

## MILITARY SCIENCE

# USES Advises on Deferment

**Draft boards must consult local employment office before inducting any man who is alleged to be in a critical war occupation.**

► DEFERMENT of military service for physicists, chemists, engineers and other men in critical war occupations is now up to the U. S. Employment Service, not solely to the local draft board.

Latest directive of the National Headquarters, Selective Service System, requires local boards, whenever they decide that a man alleged to be in a critical occupation is not entitled to occupational deferment, to refer the case to the local office of the USES.

Then, within 30 days, USES must decide whether the man is actually fully employing his qualifications in a critical occupation in the war effort. If he is not, but is qualified to do so, it is then up to USES to get him a job where he will use his talents in some essential job.

If USES certifies to the local draft board that the man was in a critical job or that they have placed him in one, then the draft board is required to consider this new evidence as basis for deferment. If the 30 days go by and the USES fails to certify that he is essential in a civilian occupation, then the draft board may go ahead with the induction.

Meanwhile, the War Manpower Commission has notified local offices of USES of the importance of expediting all such requests from the local draft boards. In the case of scientists and other profes-

sional men, they are urged to consult the National Roster of Scientific and Specialized Personnel. The occupations listed as "critical" are those which in the judgment of the War Manpower Commission can not have any substantial number withdrawn from them without serious shortages resulting.

"It is imperative," Director Lewis B. Hershey said, "that registrants engaged in critical occupations in war production or in support of the war effort should be given grave consideration for occupational deferment by the agencies of the Selective Service System. Administrative action will be taken to insure such consideration by the Selective Service System."

In case a professionally qualified employee considered to be working in an essential activity is kept in Class 1-A and scheduled for induction by his local board after the matter has been referred to the USES, the individual or his employer is urged by Dr. Leonard Carmichael, director of the National Roster, to let the Roster know immediately, giving the registrant's name, address, local Selective Service board address, order number, name and address of employer, description of present job, and Roster registration number.

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of the irradiated substances keep on glowing briefly after the ultraviolet lamp has been turned off. This glow, in many cases lasting for only a fraction of a second, has been termed phosphorescence. Among the substances showing this property are human teeth, wool, coral, dried potato and several other materials of both animal and plant origin.

Because of the short duration of this phosphorescence, ordinary microscopic observation has not been possible. Drs. Harvey and Chase, however, thought of the expedient of getting a large number of intermittent flashes, so close together that they appear to merge into one continuous illumination, like the rapidly succeeding "frames" of a motion picture.

Several different means for achieving this end have been devised. In some, the ultraviolet ray source is an intermittent spark, with a rotating shutter shielding the object-lens of the microscope while it is "on" and opening it for the passage of the phosphorescent flash when the spark is "off." Simpler, however, is a continuous source of ultraviolet with a double rotating shutter having staggered openings that alternately admit the ultraviolet rays and open the path for the phosphorescent light to the lens.

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## MEDICINE

## Sex of Twins in Doubt; Case Rare in History

► THE QUESTION, Is it a boy or a girl? can not yet be answered for two babies of New York City, although they were born nearly a year ago. The babies are identical twins. Their strange case is reported by Dr. Adrian Rhodes, of the department of pediatrics, New York Medical College, Flower and Fifth Avenue Hospitals. (*Archives of Pediatrics*, October)

The babies were thought to be girls when they were born. One of them was brought to the Flower-Fifth Avenue Hospital, when seven weeks old, because of a bad cold and intestinal disturbance. At first glance, the infant was again considered a girl but further examination showed that it was a pseudohermaphrodite. The other twin was sent for and found to have exactly the same condition.

Hermaphroditism is a condition in which sex organs of both sexes are found in one individual. The word comes from the old Greek myth about the child of Hermes and Aphrodite whose name was Hermaphrodite. Pseudohermaphroditism

## PHYSICS

# New Microscope

**Instrument which permits examination of objects by their own shortlived glow after ultraviolet irradiation, opens new field to research.**

► A NEW KIND of microscope, that promises to open up new fields for exploration in biology and mineralogy, has been devised by Dr. E. Newton Harvey and Dr. Aurin M. Chase of Princeton University. It is called the phosphorescence microscope because it makes use of the short-lived phosphorescent glow given off by many substances just after they have been exposed to the action of ultraviolet radiation.

That many things shine in the dark with peculiarly-colored visible light when invisible ultraviolet rays strike them is a well-known phenomenon. This light is called fluorescence; and it has been much used in research during recent years. Special fluorescence microscopes have been devised to aid in this work.

When the ultraviolet irradiation stops, fluorescence stops with it. However, it has frequently been noticed that some

is a condition in which the sex of the individual is in doubt.

