Curran, Professor Nicholas Gamham,
Paddy Scannell, Professor Philip Schlesinger, Colin Sparks

Corresponding Editors

J. Vidal-Beneyto, Council of Europe
P. Bourdieu, Centre for European Sociology, Paris, France
Lord A. Briggs, Worcester College, Oxford, UK
E. Bustamante, Telos, Madrid, Spain
F. Chevaldonné, CERCOM-CRESM (CNRS), Aix-Marseille, France
P. Dahlgren, University of Stockholm, Sweden
F. Dzinié, University of Belgrade, Yugoslavia
S. Hall, Open University, Milton Keynes, UK
H. Himmelweit, London School of Economics, London, UK
Y. Ito, Keio University, Tokyo, Japan
B. Miede, Université de Grenoble, France
G. Molina, Universidad de las Americas, Mexico
K. Mrela, Arizona, USA
L. Palden, University of Turku, Finland
G. Richeri, Milan, Italy
D. Schiller, UCLA, USA
H. Schiller, University of California, San Diego, USA
D. Smythe, Simon Fraser University, Canada
T. Tanwar, Indian Institute of Forest Management, Bhopal, India
R. White, Centre for Communication and Culture, London, UK
Ali editorial correspondence should be sent to *Media, Culture and Society*, School
of Communication, Polytechnic of Central London, 18-22 Riding House Street,
London W1P 7PD, UK.

Published quarterly by SAGE Publications, London, Newbury Park, Beverly Hills,
New Delhi

Annual subscriptions: institutions £50/\$75; individuals £23/\$34.50. \$ prices are
subject to change due to fluctuations in the £/\$ exchange rate.

Subscription and advertising details available from

SAGE Publications Ltd, 28 Banner Street, London EC1Y 8QE, UK

Second class postage paid at Westwood, NJ 07675. Mailing in the USA by PSCA,
40 Carver Avenue, Westwood, NJ 07675.

Printed by J.W. Arrowsmith Ltd, Bristol, UK

Copyright© 1988 SAGE Publications Ltd ISSN 0163-4437



Latin American perspectives
Issue editor: Philip Schlesinger

- | | |
|-----|--|
| 395 | Editorial |
| 405 | José Marques de Melo Communication theory and research in Latin America: a preliminary balance of the past twenty-five years |
| 419 | Javier Esteinou Madrid <u>l'he Morelos Satellite S stem and its imQact on Mexican societ</u> |
| 447 | Jesús Martín-Barbero Communication from culture: the crisis of the national and the emergence of the popular |
| 467 | Néstor García Canclini Culture and power: the state of research |
| 499 | Colin Hoskins and Rolf Mirus Reasons for the US dominance of the international trade in television programmes |
| 517 | Discussion Greg Philo <i>Television and the Miners' Strike - a note on method</i> |
| 523 | Book reviews |
| 535 | Index to Volume 10 |
-

The Morelos Satellite System and its impact on Mexican society

Javier Esteinou Madrid

DEPARTMENT OF EDUCATION AND COMMUNICATION,
AUTONOMOUS METROPOLITAN UNIVERSITY, XOCHIMILCO,
MEXICO

Translated by Philip Schlesinger

The Morelos Satellite System: interpretative guidelines

To elaborate definitive judgments about social phenomena requires a lengthy period of observation. The Morelos Satellite System is a technological reality with only a short life behind it so far. Moreover, as it has grown up amongst enormous contradictions in planning and notable shortcomings in official information, it would be hazardous just now to make a definitive appreciation of the significance and repercussions that this initiative will have for the country's development model.

However, although limitations exist, it is very important to make one's own observations of what is known in this preliminary phase of the system's evolution, for it is in this embryonic stage that the phenomenon will acquire the characteristics basic to the next nine or fourteen years of its life. For this reason, it is pertinent to present the elements of a temporary overall analysis, independently of the official ideology spread by the government, in order to offer a more objective evaluation of the import and impact of this project for the future evolution of the nation.

The following eight elements figure amongst the most relevant aspects that need to be taken into account: the birth of a system without national objectives; the project's deficient management; the loss of sovereignty and the nation's political dependence; the country's questionable development; relatively loose national integration; the transformation of television into the principal apparatus of cultural hegemony; the accentuation of the cultural backwardness of the Mexican state; and the attitude of the Mexican government in the face of the expansion of the new technologies.

A birth without national objectives

Over a period of several years, official documentation has repeatedly indicated that the Morelos Satellite System is being created because of the country's need for modernization in the field of information, in order to extend telecommunications services to all the small communities, because of the urgent need to decongest the Federal Microwave Network, because of the need to unify the national territory, because of the demand to develop the rural telephone system, in order to make use of the low costs of a space launch, etc. However, despite the difficult task of teasing out the authentic reasons behind public policies, we think that the real motive behind the birth of the Morelos Satellite System lay in commercial television's strong need to expand, especially that of Televisa, the dominant conglomerate in the field. Subsequently, the utilization of other national telecommunication services, such as rural telephony, were just fitted in (cf. Fadul, et al., 1985: 29).

That is to say, that faced with the absence of a rational, coherent, and integrated cultural development policy for the new information technologies in the medium and long term, the Morelos Satellite System emerged in line with the same tendencies as the country's traditional telecommunications systems; in the first instance, they were defined and conditioned by private commercial necessities, and in the second place, whatever was not exploited by the commercial sector was forcibly adapted to various social needs. We may observe how in 1968 the Federal Microwave Network grew up along these lines because of the need to transmit the Olympic Games of 1968, and not because of other needs, such as for instance that of rural literacy. And similarly, note how the

hasty installation of the Tulancingo III antenna came about in 1980 because of demands by the television industry for a parabolic 11 metre antenna to transmit the Univision Network via the Galaxy I satellite, and not, for instance, because of projects to expand urban telephony. In the same way, the installation of the Morelos Satellite System, previously called 'Iluicahua', according to accounts circulating amongst various civil servants, derives from the fact that in 1980 Televisa had announced its decision to install its own satellite transmission system, particularly in order to transmit the World Cup soccer games of 1986 to a world audience.

Televisa's participation in the development of this communication policy was highly relevant, and the confusion and weakness of the state much accentuated by the country's wide-ranging economic crisis. Instead of going for the introduction of an adequate satellite that would advance Mexico's growth (a remote sensing satellite would have directly benefited the extractive industry, agriculture and oil exploration), it agreed to the construction of a direct broadcast satellite, whose favoured beneficiary was private commercial television (Fernández Christlieb, 1986a: 9).

