

controlled. Close to 40 per cent. more cases of smallpox were reported in this country during 1938 than were registered in 1937. Luckily, the cases were of the so-called mild form of the disease, which causes few deaths. However, sooner or later, certain of those communities which continue to regard this mild form of contagion too lightly, will awake to find the more virulent type of smallpox raging in their midst with all its dire consequences. Why do these places persist in taking this serious risk when it can be avoided so easily by community-wide vaccination?

Will the present favorable health conditions continue during the coming year? In general, I think they will; but no such statement can be made without reservations and safeguards. So much depends upon the occurrence of major epidemics, weather conditions, and other "acts of God," that no one can now predict with reasonable accuracy the final outcome. No one can foresee such disastrous visitations as nationwide epidemics of disease, floods, droughts, earthquakes or prolonged periods of extreme temperature. Barring these, however, it is safe to say that 1939 will be another very favorable year in the health of the American people. I do not believe, however, that the unprecedentedly low influenza death date during 1938, will be maintained in 1939. That is too much to expect in the light of the past performance of this disease. If we have more influenza, we shall probably have more pneumonia, but even so, with wider use of serum therapy the mortality may still decline further.

Polio May Increase

It is reasonable to suppose that owing to the very low incidence of poliomyelitis this year, there will be some increase during 1939. On the other hand, measles, following its usual cycle, is almost sure to show a sharp decrease. Perhaps it is too much to hope for a decline in smallpox, but possibly the mounting incidence of the past few years will frighten enough people into being vaccinated to reduce materially the number who are susceptible to the disease. In that case some decline in the number of cases may be expected. Nothing at present indicates any unfavorable changes in the prevalence of the other important communicable diseases.

On the whole, the augury for the coming year is most propitious. At no time in the history of our country have there been so many signs of popular interest in public health affairs. The widespread

and active campaign against venereal disease, the ambitious program advocated by the American Tuberculosis Association, and the successful National Health Conference at Washington in July, all emphasize the keen interest that is being manifested in communal and individual health.

With such evidence of public interest and support, it is needless to say that there will be no letup in the good work of the past. Rather, we can look forward to even more active and capable handling of our many health problems. All this moral and material backing is bound to benefit the work of our health de-

partments, to encourage fruitful research work and to increase and improve the medical facilities available to the indigent and less fortunate members of society.

Not the least favorable aspect of the present movement is the whole-hearted response that has been received from the press and organized medicine. This makes it unanimous. There never has been a time when the health prospect seemed so auspicious. Barring unforeseen and uncontrollable acts of nature, 1939 should prove to be another milestone on the road to better health and longer life for our people.

Science News Letter, December 31, 1938

PHYSICS

Theories of Solar Energy Also Forecast End of World

CARBON, so vital to life on earth, is now revealed as the transmuting catalyst in the sun which makes it possible for hydrogen atoms to combine into helium and thus release the vast store of nuclear energy which makes the sun shine on and on through the ages.

The Morrison Prize of \$500 to Prof. Hans A. Bethe of Cornell University for the theory which produces this picture of the cause of solar energy brings public recognition to something which scientists have known for some time.

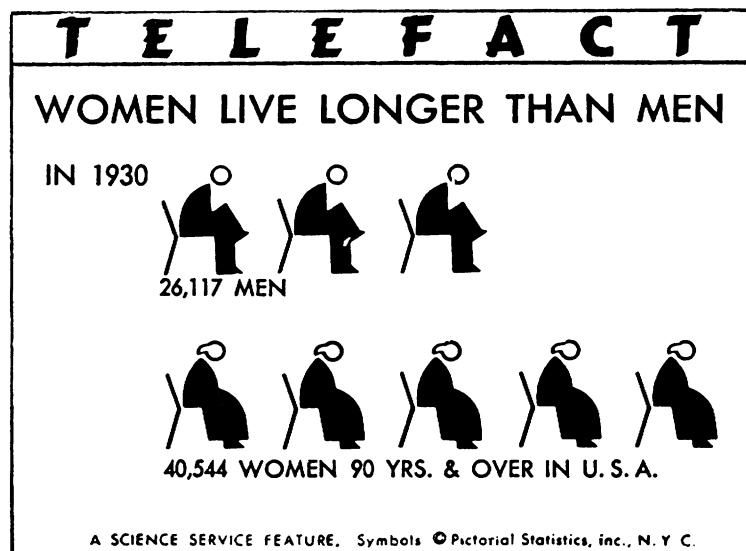
The details are ingenious and important. Carbon atoms are transmuted by swift-moving hydrogen nuclei into nitrogen. These nitrogen atoms are again struck by hydrogen particles and eventu-

ally create helium atoms and regenerate carbon atoms with the release of enormous energy. It is the hydrogen on the sun which is used up in the process, while the carbon content of the sun remains pretty much the same.

