

## AGRICULTURE

**Europe's War Creates American Cheese Problem**

**A**MERICA now has a cheese problem, the result of European war conditions which are interfering with shipments of rennet from such countries as Denmark, Germany, Italy and Poland.

A warning that the United States had better look to American sources of rennet, is sounded by the U. S. Department of Agriculture. Rennets, which are calves' stomachs, are the source of an extract used to curdle milk. The extract is used in making cheddar or American cheese, the leading type of cheese produced in this country.

Rennets can readily be prepared in any country, the Department explains, and no effect on prices or supplies of American cheese is foreseen, for want of imports.

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## ARCHAEOLOGY

**Records on Clay Tablets Match Situations in Bible**

**A**LTHOUGH the life stories of Abraham, Isaac, and Jacob were handed on by word of mouth for a thousand years before the Book of Genesis was written, they provide a true and undistorted picture of social conditions in the Patriarchal Age.

So Dr. Cyrus H. Gordon of the Institute for Advanced Study, Princeton, declares in the quarterly journal, *The Biblical Archaeologist*, citing some of the striking discoveries that scholars have made as they decipher clay tablets unearthed at Nuzi, in Mesopotamia.

Poring over quantities of records in cuneiform writing, preserved since 1500 B. C. in the earth at Nuzi, they find instance after instance in which business deals, customs of marriage and inheritance, and legal arguments parallel Old Testament situations of about 2000 to 1500 B. C. The clay tablets were made by Hurrian people, now identified as some of the long-lost Horites named in the Bible.

Archives from Nuzi show why Abraham's heir at first was a slave adopted as his son, Dr. Gordon explains.

"It was a custom at Nuzi," he states, "for childless people to adopt a son to serve them as long as they lived and to bury and mourn for them when they died. In exchange for these services the adopted son was designated as heir."

When Abraham's own son was born, the inheritance shifted—again in accord-

ance with customs recorded at Nuzi.

Spoken blessings of Bible patriarchs, which were as binding as last wills and testaments, were paralleled at Nuzi. Here, the Bible clarifies Nuzi customs.

It would be natural for nomadic patriarchs, who did not resort to writing, to accept the spoken word as binding, explains Dr. Gordon. But it is strange to learn that Nuzi's Horites, who were so given to recording even trivial transactions, would uphold an oral "blessing" in court.

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## PSYCHOLOGY

**Scientists Measure Heat Causing Pain on Own Skins**

**T**HREE scientists submitted themselves to a burning radiation in order to learn more about human pain and reported their results to the Eastern Psychological Association.

The amount of heat that will cause pain remains constant, regardless of the spirits or attitude of the individual, Drs. J. D. Hardy, H. G. Wolff, and H. Goodell, reported to the meeting. Exactly 0.228 (plus or minus .004) gram calories per second per square centimeter is required to evoke pain in three seconds. They made their study for the Russell Sage Institute of Pathology in affiliation with the New York Hospital and Cornell University Medical College.

You feel pain because of nerve pathways, sense structures, and brain receiving mechanisms, entirely separate from those of other senses, they concluded. That the feeling of pain is separate from that of heat, for example, is clearly shown by the fact that acetylsalicylic acid (Aspirin) increases the amount of radiation that is necessary to cause pain, but actually decreases the amount necessary to cause the sensation of heat.

Pain in one part of the body raises the pain threshold, or decreases the sensitivity to pain, in other parts of the body. This finding gives confirmation to the theory that a counter-irritant such as the burning of a mustard plaster may relieve the feeling of pain elsewhere in the body.

The experience of pain probably causes a chemical change in the brain which outlasts the pain itself several hours, these investigators found.

A severe pain of 40 minutes duration preceding the injection of morphine, they observed, will abolish the pain-relieving effect of this drug.

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**IN SCIEN**

## PHYSIOLOGY

**New Science Publication Planned for Scandinavia**

**A**LMOST under the menacing muzzles of Nazi guns, a new venture in scientific journalism is being undertaken for the publication of results of physiological research in the four Scandinavian countries. The new journal will be issued from Stockholm under the editorship of Prof. Göran Liljestrand, and will be known as *Acta Physiologica Scandinavica*.

Announcement of the new venture, published in *Science*, (April 19) contains an appeal to English-writing scientists to send manuscripts for publication and to subscribe, "the more so as we must face the probability that it will be officially or unofficially excluded from Germany."

The statement, which was mailed from Copenhagen before the Blitzkrieg over Denmark and Norway, continues:

"We are well aware of the difficulties. Our countries are being impoverished by the war at an appalling rate and are under a constant menace, but we are determined (even our colleagues in Finland) to carry on the scientific work and to do our best to make this new venture a success."

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## BOTANY

**Floating Liverwort Is Study in Design**

See Front Cover

**N**AURAL courses of events, if simply left to themselves, frequently produce patterns and designs of beauty that the cleverest of human artists cannot approach. Such a design, for example, is shown in the cover picture on this issue of THE SCIENCE NEWS LETTER.

It is a photograph of a floating mat of aquatic liverwort, *Ricciocarpus natans*, made by Prof. William Campbell Steere, of the University of Michigan, and used by him as an illustration in a newly published regional bryological flora. But wouldn't it look lovely, simply transferred directly to green silk?

