

# THE SCIENCE NEWS-LETTER

*A Weekly Summary of Current Science*

EDITED BY WATSON DAVIS

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### CAUSE OF FISHY BUTTER DISCOVERED

The cause and remedy for that "fishy" taste sometimes noted in poor butter has been discovered.

In the past 10 years the losses from this butter malady in the country of Australia alone has been estimated at \$5,000,000.

Working in the dairy laboratory of the University of Wisconsin, under the direction of Dr. H. H. Sommers, Benjamin Smit, a South African student, has ferreted out the cause and supplied a remedy which should prove of inestimable value to the butter industry.

Smit found that a chemical substance known as "trimethylamine" was responsible for all the trouble, thus putting to rout all the old theories that the ice in which the butter was packed for shipment imparted the odor, or that the flavor was due to salting the butter with salt that had been used to pack fish.

In his investigations, the South African chemist discovered that the "fishy" taste occurred in salted butter made from a very acid cream. He attributes the formation of "trimethylamine" to the action of the metals from rusty cream cans absorbed by sour cream. He explains the process like this:

"Lecithin, a chemical substance found in all cream, is changed by the acid from the sour cream to another chemical product known as choline. At this point, the metal cans enter into the series of events. The metal salts act as 'promoters'. They cause the choline to change to trimethylamine, and then you get a fishy taste."

What is the remedy? "Well", says Smith, "since the original source of the whole trouble is the sour cream from which the butter was made, the remedy quite naturally is to get rid of the sour cream."

"If they still want to use sour cream instead of sweet cream for making butter, then they can get rid of the fishy taste by neutralizing the acidity in the sour cream with lime or other chemicals not harmful to man. A further precaution is the pasteurizing of the cream."

Benjamin Smith, explorer in the realms of faulty tastes of butter, is a native of Orange Free State, South Africa. He is supported in his investigations at the University of Wisconsin by his home government. He speaks several languages fluently. For several years he studied in Germany. He came to Wisconsin in 1920 for dairy investigation work.

READING REFERENCE - Hunziker, Otto, Fred. The butter industry. La Grange, Ill. The Author, 1920. McKay, G.L. and Larcen, C. Principles and practice of butter making. 3rd ed. rev. N.Y. John Wiley & Sons. 1922



## (A Chat on Science)

REWARDED FOR WORKING INSIDE THE ATOM

By Dr. Edwin E. Slosson  
Science Service,  
Washington.

Two Englishmen, one Dane and one German, are the winners of Nobel prizes in physics and chemistry for 1921 and 1922. The names just announced from Stockholm are Albert Einstein of Berlin, Neils Bohr of Copenhagen, Frederick Soddy of Oxford and Francis William Aston of Cambridge.

This is a striking illustration of the unity of science in spite of national divisions, for these four scientists have been in unconsidered cooperation trying to solve the same question, the most fundamental problem of the universe, what is the atom made of.

The atom was originally supposed to be the smallest thing possible, the ultimate unit of the universe. The ancient Greeks, who were the first to think about the question, concluded that if you kept on cutting up matter into smaller and smaller pieces you must come at length to something too small to be further subdivided, so they called this smallest of all possible particles the "atom" which means the "uncuttable". The modern chemist took over this old Greek idea to serve for the combining weights of the elements and likewise assumed that the atom was the limit.

But early in the present century, Professor J. J. Thomson of Cambridge, found radioactive matter giving off particles more than a thousand times smaller than the smallest atom, and for this discovery he received the Nobel prize of 1905.

This opened up a new field of research that has been diligently prosecuted ever since, especially by British scientists. Professor Soddy has not only done a large part of this work but he has given a good popular account of what it means in his book, "Science and Life".

