Dr. Campbell

I.I.A.A.

BUILDING A BETTER HEMISPHERE SERIES NO. 26

Vocational Education In Peru

1944–1952

By

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and

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POINT 4 IN ACTION

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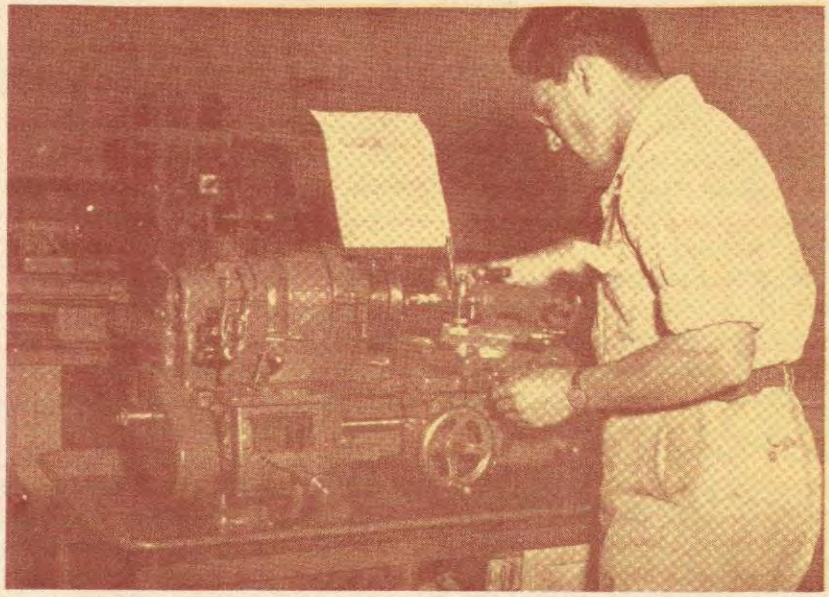
TECHNICAL COOPERATION ADMINISTRATION

under the joint program since its beginning. Authorization by these governments for the signing of the five-year agreement, instead of an annual agreement, make possible the long range planning of the Cooperative Education Program. One of the most important sections of this basic agreement authorized the construction of a new Central Normal School. It was decided to locate this new campus near Chosica, a city of 15,000 people, 25 miles east of Lima in the fertile Rimac River Valley. Here, on a campus of 47.6 hectares, (about 118 acres), construction has already begun on an administration building which will include a cafeteria, student union, and auditorium in addition to the general administrative offices. Two one-story shop buildings, one men's dormitory, and an education building, are also under construction. In the near future another dormitory, a library, and a gymnasium will be added. Future plans include buildings for the humanities, science, social science, home economics, and additional dormitories for men and women.



Student working on a bench lathe in the Technical Division of the Central Normal School, Lima, Peru

Selection of the Staff

The organization of the technical division of the Central Normal School required considerable planning. Long and careful study, as well as lengthy discussions went into the construction of the curriculum for the preparation of teachers of vocational shop subjects.

Once agreement had been reached with the Ministry of Education concerning the problems of curriculum, then followed the need for finding persons qualified to teach those subjects included in the curriculum. Most of the month of December, 1950, was spent in the preparation of trade tests that were to be used in the selection of prospective shop teachers for the Central Normal School. One hundred and twenty-five men appeared for interviews in answer to several newspaper advertisements for qualified shop teachers. Forty-eight of these were judged as sufficiently well prepared to take the trade tests. The written trade tests eliminated more candidates leaving only 22 who were qualified for practical tests. Eight men, each judged to be the best in his trade specialty, were finally selected. These eight men were given experience as teachers of the shop courses during the five-week summer session for in-service shop teachers.

Much work of planning and organizing preceded the formal opening of classes, on April 9, 1951, of the technical division of the Central Normal School. By special arrangement with the Peruvian Ministry of Education early in the year the new vocational building of the high school "Melitón Carvajal" was designated as the temporary location of the division.

During the year or more when the two shop buildings on the Central Normal School campus near Chosica are under construction, the industrial education division of the college will be housed in the Unidad Escolar "Melitón Carvajal." The shops and classrooms here are adequate for the activities for the program of teacher education. A large part of the same school also is occupied by the Ministry of Education.

