

to accomplish the automatic holding of milk for a fixed time at the required temperature and without risk of contamination of the pasteurized milk with raw or partly pasteurized milk.

In 1923 a major development occurred which was later to revolutionize the methods in general use for the heat treatment of milk. This was a patent granted to Dr. Seligman for a heat exchanger of the plate type, and he explained that the plate-heat exchangers now used so extensively in the milk industry were developments of the 1923 British patent. The original cast plates have now been largely replaced by pressed stainless-steel plates with bosses or grooves to provide the necessary turbulence.

Special holder-plates, developed originally for the retardation of flow of milk treated at the higher temperatures, have been largely replaced by flow holders of the tubular type for the high-temperature short-time process. These tubular holders are accurately proportioned to the rate of flow, which is itself accurately controlled to secure the necessary holding time of fifteen seconds. The introduction of the high-temperature short-time process has also demanded accurate control instruments, and the 'diversion valve', designed automatically to divert underheated milk from the main stream, has been perfected. Electrical heating, originated by Beattie and Lewis in Liverpool in 1917, is now in use commercially in some high-temperature short-time plants in the United States.

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## AMERICAN EDUCATION

IN the United States the Office of Education forms one department of the Federal Security Agency. In his annual report to the Federal Security Administrator for 1949, the Commissioner for Education directs attention to inadequacies in the educational system which sound very familiar to educationists in Great Britain. The teacher shortage, for example, bears a striking similarity to the position in Britain. During 1948-49 approximately 28,000,000 children enrolled in the elementary and secondary schools, and a startlingly rapid increase in this number has already begun. By 1960 the number of children enrolled in elementary and secondary schools will be about 37,000,000, with the most rapid increase occurring in the three school years beginning in 1952, 1953 and 1954. The available teachers fell far short of the number needed even to staff the classes assembling in the autumn of 1949. This shortage exists largely among elementary school teachers, and in many communities the shortage of teachers has resulted in classes of more than fifty children. In others education has been curtailed by dividing the school day into two sessions, one group of children attending in the morning and another in the afternoon. Thousands of classes are taught by teachers who hold only emergency or temporary certificates.

Income is a significant factor in recruiting and keeping teachers in the profession, but is by no means the only one. The status which the teacher occupies in the community, the regard of the public for the work of the schools, the opportunity to live a normal life unhampered by local conventions and projects and a number of other psychological and social factors are no less important. In too many communities in the United States teachers are required to adapt their own tastes, conduct and social activities to those of members of the school board or other

prominent citizens. They are often expected to lead an abnormally restrained and inhibited life compared with the life of the parents who impose such restrictions.

The critical shortage of teachers is matched by an arresting lack of schools. If all the needed teachers were available to-day many would have no suitable rooms in which to conduct their classes. A shortage of school buildings is in part the result of the depression of the 30's and in part the result of restrictions on construction during the war years. As a result, many children must attend classes conducted in obsolete, insanitary and frequently dangerously dilapidated structures. Many of the buildings which are physically sound are inadequate in terms of the functions of modern education. Some teachers during 1948-49 were conducting their classes in church basements, factories and stores and other unusual locations. It is difficult to say how serious is the shortage of classrooms; but, assuming thirty to be a suitable number in any one class, the number of new classrooms required each year to accommodate new enrolments up to 1958 will be approximately 25,000.

One interesting section in the report deals with the place of Communism in the schools. In the spring of 1949 the Educational Policies Commission of the National Education Association issued a report which makes four specific recommendations.

(1) Young citizens should have an opportunity to learn about the principles and practices of totalitarianism, including those represented by the Soviet Union and by the Communist Party in the United States.

(2) Teaching about Communism or any other form of dictatorship does not mean advocacy of these doctrines. Such advocacy should not be permitted in American schools.

(3) The schools should continue with vigour their programmes for giving young citizens a clear understanding of the principles of the American way of life and a desire to make these principles prevail in their own lives and in the life of their country.

(4) Members of the Communist Party of the United States should not be employed as teachers.

These proposals are supported by the Commissioner, who argues that children are not sent to school to be indoctrinated with a closed system of philosophy or the political views of the teachers. To the extent that education becomes dogmatic indoctrination, it ceases to be education.

"The Communist embraces and teaches dogma. He is, by his Party membership and sympathy, committed to a closed system of thought. He has given his allegiance to a predetermined set of principles which are not to be evaluated in the light of evidence or examined on the basis of results. He is not free to serve the truth as the evidence may uncover that truth. He has therefore surrendered his right to teach in a nation of free people. In this the Communist is not alone, of course; but the fact that there are those others whose commitments prevent them in some measure from pursuing the truth does not justify the retention of Communists."

The report also contains valuable sections giving details of educational research and statistics, the administration of grants, programmes of organisation and administration, programmes of instruction, programmes for improving the professional status of teachers, and, finally, the position of the United States in international educational relations.

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