Chemists used to suppose that all the atoms of the same element were exactly alike in weight and every other way, wherever it came from, but this fixed idea has been upset. Soddy found, for instance, that lead from thorium ores is eleven per cent. heavier in its atomic weight than lead from uranium ores. Soddy named these different forms "isotopes". What are listed in chemical text books as atomic weights and were supposed to be unvarying turn out to be in many cases averages of several isotopes. Mercury, for instance, which is listed as having an atomic weight of 200.5 consists of six isotopes with weights varying from 197 to 204.

Aston devised an ingenious way of making the atoms record their own atomic weights. He drives a stream of positively charged particles between the poles of a powerful magnet which deflects them in the degree of their relative weights. When the dividing streams strike a photographic plate they leave their tracks and from these the mass of the various isotopes can be determined. Chlorine has always been a puzzle to chemists because its atomic weight figured 35.46 instead of a whole number. But subjected to the scrutiny of Aston's apparatus it is found to be a mixture of two kinds of chlorine atoms, one weighing exactly 35 and the other exactly 37.

The Scandinavian scientists, Bohr, was the first to venture on a picture of the new fashioned atom. We had been accustomed to think of atoms as round hard balls but according to Bohr they are more like miniature solar systems with a positive electrical nucleus in the center and one or more negative electrical particles,



called "electrons", revolving around it at tremendous speed.

Here is where Einstein comes in, for while the planets moving majestically in their orbits obey Newton's law of gravitation, the electrons, which travel almost as fast as light, deviate from Newton's law in proportion to their speed and follow the formula of Einstein instead. According to Newton the mass of a body remains the same whatever its motion. According to Einstein the mass increases with its velocity. The difference between them is inconsiderable for any ordinary speed but when we are dealing with electrons moving at the rate of 100,000 miles a second it becomes important. The public has associated Einstein exclusively with astronomy because his theory has been tested at a time of eclipse but the theory of relativity has applications quite as revolutionary and much more practical in earthly chemistry and physics.

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READING REFERENCE - Atomic structure problem. National Research Council Bulletin no. 14 v. 2 pt. 6. July, 1921. Washington, D.C. Loring, F. H. Atomic theories. N.Y. E.P. Dutton and Co., 1921. Mills, John. Within the Atom. Van Nostrand Co., 1921.

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#### News of the Stars

#### A NEW COMET - BUT YOU CAN'T SEE IT.

By Isabel M. Lewis,  
of the U. S. Naval Observatory.

The new comet recently discovered by Dr. Walter Baade of the Hamburg Observatory will never come near enough to be seen by the naked eye although it will be followed telescopically for some time to come.

Elements of its orbit have now been computed and have been announced by the Harvard College Observatory. They indicate that this newly discovered body is not one of the periodic comets that are due to return to the sun this fall or winter.

Either this new comet has been drawn from interstellar space under the spell of the sun's attraction or it is moving in an elliptical orbit of enormous period, for the form of its orbit is practically that of a parabola.

Its nearest approach to the sun, at perihelion passage, occurred several weeks ago. At that time its distance from the sun was about two hundred million miles and this distance is now increasing as the visitor speeds away once more toward the outer limits of the solar system.

In the telescope this comet appears as a very small, fuzzy object devoid of tail. It is still located in the constellation of Cygnus a few degrees to the northeast of Albirea, the bright star at the foot of the Northern Cross, and it is moving in a southeasterly direction toward the constellation of Pegasus. It is of the tenth magnitude at the present time and so is visible in small telescopes but it will continue to decrease in brightness from now on.

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In order for a comet to become visible to the unaided vision its perihelion point must lie fairly close to the sun and it must be well-placed for observation from the earth. Comets that do not come within the orbit of Mars are rarely visible



to the naked eye.

The pride of the comet, as of the peacock, is in its tail; but for a comet to develop a conspicuous tail a comparatively near approach to the sun is essential, unless the body is exceptionally large and luminous.

A few times in the course of a century comets of exceptional size pass close to the sun and then develop spectacular features that cause them to strike terror to the hearts of the ignorant and superstitious who see in these erratic visitors a sign of ill-omen.

