that the action of the enzymes was to break down complex proteins into those the body could use. Now enzymes take on the new role of permitting—indeed determining—the building up of body proteins.

Sequence of Reactions

The mechanism of creating the complex proteins, said Dr. Bergmann, now appears to be a sequence of many, many reactions wherein a simple protein is turned, by specific enzymes, into a more complex protein.

The whole chain of reactions therefore goes on until finally a protein is created which does not have present the specific enzyme that can build it higher, and there the chain stops.

"Thus the specificity of an individual enzyme predetermines the molecular pattern of the protein synthesized by this enzyme. The numerical rules governing a protein molecule have their basis in the specificity of the enzyme involved," declared Dr. Bergmann. "Here we arrive, for the first time, at a physicochemical concept of the predetermination which is an inherent attribute of many phenomena of life.

Set of Chemical Tools

"The question has frequently been discussed whether hereditary phenomena are connected with, and explained by, a transmission of individual proteins and in particular, whether the chromosomes are proteins. On the basis of the conclusion which we have reached I think you will agree that the essential substances transmitted from one generation of cells to the next, from parents to children, must be enzymes and that they have to be enzymes with the capability of synthesizing individual proteins by predetermined sequences of specific reactions."

What Dr. Bergmann is saying here—to use an analogy—is that heredity consists of passing on, from one generation to another, a set of chemical tools which permit the offspring to fashion the proteins they will encounter in life in only certain ways. These chemical tools, of course, are specific sets of enzymes.

If you, for example, have red hair it means that heredity handed on to you the enzymes which permit your body to change the food you eat into proteins that occur in red hair pigment. Dark-haired people have a different set of enzyme tools which enables them to fashion dark hair pigment out of the same foods which you both eat. Similar examples can be found in the color of the eyes and other physical characteristics.

"Will we ever be able to copy in life the synthesis of natural proteins?" asks Dr. Bergman. "I do not know whether we shall succeed sooner or later (probably later) in synthesizing proteins without the cooperation of living cells and only with the aid of enzymes. However, I am doubtful how much a synthesis would add to our understanding of protein chemistry and life phenomena. At the present moment it seems to me to be of still greater significance that we have available methods to study the compositions and transformations of proteins and the specific action of protein-creating enzymes with the same precision as in the case of simpler substances and simpler phenomena."

Science News Letter, February 12, 1938

PSYCHOLOGY

More Intelligent Men Not Always Best Citizens

AMONG humans, a certain amount of intelligence appears to be essential to good citizenship. The idiot cannot become a satisfactory member of the social group.

At the other end of the intellectual scale, the genius contributes greatly to social life. But in between these two extremes, the level of intelligence does not seem to parallel the level of socialization.

Human social organization depends upon intelligence and not upon instinct as does the social life of ants or termites, it is pointed out by a psychologist, Dr. F. L. Wells of Harvard, but, he explains, beyond that certain minimum needed to learn how to get on in the world, a higher average intelligence does not necessarily mean less crime or less anti-social conduct.

Modern technological developments have made possible the automobile, the telephone, and the airplane serving to bring men closer together. But they have also made possible the instruments of modern warfare and crime. The automobile may serve as a weapon of crime as well as a socializing influence.

Against Restraints

The individual who is mentally alert and of inventive mind is likely to chafe against the restraints of society and discover means of escaping them.

The more mentally gifted, if also possessed of a lust for power, are apt to exploit the less intelligent members of the community.

Humanity would benefit most, Dr. Wells believes, not from a raising of the average of the intelligence, but from a more equable distribution of all human traits with fewer extremes in ability to adjust to the general pattern of life.

Men need ability to restrain and sublimate their emotional and animal desires. With a proper balance between natural drives, intelligence, and sublimation, great individuals and great communities can develop.

If a people were under a large-scale administration equal in competence to that of a well-run hospital, Dr. Wells declared, it should be possible to attain a harmony of individual difference, liberty, and order necessary for the mental hygiene of society.

Science News Letter, February 12, 1938

ARCHAEOLOGY

Indian Chiefs Protest Uncivilized Pot-Hunting

INDIAN CHIEFS don't like the robbing of Indian graves by white men. It's "uncivilized."

In a protest, drawn up in formal fashion, a group of Seneca chiefs have expressed forthright ideas on what is proper in archaeology, and what is not.

Summed up briefly, they approve of scientific excavations by trained experts, who are seeking prehistory.

They do not approve of ignorant and commercial relic hunting in their state, which happens to be New York.

