holds an interim degree such as an "associate Ph.D.") should be on an equal footing with a Ph.D.

Nor does he believe that a regional accrediting association should make "invidious distinctions" between disciplines by altering its standards to allow a mathematics department to get by with a smaller percentage of doctoral-degree holders than the percentage required for other departments. (In general, the SACS requirement for a 4-year college is that at least 25 percent of the members of each academic department, and at least 30 percent of the total faculty, must hold the doctorate.)

Derryberry is among those who believe that, if the non-Ph.D. who teaches mathematics is at an unfair disadvantage vis-à-vis teachers in other fields where doctoral requirements are less demanding, much of the blame lies with the mathematicians themselves. Some leading mathematicians have been opposed to the idea of conferring the title of "doctor" on anyone who has failed to demonstrate, by a doctoral thesis, competence in mathematical research.

Proposals to award a "doctor of arts" or "doctor of education" degree in mathematics are not new, and some institutions confer such degrees. For example, Pennsylvania State University and the University of Michigan each awards a doctor of education degree in mathematics. Carnegie-Mellon University in Pittsburgh awards a doctor of arts degree in mathematics. One candidate for this Carnegie-Mellon degree satisfied his thesis requirement by preparation of a new course for the undergraduate curriculum.

Derryberry is by no means alone in his belief that mathematicians should agree on an appropriate doctoral degree for the candidate who, by reason of ability or inclination, cannot qualify for or does not seek the traditional Ph.D. degree. One consequence of a failure to do this may be to encourage weaker universities to award Ph.D. degrees for thesis work which stronger institutions would not accept.

The CUPM report includes some cautious language which seems to sanction the idea that a doctorate should be conferred on the candidate who completes the Advanced Graduate Component and prepares an acceptable thesis, even if it is not of the traditional research variety. While the mathematicians deliberate on this question of credentials, the shortage of qualified mathematics teachers in the colleges continues to grow.—LUTHER J. CARTER

Louvain: The University Incubates Belgian Political Crisis

Louvain/Leuven, Belgium. Chronic tensions between Belgium's two linguistic communities provided the gunpowder for the political crisis which exploded in February when the national government resigned, but it was the students of the famous Catholic University of Louvain who lit the fuse. What has not been widely noticed is that Flemish advocates of student power were calling not only for cultural emancipation but for social revolution.

The troubles at Louvain center on insistence by the Flemish activists that the French-speaking or "francophone" section of the university be transplanted into French-speaking territory. Belgium is divided north and south by a linguistic Mason-Dixon line. North of the line, in Flanders, the official language of classroom, court, and street sign is Dutch; south of the line, in Wallonia, it is French.

Belgian political parties have sought to keep the "linguistic question" below the flash point not only in the interest of national unity but also because the major parties have been composed of both Flemish and French-speaking elements. For a century after the founding of the Belgian state in 1830, French culture dominated. French was the language of the middle class, even in the Flemish cities of Ghent, Bruges, and Antwerp. To many a Belgian bourgeois, Flemish was the language of the kitchen. Even today, relatively few francophones seem to learn much Flemish. (The written language is Dutch, the spoken dialect Flemish.)

In recent years Flemish nationalism has been gaining ground steadily in most sectors of Belgian life. It was inevitable that the University of Louvain should become a special objective in the campaign. Louvain is Belgium's oldest and biggest university, and its most distinguished. Erasmus and Vesalius grace its past, and 20th-century Louvain can boast of men like Canon Georges Lemaître, author of the "big bang" theory of the creation of the universe. Louvain is the alma mater of many influential Belgians, both Flemish and French-speaking. And it is in Flemish territory.

Student action in the streets in support of the demand that the French-speaking section of the university be moved attracted increasing Flemish nationalist political support outside the university, and this resulted in mounting pressure for action, on the government and on the church, which in principle administers the university. "Politisation" of the issue diverted attention from the content and style of student demands, which had much in common with the demands of student activists at Berkeley and Berlin. In early February the government of Premier Vanden Boeynants felt compelled to try to reach a decision on the future of the university. Unable to reach agreement, the cabinet resigned. Belgium now appears to be facing new elections in which the parties will be split on linguistic lines. The language question and the future of the university itself will be major issues.

Louvain—or Leuven, in Dutch—lies a few kilometers north of the linguistic frontier, but the university has had special rules which provide that instruction be in both languages. There has been progressive separation, however. A 1966 decree divided the university into Flemish and French sections, each with its own administrative and academic staffs and each charged with its own development.

In demanding the departure of the French section the Flemish do not talk much about cultural humiliation. A main line of argument is that the problem is not linguistic at all, but one of numbers. The town of Louvain has

32,000 inhabitants, the university some 25,000 students and 2500 faculty and staff. The current estimate is that there are some 12,500 Flemish, 10,000 French-speaking, and perhaps 2250 foreign students.*

The prediction is 50,000 students by 1980, and it is claimed that room for expansion is insufficient. This "decongestion" argument is disputed, however, since a "new campus" is going up on a corridor of land owned by the university outside the town and public officials have said that more such land is available. On the other hand, there is no question that student lodging is hard to find.