This satellite would enable communication with any household without needing retransmission by means of a small 1.5 metre dish, an approach totally abstracted from the traditional telecommunications installations formally administered by the state.

The political significance of this was that:

Televisa would be able to transmit without any need for formal procedures through, or subordinate to, the Ministry of Communications and Transport, and outside of any geographical or cultural limits that the Mexican state might eventually be able to enforce. In other words, given the radio and television industry's trajectory in Mexico and awaiting the cancellation of the political reforms in the field of broadcasting during the government of President López Portillo, it is clear that the installation of a direct broadcasting satellite signifies an authentic demonstration of Televisa's political strength and the reaffirmation of Mexico as part of the US zone of influence when forces at an international level are recomposing, and there is growing investment in the telematic industry as a strategic zone of the global economy. (Fernández Christlieb, 1985a: 6)

If it had not been for the active influence of commercial television in the management of Mexico's satellite, how could we explain the Mexican government's acceptance of its use for direct broadcasting and not for other national needs?

Contrary to the enormous efforts at rationalization in introduc-

ing technologies engaged in by other Latin American countries, the present regime once more accepted the forced compromise (entered into with the Hughes Aircraft Company by the previous government) and built a domestic communications satellite. As this was not the optimal technical model for handling the needs of national communications, once acquired it was necessary to fill it up with services and invent uses (Fernández Christlieb, 1985b: 6).

Thus Colombia's experience with SATCOL was left aside. On that occasion, the same thing happened to Colombia's President Belisario Betancourt as to Mexico's President De la Madrid: Betancourt also inherited the previous regime's agreement to install direct broadcast satellites but decided to stop the project, even though the contractors had already been chosen. The government had neither sufficient means nor conducted adequate research into its proper exploitation. Nor was it precisely certain why it was being installed at all. Colombia simultaneously sought alternative ways out and together with the countries of the Andean Pact it was decided to build the Condor Satellite, sharing expenditure and use with the nations of the region (*Computer World*, 13 May 1985: 6; *Expansión*, August 1985: 51; Fernández Christlieb, 1986b).

However, the Mexican government continued to go ahead uncritically with the implementation of a project completely unnecessary for the country

... if we consider the real uses of communication satellites (not those set out by the Ministry of Communications and Transport) which are basically three: television, telephony and data transmission. The last of these uses does not justify the acquisition of a national satellite, the second may be supplemented with fibre optics, and as for television it would be necessary to review very seriously the following options: (1) to continue renting transponders from Intelsat, an organization tending to lower its prices; (2) to locate a Latin American satellite in a Mexican orbital position with the governments of the region deciding on distribution; and (3) to give more power to the regional and local television stations by exploiting the UHF waveband which does not require any kind of satellite at all. (Fernández Christlieb, 1986b: 41)

In this way

... the Morelos Satellite System was bought with private television as its only certain user; the Hughes company, with which Televisa had had relations since the beginning of the 1970s, was chosen as manufacturer, and the possibility of continuing to rent transponders from Intelsat while the country looked for the best use for a satellite was set aside. (Fernández Christlieb, 1986b: 40)

Thus, the Morelos Satellite project was born without any clear objectives for advancing the nation, as is the case with any project that is improvised, the only goals being those that accorded with the expansion of commercial television.

In the third place, despite the fact the government could have controlled the entire direction of this strategic project, it permitted Televisa to take part in the construction of various earth stations. In exchange for this, in the Agreement signed on 5 June 1982 between the government and Televisa, the state granted Televisa the preferential right to transmit signals. In this way, the state once again ceded the cultural governance of the nation to the country's most powerful audiovisual enterprise.

Fourthly, the influence of the private consortium over the conception of the satellite project was such that not only did it obtain preferential rights over the operation of television signals, but also in virtue of the Agreement signed in October 1980 between Televisa and the Ministry of Communications and Transport, it succeeded in having

... the state discount from Televisa an amount equivalent to the company's investment in the setting up of earth stations. In this way, the consortium obtained as a gift the exclusivity or legal monopoly of transmission of its television signals. (López Dávila, 1984a: 4, 1984b: 15)

In synthesis, we can say that the Morelos Satellite System

... did not originate in a state project designed to confirm the nation's control over the means of electrical and electronic communications, nor in order to reinforce national independence or to reduce technological subordination as announced by the National Development Plan; rather transnational factors, located inside Mexico and without, intervened in the decision. (Fernández Christlieb, 1984: 4)

Thus, even though

... the search for control in the field of social communication brought in the state, the private consortium continued to be the main recipient of the substantial sales of this technological innovation. (Fernández Christlieb, 1984: 7).

Thus, in the midst of a global crisis in our society, Mexico inserted itself uncritically into the industrial pattern proposed by the industrialized countries. Not only is it passively entering the strategic zones of international finance in the mid 1980s, but also

reinforcing external and internal cultural dependencies that are very dangerous for the country at this time (Fernández Christlieb, 1985a: 8).

Thus, the monopoly's power to impose its private expansion plans on the whole of Mexican society is demonstrable and so is the state's weakness in ceding its national mandate to monopolistic interests. Given this, we can conclude that the state, as the expression of the public, appears to have ceded its prerogatives and in this sense, to have been replaced by private interests. To the extent that the private is confused with the public, the logical consequence is also a vacuum in state policy in the field of research and development, which should be aimed at satisfying collective needs (Fadul et al., 1985: 30).

It is in this context that we ask ourselves how the Mexican state can speak of its stewardship and of independence in the field of communication.

Poor management of the project

Faced by the process by means of which the Ministry of Communications and Transport negotiated the manufacture, launching and positioning of the Morelos Satellite System, it is very important to underline that the state tied its own hands by not exploiting the project's bilateral sales potential: it put all its eggs in one basket.

The initial deal negotiated by Televisa together with Hughes Communications International was to produce a direct broadcast satellite that subsequently would be substituted for domestic distribution. However, the state did not look for another way of restarting this project. Losing any view of the overall national interest, it followed a path traced by one specific consortium. The government did not know how to negotiate or seek out other alternatives. It made contracts with six US companies (Hughes Aircraft, McDonnell Douglas, NASA, Comsat General Corporation, INSPACE and EXIMBANK) and with one from Japan (the Nippon Electric Co of Tokyo) to develop this essential satellite infrastructure.

