We are the champions...

... of the World! On July 12, 1998, in the Stade de France, built and fitted out by numerous companies from the group, the French team was crowned football world champions. This was a magnificent accomplishment – achieved for the first time in France’s history – by a team reflecting the ethnic diversity that makes up the French nation.

Several lessons can be drawn from this extraordinary success:
- The team had plenty of international experience, since many of the members play soccer in other countries.
- Specialization, versatility and flexibility were all very much in evidence, as forwards, backs and midfielders shared out responsibility for both scoring and defending.
- The faultless organization was worthy of ISO accreditation.
- The impressive and exemplary solidarity of all the players and their management was certainly the “plus” that saw them to victory against talented opponents.

In whatever part of the globe they work, all our teams can be inspired by this great example. Even though they have to work in different “fields”!
LATITUDE/LONGITUDE
From Fez to Antananarivo, from Perpignan to Reunion Island... snapshots of Colas expertise around the world.

DIRECTIONS
Drivers
- Management, methods, markets...
  What's changing at Colas around the world

Backward glance
- When Colsoft came to Ireland

In depth
- How Colas expertise has taken off at airports

Indicators
- Quarries and gravel pits: 371 sites around the world

ITINERARIES
Working behind the scenes or under the floodlights, these are the men and women who make the Colas Group what it is today.

INTERSECTIONS
- Jean-Antoine Winghart on the European motorway
- 500 group sailors meet the 15th Scrg Challenge

16 - 35
EN ROUTE
Gabon
Adventures in the Gabonese forest
France
The Occitane: a new North-South road link

Iceland
A tunnel beneath the sea
From Fez to Antananarivo, from Perpignan to Reunion Island... visits to job-sites, snapshots of work in progress, reports on finished projects. Colas expertise around the world.

FRANCE

Suburbaine invests in an extractor/collector excavator
In order to satisfy a demand expressed by a customer, Gaz de France, which wanted not only to reduce the disruption caused by work in Paris to local residents, but also to remove the risk of causing damage to pipes and cables, Spac's Suburbaine Saint-Maur office has purchased an extractor/collector excavator. The new machine, mounted on a 26-ton truck, is capable of evacuating water, mud, earth and even loose stones. To improve environmental protection, the dump box of the truck is fitted with filter bags which guarantee that discharged air has a high level of purity (50 mg/m³).

GTR builds a new reservoir to store power plant ash
Jerada is situated a few hundred kilometers from Fez, in northern Morocco. It is there that teams from GTR spent a long winter in the mountains, building a new dam for the mining town's coal-fired power plant. The ash generated from combustion of the coal is evacuated via a waterway to a settling tank. The water that is recovered is reused in a closed circuit to transport more ash. When the first reservoir reached maximum capacity, the Moroccan electricity utility took the decision late last year to construct a new dam and reservoir. The dam is 320 meters long, and the capacity of the reservoir is 450,000 cubic meters. The project, which lasted five months, consisted in 200,000 cubic meters of cut and fill earthworks. In order to filter the ash, crushed and naturally washed wadi gravel had to be used. And to obtain clays with high water content, GTR constructed “pools” which allowed water to penetrate into the material. The newly constructed reservoir is expected to be capable of storing ash until 2005.
Colas Mauritius and its subsidiary AJMC go East

For the past year, Colas Mauritius and its subsidiary, AJMC, have been working on the island’s Third Highway Project. They are constructing a first 17-kilometer stretch of two-lane road, starting from the Rose Hill military base, which, when completed, will provide access to the beaches and resorts in the East of Mauritius. The new road will be joined up by an interchange with the island’s north-south motorway, which serves the airport, the capital, Port Louis, and the northern beaches of Grand Baie. The interchange and the road are under simultaneous construction, but the interchange will be the first part completed, in October.

The contract, worth FRF 130 million, was signed with the Mauritian ministry of public infrastructures, which is working in conjunction with a Luxembourg firm of consulting engineers, present on the site. Colas Mauritius is devoting considerable resources to the project. Preliminary site studies called for specialized topographical equipment, software and specific training.

After the contract was awarded to Colas Mauritius, the teams proposed an alternative, which consisted in replacing “as dug” gravel with pre-cracked cement-treated gravel, which is both better adapted to the traffic conditions and a more economical solution. This alternative also ensures that the subsidiaries maintain a high degree of autonomy, particularly in relation to schedules, because all materials used will be supplied from the group’s own quarries and crushing plants.

The site itself has not been without difficulties, with works carried out under heavy traffic and in an area of heavy rainfall, where the rainy season gives way to the monsoon season!
Colas Benin is improving the Cotonou-Hillacondji road

The Cotonou-Hillacondji coastal road linking Benin to neighboring nation Togo is one of the country’s major road links. From Cotonou, Benin’s economic capital and major port, an annual capacity of 2 million metric tons of freight is carried into the country, through to Togo or on to land-locked Burkina Faso and Mali. As a result, there is particularly dense traffic of heavily-laden trucks.

The contract for refurbishing this 93 kilometer road, which has received funding from the European Community, was adjudicated to Colas Benin in September 1997. The site contract included preparatory work on clearing shrubbery from the roadway shoulders, followed by 40,000 m³ of excavations to provide fill required to carry out the roadway widening. The structure itself comprises a 20 centimeter-thick foundation layer made with a laterite gravel component and a 20 centimeter sub-base, also in laterite gravel, but with an additional 4% cement treatment. In all, some 19,500 metric tons of cement – a monumental total of no fewer than 390,000 fifty-kilogram bags – were shared out and spread before mixing. The entire roadway then received a surface dressing of 90,000 metric tons of asphaltic overlay.

The aggregates that are required to manufacture the asphalt concrete are carried by rail a distance of 125 kilometers to the mixing plants.

More than 250 Benin nationals are employed on the jobsite, which is worth seven billion Central African francs. According to schedule, the road will be handed over in July 1999.
Putting a ring around Budapest

Egútt Rt has been adjudicated a contract, worth 5 billion Hungarian forints, for the construction of the M0 motorway. The project will divert through traffic away from the Hungarian capital, Budapest, and also provide a safer road link between the city and the country’s northern regions. The new road will be required to comply with European standards for international road traffic. The contract signed by Egútt Rt comprises the construction of 3.5 kilometers of roadway on the northern stretch of the M0, between the M3 and main highway number 2 and, in addition, laying 800 meters of the new number 2 road. The project calls for 890,000 m³ of excavations, 25,000 m³ of cement stabilization, the application of 85,000 metric tons of asphalt mix and the construction of nine bridges, four of which are over water, and a maintenance center. Because of unusually clement weather conditions, work on the site was able to progress uninterupted straight through the winter. The site was launched in mid-December 1997, and is scheduled for completion in July 1999.

Sacer Paris Nord-Est builds a bus station for the Paris RATP

The Paris-Champigny office of Sacer Le Bourget has just completed the construction of a bus station at the Paris Metro subway station of Saint Denis University. The work was part of the France '98 World Cup urban improvement program. The Metro stop is the terminus of Paris number 13 Metro line and provides access to the new Saint Denis University campus in the north of the city. The subway station is one up-line from the Porte de Paris-Stade de France station. From the new 11,000 m² bus station, commuters can journey by bus to the neighboring towns. Work, originally scheduled to last nine months, was completed in eight. The office contracted for construction of roadways and sidewalks, sanitary systems, roads and main services and road signs. The site was located on cleared land that was owned by the customer and was performed entirely without traffic, which facilitated the application of materials. As an accredited supplier of the RATP Paris Transport Authority, Sacer has this year also built a parking lot for old buses and carried out improvements on a bus garage.
An experimental project on Reunion Island

In November 1996, GTOI was awarded a contract by Sodiac, a semi-public company in Saint-Denis, capital city of Reunion Island, for work on a construction project comprising an underground parking lot on one level, a first floor with shops and offices, and some 69 apartments on seven stories. Given the demands of a tight deadline – 18 months – and the inaccessibility of the urban site, the Reunion Island subsidiary's engineering and feasibility department worked on a global structural design, proposing a technical solution used in civil engineering structures, and never before used on the island: post-tension prestressed floors.

Unlike reinforced concrete, this process consists in placing cables in the concrete and then placing them under tension by means of jacks after the concrete has been poured. The lost formwork was done with shells and precast preliminary slabs, resting on shoring mounted six meters from the ground. With each floor representing a substantial volume of 400 to 500 m³, twenty hours of continuous pouring were needed. The complex was delivered this summer, in line with the owner's schedule.

Civale's riverside expressway relieves congestion in Perpignan

The highway linking the city of Perpignan and the coastal resort of Canet-en-Roussillon is one of the busiest stretches of roads in southeastern France, especially in the summer. The local highway department decided to build a new four-lane 7 kilometer stretch of road in the form of a riverside expressway on the southern bank of the Têt river. Avoiding the east of Perpignan, the new highway will be a continuation of the new RN 116 (see Routes no. 3) and link up with the coastal zones.

Because of the rate of flow of the river, and in particular the risk of sudden sharp rises in the water level, the embankment road is protected by a layer of rip-rap along the whole surface of the bank. The contract for the entire riverbank protection project was awarded to earthworks company Civale, a subsidiary of Colas Midi-Méditerranée specialized in building protections against rivers and seas.

Most of the rip-rap needed for the operation was furnished by the Sainte-Colombe quarry, located near Thuir, where Civale extracts the materials required to supply Roussillon Agrégats, another subsidiary of Colas Midi-Méditerranée.

When works were completed, in mid-July, Civale's teams had produced 250,000 metric tons of quarry graded rip-rap and applied 120,000 m² of geotextile with high tensile strength and shear failure resistance for the protection of the slopes, along with 50,000 metric tons of filters. The site was completed two months ahead of the original schedule, enabling road building companies, including the Thuir work center, to launch the next phase during the summer.
1,400 students begin classes at Antananarivo's new high school

In May 1997, Colas Madagascar was awarded the entire contract for building a new French high school in Antananarivo, a contract worth 54 million French francs, totally financed by the French government. The school previously rented a building that its landlord, the Malagasy episcopate, itself wished to occupy, and so was obliged to move into new premises in time for the start of the new school year, in September 1998.

The foundation stone was laid at a ceremony attended by the Malagasy Prime Minister and the French Ambassador. The ceremony took account of many ancestral rites, and was conducted by a “mpanandro”, a kind of star-gazing sorcerer. The program included sacrificing a zebu, sprinkling a mixture of rum and honey, planting holy trees and sealing precious stones. Although the school's more civilized parents objected to such barbaric practices, the site was regarded by local laborers to have gotten off to an auspicious start. There were 15 months to construct 15,000 m² of buildings and several hectares of outdoor installations. The Colas Madagascar engineering office, with the backing of the technical department, and the Indian Ocean feasibility-quality department brought in powerful computerized tools to assist in the calculation of the structures and the production of some 300 construction drawings.

When the interior works began to be integrated into the works schedule, the site became a hive of activity. At the height, there were more than one thousand workers on site seven days a week, with seven concrete plants and four tower cranes, manufacturing and pouring 13,000 m³ of concrete.

In September 1998, the school was handed over on schedule, and the 1,400 students began their classes in their new school, in a leafy setting and with a range of top-level facilities, including sports fields, gym, swimming pool and resource center.
Screg Sud-Est extends the Lyon subway

In the context of the Lyon subway B-line extension – a distance of 2.9 kilometers from Jean-Macé square to the Gerland stadium – a group headed by Screg Sud-Est and including CLGB (Colas Rhône-Alpes) is refurbishing the surface of the Avenue Jean Jaurès for an amount of FRF 15 million. The site work, which is highly complex because this major road provides access to the Gerland stadium, is being performed under traffic. In June, when the France 98 soccer World Cup was at its height, Screg Sud-Est teams, for reasons of safety, had to surface the section and then continue working under the surface. As a result of pedestrians, vehicles, workers and machines, safety problems were ever-present on the site, justifying the high expenditure on signs, which accounted for no less than 30% of the submission, scarcely less than the asphalt budget.

The project, which is organized in several phases, calls for the application of 2,900 metric tons of road base asphalt, 3,900 metric tons of base course asphalt concrete and 11,200 m² of low-noise asphalt concrete.

Begun in April 1997, the site is scheduled for hand-over at the end of 1999 and traffic is due to start up in December 2000.
Colas + has a smashing time refurbishing the surface of the A 1
As part of the program to refurbish Switzerland’s A 1 motorway, one of the country’s principal highways, which links the capital city, Bern, with Zurich, Colas +, a subsidiary of Colas Suisse, is preparing the terrain by demolishing the old concrete slabs, now more than thirty years old. When the concrete crusher slams down into the roadway, the noise it makes is nothing less than terrific. With each impact it feels as if a minor earthquake is produced and the concrete-paved motorway has begun to look more like a plowed field. At intervals of 25 centimeters, the heavy, seven-ton blade falls powerfully from a height of 3 meters onto the 20- to 25-centimeter thick slabs. In the vicinity of bridges and conduits, the “guillotine” is not permitted to strike the ground full force and the shock waves it generates are subject to continual monitoring with a seismograph to ensure there is no damage to structural work. The crushed concrete is then loaded onto carriers and transported for reprocessing.