Although the distinction has a scholastic refinement, the Flemish argue with apparent sincerity that what they want is not the expulsion of the French section but the creation of one university in two locations. They emphasize that they do not expect the move to be completed in a year or two. The transition should be made over a reasonable period, with maximum guarantees against the French section suffering as a result of the relocation. What they demand is a decision to move.

Partisans of one bilingual Louvain assert that the agreement to have two autonomous sections at Louvain should be honored. They estimate that $500 million would be needed to duplicate facilities, and that such a sum is nowhere in prospect. On another tack, it is pointed out that Louvain's benefactors abroad, who contributed heavily to restore the university after it was twice ravaged in world wars, were not contributing to a Flemish nationalist university. Given Louvain's history, they say, what the Flemish ask is "unscientific, un-European, and un-Catholic."

It happens that the Flemish, if they choose, are in a position to pursue the politics of revenge. The Flemish now hold the edge in population, with all that implies electorally. Since the war, Flanders has prospered. Antwerp is the third busiest port in Europe, and foreign-financed industry has brought a boom to the area. In French-speaking Wallonia, by contrast, the traditional glass- and metal-working industries have languished and the mines and mills have shared in the European slump in coal and steel.

What the Flemish nationalists and some Walloons want is decentralization of government and more autonomy in cultural and educational affairs. Federalism is the Flemish watchword, but so far no party or group has come forward with acceptable proposals for remaking Belgium's unitary state.

In student politics the Flemish activists have unquestionably held the initiative. The militants are a relatively small group, but they have been able to sway large numbers to sometimes violent action. Demonstrations have several times erupted into knock-down, drag-out bouts with the gendarmes. Critics recall that, during the wartime occupation, the Nazis sought to kindle Flemish nationalism in order to divide those they had conquered. The suggestion is that Flemish rough stuff directed against French-speaking students and the authorities reveals a fascist streak. Recently, Flemish activists have been using Marxist terminology, and the obvious conclusions have been drawn.

Coloring the Flemish student movement red or black, however, is risky. Along with Flemish nationalism there is a strong strain of the social and educational reformism that is found among students in most European universities today, which is perhaps most obvious now in Germany. The students see Louvain as part of the issue of university expansion in Belgium, an issue that has been befogged by the troubles at Louvain. The students want more university places, and university recruitment from a broader social spectrum. Inside the universities they ask for smaller classes, closer relations between professors and students, and a better curriculum. They are critical of Louvain not only because it has a French section but because it is still the university of a middle-class elite.

It is this impulse toward radical social action, running outside traditional ideological channels and shared with students in other European countries, which could in the long run be the most significant feature of the Flemish student revolt. At present, the linguistic issue is the paramount one, but there is, so to speak, a crisis within a crisis.

The position of the church is a difficult one. Authority over the university is vested in the Belgian bishops and in the rector magnificus, who heads both sections of the university. But the Belgian government provides 95 percent of the budget. Flemish spokesmen tend to assume that control of the university has passed from the hands of the hierarchy, and they suggest that there is no clear image of the particular way in which Louvain will be a Catholic university in the future.

Discussion of the issue increasingly

*Enrollment in each of the two sections exceeds that of any other Belgian university. The others are Antwerp and Ghent (Flemish), Liége (French), and Brussels (bilingual).

A POINT OF VIEW

"Revolt Against Physics?" New York Times *editorial, 12 February.*

Feelings of rejection and self-pity were apparently rife at the recent meeting of the American Physical Society in Chicago. Complaints were voiced of inadequate enrollment in physics courses, from the high school to graduate levels, as well as of declining financial support. One speaker referred to a "revulsion against science" throughout all American society.

Can it be that the Cassandras among the physicists have lost their historical perspective? Whatever the problems of American physics today, it is incomparably stronger in every respect than it was in the 1930's when only a relative handful of young people went into the field and when Government and private financial support in the volume now taken for granted was undreamed of.

Physics does have genuine problems, of course. It is no longer the dominant glamour king of the sciences, as it was in the heyday of research in nuclear and solid state physics during World War II and the succeeding decade. Today much of the "action" has shifted to biology. As for shortages of students, the hard fact is that physics is a taxing subject and that competent and inspiring teachers are in very short supply, especially at the high-school level.

Yet the basic fascination and importance of physics and its still uncrossed frontiers remain very strong attractions indeed, and the national interest in maintaining a strong physics establishment is unquestioned.

reflects the assumption that physical partition of some sort is inevitable. It is difficult to find anyone who can give a neutral estimate of the effects of a split. In the natural sciences, the immediate effect would be to leave both sections with unsymmetrical programs, with the Flemish section perhaps the more seriously affected.