Thus, without taking into account the example of other countries in the region which had strategically diversified the production of their first internal communication satellite much

earlier, the Mexican government handed over practically the entire building of its space programme to a group of US monopolies without obtaining any reciprocal advantage in exchange. For example, the Mexican administration ignored the case of Brazil, which, several months earlier had negotiated construction of its new domestic satellite, 'Brasilat', in a very distinctive way. It assigned the technical production to the Canadian firm Spar, the positioning and orbit to the French company Ariane Space, and the installation of the ground stations to local consortia. The result was better prices, various concessions over finance, technology transfer and commercial benefits which translated themselves into agreements for the importation of Brazilian products and technological equipment. The benefit of this strategy has been such that Brazil is already constructing a gigantic launching pad in Alcántara which will turn it into the first Latin American country to start the twenty-first century self-sufficient in space technology (*Boletín INTERCOM*, 1984: 38-41; *Revista del Comercio Exterior*, December 1984: 1214-13; *Excelsior*, 19 July 1985; *Revista de las Comunicaciones*, May-June 1985: 1).

This means that, despite the central interest of President Miguel de la Madrid's government in attenuating and diversifying our dependence (as has been attempted with the renegotiation of Mexico's debt with various European countries, or with the search for new international markets in other continents for the sale of our domestic production by means of entering GATT, etc.), the Ministry of Communications and Transport, demonstrating a lack of political vision, handed over the creation of the principal system of national communications to a small group of North American and Japanese enterprises.

Hence, instead of redistributing the already extremely high level of technological dependence on the United States, the subordination to that country increased disproportionately. Thus, despite distinct alternatives for handling this project, the Mexican government, of its own volition, initiated the new space era with the highest level of technological dependence that the national telecommunications sector has ever had.

Once again, this fact demonstrates, that because of a lack of medium- and long-term planning, after forty-five years of broadcasting in Mexico the state has not assimilated the lesson that Televisa's participation in the creation of its national projects implies. We believe that if the government had been the principal

in the satellite negotiations from the outset, it would certainly have been possible to control the project's management from the start, and it would therefore have been able to reaffirm Mexico's sovereignty in relation to the USA to a greater extent.

Given this picture, it is urgent for the state and civil society to learn from this lamentable experience so as not to make the same mistakes in managing the introduction of other new technologies such as industrial robotics, office data banks, financial computing systems, etc., which are already penetrating the country and transforming it rapidly.

Loss of sovereignty and the nation's political dependency

During the planning process for the Morelos Satellite System by specialized organizations, official circles emphasized that obtaining this space capacity would contribute substantially to reinforcing national sovereignty and independence, since internal signals could be handled and sent all over the republic in accordance with national priorities. It was insistently repeated that with the Morelos System the state would bring together its communication services under national ownership and control (Sánchez Ruiz and Elbert, 1983: 9; *Expansión*, 20 June 1984: 28). It would diminish dependency upon Intelsat, and then, once built and orbiting in space, the two satellites would be ours completely and would form part of the federal government's infrastructure. Hence, the system would remain subject to state direction in a mixed economy, attending first to the needs of the Mexican government, and then to the remaining requirements according to contract. Thus, once the Morelos System was in operation, Mexico would be entirely self-sufficient in the field of internal communications (Crespo, 1983: 1, 6; Kleiman, 1984: 15, 1985: 8).

However, notwithstanding the widespread diffusion of this ideology, we think that what has directly derived from the way in which the construction, orbiting and maintenance of the Morelos System was planned and managed is an enormous growth in the country's external political dependency, in particular upon the United States of America.

This means that if the Morelos System has transformed itself into a technology integrating all of the remaining telecommuni-

ations systems operating in the country, at a stroke it has become the principal system for national information, upon which the performance of the most important economic, political, financial, fiscal, social and cultural processes of the nation depend. That is to say, the Morelos Satellite System, in the medium and long term, will become a highly strategic technology for the functioning of telecommunications, and for that reason for the country's mobility, since the operation of telephony, telex, data transmission, telegraphy, television and so forth — namely, the operative organizational and functional networks of our society — will depend upon this new infrastructure.

All well and good, until we consider that the real capacity for making this system work, supervising its physical conservation, producing its technical follow-ups, renewing its material structure, replacing it in space, cannot be attained by our own national means because of the tremendous backwardness of our electronics and space industries. It can only be done with the support of transnational consortia. We may conclude that the technological, economic and political sovereignty of our republic will increasingly depend upon the controllers' norms and the interests of the leading high technology enterprises.

In sum, we can state that once the Federal Microwave Network has been abandoned and the shift to using the satellite infrastructure has occurred, national sovereignty will be open to exploitation through the Morelos System just like any other highly efficient weapon of political pressure on Mexico. Before this happens, it is important to recognize that the Morelos System is not the only means of pressure upon which the USA may count in order to coerce Mexico. We know that many others exist: migrant labour, the external debt, foreign investment and so on. But the Morelos Satellite complex — the 'central nervous system' of national communications — has become potentially one of the most strategic elements for influencing our internal and external self-determination.

Let us think hypothetically for a moment: in a phase of tension in Mexican-US relations, NASA might decide that the Morelos satellites have 'gone wrong', leaving the country incommunicado and therefore paralysing it (*La Jornada*, 1984: 15).

Or we might consider the fact (recognized by a representative of the Hughes Aircraft Company) that 'the Indonesian satellite "Palap", designed by Hughes and put into orbit by NASA (just

like the Mexican one) could be disconnected by order of Hughes or of the US Defense Department' (Fernández Christlieb, 1984: 9, citing Schiller, 1983).

It is necessary to recall how, merely as a result of the earthquakes of 19 and 20 September 1985, which destroyed the telephone exchanges in Victoria and San Juan, 55,000 circuits in the telephone network that connected the Federal District with the provinces and the rest of the world were rendered unusable, and for several weeks long-distance communications were broken. The capital and other states of the republic remained isolated from the interior and also the exterior, provoking great public anxiety, much social disorganization, an enormous waste of collective energy, delay in the work of reconstruction and heavy economic losses (*Excelsior*, 20 September 1985; *Uno Más Uno*, 24 September 1985). This obliges us to ask some questions. If as a result of the earthquakes, which damaged no more than part of the national communications infrastructure, especially telephony, the country suffered enormous economic and civil consequences, what would happen to Mexican society if the Morelos System's services were paralysed, since in the medium to long term they will be carrying virtually all our signals, whether telephonic, telegraphic, data transmission, telex, telematics, television, radio, teletext and so forth? For this concerns the main state apparatuses which govern the country, such as the Mexican Petroleum Corporation, the Federal Electricity Commission, the Ministry of Health, the Mexican Social Security Institute, the Institute for Insurance and Social Services for State Employees, the Ministry of National Defence, the Assistance Commission for Marginal Areas, the Ministry of Education, Federal Toll Roads and Bridges, Mexican Telephones, National Telegraphs, the National Meteorological Service, the Public Data Transmission Network, the National Bank, private enterprises and industries etc., etc.