Before the road surface is reconstructed, and in order to preserve the cutting base, Splttimastic asphaltic overlay is applied.

Colas combats the effects of pollution on the A 22
Colas Nord-Picardie has carried out the relocation of the Roncq exit ramp of the A 22 motorway, east of Tourcoing and opposite the Auchan supermarket shopping mall. The Auchan group, under the terms of an agreement with the city of Roncq, which is the site’s contracting authority, has funded the project for an amount of approximately FRF 10 million. The French authorities have seized the opportunity presented by the nature of the operation to combat the effects of past industrial pollution. Part of the motorway was in fact constructed over fill furnished by chemicals plants. Jobsite work involved sorting and removing the polluted rubble (an estimated quantity of 7,000 m³) from the existing roadway and containing it within 10,000 m² of Coletanche NTP laid along the side of the motorway. The remaining, non-polluted rubble, estimated at 18,000 m³, was reutilized as in-fill on the ramp under construction. Auchan has extended its parking lot over the area vacated by the dismantled motorway lane. The work was carried out during the summer and was completed by top-soil renewal and grass seeding.
More than meets the eye
A 12-kilometer stretch of SR 219, south of Johnstown in southwestern Pennsylvania (SWPA), was in dire need of repair when IA’s SWPA Regional Office began repairing and overlaying it in April. Scheduled for completion by October 31, 1999, it is IA’s second Superpave project in SWPA. The state authorities are among the many in the US promoting Superpave to lengthen the life cycles of their bituminous pavements. Says SWPA Regional Manager Frank Piedimonte: “The SR 219 Project isn’t exactly glamorous. But numerous routine jobs are crucial to the longevity of a road.” True. Although the jobsite is small in area, IA SWPA has a wide-ranging scope. The company is patching the existing concrete roadway, modifying bridges, upgrading guide rails, replacing advisory signs, repairing drainage structures, relining four box culverts, and placing a 75 mm Superpave overlay. Individually, such jobs seem minor. Taken as a whole, they add up to safe, smooth roads. The project calls for the installation of a weather station. Sensors in the roadway feed data to a central computer for analysis. The state Department of Transportation uses it to assess the status of the roadway and take early action.

Somaros installs 250 km of safety barriers on the A 39
The Rhin-Rhône-Alpes office of Somaro has completed the installation of 250 km of safety barriers on the A 39, for Scetauroute, contracting authority for the project. In the space of three and a half months, Somaro teams worked around the clock on a 75-kilometer stretch of the motorway, which crosses three French Departments, Jura, Saône-et-Loire and Ain.

Following a two-week preparatory phase, which included staking out, preparation of storage areas and Europe-wide negotiations for the supply of the barriers themselves, 45 men from Somaro began work on January 26. The work was completed on May 20, and the stretch was opened to traffic on June 2.
The Normandy motorway adds two lanes

France’s A13 motorway, running between Normandy and Paris, carries 37,000 vehicles a day in both directions throughout the year, of which almost 12% consists of heavy trucks. To help cope with such dense traffic, it was decided to widen a twelve kilometer section between Criquêbeuf and Chauffour, just south of Rouen, from 2 x 2 lanes to 2 x 3 lanes. The contract was awarded to Devaux Haute-Normandie, a subsidiary of Colas Ile-de-France-Normandie. The widening will be carried out by reducing the width of the median from 12 meters to 5 meters.

A number of preparatory phases were called for before the project proper got under way, including temporary emergency lay-bys every 500 meters, upgrading both the feed-on lane in the direction of Paris and the Gaillon interchange, and setting up all the temporary signs and signals and the concrete barriers. The main works, launched in May and scheduled to last six months, include the excavation of the median, drainage and application of the sub-base and the various other layers.
Adventures in the Gabonese forest

Building a 190-kilometer road linking Lastourville to Franceville required more than three years of construction work on a tight schedule, often performed at a fast pace, despite tough weather conditions and provisioning difficulties. The saga of the Group's biggest jobsite.
"Yes, it is a tough jobsite," agrees site manager Marc Vincotte, "but then it is also a comprehensive contract, covering everything from project design down to sign installation and road markings. It's a three-year contract if you take into account the extensions for work carried out in the towns the road crosses. You need organization here more than you need technical feats." After twenty years in the business, he should know. Marc Vincotte has expert knowledge of major jobsites in Central Africa.

To better understand the nature of the difficulties he deals with on a daily basis, let us step back in time a year.

Due to problems of red tape entirely beyond the company's control, work that should have initially got under way at the start of the dry season, in June, kicked off three months late in September, the beginning of the rainy season. In this small country, situated right on the equator, one dry season occurs at the start of the northern hemisphere summer and the other in January and February. So as to catch up on lost time and not tie up plant and manpower, construction managers made the decision to launch the work on several stretches of roadway simultaneously.

**SURVEYING THE JOB**

The site is jointly financed by the African Development Bank and the Gabon government, with Gabon's ministry of equipment and construction as the contracting authority. It is divided into two lots, Franceville-La Leyou and La Leyou-Lastourville. The two parts of the site are different technically. Franceville-La Leyou is a refurbishment contract, while La Leyou-Lastourville is for laying a new roadway including excavations, foundations, sub-base and asphalt concrete surfacing.
Marc Vinçotte heads lot 1, scheduled to finish in October 1999. "For this lot, there are two types of work being carried out, depending on whether it is possible to retain the existing structure or not," he explains. "Whenever possible, we widen and make a number of modifications to the line of the road, then re-profile and reinforce it with a layer of road base asphalt, the thickness of which varies depending on the deflection, and then cover it with black-top. For the second type of work, if the quality of the existing road structure is insufficient, we totally reconstitute a foundation layer in laterite gravel, followed by a base layer in road base asphalt. The entire structure is then black-topped."

RE-WORKING A DISUSED QUARRY

A few kilometers from base camp, at almost the half-way point between the two lots, engineers successfully uncovered a disused sandstone quarry with a workface that had already been opened some years previously. This provided an extraordinary opportunity as quarrying could begin immediately, as soon as the access roads were resurfaced to improve conditions for the trucks. From the top of the quarry the view is impressive as over time blasting has modified the course of a nearby brook, which now falls down in a cascade from the heights of the quarry face. "Apart from the beauty of it all, the waterfall is really a blessing," emphasizes Pierre Cerantola, who is in charge of the crushing plants. "Because we are quarrying wet matter, we lose far less fines for the asphalt mix."

A weekly dynamite blast provides average monthly production of 35,000 tons of materials. Downstream from the quarry face, the crushing plant produces the aggregates needed to manufacture road base asphalt, asphalt concrete and cement-bound concrete.

On site, an asphalt plant turns out mix for the central section of the site. "Because the plant is located at a distance in the rain forest, we have an asphalt storage capacity that is close on 400 tons. This buffer is calculated to keep us going for around ten days in case there is a breakdown in supplies," explains Daniel Gauveau, who runs the plant. He, too, is a specialist in isolated job sites.

A little further on are the workshops for making prefabricated concrete units and steel reinforcements. These are required because for the first time in Gabon, Colas is building three bridges, one of them using micro-piles. This has been made possible through the expertise of Jean-Louis Borde, who has come to Gabon from the Indian Ocean. Also a drainage and industrial building specialist, he has reservations. "We have three months in which to
How to get 263 site vehicles and machines into the heart of the forest

Before starting up a jobsite in the middle of a tropical rainforest, it is best to take stock of the situation and organize properly. Everything must be accurately calculated, orders must be placed and equipment brought to the site beforehand. The slightest shortage can ruin the working schedule. Given the state of the actual track between Franceville and Libreville, heavy transport is difficult, and everything must be shipped in by rail from Libreville to Moanda rail station. “When all the equipment is in place, there will be 263 pool numbers allocated on the Franceville-Libreville site,” explains Gilbert Breuil, equipment manager for Colas in Gabon. Some of the equipment was already in Gabon. We had to put an entire set of logistics in place to get everything to the site.” Trucks from Benin came by road as far as Abidjan, the capital of the Ivory Coast. From there, along with a mobile crushing plant and motor-scrappers, they were shipped by barge to Colas’ own landing site at Libreville, a voyage that takes two weeks. Some of the new plant—graders and compactors—came from Brazil or the United States via France. The mobile mixing plant came from Scrog Ouest. It took three weeks to come from Le Havre, in France, by sea. From Libreville onwards, all of the equipment was shipped by rail, sometimes on special rolling stock, as far as Moanda. This was also the case for all the supplies, such as parts, cement, reinforcing bars, etc. Steel was shipped in from Spain, cement from Gabon and Cameroon, and so on. During the summer, a second mobile mixing plant along with machinery for road-laying, compacting and transporting were transferred to the site for the second installment of lot 1, then for the second installment of lot 2. The plant already installed in Mounana was used for work on the central stretch of both lots.

complete the foundations of the bridges before the rainy season is upon us. We will make it somehow, but it is certainly not a foregone conclusion,” he maintains. “In the normal course of events, we should also complete the first two bridges by the end of the year.”

Back to the road. “Last year we concentrated all our strength on lot 1,” remarks Vinçotte. “This meant that we achieved progress in the order of 60% after eleven months of site work.” This is not true of lot 2, however, which is only 25% complete.

BUILDING THE ROAD

On the second stretch of road, supervised by site engineer Francis Grass, problems are of a different order. “The first forty kilometers require a major excavation phase which is only possible to complete in the dry season,” he explains. This year, early in June, men and plant were deployed on the first few kilometers. Even so, progress in this rainy equatorial climate was erratic. For several days rain fell intermittently, with a degree of humidity of around 95%. This means that the water content of cut and fill materials does not fall rapidly with their levels close to saturation, making it difficult to work with excavators.

To keep work moving along at a reasonable pace, a team made up of a site foreman, a bulldozer driver and a team of chain-saw operators move in ahead of the site. They cover 4,000 m² to 7,000 m² a day of deforestation along the edges of the old road, in order to widen it and open up the intersections for the secondary...
roads. All of this is barring problems of varying sorts and assuming that the zone to be deforested is not currently occupied! Although the Gabon government legally owns the land adjacent to the road, in practice the Gabonese frequently take up residence there. "They have a legal right to do so," explains Francis, "and, in fact, if they have to `clear off' the government awards them compensation based on a scale specifying levels of the `clearing off indemnity'. Obviously these sums are much sought after, and cabins and plantations spring up rapidly along the project roads. We advance the compensation to the people under the terms of the contract, but the time lost in protracted negotiations with the locals is unfortunately not reimbursed."

As soon as the weather permits, the coming and going of the scrapers and compactors begins, preparing the new profile for the road. The roadway structure of lot 2 consists of a 30 cm laterite gravel foundation course, a layer of road-base asphalt and black-top surfacing. On certain sections the depth of the foundation layer has had to be increased because the natural terrain is not sufficiently load-bearing. Included in the contract is the construction of the road's drainage network.

Quite apart from the problems of climate, the excavation phase is not a simple one, some slopes which have been excavated with the grader attaining eighteen meters in height. "We couldn't afford to fall behind schedule," explains Francis Grass. "Excavation is what determines the execution of other work, as we move up through the kilometers. The time spent would affect our rate of progress."

On top of this, work has to be adapted to cope with the trucks that drive along the track. In certain areas, excavation and water-logged soil has made the going difficult, and site workers are sometimes called in to help pull out trucks that have got bogged down. "There are no possible diversions through the forest here," points out Grass, "and we can't let the track get cut off for hours on end.

**A ROAD WITH HIGH SOCIO-ECONOMIC IMPACT**

Currently traffic on this stretch of road, which forms part of the Libreville-Franceville link, is estimated at one hundred, usually overloaded, trucks per day in both directions. This figure may appear derisory by the...
What's laterite?

There are several definitions of laterite, the simplest of which reads: "soil whose color ranges from yellow to red, occasionally black, formed by the disintegration through leaching in tropical climates of a parent rock and constituted by a mix of natural gravel and a silty clayish matrix."

This core material for African construction varies from one place to another, in terms of both composition and properties, making general tests of aggregate quality difficult. Given the size of African job sites and what is at stake, Scrig's RTE laboratory is currently engaging in research into treatments based on either hydraulic binders (cement and assimilated) or hydrocarbons (bitumen and emulsions). To obtain results that are as representative as possible, seven samples are being studied taken from Benin, Gabon, Ivory Coast and Niger. The lab will continue to produce findings until the second half of 1999.

