

GENERAL SCIENCE

Synthetic Future Forecast

Man's scientific future foreseen as bringing clothing made from coal and oil, cures for any human ills and people "kittenish" at 100.

► MANKIND'S SYNTHETIC future forecast by a leading organic chemist, Dr. Roger Adams of the University of Illinois, foresees:

People happy, healthy and kittenish at the age of 100.

Clothing made from coal and oil.

Cure of any human ailment by a variety of drugs and medicinals.

Storage of the sun's energy for man's use.

Fish ranches in fenced-off water, rivaling cattle ranches.

Deliberate molding of people, mentally and physically, by drugs.

Pears, apples and oranges the size of grapefruit.

And even interplanetary football matches and celestially-anchored hot-dog stands along rocket ship routes.

Dr. Adams, principal speaker and retiring president of the American Association for the Advancement of Science meeting, projected at that organization's annual meeting in Philadelphia the chemical discoveries of the past to logical achievements in the future.

Pointing out that a century ago all materials used by man were derived directly from the natural sources of plants, animals and minerals, he explained that the chemist can now determine the atomic patterns in nature's substances and assemble atoms to his own design. Man creates new, better and cheaper compounds.

Already dyes are 99% synthetic, drugs and medicinals are 75% synthetic and natural gums and resins account for only 5% of the 2.3 billion pounds of plastics produced last year in the United States. Half the paint, half the rubber and a fifth of the textiles are synthetic. A billion pounds of synthetic detergents are produced annually, although more soap than that is still consumed.

Titanium is the metal of the future, in Dr. Adams' opinion, since it is the fourth in abundance of all metals and its ores are widespread. It is only half as heavy as steel, ductile in pure form, valuable in alloys, heat and chemical resistant, even to sea water and in jet engines. High price due to difficulty in separating it from its ores is the problem, and Dr. Adams predicts that a cheaper way will be found and it will come into wide use.

Mineral deposits of ores of less common metals, such as copper, lead, zinc, manganese, chromium, tungsten and tin, will be

found deeper in the earth and under lakes and seas, he forecast.

The sea, from which magnesium, bromine and salt are now extracted commercially, will be mined in the future for other elements.

Exhaustion of the supplies of oil, natural gas and coal in the earth's crust has been predicted periodically for three decades, but Dr. Adams observed that still new reserves continue to be discovered, though with greater difficulty and at increased expense. He prophesied that when the time of exhaustion finally arrives scientists will have found substitutes or this kind of fuel will no longer be needed.

Industry has now turned to petroleum for a substantial portion of its chemicals for the synthesis of dyes, drugs, plastics and synthetic fibers. Just a decade or two ago these were made largely from coal tar, the volatile liquids obtained when coal is coked.

Future power for the world will come from the use of solar energy, in Dr. Adams' opinion. The energy that reaches

earth from the sun is over 30,000 times that of all the fuel and water power now used. Algae growth in water which can quintuple the yield of the best land growth may be one successful method of collecting the sun's energy. Replacement of the green chlorophyll of the plant by synthetic dyes and inorganic chemicals in the method of artificial photosynthesis appears promising. Energy absorption by glass shows promise of surpassing the best agricultural capture of sun energy. And phosphorus might be employed to absorb energy from the sun during the day and for illuminating purposes at night, Dr. Adams suggested.

An extraordinary development of synthetic polymers, the chemicals that are giant molecules manufactured from very simple molecules, was predicted, added to the amazing plastics and fibers now commercially available or about to come out of laboratories.

The future will see, according to Dr. Adams, transparent plastics that will not gradually discolor and the surface of which will not scratch or craze, finishes for wood and metals which will remain durable for long periods of time in the presence of sunlight and salt air, transparent, flexible, waterproof and moistureproof film which will be as strong as desired.

A rayon will come on the market with a basic structure so modified that it has strength when wet equal to that of natural fibers.



JET-PROPELLED LABORATORY—The nation's first jet-propelled "laboratory," now placed in operation for the high-speed flight testing of turbo-jet engines, is shown here in flight. The test engine is housed in the nacelle under the bomb bay. The plane is equipped with hundreds of special instruments which will record every phase of the test engine's performance in flight.

The chemists will not be able to find a synthetic fiber that will dry rapidly like nylon and at the same time allow moisture to penetrate it like cotton, Dr. Adams explained, because these two properties are incompatible.

But he predicted that synthetic fibers will replace the natural fibers, with half the wool now consumed substituted by synthetics within 10 to 20 years, and this discovery of strong, durable, moisture-absorbing synthetic fibers to replace cotton. The cotton-replacing plastics will replace natural leathers for shoe tops, for which artificial leathers are now unsatisfactory because they do not allow moisture of the feet to penetrate and escape.

Food crops, thanks to chemical modification of plant metabolism, will have the plant size dwarfed and the fruit, kernels or ears are larger, Dr. Adams foresees. Chemicals that speed the growth of plants will be improved so that pears, apples and oranges will be the size of grapefruit.

The ultimate in insecticides, visualized by Dr. Adams, is a chemical, repellent to all insects and mites, innocuous to the plant and to higher animals, which when sprayed on the leaves will be absorbed and completely translocated by means of the plant juices. To feed plants, he suggests that a combination of minerals and fertilizer be absorbed through the leaves instead of fertilizing the soil.

Chemicals will be available in the future to sterilize the soil completely toward grasses and weeds but not toward the desired crop.

Oceans will furnish more of the world's food in the future, Dr. Adams believes, and there will be a more systematic fishing industry than at present with fish ranches, large water areas fenced off and handled like cattle ranches. Marine plants for food, fuel or chemical use will be grown and harvested like land crops.

Chemicals to kill the viruses that cause such stubborn diseases as colds, poliomyelitis, meningitis, influenza, virus pneumonia, mumps and measles will be found in the next decades, Dr. Adams predicted. The organic chemist will succeed in providing products which will eliminate susceptibilities toward the degenerative diseases, such as cancer, heart disease, and arteriosclerosis.

Since hormones and other drugs affect the mental attitude as well as the physical well-being of people, Dr. Adams forecast that the future may bring us a series of drugs which will permit deliberate molding of a person, mentally and physically. Control of such chemicals would be a great public problem. They would present dire potentialities in the hands of an unscrupulous dictator.

As to interplanetary rocket flights, Dr. Adams considered predictions in this field outside his specialization of chemistry. But he did call attention to the need of dining compartments of enormous size for a trip to Jupiter that would need 666 days, even if food concentrates were used and people require less food under gravity-free conditions. Perhaps there will be celestially-anchored hot-dog stands along the way. But, in his opinion, it will be many, many decades before rocket ships are built that will accelerate to the 25,000 miles an hour required to escape from earth's gravity.

Science News Letter, January 5, 1952

ASTRONOMY

Star Light Changed By Cosmic Iron Dust

➤ LIGHT FROM many of the stars in the constellation of Aquila, the eagle, vibrates slightly more in one direction than in another.

Light from at least two-thirds of the 300 faint stars within a half square degree area

in Aquila is polarized to at least 1.5%, Joseph L. Gossner of the U. S. Naval Observatory told members of the American Astronomical Society meeting in Cleveland.

These stars are so far from the earth that light which started from them some 1,000 or more years ago is just now reaching our planet. At some time in its journey the light passed through a dust cloud containing many iron particles which polarized it. Light from stars in this constellation that are closer to us has not been polarized.

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