SCIENCE NEWS

THE COMPOSITION OF ANTIMONY

Science Service

ANTIMONY, the brittle metal used by printers to impart hardness to type, seems to be a mixture of metals, and not a single chemical element, as the books tell us. The ingredients are the so-called "isotopes," which are identical in chemical behavior, although they differ in a few physical properties.

According to data from the Cambridge metallurgical laboratory, antimony from Hungary is apparently composed of atoms which are lighter than those in samples received from Bolivia. The difference is only one per cent., however, a quantity which never will trouble the printer, but which provokes the analytical chemist who can not make his antimony analyses agree with published professional standards. The atomic weight value obtained in preliminary work with Hungarian antimony is 121.1, and with Bolivian metal 122.4.

Ages ago, when chaos was becoming cosmos, most of the twin and triplet elements, or isotopes, were very intimately mixed. Chlorine, for example, is undoubtedly a mixture of substances; but so thorough was the mixing process that chlorine from all parts of the world now has a constant composition. Thus chlorine for all practical purposes plays the rôle of a single element. Antimony, however, does not seem to have been so carefully mixed in the melting pot.

RUBBER AND WATER

Science Service

A METHOD of dispersing rubber in water in such a way that it can be used for coating fabrics, making paper, treating leather, doctoring trees, making chewing gum and many other articles has been patented in Italy by William Beach Pratt as a result of work at his laboratory at Wellesley, Mass.

Crude or coagulated rubber is brought into suspension by the new process with such completeness that the dispersed solution is substantially the same as the original rubber latex from which the crude rubber is coagulated.

Last year several rubber factories began to import and use rubber as liquid latex rather than in the solid form, claiming that it is possible to use it more economically and with better results for coating fabrics. The new process developed by the Pratt laboratory is claimed to have the advantages of the latex without the extra cost of transportation due to its liquid form.

It is possible to compound with the crude rubber before dispersion any desired fillers, oils, sulphur, accelerating agents and similar compounds. This allows vulcanization of such rubber compounds. Inflammable, dangerous and costly solvents, such as benzol, now used in making solutions of rubber, are not needed in the new process, but soaps and glues are introduced into the spaces between the rubber particles and cause small globules of rubber to become dispersed in the water.

Among the ways in which the new water dispersed rubber can be used are: It can be spread upon fabrics, which, after removal of the water, can be used in the manufacture of tires, hose, rain coats and vehicle tops, or boots and water proof garments. It can replace the ordinary rubber cement made with organic solvents.

With additions of oils and waxes, or alone, it can be mixed with pulp in making paper or can be spread on the surface of cardboard or paper, and then vulcanized. Leather can be filled or coated with it. Wounds in trees can be covered with a paste made of the new rubber compounded with substances toxic to insects. It can be used as binder for ground leather, cork, asbestos, cotton and other materials and the compound applied with a trowel. A rubber chewing gum can be made by incorporating with the dispersed rubber sugars, waxes, gums and flavors.

SEASONING LUMBER

Science Service

ARTIFICIAL seasoning of lumber so effective that within three days after a tree has been felled in the forest its wood is made ready for the finest cabinet work has just been perfected in Sweden. The process is known as Forselle vacuum drying, and consists essentially of running logs into a large cylinder in which a vacuum is created by pumping.

Logs fresh from the stump are placed in the Forselle cylinder, which accommodates about 3,600 board feet at a time. A centrifugal pump is then brought into action, which gradually creates a vacuum drawing off the moisture evenly and simultaneously both from the heart wood and the sap wood of the logs. Since the escaping moisture keeps the surface of the log wet during the process no cracks are formed, and, indeed, already existing cracks are closed up. Experts who have observed the tests report that after 48 hours of drying most of the samples were ready for immediate use. Incidentally there is no weakening of the fibers in spite of the high rapidity of drying.

The practical value of the Forselle process is evident in all work where time is an important factor, as in the construction of air craft or naval vessels. It also eliminates the cost of storage, piling, insurance, etc., which accumulate when timber has to be kept in the yard during long periods of time.

Drying plants of this type are to be installed within the near future in Finland and Japan as well as Sweden. The present cost of operation is estimated at a little more than $1.00 per thousand board feet.

FAKE PSYCHOLOGISTS

Science Service

CHARGING that many lecturers and so-called schools are exploiting unscientific beliefs and practices under the guise of psychology, the National Committee for Mental

Hygiene has issued a warning against fake psychologists.