Chauvinism is not very evident among the physical scientists. When this reporter visited Louvain in February, a strike of Flemish faculty and students appeared to be having no great effect on the ordinary routine of research. The language line seemed easy to cross in the laboratories. In the chemistry department, for example, there are Flemish- and French-speaking units which are, as one scientist said, "officially two, but actually one." The policy, however, is to unmix, and it is being pushed.

Opponents of the move insist that the flow of foreign students to Louvain will cease if the French section is not there. There are 2000 such students in the French section and some 250 in the Flemish section. This does not seem to worry the Flemish activists unduly in the case of students working for first degrees. A lack of foreign graduate students and visiting scholars, however, would be serious. One answer that might not please the more passionate defenders of Flemish is that many of the more competent researchers already publish their work in international journals, most in English. English already seems to be used as a handy neutral language in the laboratories, and would probably be used even more in a Flemish Louvain.

What is most discouraging to moderates close to the university is that there is "no dialogue" among those at Louvain who should make policy. The university's dual structure reinforces this, and church and government, for their own reasons, are reluctant to act.

The outsider may exaggerate the perils. The two Belgiums have lived for more than a century with their marriage of necessity and have endured other serious crises. But it is difficult to see, at the moment, what compromise will work.

It is ironical that Brussels, the city of convenience for international corporations and the headquarters of NATO and the Common Market, is called the capital of the new Europe, while a few miles away the troubled university is a reminder that the ills of the old Europe are still with us.—JOHN WALSH

Technology Gap: French Best Seller Urges Europe To Copy U.S. Methods

"In ten or fifteen years, the third international industrial power of the world, after the United States and the U.S.S.R., could be, not Europe, but *U.S. industry in Europe.*"—*Le Defi Americain* (The American Challenge)

*Paris. Le Defi Americain** has perched near the top of the best-seller list since first appearing 4 months ago. With more than 400,000 copies sold, the book represents one of the most phenomenal publishing successes in recent French history. It has quickly become a cornerstone of European thinking on some current transatlantic controversies: the "technology gap," the "management gap," and American overseas investments.

Written by Jean-Jacques Servan-Schreiber, editor of the weekly *l'Express, Le Defi* warns against the growing power of transplanted American firms in Europe, but without being anti-American. The book rejects, for example, restrictions on American investments. Europe depends on advanced U.S. products for its own growth, says Servan-Schreiber; more important, Europe needs the stimulus derived from American competition and America's demonstrated superiority in both marketing and industrial organization.

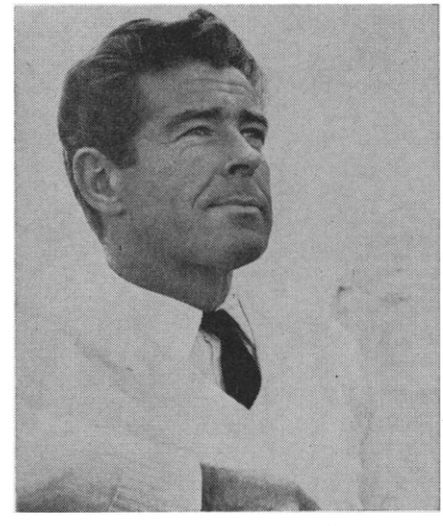
Servan-Schreiber sees science and technology as a prime pillar of modern power and the key source of economic growth. He writes with almost uncontrollable admiration about the U.S. economy because it has, he says, successfully integrated science with big industry. That giant step, he repeatedly states, has escaped most of the European firms.

Thus, the "technology gap" exists, but Servan-Schreiber considers it only a symptom of deeper problems. He is primarily interested in identifying the reasons for Europe's industrial retardation, and remedies to cure it. What concerns him is not only the size of America's European investments but U.S. domination in the fastest-growing, most technical industries. By the book's figures, in 1963 U.S. industries controlled 40 percent of the continent's oil distribution, 45 percent of the production of synthetic rubber, 80 percent of the production of computers, 50 percent of semiconductors, and 95 percent of integrated circuits.

Why is Europe lagging? Two themes dominate *Le Defi.*

The first—that there is too much economic nationalism, derived in part from parochial politics—has attracted the most attention. To compete with large American companies, says Servan-Schreiber, Europe needs Continent-wide firms with capital resources matching those of their American counterparts. It also needs a force similar to the U.S. federal government, which provides billions every year for research and development. The author specifically criticizes the six nations of the European Economic Community (EEC) for having failed to formulate an effective law to stimulate continental mergers.

Second, Servan-Schreiber says that most European efforts to pool scientific talent and resources have faltered because of constant political and financial bickering; nations are stingy with their contributions, and there is an unwritten rule that projects must be planned so as to return each country's financial input to its own economy. Servan-Schreiber prescribes flexible laws for international mergers. More importantly, he



J.-J. Servan-Schreiber

*Published in French by Plon, 8 rue Garancière, Paris 6; $5.75. A version in English is to be published this spring.