Among civilized nations, however, this fear of comets has practically vanished in the light of scientific knowledge.

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#### NEW MUSEUM INTERPRETS AMERICAN ABORIGINAL LIFE

New Light from all directions breaks in upon the life of the aborigines of the Western World through the study of the vast collections of the Museum of the American Indian, Heye Foundation, New York, which opened free to the general public Nov. 15.

This is the only museum in the world devoted exclusively to the preservation of the records of the races which were living in the Western World when Columbus reached these shores, and contains 1,800,000 specimens. The great problems to which is is dedicated include the unveiling of the mystery of the origin of the so-called Red Men themselves. It is within the range of possibility, in the opinion of George G. Heye, the founder and the director of the Museum, that this goal will be reached. The relatively small staff of the museum is collating its stores of information in the interests of all those of inquiring minds. The public is welcome to view the collections as a means of recreation and education, while at the same time the quest for the secret of origin proceeds.

The building of the Museum of the American Indian is situated in Broadway at 155th street, close to the museums of the Hispanic Society and of the American Numismatic Society and the quarters of the American Geographical Society. The rearing of the whole important group was due primarily to the zeal of Archer M. Huntington, who gave the site for the Museum of the American Indian and as one of its trustees gave liberally to its building fund.

The specimens are shown on three of the four floors and at the top of the building is a commodious work room given to the cleaning and preparation of the collections for display. Although this Museum is devoted to delving into the past, it is conducted in accordance with the principles of modern business efficiency. The installations are in the latest types of cases. Already the storage vaults in the basement are filled, and many of the bulky specimens which cannot be shown at present, are housed in another building which is almost as large as the museum itself.

There is a novel system of installation, introduced for the first time in the United States, through which the public can see what is not in open view, without asking for it. Under many cases, there are drawers which the visitors may pull out and view objects under their glass tops. The students and the research investigators also have access to the collections in storage, all of which have been systematically catalogued by the director himself. There is not a bit of bone or a potsherd in the whole institution which cannot be instantly found for purposes of comparison and research.

If some one should come in with a fanciful theory that the Australian bushmen



and the American Indians had some relationships because both used boomerangs, he would see that such a comparison did not hold good very far. The Indian rabbit stick is not a boomerang, although it looks a little like that famous weapon, because it really does not come back. Fact can thus be quickly separated from fancy by bringing the objects themselves quickly to the study of the investigator.

"The trustees of the Museum", said Mr. Heye, "wish to make it clear, that the objects which are assembled here, are of great practical value, aside from the historical and archaeological interest attaching to them. This is realized, for instance, by many manufacturers of textiles, who have been making use of ideas gained from our collections. They have been sending their designers here even before the Museum was officially open and they inform us that they have found the inspiration of many new designs, which were adapted from what was seen here. We think also, that the textile industry will find data to guide it in dyeing operations, as many of the objects here, centuries old, were dyed with vegetable colors which to all appearances are as fresh as they were when first applied. We believe also, that although modern machinery has outdistanced the Indian craftsmen in speed, that the industries of the twentieth century will find many hints in the synoptic exhibitions of basketry, ceramics and carving which we have installed. In every way the desire to serve the public is uppermost."

The Board of the Museum consists of Harmon W. Hendricks, James B. Ford, F. Kingsbury Curtiss, Archer M. Huntington, Minor C. Keith, Clarence B. Moore, F. K. Seward, and Samuel Riker, Jr.; Mr. Heye, also a trustee, is chairman.

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#### KANSAS FAIRS TO JUDGE BLUERIBBON HUMANS

"From one of the best families" may soon be no mere idle boast of the socially select. Dr. Florence Brown Sherbon of the Kansas State University says that it is planned to hold human stock contests every year, similar to the one recently held at the Kansas Free Fair in Topeka.

The object of these contests is to apply the well known principles of heredity and scientific are which have revolutionized agriculture and stock breeding to the next higher order of creation - the human family. Trophies are offered and every county is urged to enter its best families in the competition.