We believe that faced with this new situation, the Mexican state will have no technological response capacity for examining and correcting those shortcomings. If, during the earthquake our society could simply not find the necessary machinery for removing the debris and extricating the victims but needed to seek assistance from other developed nations; if, our industrial plant have been unable to produce capital goods but have had to import them for more than forty years; if, before launching our domestic satellites we could scarcely minimally maintain the terrestrial

Federal Microwave Network, then we may well ask ourselves how on earth can we imagine that the Ministry of Communications and Transport, or whatever other agency is using its own resources, is going to repair some hypothetical damage to the Morelos System at an altitude of 36,000 kilometers?

All that the state could do would be to accept with resignation the pressure from the monopolies to come back again to restore our principal communications system, at whatever economic and political cost they might determine. We need to recall, for instance, that following the intense tendency towards reordering, diversification, and remonopolization being undergone by the transnational and US capitalist economies, the Hughes Aircraft Company, which constructed the two Morelos satellites and part of the earth stations, and is the seventh largest military supplier to the Pentagon, ended up being acquired by the strongest US enterprise, General Motors. GM is top of the 500 key North American companies and controller of 23 percent of the world motor vehicle market with annual sales in excess of 96,400 million dollars, i.e., more than the entire Gross National Product of Switzerland, Pakistan and the countries of Southern Africa put together (*Time* 17 June 1985: 30–33; *Excelsior*, 12 July 1985, 15 February 1986, 15 April 1986, 14 May 1986).

Given a real emergency on the lines described above we need to ask ourselves how might the Mexican state confront the interests of the most powerful enterprise in the USA if Hughes — who would actually have to repair the Morelos satellites — already belonged to GM. How could our nation confront the interests of so many companies in Mexico owned by GM if all of them were interdependent with Hughes? How can the Ministry of Commerce resist pressures from GM to gain greater commercial advantages allowing it to manufacture the 2000 cars that its Saltillo assembly plant produced in 1975 and at present cannot be sold due to the depressed world car market, if its needs are so intimately related with Hughes's needs (*Excelsior*, 15 May 1986)?

In sum, it is difficult to understand why if, as claimed, the Morelos System is to reduce technological dependence and increase national independence, the contracts have been made chiefly with US consortia thereby increasing our subordination to the United States.

We may focus on a second example if we consider for a moment how we are going to achieve greater sovereignty through the

Morelos System (as the administration's officials have said repeatedly) if we take account of the Mexican astronaut Rodolfo Neri Vela's recognition that 'it is impossible to avoid all the information that passes through Morelos I and II from being known by other countries, especially the USA' (*Excelsior*, 23 July 1985; *La Jornada*, 23 July 1985). In the face of this, we may ask just what margin of independence can the Mexican political system attain when all the activities of the principal apparatuses of government, by being transmitted through the Morelos System, can be instantly gathered in by the US? What new space for autonomy will our nation-state obtain when, by passing through the satellite system, strategic data such as the quantity of electric power, control over the gas distribution system, coordination of petrol supplies, the exploration and exploitation of new oil platforms, the meteorological conditions of agriculture in the regions, the quantity of banking transactions, and so forth, can all be automatically known by the highly industrialized countries? What new boundaries of sovereignty are we conquering when the entire flow of information sent by the command centres of the Mexican armed forces and the Ministry of National Defence to their thirteen zones and eighteen naval sectors, to the marine corps, to the navy's ships and aircraft, to the army, to the airforce are open to interception by the National Security Agency of the US Department of Defense as it passes through the Morelos System (Montoya Martín del Campo, 1985: 102; *Siempre*, 25 July 1985; *El Financiero*, 6 May 1985 and 5 December 1985)?

We may identify a third example if we think ahead, and see that at the end of its nine-year life the satellite system will have to be replaced by another. Before this occurs the US transnationals who have the technology may find themselves with the chance of refusing to sell a new system, if the country does not satisfy their interests. This could mean the economic paralysis of Mexico, since by this time most of the national communications infrastructure will already be hooked into the Morelos model and it would be impossible suddenly to change to another communications system.

Before this geometric growth in our vulnerability to and dependence upon the United States, the Mexican state and society are obliged to consider how we might negotiate better terms for the sale of our primary materials, especially gas and minerals. With what support can we bargain for better conditions for the supply of the 50,000 barrels of petroleum that our country sells

daily to the USA, allowing it to store its strategic reserve of hydrocarbons underground? With what political support may we manage the refinancing of our monumental external debt, which grows from day to day? From what positions of strength may we renegotiate the migration of workers to the north? With what social support can we prevent the conditioning of foreign investment in Mexico? With what firmness will the government be able to maintain its traditional foreign policy of self-determination for all peoples, especially in Central America and the Caribbean? With what strategic power will we be able to defend the 200 nautical miles of our territorial waters and our maritime resources? With what powers may we declare the suspension of our payments servicing the external debt, should the rest of Latin America decide on this? With what technological base will the government of the republic be able to confront the permanent international campaign of denigration, lies, fairy tales and pressures that various US congressmen and officials periodically put out about Mexico at moments crucial for our national self-determination?

In this regard, we think that the legal changes that the Congress has made to Articles 11, 20, 45, 55 (Section iii), 66 and 127 of the General Law on Methods of Communication, which indicate that 'the handling of the strategic areas of radio-telegraphy and communication via satellite will be functions exclusive to the state' are totally inadequate means for the protection of national sovereignty (Annexe No. 4). If it is certain that such legal initiatives give a more defined substance to the space policy of the Mexican government, it is also true that such constitutional reforms cannot compensate for the poor initial handling of the project which has placed us in a position of considerable sovereign vulnerability as a nation.

It is necessary to emphasize that the legal ownership of such technological systems does not guarantee real control over them. Lack of control creates a technological dependence that is becoming part and parcel of all other aspects of industrial, commercial and financial relations with the capitalist centres (Montoya Martín del Campo, 1985: 103).

Similarly, we believe that the training of an initial group of thirty-six Mexican technicians in the United States, divided into three groups of specialists who will have the job of operating the Morelos Satellite System from the earth station CONTEL, is insufficient and will guarantee the same level of dependence already

reached by the Federal Microwave Network. Especially so, when in the view of Mexican engineers

... 'there is no well-founded project for the development of human resources either in the short or long term. More than this, the technicians who are being trained at Hughes and who now work at the Satellite Tracking Centre in Ixtapalapa are merely button pushers.' That is to say, we know that we cannot depend on the know-how of space technology needed in general, and needed in particular for the manufacture of satellites. The Mexican technicians spoken of in the news, to be truthful, are only sorcerers' apprentices. (Fernández Christlieb, 1984: 6)

To sum up, we can say that in 1985, the year in which the 175th anniversary of national independence will be commemorated, the government has created the technological bases for producing the greatest economic and political subordination in the modern history of Mexico. For this reason, this is one of the highest priorities for national security that the Mexican state and civil society need to face.

