

tween the belt stars and the sword stars in Orion is sometimes called the Bay Nebula, sometimes the Horsehead. It is a mixture of dark and bright nebulosity, clouds of dust and gas. Distance about a thousand light years.

Next is the 5-centavo stamp showing the total eclipse of the sun. The shape of the corona depends on the time of the eclipse in the sun's eleven-year sunspot period. Recent investigations have indicated that highly ionized atoms of iron, nickel, and calcium are responsible for the brighter radiations of the sun's corona.

At the right is the 10-centavo stamp showing the spiral galaxy in the Hunting Dogs, Messier 51. The spiral is seen face on, and above it is a great gaseous nebulosity, at the end of one of the spiral arms. The system is composed of billions of stars, and the whole group is separating from our somewhat similar galaxy at the rate of about 160 miles a second.

On this page, the first stamp shown, is the 20-centavo stamp. The spiral galaxy NGC 4594 is an enormous flattened system of stars about seven million light years distant. The individual stars cannot be seen with the most powerful telescopes. The spiral is receding from our galactic system with a speed of 700 miles a second—a local indicator of the expansion of the universe. The dark line across the galaxy is produced by clouds of absorbing dust in its Milky Way plane, dust of the same sort that makes the Bay Nebulosity on the 2-centavo stamp.

The 40-centavo stamp, next, shows the famous Ring Nebula in Lyra, visible with a moderate-sized telescope. The Ring apparently is a part of the

central star, a great shell of atmosphere that blew off long ago, making the star temporarily a "nova." The four stars outside the Ring belong to the field and have nothing to do with the Nebula.

On the one-peso stamp at the extreme right is what may be one of the first scientific plottings ever to appear on a postage stamp. It is the famous Russell

diagram and shows the observed relation between the candlepowers of stars and their surface temperatures, or in other words, between their absolute magnitudes and spectral classes. The sun's place is in the middle of the longer sloping streak—a star of average color and average candlepower.

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#### ENGINEERING

## Save Waste Light

**Illumination falling on dark surfaces in war plants must be salvaged for victory. Brighter color contrast may double visibility with same light.**

► VISIBILITY in factories may be greatly increased, sometimes even doubled, without any change in the lighting system, by the use of high-reflecting paints and contrasting colors. This was described at the meeting of the Illuminating Engineering Society in St. Louis by Arthur A. Brainerd of the Philadelphia Electric Co., and Robert A. Massey of E. I. du Pont de Nemours & Company.

Light which falls on dark walls, floors and ceilings, or escapes to the rafters, is waste light which, along with other industrial wastes, must be salvaged for victory, in the opinion of these engineers.

By painting these surfaces, as well as bench and table tops with light-colored high-reflecting paints, this light may bounce from the surfaces many times and thus be used several times over. By making these changes in a small test room, the visibility was increased from an original 27% to 55%, a 100% improvement. Similar changes made in

a number of factories gave very satisfactory results, it was reported.

Particularly important is a ceiling under the rafters. A light colored floor also adds visibility to all sides of a machine.

These background colors should be weak colors, such as horizon gray, and cream, the engineers said. Also they should be matt or dull finish, since it is the diffuse light that makes objects visible.

Since surroundings will be bright, color contrast must be relied on, rather than brightness contrast, to bring out the machinery and work. These colors must be stronger than the background colors, but not too strong, for strong colors fatigue the eye. Rather they should be

**HONORING ASTRONOMY — Mexico has issued this series of stamps of particular astronomical interest. The meaning of the stamps is described in the article on this page.**



pastel shades, colors that are easy to live with all day.

Two colors very suitable for this purpose are "Spotlight Buff" and "Spotlight Green," the engineers have found. These "spotlight" colors provide what

they call "three-dimensional seeing." This system has received warm praise in the factories where it has been applied. The seeing was not only better, but pleasant and restful to the eyes.

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PSYCHOLOGY

## Work—But Not for Pay

War-lonely women, emotionally stranded when their husbands go to war, are advised to volunteer for a war job, but if possible to refuse wages.