Since classwork is taken only in the afternoons, the morning hours of the eight normal school shop instructors are spent in the preparation of written instructional materials and practical shop instructional aids. All the instructors are responsible to the North American specialists directing the division's operations. Supervision and counseling is administered in a continuous pattern resulting from the maintenance of close office, classroom, and shop contact between the Servicio's specialists and the normal school instructors.

Course outlines were developed from trade analyses made by the shop instructors. These outlines were filled in gradually as the school year advanced and the instructors had time to do research, to select, and to edit instructional materials. By the end of the school year each instructor had developed a fairly complete first year or beginner's course in his trade specialty.

Selection of the Students

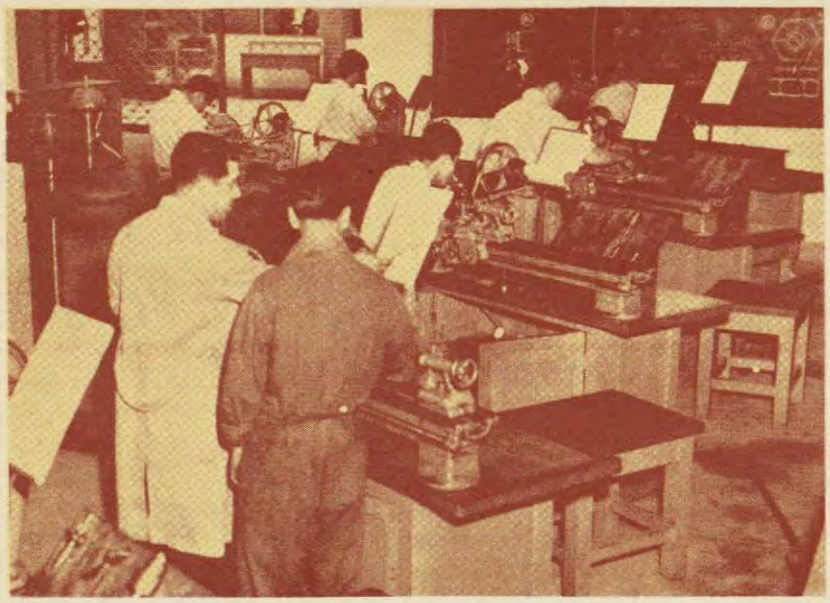
Objective tests were developed for the selection of the normal school students for the technical division during February and March of 1950 and the administration of these tests resulted in the final selection of 48 students who were placed in the following trade specialties:

Woodworking	8
Machine shop	10
Electricity and radio	8
Auto mechanics	8
Foundry and patternmaking	6
Forging and welding	8

Most of the students selected for the industrial-education division were recent graduates of technical institutes. Others were teachers in service in fields other than industrial education. The students selected receive scholarships which include board and room while in school, plus all instruction and instructional materials. Before formal admission to the normal school, the student teacher is required to sign a contract with the Ministry of Education wherein he agrees to:

1. Accept and take immediate charge of a teaching post that the Ministry assigns him.

2. Remain on active duty at his as-



Students in the machine shop of the Technical Division of the Central Normal School, Lima, Peru

signed post for a period of not less than three years.

During the half day of shop practice the 48 normal school men helped, in their trade specialty, the shop instructors in the work of installing the machines and preparing storage and checking facilities for the hand tools and materials that arrived on the site of the new school. In this way these men, being prepared as future shop instructors, acquired valuable experience in the problems of shop installations, organization, and management. This experience will probably help them in their future careers as teachers when they are confronted with a similar situation.

The completion of the major installations in the shops was effected by the end of the fiscal year. In July, 1951, 75 boys from the vocational education section of the secondary school "Melitón Carvajal" were admitted to the shops. These boys formed the demonstration classes where the normal school men do their practice teaching.

In April, 1952, 44 men students started their second year of industrial teacher training at this school. Teachers are being prepared in auto mechanics, electricity and radio, carpentry, machine shop, forging and welding, and foundry and patternmaking. This group completed a two-year course in January, 1953.

Two Shop Buildings

The industrial-education division of the Central Normal School will be housed in two one-story buildings which are approximately 60 by 255 ft. each. These two structures, which are made of reinforced concrete and brick, will house ten shops. Auto mechanics, machine shop and bench metal, drafting, graphic arts, and art metal, leathercraft and wood carving, plus an exhibition room will be included in the South building. Electricity and radio, plumbing and sheet metal, foundry and patternmaking, welding and forging, and carpentry will be located in the North building. In addition to the regular work area, each shop has an office, storeroom, and washroom. Small classrooms adjoin six of the shops.