In common with many Africans, the Gabonese are often on the move. When the local labor pool is not well enough qualified to satisfy the requirements of the site or when specific skills are required, labor can be brought in from other areas, in particular central and western Africa.

RECRUITING LOCAL MANPOWER

Gabon's wealth comes from its oil resources. It has a comparatively small population and the Gabonese do not always possess the necessary skills. Trying to put together teams from the men living in the villages the road goes through usually entails distributing the work fairly between the various families, not always an easy task. However, selecting and recruiting manpower in the field is in the very nature of every jobsite that starts up, and this one is no exception as it will be carried out with 65% local labor. Explains Marc Vinçotte: "We receive numerous job applications, but Francis and I try to see everyone. We try out equipment operators, truck drivers and surveyors and then hire them on a trial basis. This
takes time but it also ensures that we only hire on the basis of skills and aptitude.”

BACK TO BASE

It is now half-past six in the evening in Mounana, the Colas headquarters located in the middle of the jobsite. A red tropical sun has just set behind the buildings.

Having spent the day driving from one end of the road to the other, Marc Vinçotte sits down at his desk and swaps his radio transmitter for a telephone. The day is over and the men are starting to leave work. Each of them gives a brief report of their day, mentioning any problems they foresee. Then the next day’s tasks, and the equipment, are allocated.

Then comes the only break in the working day, when it is time for a local Castel beer “sundowner,” but also the only moment at which the men get to see each other. They work on stretches often spaced dozens of kilometers apart and communication is often difficult between team-members on this enormous site in the depths of the equatorial rainforest. It is a magnificent challenge for all the men present. Despite often difficult working conditions, they all believe that they are fortunate in having pleasant living conditions, a far cry from the isolated life-support bases of some job sites. “Here,” says one, “we can live a normal life.”

A few years ago, the discovery of a seam of uranium led the Cominco, a subsidiary of the French nuclear operator, Cogema, to build an entire town for its managerial staff. Production having come to an end, Colas managers and their families have taken over the housing for the length of the jobsite, and are able to make use of the sporting facilities. Whenever they have the time, that is, as in this part of Africa, the weekend is restricted to Sundays and involves an obligatory game of pétanque at cocktail time! And if they feel like some high life, the town of Mbaikina, a few kilometers from the executive compound, boasts quite a number of restaurants and even the occasional night-club!

PORTRAIT

Joachim Lima, quality engineer at Colas Gabon

One of the first crop of graduates to emerge from the Libreville engineering school, Joachim Lima was the first Gabonese engineer to join Colas back in 1978, when most of his fellow graduates chose to move into public service or the semi-public sector. Joachim, who is responsible for quality, has always divided his time between the laboratory and the field. On the Franceville-Lastouville site, he is once again managing the interface between site managers, application teams, the laboratory, and the Canadian-Romanian quality consultant, SNC Lavalin. “Size really does matter!” says Joachim. “A jobsite as big as this one calls for a lot of care, organization and rigor.” Blessed with a dead-pan delivery, Joachim Lima possesses all the qualities of a diplomat! He’s also a born teacher, who enjoys “explaining what’s right, what’s wrong... and handing out punishment if that’s what’s needed!” He likes to be out and about, operating independently, and admits to finding it hard to remain seated for more than a few hours: “I’m no bureaucrat!” He would certainly love to be able to spend more time with his wife and five children. But when you choose a career in road building, packing your suitcase and heading off wherever the next road takes you is all part of the job!
The Occitane: a new north-south road link

After 20 years of construction, the final stretches of the A 20 Occitane motorway between Vierzon and Brive are set for hand-over at year end, and the road opened to traffic in spring 1999. This 290-km, toll-free link forms part of the plan to network France and hook up the isolated area to the west of the Massif Central mountain range. Several subsidiaries have taken part in this example of synergy, Colas-style.
Back in March 1988, the decision to upgrade the RN 20 highway to ensure a continuous road link between motorway systems was approved. The aim was to create a new European scale north-south road link that would join up London or Brussels to Barcelona via the A 10, A 20 and A 62 motorways successively.

Over a 300 km stretch between Vierzon and Brive, the Occitane is a toll-free, State-run motorway that crosses five French Departments: Cher, Indre, Creuse, Haute-Vienne and Corrèze. Beyond Brive, going on to Montauban, it will be managed by the motorway operator, ASF.

Refurbishment of the existing road link actually began back in 1978, as part of the French motorway network development program. The March 1988 decision simply speeded up the upgrading process.

The A 20, which has been re-sited in some areas and improved in others, is a project that has progressed in fits and starts, as it has moved from one Department to another. The rate of progress was constantly affected by political decisions and economic, financial and environmental constraints – some choices seem to have been made for reasons that remain obscure – but the fact remains that, after twenty years, the end is finally in sight!

**TWENTY YEARS IS A LONG, LONG TIME**

"We have had part of our teams working on the motorway for the last 20 years," says Jean-Pierre Jacquet, manager of the Touraine Berry Colas Centre-Ouest work center. "Early on, the improvements were not particularly spectacular, mainly trunk road widening and creation of passing lanes. We felt that things really started to speed up in 1992. Since then, over 75 km of motorway have emerged."

Both the teams and their leader are used to major sites. "In 1995 we also won the Châteauroux Déols airport runway extension contract," notes Jean-Pierre Jacquet, "so our teams were well trained in large-scale site..."
work.” All the work was handled directly by the Châteauroux work center, which only requested reinforcements from the subsidiary in the shape of a single engineer, plus a high-capacity mixing plant and some specialist equipment! “The only real technical difficulties we encountered had to do with traffic switching,” recalls Châteauroux work center site manager Christian Bordier, who has worked on the A 20 for the last ten years. “We worked straight shifts and started normal traffic up again every evening at around 5 p.m.”

COUNTING ON SYNERGY

In 1996, for the construction of the Châteauroux bypass, group synergy played a crucial role. Miro (Colas Sud-Ouest) was in charge of excavation work, then later turned the site over to handed over later to teams from the Châteauroux work center, who laid the drainage and emergency call network as well as the roadway. It was then the turn of Somaro to install the metal and concrete safety barriers.

A few kilometers further down the road, between Châteauroux and Tendu, the same process was repeated over a 16 kilometer stretch but with a few additional players.

Since last winter, Colas Sud-Ouest teams have been building 22 km of roadway, three interchanges and a rest area between Brive and Montauban.

Segec, a subsidiary of Spac, carried out the engineering structure work, SES installed the road signs, Somaro subsidiary BRS the noise walls, and laboratory work was performed by LTR. To complete the Colas family atmosphere, the Châteauroux work center was also responsible for building a rest area and service station on the same stretch. A Shell service station of course! All in the family!

Currently, a few of the center’s teams are still working on the two final stretches which should be ready for hand-over by the end of the year, the Celon bypass and the southern Departmental link-up (Clidier-l’Aumone).

ACROSS THREE DEPARTMENTS — CHER, INDRE AND CORRÈZE

Once across the border of the Indre Department, the landscape is different, but the group contracting companies stay on the job. Within the space of a few dozen kilometers, a driver on the A20 will have seen the landscape change from the cereal crops of the Cher and Indre and to the foothills of the Massif Central range, with smaller farms, mainly raising livestock. Once in the Limousin region, the A20 crosses two Departments, Haute-Vienne and Corrèze,
from north to south. On this stretch of motorway, also State-operated and toll-free, work is being carried out for the regional highways department. Since 1991, the Limoges office of Sreg Ouest has performed a number of contracts either alone or in partnership, for stretches varying between ten and twenty kilometers annually. Some of the sections were new constructions, others simply consisted of improvements.

From 1993 to 1994, for a section north of Limoges, Sreg Ouest was principal contractor for an 18 kilometer stretch between Bessines and Raze. The Limoges office and Sreg Grands Travaux shared responsibility for the roadway construction and drainage system, working with Sreg Est for the extruded concretes. Somaro installed the safety barriers.

Two years later, and several kilometers further down the road to the south in Corrèze, the same organization carried out the Uzerche bypass, a stretch of some 20 kilometers.

"There now only remain two stretches of road to be upgraded to motorway standards," declares Limoges office head Philippe Durand. "This will be carried out in 1999, and then the Occitane motorway will run through the entire Limousin region."

BEYOND CORRÈZE, THE A20 WILL BE OPERATED BY ASF

Continuing along the road from the Department of Corrèze towards the Department of Lot, the A20 keeps the same group contractors but takes on a different form, as it now forms part of the ASF (Autoroutes du Sud de la France) concession. Having enjoyed 290 toll-free kilometers, drivers now go through the toll-booths operated by ASF, which at this point take over the Occitane concession.

Work between Brive and Montauban began in July 1995, and since last winter, Colas Sud-Ouest teams have been building 22.1
kilometers of roadway, three interchanges and a rest area. Hand-over is scheduled for October, 1998. Working alongside the road construction subsidiary, in charge of drainage and road works, BRS and its subsidiary, Saba, are carrying out the extruded concrete, and Somaro the safety barriers and road signs.

The only real technical difficulties that were encountered on the A20 had to do with traffic switching.

**TOWARDS 30,000 VEHICLES DAILY**

Whether or not the motorway is operated as a concession, it retains identical technical characteristics. On the non-conceded part of the A20, however, there are a greater number of interchanges, which provide neighboring villages with access at intervals of seven kilo-

---

**PORTRAIT**

**Site manager Lucien Lissonnet has spent ten years on the A 20**

Soon after completing training as a machine tool fitter, Lucien Lissonnet decided that sitting behind a machine on a work bench from morning to evening was decidedly not for him. He got a license to drive trucks and then “hit the road” for a few years. Still not happy with his lifestyle, Lucien decided to try road building for a career and joined the Châteauroux center, where for the last 25 years he has been on the road again, so to speak. Starting as a truck driver, he progressed to foreman and then site manager and has spent the entire last ten years on the A20. Compared with normal roads and main services work, a major highway construction site is a different universe. “I have worked the Department from north to south, he says, “and during that time I have learned drainage work, minor excavation, application of the various layers of roadway and even road sign installation.”

Working on the A20, Lucien also found communication with the other group subsidiaries much easier. “We understand each other better and we know the details of how each other’s businesses move into the area and they are going to provide jobs here for our children.”
meters, on average. "There are four junctions in the Châteauroux area alone," notes Jean-Pierre Jacquet.

The highway has not needed any specialty surface treatments, except for some of the older parts of the road, where cracking has been treated with Bituflex and Rulflex in order to cope with the heavier load when the road is fully open to traffic.

Even though this is not yet the case, traffic has increased greatly since half of the motorway was completed, rising from 8,000 to 15,000 vehicles per day, with peaks of nearly 20,000. With the construction of a Shell service station, transport ministry traffic projections forecast around 30,000 vehicles per day, 20% of them heavy trucks — a figure that is sure to increase, as the road offers savings in terms of both distance and money. The A20 still has "a long way to go," so resources have not been spared to reach the target.

OPENING UP THE SURROUNDING COUNTRYSIDE

Those in charge of the project at the Highways Department wished to optimize the integration of the Occitane into the country-side of the regions the road runs through, opening it up to travelers and providing opportunities for economic growth.

To this end, a "19% countryside development budget" was set up, which for the first time brought in the notion of so-called "villages étapes," or stopover villages. Currently, five villages along the Occitane motorway bear the tag. The idea is to invite drivers to leave the motorway to use a range of services available in neighboring villages, such as hotels, restaurants and service stations. The concept, which was inaugurated on the A20 and piloted since summer 1995, will now be extended to all non-conceded motorways in France.

An additional note: the avenues of trees bordering the road prior to up-grading will be replanted.

BOOSTING THE REGIONAL ECONOMY

Another consequence of the new infrastructure is that new centers of economic activity will spring up. A town like Châteauroux is located halfway between France's northern and southern neighbors. Logistics hubs for the transportation industry may locate there — staging posts for the wagon-trains of the 21st century. Such zones could also provide service station and repair facilities for trucks, along with hotel and restaurant facilities for drivers.

The final stretch of the north-south European link, between Toulouse and Barcelona, is scheduled to be handed over in 2001. But even before then, maintenance has already started on the older sections, handed over some ten years ago. In this context, the Châteauroux work center has been awarded a three-year highway maintenance contract by the Department.

In addition, there are still several years' work ahead to link up all the major towns in the Department with the non-conceded stretch.
Colas Iceland lays asphalt under the sea...