"Much that is to-day called 'psychology' is misnamed," the committee says. "Perhaps no word is more abused. It should not be confused with phrenology, spiritism, faith-healing, self-improvement by magic, psychic phenomena and the like. Psychology is the science of human behavior.

"As often happens in the development of a new science, many people have seized upon the opportunity to gain support for their unscientific beliefs and practices. The exploiters of the present interest in psychology may be roughly grouped as follows:

"First, there are certain lecturers who are going about the country organizing classes or advertising 'self-improvement' courses in the name of psychology.

"The second group consists of those correspondence courses that make extravagant claims for developing the mind and the will. These courses, whose charges, we understand, run from $30 to over $100, are alleged to be doing a land-office business.

"Then there are special book publishers, who write and issue sets of books, ranging in price from $10 to $30 a set, and some magazines purporting to discuss psychological subjects, which have a wide circulation.

"It is conceivable that some, at least, of the 'students' of such courses are inadequate personalities, who, from physical or other causes, are unable to compete successfully with their fellow-men, and see in these courses, lectures and literature a cure-all for their troubles. In some instances no harm may result. But when a false sense of security postpones needed medical or psychiatric treatment, disaster is sure to follow. For these persons to resort to courses, lectures and literature would seem about as effective as for them to carry a horse-chestnut, rabbit's foot or other charm in their pockets."

THE ISOLATION OF VITAMINS

Science Service

ONE of the vitamins, the mysterious and unisolated food factors, has at last been obtained in a state of such purity that its early identification may be anticipated with certainty.

Dr. Atherton Seidell, chemist at the U. S. Public Health Service Hygienic Laboratory at Washington, has announced that he has been able to prepare from brewer's yeast a definitely crystalline compound that has the antineuritic properties of vitamin B.

He used fuller's earth to absorb from a solution of yeast the active vitamin principle and after precipitating with picric acid and subjecting this product to many solutions and crystallizations, pale yellow, transparent, crystalline flakes were obtained that in doses as minute as two milligrams a day protect pigeons from the effects that follow lack of vitamin B.

When a chemist obtains a crystalline substance it is usually only a matter of time until its identity can be established and its true chemical structure determined. With this information its synthesis frequently becomes possible.

"There has been a tendency in the past to regard vitamins as substances comparable with enzymes and toxines in their stability and marked activity of infinitesimal doses," said Dr. Seidell. "Acceptation of this view has, no doubt, deterred many from work on this problem, since the possibility of isolating substances of the nature of enzymes is very remote. It is distinctly encouraging, therefore, to obtain evidence that the antineuritic vitamin performs its function in doses of convenient magnitude and withstands ordinary laboratory manipulations. Assuming a satisfactory demonstration of these points, the final solution of the true chemical nature of vitamins may be anticipated with certainty."

BODILY BUILD AND DISEASE

(Science Service)

DIAGNOSIS of disease from the physical build of the patient may become a reality if the conclusions reached by Drs. George Draper, Halbert L. Dunn and David Seegal of the Presbyterian Hospital, New York, become generally confirmed. The "consumptive build" or the "bilious countenance" may be accepted as scientific realities.

Measurements made of 50 patients with gall-bladder disease, and of 39 patients with ulcers of the stomach or intestines have shown that those who suffer from one complaint have on the average a different physical build from those who suffer from the other. The diagnoses in all these cases were confirmed at operation. About 85 separate measurements were made on each individual.

Gall-bladder patients were generally heavier for their height than those afflicted with ulcer, had greater chest depth, a wider and squarer upper jaw, and showed other marked differences. The method offers confirmatory evidence in cases of doubtful diagnosis.

The physicians who made these investigations do not believe that a given physiological form "in itself predisposes to or actually causes disease," but merely that physical features express inherited influences and predispositions. Aside from their value in finding out what is the matter with sick people, these measurements made upon well persons will be a guide to them as to what diseases they have particular reason to guard against.

These first reported scientific measurements were made of the new "Constitution Clinic" of the Presbyterian Hospital which has been established for the purpose of finding out the relations betwen the bodily structure, the body functions, the mental processes, and immunity and susceptibility to disease.

THE EFFICIENCY OF PROOFREADERS

Science Service

A PROOFREADER overlooks a greater number of mistakes on the right, vertical portion of a proof sheet than he does on the left, according to Dr. H. R. Crosland, assistant professor of psychology at the University of Oregon, who has just completed a two years' investigation into the causes of errors in proofreading. This is claimed to be the first thorough-going scientific investigation of its kind.