Technical Advice and Assistance

One of the first plans of the co-operative assistance program to be implemented concerned advising the Ministry of Education on problems of selection, purchase, and installation of shop machinery and equipment. Working co-operatively with Comandante Fernando Romero, Peruvian director of Technical Education in 1945, curriculum planning, surveys, and course organization were also given early consideration.

The staff of the vocational education division has been continually available and has rendered services to other divisions of the Servicio when called upon for technical advice or assistance. The same relationship has existed with the division of technical education of the Ministry of Education of Peru.

When the Servicio began working in Peru, school buildings were rented and equipment was almost non-existent in other than the Polytechnic Schools. During the period 1947–48, when Comandante Fernando Romero was director of technical education, funds were finally obtained to buy equipment for industrial schools. The Servicio aided in the purchase, distribution, and installation of this equipment, although teacher training activities suffered somewhat through lack of personnel during this change of emphasis.

In 1948, by agreement with the then SECPANE, the Peruvian Ministry of Education, Technical Division, provided $565,000 for the purchase of basic tools and equipment for the 40 industrial schools. The Vocational Division technicians were in charge of the purchase, distribution, and placement of this equipment. Visitations were made to the schools which were to receive equipment. Plans for its installation were drawn up in each case. At this time, only small funds were available for the construction of new school buildings and the expansion of improvement of existing structures. Most of the available funds were concentrated in equipment purchase. One basic reason for this was the fact that most Peruvian schools were on rented properties and any improvements that were effected would eventually revert to the private owner. During this period of planning for shop installations, shop layout plans were drawn for over 75 per cent of Peruvian industrial schools. With the advent of the present government in 1949, considerable money was obtained for the construction of the so-called "Grandes Unidades Escolares," which are government owned educational units comprising elementary and secondary levels and including an industrial school curriculum. Existing industrial schools in many cases will be transferred to these units. The Vocational Division of SECPANE including the IIAA specialists, Earl N. Gessler and J. Arthur Elmer, with the Peruvian representative, Engineer Gustavo Reusens, were called upon in 1950 by the Ministry of Education, Technical Division, to aid in the design of the buildings to house the Vocational Department of these units, as well as the planning of the distribution of equipment in the various shops themselves.

At the request of the Ministry of Education in 1950, the Servicio undertook the designing of the shop areas for all the

shops of five "Grandes Unidades Escolares." The plans made available included the layout of each shop's equipment and its electrical connections; the design of storage rooms for tools and materials; blueprints of standard work benches and tool bins; and panels and drawings for simple shop furniture.

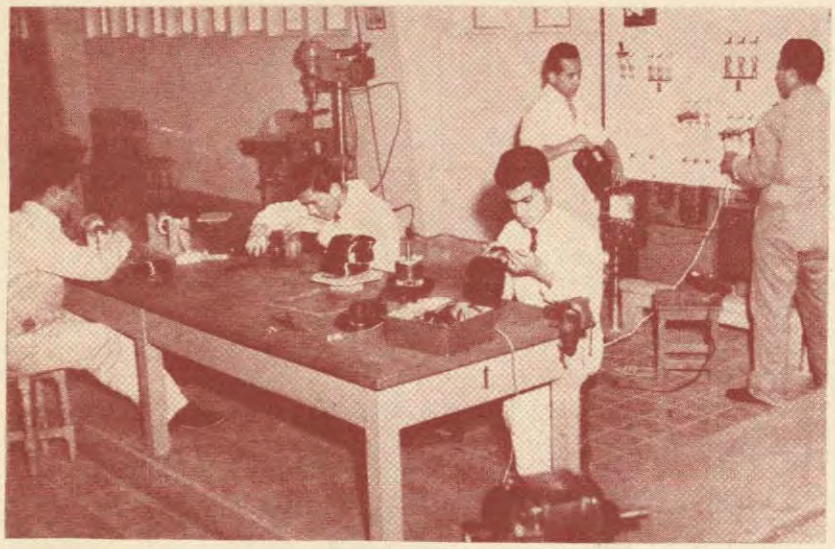
The purchase of $65,000 of equipment for the shops of two new "Unidades" in Lima was entirely negotiated by the Servicio. The lists specifying the essential tools and machinery to equip the basic shops of each school were prepared and submitted to suppliers in August, 1950 for quotations, specifications, and delivery dates. Considerable difficulty was encountered in finding acceptable equipment and many substitutions had to be made. Shipments began arriving in March of 1951.