But many people will leave the intricate details of the process to the scientists and jump mentally onward to a most important question for all of man's descendants on earth in the millions of years to come.

That question is, "What happens to the sun and to the earth as the sun goes on using up its hydrogen to create the solar energy?"

And the answer, as scientists now see the picture, is one of (*Turn to page 427*)



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flaming death for the earth, as contrasted with former pictures of the earth becoming colder and colder as the sun's energy diminishes.

True, the sun probably will become a cold body and hence the earth, too, will sink into an ultimate frozen state, which is known already to have overtaken other stellar objects.

But before that day comes, the sun is going to become much hotter than it now is and life on earth, as man knows it, will probably end. That forecast of the end of the world is an outgrowth of the theory of Prof. Bethe on the transmutation of hydrogen into helium on the sun as the cause of solar heat and radiant energy.

Prof. George Gamow at George Washington University ten years ago worked out the theory of nuclear transformations which made it possible to calculate exactly the rate of energy liberation due to the transformation of the elements at the enormous temperatures of several million degrees existing inside stars and particularly inside the sun.

In recent work Prof. Gamow has extended his studies to include the evolution of stars as they transmute their hydrogen into helium atoms. The main result of the constantly decreasing hydrogen content, it is pointed out, is to increase the luminosity of such stars and to increase their outpouring of energy.

Prof. Gamow estimates that the sun at the present time consists of about 60 per cent. hydrogen. Most important, the sun is bound to become about 100 times brighter than it is at present when its hydrogen content drops only a few per cent.

"Such brightening of the sun will necessarily lead to the melting of the earth and, of course, to the disappearance of life," he stated in a recent lecture.

This then, at the present time, is the

best concept of the end of the world. But before alarms need be raised by present occupants of the earth it should be added that while the sun may be getting hotter it is doing so most slowly as measured by man's calendar. Scientists suspect that there has been no observable climatic change in historical time due to an increase in the luminosity of the sun. Hence the end of the world, from this cause at any rate, is millions upon millions of years in the future.

Science News Letter, December 31, 1938

ASTRONOMY

"Poor Man's Platinum,"
For Telescope Mirrors

WHITISH metallic rhodium, often called the poor man's platinum because it is widely used for low-cost jewelry and such humble items as collar buttons, may soon be destined for the more lofty role of coating great telescope mirrors and gathering star light from the outermost depths of space.

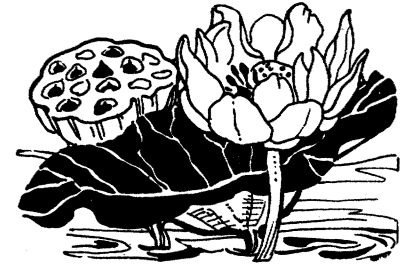
Studies at the National Bureau of Standards by Dr. W. W. Coblentz and Ralph Stair show that rhodium has several special properties which make it desirable as a surfacing material for telescope mirrors.

Standard mirror coating for many years has been silver, but recently scientists have sought to avoid the serious and annoying blackening of the silver through oxidation. This has meant the resilvering of some telescope mirrors every month.

Rhodium's application by electrolytic action is a standard commercial process today and one that can be done at low cost.

Rhodium's reflectivity, as measured by Dr. Coblentz and Mr. Stair, is superior to chromium in the visible region of the spectrum but not quite so good in the ultraviolet. Silver is very good in the visible but very poor in the ultraviolet wavelengths.

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Improper Names

A ROSE by any other name would smell as sweet, we have been assured by generation after generation of Shakespeare-quoters. Doubtless; but it would cause no end of confusion and perhaps some annoyance if some people should insist upon calling it a thorn-buttercup or a shrub-strawberry. Yet that is no worse than we do with many fine flowers that are entitled to honest names of their own.

Miss Alice Early Hyde calls attention to some of these improper names of our native plants, in *Wild Flower*, the official publication of the Wild Flower Preservation Society.

Misapplication of the name, grass, is particularly and annoyingly frequent, Miss Hyde points out. Thus, we have blue-eyed grass, which is a member of the iris family; yellow star grass, which is an amaryllis; grass of Parnassus, a saxifrage; Whitlow grass, a crucifer; poverty grass, belonging to the rockrose family.

And that word rockrose brings up some more improper names. For though some of the rockroses grow among rocks none of them are roses. And though the tuberose has tubers it isn't a rose, either. And the rose mallow is a mallow and not a rose. Nor is rosemary a rose, nor are rose geranium, rose bay, rose of Sharon and guelder rose at all closely related to the rose family.

Lilies also have alien plants thrust upon them under lily aliases. The calla lily is a cousin of Jack-in-the-pulpit, and the water lily is much more nearly akin to the magnolias and buttercups than it is to lilies. Also, a lovely little plant that is a true member of the lily family is compelled to masquerade under the wholly misleading name of dogtooth violet.

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