The condition is rare in twins. Only eight previous cases in twins have been reported in medical history, and of these six were either born dead or died in early

infancy. From their external appearances, Dr. Rhodes believes the twins he reports are male pseudohermaphrodites. When they are older, further examinations will be made to find their sex.

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#### RESOURCES

## Critical Coal Shortage

**Low temperatures may prevail in homes in many sections of the country this year due to the lack of sufficient fuels of all types.**

► RESERVE COAL stockpiles are reported low in various sections and low temperatures may result in many homes this winter unless increased production and shipments meet the daily needs. Even the quota allowed to retailers by government officials, 90% of last year's supply, may not be available in certain communities.

The reason is a coal shortage which will probably grow worse as the activities incident to war continue to expand, unless production can be increased. For a substantial period the production has fallen below the level of national requirements.

The best proof of this statement rests in the fact that in the period from Jan. 1 to Sept. 1 of this year, consumers' stockpiles of bituminous coal were reduced from 85,889,000 tons to 75,292,000 tons. Production in that period lacked 10,597,000 tons of equalling requirements, and the difference had to be made up from reserves.

That is only half the story. During the same period last year stockpiles were increased by nearly 20,000,000 tons as protection against future requirements. This year, instead of building up reserves, production did not meet current needs and consumers were forced to burn stockpiles.

In September, 1942, it was estimated

by the Federal Solid Fuels Administrator that 600,000,000 tons would be needed for 1943. Consumption so far shows this estimate to be close to the mark. Production as of Oct. 1 was a little less than 445,000,000 tons. Even without strikes it would be a practical impossibility to reach the 600,000,000 goal now.

The anthracite situation is even worse than the bituminous coal situation. It was estimated at the beginning of the year that 65,000,000 tons would have to be mined to meet all requirements. This is an increase of 10% over the production of the previous year. Actual increased production to date is less than 1%.

Anthracite is the number one household fuel in the North Middle Atlantic States, and large quantities are used in New England although fuel oil was the most used fuel there in normal times. New England now is reported to be in a bad situation, with many communities whose local stockpiles are exhausted.

The price factor does not enter into the present coal situation to any considerable extent. Ceiling prices established by OPA permitted an increase of about 25c a ton for bituminous coal and 50c for anthracite to meet mining adjustments.

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comfortable seat, air conditioning, the latest magazines and meals.

Air "freight trains," employing glider pick-up service, to come after the war will change this cargo picture, Grover Loening, consultant on aircraft for the WPB, reported to the Institute of Aeronautical Sciences meeting in Washington. He emphasized the tremendous commercial aspects of the glider pick-up air train. Developments initiated by the late Richard Du Pont and use by the Army Air Forces have greatly accelerated the progress in this field. Though just beginning, this type of service is now out of the stunt class and into the practical, Mr. Loening stated.

Using the hypothetical example of an air trip between New York and Washington, Mr. Loening pointed out that a glider train carrying cargo designated for intermediate stops on the run, could unload and pick up new cargo without losing valuable time by stopping to land and could make the complete trip in 81 minutes with an average rate of speed of 168 miles per hour.

The same trip, using a present-type cargo plane without a trailer, would take 168 minutes with an average rate of speed of 82 miles per hour due to the frequent stops for loading and unloading. On the same trip by glider train, non-stop passengers bound for Washington would be placed in the tug, or powered, plane.

These air freight cars, Mr. Loening explained, will not be strung out in a single line behind the tug plane, but will be fanned out on different length cables to prevent any chance of collision. They will not be the clumsy, box-car shape that the word "freight car" brings to mind, but will be the ultimate in stream-lining to eliminate all surface drag.

It is generally assumed at this time that having more than three gliders in the train is impractical.

Advantages of such a system of glider pick-up air trains, as pointed out by Mr. Loening, will be the time saved in cargo handling; the lower freight cost for air cargo; the many points along a route served without stopping to land; the use of shorter runways already in existence as a glider needs less length to land; the lack of vibration in a glider carrier, which will permit the fast and safe shipping of perishables; less fire and crash risk as the gliders carry no engines, so if something should go wrong with one of three gliders, this glider could be automatically released and 75% of the load

#### AERONAUTICS

## Air "Freight Trains"

**Post-war planes, using glider pick-up service, will make safe, speedy and cheap delivery of cargo. This type of service is now out of the stunt class.**

► IT COSTS less per pound to ship your wife by air from Washington to Mexico City than a pair of shoes, and

the shoe package needs only a pair of legs to get it on and off the plane, while your wife demands attentive service, a