An inventory system proposed for the maintenance of records in the Peruvian Technical Division by the kardex system was prepared and presented to the director, Engineer Salmón de la Jara.

The Servicio studied and made recommendations that affected the curriculum structure of the industrial schools. By means of trade analyses, and instruction in course planning and construction, changes in the plan of studies could be defined and urged in order to keep the industrial schools in step with modern industrial developments. Mr. Elmer of the IIAA staff visited all of the cities which had auto-mechanics shops. In addition to visiting the industrial schools in Lima at frequent intervals, trips of inspection were made to Sullana, Cuzco, and Trujillo where opportunities were present for conferring with teachers and directors on problems of instruction and school management.

The present shift to the Gran Unida Escolar "Melitón Carvajal" represents a divergence from established practice in this respect. Since 1949, less money has become available for the betterment of existing vocational equipment or buildings. The program of construction of "Grandes Unidades Escolares" was begun and funds were concentrated upon new building construction intended principally for elementary and secondary general education ends.

With the "Grandes Unidades Escolares" incorporating the vocational school programs of their immediate area, new demands are being received from the Ministry for help in planning and purchasing. This type of service, together with a concentration upon the development of a permanent industrial normal school program of training, represented the emphasis of Servicio objectives in 1951. In 1951 and 1952 the education Servicio provided the procurement services for the purchase of new shop equipment for seven "Grandes Unidades Escolares." Funds to purchase these tools and machines, manufactured in the U.S.A., were contributed by the Ministry of Education and SECPANE. Peru contributed approximately $166,666 and the United States government about $103,333 for the tools. Total SECPANE funds are established at a ratio of $2.62 from the Peruvian government to $1.00 from the U.S.A.



Students in the electric shop of the Technical Division of the Central Normal School, Lima, Peru

Prevocational Education in Elementary Schools

Many children leave school at the end of elementary school and go to work. The primary school does not offer orientation in vocations or shop activity. Only a small proportion of the pupils who complete the elementary school go on to high school. And only a fraction of the students in the secondary schools are given shop experiences. Consequently, it was believed that this apparent need could be met by offering elementary industrial arts in the fourth and fifth years of the primary school. In 1946 three schools were selected in which to set up model programs of this nature. Two schools for boys and one for girls were chosen. The girls' program was delayed until the boys' programs were established. The two schools selected were considered fairly typical of Peru. The smaller school is in a rural community near Lima, while the larger one is located in the densely populated Rimac District of Lima. Shops in carpentry, mechanics, and ceramics were organized. SECPANE cooperated with the Ministry by helping with the selection of teachers, writing specifications for equipment, developing plans for building changes, establishing and conducting a training program for the teachers selected, and initiating and supervising the entire program. A guiding committee comprised Comandante Romero, director of Technical Education; Dr. Zegarra Araujo, director of Common Education; and Dr. Manuel Velasco, director of Normal Education. All members of the Ministry worked with Earl N. Gessler in planning this program.

Home-Economics Program

Servicio activity in vocational education for girls in Peru began in 1945 with the establishment of a home-economics program that included parents' education and women's trades. In 1946 the program was expanded to include work in nutrition and health in the rural regions of Puno and Talara and in the Rimac Section of Lima with the co-operation of the health and sanitation bureau of the Peruvian Ministry of Health. In this same year a six-week

short course was given in nutrition and home economics to teachers for the purpose of revising the curriculum for these same industrial schools for women. In 1948, courses in cosmetology began in the Women's Industrial Institute in Lima.

Teacher education courses and the development of instructional materials for vocational school courses for girls were regular functions performed in the years up to the middle of 1950. Shop design and layout and the procurement of equipment for vocational school classes were included among the most important activities of the Servicio in the field of vocational education for girls.

The services of a North American specialist in home economics and her Peruvian assistant were made available during 1951 in order to carry to completion those projects initiated in their field of activity in previous years.