The uncertain expansion of telecommunications services

Official circles have believed that the Mexican satellite system, amongst other factors, would revolutionize national telecommunications by transforming existing systems for carrying information. It is said, for instance, that the terrestrial infrastructure will be used more efficiently since the Federal Microwave Network will be able to expand several services to which it now contributes, and will also remain capable of supplying further services due to the fact that the satellites will transmit various signals that now saturate and congest it.

At the same time we are assured that it will be able to count upon sufficient television channels and circuits capable of transmitting millions of bits of information per second (Landeros Ayala and Neri Vela, 1984: 23-4).

Similarly, it has been pointed out by government agencies that with the acquisition and putting in orbit of the Morelos System, Mexico will take an important step in the demolition of great areas of national backwardness in telecommunications as it will be able to distribute information to the most far-flung and inaccessible corners of our national territory. With this new technology the

diffusion of information to zones hitherto unreachable will not only improve, but the whole of the Mexican Republic will also be covered by voice, image and data signals (SCT, 1983: 2; *Excelsior* 18 December 1984: 26).

Despite the circulation of these official images in our minds, we think that the above statements can only be considered partly true, as given the paucity of planning that the Morelos Satellite System has had in relation to the project of national development, various factors exist that obstruct the expansion of telecommunications by satellite.

The first obstacle to the expansion of communication services through Morelos is the need for a complete earth tracking station infrastructure that will allow the space technology to provide what it has to offer at maximum capacity. However, at present, the country cannot rely upon this terrestrial network, since in order fully to exploit Morelos from the start would require 850 receiving stations and in fact only 198 earth stations are in operation. It needs at least four years to make up the deficit of these 650 stations. Around 1988 the Mexican state will hardly have installed 500 earth stations with an additional investment of 25 thousand million pesos (Jiménez Espriu, 1985).

Consequently, in an overall estimate taking into account the percentage of earth stations constructed, we can say that after the Morelos system has been installed, its supply capability has been and will be as follows. In 1985, only 24 percent of its capacity was employed, with private television and cultural and educational television accounting for 19 percent of the total of that figure. In 1986, 25 percent will be utilized towards the middle of the year, rising to 49 percent at the end of the period, with the participation of the nationalized bank Notimex, the Ministry of Public Education, various voice transmission networks, regional television enterprises, the Mexican Children's Hospital and the *El Nacional* newspaper. In 1988, it will be at 65 percent capacity, of which 18.5 percent will be taken up by Mexican Telephones, 9.4 percent by television, 6.6 percent by telephony and rural television, 10 percent by private networks and data banks, 12 percent by public networks and 8 percent by various other services.

By 1989, Satellite 1 will have utilized 70 percent of its capacity and Morelos 2 some 10 percent. In 1990, 31 percent will be given over to television, 45 percent for telephony and 20 percent for data transmission. Finally, towards 1994 Morelos 1 will be at full

stretch, with Morelos 2 using 33 percent of capacity (Eliás Guzman, 1984: 58; *El Universal*, 7 June 1985; *El Nacional*, 26 July 1985; Spriu Jiménez, 1986; *La Jornada*, 3 July 1986; *Excelsior*, 14 July 1986, 26 July 1986).

Thus, once again, the satellites will only extend a very minor portion of the present telecommunications services. For instance, the rural telephone system will not be developed until the Morelos have used up five years of useful life, and then only to a minimal extent.

The second obstacle in the way of the expansion of the telecommunications services to all the regions of the country is that the lack of realistic planning for the country's needs has made the costs of using the satellite so expensive that they are beyond the means of the majority of users. For instance, of the eighteen channels of capacity that Morelos 1 has for transmitting television signals, only three are in use, at a time when the state television services, especially the local radio and television systems, are in urgent need of support. But these institutions cannot use it since to rent a transponder for eight hours a day it is necessary to invest two million pesos which amounts to an average of sixty million pesos per month, plus 200 million on top needed to send the signal up to the satellite (*Excelsior*, 26 April 1986; *El Sol de México*, 29 April 1986). Such a situation keeps the small chains out and noticeably favours the expansion of the large public and private audiovisual consortia.

Similarly, the transmission of data meets strong obstacles, since to transmit information requires the acquisition of equipment costing eight million dollars; by law the invoice has to be endorsed as a draft in favour of the Ministry of Communications and Transport, without consequently being entered into the company's assets. Additional difficulties have cropped up which have contributed to the squandering of the satellite infrastructure, such as the faults that became apparent seven days before the inauguration of the World Soccer Championship during the overheating of an energy plant earmarked for television transmissions of this sporting event (*Punto*, 17 June 1985; *Siempre*, 4 September 1985; *El Financiero*, 30 July 1986).

Finally, one last factor that has contributed to the under-utilization of this infrastructure is the inappropriateness of the users. The federal government through the Ministry of Communications and Transport first decided to build the satellites and then

afterwards thought about what use they could have. Therefore, it was only a few months before the first Morelos was launched into space, that the Ministry registered its far-flung clients with the aim of giving content and sense to this unplanned project.

This improvised reality was confirmed publicly by the Mexican astronaut Rodolfo Neri Vela when he indicated that after completing a list of users

. . . the Ministry of Communications and Transport did not calculate a budget sufficient to meet the needs declared by the various interested organizations and it is certain that it was unable to coordinate related agreements with institutions such as the banks and other ministries which would greatly benefit by the building of earth stations on national territory. So in this way a responsible enterprise cannot commit itself to install ground equipment in an arbitrary way without first having an assurance or guarantee that it is going to have 'users', or better those from whom it will be able to recover at least a part of the amount invested. (*Jueves de Excelsior*, 17 July 1986: 13)

In sum, we can say that the Morelos were acquired without having a more definite user than private commercial television, and that the possibility of continuing to rent transponders from Intelsat whilst the country considered the best option in satellite use was thrown away (*Proceso*, 24 June 1983: 33; *El Universal*, 14 June 1985).