An examination form has been worked out by a group of experts. This covers inheritance; individual health history; mental, nervous and psychological examination; structural examination, including posture, development and strength; general physical examination; special examination of eyes, ears, nose, throat and teeth; and laboratory examination of urine and blood.

The Kansas classification of human exhibits is as follows:



## Division 366 - Human Stock.

## Class

- 3681 Single Adults; 17 years and above.  
3682 Pair, man, wife, no children.  
3683 Small Family; man, wife, one child.  
3684 Average Family; man, wife, two to four children.  
3685 Large Family; man, wife, five or more children.

Individuals are classified into pre-school children up to six years of age, school children from six to seventeen years, and adults. Young adults of marriageable age will be given a eugenic examination to determine their fitness to marry. Although no medical advice or treatment will be given, each individual is informed as to his condition and advised as to how to improve his health.

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READING REFERENCE - Chapin, H. D. Heredity and child culture. N.Y. E.P. Dutton & Co., 1922. Conklin, E. G. Heredity and environment in the development of men. 4th ed. Princeton, N.J. Princeton Univ. press., 1922.

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## USE OF RIGHT HAND CAME WITH METALS

Where did we get our right hands? Sarafin, eminent French archeologist, has found that righthandedness suddenly developed when man began to use metals at the beginning of what is known as the bronze age. Up until that time, prehistoric man apparently used his left and right with equal proficiency.

These facts have been deduced from careful examination of the sharp-edged flint scrapers of early man found at Moustier. The position of the greatest wear on the edges of these implements shows which hand the worker used most. Throughout the stone ages man was ambidextrous, according to this evidence. But the wear on the instruments of the bronze age points indisputably to the fact that then man began to rely largely on the right hand.

It is believed that this righthandedness may have arisen as a result of some religious idea which attributed baser significance to the left hand. Just as today popular superstition regards the left hand as emblematical of evil and the right hand indicative of good.

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READING REFERENCE- Quinan, C. Study of sinistrality and muscle coordination in musicians, iron workers and others. Archives of Neurology and Psychiatry, vol. 7: 352-60. March, 1922. Brown, H. Let the southpaw alone. Collier 65:22, April 3, 1920.

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Ten Egyptian students are working in factories in the United States with the purpose of carrying back to the land of the pyramids American industrial and technical knowledge and skill.

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It is estimated that \$742,000,000 will be spent in the United States on highway construction during this calendar year.

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## HALF STARVED STEERS MAY STILL BE FATTENED

Steers fed for over three winter months on only one-half normal rations will suffer no permanent damage and can all subsequently be fattened for the market, Dr. Francis G. Benedict and Ernest G. Ritzman of the Nutrition Laboratory of the Carnegie Institution of Washington at Boston, told the National Academy of Sciences at its recent meeting in New York.

Eleven steers were studied intensively by these nutrition specialists, who placed the cattle in a specially constructed respiration chamber and measured and analysed the air, food and other material they consumed and gave off.

Human beings who voluntarily cut down their food consumption and submitted to similar tests furnished the data on which the steer tests were planned. Drs. Benedict and Ritzman also observed that wild animals which must necessarily submit to the inequalities of ration suffer little or no harm.

"Curtailed rations resulted in a distinct loss of nitrogen and fat from the body," said Dr. Benedict, "but the steers recovered their initial state by subsequent feeding with hay, concentrates or pasture."

The experiments are expected to prove of value to cattlemen who are forced to winter stock on very short rations such as has been the case in various parts of the west for the last few years.

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## TRAPPED MINERS USED SAFETY MEASURES

When miners entombed by the Reilly mine explosion at Spangler, Pa., built bulkheads in an attempt to protect themselves from the deadly gases that were created, they followed the instructions that were given them in safety training.