During the fiscal year 1951 considerable equipment was distributed to the industrial schools for women. A total of 13 schools received equipment for their kitchens and dining rooms that included stoves, electric refrigerators, wall cabinets, metal tables with sinks, work and serving tables with shelves, and large kettles and pans as well as working utensils. Most of this equipment came from surplus U. S. stocks in the Canal Zone.

The Servicio specialist in home economics has rendered technical advice and information concerning problems related to the Central Normal School's dormitory arrangements, its kitchen and dining facilities, and its courses of study, special classrooms and laboratories for home-economics subjects.

Publications

One of the first needs noted by the vocational specialists was for technical books and instructional materials in the Spanish language. Although a few publications were available they were usually unsuitable for teaching purposes, too expensive for students to purchase, or obsolete. In most technical areas, no Spanish publications were available.

Because a number of excellent books on technical subjects had been printed in the English language, it was decided to make translations of this material rather than prepare original manuscripts in Spanish. Permission to reproduce well-established books was obtained from the various publishers in the United States. All translating and proofreading was done by specialists and Peruvian staff members in the vocational division.

Since 1946, when the first three books were translated, 36 technical books have been reproduced. Although 1000 or 2000 copies of each book were printed, usually by offset, 14 texts are no longer available because the demand for these books has exhausted the supply. More than 38,000 books have been either donated or sold out of a total of 45,000 copies prepared.

The books are sold at cost to educational institutions. The average cost is S/o. 10. for a 400-page book. Approximately 50 per cent of the paper for publications was furnished by the Peruvian Ministry of Education.

The vocational division of SECPANE also has translated and reproduced nearly twenty pamphlets. Copies of these instructional materials were sent to the various schools in sufficient numbers so that they could be used as textbooks for the operation of the different machines and equipment.

In addition to giving two copies to each of the 43 men's vocational schools and the 25 women's vocational schools, the naval, military, aeronautical, engineering, and navy arsenal schools of Peru each received the same number of books. The U. S. Air, Military, and Naval Missions were given copies as were all other IIAA educational programs in Latin America and the Washington Office of IIAA.

A number of other technical publications are now in various stages of preparation.

A summary of the publications reproduced in Spanish follows:

1946

- Heat Treatment of Iron and Steel
- Industrial-Arts Manual
- Course in Dressmaking

1947

- Shop Arithmetic
- Course in Line Trade
- Fundamentals of Mechanical Drawing
- Course in Electric Welding
- Fundamentals of Alternate Current for Radio
- Course in Carpentry
- Heat Treatment for Metals
- Bench Mechanics
- Elements of Shop Drawing

1948

- Course in Leatherwork
- Mathematics for Plumbers
- Course in Sheet Metal
- Course in Milling Machines

1949

- Shop Mathematics
- Course in Blueprint Reading
- An Introduction to the Art of Instruction
- Fuels and Carburetion
- The Internal Combustion Engine
- Automotive Brakes
- Electrical Systems of Motor Vehicles

1950

- Hand Power and Measuring Tools
- Visual Aids
- Armature Winding

1951

- Shop Organization and Management
- Strip Films, 35 mm.
- The Instructor and His Job
- Technical English
- Shop Mathematics
- Transmission and Drive Units
- Elements of Radio Electricity
- Radio Repairs
- Woodworking and Furniture Repair
- Plumbing Installation and Repair