All of these circumstances have brought about the accentuated under-utilization of the Morelos satellites, since after being put into orbit, they only were used at 10 to 15 percent of their capacity. In the midst of the economic austerity that the country is undergoing this shortfall has resulted in a daily waste of US\$ 20,548 which, in the first thirteen months of the project's life came to US\$ 8,116 million, based on the cost of equipment and its average life-span of nine years.

Given this, we must ask where are the monumental benefits for the whole country that in the short term have been claimed insistently for the public by the press, radio and television? Why, in order to be used at full capacity will the satellite have to have nine years of under-utilization, when, in the midst of a financial crisis it is costing Mexican society more than US\$150 million and when many millions of inhabitants of the republic have great communicative needs? Why was no careful and realistic study of uses undertaken before the satellites were bought? Why was the satellite acquired and the users sought subsequently, without

mature consideration of whether the needs could be met by other, less expensive, information transmission networks? If the unutilized capacity of the satellite is both time and investment lost, given its limited life-span, why are the remaining 650 earth stations not urgently being installed, for this would have immediate results, for instance, in meeting the great demand amongst citizens for a universal telephone service, instead of simply throwing away capacity already available in space?

The country's questionable development

During the building of the Morelos Satellite System, the Ministry of Communications and Transport put about the notion that once it was launched, Mexico would be one of the first countries in the world (after India, Indonesia, the USA, Brazil and Canada, amongst others) to benefit from an unprecedented advance in the history of telecommunications. With this innovation the present network of telecommunications could be expanded quantitatively so that telephonic, telegraphic, telematic, telex and television signals could be sent more rapidly to all corners of the Mexican Republic (*El Día Económico*, 22 January 1985: 8).

The Mexican state is counting on the Morelos system to act as a lever for the country's development — to provide support for programmes of education, culture, health, housing, agriculture, industry, fishing, business, energy, transport, meteorology and scientific and technological research; it is supposed to promote rapid growth, to almost unlimitedly expand our potential for growth, generating enormous and beneficial changes for the nation (*Excelsior*, 18 February 1985).

In assessing this novelty, some went so far as to repeatedly emphasize — for both public and private sectors — that the creation of the Morelos System did not only signify the entry of Mexico into the era of telecommunications and the modernization of its informational base, but that it represented a watershed in our history, as with this technology the country was marking a new moment in its evolution. Now it was possible to speak of Mexico before and after Morelos! Now we could stop being an underdeveloped country! Now we could stand on our own feet in outer space! Now we could leave behind us the old inferiority provoked

in us by the crisis! (*El Día*, 18 May 1985; *Excelsior*, 17 June 1985; *El Nacional*, 18 June 1985; *Uno Más Uno*, 19 June 1985).

Despite the diffusion of these official formulae, we believe that to assess such opinions objectively we need to keep the following considerations in mind.

First, before analysing the consequences that the Morelos System is producing for the country's growth, we need to consider that the use of this space infrastructure and of its successor systems, together with the new information technology that is being introduced into the country, are bringing some areas of society closer to the pattern of an information society. That is to say, it is bringing us more closely towards the type of society that employs technologies intensive in microelectronics and not in manpower.

That is to say, Mexican society is speeding up its pace in adapting itself to a new industrial restructuring whose central characteristic is the high degree of automatization in all its internal and external processes. This implies, on the one hand, that the activities effected by means of these new technologies operate more rapidly and efficiently, but at the same time, they displace a large quantity of manpower, thereby raising national unemployment.

Therefore, the acquisition of the Morelos system should not just be seen as an initiative which modernizes the telecommunications infrastructure; rather, in the long term it needs to be understood as a problem of change in the model of the country's industrial economy. For that reason, the decision should not be taken by an isolated group of administrators in the heart of the principal organizations of Mexican society. At what cost, and in terms of what strategy should Mexico absorb the great Third Industrial Revolution being born in the contemporary world? Who is to make this transcendental decision for the future of Mexican society, and to what end?

Therefore, before continuing to take in new production and information technologies in our national space, it is urgent for the Mexican state to design an overall programme of rational incorporation in respect of the population's main social growth requirements and not on the basis of the need to expand by the big national and transnational monopolies operating in the republic. To this end, as a point of departure it is necessary to modify a

traditional criterion for acquiring technology which suggests that the best technology is that which brings most productivity; instead the new criterion should indicate that the best technology is that which creates more jobs, without worsening productivity. For these reasons, the axis of technological acquisition needs to rotate around the generation of work and not the suppression of employment. For the primacy of utility and profitability we should substitute the primacy of creative and expansive work (*Excelsior*, 30 December 1985, 6 January 1986).

We should not forget that the highly industrialized societies have entered a trap, as in order to resist the competition of the national and international market they have needed to improve technology, and to do this continually has required the use of more capital and not of manpower, which, each time, has gone on to produce major unemployment. In this way, work has ceased to be the axis of production and of consumption. With this the economy has been devalued and we have become slaves of technology. Thus, we now need to force ourselves to invert this relation and take command of technology so that it increases employment and does not reduce it (*Excelsior*, 15 January 1986, 22 January 1986).

Such a programme must consider the following questions, among others. Given the present components of Mexican society, in which one of the most abundant elements is manpower, is the model of highly automated major institutions and economic sectors the pattern that is most useful to the project of national development? Why is the Mexican state accepting the modernization of the industrial sector by means of microelectronics and not that of the agricultural sector, when, from being a grain-exporting country we have now changed ourselves into a food-importing country? What creates more employment for the economically active population, the Federal Microwave Network or the Morelos Satellite System? How can we harmonize the vertiginous scientific-technical advance in the highly industrialized zones of the world with the needs for social development in our country without again committing errors made during the national industrialization of the period 1940–80? What are the economic, political and administrative areas of the state and society that must be modernized through the incorporation of high technology and which need to renew themselves by means of the intensive absorption of manpower? How many of the eighteen million employees that Mexican society needs to prepare for the year 2000

will the Morelos satellites generate — or how many will it suppress by introducing high technology? As for the utilization of the four geostationary positions obtained by Mexico from the International Telecommunications Union, is it more useful for them to be used for domestic or direct broadcast satellites or for remote sensing which directly benefits agriculture and the extractive industries which are amongst the most backward areas of the national economy?

Secondly, we think that it is very hazardous to state, a priori, that with the help of such advanced technology the country will attain a new level of development. We need to demystify the widely diffused notion that with the acquisition of greater quantities of sophisticated technology (with lots of hardware) more social growth will result.

We believe that it is essential to take account of the fact that the new information technologies, however sophisticated, do not by themselves promote the progress of any nation, but that it is the social use that each community makes of them which defines whether they promote the growth or the involution of a country.