To open up the northern part of Iceland, and to ease the flow of trucks loaded with fish, Colas Iceland teams are taking part in the construction of a tunnel beneath a fjord, which will halve the journey time between the capital city, Reykjavik, and Akranes, a port and transit center. This country on the edge of the Arctic Circle has very specific means and methods. Work keeps pace with the rhythm of the seasons...
Reykjavik, June 1998, 6° C in the sun, and a bright blue sky. Sigurdur Sigurðsson, General Manager of Malbikunarstöðin Hladaer-Colas, has visited the enormous site that his company is working on every morning for the last few months. Today, he is clearly delighted that the weather is so mild. "In our country, the road building season is at its height between May and October. The rest of the time, we carry out minor maintenance jobs. But for the past three months, weather conditions have been favorable."

This year, Malbikunarstöðin Hladaer, which became a subsidiary of Colas Danmark ten years ago, began work in the middle of March. Sigurðsson rubs his hands with glee: "That means we’re almost two months ahead!" Last year, too, conditions were far better than expected. The company’s teams were able to go on laying asphalt until late December, when most years the first snows come in October. In Iceland, air brought by the Gulf Stream makes for a reduced range of temperature, with summer temperature 5° to 15° C and average winter temperature around 0° C.

In this European country of 103,000 square kilometers (the equivalent of one fifth the size of France), journeys from one town to another are often long. The entire network consists of 8,200 kilometers of roads, including only 1,500 km of two-lane highways running right round the country, but barely one third of the network is surfaced. The coasts of the island, like those of its Swedish and Norwegian neighbors, are heavily indented with fjords, requiring many bypasses and considerably multiplying the distances covered on the roads.

Although the traffic outside the capital is not very dense (150 km from Reykjavik the traffic is below 1,000 cars per day), this key factor led to the decision to dig a tunnel beneath one of the fjords, so shortening the distance between the Icelandic capital, Reykjavik, where 50% of the population live, and Akranes, a port and transit center, from 108 km to 48 km. Akranes is on the long road to Borgarhals, a trading zone serving northwest Iceland.

THE LARGEST SITE OF THE DECADE

The project had been under consideration for several years, chiefly because of complex topography, but it finally saw the light of day, and the tunnel was opened to the public on July 11.

The group’s Icelandic subsidiary is a sub-
contractor of a consortium made up of three companies, one of them Danish (E. Phil & Son), one Swedish (Skanska) and the third Icelandic (Istak). It won tenders for a total sum of FRF 25 million for laying asphalt in the tunnel and on the linking roads. The southern part of the tunnel consists of two lanes, but it widens to three lanes in the northern section, where the gradient is more marked.

The tunnel construction site is the country's largest road project of the decade. The general manager is, of course, delighted to have the opportunity to sell his expertise and his products, and to swell his annual revenues. But the men find the project particularly satisfying, too. "In general, we work on job sites spread over the whole country's road network, but on this job we see each other every day at our rallying point, and we can follow the progress being made day after day," says Dadi Hreidarson, one of the site foremen, the spokesman for his team. "It's really something new for us."

**PORTRAIT**

**Sigurdur B. Bjornsson, head of mobile mixing plant, hunter and fisherman**

When he was still at school, Sigurdur always intended to have a career in geology, but in the end, things turned out differently. After spending a number of years working in a Norwegian pipe-laying company, he joined the Icelandic subsidiary to run the Colas Iceland bitumen depot.

Two years ago, he took charge of the mobile mixing plant. Although his job is fairly far removed from the profession of geologist, there are perhaps some similarities, especially when you have to produce the correct mixtures of aggregates. With his faithful dog – always aware of his master's slightest changes of mood – by his side, Sigurdur stays at the helm of his machine each time it is moved. The road and tunnel site has been a godsend. "What makes me happy is seeing the plant operating," he says. "Last year, we produced 25,000 metric tons, and this year, we should reach 40,000 tons. Everything's perfect!"

The first time he has been in sole control of a site, he is proud of his responsibility, as he is proud to work for a small national entity that is part of a major international group. "I am independent and free to do as I see fit, but at the same time I am a member of a team where each element is important."

But Sigurdur doesn't only get his kicks when he's at the controls of his machine. An inveterate hunter and fisherman, he uses his free time to travel around the world, seeking out new territories where he can find different prey to hunt down.
After spending several summers working for the company as a student, Gudmundur joined Malbikunarstöðin Hládaðar full time. He has been working with asphalt for 20 years, including 10 years for Hládaðar before it became part of Colas. Today, he is one of the key men of the tunnel and road project, as site foreman in charge of asphalt. Now he leads a handful of young workers himself, he knows just how important his role of teacher and trainer is.

"In the summer, we give of our best on the sites. We really fulfill ourselves. In the winter, it’s different. We have to adapt to the weather conditions..." When the first snows arrive, Gudmundur turns his mind to other passions. A lover of his country’s massive and magical landscapes, he abandons his hot mix asphalt and road construction and replaces them with ice and trails (when they exist!). In the company of a few friends, he sets out across the glaciers in a 4x4, touring the country’s largest volcanoes. "Every winter we discover new horizons, it’s wonderful!"

There’s no point asking him whether he loves his country when you see his face light up as he looks at the photographs of his last vacation. In the middle of one of them, you see a hut hunched under a thick layer of ice. "When you sleep in a hut like that, miles from anywhere, you can recharge your batteries for months!"

> imported, because there are no refineries in Iceland. 6,000 metric tons were shipped in, from Scotland and Sweden.

For equipment, the second phase, the subsidiary differentiated itself from its competitors. Thanks to the mobile mixing plant that it acquired in 1995, with a capacity of 100 metric tons/hour, Colas Iceland has been able to simultaneously supply the asphalt needed for the access roads to the tunnel and also for the tunnel itself, from a fixed mixing plant in Reykjavik and a mobile plant at the site. Such strike force meant that it was possible to replace the bitumen foam specified in the bid by a 10 centimeter layer of asphalt.

**SUMMER REINFORCEMENTS**

The third chapter is manpower. Once again, in Iceland, they have a way of doing things that is different from elsewhere. Because of the long winter season, permanent employees are kept to a strict minimum. But as soon as the sun returns – throughout the day and most of the night – young students are hired on a job-by-job basis. Every spring, the twenty-five regular employees welcome on board an equivalent number of youngsters to strengthen their teams.

One bonus is that the students bring added spirit and energy to the job. "Everything is new for them and they are totally committed to their work," says site foreman Gudmundur Gunnarsson. However, their enthusiasm can sometimes lead them to forget about rudi-
mentary safety precautions, so it is necessary to work on safety awareness on a daily basis. After a few summers, most of them stay with the company. The older members of the teams recall having followed a similar path.

It is common for young people to work like this in Iceland. The school vacation lasts three months, and to take advantage of the long daylight hours local authorities employ young people over the age of 14 to perform menial jobs along the country’s roads, including cleaning green areas, planting flowers, sweeping roads, etc. The hiring practice of Colas Iceland is a minimum age of 20.

With the three principal ingredients – men, materials and machines – in place, work could take place in ideal conditions. “We are even a few weeks ahead of the original schedule,” acknowledges Sigurdur Sigurðsson. The activity is fully under control: trucks loaded with asphalt, the paver permanently ahead, and just the right number of men and often, with one person allotted to each task, with particular attention given to tipper trucks when they empty their load in the tunnel.

**SHARED RESPONSIBILITY**

Days are long and rest-time and meal-times are kept as short as possible. The working hours are usually 7.30 a.m. to 8 p.m. at the tunnel site. But even after 11 hours of intensive work, the fact that it’s still broad daylight gives the men the strength to go out and enjoy themselves at night in the city center.

A feature of this project is the responsibility accepted by everyone. The clients are not very present on the site, but they have full confidence in the company’s work. Quality control is in the hands of a technician specially added to the regular staff for the project who received a week’s special training in the Colas Danmark laboratory. He furnishes the client with regular reports on the density and level of compaction of the products applied.

In total, at the end of several months of work, the company will have completed 27 kilometers of road, including 5.7 kilometers in the tunnel. The project was funded primarily by private investment, and users of the tunnel will pay a toll of approximately seventy French francs.

General manager Sigurdur Sigurðsson is well aware that this type of site is not very common in his country. “There is not likely to be further heavy investment in roads for a few years,” he says. He is therefore on the lookout for different projects, in particular airport runways. The best means of getting around in Iceland, in summer and winter alike, is often using domestic flights. The company, which currently operates within a perimeter of 70 km around Reykjavik, now seeks to develop onto these markets, something which is now possible thanks to the mobile mixing plant. Perhaps another channel for future development could be cold mix asphalt. Sigurðsson is not short of ideas. He now needs to carry them out.
Creating new products, honing new methods, responding to new markets, organizing people, breaking new ground... What's changing at Colas around the world.

PRODUCTS

All quiet on the road ahead

Describing noise in written form is no easy matter. The dictionary definition is "an ensemble of sounds produced by vibrations within the range of hearing". Perception of what is noise is a factor that is individual, societal, cultural or even environmental. The same level of noise may be acceptable for one person and intolerable for his neighbor. The same person may listen with pleasure to the noise of waves breaking over surf but be unable to stand the noise of road traffic, even if the decibel level generated by the two is identical.

But one thing is certain: man is sensitive to noise and its effect on human health is far from negligible. Recent surveys have shown 40% of the French population complaining about noise, and there is no obvious reason to suppose that the figure is not much the same in the rest of the world.

The principal sources of noise from a moving vehicle are the engine, transmission, exhaust, aerodynamics and rolling noise. To reduce nuisance from noise levels, it is possible to act both on how noise is produced and how it is propagated. This latter is something that directly concerns the Colas Group, as road builders.

Tire noise starts to dominate once speeds of 40 kph or 50 kph are attained. It arises from the impact of parts of the tire on the roadway, to the compression and expansion of air and to tread grip and movement. The noisiest road surfaces are surface dressings and concrete, while porous and "silent" asphalt mixes are classified as among the least noisy. Noise measurement readings taken on these surfaces show the relative importance of the grading curve and void content in these asphalts.

Each group company has its own response to the noise against war in the form of specialty products: Cols for Colas, Microville for Sreg and Miniphone for Sacer.
Thin, soft and resistant

Microville is a thin mix designed for all types of roadway, especially in towns and cities. It has all the basic qualities of a modern road surfacing. Noise is minimized because the contact of tires with the road surface is particularly soft, and the highly porous layer partially absorbs the noise through its entire thickness. Its anti-skid properties, vital for stopping in all circumstances, are particularly good. Winner in 1992 of the first Golden Decibel ever awarded to a road surface, Microville has been more and more widely used throughout France in the past six years.

Using rubber crumb

Colsoft is a very thin asphalt mix (2 to 3 cm) containing rubber crumb, which helps it in the fight against noise pollution, with an average saving of 5 dB(A). It is intended to be used as a wearing course, whether for maintenance, reinforcement or new road construction. The use of rubber crumb originating from recycled used tires also offers a solution to the environmental problem of how to dispose of used tires. After winning a Golden Decibel award in 1995, Colsoft was recently accredited by the French highway department as part of the road innovation charter.

Reducing air noise

Miniphone is gap graded asphalt concrete with low sand content. This formula allows it to reduce air noise caused by friction of the tire on the road surface. The materials used have quite high roughness to prevent an effect of "road hiss". Miniphone is applied in association with an Accronet tack coat. Miniphone received a special commendation in the 1995 Golden Decibel awards.

Showing just how effective a surface can be

The Research and Development department has supplied the technical departments of all the French subsidiaries with a "noise-box" that will assist them during the promotional campaign for the Group's anti-noise products, as well as help demonstrate their capacities to contracting authorities. A noise simulator placed in a miniature vehicle which drives first over a normal surface then over an anti-noise surface, the device invites people to compare the two and judge for themselves the effectiveness of an anti-noise surface.

ANTI-NOISE PRODUCTS GO HIGH PROFILE

In September, the group launched an advertising campaign on the anti-noise products of its three brands, Colas, Sacer and Screg. The nationwide French campaign, is backed up on a regional level by all the road construction subsidiaries. The aim of the campaign? To make decision-makers aware that traffic noise can be reduced by using specific road surfacing materials; to position the group as an industry partner in the fight to stem noise; and lastly, to inform and convince the general public.

The campaign combines national and regional media in three successive waves. Each wave starts with a TV commercial (a first in the road building industry), a 30-second film presenting one of the three products, to be aired mainly on the French France 3 regional TV network for two weeks. A radio campaign and advertisements in the French national daily press reinforce the TV campaign launch in the second half of September. To bring home the message to national and local politicians and interest groups, each of the audio-visual ad campaigns is supported by a mail-shot of a video cassette about the products accompanied by a personalized letter. During a series of local events, press officers at both national and regional level will work to arouse the interest of journalists and supply copy for articles and packages. To improve penetration of information at regional level, a "noise" correspondent has been appointed in each French road subsidiary whose task is to either find or create local events which can be used to showcase their brand's anti-noise products. All of this is a first for the group, but also a genuine innovation in this domain.
Prevention is better than cure

A well-targeted policy and an increasingly responsible attitude adopted by all concerned are witness to a continuing improvement in safety within the group. In France, the number of work centers that had no accident resulting in sick leave rose from one in 1991 to 43 in 1996, to reach 68 in 1997.