➤ WAR-LONELY WOMEN who don't need work, but who want to get a war job as a means of forgetting their troubles are advised to volunteer for work with the Red Cross, OCD or some similar job without pay. This counsel comes from a Washington psychiatrist familiar with the problems of war-hit women, Dr. Benjamin Karpman, of St. Elizabeths Hospital, in Washington, D. C.

"A woman who accepts work at a salary may have her time well occupied while she is on her job," Dr. Karpman said. "But when she goes home at the end of the day to her empty room, the pain of separation from her sweetheart, her husband or her son returns. She is emotionally stranded."

"If, however, she can feel that she is giving of her time, her strength and her life for the winning of the war in just the same way as is the man she loves, she is building a tie between them that the miles of distance can never destroy. This dissipates her anxiety."

The plight of the "girl he left behind" is a serious one from the standpoint of mental health, Dr. Karpman emphasized. It is especially hard for the young war bride whose husband has gone to the front.

The painful loneliness of the emotionally-stranded woman is built up by the continual denial of the instincts normally satisfied in married life. A woman's instinct, Dr. Karpman explained, is like a negative electrical potential. Electricity cannot flow until the negative charge finds a path to a corresponding positive charge. In very much the same way, a woman's unsatisfied love builds up a potential of emotion which cannot be dissipated until she is re-united with her husband.

If, however, the lonely woman can

find a "cause" or an occupation that she more or less unconsciously links in her heart with the absent loved one, she can lavish on her work the emotional energy that is pent up within her. This sort of substitute for normal family life can never quite take the place of the real thing, but it will give a lot of satisfaction, especially if it is work that is generally considered worth while and necessary.

The same satisfaction is obviously not found in a job for which payment is taken. This involves no sacrifice — no labor of love—it becomes a mere exchange of time for money without investment of emotion.

GEOLOGY

## Oil For Alaska Highway

➤ AVIATION GASOLINE and diesel engine oil will soon be flowing through a new pipeline toward the Alaska highway from oil wells and the world's most northern refinery at Fort Norman on the Mackenzie River in Canada 125 miles south of the Arctic Circle. Vast untapped tar sands in northern Alberta are being mined for oil, gasoline, asphalt and coke.

The wells at Fort Norman have been in existence since 1921. They were little used, however, in fact were capped until 1930, when discovery of radium on Great Bear Lake shores brought aerial prospectors in vast numbers. Shortly after the outbreak of war a new refinery was built at Fort Norman producing aviation gasoline and diesel engine oil. This plant, according to Munitions and Supply Minister C. D. Howe, has now been expanded, and will likely be in use for a longer period than just during the summer, as it has since installation.

A young girl who has not yet found a permanent attachment may be lonely, too, with so many boys gone to camp or away to war production jobs. But she can always hope for her Prince Charming to come to her, perhaps in the person of some soldier home on furlough. Meantime, she can find diversion in dancing or going to the movies with whatever boys may come and go in her neighborhood.

But whenever a young woman accepts the courtship of a man, somewhere back in her mind, perhaps unconsciously or perhaps half-consciously, is the hope that it may realize itself in marriage. Going out with a stray young man takes away that hope and, therefore, she doesn't get as much satisfaction from her diversions as she would otherwise.

It must also be remembered that as a majority of the younger men are disappearing, the proportion of women keeps increasing, and the opportunities for going out with the opposite sex are proportionately decreasing.

Such diversions are not possible, however, to the woman who has already found her Prince Charming and married him. She has had, perhaps, a few blissful weeks or months of happy married life and then when he went to war she was left with an emptiness in her heart which only he can fill.

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"An intensive study of the tar sands is under way at present time," stated Minister Howe, in Parliament. "Today we think of that area as a source of immediate oil production, provided the problems connected with its development can be solved rapidly and with some degree of certainty. Arrangements have been made to develop further the wells on the lower Mackenzie River at Fort Norman. Additional wells are being drilled, the refinery capacity is being increased, and a short pipeline is being installed to bring the oil across to the location of the Alaska highway."

From the sands along the Athabasca River in Northern Alberta, Indians have since time immemorial used pitch to caulk their canoes. The first white man to come into the area in 1788 found the oil sands to stretch for miles, in some places found oil bubbling to the surface. Since the settlement of Alberta many attempts have been made to obtain oil