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that they must master in their profession. They must be good at elementary mathematics and at understanding mechanical devices and diagrams. They must be able to read maps and weather reports. They must be good leaders.

Finally, they must have good judgment. The navigator who had poor judgment would never be able to find the objective. The bombardier who had poor judgment would not be able to place the deadly missiles accurately on the target. The pilot who had poor judgment might take all hands crashing to their death.

The qualifying examination which picks men who can meet these demands and screens out those who would waste training time and eventually wash out is not exactly an easy test. Only about half the men who have taken it so far have passed and been appointed.

But this qualifying examination is one of the most important of the Army's war weapons. For it is because of this test and the classification tests taken later that the Army is able to make the most effective use of our most precious of all resources—manpower.

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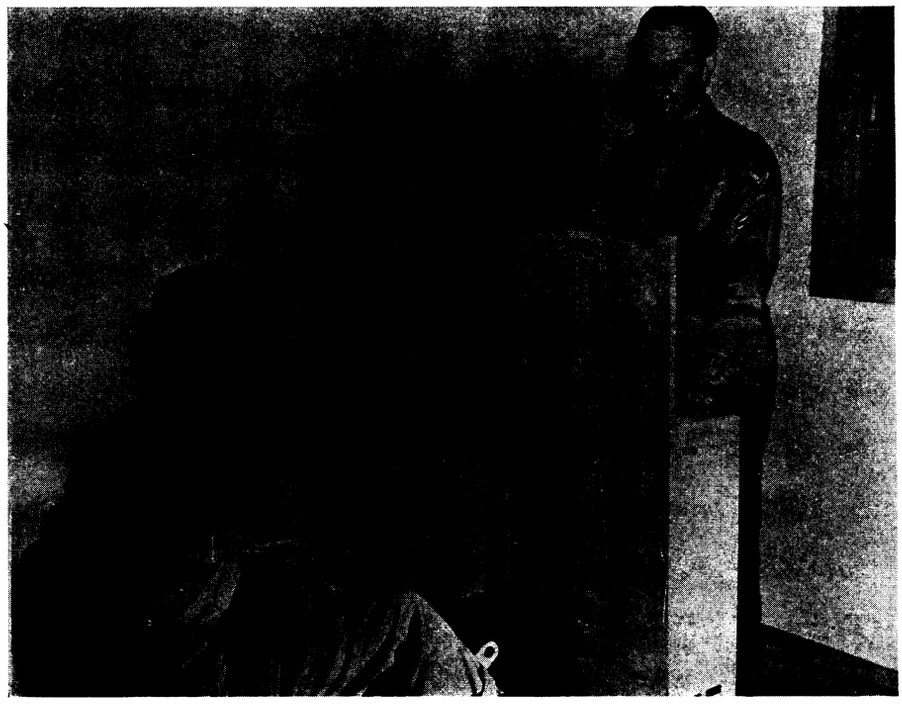

***FORETASTE OF FLIGHT** is given aviation cadets by new psychological tests being developed by Army scientists. This picture shows a cadet working joy stick and rudder bar in response to flashing light signals to determine his coordination of the movements of his hands and feet. Official photograph of U. S. Army Air Forces.*

PHYSICS

Power From Sunbeams

The post-war world may get its energy by snatching it from the sun's rays. Main obstacle is that power produced depends on area over which light is gathered.

➤ MAN IS harnessing the sun to supply power for his home, factories, and vehicles. Long a dream, present research indicates that the future world may be powered by energy snatched from a sunbeam. But practical application awaits results of the long range research program now being conducted.

Many such glimpses of happenings in science are presented in the annual report of the Smithsonian Institution.

Utilization of scientific advances in post-war reconstruction, however, will require sources of power not dependent on dwindling resources.

Energy equal to 21,000,000,000 tons of coal which the sun showers on the surface of our globe every hour, offers fascinating possibilities.

There is one major obstacle to harnessing this power: economics. Power produced, the report indicates, depends directly on the area over which solar energy is gathered. This would need to be large and the cost consequently high. Solution of this problem has been a foremost objective at Smithsonian.