The HSE France challenge (Health, Safety and Environment) rewards the subsidiary ranking highest on a safety index determined by multiplying the accident frequency rating by the scale of severity rating. Colas Nord-Picardie won the award in 1997, with an index rating of 3.52 (the group average was 23.84). The crystal woodpecker trophy, symbolizing the challenge program, is competed for every year. In 1998 the challenge was extended to all the group’s international subsidiaries. In addition to policies implemented in the field, the challenge expects subsidiaries to show greater awareness of the following issues:
- Hygiene, health and the environment
- Exchanges of experience
- Coordination of actions
- Incentives for better cost management
- Personnel incentives and encouragement
- Involvement in industry associations.

An international safety policy
The safety committee met in Bordeaux on June 22 and 23 to discuss work in progress. International speakers Barry Agutter from Colas UK and Gordon Harmer from Barrett Paving explained their strategies, particularly concerning accident analysis and work-related illnesses.

Winners of the Safety Trophy in France
- Boulogne-sur-Mer (Colas Nord-Picardie)
- Châteleraut (Colas Centre-Ouest)
- Lorient (Sacer Atlantique)
- Narbonne (Sreg Sud-Est)
- Carrière Néee (Colas Ile-de-France-Normandie)
- Quimper (Colas Centre-Ouest)
- Gravière Rosseille (Sreg Sud-Ouest)
- Trovero (Colas Ile-de-France-Normandie)

<table>
<thead>
<tr>
<th>SAFETY INITIATIVES TAKEN BY SUBSIDIARIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colas Nord-Picardie</td>
</tr>
<tr>
<td>Winner of the 1997 HSE challenge</td>
</tr>
<tr>
<td>Safety index: 3.52</td>
</tr>
<tr>
<td>Sreg subsidiaries</td>
</tr>
<tr>
<td>A quarter hour for safety</td>
</tr>
<tr>
<td>Sacer Sud-Est</td>
</tr>
<tr>
<td>On-site video truck</td>
</tr>
<tr>
<td>Somaro</td>
</tr>
<tr>
<td>Increased number of first-aid workers</td>
</tr>
<tr>
<td>Spac</td>
</tr>
<tr>
<td>News sheet explaining every jobsite accident and how it should be avoided</td>
</tr>
<tr>
<td>Colas UK</td>
</tr>
<tr>
<td>“Cascade” system of responsibility</td>
</tr>
<tr>
<td>Sintra</td>
</tr>
<tr>
<td>Redevelopment of accident victims with less physically demanding work</td>
</tr>
<tr>
<td>Barrett</td>
</tr>
<tr>
<td>Appointment of seven regional safety delegates</td>
</tr>
<tr>
<td>Colas Danmark</td>
</tr>
<tr>
<td>Awareness program on the work environment</td>
</tr>
<tr>
<td>Sreg Belgium</td>
</tr>
<tr>
<td>Safety challenge</td>
</tr>
<tr>
<td>Terus</td>
</tr>
<tr>
<td>The safety manager is a member of construction industry HSE associations for Alberta and British Colombia</td>
</tr>
</tbody>
</table>
APPOINTMENTS

Thierry Genestar, President, Colas Midi-Méditerranée
Following the retirement of Georges Mora, the Board of Directors appointed Thierry Genestar president of Colas Midi-Méditerranée at a meeting of the Board held on April 2, 1998. A graduate of the Paris Ecole Centrale engineering school, Thierry Genestar joined the Group in 1979 as a site engineer at the Châtellerault center. He became in succession site engineer at the Orléans center, then its deputy manager, the head of the Le Mans center and finally head of the Orléans center. Nominated general manager of Voies Management in 1991, he has been CEO of Sintra, the Group's Canadian subsidiary, since 1992.

Patrick Guénolé, President, Colas Sud-Ouest
Patrick Guénolé was appointed president by the Board of Directors of Colas Sud-Ouest at its meeting of June 24, 1998. A graduate of the French School of Higher Mechanical Engineering Studies, Patrick Guénolé joined the Group in 1978. From 1978 to 1981 in France he was a site engineer, based in Provence and in St. Etienne. Away from Europe, he worked as deputy site manager in Martinique from 1981 to 1984 then became manager of Colas Guadeloupe from 1984 to 1989. He became head of the northern Morocco office between 1989 and 1992. Then it was back to the Caribbean, where after heading a center, he became regional manager, remaining there until the end of 1997.

EMULSION

Hincol opens a new production facility
Hincol, the joint subsidiary of Colas and Hindustan Petroleum, recently opened a second production facility. Located 40 kilometers north of Delhi, this inline plant has a capacity of 15 metric tons per hour and will enable Hincol to expand its business into northern India.

Set up in October 1995, the company started production at its first plant, situated near Bombay, in March 1996. The plant is now operating at full production capacity, and will this year manufacture some 20,000 metric tons of emulsion.
In the space of a few years, Colas has become leader in its business sector on a very promising market.

ENVIRONMENT

The Airvault center plants a tree for every jobsite
Promoting the use of environmentally-friendly materials and processes has been the policy of the Airvault center (Colas Centre-Ouest) for four years now. To give even more weight to this commitment, the center has decided to donate a tree to be planted on land belonging to the town in question on each jobsite where the Colas Environmental Charter has been applied.

Since 1995, Airvault has already planted several oaks and maples. What more appropriate way can there be than planting a tree to mark another step along the environmental road?

AFRICA

Colas moves into Kenya
The Colas Group recently announced that it has acquired from Shell Chemicals East Africa all its holding in Colas East Africa. The company, which is based in Nairobi, runs an emulsion plant. This new acquisition will allow Colas to set up a new permanent base for development into English-speaking African countries.
Colas strengthens its base in North America

Colas Inc., the Group's American subsidiary, acquired a number of companies and facilities in the United States from the British conglomerate, Hanson Plc. in April of this year.

The companies in question are HRI Inc., Nello L. Teer, Sloan Construction Company, Reeves Construction Company, Sully-Miller Contracting and Blue Diamond Inglewood Asphalt Corporation, operating respectively in the states of Pennsylvania, North Carolina, South Carolina, Georgia and California.

Based on asphalt mix production (5.5 million metric tons with 46 mixing plants), road building and maintenance, these businesses combine to represent annual revenues of approximately $330 million.

This acquisition forms part of the Colas Group's overall strategy for international development. As a result, it now operates permanent facilities in no fewer than 23 states, in the east and mid-west plus California. "There has been no change to our strategy," states Alain Dupont. "We purchase companies with a certain weight which will enable us to move into new regions, we do not unify our networks. They must remain independent, with local management."

With the addition of these new companies, Colas expects to generate revenues of close to one billion dollars in North America, as of 1998.
Screg... 100 years young

On June 13 and 19, Screg celebrated its one hundredth anniversary in the company of all its employees. On the first date, 2,500 managers and foremen gathered at the Palais des Congrès in Paris. On the second, 7,400 operatives met together in groups ranging from 100 to 300 people at 50 different points, spread through France and Belgium.

June 13: managers and foremen celebrate in Paris
Those attending the celebrations at the Palais des Congrès were first treated to a historical review of the company's first hundred years. A film relating the story of Screg's first century was punctuated by video extracts and presentations on more technical topics, such as equipment, emulsions, Compomac, jobsite organization, communication, the company's presence in Belgium and its family spirit. A presentation of a new corporate film and a speech from president Philippe Cresset brought the morning session to an end.

After lunch, the afternoon program was more lighthearted, but kept to the theme of the road. Three special guests, yachtsman Loick Peyron, Formula One driver Olivier Panis and the first French astronaut, Jean-Loup Chrétien, came to give accounts of their experience of roads on land and sea and in space. They talked about the paths they had taken on the journey to success. The event came to a close with a gigantic birthday cake and a firework display.

June 19: festivities across France and Belgium
The entire Screg workforce gathered together in 50 different sites in France and Belgium. They were shown the film portraying the history of Screg along with the new corporate film. Then, simultaneously in all the subsidiaries, the voice of the president could be heard, giving an outline of Screg strategies.

When the serious business was over, the partying began! Each subsidiary organized sporting events, and the day concluded with a gala dinner.

Screg Publishes a Book Outlining Its History

The Pioneer Spirit: 100 Years On the Road is an illustrated anthology relating the major events in the history of the company. The book is divided into four parts. The first depicts four key periods in the life of the company. The second highlights road building techniques and products. The third focuses on some major jobsites and shows how the qualities of Screg team members brought them to conclusion. And the final part looks ahead to the challenges the company now faces as it plans its development on the roads of the 21st century.

Environment

Caribbean subsidiaries put Colas on show
The first fair specifically devoted to the environment ever held in the Caribbean took place in June at Lamentin, in Martinique. The event, which attracted a great deal of interest in the English-speaking West Indies, was attended by many industry representatives and institutional investors. The Colas booth was organized around the themes of Colas Environment and recycling, Colétanche and Colsoft. It was manned by teams from Guadeloupe and Martinique.
And now for the Intranet...

The word Internet now forms part of everyday speech. But what about an Intranet? From Inter to Intra, for those with little Latin, an Intranet is a corporate form of the Internet, company-wide and limited to the secure company network. The Intranet is the Colas Group's professional Internet space. Let's take a look...

The Intranet is a technology that provides a simple method which makes computer applications accessible worldwide. Its use is simple, intuitive and totally independent of the type of computer or operating system. Users need only have an Intranet browser, which both Netscape and Microsoft distribute free of charge and is currently available in all the group's subsidiaries.

A powerful computer system
Because of the increasing size of the group and the frequent changes to contact information for the subsidiaries, along with transfers of personnel, it has become vital to update all of the data collected in Contacts and Profiles in real time, using a powerful data-processing computer system.

Contacts and Profiles on Intranet
The Contacts and Profiles paper directories for Colas, Sacer and Sccreg, updated annually, are now available on the computer screens of everyone in the group who is linked up to the network.

The new database application "Directory" can be accessed in all countries where the group operates.

The Group directory is organized by brand name, separating out the Colas, Sacer and Sccreg entities in France and abroad. It also offers links with the two information directories "Contacts" and "Profiles".

Having the directory on Intranet also means that multi-criteria searches may be performed on keyword, name, country or department. Selection using maps is also possible. It is up to each of the subsidiaries to enrich
the directory with supplementary information about their company such as access maps, photographs, etc.

This directory is linked directly to the group mail center, so that messages can be sent to a recipient who is clearly identified on the screen.

**A major human resources and communications tool**

Because information can be published in real time based on a simple-to-perform update carried out by the subsidiaries, this tool is a new vector for information and communication.

The "News" section is also the resource for all information about group employees – transfers, promotions, retirements, new arrivals, etc.

The directory is linked to the Internet Web servers of those subsidiaries which are equipped with them. It will therefore become an effective tool for developing communications within the group.

However, the introduction of this electronic directory does not make the paper directories obsolete. They will continue to be published annually, but updating them will be much easier. Furthermore, the supervisors who are in charge of updating the data in each of the French subsidiaries or international departments may choose to print out a personalized paper document from the database.

Both the “Directory” and “References” applications are open to 420 French sites and 150 offices outside France. In France, access is via the group’s internal computer network, and internationally, through secure Internet access points.

**Jobsites on CD-ROM and Intranet**

The group’s IT subsidiary, Speig, is also developing the Intranet jobsite reference database. For the past three years, Speig has distributed to every location in France and abroad, the "References" CD-ROM, which is updated every year from a central source. Publishing this application on the Intranet seemed an obvious step as soon as the group was equipped with a network. With this new on-line tool, the latest and most relevant jobsite references can be entered and made accessible to furnish supplementary information and aid with making up tenders, or to provide additional sales information.