Recent instructions issued by the U. S. Bureau of Mines advised entrapped miners when forced back by gases into a portion of the mine which has comparatively good air, to consider building a bulkhead and collect tools, timber, water and other necessities on the way. If an isolated portion of the mine filled with good air can be found, 10 to 30 men can build a bulkhead in from one to four hours.

A drift, bulkheaded against gas, containing only 9,000 cubic feet of air, kept 29 men alive for 36 hours in a recent fire in a Montana mine, and 6 out of 8 men were supported for 50 hours by 6,500 cubic feet of air, and that amount would have sufficed for all if the air had been circulated by the men moving about.

The Bureau of Mines experts advise the miners to burn only the minimum of lights because they consume oxygen needed by the men. Candle and carbide lamp flames can be used, however, for testing the air, if explosive gases are absent.

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Of more than 50 wood-using industries in this country, matches and toothpicks together hold sixteenth place in amount of wood consumed.

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There are 2,500,000 miles of rural highway in the United States.

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## JAPANESE BECOME MORE YELLOW

Numerous inhabitants of northern Japan are becoming more yellow, not because they are becoming more Mongolian in characteristics, but because of an excessive consumption of squash in the fall of the year.

Dr. H. Hashimoto seems to have proved that this so-called "false jaundice" in his patients is caused by the long continued hearty partaking of this vegetable. The squash contains a yellow coloring matter called carotin which the body eliminates slowly and when overloaded with it the body is unable to excrete it fast enough with the consequence that it colors the skin. The tint becomes particularly noticeable in the whites of the eyes, the palms of the hands, and the soles of the feet.

In Japan within the last year there have been numerous reports of this same disease caused by the consumption of large amounts of carrots which also contain this pigment, carotin, and hence the disease has received the name "carotinemia".

Why is it that a brown cow, eating green grass, gives white milk containing yellow butter? The answer is that the cow is able to destroy the green coloring matter of the grass and unable to destroy another yellow one which colors the butter. It is only a trick of nature, therefore, that our butter is yellow instead of green or that our skins do not turn green after a continued excess of green vegetables in the diet. Were the human organism able to destroy carotin as well as it does other coloring matters, such a disease as carotinemia would never exist.

The class of pigments to which the carotinoids belong has become so important recently that Professor L. S. Palmer of the University of Minnesota Farm School has just completed a book devoted entirely to the treatment of this subject.

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## FIND LITTLE RADIUM IN "RADIOACTIVE" WATERS

The news that patients are rushing to the Isle of Pines, south of Cuba, to bathe - at \$5 per dip - in waters claimed to be strongly radioactive should be considered in the light of a report of the U. S. Bureau of Chemistry giving tests of commercial bottled waters of natural origin. After scientific examination of many foreign and domestic mineral waters for which the claim of radioactivity has been made, these experts find that none of these waters contain enough of the salts of this precious element to answer medicinal requirements.

The sample of water showing the largest quantity of permanent radioactivity was in a sample from a deep well in northern Ohio. It is estimated that the patient would have to drink 1957 gallons of this water a day to get the minimum dosage of two micrograms of radium solution declared acceptable by the American Medical Association.

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Sweden uses 69 gallons of whole milk per capita, Denmark uses 68 gallons, while the United States uses only 43 gallons.

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Tapioca is made from the tuberous root of the cassava plant which had its origin in tropical South America, but which is now also extensively cultivated in tropical Africa and the Malay Archipelago.

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Motor vehicles registered in the United States on July 1 numbered 10,620,471.

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## DEFEAT ANTIVIVISECTION BILL IN CALIFORNIA

Election returns show that the antivivisection measure that was submitted to popular vote at the recent election has been defeated three to one, thus assuring the continuance of scientific and medical research work in California. If this radical bill prohibiting the use of animals in experimentation had passed, its strict enforcement would have prevented protective health work, hampered the enforcement of pure food and drug laws and greatly hindered the agricultural, industrial and commercial progress of the state.