If by this token one considers that the exploitation and use of the system by various agencies of the state has been anarchic, hasty, conjunctural, improvised, rhetorical and remote from any public discussion, one may consider that the country's real development by means of this space technology is a long way from being achieved.

A very distinctive situation prevails amongst the private television stations, which have maintained a well-defined strategic line with respect to using the satellite. To illustrate the case, one need do no more than recall that Televisa has gained the greatest advantages and a guarantee of using the satellite by providing the government with sufficient financial support to build the network of ground stations. Moreover, Televisa

... will be able to transmit its programmes without the need for intermediaries or formal subordination to the Ministry of Communications and Transport and without geographical or cultural limits that the Mexican state may eventually lay claim to. (Fernández Christlieb, 1985a: 7)

Third, it is necessary to consider that by itself the mere presence of this information technology, will achieve no new level of development for Mexican society. It will be the relations established between different kinds of users, the data that are transmitted and

the ways these are retrieved that will determine whether major development or involuted backwardness among various social groups is promoted.

For instance, we need to recognize that the great cities such as Mexico City, Guadalajara and Monterrey are daily inundated by oceans of information transmitted by the press and electronic media; yet paradoxically, those three cities are where one encounters the major problems of social advance in their most acute form. That is to say, the mere distribution of large quantities of information will by itself not liberate any town, region or state from its historic state of underdevelopment. Moreover, on the contrary, the irrational and abundant diffusion of information can create blocks on consciousness that prevent an objective comprehension of the main problems that choke off development and thus impede social progress. At various times, for instance, by means of the Morelos system we can observe the most sophisticated heart transplant operations taking place, whereas for most Mexicans the main cause of sickness continues to be simple gastro-intestinal illness. Consequently, the kind of information that should come via satellite in this national context ought to be extending knowledge about personal hygiene and nutrition (*Radio UNAM*, 21 June 1985).

Thus, before announcing any victories achieved by means of the Morelos system, we need to ask ourselves whether our problems of growth as a society are due to lack of information or to backwardness in the formation of national consciousness. What collective information do the various zones of the republic need in order to give impetus to their model of development? Was it possible to achieve these informational tasks with traditional infrastructures such as the Federal Microwave Network and the Intelsat satellites, or is the Morelos system quite indispensable? What specific advantages for national growth does the introduction of Morelos bring that could not be dealt with by traditional Mexican information networks? What evidence is there that use of the satellite will favour the decentralization of national life and a more egalitarian society given that 50 percent of all telephone lines and 97 percent of the computer park are geographically concentrated in Mexico City, Guadalajara, Monterrey, etc. (Montoya Martín del Campo, 1985: 97).

Confronted with these circumstances, the state must shake off the demagogic and irresponsible lethargy which it has actually

nurtured in the medium term by the introduction of new information technologies; for it could lose much of the stewardship of the nation which, at present, it retains with many difficulties.

Relative national integration

On various occasions officials of the Ministry of Communications and Transport have proclaimed that the Morelos system constitutes a valuable instrument of national integration for the Mexican state as it will bring the urban and rural populations closer together, relying upon the media to incorporate the marginal zones of the country by means of more advanced systems of communication.

In the same way, the project is conceived of as an instrument of social, political and cultural unification, since by expanding the potentialities of space telecommunications, it will be possible to handle the needs of every entity and organization in a more efficient way, taking account of all the specific demands they make. Thus, by means of communication via satellite, a contribution will be made to overcoming the unequal development that exists between various centres in the republic without concerning oneself with the socio-economic conditions of those at the receiving end (Landeros Ayala and Neri Vela, 1984: 23–24; *Gaceta de la UNAM*, 6 February 1984: 22; *El Heraldo*, 11 February 1985: 5).

On the same lines, the state affirms that given the wide coverage afforded by the satellites, this will help the economic development of the regions most distant from the Valley of Mexico and will thereby avoid migration towards the great centres of production (Sánchez Ruiz and Bruce, 1983: 9).

In relation to the above, we do believe that the satellite could certainly achieve an integrative function by eliminating the natural territorial barriers to communication, on a time-scale and at a cost significantly lower than those required by the routing of roads, railways, the installation of telephone lines, transmission stations and so forth. However, what is forgotten is that the lack of national cohesion is in general a result of matters much more complicated than simple territorial obstacles or the exchange of information. Not least is the need for local autonomy: very often

municipalities have been obliged to coalesce around hegemonic centres with the aim of satisfying their requirements.

In the second place, we think that most of the Mexican community will be able to have access to satellite services only if there is substantial modification of the unequal model operated by the traditional national microwave network: at present it favours the comfortable minorities over the unprivileged majorities. Therefore, it will be necessary to ask oneself up to what point will regions distant from the centre be able to participate directly in the technical, economic and cultural benefits of this project?

This issue is of capital importance, as by incorporating the new space technology into the vertical logic with which traditional information systems have operated, the satellite will not promote national integration but will be 'an underlying element of coercion' (Schmucler, 1983: 57).

Finally, the view that Morelos will help economic development in the remote areas is hardly realistic. That is because in our country there is a great concentration of centres of production, which means that there is a discontinuity within the administrative structures and those regions have few stimuli from the federal government to grow.

For that reason it is difficult to accept that with the mere distribution of information far and wide in the republic the development of the whole population will be achieved. Furthermore, all that could be accepted is the existence of a higher level of circulation of information inside the nation, which does not necessarily imply its socio-economic development.

The transformation of television into the main apparatus of cultural hegemony

From the foregoing one may say that despite what official discourse on the Morelos programme has so far singled out and presented to public opinion as the seductive benefits of acquiring satellite technology, the most important thing is to probe its relation with existing systems of communication and its linkages with the project of national development. Hence, our object of discussion should not be the Morelos system as an independent variable, but rather the transformation of the means of production of national consciousness that will be generated by means of this new cultural instrument.

Therefore, although the Morelos system will expand the various communication services such as telegraphy, telephony, posts, telex, radio and others besides, of especial importance is its impact on the audiovisual media. Television will obtain the most privileged place amongst the cultural spaces presently occupied by the press, cinema and radio in the Mexican Republic.

In this way, this new form of mediation will transform television into the principal hegemonic apparatus in Mexican society. This means that in the next years, the images, values and attitudes that children, young people and adults will form concerning the external debt, the presidency, migrant workers, the Central American conflict, the renewal of municipal powers, ecological damage, official history and so on, will increasingly come from television rather than the press, cinema, radio, schools, political parties, and the church.

This implies that Mexican society will be made more culturally cohesive by the impact of television than by that of any other agency of mass socialization, and that the business of everyday education and the future ideological control of the country increasingly concerns the audiovisual.