The database will be continually updated on a localized basis from within each subsidiary or country headquarters. In line with the existing CD-ROM format, each jobsite reference comprises a descriptive information page that includes information on the localization, presentation and value of the contract and of the contracting authority. The page also displays a photograph of the jobsite and a certificate of capacity. This document, vitally important on international contracts or new markets, attests to the group's capacity to perform high-quality construction and manage very large scale jobsites.
When Colsoft came to Ireland

Buses, trucks and cars make more and more noise

Michael Collins Road is an important link between two main routes into Galway. It carries private cars, buses and goods vehicles. But spare a thought for local residents. It cuts a swathe through a dense residential area. On either side stand the flats and houses of two large housing estates. So when, one day in mid-

June, a roadwork crew assembled on the road, long-inured locals shrugged and thought, "More noise". But that crew was there at the request of Galway Corporation and Colas Ireland. Both had agreed on this 3,800 m² stretch of Michael Collins Road for the first trial of Colsoft in Ireland. The road's bitumen emulsion surface dressing with its 14 mm-long chippings was amplifying traffic noise to levels of 73 dB(A).
Demonstrably effective

"Trial? No. Demonstration," asserts project coordinator Gerry Stenson who rejoined Colas Ireland in 1997 as development manager. "We know how effectively Colsoft cuts noise levels. Other people don’t." What differentiates Colsoft from other hot mixes is recycled rubber in crumb form added as an aggregate at the mixing stage. A specially formulated polymer modified binder is also used. "Galway Corporation offered us other sites. But this one was ideal for demonstrating our commitment to noise reduction," says Jim Campbell who recently joined Colas Ireland to manage developments in the west. The 258-metric-ton job was a joint venture between Colas Ireland and Roadstone Provinces Ltd. Colas provided the design, binder, rubber and tack coat. It also tested and analyzed the materials, and supervised as Roadstone mixed and paved it.

Sounds good, looks good...

"It looks good. Nice adherence, too. Like a carpet should," enthuses Campbell, while Stetson adds: "I’ve noticed the traffic is definitely quieter." Being from Colas he would, wouldn’t he? But readings by independent Galway University researcher Alan Kavanagh to an international ISO standard bear out his impression. He recorded 68.5 db(A) - down by 5 db(A) on pre-Colsoft levels. Last word on the demonstration must go to those who stand to gain most. As Kavanagh took readings an onlooker approached. "He said the road sounded much quieter," recalls Kavanagh. "Then he said, ‘probably because it looks so good.’"

... Is good!

A second demonstration is scheduled in Dublin. Stenson hopes it will awake the authorities to the high quality of the product. "Colsoft, like any macadam wearing course, must have, as the French put it, a good aspect, or good look," he says. "Very true. We will also emphasize how it curbs noise propagation, with impartial evidence as proof. Independent experts are measuring noise levels to the latest ISO standards and certifying significant noise level reductions." Such international credentials of excellence will help Colas Ireland make its case to the National Roads Authority and the Department of the Environment. Says Stenson: "As we seek to promote quiet roads, it’s a way of smoothing our path!"
How Colas expertise has taken off at airports

Runways, taxiways, aprons, parking areas and signs – for nearly fifty years Colas has demonstrated comprehensive expertise over the entire domain of airport construction. The Group’s international airport sites have included Ouarzazate, Pointe-à-Pitre, Roissy-Charles-de-Gaulle, Libreville and Jakarta.
Nobody who was involved in the construction of Jakarta airport in Indonesia can have forgotten the experience, even though it took place 20 years ago. The contract was not the first airport construction site carried out by the Colas Group, but it was certainly the most spectacular in terms of deployment of manpower, logistics and equipment.

Thirty years previously, the group’s subsidiaries both in France and overseas were already building runways around the world, and today the group has so many airport construction sites in progress that it is barely possible to keep up with them. There are major sites at Nice, in France, Raizet on the island of Guadeloupe, Ouarzazate in Morocco, Mauritius, the two Paris airports of Orly and Roissy-Charles-de-Gaulle and Libreville in Gabon, plus many other examples too numerous to mention. Colas’ expertise as the world number one road construction company is already well known, but it also has significant, acknowledged expertise in the building of runways, taxiways, aprons, parking areas and airport sign systems.

The changing face of airport sites

For some decades past, air traffic has been characterized by a strong increase in the number of domestic and international flights. According to the experts, air traffic will have doubled during the last decade of the 20th century.

Those in charge of infrastructures maintain a goal of constant improvement to airports with the aim of raising passenger safety and being able to handle greater capacity airplanes.

A Boeing 747 weighs 150 metric tons when empty, but when fueled up before take-off, its weight is doubled. Increasing use of high-capacity aircraft means that runways often have to be widened and lengthened and the shoulders strengthened. It is also the cause of increased runway wear.

When a high-capacity cargo plane revs up and gets poised for take-off, extreme pressure and powerful blast from the jet engines place enormous stresses on the structure and particularly on the runway surfacing. On military bases these problems of stripping and burning are considerably worsened because on some types of aircraft the rear engine is placed on a sharp incline and acts on the runway like a blowtorch.

Month after month, extensive surface degradation and evenness faults that arise cause leaching of water, which then attacks the foundations and also threatens the comfort and safety of passengers on take-off and landing. When things reach

Although twenty years has now elapsed, the Jakarta airport site, still remains the most spectacular in terms of logistics, plant and manpower.
Passengers, this way!

Airports around the world are continually on the lookout for the form of signs and signals that best corresponds to their specific characteristics, with the aim of consistently providing improved guidance for passengers. When the decision was made to completely refurbish the sign system at Nice airport in 1994 and 1995, Somaro, specialized in the manufacture and installation of sign equipment, and its subsidiary, Porte, were both adjudicated contracts. These companies were responsible for the development, production, installation and bringing on-line of illuminated sign gantries and totems in Nice airport. Variable message panels communicating the status of free space available were installed in each of the parking lots. Together, Somaro and Porte provided all the ancillary services: engineering, IT, electronic engineering and installation of signs and signals products.

More recently, in 1997, Porte put in a winning bid for the Aéroports de Paris contract for signs and signals equipment for the new Roissy-Charles-de-Gaulle 2F air terminal. Porte supplied 1,600 lighted panels, 20 image walls each with 2 to 24 television sets, 40 directional signs and information panels and 14 oval sign gantries on bases of glass, the design and production of which constituted a world first.

A world first for the new Roissy-Charles de Gaulle airport sign system: an oval signal gantry on a glass base.

Each problem has a specific solution

The specialists’ answer to the question “cement-bound concrete or asphaltic overlay?” is not always clearcut, as is evidenced by the different types of work carried out. Beyond considerations of soil characteristics and the weather conditions under which the job will be performed, a few major trends can be discerned. Construction of a new runway from scratch is generally carried out in concrete and refurbishment is more usually executed in asphalt mix. Airport-specific asphalt mixes have a higher bitumen content than standard asphalt in order to give more impervious surfaces. Taxiways, aprons and parking areas are often carried out in concrete and subsequent strengthening is also sometimes performed using the same material because of the numerous ancillary structures linked to these traffic ways. In some instances, the concrete is surfaced with an anti-kerosene asphalt, such as Colas Colnak. The time required to lay the materials varies proportionally from one to eight between a “black” material and a “white” material, and costs vary in the same proportions.

“Concrete remains reliable
for twenty years," explains Sofréavia's André Hamou, "but asphalt concrete is more workable and easier to apply."

**Regular upkeep**

The average length of life of an airplane strip is reckoned at thirty years, but the first round of maintenance work generally takes place after four or five. "At Orly, the Screg Ile-de-France-Normandie teams resurface small sections of the taxiways every year. By performing regular maintenance in this way, a taxiway is totally renovated by the end of six or seven years," explains Jean-François Pizzinat, a technician from the Aéroports de Paris hub at Orly. To facilitate execution of its two 3-year maintenance contracts over the past thirty years, the Orly Screg office has a mobile mixing plant which is used for all types of minor and major maintenance work. It is the only such case in France. 500 kilometers further south, Screg Sud-Ouest holds a maintenance contract for Bordeaux airport. During the summer, the Bordeaux office resurfaced the taxiway after having laid asphalt mix the previous year at the entrance to the air terminal and asphalt concrete on the air terminal access viaduct.

**Expertise in France and abroad**

In 1996, the Bourges office of Colas Centre-Ouest performed reinforcement of the Avord air base runway. The runway is the roost of Awacs, the radar spy planes of the French Air Force. Work consisted of refurbishing 6,000 m² of concrete.
What's in a brand name?

When a contract is to apply asphalt mix, the group subsidiaries generally put forward a variety of solutions involving the use of specialty products that are specific to each trade name. For resins, percolated asphalt, the products are Rodal for Colas, Compocem for Screg and Sacercim for Sacer. In the case of rut resistant and shear resistant mixes, Stabicol and Compoflex are used. Special mixes for airstrips and aprons evolve over the years just as road asphalts do, thanks to upstream research carried out by the technical departments and regional and national laboratories.

> surface and strengthening the concrete asphalt runway over 45 meters of its width and 2,720 meters of its length by treatment of cracks and planing and then laying asphalt mix with a tack coat of Colnet. In 1996 Colas Ltd exported its expertise as far as the Falkland Islands. It microsurfaced 332,000 m² of runway on the islands’ two air strips, heavily damaged during the 1982 sovereignty war between Argentina and the United Kingdom. For the extension of the Biarritz-Bayonne airport parking bays, the Colas Sud-Ouest teams used Stabicol binder to retain the existing base, integrating it into the runway structure and adapting the structure so that it can meet increasing traffic demands. This solution meant that the parking areas could be made available as the work progressed. Another advantage of this cold surfacing technique is that the absence of smoke and dust emissions helps safeguard the environment. In addition, Stabicol grave is recyclable.

In 1993, performing different work at the same airport site, Screg Sud-Ouest used Compoflex, an asphalt mix, 33% composed of a hard bitumen mastic. For a number of years, the Puy office of Colas Rhône-Alpes has maintained the traffic zones of the Puy-Loudes airport. In 1997 the sector was named contracting authority for the refurbishment of the runway and its upgrading to current aeronautical standards. In the spring of 1996, Sacer Paris Nord-Est laid an Accronet tack coat at Beauvais airport. During the summer of 1996, it was the turn of Sacer Atlantic to take charge of the extension of the Toulouse-Blagnac airport parking areas. Some years ago, Van Brockhoven and Wegebo, subsidiaries of Screg Belgium, carried out most of the extension and modernization work on the Brussels National airport at Zaventem. For this site, two different solutions were implemented: the taxiways were surfaced in asphaltic overlay and the parking areas in concrete. At the same time the Belgian companies installed in the airport perimeter a large drainage network for rainwater runoff.
and thawed water from the ice that covers airplanes when the temperature drops below zero. Last year Screg Belgium laid an 8,000 m² concrete slab at Liège airport and 10,000 m² of hot-mix asphalt, along with the drainage on part of the airport. They also ensured installation of the lighting of the hub and the access roads.

**Repaving gains ground**

During the summer of 1994, the alternative solution of repaving using the Thermo-col process was used by Colas Midi-Méditerranée over 55,000 m² of the Salon-de-Provence military air base. A month after the start of work, the Patrouille de France, the French Air Force crack flying team, were unstinting in praise for the comfort and safety of the newly-renovated runway. It seems that repaving is now well on its way to becoming a fully-fledged road construction technique. Screg Ile-de-France-Normandie used it two years ago when participated in the refurbishment of the Paris-Le Bourget airport runway. In the spring of 1998, Colas Midi-Méditerranée sent equipment to Morocco to treat the airport at Ouarzazate. Three months later, the same concrete train was sent across the Atlantic ocean to repave 80,000 m² of the Raïzet airport in Guadeloupe. Paving, it seems, is a technique for the future. Will new asphalts be developed as well? According to André Hamou, the use of “silent” asphalts, increasingly favored for roads, will also increase in airport.
zones, particularly for airports located near cities. It appears there is also a trend towards the use of gap grading to solve problems of adherence and penetration of the water.

**Specialized equipment**

“The specificity of aviation applications is somewhat different from road standards,” stresses Philippe Esnault, head of the Nantes office (Sreg Ouest), as he discusses the Montoir-Saint-Nazaire airport runway.

“The most important thing is the watertightness of the surface. We have to meet longitudinal profile analysis standards that are much more stringent than those of highways and motorways, and have high levels of both aggregate roughness and of wearing course compaction.”

In order to improve the longitudinal profile, the teams used automatic laser-guided pavers and planers to reprofile the runways. When the work is carried out on concrete, pavers with built-in emulsion spray bars are used.

**Sticking to stringent schedules**

At any airport, every time an aircraft touches down, the company pays a landing tax. All work that runs over schedule not only may interfere with passenger safety but on top of this can cause a fall in profitability with loss of take-off and landing taxes and a drop in provision of services such as fuelling and cleaning of aircraft. The conditions governing the operation of airport hubs mean that teams must stick to very tight schedules, with work taking place at night or on week-ends in order to disturb air traffic as little as possible. “Each operation is a challenge which has to be met and properly executed both in terms of safety and of quality,” emphasizes Philippe Paccoud, head of the Orly office (Sreg Ile-de-France-Normandie). This means that teams have to be able to perform urgent work both by day and by night.