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# CE FIELDS

## PSYCHOLOGY

## You Can be Hungry in Five Different Ways

**H**UNGER is not one simple pang, Dr. Paul Thomas Young, of the University of Illinois, told the Eastern Psychological Association. There are at least five independently variable hungers: for fat, carbohydrate, protein, salt and water.

If a rat is fed sugar as a reward for running, his activity will gradually decrease as he gets "fed up" with sugar, Dr. Young found. But if wheat is then substituted for the sugar, the rat's activity will increase again. He is hungry for the wheat although well fed on sugar.

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## PSYCHOLOGY

## War Gives Opportunity For "Phantom Limb" Studies

**T**HE WHOLESALÉ maiming of human bodies in the present European conflict is seen by the psychologist as an unfortunate opportunity for study of a curious phenomenon—the "phantom limb."

After the amputation of a leg or an arm (and some 60,000 were cut off in the World War), the patient is likely to suffer from a strong hallucination that the missing limb is there and functioning, moving, itching, or hurting in the usual way, Dr. S. Feldman, of Cornell University, told the Eastern Psychological Association.

The illusion is very strong and clings involuntarily, in one case for as long as 56 years.

The illusion, Dr. Feldman suggests, may be caused, paradoxically, by the very absence of the missing limb, for we are aware of parts of our body only when something goes wrong with them. He thinks that the peculiar experience is something like the feeling one has of a ring of pressure around the head after the hat has been removed. Some movement of the body will initiate the feeling of compensating movement in the missing limb and the phantom returns making its presence keenly felt as does that little man on the stair.

In an experiment described by Dr. Feldman, a phantom fishing rod was created in the fisherman's hand by allowing him to grasp only an amputated rod, a mere handle, and putting a down pull on one end and an up pull on the other. Thus it was shown that perception of the rod extending beyond the hand depends upon the rod's lever action.

The human limb is a balanced system of weights and levers and perception of it depends, Dr. Feldman explained, upon the body's adjustment to the limb's lever action.

Whenever we move, he said, a readjustment takes place involving all the limbs. So long as that proceeds without a hitch, we remain unaware of the process. But when an arm or a leg has been amputated, almost every movement attempted entails a very serious hitch in the readjustment.

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## PHYSICS

## For Best Mayonnaise Put Oil in Underneath

**T**HE best method for the preparation of concentrated oil-in-water emulsions (mayonnaise to you) has been determined by Dr. Irene Sanborn Hall and Mrs. Elsie Halstrom Dawson working at the University of California (*Industrial and Engineering Chemistry*, March).

The trick is to put in the oil beneath the surface of the liquids being whipped together, not by pouring it or dropping it from above. When an air film adheres to the oil the stability and homogeneity of the mayonnaise is less than it is when the film is absent. Here is the recommended method of preparation: (recipe to you) To one large egg yolk which has been thoroughly beaten for about half a minute, approximately 2 large tablespoons of salad oil are added by injecting beneath the surface of the egg yolk. This oil must be added very slowly and the electric beater should be used at its slowest speed. The mixture will be very stiff and more oil should not be added at this time else the emulsion will break. To this mixture 2 1/3 tablespoons vinegar and approximately 3 teaspoons of mixed spices are added. The emulsion is immediately thinned by these but does not break. The rest of the salad oil is then added at a faster rate with the electric beater operating at speed 3. The quantity of oil added will depend upon the consistency desired.

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## PHYSICS

## New Coated Lenses Better Than Costlier Old Ones

**M**ODERATELY priced binoculars, thanks to a new coating for their lenses, can be made as effective as more expensive instruments of the past with untreated lenses on account of a development by Dr. John Strong of the California Institute of Technology, reported by W. C. Miller of Paramount Pictures to the Society of Motion Picture Engineers at Atlantic City.

Paradoxically, by coating lenses with a transparent film of the order of a millionth of an inch thick about 85% of the surface reflection is eliminated and the light no longer reflected goes through the lenses and makes the vision more effective. This reflection - suppressing trick is being used wherever optical glass lenses are being used, in microscopes, cameras, motion picture cameras, motion picture projectors, etc. Motion picture projector lenses treated with the new film show a 50% increase in screen brightness, it is reported.

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## CHEMISTRY

## Liquid Wood Promises New Plastic Industries

**L**IQUID wood, produced by the same kind of methods by which Germany is now creating much of its gasoline from coal, is the newest product of Canadian chemical science. Water-white liquids are obtained which chemists believe will provide the raw materials for a future synthetic organic chemical industry. Prof. Harold Hibbert of McGill University described the new way of processing wood at the meeting of the American Chemical Society.

One of the new liquid woods, Prof. Hibbert explained, "is so closely related to the raw material from which the synthetic fiber nylon is made that it should readily prove possible to obtain from it a new variety of this interesting fiber, the raw material being wood instead of coal."

Liquid woods are made under high pressure by adding hydrogen to the molecules. A similar method can be used with coal to make liquid petroleum in a way first discovered by the German Nobelist, Dr. Friedrich Bergius.

Prof. Hibbert sees in his new liquid wood a way to utilize the tremendous masses of waste wood of the world.

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