The accentuation of Mexican cultural backwardness

With the advent of the Morelos system not only is Mexican civil society being transformed, but a new ideological dimension of the state is being created. To put it more generally: with the creation of satellite technology the whole of Mexican society is undergoing a huge cultural expansion, for citizens and various social groups can extend the scope of their communicative tasks by means of this technology. From this moment on, our society is entering a phase of wide-ranging and unanticipated cultural processes and social consequences, because these communications can reach all cardinal points of the republic. However, given that the Morelos project is not an 'autonomous' or 'neutral' reality, but an innovation employed as the new technical intermediary of cultural relations that obtain in the country, only those groups that have access to, and control over it can participate.

Given these structural determinants, if we consider that satellite technology is also fundamentally transforming the audiovisual medium, we may conclude that what is happening is an expansion of the present model of Mexican television. So, to learn about the

possible future consequences brought about by the combination of television and satellite, we need to project the tendencies already followed by private and official television in Mexico in recent decades. We can infer that if in the past both models have, to varying extents, allowed the progressive cultural denationalization of the country, in the future this tendency will continue apace, for presently there are no signs to the contrary.

In the past, the programming policies of both television sectors have propitiated avaricious consumerism, the melting down of ideological frontiers, the casting into oblivion and devaluing of patriotic symbols, the prioritizing of commercial culture, the contradiction of official school education, the devaluation of Mexican womanhood, the modification of eating habits, an unqualified admiration for a transnational lifestyle, the deformation of the Spanish language, and so on. We believe that unless the state constructs a solid policy in defence of the national culture, the insertion of the Morelos system into the dominant television model will result in an acceleration of the process of cultural backwardness which is already part of Mexican life.

The government's attitude towards the expansion of new technologies

So far as can be judged at the moment (as the information circulating about the Morelos system is superficial and contradictory) the incorporation of this satellite into national space does not correspond to a proposal that has come out of the sectoral development plans of the state, but rather conforms to the need to expand the capacity for information distribution by the most developed private industries and meets the requirements of expanded coverage by commercial television, with an indirect benefit flowing to official stations. History is repeating itself. So it is with the satellite as it was with computing and telecommunications: the process that brings about the introduction of these advanced technologies does not emerge from the government sector but from the expansionary interests of private capital, then, once in place, the state legislates only in order to renegotiate the balance of power.

It is very important to clarify this because it means that the sector that carries the modernizing dynamic — and for that reason

is the economic vanguard of the new technological change that is surging ahead in the nation — is not the state, but the monopolistic and transnational sector of the country.

That is to say, at present, rather than the state accomplishing a vanguard role in considering and executing the technological modernization demanded by the project of national advance, it is discharging the simple duty of regulating private and multinational proposals that derive from other coordinates of power. This reflects the fact that, at present, so far as innovation in communication is concerned, the Mexican government is not a towering creative presence concerned with the development of communication policies and technologies adequate to the project of national advance, but a mere political bureaucracy that invests most of its energies in handling projects designed by the advanced industries in order to continue administering its political apparatus over those domains of civil society that it has already conquered.

For all of these provisional considerations, and others besides, it is most important to produce a package of proposals that in the medium and long term allows us to correct the deviations and deficiencies of the Morelos Satellite System and the other new information technologies that have already developed in our country.

Note

This paper was originally presented at the Fifth Meeting of Latin American Social Communication Faculties in Bogotá, Colombia, 6–10 October 1986.

References

- Crespo, A. (1983) 'Felix Valdés a 20 mujeres: la nueva organización de la SCT ha permitido la integración del sector', *El Día* (27 October).
- Elías Guzman (1984) 'Diálogo de sordos—desaprovecharemos el Satélite Morelos', *Tiempo libre* 249 (15–21 February).
- Fadul, L.M., Fernández, F. and Schmucler, H. (1985) 'Satélites de comunicación en México', *Comunicación y cultura* 13.
- Fernández Christlieb, F. (1984) 'Nuevas tecnologías de información en México', III Encuentro del Consejo Nacional de Enseñanza e Investigación de las Ciencias de la Comunicación (CONEICC). Guadalajara, Jalisco (26 October).

- Fernández Christlieb, F. (1985a) 'Interrogantes sobre el Ilhuicahua: Satélite Mexicano en 1985', mimeo.
- Fernández Christlieb, F. (1985b) '¿Pasajero de carga util?', *La Jornada* (26 November).
- Fernández Christlieb, F. (1986a) 'Comunicación, crisis nacional y regional', IV Encuentro Nacional del Consejo para la Enseñanza e Investigación de las Ciencias de la Comunicación (CONEICC). Universidad Iberoamericana, León Guanajato (19 March).
- Fernández Christlieb, F. (1986b) 'La Democracia en los tiempos de la fibra óptica', *Nexos* 101 (May).
- Jiménez Espriu, J. (1985) Informaciones presentadas al Presidente Miguel de la Madrid durante la ceremonia de inauguración del Centro Espacial Walter C. Buchanan (3 June).
- Kleiman, N. (1984) 'Casi la mitad de las señales del sistema de satélites servirá a redes comerciales de telefonía y televisión', *El Día* (31 December).
- Kleiman, N. (1985) 'Ingresa México a nueva era en la comunicación con el Sistema Morelos', *Novedades* (15 January).
- Landeros Ayala, S. and Neri Vela, R. (1984) 'Sistemas Morelos de satélites', *Teledato: Revista de la Dirección General de Telecomunicaciones* 176(iii).
- López Dávila, J. (1984a) 'El Satélite "Morelos" entregado por el gobierno a Televisa', *Por Esto* 107 (3 May).
- López Dávila, J. (1984b) 'El Pueblo exige respuestas veraces', *Por Esto* 109 (17 May).
- Montoya Martín del Campo, A. (1985) 'Políticas de información del estado Mexicano', Universidad Metropolitana-Xochimilco, mimeo.
- Sánchez Ruiz, M. and Bruce, A. (1983) *Mexico's First Domestic Satellite*. Hughes Aircraft Company (December).
- Schiller, H. (1983) *El Poder informático*. Mexico City: Gilli.
- Schmucler, H. (1983) *Los Satélites en la expansión transnacional: el caso de América Latina*. Mexico: ILET.
- Spriu Jiménez, J. (1986) 'Comunicación mediante satélites', Subsecretario de la Secretaría de Comunicaciones y Transportes, Simposium Evaluación y Perspectivas de la Era Espacial en México, Grupo Interdisciplinario de Actividades Espaciales, GIAE-UNAM (19-22 May).