In Mauritius last year Colas worked at night on the Plaisance airport extension. Every day, after the last airplane had taken off, the teams were ready to swing into action on a section of the runway. The next morn-
ing, the cleared and restored runway, with all equipment removed, was handed back to the aircraft. This type of work obviously requires rigorous planning and scheduling of suppliers of material, start-up of plant, etc. Preparation of the site takes almost longer than performing the work itself. The sites are carried out in liaison with the control tower because occasionally there is a quarter of an hour to clear the runway of all equipment and materials because an airplane has to make an emergency landing. The control tower also keeps track of the weather conditions, which means that appropriate measures can be taken on the sites in case of heavy rain or extreme heat. In the case of maintenance contracts, such as at Orly, rapid response is everything. "We are not on call, but we might get notified at 6 o'clock in the evening that we will be working on the runway that night," explains Philippe Paccoud. "This means we have to get the necessary personnel together and start up the plants as quickly as possible." At Sotréavia, the customer is recommended that whenever possible, the final asphaltic overlay is applied during the day, for reasons of quality, but also naturally of cost. To make this possible, the airport traffic managers have to concentrate all of the heavy carrier traffic into a restricted window, other types of aircraft being able to take off on the reduced runway length of 2,000 meters. Theory is all very well, but in practice, "on a jobsite, the customer is king!" laughs André Hamou. But just who is the customer? Most airport infrastructures are government-owned, but the trend is more and more to contract them out as concessions run by an airport authority. This is the case, for example, with Abidjan. However, clearly this move will not be made in all countries, given the strategic nature of many airport sites.

Thermocol in the Southern Med

Following a feasibility study carried out by GTR, the group's Moroccan subsidiary, and the technical department of Colas MIDI-Méditerranée, teams from both subsidiaries used thermoregenerating for the Ouarzazate airport refurbishment contract. The technology, which was approved by the airports department for use on 3,000 meters of runway, over a 40 meter width, was chosen by the customer, Onda, the Moroccan Airports Authority, because of its low cost and because it meant that the airport would not have to be closed to air traffic.

After two days at sea, customers clearance and technical inspection, the thermoregenerating plant was then shipped by road from Casablanca to Ouarzazate for a month of work. Five operatives from the French subsidiary who were specially trained in the application went out to join the teams and extra plant supplied by GTR. The result of the total operation was 120,000 m² of 4-centimeter asphalt mix repaved with a regenerative binder additive to balance the bitumen content and degree of penetrability. The FRF 12 million operation included the extension of the airplane parking areas, applying anti-kerosene treatment to them, applying asphalt mix to the shoulders, the runways and the access roads.

GTR and Colas MIDI-Méditerranée carried out refurbishment work at Morocco's Ouarzazate airport. Here: transportation of plant.
Quarries and gravel pits: 371 sites around the world
The Group owns 371 quarries and gravel pits, 259 of which are currently being exploited. Production of aggregates in 1997 totaled 43.4 million metric tons. The Group's worldwide reserves are estimated at 1.7 billion metric tons.
One is a site manager in the Ivory Coast, another is an engineer in Romania, a third is joint manager of Strada Sp.zo.o in Poland, yet another is operations manager of Sgreg Sud-Est’s SATP sand quarry... Every day, all of these people give it all they’ve got to make Colas succeed.
Nobody does it better

Bill Turner, municipal superintendent with Wapiti Gravel Supplies

Bill Turner, 34, has 15 years in road construction behind him. He was an engineering technologist with Alberta’s Transportation Department for seven years, then in 1990, he joined Wapiti as highway base superintendent. “Wapiti gave me independence I’d never experienced,” he recalls. “Before, I had to work to formula. Wapiti expected me to show creativity and drive.” He did just that, spending 140 days a year on the road in charge of the performance and well-being of his 23-strong crew. In one year, he saw them to a record lay of 770,000 tons. In 1995 he became estimator. A year later came the second culture shock of his career, as he moved into municipal works as superintendent. “I had to adjust from the big, fast world of highways to the finesse of municipal work.”

Bill oversees all paving work in and around Grand Prairie, where Wapiti is headquar-

tered. The demanding production attitude born of his years with the Highway Division is stronger than ever. “First-time quality is paramount. North Alberta’s work season is short, winters harsh, and penalties for not meeting end-product specifications are high. We have our own in-house quality laboratory. This year has been penalty-free. Nobody does that. I’m real proud of the guys. They’re the best!”

One of a kind

Philippe Raffin, technical manager, building and civil engineering

Working for an independent Reunion Island engineering office, Philippe Raffin first made contact with the local subsidiary, GTOL. Three years ago, the relationship became firmer when he signed a work contract with the company! Philippe hands costing, feasibility and technical assistance for both construction and civil engineering projects. In other words, he passes a fine-tooth comb over practically all aspects of each jobsite before it is launched: costs, schedules, building methods, and so on. The technical side of his responsibilities extends to other Colas operations in the zone. “I reckoned the job I do here must be just about unique in Colas,” he reflects. “That’s because of the diversity of the group’s operations in the Indian Ocean.”

Although he spends most of his time at the office, Philippe is often to be found in the field, providing technical assistance and solving problems on jobsites. Finalizing alternatives to bid specifications, as happened for the Mauritius container port, or adapting solutions according to the varying economic situations from one island to another... Philippe’s job is very varied, and that’s the way he likes it!
A return to Romania

Ovidiu Oprea, engineer at Sorocam in Romania

After studying at the Bucharest School of Public Works, Ovidiu Oprea moved to France. He trained as a site manager with Eyrolles and spent a year at the Ponts et Chaussées engineering school. Returning to Romania in 1994, he joined the group subsidiary Sorocam, which he already knew from several periods as an intern. Since then, Ovidiu has gained experience in the various types of work performed in the country, managing sites consisting of both application of asphalt concrete and recycling with the Novacol process. He even spent a few months running an asphalt plant.

Ovidiu has an enquiring mind and an enthusiasm for road building technique, and hopes to have the opportunity to apply some of the new technologies developed by the group on Romanian roads. “Unfortunately, our roads are in such a bad state that we do more repairing than innovating,” he says. “But we will benefit from more and more international finance.” This year, the young engineer is managing a jobsite renewing 50 km of roads near Warsaw, and is glad to be able to develop the use of Stabicol with the Novacol process. “Every step forward we take technically presents a new challenge,” smiles Ovidiu, “which I am, of course, pleased to accept.”

A posting to Poznań

Marek Lorecki, joint manager of Strada Sp.z.o.o. in Poland

Now in his late thirties, Marek Lorecki was born in Poland but settled in the St Etienne region of France as a child. After studying for a diploma, he took a job with the then Colas Sud-Est as site manager in 1982. The Group’s potential for international opportunities played a large part in his choice. However, growth in business in the Rhône-Alpes region made it difficult to envisage an international assignment. So Marek decided to specialize in large-scale projects, such as the St Etienne-Clermont motorway, the Bourg-en-Bresse motorway, and, as of 1987, the region’s preparations for hosting the 1992 Winter Olympics at Albertville. “It was an enormous project, creating new roads to winter sports resorts and renewing the roads of the towns, all in record time!” recalls Marek. He was appointed head of the Haute Tarentaise sector, but he never gave up his old dreams of expatriation. So when the Group acquired a 51% stake in Poland’s State-owned company Strada early this year and invited Marek to become joint manager, he didn’t hesitate for a moment.

In Poznań, in northeast Poland, the road building industry is very different to what it is in France. “For the past few months, I have been trying to get people to accept new technologies imported from France,” he says. The exercise is not an easy one. But Marek is a go-getter who is not afraid of a challenge!
Family spirit

Joseph Sicart, operations manager of the SATP sand quarry, Sgreg Sud-Est

Whether in the context of his family business in the early days or as part of SATP for very nearly twenty years, Joseph has never changed the way he sees things. "You know what they say about Catalans: tight-fisted, down-to-earth and stubborn as mules," he says proudly. "That's me to a tee!"

When he took over the family quarry outside Perpignan in 1979, Joseph homed in on the quality issue, and his focus has never wavered. But apart from the quality of the materials produced, he has also banked on the development of the company, diversifying its production and, hence, its clientele.

What counts even more for Joseph than his love of his profession is the spirit he has always managed to maintain in the quarry, which was acquired by Sgreg Sud-Est in 1990. "We are a close-knit team of six, all sharing the same motivation and the same 'family spirit'," he says.

SATP, which has diversified its production of materials, now supplies, in equal quantities, sand and gravel for concrete agglomerates and concrete plants as well as aggregates for road building companies.

Earlier this year, the company won a new license to quarry a seam of alluvial materials on the banks of the Têt river. After a few difficult years, sales of silica-limestone sands will rise to an annual level of 200,000 m³. "That would put a smile back on people's faces, if ever any such thing were needed!"

Enthusiasm catches on

Acacio E. Silva, general foreman, Poitiers office, Sacer Atlantique

Acacio E. Silva joined the Poitiers office at age 16, thirty years ago. His father, previously a foreman at a Portuguese granite quarry, had come to Sacer a little earlier. He transmitted both an understanding and a love of noble materials to Acacio. After acquiring wide ranging road building expertise in the field, Acacio worked his way up through the ranks and was soon put in charge of a team.

Returning to the materials that had marked his youth, he set about restoring ancient sites with a passion. Indeed, it is thanks to Acacio and his team that over the past ten years, the Poitiers office has been able to develop in the domain of laying paving stones and sanded and pumiced concrete slabs. There are increasing numbers of sites calling for this specialized skill, much to the pleasure of Acacio. The region is brimming with sites needing preservation, such as Place Notre Dame in Poitiers, the approach to the Futuroscope, the Ile d'Oléron and the Ile de Ré... Acacio and his seven-strong team of journeymen have plenty to occupy them. "I adore my trade, because our work will survive for many years to come." He talks of his craft with joy and passion. So eloquently, in fact, that having persuaded his brother and elder son to follow him, his younger son has now joined him as an apprentice. It's all in the family! "The job is tough, but what satisfaction it gives! We work on our hands and knees, but setting the right stone in the right place means putting yourself in the eye of someone viewing the whole thing." And it may be for the eye of future visitors that Acacio spends his spare time building his own broad stone house, with sanded concrete paths!
Out of Africa

Alain Chauvet,
site manager in Gabon

When he began his training as a topographer, Alain Chauvet had already begun to think about a career in construction and public works. Following a ten-year period as a trainee in a civil engineering office, he joined the group in Martinique. His ambition was to perform an on-site job and work abroad. Eight years later, he has achieved his aims, which has made him a happy man. In Martinique he became familiar with main services work, three years later in Mali he took part in the refurbishment of a road, which remains his most abiding memory. His next assignments took him to the Ivory Coast and Benin, and since last October he has been in Libreville, Gabon. This site supervisor talks about his job with affection. “To do the sort of work we do in our business, you have to be passionate about it, hate routine but have your feet firmly on the ground,” he says. Other attributes he lists as requisites for a successful site supervisor? Psychological savvy, energy, leadership and the ability to solve problems as they arise. “During my different postings I discovered new countries and new working methods. On each new jobsite I set myself new challenges and found new ways of meeting them,” he explains. After a few more years on international sites, Alain will come back happily to Europe to learn some more about the group’s state-of-the-art technology, something that is still little used in Africa.

Journey without maps

André Belloche, site manager in the Ivory Coast

Although he is delighted to enjoy the fresh air of the French countryside during his summer holidays, André Belloche is always happy to return to Africa every year. After spending eight years in France he set out for Cameroon in 1983 and since then, with the exception of three years spent in Normandy, he has worked in Gabon for his entire career as site supervisor. In 1998 he moved on to Ivory Coast. “Of course,” he says, “the rhythm of work in Africa is very intense. The days are very long, but we use our time differently.” André loves the varied, independent nature of his job. “I organize the jobsites that I am given according to my own ideas, and I do so with as much dedication as if it were my own company,” he states proudly. Specialized in mains services work in towns, André has gotten to know every corner of Libreville during the seven years he spent there and he is now doing the same thing for Ivory Coast capital Abidjan. As he explains, “One of the main differences between Ivory Coast and Gabon is the road network. Here surface communications go much faster – except for the Abidjan traffic jams!”

“I organize jobsites according to my own ideas, as if it were my own company”
Return of the native

Frédéric Pierre, feasibility and tenders manager, Colas Guadeloupe

Frédéric left his native island of Guadeloupe for the French mainland at the age of nine. When he joined the Colas Group in 1988, having taken an engineering degree and been trained at ESTIP as a site supervisor, he was sent off to join the Caribbean subsidiary! After working as a general foreman and then as a surveyor, he is now in charge of feasibility and tenders. "I enjoy this job, because it is a mixture of field work and selling. I spend almost as much time with site supervisors as with customers," he says. Pleased to be part of a major group, he nonetheless sometimes feels cut off and wishes that he had more contact with his counterparts in France. "Our greatest advantage in the face of the competition is our technical ability and our creativity, but also our sense of human relations," he says with a grin. In Guadeloupe, things go much easier when you are an island native! Naturally curious and always eager to learn more, Frédéric currently forms part of the teams working on the Raizet Airport thermo-regenerated paving contract. "I am learning a new and fascinating technique. This jobsite will be a valuable reference for us!" he enthuses. But Frédéric knows that major jobsites are not common in the Caribbean, so he spends time promoting the image of his subsidiary as that of a company that is capable of handling construction sites of any size.