The Indians themselves put it this way: "We have no objection to the scientific examinations of qualified museums known to and approved by the National Research Council or of the Society for American Archaeology, or to individual scientists who keep careful records of a type having the approval of scientific bodies. Methodical and purposeful work adds to the sum of the world's knowledge, but the grave robbery of 'pot-hunters' and relic diggers is repugnant to every person understanding

the value of the material history that our ancestors wrote into the soil of Mother Earth."

The Senecas have even stronger words to add about commercial relic hunters, who dig at Indian village sites and graves: "We protest that this work has no justification, that it is robbing America of the only remaining source of her prehistory, and is an uncivilized affront to the memory of our forefathers."

The Neighborhood Indian Society of Rochester, which adopted the resolution, is using it to petition state officials of New York to enact laws. They want laws forbidding excavations by "untrained, unregistered, and unlicensed persons."

Archaeologists who have spent years studying their specialized science in universities, would echo the Seneca protest. They themselves have protested against the wrecking of Indian sites by unskilled diggers. Any site once damaged becomes a blurred or unreadable page of our ancient history, lost forever.

Science News Letter, February 12, 1938

GLORY THAT WAS NOT GREECE

Asia Minor did not have to await the coming of the Greeks to show forth beauty in stone. The Hittites in their day were a folk of high culture, as witness this exquisitely carved column base, found in the porch of a Hittite palace of the eighth century B. C. at Tell Tainat in North Syria by an expedition of the Oriental Institute of Chicago.

PHARMACY

Ephedra, Valuable Drug, Can be Grown on Badlands

500 Acres of Now Worthless Soil Able to Produce Crop For Whole American Market if War Stops Chinese Supply

THE DAKOTA Badlands may never have been good for much before, but if fighting continues in China, this unproductive region of our own country may get a chance to redeem its reputation by making the United States independent of outside sources of an important medicine.

This medicine is ephedrine, valuable aid to asthma and hay fever sufferers and important ingredient of the solutions you drop or spray into your nose to relieve the miserable congestion and stuffiness of a cold. Ephedrine is obtained from the Chinese plant, ma huang or ephedra. In 1935 the United States imported 2,000,000 pounds of the little green ephedra stems for making nose drops, eye drops, capsules to relieve low blood pressure and various other medical uses. The next year the crop was bad and imports fell to 1,000,000 pounds. Only 700,000 pounds were obtained during the first ten months of 1937.

Manufacturers Worried

Drug manufacturers, worried over possibility of even worse reduction in the supply of ephedra, saw hope in the announcement by the U. S. Bureau of Foreign and Domestic Commerce that three German firms are manufacturing synthetic ephedrine.

Even better seems a report to the American Pharmaceutical Association which forecasts complete independence of outside sources of ephedrine. The ephedra plant itself has been cultivated successfully in the medicinal plant garden of the South Dakota State College at Brookings. The men responsible for this achievement are Dr. B. V. Christensen, director of the University of Florida School of Pharmacy, and Prof. Lovell D. Hiner of South Dakota State College.

The plants were grown from seeds obtained from the Peking Union Medical College and were first cultivated in the South Dakota college's greenhouses. Later they were transplanted to the medicinal plant garden where they survived the "ghastly black blizzard," when the average annual rainfall was not more than a dozen inches, and the fierce winter of 1935-1936, pronounced the coldest for South Dakota in 50 years. Because the plants survived the drought so well, a test planting was made in the Badlands section of the state. The plants grew and were healthy even in this unproductive region, and although smaller than those in the college's garden, they yielded just as much of the drug, ephedrine.

At first the ephedrine yield—pharmacologists call it assay—of the plants was not very high but further cultivation has brought the assay up to that of the imported Chinese ephedra stems.

Emergency Production

Cultivation has not yet reached a commercial scale but Dr. Hiner has reported that several hundred pounds can now be cut from American-grown ephedra plants, and that "in case of emergency, ephedra of fair quality could be produced in South Dakota."

The plant itself is a low, bushy growth that appears to be all stems. Actually the leaves are there but have degenerated into scales. The medicine is obtained from the stems. The plant spreads something like grass by sending out underground stems or roots. In the course of two years one plant will grow to cover an area the size of a bushel basket. Dr. Hiner was able to obtain about two tons of ephedra from an acre, which means that the entire supply for the United States could be grown on some 500 acres of Dakota Badlands.

Labor Costs High

Cultivation of ephedra might be a successful venture during war or emergency that threatens to cut off outside supplies. At other times, however, it would not be successful financially. Officials of the American Pharmaceutical Association point out that in this case, as in the case of many other medicinal plants, the cost of labor would make American cultivation unprofitable if the plants could be obtained from other countries.

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