rhythm of breathing as well as for rhythm in other body activities.

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PHYSIOLOGY

Dr. Karl Landsteiner—Antibodies and Sneezes

THE SNEEZES of the hayfever sufferer, the hives of the person who is upset by eating fish, the rash or more severe reaction that follows taking a drug in persons hypersensitive to it, are all signs of a "very comprehensive and remarkable biologic phenomenon," Dr. Karl Landsteiner of the Rockefeller Institute for Medical Research told fellow scientists at the Harvard Tercentenary celebration.

Best known for his discovery of the blood groups, Dr. Landsteiner has investigated other features of blood, such as its mysterious antibodies which fight invading disease germs. From that he has branched over into a study of the body mechanisms for resisting other foreign substances, particularly chemicals taken into the body as drugs.

The antibodies, Dr. Landsteiner believes, play a defensive role not only against disease germs but in allergies, such as hayfever, and in drug idiosyncrasies, although scientists have not yet been able to demonstrate their presence in all cases of these conditions.

By means of these antibodies, circulating in the blood or fixed in body tissues, the body adapts itself to various chemical agents.

"If successful, this mechanism guards against infectious disease," Dr. Landsteiner said, "but when it miscarries it induces sensitivity to exceedingly small quantities of proteins or simple chemical compounds."

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CHEMISTRY

Prof. August Krogh—Isotopes a Tool

CHEMICAL isotopes, the seldom-met "twins" of ordinary atoms, are being used in Denmark to trace the course of water, minerals, and organic substances through the physiological processes of plant and animal bodies. Some of the results were revealed for the first time, by Prof. August Krogh of the University of Copenhagen, speaking before the Harvard Tercentenary Conference.

An isotope might be defined as a form of a chemical element that behaves chemically like its better known twin, but is different enough on the physical side to permit it to be detected by suitable physical means. Thus, it is possible to produce a form of phosphorus distinguished by being radioactive, whereas ordinary phosphorus is not. Or, the famous heavy hydrogen is twice as heavy as ordinary hydrogen, so that heavy water containing it can be detected by weighing it.

Prof. Krogh and his associates have been giving isotopes of various nutrient elements to plants and animals, and afterwards analyzing the tissues from various parts, to find out where the isotopes went. They found, among other things, that radioactive phosphorus traveled around plants a good deal more rapidly than had previously been thought to be the case. Also, radioactive phosphorus turned up in the dentine of teeth, which has always been thought to be pretty well cut off from the rest of the body.

Another series of experiments, using heavy water, showed that water gets around through the body of an animal quite rapidly, once it enters, and that any given quantity of water comes to be distributed pretty evenly throughout the whole body. Water-dwelling animal forms were shown to be capable of absorbing water through their gills, and also through their skins when these were not too thick.

Prof. Krogh stated his belief that of all types of isotopes, the radioactive ones would prove most useful in physiological studies because it is so easy to detect them. He said that powerful apparatus is now being erected in his laboratory for the preparation of new kinds of radioactive elements.

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CHEMISTRY

Prof. The Svedberg—The Protein Molecule

FROM another Baltic country came a report on investigations into the size and makeup of the protein molecule, among the largest and most complex of atomic aggregates. Prof. The Svedberg of the University of Upsala, Sweden, told of methods and instruments evolved in his laboratory, which include an ultra-centrifuge that can whirl solutions at a rate of from sixty to seventy thousand revolutions a minute. This separates out intimately mixed things, as cream is separated from milk in a cream separator, and permits physical and chemical examinations to be made of the parts.

Prof. Svedberg's results confirm the idea previously held, that protein molecules are relatively enormous, containing tens or even hundreds of thousands of atoms each, as against a mere half-dozen or dozen in common inorganic compounds, or a few scores or hundreds in the simpler organic molecules. Also, it was found that these huge molecules were not built up single atom by atom, but that whole blocks of atoms were manipulated at a time. That is, they were not put together a brick at a time, like a mason erecting a wall, but more like bolting together the whole sides of a knock-down house.

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MEDICINE

Dr. Kiyoshi Shiga—Dysentery Unconquered

BACILLARY dysentery, one of the great health hazards of tropical regions, which occasionally reaches into more northern parts, is still unconquered, scientists at Harvard's Tercentenary were told by Dr. Kiyoshi Shiga of the Kitasato Institute, Tokyo.

Dr. Shiga more than thirty years ago discovered the bacillus or germ that causes dysentery. Now he told with keen regret how, in spite of this discovery and a lifetime of subsequent research, the disease still defies the efforts of himself and other scientists to wipe it out.

In the years that passed since the epochal discovery of Dr. Shiga's youth, much new knowledge has been gained about the disease, he related. Almost a hundred different strains of germs that cause the disease have been discovered. The poison produced by the germ has been studied and found to rank next to the toxins of tetanus (lockjaw) and diphtheria in strength. An antitoxin has been prepared and found effective in mild and medium cases, but less effective in severe cases.

Carriers of the bacillus present an important problem, as they do in typhoid fever. Carriers of one type of dysentery bacillus have decreased, but carriers of another type have increased. The decrease Dr. Shiga attributes to the fact that another bacillus normally present in the intestinal tract has been able to overcome the Shiga type of dysentery bacillus, but has become accustomed to living side by side with the other type which consequently still flourishes.

"Suppresssion of carriers may be an important problem but suppression of the cases is more feasible," Dr. Shiga