Portrait of the artist

Ernesto Dal Pan, foreman at Jean Piazza, Switzerland

Ernesto Dal Pan's career has not been a straightforward one. Born in an Italian village at the foot of the Dolomite mountains, he left school and his birthplace at the age of 14 worked as an itinerant carpenter to learn his craft in the field. Once he had earned his apprenticeship qualification, he went to Switzerland. From major motorway construction sites such as the Basle-Zurich highway to big structural projects such as the Emessan dam or the Simplon tunnel, as he moved from job to job working piecework, he learned the arts of his trade such as iron works, blasting and shuttering. One day fate dealt a blow in the form of an accident, which after a spell in hospital put an end to his itinerant days. In true romantic style, he married his nurse and built a house for them in Lausanne, before joining Jean Piazza as a foreman in 1976. Today, the entire area is undergoing a program of re-zoning and Ernesto is finishing the first land improvement site, some ten kilometers outside Lausanne. In his spare time, he crafts and sculpts everything he can lay his hands on. Wood is transformed into chairs, tables or magazine racks with poker-work decoration. Brier is hewn into pipes that he likes to smoke, stone carved into a fountain and a rock transformed into an ashtray. Ernesto is a true artist.

"I learned my craft in the field, over many years of moving from job to job"
Jean-Antoine Winghart on the European motorway
Jean-Antoine Winghart is fascinated by all forms of geography and networks. A former director of the French National Geographical Institute, he is a strong defender of the European cause faced with the globalization of social and economic exchange. He has been chairman of the Société des Autoroutes Paris-Rhin-Rhône for over ten years.

You are the chairman of a major French motorway operator but you have also worked a great deal on the Trans-European motorway network. What are the main priorities that are emerging in Europe today?

At the overall European level, there are four inter-related priorities in terms of highways and motorways.

The first priority involves the countries situated to the east of the Vienna meridian, i.e. the former Socialist bloc including Ukraine, Byelorussia, Russia and the three Baltic states as well.

The second priority is the north-south Trans-European road links that should make it possible to cross the mountainous barrier constituted by the Alps, the Carpathians and the Balkans. This would, for example, link the Baltic to the Mediterranean. I believe it would be a mistake to promote east-west European road links rather than north-south ones. The extraordinary success in France of the A 39 motorway (Dole-Bourg-en-Bresse) on the SAPRR network, with 15,000 vehicles per day three months after its opening in June 1998, shows the socio-economic interest of north-south road links. A third priority involves the peripheral European nations, such as Ireland and Portugal. Portugal is currently making huge strides to catch up on its infrastructure gap, principally through a policy of building major structures, toll motorways and experimentation of shadow tolls. The same applies to Greece or to Finland, a small dynamic country which is a veritable reservoir of energy. Then there are the countries beyond the European Union such as Turkey or even Morocco, which is actively getting ready for the Trans-Gibraltar link.

And finally, and this is an absolute precondition, emphasis must be placed in the coming years on developing urban ring roads around all the major European cities, both in the west and the east of the continent. These ring road infrastruc-

tures are vital. Not getting down to this today will cause a serious infrastructure gap in the future, with cities like Hamburg, Budapest and St. Petersburg facing total gridlock in the short term.

Do you think it is possible to go against the natural stream of economic logic which, of course, sanctions the road?

Of course not. Building a new global rail network dedicated to mixed transportation at the European level would seem inconceivable because of its very costly nature and of doubtful efficiency. The Oudin-Inchauspe Senatorial report repeats this point yet again. Only Switzerland is currently attempting to implement a policy of having trucks transit systematically by flat-bed rail transporters. This expensive and ambitious project, which involves digging several tunnels, will be put to the Swiss population by referendum at the end of the year. If the vote is favorable, Switzerland will be a European exception. But it's hard to imagine such a policy being implemented over the whole of Europe.

Did the finalization of the master plan for the TERN (the Trans-European Road Network) in July 1996 allow significant stages to be reached in motorway networking the different European countries? And how is the Trans-European program to be financed?

In theory, the master plan did this, but in practice, the most vital element - the funding - is missing. Nonetheless, funds are being organized by Brussels to help the countries in the east of Europe through TINA (the Transport Infrastructure Needs Assessment program). In addition, as the financial commitments made by banks such as the EIB, the EBRD and the World Bank in the trans-
portation sector are substantial, I am optimistic about the future of major European projects. But whatever the outcome, there will be no motorway to the east of the Vienna meridian if the governments themselves do not finance between 30% and 40% of the investment cost through providing land, integrating existing stretches of free motorway into new toll roads, and so forth.

The major French radial motorway axes are now under completion. Do you think it is now necessary to speed up the construction of transversal axes?
Yes, of course it is, particularly the major CEAR link, the Central Europe Atlantic Route which will link the Atlantic Ocean to Switzerland, Austria and Hungary via the Lyon region, an area which throughout history has held the role of a European crossroads. However, there are north-south links which remain to be completed, such as the duplication of the A 6–A 7 motorway axis with the A 39 which has just opened and which must be continued with the A 51 motorway to the south of the Upper Rhône.

On a general level, what are your feelings about the density of the French motorway network?
Even though there are still gaps, France is rather well off in terms of motorways, and the same can be said for Italy and Germany. However, we need to carefully monitor the development of French traffic, which over the last few weeks seems to have taken its lead from the French economy and be clearly back on the road to growth. If this trend continues, additional stretches of motorway will definitely be required before the next ten years are out. And above all, much attention must be paid to the areas around major cities to avoid congestion in their old town centers.

In other European countries are there types of financing that we could put into operation in France?
The French toll system has the major advantage of balanced taxation. It is the road user who pays, and not the taxpayer. I believe there is a danger in mixing privately-operated motorways with publicly-owned motorways, because users simply can’t understand why some stretches, such as Clermont-Ferrand-Béziers, are free whereas as the Rhône valley is both overcrowded and toll-paying! There seems to be some problem of inter-regional imbalance here. The shadow toll system, where the taxpayer pays, seems more questionable to me. Finally, there are other methods which seem to me to be more appropriate, such as the one that the Czechs are gradually moving to, which is gradual in nature and adapted to the eastern European countries. The Czech government finances the first two-way roads, operates them toll-free. As soon as traffic reaches a threshold of 10,000 to 15,000 vehicles per day and the standard of living has risen, they put in a toll, which is usually graduated, to pay for upgrading the road to a four-lane highway. But I am not sure that such a method can be adapted for France, even if it is a good idea to look into the concept of a motorway that can be upgraded, starting from a road with fewer characteristics.

What forms of action are you currently taking vis-à-vis the government to defend the principle of privately-operated motorways?
Through the ASFA, the Association of French Motorway Operators, to which all the French motorway companies belong, we are lobbying the Highways Department and the French Treasury Department. Since last year, we also launched an advertising campaign in the French press on the theme of “How do you like driving on the motorway?” On the whole, public opinion in the French regions, unlike the Paris-based press, is outwardly in favor of the development of the motorway in France, as it is in the rest of Europe.
Five hundred group sailors meet the 15th Screg Challenge

Hyères, May 21-24, 1998. 70 crews representing 50 companies in the Bouygues and Colas groups sailed against each other, all bidding to win the 15th Screg Challenge yacht race.

The first ever Screg Challenge was the brainchild of some Screg yachting enthusiasts, took place at Port Grimaud in 1981 and attracted a grand total of 19 craft. From the outset, the Challenge was designed as a genuine sporting event where camaraderie went hand-in-hand with amateur status and a serious interest in sailing.

Twenty years on, the 15th Challenge, which coincides with the Screg centenary, still retains the same spirit. For the fourth time, the yachts anchored in the port of Saint Pierre in Hyères. Organization of the race was handled by the Challenge stewards’ committee, which is composed of the event’s original founders. Among the many well known figures on the committee is Michel Travert, a very active member and former plant and equipment manager of the company who is more than delighted to spend a few months of his “retirement” on preparations for the Challenge.

The 500 yachtsmen from all over France and other European countries all assembled ➤
on Thursday, May 21 to carry out the final adjustments before the four heats of the sailing event.

In addition to the boats representing the subsidiaries of Screg, Colas, Sacer, Saur and Bouygues, there were, as usual, some ten boats from "friendly" contenders such as Shell, Esso, JCR Equipements, Gruau, ESTP, etc. After three days of competition they stood to win two trophies – one for crews from the group and the other for friendly boats.

For the three days, each start of a race is the same as the previous one. All of the boats come under the racing committee starter’s orders for the starting procedure. Each team has its own way of readying itself for the race. Some crews analyze their trajectory in terms of the prevailing winds, the course they have decided to steer and the characteristics of their craft. Others use the time to joke around and try to destabilize their competitors. The first starting gun is fired six minutes before the commencement of hostilities. A second follows a minute before the start and the third signals the start of the race.

The calls from one boat to another die away. Each crew member, at his post, follows his skipper’s orders. Silence falls over the water. From now on, it is every man for himself.

Each evening, back in the port, the judging takes place and the provisional scores are posted. But a poor score or even a disqualification does not dampen spirits – as soon as the daily "moment of judgement" is past and a hot shower has washed clean the salt spray from the skin (although not the sunburn), it is time for a drink, enjoyed against a musical background of sea shanties. The notion of challenge and the heat of the competition is dropped for a few hours to give way to camaraderie, with people charging around from boat to boat. The yachtmen embark upon a second, "after hours", existence. Sailing gives way to night life, which takes over the port, the pontoons and the boats.

Some crews get together on board to eat a gigantic paella, enough to make onlookers turn green… with envy! Others go ashore to eat in local restaurants, grateful to be on dry land after a day at sea in a heavy swell. The nights are as fine and warm as the days, and unfortunately, just as balmy and wind-free.

The final evening, all of the crews assembled under a huge marquee for a banquet dinner. Because each crew was seated at a separate table, this unfortunately did not facilitate contact between the participants from different companies, which could have been one of the aims of this event. But then it is not possible to split up crew members who, all together, have faced the sea, the sun and the skipper’s orders! Rivalry on the water gave way to attempts to outdo one another in mirth and merriment – shouts and laughter rang out ever louder, people called to each other from one table to another, cheering with their arms, their chairs, even their tables.

Philippe Gresset, chairman of Screg, thanked all of the crews for taking part and presented model yachts to the "friendly" crews. The evening continued with sea songs and shanties sung around the tables, aided by the song booklet produced by the regatta organizers. There were songs for raising the mast, hauling the anchor, hoisting the sail, splicing the main-brace and other nautical activities. Then it was "on with the dance!"

Despite such a lively evening, on the Sunday morning all of the crews turn out and put out to sea for the last heat, the Olympic triangle.

Back in port at the beginning of the afternoon, Philippe Gresset awarded the prizes.

As in the previous year’s event, the "friendly" Challenge was won by JCR Equipements, while Screg Est, the previous holders of the Group Challenge, handed over the trophy to the new winner, 9 Telecom, skippered by Claude Albanese, chairman of the company.

The three best placed road construction companies in the competition were Colas Midi-Méditerranée, Sacer Atlantique and Screg Est, placed 9th, 15th and 19th respectively. Will they do better next year? Watch the horizon…

 ROUTES number 5 

15ème CHALLENGE Voile SCREG 21-24 mai 1998
Acknowledgements

Sophie Sadeler, Tracey Hofheinz,
François Chaignon, Caroline Chardonnnet,
Bruno De Lamerie, Hervé Grillot,
Jean-Paul Billes, Daniel Drouin,
Didier Debunne, Pierre Calvin,
Patrick Darmedru, Philippe Guilmant,
Didier Calbry, Philippe Raffin,
Christophe Guy, Jean-Luc Gautier,
Thierry Le Roch, Remi Tournaire,
Jean-Pierre Largo, Philippe Durand,
Hugues De Champs, Gilles Foucher,
Yves Mortel, Jean-Louis Varennes,
Guy Jaudon, Dominique Viard,
Martine Duriez, Jean-Pierre Prat,
Yvette Scholz, Henri Robert,
Daniel Thibault, Bill Turner,
Franck Piedimonte, Gerry Stenson,
Jim Campbell.
Journey through an interior land, and mark a curtailed furrow on the brow. Then strive to resolve the ancient passage from intuition to reason. Forever, we stubbornly move forward.