An initiated act to forbid vivisection in Colorado also was defeated by about six to one.

The victory in California not only indicates the present feeling of the state against antivivisection but is proof of a weakening of the fight against medical research as a similar antivivisection measure two years ago was defeated by only two to one.

Bills providing separate boards for licensing chiropractors and osteopaths in California were carried by a small margin. This action is regretted by scientists as it lessens the restrictions and safeguards placed around the practice of medicine.

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## CEMENT BUTTONS APPEAR IN GERMANY

Now buttons are made of cement in Germany. Mechanical filling machines bring a cement-mixture into automatic presses, which press the form and stamp the small holes. Pushed out of the form, the buttons are prepared and left to harden under steam pressure. They are then polished between two wheels. The buttons are then ready to be colored, which is done by spraying similar to the method used in coloring ivory-nut and horn buttons. In spite of the heavy increases in the price of German cement, it is still a very cheap material for this purpose, and the fact that the buttons can be produced automatically in great quantities is likely to make possible the extensive introduction of the cement button.

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Each molecule of the gases of the air in the house on a still day is traveling faster than a rifle bullet and is turned from its course 5,000,000,000 times every second by collisions with other molecules in the air.

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Were it possible for an airplane to fly from the earth to the moon at the rate of 200 miles an hour, it would take seven weeks to make the trip.

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Enterprising Americans have recently established farms to tame the tomatoes which grow wild in the districts of Manuel and Columbus, Mexico.

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More oxygen is to be found in the first six feet of the earth's crust than in all the atmosphere above.

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A clock ticking seconds takes one week, four days and fourteen hours to tick a million times.

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## TABLOID BOOK REVIEWS

RADIO RECEPTION. By Harry J. Marx and Adrian Van Muffling. Published by G. P. Putnam's Sons, 1922, New York City. Contains 92 Illustrations and 38 Hook-Up Diagrams. 241 pp.

Presents the underlying principles of radio reception, going step by step from the simplest forms of apparatus to the most complicated sets. The explanations are simple and complete and special reference is given to practical tuning, radio and audio-frequency amplifications.

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THE WEATHER BUREAU. Service Monographs of the United States Government, No. 9. By Gustavus A. Weber. Publication of the Institute for Government Research. D. Appleton & Co., New York.

An analysis of the organization, activities and history of the U. S. Weather Bureau, written more from the administrative and legal standpoint than the purely scientific. This is one of a series of monographs being issued on various governmental agencies. A bibliography, financial statement and a summary of the laws relating to our weather predicting organization are included in the bibliography.

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## BRIDES MAY GROW OWN ORANGE BLOSSOMS

Orange groves in the dining-room, breakfast fruit direct from tree to plate, and prospective brides raising their own orange blossoms in their own apartments while they fill their hope chests, are some of the possibilities foreseen in the introduction of the Chilean dwarf sweet orange into this country, by the U. S. Department of Agriculture. This orange, called the Capuchin, gives promise of being useful in the United States as a house plant, as well as for dooryards and other places where an ornamental fruiting plant is desired.

It is believed that this small size juicy fruit tree which is being brought from the vicinity of Santiago de Chile, where it is extensively cultivated, must have originated in that section. The trees bear heavy crops of excellent thin-skinned oranges about two inches in diameter.

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## DYED FURS CAUSE SKIN RASH

Nine cases of skin poisoning are reported from Copenhagen, due to the dyes used in coloring rabbit skin to look like beaver. The dye used is known as paraphenylenediamin which is all right in dry weather but when wet by a rain it may produce a severe rash on the skin in contact with the fur. Ladies who wear stoles of imitation "brown beaver" should look out or they will get it in the neck.

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READING REFERENCE - Austin, W. E. Principles and practice of fur dressing and fur dyeing. N.Y. Van Nostrand, 1922. Fierz-David, H.E. Fundamental processes of dye chemistry. N.Y. Van Nostrand, 1921.

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