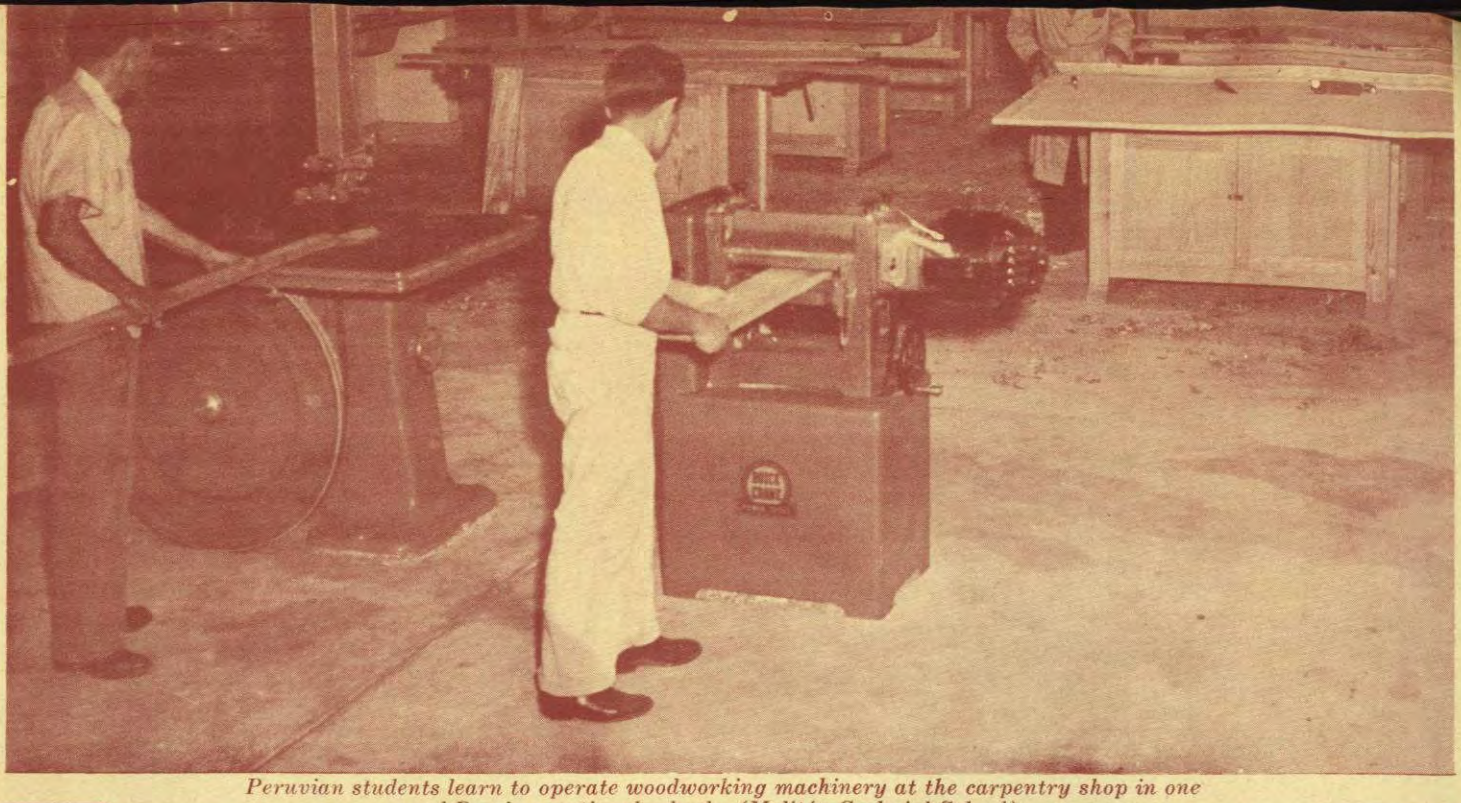
1952

- Chassis, Body, and Trailer Units
- Elementary Forge Practice
- Fundamentals of Direct Current

1953

In progress:

- The Body Finisher, Woodworker, Upholsterer, Painter, and Glassworker
- Body Fender and Radiator Repairs
- Electrical Measurements
- Electric Motor Control
- Alternating Current
- The Junior Radio Repairman Trainee
- Radio Mechanics Instruction Book
- Suggested Course in Sheet Metal Machine Processes
- Applied Mathematics for Machine Shop
- Heat Treatment of Iron and Steel
- Units in Patternmaking and Foundry Work
- School Shop Safety Manual
- The Craftsman Prepares to Teach
- Methods of Teaching Industrial Subjects
- Occupational Analysis
- Methods of Teaching Applied to Industrial Subjects
- Problems of Industrial Education
- Psychology for Industrial Teachers



Peruvian students learn to operate woodworking machinery at the carpentry shop in one of Peru's vocational schools. (Melitón Corbajal School)

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25. POINT IV VOCATIONAL EDUCATION IN PARAGUAY
26. VOCATIONAL EDUCATION IN PERU, 1944-1952
27. FOOD FOR EL SALVADOR
28. BUILDING BETTER HEALTH IN LATIN AMERICA

The above publications may be obtained upon request from

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