Dr. Charles G. Abbot, secretary of the Institution, has built highly efficient solar engines which have come close to eco-

● RADIO

Saturday, October 17, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Selman A. Waksman, microbiologist of the New Jersey State Agricultural Experiment Station, will tell of some of the disease-producing germs in soil and of soil microbes that destroy them.

Tuesday, October 13, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

One in a series of regular periods, over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.

nomic practicability compared with other power-producing systems.

Various possibilities of solar energy are outlined in the Smithsonian report by Dr. H. C. Hottel of the Massachusetts Institute of Technology, where experiments are also being conducted. Their program calls for exploration of all the possibilities of economic conversion of solar energy into forms useful in industry.

One method would be direct conversion of the sun's rays into electricity. This would be based on the principle of the thermocouple. That is, when two wires of two different elements are joined and the junction is heated, a small part of the heat is converted into electrical energy. Efficiency here depends on the properties of the two materials used. Intensive study is now in progress, Dr. Hottel reports, to learn which metallic compounds give best results.

Another apparatus is operated by photoelectricity—the same principle which operates the exposure meter used by photographers. Here the light strikes a prepared metal plate which also results in conversion to electrical energy.

Or perhaps we can duplicate nature's own method of storing solar energy, it is suggested. Through chlorophyll, the green stuff in leaves, sunlight is stored in growing things. Perhaps millions of years later it is released by the burning of coal or oil. It is hoped that through a thorough understanding of nature's process, we may be able to make synthetic fuels out of easily available chemicals.

Atomic power, discussed by Dr. Ernest O. Lawrence of the University of California, is also much in the news. Recent progress must be kept secret at this time. But up to about a year ago the status was about that of aviation 50 years ago. That is, the basic principles are known, but practical application awaits the development of a new instrument or technique.

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PUBLIC HEALTH

Wear a Sweater

With fuel rationed and office and home temperatures low, it will be aiding to win the war if you dress yourself in warm clothing, physicians advise.

➤ "WEAR A SWEATER and help win the war" is the slogan suggested in a report to the OPA by a committee on health aspects of fuel rationing. The report, tentatively accepted by the OPA, is summarized in the *Journal of the American Medical Association* (Oct. 3).

There is a "dearth of scientific information as to tolerable minimum temperatures," the editor of the *Journal* points out. So the medical advisory committee to the OPA, headed by Dr. Leverett D. Bristol, of New York, had to disregard standard published recommendations for heating and ventilating comfort and attempt to establish a safe zone at a lower temperature which would protect health and not be too uncomfortable.

Temperatures of 60 to 80 degrees Fahrenheit, majority opinion 65° F., were considered the minimum for the average private home, apartment house, stores, office buildings and schools, with a range of 60° to 70° F. for the latter. For hospitals and sanatoriums, temperatures of 68° to 80° F. were recommended, the majority opinion holding for 70° F. except operating rooms, which should be 80° F.

Homes with one or more children under four years, one or more persons over 65 years, one or more cases of illness, and convalescents or those with low vitality should have a temperature of not less than 70° F.

Our winter indoor temperatures in the past have been too high and our atmospheres too dry. The English, the committee points out, believe as a result of experience with radiant heat that a 60° F. dry bulb temperature is adequate if room occupants are properly clothed. This is the cue for the wear-a-sweater slogan the committee suggested to emphasize the point that each of us must be his own clothing engineer and take care of winter health and comfort in over-cooled rooms by dressing for the new indoor weather.

"The body adjusts itself readily," the summarized report states, "to temperatures at least 10 degrees below what we in the United States consider the standard temperature for dwelling houses."

"Reduced indoor temperature is less apt to injure persons in good physical condition and having good health habits," the summary continues. "The usual recommendations relative to exercise, sunlight, food and rest are stressed. Adequate clothing, and especially foot covering, is emphasized. Cold baths of short duration are recommended for certain persons. Overfatigue should be avoided.

"While most of our winter ills are due to bacterial and virus infections, scientific evidence shows the important relationship of lowered resistances and changes of weather to these conditions. There is little experimental evidence to show what an individual in a wartime economy can get along without in his artificial heat requirements without injury to health."

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