Dr. Crosland also discovered that there will be a

greater number of errors overlooked in the lower half of the sheet than in the upper half. This is caused, he explained, by the tendency of the proofreader to become absorbed in what he is reading as he nears the end of the proof sheet, and also by fatigue.

Proofreaders show no appreciable improvement in accuracy as the result of practice and experience, according to the investigator. This was attributed by him to the fact that in reading a line of type the eye passes from one fixation pause to another and does not directly focus on every character in that line. The length of fixation pauses, the number of letters spaces taken in by the eye during each pause, and the number of pauses per line, are all the result of heredity and very early environment. Therefore it follows that practice has little to do with the proofreader's ability to catch mistakes in printed matter.

Dr. Crosland found that it is not necessary to spend an undue length of time on a proof. "In fact, little kinship exists between the lenth of time spent in reading a proof sheet and the accuracy obtained by the reader," continued Dr. Crosland. "Indeed, there is evidence to show that the practiced proofreader takes too long to do his work."

The investigator believes the use of his tests will be of practical vocational value. In the course of his investigations he found he was able to predict with a high degree of accuracy the competitive rating which a given subject would make in a given series of the test by considering his record in the series already taken.

Thirty persons, consisting of journalism teachers, all of whom had previous newspaper experience, printers, and laymen were engaged in the experiment. Twenty proof sheets were read by each person, an interval of approximately one week elapsing between the reading of each sheet. The proof sheets were grouped in four series and each of the four series was read with a certain purpose in mind. Readers were instructed to read for (1) accuracy, (2) for speed, (3) for meaning, and (4) with a stated time limit.

Thirteen em proof sheets, the usual newspaper column, were employed in the tests.

AMERICAN MEDICAL SCHOOLS

Science Service

GREATER progress in medical education has taken place in America than in other countries during the past fifteen years, Abraham Flexner, secretary of the General Education Board, said in an address before the Annual Congress on Medical Education in Chicago. But conditions are still far from entirely satisfactory, his survey indicated.

"Relatively viewed, progress in this country has been enormously greater than anywhere else," Mr. Flexner said. "It affects every item that goes to make up a medical school. There were one hundred fifty-odd schools, so called, in this country fifteen years ago. That number has been practically cut in half. The weak schools in all sections of the country, particularly in the South and West, where they were most abundant, have been almost wholly eliminated."

Equipment, facilities, teaching and standards of admission have been improved, but he attributed the relatively quicker and greater progress to the fact that we had further to go than other countries.

The differences between what was good and what was bad were in America ten years ago far more marked than was the case in any other country of the Western World. Things were so excellent in Germany, Denmark and Switzerland that very great progress was not to be expected and could not take place in so brief a term. In England and France, on the other hand, great general progress would have been possible, but it was not made. America, worse off than any of them, bestirred itself actively.

Discussing the requirement of four years of high school education followed by two years of college work for entrance to medical schools, Mr. Flexner pointed out that the great differences between high schools and colleges in various parts of the country make such requirements practically meaningless, as compared with the more definite standard indicated by the certificate of graduation from the German Gymnasium, a French Lycée, or the honors course of an English secondary school.

Our student body, is, as a whole, at a higher level of maturity and training than was the student body ten or fifteen years ago because fifteen years ago there was no general requirement even in name. But it is still much more heterogeneous than that of any other nation in the world.

Mr. Flexner urged better faculty and facilities for clinical teaching and a return to the old habit of sending our medical men to Europe for a couple of years of medical study and research in European centers.

ITEMS

(Science Service)

THE new expedition to conquer Mt. Everest, the highest peak of the Himalayas and the highest mountain in the world, will leave Darjeeling in northern India towards the end of March. It will be commanded by General C. G. Bruce, who commanded the expedition that almost achieved the goal last year, being forced to turn back when only 2,000 feet below the summit. More than half of the expedition will be composed of those who took part in the effort last year. A new type of oxygen apparatus for use above 20,000 feet will be used. The final attempt on the summit will be made toward the end of May.

A LARGE deposit of soapstone has been found on the shores and islands of Trap Lake in the Kenora district, about 200 miles east of Winnipeg. The deposit is remarkable in that it is of great extent and because it outcrops from 8 to 15 feet above the surface. It is believed that there are more than 1,000,000 cubic feet of the material above the water level. Transportation facilities are excellent. Soapstone is coming into wide use, owing to its capacity for absorbing heat. It is employed in fireless cookers and electric irons. Because of its resistance to acids it is largely used in the manufacture of laboratory and sanitary fittings.